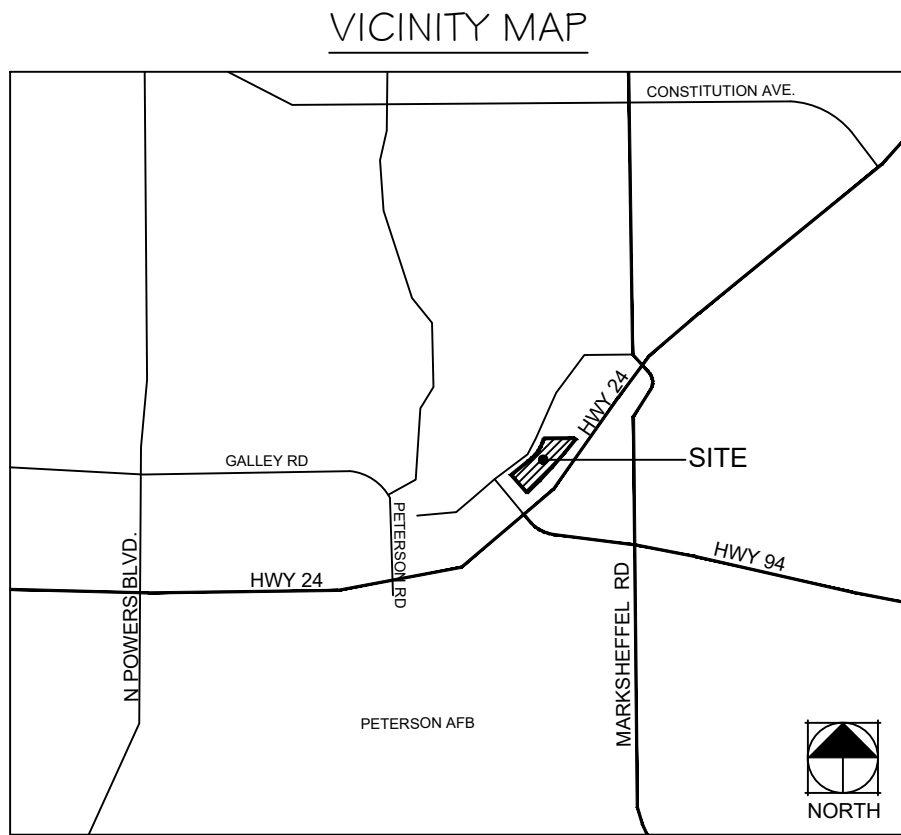


MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN  
LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO



LEGAL DESCRIPTION:

THAT PORTION OF LAND LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8 TOWNSHIP 14 SOUTH,  
RANGE 65 WEST, OF THE 6TH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO:

BEING, TRACT A, 24/94 BUSINESS PARK FILING NO 1;

AND

TRACT 1, MEADOWBROOK CROSSING FILING NO 1, AS AMENDED BY AFFIDAVIT OF CORRECTION REC #218068301;

AND

THAT TRACT OF LAND LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8 TOWNSHIP 14 SOUTH, RANGE 65 WEST, OF THE 6TH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO:

COMMENCING AT A POINT ON THE NORTH BOUNDARY LINE OF THE SOUTHEAST 1/4 OF SAID SECTION 8; BEARINGS ARE BASED ON SAID NORTH BOUNDARY LINE, 389°33'00"E, A DISTANCE OF 2023.0 FEET; THENCE S89°33'00"E, A DISTANCE OF 598.6 FEET; THENCE LEAVING SAID NORTH LINE, S33°35'00"W, A DISTANCE OF 508.5 FEET; THENCE, S56°25'00"E, A DISTANCE OF 30.0; THENCE S37°48'00"W, A DISTANCE OF 375.0 FEET; THENCE, S17°06'00"W, A DISTANCE OF 148.2 FEET; THENCE N02°16'00"W, A DISTANCE OF 417.0 FEET; THENCE N06°38'00"E, A DISTANCE OF 358.0 FEET; THENCE N17°04'00"E, A DISTANCE OF 15.7 FEET, TO THE POINT OF BEGINNING.

EXCEPT THAT PT PLATTED TO CLAREMONT BUSINESS PARK FIL NO 2, AND THAT PART CONVEYED TO D.O.T. FOR R/W BY REC # 205077959.

SAID DESCRIPTION TO CONTAIN 8.01 ACRES, MORE OR LESS.

DEVELOPMENT STANDARDS AND GUIDELINES  
RESIDENTIAL USE STANDARDS:

1. PRINCIPAL USE(S) SHALL BE LIMITED TO ONE (1) SINGLE-FAMILY RESIDENCE PER LOT.
2. PERMITTED USES WITHIN THE MEADOWBROOK PARK PUD INCLUDE: SINGLE FAMILY RESIDENTIAL, MAIL KIOSKS, TRAIL CORRIDORS, DEVELOPMENT SIGNAGE, PEDESTRIAN PATHS, WALKWAYS, & PUBLIC SIDEWALKS, DECORATIVE & SPLIT RAIL FENCING, UTILITIES, STORM WATER FACILITIES, DRAINAGE IMPROVEMENTS, OPEN SPACE AND LANDSCAPE IMPROVEMENTS, PARKS AND ASSOCIATED PARK RELATED EQUIPMENT, AND PUBLIC AND PRIVATE ROADS.
3. ACCESSORY STRUCTURES ARE PROHIBITED ON INDIVIDUAL LOTS REGARDLESS OF PLACEMENT OR SIZE.
4. MODEL HOME/SUBDIVISION SALES OFFICE ARE PERMITTED TEMPORARY USES. TEMPORARY USES ARE SUBJECT TO THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE SECTION 5.3.1, AS AMENDED.
5. RESIDENTIAL HOME OCCUPATIONS ARE PERMITTED PURSUANT TO APPLICANT COMPLIANCE WITH THE EL PASO COUNTY LAND DEVELOPMENT CODE, AS AMENDED. COMPLIANCE WITH VISITOR/GUEST PARKING REQUIREMENTS NECESSARY TO OBTAIN A HOME OCCUPATION PERMIT SHALL BE THE SOLE RESPONSIBILITY OF THE HOME OWNER/APPLICANT. HOME OCCUPATIONS MAY BE LIMITED OR OTHERWISE RESTRICTED BASED ON APPLICANT'S ABILITY TO MEET ALL REQUIRED STANDARDS AND COMPLIANCE WITH ANY APPLICABLE STATE OF COLORADO REQUIREMENTS.
6. RESIDENTIAL DAY CARES TO BE PERMITTED PER THE EL PASO COUNTY LAND DEVELOPMENT CODE, AS AMENDED AND COMPLIANCE WITH ALL STATE OF COLORADO PERMITTING REQUIREMENTS AND/OR RESTRICTIONS.
7. PRIVATE RESIDENTIAL SOLAR ENERGY SYSTEMS ARE PERMITTED AS PART OF THE MAIN STRUCTURE PER THE EL PASO COUNTY LAND DEVELOPMENT CODE, AS AMENDED.
8. PERIMETER FENCING: THERE WILL BE A 6' SOUND WALL IN THE LANDSCAPE BUFFER ALONG MEADOWBROOK PARKWAY, AS WELL AS, COMMON BOUNDARIES BETWEEN AND ALONG ADJACENT PROPERTIES. FENCES USED FOR BUFFERING, SCREENING, OR LANDSCAPE ENHANCEMENT, SHALL IN NO WAY BE OR SITED OR OTHERWISE CONSTRUCTED IN A MANNER WHICH MAY IMPEDE SURFACE DRAINAGE, STORMWATER RUNOFF, OR PLANNED DRAINAGE FACILITIES IN ANY WAY.
9. INDIVIDUAL SINGLE-FAMILY LOT FENCING: FENCING FOR INDIVIDUAL SINGLE-FAMILY LOTS SHALL BE LIMITED TO SPLIT RAIL FENCING.
10. REFUSE AND GARBAGE DISPOSAL SERVICES TO BE PROVIDED BY PRIVATE GARBAGE SERVICE COMPANIES. SOLE RESPONSIBILITY FOR GARBAGE COLLECTION SERVICES SHALL REST INDIVIDUALLY AND SOLELY WITH THE INDIVIDUAL LOT OWNER.
11. PRIOR TO BUILDING PERMIT APPROVAL, A FINAL SUBDIVISION PLAT SHALL BE SUBMITTED FOR REVIEW BY THE EL PASO COUNTY PLANNING & COMMUNITY DEVELOPMENT DEPARTMENT, AND APPROVAL BY THE BOARD OF COUNTY COMMISSIONERS, AND THE PLAT MUST BE RECORDED.
12. SIX FOOT TALL DECORATIVE FENCE MAY BE CONSTRUCTED ALONG THE PERIMETER OF THE AREA OF DEVELOPMENT. THE MATERIAL AND LOCATION SHALL BE PROVIDED WITH THE SITE DEVELOPMENT PLAN.
13. ALL STREETS SHALL BE NAMED AND CONSTRUCTED TO EL PASO COUNTY STANDARDS AND ANY APPROVED DEVIATIONS IN THE PUD ROAD DESIGN MODIFICATIONS. PRIVATE STREETS SHALL BE MAINTAINED BY THE MEADOWBROOK CROSSING METROPOLITAN DISTRICT.
14. NOTWITHSTANDING ANYTHING DEPICTED IN THIS PLAN IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE (LDC), THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL (DCM), AND DCM VOLUME 2. ANY DEVIATIONS FROM THESE STANDARDS MUST BE SPECIFICALLY REQUESTED AND APPROVED IN WRITING TO BE ACCEPTABLE. THE APPROVAL OF THIS PUD PLAN DOES NOT IMPLICITLY ALLOW ANY DEVIATIONS OR WAIVERS THAT HAVE NOT BEEN OTHERWISE APPROVED THROUGH THE DEVIATION APPROVAL PROCESS.
15. DEVELOPMENT OF THE PROPERTY WILL BE IN ACCORDANCE WITH THE MOST RECENT VERSION OF THE EL PASO COUNTY LAND DEVELOPMENT CODE FOR PUD ZONING, AND THE CRITERIA ESTABLISHED BY THIS PUD DEVELOPMENT PLAN.
16. WATER AND WASTEWATER SERVICES FOR THIS SUBDIVISION WILL BE PROVIDED BY THE CHEROKEE METROPOLITAN DISTRICT (CHEROKEE) SUBJECT TO THE DISTRICT'S RULES, REGULATION AND SPECIFICATIONS. A LETTER OF COMMITMENT FROM THE DISTRICT, DATED 09/21/20, WAS PROVIDED INDICATING THAT THE DISTRICT IS COMMITTED TO PROVIDED 18.70 ACRE-FEET/TO THE PROPOSED SUBDIVISION. THE COLORADO DIVISION OF WATER RESOURCES, THROUGH THE STATE ENGINEER'S OFFICE HAS ISSUED AN OPINION THAT WAS PROPOSED WATER SUPPLY CAN BE PROVIDED WITHOUT CAUSING INJURY TO DECREE WATER RIGHTS, AND THAT THE WATER SUPPLY IS EXPECTED TO BE ADEQUATE.
17. THE PROPERTY IS LOCATED IN THE AIRPORT OVERLAY ZONE. THIS SERVES AS NOTICE OF POTENTIAL AIRCRAFT OVERFLIGHT AND NOISE IMPACTS ON THIS PROPERTY DUE TO ITS CLOSE PROXIMITY TO AN AIRPORT, WHICH IS BEING DISCLOSED TO ALL PROSPECTIVE PURCHASERS CONSIDERING THE USE OF THIS PROPERTY FOR RESIDENTIAL AND OTHER PURPOSES. THIS PROPERTY IS SUBJECT TO THE OVERFLIGHT AND ASSOCIATED NOISE OF ARRIVING AND DEPARTING AIRCRAFT DURING THE COURSE OF NORMAL AIRPORT OPERATIONS. ALL PROPERTY WITHIN THIS SUBDIVISION IS SUBJECT TO AN AVIGATION EASEMENT AS RECORDED IN BOOK 2478 AT PAGE 304, OF THE RECORDS OF THE EL PASO COUNTY CLERK AND RECORDER.
18. INDOOR NOISE REDUCTION TO AN INTERIOR NOISE LEVEL OF 40dB SHALL BE ACHIEVED BY APPROVED CONSTRUCTION TECHNIQUES AS EVIDENCED BY A NOISE REDUCTION CERTIFICATE PROVIDED DURING THE BUILDING PERMIT, INSPECTION, AND CERTIFICATE OF OCCUPANCY PROCESS AS ADMINISTERED BY THE REGIONAL BUILDING DEPARTMENT.
19. A TITLE 32 SPECIAL DISTRICT ANNUAL REPORT AND DISCLOSURE FORM SATISFACTORY TO THE PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT SHALL BE RECORDED WITH EACH PLAT OF INDIVIDUAL LOTS.
20. LANDSCAPE IMPROVEMENTS AND MAINTENANCE SHALL BE THE RESPONSIBILITY OF MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1.
21. LANDSCAPING SHALL CONFORM TO THE REQUIREMENTS OF CHAPTER 6 OF THE COUNTY CODE TOGETHER WITH ALL APPLICABLE CONDITIONS OF APPROVAL IMPOSED BY THE BOARD OF COUNTY COMMISSIONERS.
22. DEVELOPMENT OF THE PROPERTY WILL BE IN ACCORDANCE WITH THE MOST RECENT VERSION OF THE EL PASO COUNTY LAND DEVELOPMENT CODE FOR PUD ZONING, AND THE CRITERIA ESTABLISHED BY THIS PUD DEVELOPMENT PLAN

BULK, DENSITY, & DIMENSIONAL STANDARDS

1. PROJECTIONS INTO SETBACKS ARE GOVERNED BY THE EL PASO COUNTY LAND DEVELOPMENT CODE, AS AMENDED.
2. MAXIMUM IMPERVIOUS COVERAGE (PER RESIDENTIAL LOT); NO MAXIMUM (100% IMPERVIOUSNESS)
3. MAXIMUM STRUCTURAL HEIGHT: FORTY FEET (40')
4. FRONT YARD SETBACK: 20' FROM PRIVATE ROAD/TRACT.
5. REAR YARD SETBACK: 10' FROM REAR PROPERTY LINE.
6. LOTS WILL HAVE ONE 1' AND ONE 5' SIDE YARD SETBACK, ILLUSTRATED ON LOT DETAIL. UNLESS OTHERWISE DEPICTED
7. CORNER LOTS WILL HAVE A MINIMUM OF A 1' SIDE YARD SETBACK IN CORRESPONDENCE WITH ADJACENT PROPERTY
8. ALL LOTS ARE SETBACK A MINIMUM OF 20 FEET FROM ALL PERIMETER BOUNDARIES AND ROADWAY LANDSCAPE SETBACKS AND ARE OUTSIDE OF LINES OF SIGHT AND SIGHT TRIANGLES, AS DEPICTED ON THE PUD.

GENERAL PROVISIONS & NOTES

STATEMENT OF INTENT: THE PURPOSE OF THIS PUD (PLANNED UNIT DEVELOPMENT) PLAN IS TO PROVIDE FOR 67 SINGLE-FAMILY DETACHED RESIDENTIAL UNITS IN A MANNER CONSISTENT WITH THE APPROVED MEADOWBROOK PARK PUD PLAN WHICH IDENTIFIES A DENSITY OF 8.36 DU/AC, IN ADDITION TO THE FOLLOWING STATED PURPOSES FOR PUD ENCOURAGED BY EL PASO COUNTY:

- TO PERMIT ADJUSTMENT TO CHANGING PUBLIC AND PRIVATE NEEDS, FOSTER THE ABILITY TO PROVIDE DEVELOPMENT PATTERNS WHICH ARE MORE COMPATIBLE WITH AND EFFECTIVE IN MEETING SUCH NEEDS;
- TO IMPROVE THE DESIGN, CHARACTER AND QUALITY OF NEW DEVELOPMENT WITH FLEXIBILITY BY VARYING LOT SIZE, BUILDING HEIGHTS, SETBACK CONTROLS AND OTHER SITE DEVELOPMENT REQUIREMENTS;
- TO ENCOURAGE MORE EFFICIENT USE OF LAND SERVICES REFLECTING CHANGES IN THE TECHNOLOGIES AND ECONOMIES OF LAND DEVELOPMENT;
- TO PROVIDE HOUSING OF ALL TYPES AND DESIGNS TO BE LOCATED IN PROXIMITY TO EMPLOYMENT AND ACTIVITY CENTERS SUCH AS SHOPPING, RECREATIONAL, AND COMMUNITY CENTERS, HEALTHCARE FACILITIES, AND PUBLIC TRANSIT;
- TO ACHIEVE DEVELOPMENT ECONOMIES TO MINIMIZE IMPACTS ON EXISTING INFRASTRUCTURE AND TO ENCOURAGE THE MOST EFFICIENT USE OF PUBLIC INFRASTRUCTURE WHILE LIMITING THE COSTS OF PROVIDING SERVICES AND TO REDUCE THE BURDEN ON EXISTING STREETS AND UTILITIES BY MORE EFFICIENT DEVELOPMENT;

AUTHORITY: THIS PUD IS AUTHORIZED BY CHAPTER 4 OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, AS AMENDED, ADOPTED PURSUANT TO THE COLORADO PLANNED UNIT DEVELOPMENT ACT OF 1972, AS AMENDED.

APPLICABILITY: THE PROVISIONS OF THIS PUD SHALL RUN WITH THE LAND. THE LANDOWNERS, THEIR SUCCESSORS, HEIRS, OR ASSIGNS SHALL BE BOUND BY THIS DEVELOPMENT PLAN, AS AMENDED AND APPROVED BY THE PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT DIRECTOR OR BOARD OF COUNTY COMMISSIONERS.

ADOPTION: THE ADOPTION OF THIS DEVELOPMENT PLAN SHALL EVIDENCE THE FINDINGS AND DECISIONS OF THE EL PASO COUNTY BOARD OF COUNTY COMMISSIONERS THAT THIS DEVELOPMENT PLAN FOR MEADOWBROOK PARK IS IN GENERAL CONFORMITY WITH THE EL PASO COUNTY MASTER PLAN, EL PASO COUNTY POLICY PLAN AND APPLICABLE SMALL AREA PLAN(S); IS AUTHORIZED UNDER THE PROVISION OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, AS AMENDED, AND THIS DEVELOPMENT PLAN COMPLIES WITH THE COLORADO PLANNED UNIT DEVELOPMENT ACT OF 1972, AS AMENDED.

RELATIONSHIP TO COUNTY REGULATIONS: THE PROVISIONS OF THIS DEVELOPMENT PLAN SHALL PREVAIL AND GOVERN THE DEVELOPMENT OF MEADOWBROOK PARK PROVIDED, HOWEVER, THAT WHERE THE PROVISIONS OF THIS DEVELOPMENT PLAN DO NOT ADDRESS A PARTICULAR SUBJECT, THE RELEVANT PROVISIONS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, AS AMENDED, ADMINISTRATIVE DETERMINATION BY THE PCD DIRECTOR, OR ANY OTHER APPLICABLE RESOLUTIONS OR REGULATIONS OF EL PASO COUNTY, SHALL BE APPLICABLE.

ENFORCEMENT: TO FURTHER THE MUTUAL INTEREST OF THE RESIDENTS, OCCUPANTS, AND OWNERS OF THE PUD AND OF THE PUBLIC IN THE PRESERVATION OF THE INTEGRITY OF THIS DEVELOPMENT PLAN, THE PROVISIONS OF THIS PLAN RELATING TO THE USE OF LAND AND THE LOCATION OF COMMON OPEN SPACE SHALL RUN IN FAVOR OF EL PASO COUNTY AND SHALL BE ENFORCEABLE AT LAW OR IN EQUITY BY THE COUNTY WITHOUT LIMITATION ON ANY POWER OR REGULATION OTHERWISE GRANTED BY LAW.

CONFLICT: WHERE THERE IS MORE THAN ONE PROVISION WITHIN THE DEVELOPMENT PLAN THAT COVERS THE SAME SUBJECT MATTER, THE PROVISION WHICH IS MOST RESTRICTIVE OR IMPOSES HIGHER STANDARDS OR REQUIREMENTS SHALL GOVERN.

FLOODPLAIN NOTES

THIS PROPERTY IS NOT LOCATED WITHIN A DESIGNATED FEMA FLOODPLAIN AS DETERMINED BY THE FLOOD INSURANCE RATE MAP, COMMUNITY MAP NUMBER '08041C0752G', EFFECTIVE DATE 12/7/2018.

loi has been adjusted to reflect the change from 70 lots to 67

SITE DATA TABLE:

TOTAL SITE ACREAGE	8.01 AC
PROPOSED SINGLE-FAMILY ATTACHED DWELLING UNITS	67 D.U.
FINAL PROPOSED (GROSS) DENSITY	8.36 D.U./AC.
MAX BUILDING HEIGHT	40'
TYPE OF USE	# ACRES PROVIDED
SINGLE-FAMILY RESIDENTIAL (67 LOTS)	3.443 AC±
LANDSCAPE	1.097 AC±
OPEN SPACE	1.882 AC±
PRIVATE STREETS	1.588 AC±
TOTAL	8.01 AC±

NOTE: TOTAL OPEN SPACE REQUIRED IS 10% OF TOTAL ACREAGE, 8.01 AC X 10 = 0.801 ACRES

Land Owner Certification

IN WITNESS WHEREOF, THE AFOREMENTIONED LORSON LLC AS NOMINEE HAS EXECUTED THESE PRESENTS THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ 20\_\_\_\_ A.D. LORSON LLC AS NOMINEE FOR HEIDI LLC, A COLORADO LIMITED LIABILITY COMPANY

AUTHORIZED AGENT, MANAGER

STATE OF COLORADO )  
EL PASO COUNTY ) SS.

THE ABOVE AND FOREGOING STATEMENT WAS ACKNOWLEDGED BEFORE ME THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ 20\_\_\_\_ A.D. BY \_\_\_\_\_

WITNESS MY HAND AND SEAL:

NOTARY PUBLIC

MY COMMISSION EXPIRES: \_\_\_\_\_

County Certification

THIS REZONING REQUEST TO PUD HAS BEEN REVIEWED AND FOUND TO BE COMPLETE AND IN ACCORDANCE WITH THE (BOARD RESOLUTION OR MOTION # \_\_\_\_\_ AND DATE \_\_\_\_\_) APPROVING THE PUD AND ALL APPLICABLE EL PASO COUNTY REGULATIONS.

CHAIR, BOARD OF COUNTY COMMISSIONERS DATE \_\_\_\_\_

DIRECTOR, PLANNING AND COMMUNITY DEVELOPMENT DATE \_\_\_\_\_

Clerk and Recorder Certification

STATE OF COLORADO )  
EL PASO COUNTY ) SS.

I HEREBY CERTIFY THAT THIS PLAN WAS FILED IN MY OFFICE ON THIS \_\_\_\_\_ OF \_\_\_\_\_, 20\_\_\_\_ AT \_\_\_\_\_ O'CLOCK A.M./P.M. AND WAS RECORDED PER \_\_\_\_\_

RECEPTION NO. \_\_\_\_\_  
EL PASO COUNTY CLERK AND RECORDER

Add the mitigation techniques such as the perimeter drains to these notes. See CGS comments and the revised Geo reprot after revisions.

SOILS & GEOLOGY CONDITIONS, CONSTRAINTS, & HAZARDS

A "GEOLOGY AND SOILS STUDY" FOR MEADOWBROOK PARK, EL PASO COUNTY, COLORADO WAS COMPLETED BY ROCKY MOUNTAIN GROUP (RMG) ON AUGUST 26, 2020.

**GEOLOGIC HAZARD NOTE:** NO LOTS HAVE BEEN IDENTIFIED BY THE REFERENCED RMG REPORT WHICH ARE ADVERSELY IMPACTED BY GEOLOGIC HAZARDS. THE OVERALL DEVELOPMENT AREA HAS BEEN FOUND TO BE IMPACTED BY GEOLOGIC CONSTRAINTS LISTED BELOW. MITIGATION MEASURES AND A MAP OF GEOLOGIC CONDITIONS CAN BE FOUND IN THE REPORT "GEOLOGIC AND SOILS STUDY" PREPARED BY RMG DATED, AUGUST 26, 2020. IN FILE MEADOWBROOK PARK AVAILABLE AT THE EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT: A.) EXPANSIVE AND HYDROCOMPACTIVE SOILS; B.) SEISMICITY; AND, C.) RADON

CONCERNING GEOLOGIC CONSTRAINTS, RMG CONCLUDES THAT THE REFERENCED CONSTRAINTS ARE NOT CONSIDERED HAZARDS OR UNUSUAL FOR THE FRONT RANGE REGION OF COLORADO. MITIGATION OF IDENTIFIED CONSTRAINTS IS MOST EFFECTIVELY ACCOMPLISHED BY AVOIDANCE. HOWEVER, WHERE AVOIDANCE IS NOT A PRACTICAL OR ACCEPTABLE ALTERNATIVE, GEOLOGIC CONDITIONS SHOULD BE MITIGATED BY IMPLEMENTING APPROPRIATE PLANNING, ENGINEERING, AND LOCAL CONSTRUCTION PRACTICES.

ACCORDING TO THE REPORT, CONVENTIONAL SHALLOW FOUNDATION SYSTEMS CONSISTING OF STANDARD SPREAD FOOTINGS/STEM WALLS ARE ANTICIPATED TO BE SUITABLE FOR THE PROPOSED RESIDENTIAL STRUCTURES. THE REPORT RECOMMENDS FOUNDATION SYSTEMS FOR THE DETACHED SINGLE FAMILY STRUCTURES SHOULD BE DESIGNED AND CONSTRUCTED BASED UPON RECOMMENDATIONS DEVELOPED IN A SITE-SPECIFIC SUBSURFACE SOIL INVESTIGATION. THE RECOMMENDATIONS PRESENTED IN THE SUBSURFACE SOIL INVESTIGATION SHOULD BE VERIFIED FOLLOWING THE EXCAVATIONS OF EACH STRUCTURE AND EVALUATION OF THE BUILDING LOADS.

high ground water....under drains etc..address this in GEO report and add notes for the specific lots impacted, who is to maintain under drains?- The District. Are some lots not eligible for basements? which ones?

PUD MODIFICATION TABLE PER LDC SECTION 4.2.6.F.2.g				
	LDC/ECM SECTION	STANDARD	MODIFICATION	JUSTIFICATION
1	8.4.4.C PUBLIC ROADS REQUIRED	30 FRONTAGE AND ACCESS TO PUBLIC ROAD	LOTS ADJACENT TO PRIVATE STREETS WILL NOT HAVE DIRECT FRONTAGE OR ACCESS TO PUBLIC ROADS	PROPOSED PRIVATE ROADS FACILITATE PROJECT DENSITY AND TRADITIONAL NEIGHBORHOOD DESIGN PRINCIPLES, SUCH AS REDUCTION OF AUTOMOBILE DOMINANCE IN SUPPORT OF INCREASED PEDESTRIAN EMPHASIS THROUGHOUT DEVELOPMENT AREA
2	8.4.4.E PRIVATE ROAD ALLOWANCES	PRIVATE ROADS REQUIRE WAIVER (MODIFICATION IN PUD)	PROPOSED MODIFIED PRIVATE ROAD CROSS SECTION (SEE STREET DETAILS)	
3	LDC SECTION 8.4.6.C.1.G STANDARDS FOR EASEMENTS	BLANKET EASEMENTS PROHIBITED	PERMIT PLACEMENT OF EASEMENTS WITHIN COMMON ELEMENT TRACTS ADJACENT TO SINGLE FAMILY UNITS	PERMITS FLEXIBILITY FOR UTILITY DESIGN ENGINEERS TO PLAN DELIVER OF UTILITY SERVICE LINES WITHIN COMMON ELEMENT TRACTS IN SUPPORT OF PROPOSED DETACHED HOME DEVELOPMENT.
4	LDC SECTION 8.4.6.C.2 EASEMENT LOCATIONS AND DIMENSIONS	5' SIDE & 7' REAR UTILITY EASEMENTS ALONG LOT/TRACT LINES	ALLOW PLACEMENT OF 3' SIDE YARD UTILITY EASEMENTS	BLANKET UTILITY EASEMENTS HAVE BEEN PROVIDED IN TRACT NETWORK AND ROADWAY CROSS SECTIONS FOR DESIGN, INSTALLATION, DELIVERY, AND MAINTENANCE

not added, additional notes have been added stating all buildings will be slab on grade, no window wells and 4.5.G(4)(b) for drainage easement.  
There shall be no window wells within the side yard easements.

PROJECT TEAM:

**OWNER/ DEVELOPER:**  
THE EQUITY GROUP  
90 SOUTH CASCADE AVENUE, SUITE 1500  
COLORADO SPRINGS, CO 80903

**PLANNERS/LANDSCAPE ARCH.:**  
KIMLEY HORN  
2 NORTH NEVADA AVENUE, SUITE 300  
COLORADO SPRINGS, CO 80903

**CIVIL ENGINEER:**  
KIMLEY HORN  
2 NORTH NEVADA AVENUE, SUITE 300  
COLORADO SPRINGS, CO 80903

SHEET INDEX:

01 COVER SHEET  
02 BUILDING DETAILS SHEET  
03 STREET DETAILS SHEET  
04 LOT TRACT DETAIL  
05 PUD PLAN -1  
06 PUD PLAN - 2  
07 LANDSCAPE PLAN SHEET 1  
08 LANDSCAPE PLAN SHEET 2  
09 LANDSCAPE NOTES

2.4 of the GEC has been added, (to be known as sheet 11

Include sheet 2.4 of the GEC plans. Label centerline grades on that sheet.

County File Number: PUDSP208

Kimley»Horn

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
300 NORTH NEVADA AVENUE, SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN

PROJECT NO.  
096956009

SHEET

01 OF 10



K:\COS\_LA\096956009 - Meadowbrook Park\Working\096956009--PPUDSP-10.27.20.dwg Salazar, Larry 3/19/2021 1:55 PM

20. WATER AND WASTEWATER SERVICES FOR THIS SUBDIVISION WILL BE PROVIDED BY THE CHEROKEE METROPOLITAN DISTRICT (CHEROKEE) SUBJECT TO THE DISTRICT'S RULES, REGULATIONS AND SPECIFICATIONS. THE OFFICE OF THE STATE ENGINEER HAS ISSUED AN OPINION OF WATER INADEQUACY BASED ON ITS ANALYSIS AND INTERPRETATION OF A STIPULATED AGREEMENT CONCERNING THE AVAILABILITY OF CERTAIN WATER RIGHTS FOR USE OUTSIDE OF THE UPPER BLACK SQUIRREL CREEK DESIGNATED BASIN, AND THUS FOUND INSUFFICIENCY OF WATER RESOURCES FOR THIS SUBDIVISION BASED ON THAT AGREEMENT. THIS INTERPRETATION DIFFERS FROM CERTAIN OPINIONS ISSUED BY THE OFFICE IN THE PAST. BASED ON ITS OWN REVIEW OF THE STIPULATED AGREEMENT AND ITS HISTORY (AND NOT THE AMOUNT OF WATER ACTUALLY AVAILABLE) THE BOARD OF COUNTY COMMISSIONERS IN AN OPEN AND PUBLIC HEARING DID NOT ACCEPT THE INTERPRETATION OF THE STATE ENGINEER'S OFFICE. THE BOARD OF COUNTY COMMISSIONERS FOUND THAT CHEROKEE HAS COMMITTED TO PROVIDE WATER SERVICE TO THE SUBDIVISION AND ASSERTED THAT ITS LONG TERM WATER SERVICE CAPABILITIES ARE SUFFICIENT. THE BOARD OF COUNTY COMMISSIONERS MADE THIS DETERMINATION IN RELIANCE UPON THE TESTIMONY AND EXPERTISE PROVIDED BY CHEROKEE AT THE PUBLIC HEARING THEREON. AT THE HEARING, CHEROKEE ASSERTED THAT ITS PLANS AND CONTINUED FINANCIAL INVESTMENT IN INFRASTRUCTURE ARE DESIGNED TO ALLOW CHEROKEE TO CONTINUE TO PROVIDE THIS SUBDIVISION AND ITS EXISTING CUSTOMERS WITH WATER AND WASTEWATER SERVICES FOR 300 YEARS OR MORE.
21. THE PROPERTY IS LOCATED IN THE AIRPORT OVERLAY ZONE. THIS SERVES AS NOTICE OF POTENTIAL AIRCRAFT OVERFLIGHT AND NOISE IMPACTS ON THIS PROPERTY DUE TO ITS CLOSE PROXIMITY TO AN AIRPORT, WHICH IS BEING DISCLOSED TO ALL PROSPECTIVE PURCHASERS CONSIDERING THE USE OF THIS PROPERTY FOR RESIDENTIAL AND OTHER PURPOSES. THIS PROPERTY IS SUBJECT TO THE OVERFLIGHT AND ASSOCIATED NOISE OF ARRIVING AND DEPARTING AIRCRAFT DURING THE COURSE OF NORMAL AIRPORT OPERATIONS. ALL PROPERTY WITHIN THIS SUBDIVISION IS SUBJECT TO AN AVIGATION EASEMENT AS RECORDED IN BOOK 2478 AT PAGE 304, OF THE RECORDS OF THE EL PASO COUNTY CLERK AND RECORDER.
22. A 30 DB(A) INDOOR NOISE REDUCTION SHALL BE ACHIEVED BY APPROVED CONSTRUCTION TECHNIQUES AS EVIDENCED BY A NOISE REDUCTION CERTIFICATE PRIOR TO SITE DEVELOPMENT PLAN APPROVAL.
23. A TITLE 32 SPECIAL DISTRICT ANNUAL REPORT AND DISCLOSURE FORM SATISFACTORY TO THE PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT SHALL BE

#### PUD PLAN NOTE

- THE FOLLOWING REPORTS HAVE BEEN SUBMITTED IN ASSOCIATION WITH THE PUD PLAN FOR THIS SUBDIVISION AND ARE ON FILE AT THE COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT: TRANSPORTATION IMPACT STUDY; DRAINAGE REPORT; WATER RESOURCES REPORT; WASTEWATER DISPOSAL REPORT; GEOLOGY AND SOILS REPORT; FIRE PROTECTION REPORT; NATURAL FEATURES REPORT.
- ALL PROPERTY OWNERS ARE RESPONSIBLE FOR MAINTAINING PROPER STORM WATER DRAINAGE IN AND THROUGH THEIR PROPERTY. PUBLIC DRAINAGE EASEMENTS AS SPECIFICALLY NOTED ON THE PLAT SHALL BE MAINTAINED BY THE LOT OWNERS UNLESS OTHERWISE INDICATED. STRUCTURES, FENCES, MATERIALS OR LANDSCAPING THAT COULD IMPEDE THE FLOW OR RUNOFF SHALL NOT BE PLACED IN DRAINAGE EASEMENTS.
- UNLESS OTHERWISE INDICATED, ALL FRONT, SIDE AND REAR LOT LINES ARE HEREBY PLATTED WITH AN ALTERNATING 1' AND 5' SIDE, 20' FRONT AND 10' REAR, PUBLIC UTILITY AND DRAINAGE EASEMENT. ALL EXTERIOR SUBDIVISION BOUNDARIES ARE HEREBY PLATTED WITH A 10 FOOT PUBLIC UTILITY AND DRAINAGE EASEMENT. THE SOLE RESPONSIBILITY FOR MAINTENANCE OF THESE EASEMENTS IS HEREBY VESTED WITH THE INDIVIDUAL PROPERTY OWNERS.
- DEVELOPER SHALL COMPLY WITH FEDERAL AND STATE LAWS, REGULATIONS, ORDINANCES, REVIEW AND PERMIT REQUIREMENTS, AND OTHER AGENCY REQUIREMENTS, IF ANY, OF APPLICABLE AGENCIES INCLUDING, BUT NOT LIMITED TO, THE COLORADO DIVISION OF WILDLIFE, COLORADO DEPARTMENT OF TRANSPORTATION, U.S. ARMY CORPS OF ENGINEERS, AND THE U.S. FISH AND WILDLIFE SERVICE REGARDING THE ENDANGERED SPECIES ACT, PARTICULARLY AS RELATED TO THE LISTED SPECIES IDENTIFIED IN THE PROJECTS ENVIRONMENTAL ASSESSMENT.
- NO DRIVEWAY SHALL BE ESTABLISHED UNLESS AN ACCESS PERMIT WAIVER HAS BEEN GRANTED BY EL PASO COUNTY. PRIVATE ROADS ARE SUBJECT TO BOCC APPROVAL OF PUD MODIFICATION TO AUTHORIZE USE OF PRIVATE ROADS, FOR DRIVEWAYS ACCESSING STATED PRIVATE ROAD.
- MAILBOXES SHALL BE INSTALLED IN ACCORDANCE WITH EL PASO COUNTY AND US POSTAL SERVICE REGULATIONS.
- EXCEPT AS OTHERWISE NOTED ON THE PUD PLAN, INDIVIDUAL LOT PURCHASERS ARE RESPONSIBLE FOR CONSTRUCTING DRIVEWAYS.
- AT THE TIME OF APPROVAL OF THIS PROJECT, THIS PROPERTY IS LOCATED WITHIN THE CIMARRON HILLS FIRE PROTECTION DISTRICT, WHICH HAS ADOPTED A FIRE CODE WITH FIRE MITIGATION REQUIREMENTS DEPENDING UPON THE LEVEL OF FIRE RISK ASSOCIATED WITH THE PROPERTY AND STRUCTURES. THE OWNER OF ANY LOT SHOULD CONTACT THE FIRE DISTRICT TO DETERMINE THE EXACT DEVELOPMENT REQUIREMENTS RELATIVE TO THE ADOPTED FIRE CODE.
- NO-BUILD AREAS ARE AS SHOWN ON THE PLANS. NO-BUILD AREAS INCLUDE, BUT ARE NOT LIMITED TO, DESIGNATED DRAINAGE EASEMENTS, NO-BUILD AREAS WITHIN INDIVIDUAL LOTS ARE THE RESPONSIBILITY OF THE PROPERTY OWNER. ALL OTHER NO-BUILD AREAS SHALL BE THE RESPONSIBILITY OF THE METRO DISTRICT.
- THIS PROPERTY MAY BE ADVERSELY IMPACTED BY NOISE, DUST, FUMES, AND LIGHT POLLUTION CAUSED BY ADJACENT INDUSTRIAL PROPERTIES AND ADJACENT US HIGHWAY 24 (MAJOR EXPRESSWAY). THE BUYER SHOULD RESEARCH AND BE AWARE OF THIS POTENTIALITY AND THE RAMIFICATIONS THEREOF.
- SIGNAGE IS NOT APPROVED WITH THIS PLAN. A SEPARATE SIGN PERMIT IS REQUIRED. CONTACT THE EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT AT 2880 INTERNATIONAL CIRCLE FOR A SIGN PLAN APPLICATION.
- RETAINING WALLS EXCEEDING 4-FEET WILL NEED TO BE STRUCTURALLY ENGINEERED.
- ALL "STOP SIGNS" AND OTHER TRAFFIC CONTROL SIGNAGE SHALL BE INSTALLED BY THE DEVELOPER AT LOCATIONS SHOWN ON THE SITE DEVELOPMENT PLAN TO MEET MUTCD STANDARDS.
- LOT AND ARCHITECTURE OPTIONS A-D REFLECT THE GENERAL CONFIGURATIONS TO THE UNIT TYPES. WITHIN EACH FOOTPRINT OF UNIT TYPE (A-D) THE FINAL ARCHITECTURAL UNITS WILL VARY IN COLOR, MATERIAL MIX AND FENESTRATION.

Where did the airport  
Noise mitigation  
during construction ,  
airport notice, special  
district notice & water  
notes go?

NOISE MITIGATION NOTE(S) WERE MOVED TO SHEET 1 GENERAL NOTES.

#### DRIVEWAY & GARAGE PARKING NOTES:

- ALL PLANNED DRIVEWAYS WITHIN THE PUD ARE FOR THE PURPOSE OF FACILITATING VEHICULAR PASSAGE FROM PRIVATE STREETS TO THE INDIVIDUAL LOTS. SPECIFICALLY, TO THE DESIGNATED PARKING AREAS FOR EACH LOT WHICH IS LOCATED WITHIN THE DETACHED 1-CAR OR 2-CAR GARAGE.
- ALL PLANNED DRIVEWAYS WITHIN THE PUD WILL HAVE A TWENTY-FOOT (20') MINIMUM LENGTH, FROM FACE OF GARAGE TO SIDEWALK.
- PARKING IS PERMITTED ON DRIVEWAYS WHICH ARE TWENTY-FOOT (20') IN LENGTH AND HAVE BEEN IDENTIFIED ON THE PLAN.
- PARKING OR ANY FORM OF VEHICLE STORAGE IS NOT PERMITTED ON DRIVEWAYS LESS THAN TWENTY-FEET (20') IN LENGTH, AS RESTRICTED BY THE PUD AND ASSOCIATED NOTES.
- ALL GARAGE UNITS ARE TO BE ADA ACCESSIBLE PARKING AND MEET ADA PARKING CRITERIA.

#### PARKING TABLE

NUMBER OF LOTS: 70 (HOMES RANGE FROM 2 TO 4 BEDROOMS WITH 1 OR 2 CAR GARAGE)

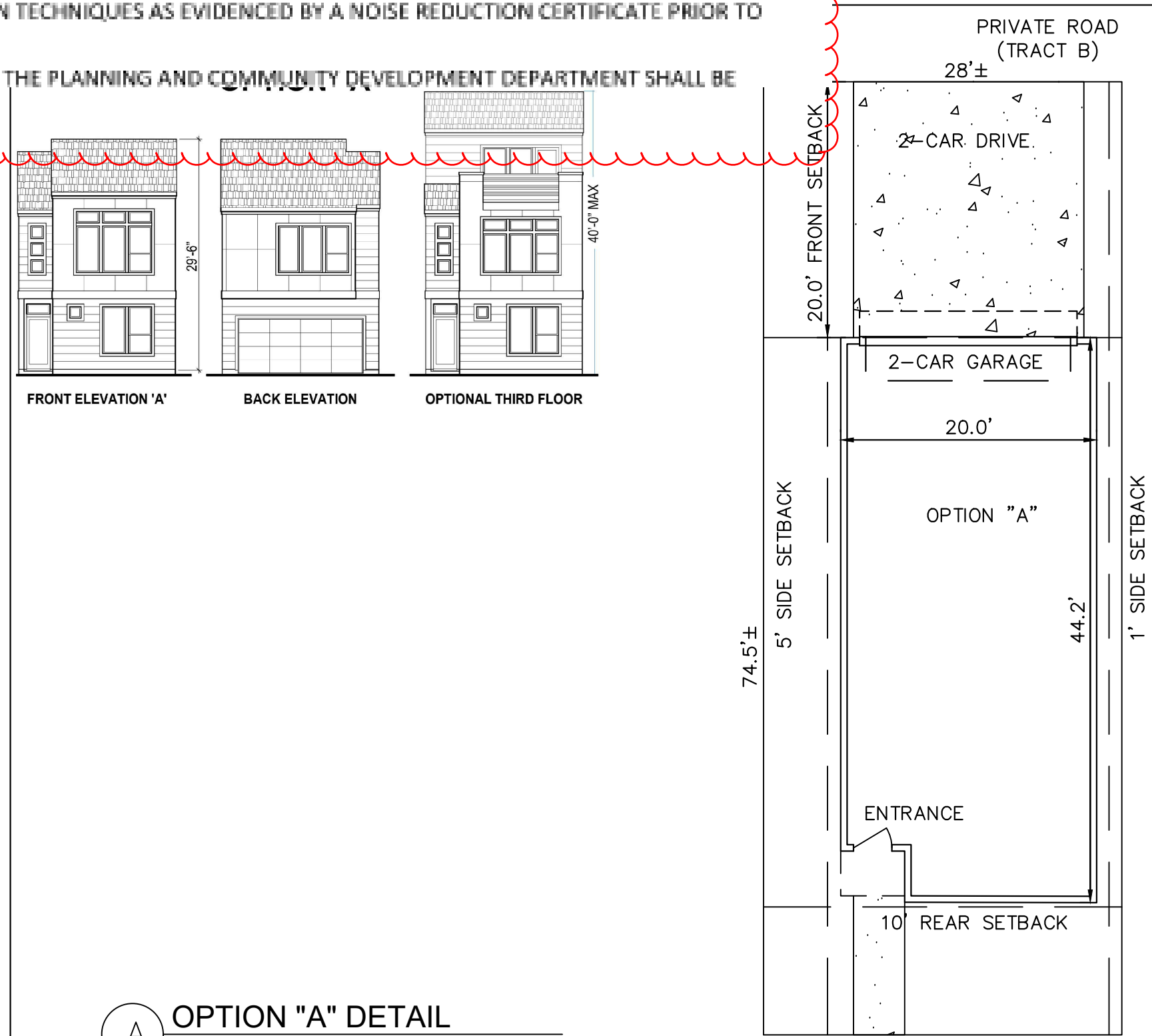
	DU	SPACES/ UNIT REQUIRED	SPACES REQUIRED	GARAGE PARKING PROVIDED	DRIVEWAY PARKING PROVIDED	TOTAL PARKING PROVIDED
**2 CAR GARAGE	38	2/DU	76 SPACES (38*2/DU)	76 SPACES (38*2/DU)	76 SPACES (38*2/DU)	152 SPACES
**1 CAR GARAGE	29	2/DU	58 SPACES (30*2/DU)	29 SPACES (29*1/DU)	29 SPACES (29*1/DU)	58 SPACES
ADDITIONAL SHARED/ADA SPACES						19 GUEST/ 2ADA
**TOTAL	67		134 SPACES (67*2/DU)	105	105	231 SPACES

ALL GARAGE SPACES WILL PROVIDE ACCESSIBLE UNIT PARKING ALONG WITH 2 GUEST ADA SPACES.

\*\* SUBTOTAL PARKING SPACES MAY BE SUBJECT TO CHANGE BASED OFF OF FINAL BUILDING DEVELOPMENT COUNT.

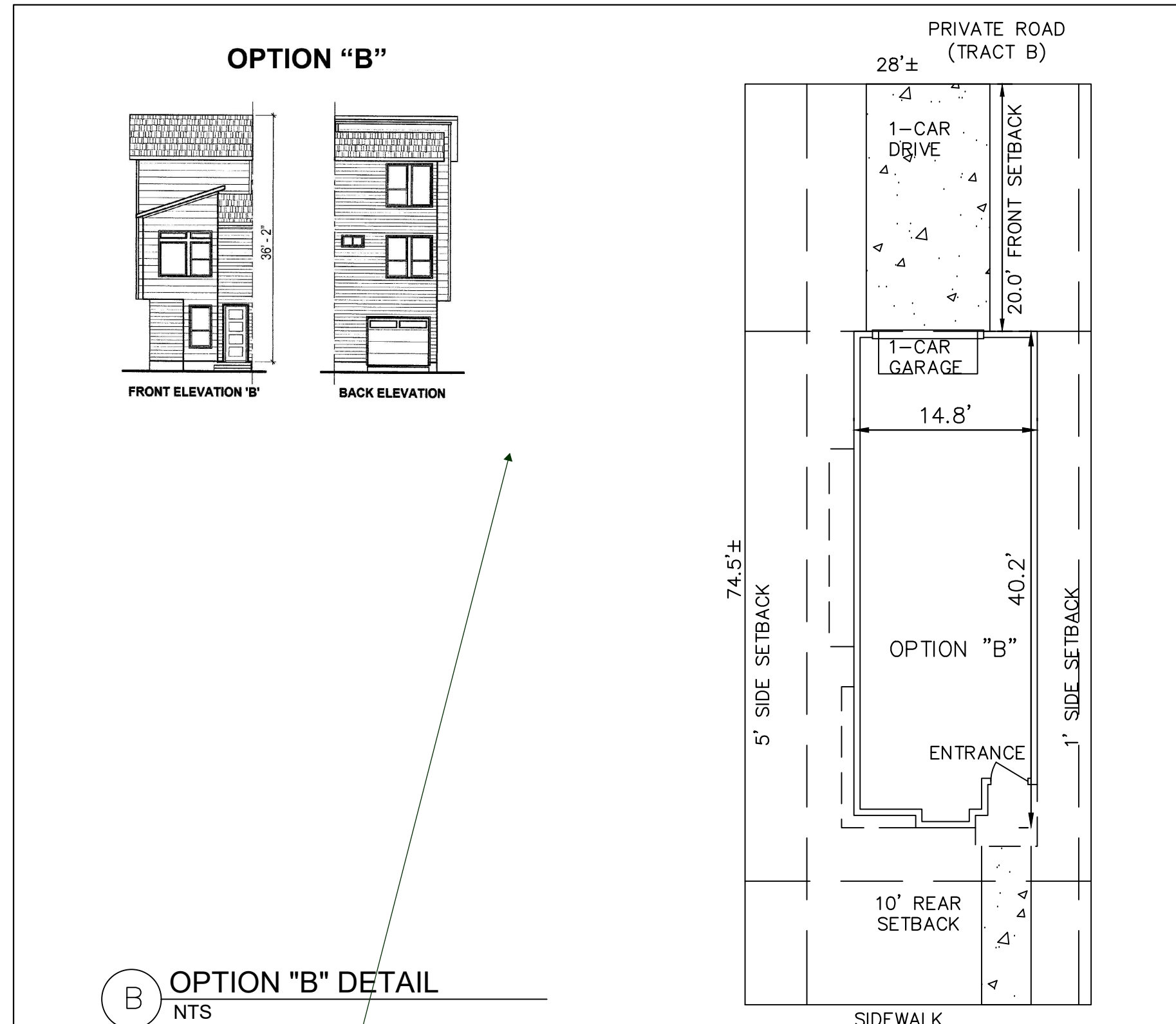
## MEADOWBROOK PARK (D) AND PRELIMINARY PLAN

OF THE 6th P.M., EL PASO COUNTY, COLORADO



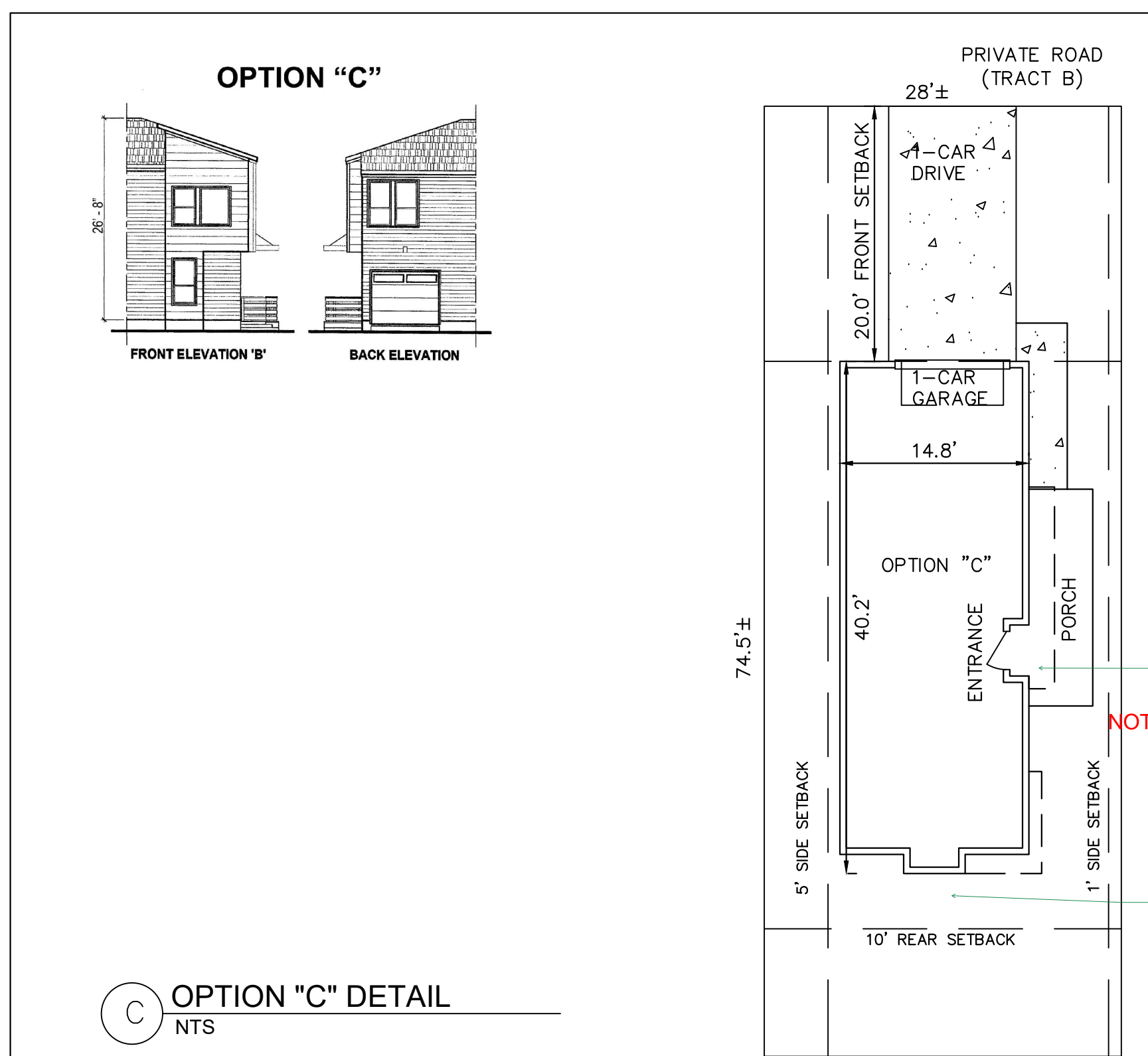
A OPTION "A" DETAIL  
NTS

LOT DIMENSIONS SUBJECT TO CHANGE TO FIT GRADE  
CHANGES OR RIGHT-OF-WAY AND EASEMENT.



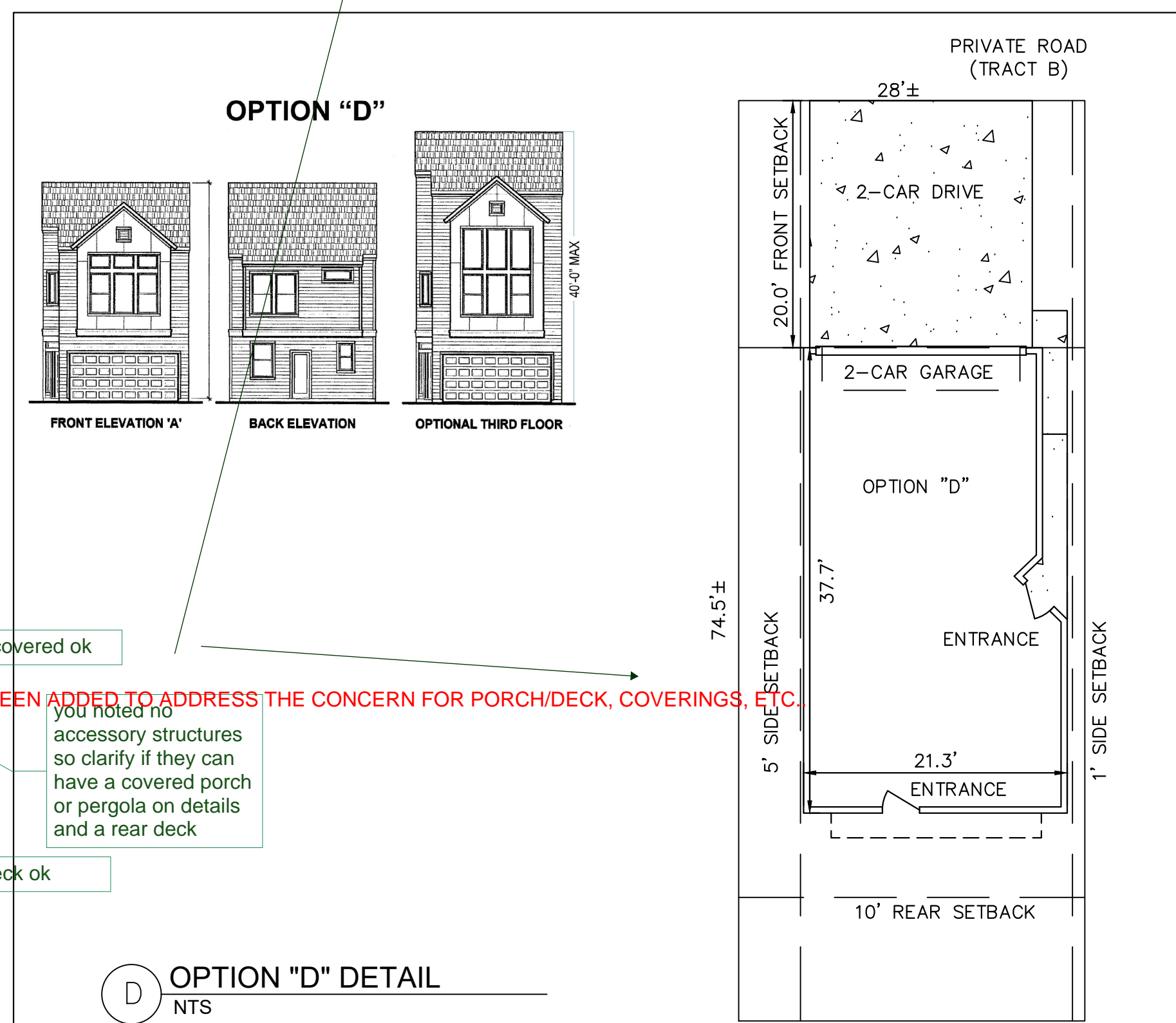
B OPTION "B" DETAIL  
NTS

LOT DIMENSIONS SUBJECT TO CHANGE TO FIT GRADE  
CHANGES OR RIGHT-OF-WAY AND EASEMENT.



C OPTION "C" DETAIL  
NTS

LOT DIMENSIONS SUBJECT TO CHANGE TO FIT GRADE  
CHANGES OR RIGHT-OF-WAY AND EASEMENT.



D OPTION "D" DETAIL  
NTS

LOT DIMENSIONS SUBJECT TO CHANGE TO FIT GRADE  
CHANGES OR RIGHT-OF-WAY AND EASEMENT.

Kimley»Horn

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
210 NORTH NEWDALE AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN

PROJECT NO.  
096956009

SHEET

02 OF 10

County File Number: PUDSP208



K:\COS\_LA\096956009 - Meadowbrook Park\Working\096956009-PPUDSP-10.27.20.dwg Salazar, Larry 3/19/2021 1:56 PM



LANDSCAPE ARCHITECT TO SELECT COLOR AND FINISH 2" THICK PRE-CAST CONCRETE CAP

1.9"

2.0"

SURFACE TO MATCH EXISTING FENCING ALONG FOUNTAIN BLVD., TYP

2-#4 RE-BAR 5' LONG

SLOPE SOIL AWAY FROM WALL, TYP

CONC. GROUT TO COVER RE-BAR- APPROX. 36"

24"x24"x36" DP- PCC FTG.

3.0'

4.0'

SECTION VIEW: 6' VERTI CRETE PRE-CAST COLUMN

LANDSCAPE ARCHITECT TO SELECT COLOR AND FINISH 2" THICK PRE-CAST CONCRETE CAP

12"

4"

SURFACE TO MATCH EXISTING FENCING ALONG FOUNTAIN BLVD., TYP

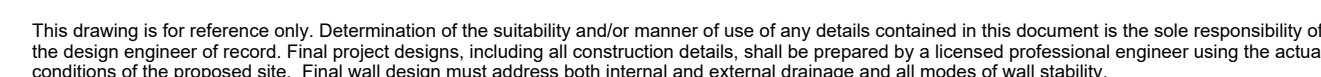
FINISHED GRADE

FRONT VIEW: 6' VERTI CRETE PRE-CAST FENCE

NOTE:

1. FENCING, COLUMNS, CAP, ETC. TO MATCH EXISTING FOUND WITHIN Meadowbrook Park, TYP
2. FENCE AND COLUMN COLOR, TEXTURE, PATTERN, ETC. TO MATCH EXISTING FOUND WITHIN Meadowbrook Park, TYP
3. COLUMNS, WALL, STEEL FENCING PER MANUFACTURES SPECIFICATIONS.
4. SOUND WALL SHALL BE SETBACK ONE-FOOT (1') FROM PROPERTY ROW LINE, AS DEDICATED HEREBY.

is this noise wall as  
noted on sheet 1  
along Meadowbrook  
Parkway?



County File Number: PUDSP208

03 OF 10



K:\COS\_LA\096956009 - Meadowbrook Park\Working\096956009--PUDSP-10.27.20.dwg Solazar, Larry 3/19/2021 1:56 PM

# MEADOWBROOK PARK

## PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN

LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO

TRACT TABLE

TRACT	SIZE (ACRES)	OWNERSHIP	MAINTENANCE	USE
A	0.884 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
B	1.597 AC±	MCMD #1	MCMD #1	PRIVATE ACCESS/ROAD/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
C	0.224 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE/HARDSCAPE/SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
D	0.216 AC±	MCMD #1	MCMD #1	DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
E	0.128 AC±	MCMD #1	MCMD #1	PRIVATE ROAD, DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
F	0.448 AC±	MCMD #1	MCMD #1	DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
G	0.040 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE, ENTRY FEATURE, HARDSCAPING, SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
H	0.237 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE, ENTRY FEATURE, HARDSCAPING, SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
I	0.091 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE, ENTRY FEATURE, HARDSCAPING, SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
J	0.608 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE, ENTRY FEATURE, HARDSCAPING, SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
TOTAL	4.493 AC±			

MCMD #1 = MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1

DETENTION POND AREA (TRACT J): 26,477 SF (0.608 AC)  
5% OPEN SPACE ALLOWED IN DETENTION AREA (TRACT J) x 5% = 1,324 SF (0.030 AC)  
TOTAL OPEN SPACE TRACT AREA (TRACTS A, C, G, H, I & 5% J): 65,578 SF (1.506 AC)  
NOTE: TOTAL OPEN SPACE REQUIRED IS 10% OF TOTAL ACREAGE (8.01 AC), 8.01 AC x 10% = 0.801 ACRES  
TOTAL OPEN SPACE PROVIDED: 1.506 ACRES OPEN SPACE/8.01 ACRE SITE= 18.8% OPEN SPACE PROVIDED

### LANDSCAPE

- LANDSCAPING AREAS, TRAILS, COMMON OPEN SPACE AND BUFFERS SHALL BE INSTALLED BY THE DEVELOPER WITH PRIVATE/PUBLIC IMPROVEMENTS REQUIRED BY THIS PUD AND ASSOCIATED FINAL PLATS. LANDSCAPING SHALL BE OWNED AND MAINTAINED BY THE MEADOWBROOK CROSSINGS METROPOLITAN DISTRICT.
- NO LANDSCAPING SHALL OBSTRUCT SIGHT DISTANCE TRIANGLES OR PEDESTRIAN FACILITIES PER ENGINEERING CRITERIA MANUAL REFERENCE 2.3.6 G.2 & 2.5.3 H AS AMENDED RESPECTIVELY. THE MINIMUM HORIZONTAL CLEARANCE FOR SIDEWALKS AROUND UTILITY STRUCTURES, FURNITURE, AND OTHER ENCROACHMENTS SHALL BE 4 FEET OR GREATER TO PROVIDE SAFE CONDITIONS FOR PEDESTRIANS AND BICYCLISTS PER THE ENGINEERING CRITERIA MANUAL.
- ROADWAY LANDSCAPE BUFFERS: A TWENTY-FOOT (20') LANDSCAPE BUFFER ADJACENT TO MEADOWBROOK PARKWAY FOR MINOR ARTERIAL ROAD/STREET LANDSCAPING AND BUFFERING. REQUIRED ROADWAY TREES TO BE INSTALLED WITHIN THE BUFFER AT A RATIO OF 1/25 FEET OF LINEAR FRONTAGE ALONG THE MEADOWBROOK PARKWAY FRONTAGE. A TWENTY-FIVE-FOOT (25') LANDSCAPE BUFFER IS REQUIRED ADJACENT TO US HIGHWAY 24 FOR EXPRESSWAY/PRINCIPAL ARTERIAL ROAD/STREET LANDSCAPING AND BUFFERING. A FIFTY-FOOT (50') BUFFER HAS BEEN PROVIDED. REQUIRED ROADWAY TREES TO BE INSTALLED WITHIN THE BUFFER AT A RATIO OF 1/20 FEET OF LINEAR FRONTAGE ALONG THE US HIGHWAY 24 FRONTAGE.
- ZONING DISTRICT BOUNDARY LANDSCAPE BUFFER: A FIFTEEN-FOOT (15') ZONING DISTRICT (RS 5000 ZONED) LOTS TO THE NORTH IN MEADOWBROOK CROSSING FILING NO 1 ADJACENT TO THE NORTH SIDE OF MEADOWBROOK PARKWAY AND THE PROPOSED PUD(S), REQUIRED LANDSCAPE BUFFER TREES IS 1/30 LINEAR FEET OF AFFECTED PROPERTY BOUNDARY. CIRCLE K (CR ZONE) TO THE SOUTH/WEST, AND MINI WAREHOUSE STORAGE FACILITY (CS ZONE) TO THE NORTH/EAST, AND US HIGHWAY 24 (EXPRESSWAY) LOCATED ON THE SOUTHERN PROPERTY BOUNDARY.
- A MINIMUM 1/3 OF ALL LANDSCAPE BUFFER TREES IN ALL LANDSCAPE BUFFER CATEGORIES SHALL BE EVERGREEN.

### TRACT USE STANDARDS:

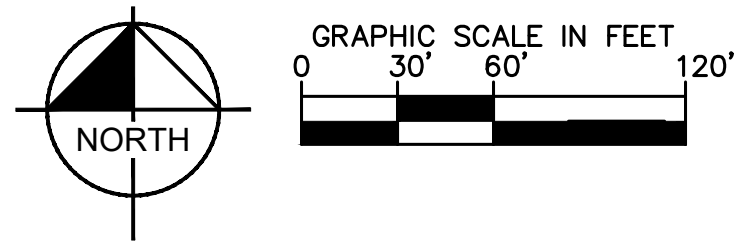
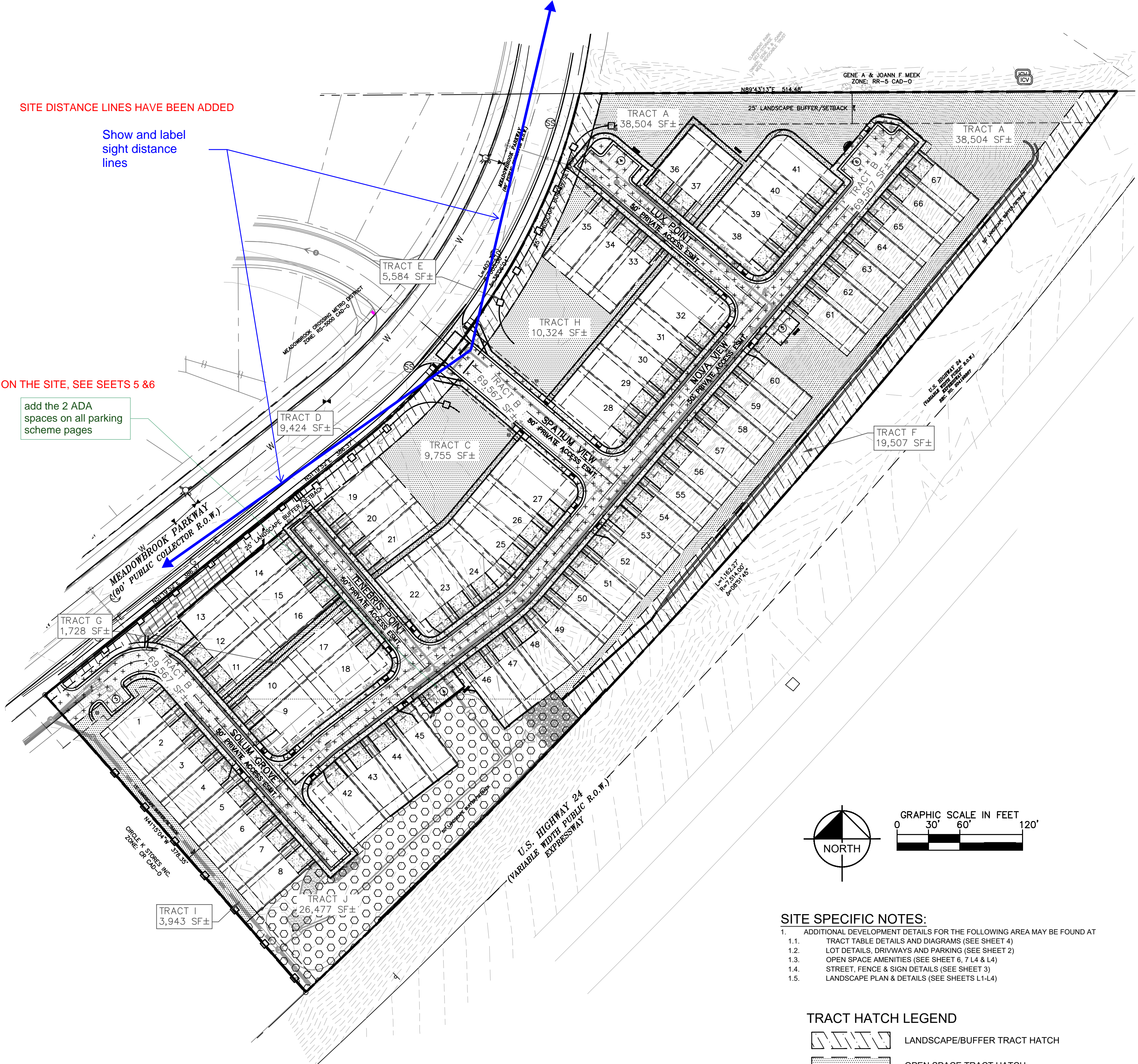
- PERMITTED TRACT USES INCLUDE: ACCESS (INGRESS/EGRESS), MAIL KIOSKS, DEVELOPMENT SIGNAGE, FENCING, UTILITIES, STORMWATER FACILITIES, DRAINAGE IMPROVEMENTS, OPEN SPACE/PARK AND LANDSCAPE IMPROVEMENTS, PARKS AND ASSOCIATED PARK RELATED EQUIPMENT, TRAIL CORRIDORS, PRIVATE PEDESTRIAN WALKWAYS & PUBLIC SIDEWALKS, AND ON-STREET PARKING WHERE DESIGNATED.
- TRACTS "A" THROUGH "G" INCLUSIVE, SHALL BE DEDICATED AS AND PLATTED WITH UTILITY EASEMENTS FOR ADDITIONAL UTILITY LINES AND APPURTENANCE WITHIN THE PROPOSED TRACTS. ALL PRELIMINARY FINAL UTILITY DESIGN SHALL BE COORDINATED WITH THE RESPECTIVE UTILITY SERVICE PROVIDER AND SUBJECT TO REVIEW BY THE PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT AND PUBLIC WORKS (COUNTY ENGINEER) FOR COMPLIANCE WITH ESTABLISHED LDC AND ECM CRITERIA. UTILITY PROVIDERS INCLUDE: COLORADO SPRINGS UTILITIES, AND CHEROKEE METRO DISTRICT. ALL ENTITIES HAVE REVIEWED THIS PUD WITH RESPECT TO THE LOCATION OF PROPOSED UTILITIES WITHIN THE PROPOSED LOT, TRACT, STREET AND DRIVE NETWORK.
- STRUCTURES SHALL BE SETBACK A MINIMUM 10' FROM OPEN SPACES AND TRAILS. THE REQUIRED 10' SEPARATION IS PROVIDED VIA LANDSCAPE BUFFER/SETBACK TRACTS "A" THROUGH "G", INCLUSIVE.
- ALL OPEN SPACE AMENITIES, INCLUDING OUTDOOR FURNITURE AND ASSOCIATED EQUIPMENT, SHALL BE OWNED AND MAINTAINED BY THE MEADOWBROOK CROSSING METRO DISTRICT NO. 1.
- PRIVATE ROAD (INGRESS/EGRESS): TRACT "B" IS DESIGNATED FOR USE AS PRIVATE ROADS TO PROVIDE ACCESS INTO THE SUBDIVISION AND TO (FRONT/REAR) LOADED GARAGES ATTACHED TO EACH DETACHED UNIT. ALL ROADS SHALL BE CONSTRUCTED TO THE APPROVED CROSS SECTION LOCATED ON THE STREET/ROAD DETAIL SHEET OF THIS PLAN. THE USE OF PRIVATE ROADS AND PRIVATE ROADS WHICH DO NOT MEET ECM STANDARDS WITHIN THE PUD REQUIRES AUTHORIZATION BY THE BOCC.
- THE FOLLOWING TRACTS HAVE BEEN PLANNED FOR USE AS PRIVATE ROADS AND WILL BE OWNED AND MAINTAINED BY THE MEADOWBROOK CROSSING METRO DISTRICT NO. 1:
  - TRACT B: SOLUM GROVE
  - TRACT B: TENEBRIS POINT
  - TRACT B: NOVA VIEW
  - TRACT B & TRACT E: LUX POINT
  - TRACT B: CELESTE HEIGHTS
- ON-STREET PARKING IS NOT PERMITTED ON PRIVATE ROADS WITHIN TRACT "B" (SOLUM GROVE, TENEBRIS POINT, NOVA VIEW, LUX POINT AND CELESTE HEIGHTS), DESIGNATED PARKING OFF VIA STRIPED GUEST PARKING AREAS WHICH ARE LOCATED WITHIN TRACT "B" BUT OUTSIDE OF THE PRIVATE ROAD CROSS SECTIONS.
- TRACT "B" IS TO BE OWNED ENTIRELY BY THE MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1, TO INCLUDE DETENTION AND LANDSCAPING LOCATED THEREIN. A LICENSE AGREEMENT FOR LANDSCAPE MAINTENANCE AND DETENTION POND MAINTENANCE AGREEMENT SHALL BE ESTABLISHED WITH THE METRO DISTRICT WITH ANY ASSOCIATED FINAL PLATS.
- TRACT "B" IS TO BE OWNED ENTIRELY BY MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1, TO INCLUDE DETENTION AND LANDSCAPING LOCATED THEREIN. A LICENSE AGREEMENT FOR LANDSCAPE MAINTENANCE AND DETENTION POND MAINTENANCE AGREEMENT SHALL BE ESTABLISHED WITH THE MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1 WITH ANY ASSOCIATED FINAL PLATS.
- GAZEBOES, PAVILIONS, PLAY GROUND EQUIPMENT, OUTDOOR SEATING AND OTHER ACCESSORY STRUCTURES SHALL BE EXCLUDED FROM RESTRICTIONS IN ANY OPEN SPACE AND LANDSCAPE TRACTS, AND IS TO BE INSTALLED AND MAINTAINED BY THE DEVELOPER, OR MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1, ARE PERMITTED.
- OPEN SPACE/LANDSCAPING IMPROVEMENTS LOCATED IN TRACTS WHICH MEET THE CLASSIFICATION OF STRUCTURES AS DEFINED IN THE LDC MAY BE SUBJECT TO A BUILDING PERMIT, PRIOR TO CONSTRUCTION.

SITE DISTANCE LINES HAVE BEEN ADDED

Show and label sight distance lines

ADA SPACES ARE NOW SHOWN ON THE SITE, SEE SEETS 5 & 6

add the 2 ADA spaces on all parking scheme pages



### SITE SPECIFIC NOTES:

- ADDITIONAL DEVELOPMENT DETAILS FOR THE FOLLOWING AREA MAY BE FOUND AT
  - TRACT TABLE DETAILS AND DIAGRAMS (SEE SHEET 4)
  - LOT DETAILS, DRIVEWAYS AND PARKING (SEE SHEET 2)
  - OPEN SPACE AMENITIES (SEE SHEET 6, 7 L4 & L4)
  - STREET, FENCE & SIGN DETAILS (SEE SHEET 3)
  - LANDSCAPE PLAN & DETAILS (SEE SHEETS L1-L4)

### TRACT HATCH LEGEND

- |  |                              |
|--|------------------------------|
|  | LANDSCAPE/BUFFER TRACT HATCH |
|  | OPEN SPACE TRACT HATCH       |
|  | PRIVATE ROAD TRACT HATCH     |
|  | DETENTION POND TRACT HATCH   |

County File Number: PUDSP208

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN

Kimley»Horn

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
1970 NORTH NEW YORK AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

PROJECT NO.  
096956009

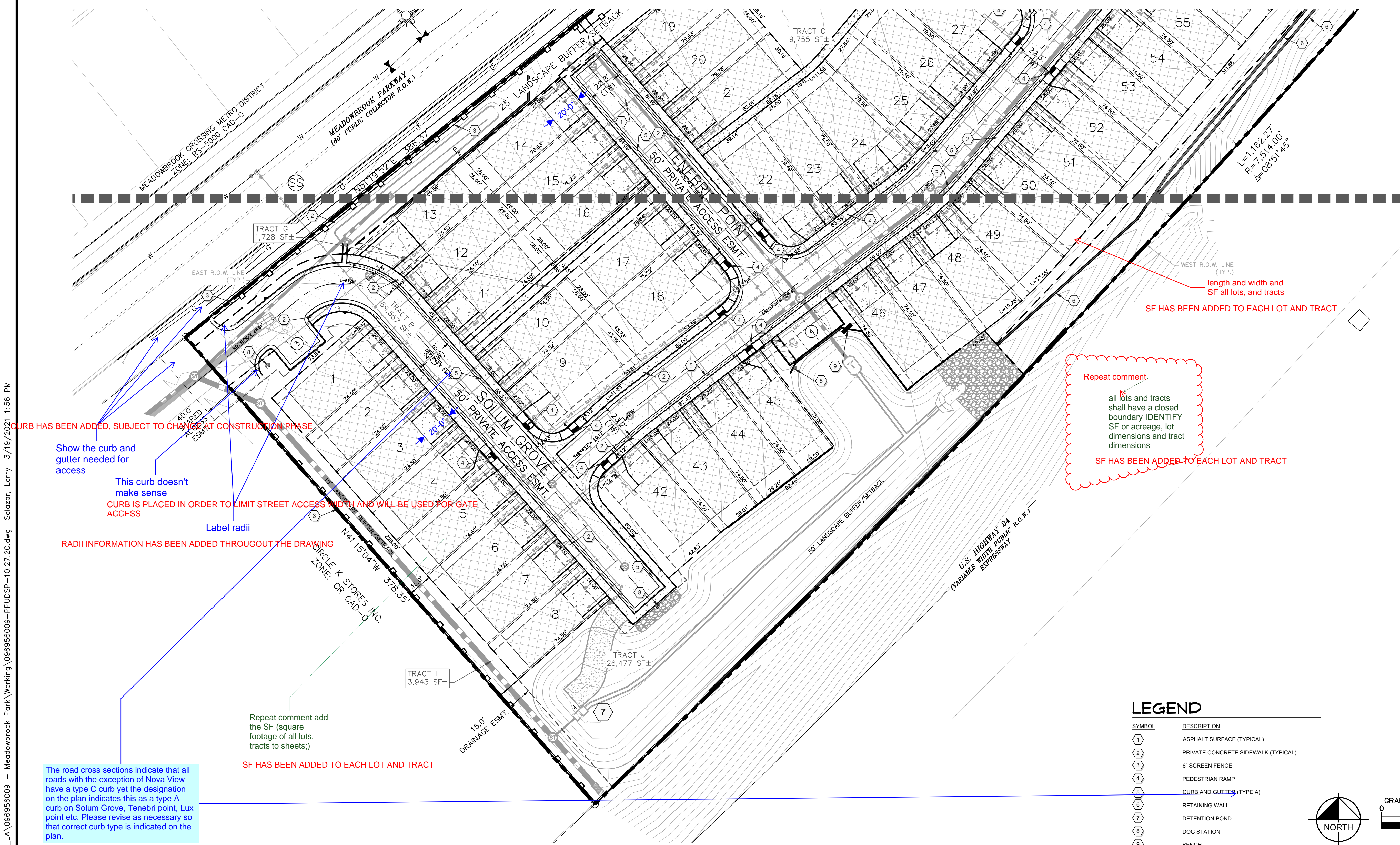
SHEET

04 OF 10

NO. BY DATE APPR.



MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN  
LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO



**Kimley»Horn**  
2021 KIMLEY-HORN AND ASSOCIATES, INC.  
2021 NORTH NEVADA A.C. SITE 38003 (719) 453-0180  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN

PROJECT NO.  
096956009

SHEET

05 OF 10

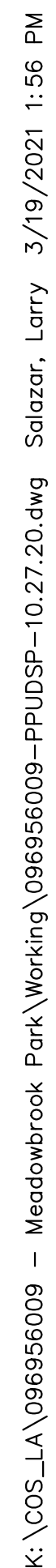
K:\COS\_LA\096956009 - Meadowbrook Park\Working\096956009--PUDSP-10.27.20.dwg Solazar, Larry 3/19/2021 1:56 PM



[illegible]

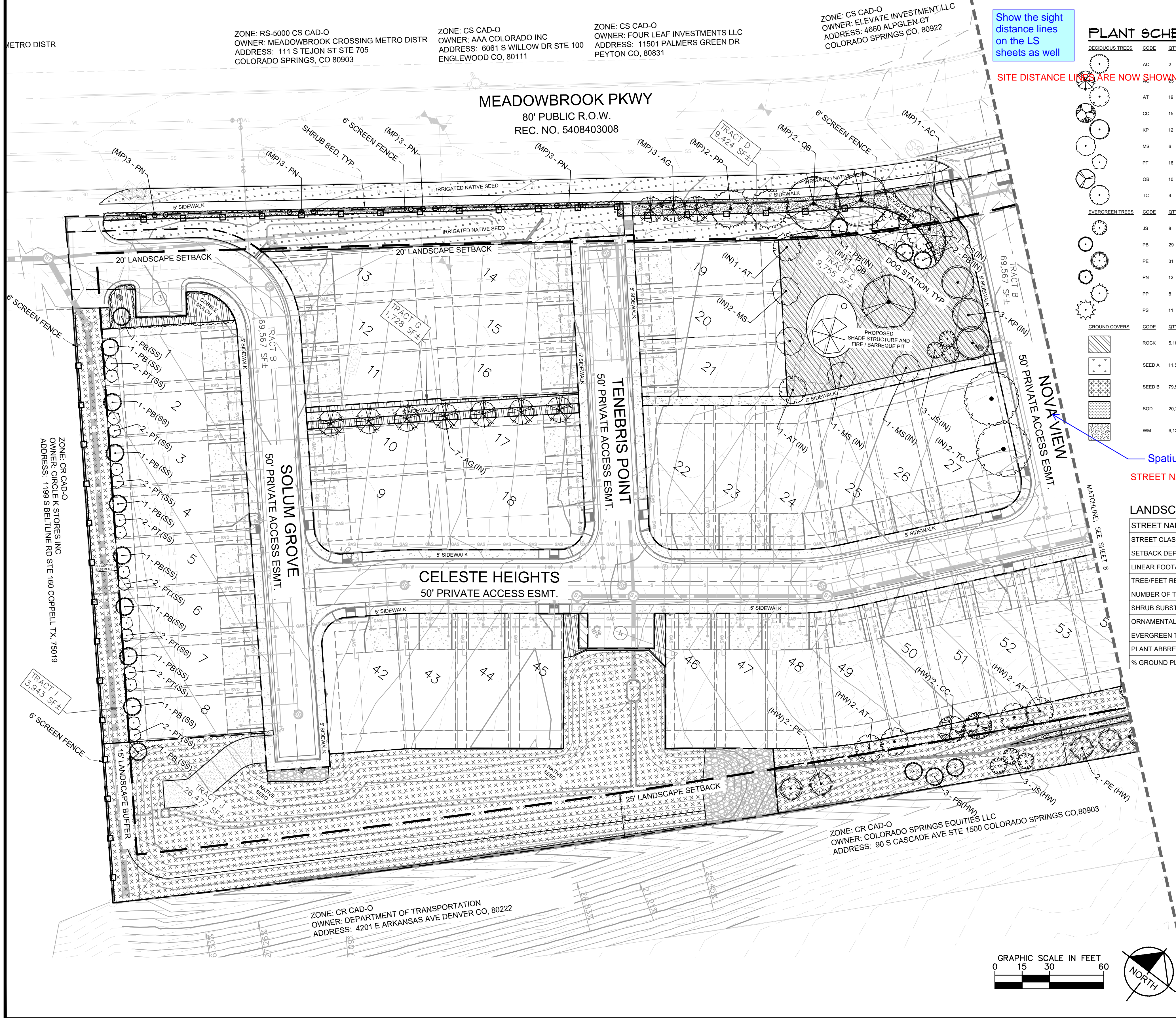
DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

PROJECT NO. 096956009
SHEET  06 OF 10





MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN  
LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO



PLANT SCHEDULE

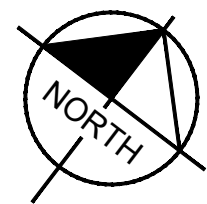
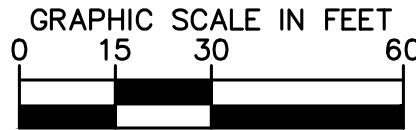
DECIDUOUS TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	SIZE/CAL	WIDTH	HEIGHT
AC	2		AESCULUS X CARNEA 'BRIOTI'	BRIOTI RED HORSECHESTNUT	B & B	2" CAL MIN	25'-35'	25'-35'
AM	15		AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	B & B	2" CAL MIN	15'-20'	15'-25'
AT	19		ACER TATARICUM 'HOT WINGS'	HOT WINGS TATARIAN MAPLE	B & B	2" CAL MIN	15'-20'	15'-20'
CC	15		CRATAEGUS CRUS-GALLI 'INERMIS'	THORNLESS HAWTHORN	B & B	2" CAL MIN	20'-30'	20'-30'
KP	12		KOELREUTERIA PANICULATA	GOLDEN RAIN TREE	B & B	2" CAL MIN	20'-30'	20'-30'
MS	6		MALUS X 'SPRING SNOW'	SPRING SNOW CRABAPPLE	B & B	2" CAL MIN	15'-20'	15'-25'
PT	16		POPULUS X CANESCENS 'TOWER'	TOWER POPLAR	B & B	2" CAL MIN	8'-10'	30'-35'
QB	10		QUERCUS BICOLOR	SWAMP WHITE OAK	B & B	2" CAL MIN	40'-50'	40'-60'
TC	4		TILIA CORDATA	LITTLELEAF LINDEN	B & B	2" CAL MIN	30'-40'	40'-50'
EVERGREEN TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	SIZE/CAL	WIDTH	HEIGHT
JS	8		JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER	B & B	6" HGT.	8'-12'	20'-30'
PB	29		PICEA PLUNGENS 'BABY BLUE EYES'	BABY BLUE EYES COLORADO BLUE SPRUCE	B & B	6" HGT.	10'-15'	20'-30'
PE	31		PINUS EDULIS	PINON PINE	B & B	6" HGT.	15'-20'	20'-30'
PN	12		PINUS NIGRA 'KOMET'	KOMET AUSTRIAN PINE	B & B	6" HGT.	3'-5'	15'-20'
PP	8		PINUS PONDEROSA	PONDEROSA PINE	B & B	6" HGT.	30'-40'	60'+
PR	11		PINUS SYLVESTRIS	SCOTCH PINE	B & B	6" HGT.	20'-30'	35'-50'
GROUND COVERS	CODE	QTY	BOTANICAL NAME	COMMON NAME	TYPE	INSTALL RATE	WEED FABRIC	MFL
ROCK		5,189 SF		3/4" TO 1-1/2" ROCK MULCH	ROCK MULCH	4"	YES	PIONEER SAND
SEED A		11,559 SF		PBSI LOW GROW MIX	SEED			PAWNEE BUTTES SEED INC.
SEED B		79,567 SF		PBSI NATIVE PRAIRIE MIX	SEED			PAWNEE BUTTES SEED INC.
SOD		20,722 SF		SURVIVALIST TALL FESCUE	SOD			GREEN BELT TURF FARM
WM		6,138 SF		WOOD MULCH	MULCH	4" DEPTH	YES	C&C SAND

LANDSCAPE SETBACKS & BUFFERS:

STREET NAME OR ZONE BOUNDARY:	MEADOWBROOK PW	HWY 24	NORTH SIDE	SOUTH SIDE
STREET CLASSIFICATION:	MINOR ARTERIAL	EXPRESSWAY	N/A	N/A
SETBACK DEPTH REQUIRED/PROVIDED:	20' / 20'	25' / 25'	15' / 15'	15' / 15'
LINEAR FOOTAGE:	788'	1161'	541'	378'
TREE/FEET REQUIRED:	1 / 25	1 / 20'	1 / 15'	1 / 15'
NUMBER OF TREES REQUIRED/PROVIDED:	32 / 32	58 / 58	35 / 35	26 / 26
SHRUB SUBSTITUTES REQUIRED/PROVIDED:	0 / 0	0 / 0	0 / 0	0 / 0
ORNAMENTAL GRASS SUBSTITUTES REQ./PROV.	0 / 0	0 / 0	0 / 0	0 / 0
EVERGREEN TREES REQ./PROV.	N/A	N/A	12 / 23	9 / 10
PLANT ABBREVIATION DENOTED ON PLAN:	MP	HW	NS	SS
% GROUND PLANE VEG. REQUIRED/PROVIDED:	75%/75%	75%/75%	75%/75%	75%/75%

INTERNAL LANDSCAPING:

NET SITE AREA (AREAS A & C):	348,971 SF (8.01 AC)
PERCENT MINIMUM INTERNAL AREA:	15%
INTERNAL AREA REQUIRED/PROVIDED:	52,345 SF / 123,175 SF
TREE/SQUARE FEET REQUIRED:	1/500
INTERNAL TREES REQUIRED/PROVIDED:	105 / 57
SHRUB SUBSTITUTES REQUIRED/PROVIDED:	480 / 480
ORN. GRASS SUBSTITUTES REQ./PROV.:	0 / 0
INTERNAL PLANT ABBREVIATED ON PLAN:	IN
% GROUND PLANE VEG. REQUIRED/PROVIDED:	75%/75%



County File Number: PUDSP208

Kimley»Horn

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
2021 KIMLEY-HORN AND ASSOCIATES, INC.  
2021 KIMLEY-HORN AND ASSOCIATES, INC.

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN  
LANDSCAPE PLAN

PROJECT NO.  
096956009

SHEET

7 OF 11

BY DATE APPR

REVISION NO.

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

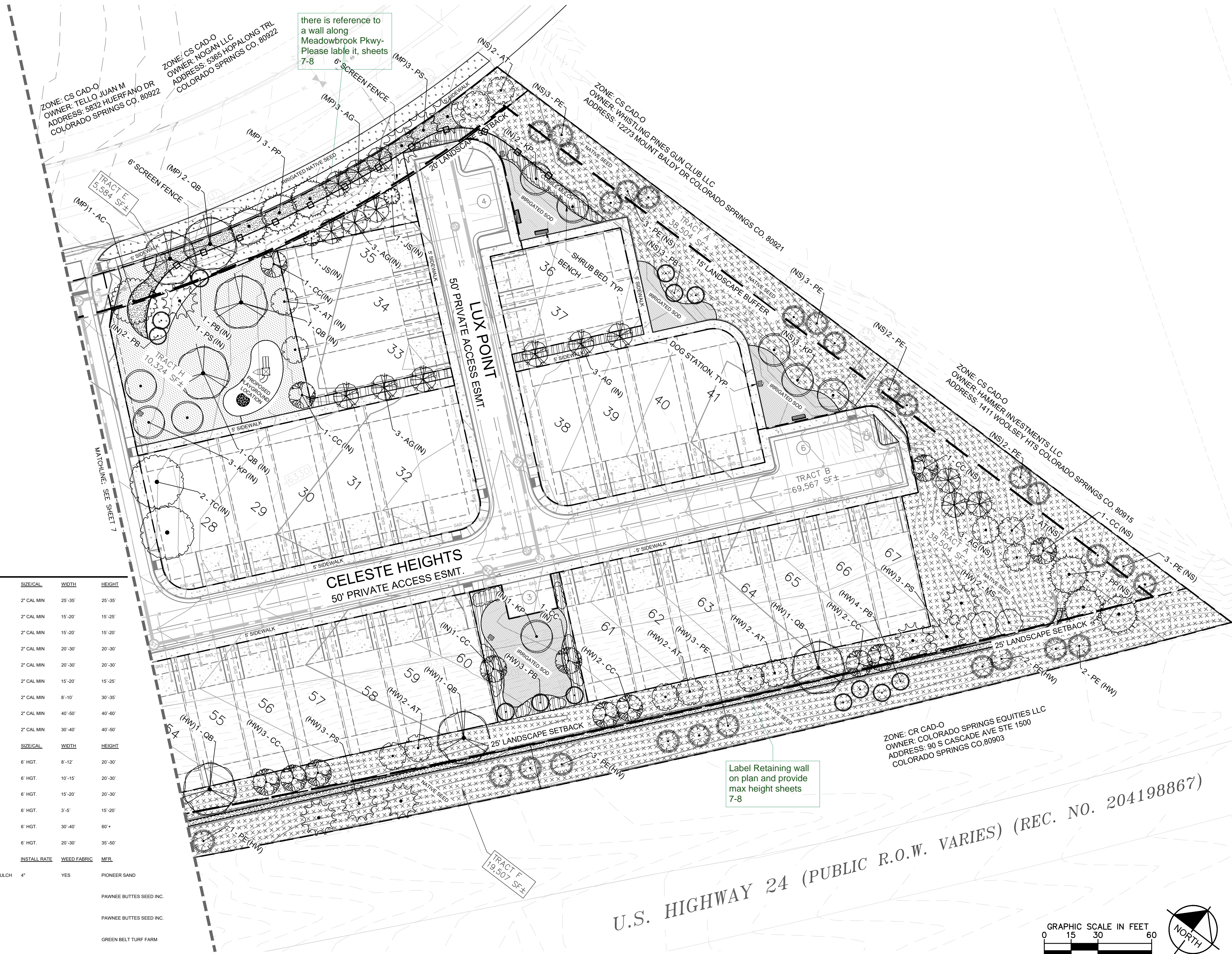


K:\COS\_LA\096956009 - Meadowbrook Park\CADD\PlanSheets\096956009-LA.dwg Salazar, Larry 3/19/2021 1:57 PM

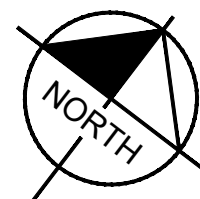
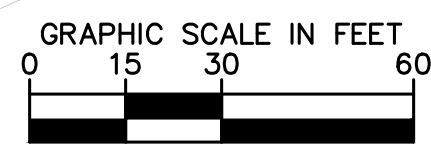
MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN  
LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO

PLANT SCHEDULE

DECIDUOUS TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	SIZE/CAL.	WIDTH	HEIGHT
AC	2		AESCULUS X CARNEA 'BRIOTI'	BRIOTH RED HORSECHESTNUT	B & B	2" CAL MIN	25'-35'	25'-35'
AG	25		AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	B & B	2" CAL MIN	15'-20'	15'-25'
AT	19		ACER TATARICUM 'HOT WINGS'	HOT WINGS TATARIAN MAPLE	B & B	2" CAL MIN	15'-20'	15'-20'
CC	15		CRATAEGUS CRUS-GALLI 'INERMIS'	THORNLESS HAWTHORN	B & B	2" CAL MIN	20'-30'	20'-30'
KP	12		KOELREUTERIA PANICULATA	GOLDEN RAIN TREE	B & B	2" CAL MIN	20'-30'	20'-30'
MS	6		MALUS X 'SPRING SNOW'	SPRING SNOW CRABAPPLE	B & B	2" CAL MIN	15'-20'	15'-25'
PT	16		POPULUS X CANESCENS 'TOWER'	TOWER POPLAR	B & B	2" CAL MIN	8'-10'	30'-35'
QB	10		QUERCUS BICOLOR	SWAMP WHITE OAK	B & B	2" CAL MIN	40'-50'	40'-60'
TC	4		TILIA CORDATA	LITTLELEAF LINDEN	B & B	2" CAL MIN	30'-40'	40'-50'
EVERGREEN TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	SIZE/CAL.	WIDTH	HEIGHT
JS	8		JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER	B & B	6' HGT.	8'-12'	20'-30'
PB	29		PICEA PUNGENS 'BABY BLUE EYES'	BABY BLUE EYES COLORADO BLUE SPRUCE	B & B	6' HGT.	10'-15'	20'-30'
PE	31		PINUS EDULIS	PINON PINE	B & B	6' HGT.	15'-20'	20'-30'
PN	12		PINUS NIGRA 'KOMET'	KOMET AUSTRIAN PINE	B & B	6' HGT.	3'-5'	15'-20'
PP	8		PINUS PONDEROSA	PONDEROSA PINE	B & B	6' HGT.	30'-40'	60'+
PS	11		PINUS SYLVESTRIS	SCOTCH PINE	B & B	6' HGT.	20'-30'	35'-50'
GROUND COVERS	CODE	QTY	BOTANICAL NAME	COMMON NAME	TYPE	INSTALL RATE	WEED FABRIC	MFR.
ROCK		5,189 SF		3/4" TO 1-1/2" ROCK MULCH	ROCK MULCH	4"	YES	PIONEER SAND
SEED A		11,559 SF		PBS LOW GROW MIX	SEED			PAWNEE BUTTES SEED INC.
SEED B		79,567 SF		PBS NATIVE PRAIRIE MIX	SEED			PAWNEE BUTTES SEED INC.
SOD		20,722 SF		SURVIVALIST TALL FESCUE	SOD			GREEN BELT TURF FARM
WM		6,138 SF		WOOD MULCH	MULCH	4" DEPTH	YES	C&C SAND



U.S. HIGHWAY 24 (PUBLIC R.O.W. VARIES) (REC. NO. 204198867)



County File Number: PUDSP208

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN  
LANDSCAPE PLAN

PROJECT NO.  
096956009  
SHEET

8 OF 11

Kimley»Horn

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
2021 NORTH NEW YORK AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

BY DATE APPR.

NO.

REVISION



K:\COS\_LA\096956009 - Meadowbrook Park\CADD\PlanSheets\096956009-LA.dwg Salazar, Larry 3/19/2021 1:57 PM

# MEADOWBROOK PARK

## PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN

LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO

### GENERAL LANDSCAPE SPECIFICATIONS

- A. SCOPE OF WORK
1. THE WORK CONSISTS OF: FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, TRANSPORTATION, AND ANY OTHER APPURTENANCES NECESSARY FOR THE COMPLETION OF THIS PROJECT AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.
  2. WORK SHALL INCLUDE MAINTENANCE AND WATERING OF ALL CONTRACT PLANTING AREAS UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER.
- B. PROTECTION OF EXISTING STRUCTURES
1. ALL EXISTING BUILDINGS, WALKS, WALLS, PAVING, PIPING, OTHER SITE CONSTRUCTION ITEMS, AND PLANTING ALREADY COMPLETED OR ESTABLISHED AND DESIGNATED TO REMAIN SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. ALL DAMAGE RESULTING FROM NEGLIGENCE SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER, AT NO COST TO THE OWNER.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL NECESSARY BEST MANAGEMENT PRACTICES (BMP) DEVICES ACCORDING TO ALL REGULATORY AGENCY'S STANDARDS THROUGHOUT THE DURATION OF ALL CONSTRUCTION ACTIVITIES.
  3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MAINTENANCE OF TRAFFIC (MOT) THAT MAY BE REQUIRED FOR THE PROJECT.
  4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES, WHETHER PUBLIC OR PRIVATE, PRIOR TO EXCAVATION. THE OWNER AND DESIGN PROFESSIONAL SHALL NOT BE RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF ANY SUCH INFORMATION OR DATA. THE CONTRACTOR SHALL HAVE FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL SUCH INFORMATION AND DATA, LOCATING ALL UNDERGROUND FACILITIES DURING CONSTRUCTION, THE SAFETY AND PROTECTION THEREOF, REPAIRING ANY DAMAGE THERETO RESULTING FROM THE WORK. THE COST OF ALL WILL BE CONSIDERED AS HAVING BEEN INCLUDED IN THE CONTRACT PRICE. THE CONTRACTOR SHALL NOTIFY ANY AFFECTED UTILITY COMPANIES OR AGENCIES IN WRITING AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
- C. PROTECTION OF EXISTING PLANT MATERIALS
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UNAUTHORIZED CUTTING OR DAMAGE TO TREES AND SHRUBS EXISTING OR OTHERWISE, CAUSED BY CARELESS EQUIPMENT OPERATION, MATERIAL STOCKPILING, ETC.. THIS SHALL INCLUDE COMPACTION BY DRIVING OR PARKING INSIDE THE DRIP-LINE AND SPILLING OIL, GASOLINE, OR OTHER DELETERIOUS MATERIALS WITHIN THE DRIP-LINE. NO MATERIALS SHALL BE BURNED ON SITE. EXISTING TREES KILLED OR DAMAGED SO THAT THEY ARE MISSHAPEN AND/OR UNSIGHTLY SHALL BE REPLACED AT THE COST TO THE CONTRACTOR OF FOUR HUNDRED DOLLARS (\$400) PER CALIPER INCH ON AN ESCALATING SCALE WHICH ADDS AN ADDITIONAL TWENTY (20) PERCENT PER INCH OVER FOUR (4) INCHES CALIPER AS FIXED AND AGREED LIQUIDATED DAMAGES. CALIPER SHALL BE MEASURED SIX (6) INCHES ABOVE GROUND LEVEL FOR TREES UP TO AND INCLUDING FOUR (4) INCHES IN CALIPER AND TWELVE (12) INCHES ABOVE GROUND LEVEL FOR TREES OVER FOUR (4) INCHES IN CALIPER.
  2. SEE TREE MITIGATION PLAN AND NOTES, IF APPLICABLE.
- D. MATERIALS
1. GENERAL  
MATERIAL SAMPLES LISTED BELOW SHALL BE SUBMITTED FOR APPROVAL, ON SITE OR AS DETERMINED BY THE OWNER. UPON APPROVAL, DELIVERY OF MATERIALS MAY COMMENCE.  

MATERIAL	SAMPLE SIZE
MULCH	ONE (1) CUBIC FOOT
TOPSOIL MIX	ONE (1) CUBIC FOOT
PLANTS	ONE (1) OF EACH VARIETY (OR TAGGED IN NURSERY)
  2. PLANT MATERIALS
    - a. FURNISH NURSERY-GROWN PLANTS TRUE TO GENUS, SPECIES, VARIETY, CULTIVAR, STEM FORM, SHEARING, AND OTHER FEATURES INDICATED IN PLANT SCHEDULE SHOWN ON DRAWINGS AND COMPLYING WITH ANSI Z60.1 AND THE COLORADO NURSERY ACT; AND WITH HEALTHY ROOT SYSTEMS DEVELOPED BY TRANSPLANTING OR ROOT PRUNING. PROVIDE WELL-SHAPED, FULLY BRANCHED, HEALTHY, VIGOROUS STOCK, DENSELY FOLIATED WHEN IN LEAF AND FREE OF DISEASE, PESTS, EGGS, LARVAE, AND DEFECTS SUCH AS KNOTS, SUN SCALD, INJURIES, ABRASIONS, AND DISFIGUREMENT.
    - b. TREES FOR PLANTING IN ROWS SHALL BE UNIFORM IN SIZE AND SHAPE.
    - c. NO SUBSTITUTIONS SHALL BE MADE WITHOUT WRITTEN PERMISSION FROM THE PROJECT LANDSCAPE ARCHITECT. ANY ROW TREES MUST BE APPROVED BY OFFICE OF THE CITY FORESTER.
    - d. PROVIDE PLANTS OF SIZES, GRADES, AND BALL OR CONTAINER SIZES COMPLYING WITH ANSI Z60.1 AND COLORADO NURSERY ACT FOR TYPES AND FORM OF PLANTS REQUIRED. PLANTS OF A LARGER SIZE MAY BE USED IF ACCEPTABLE TO PROJECT LANDSCAPE ARCHITECT WITH A PROPORTIONATE INCREASE IN SIZE OF ROOTS OR BALLS.
    - e. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, OR UPON DELIVERY TO THE SITE, AS DETERMINED BY THE OWNER. FOR QUALITY, SIZE, AND VARIETY, SUCH APPROVAL SHALL NOT IMPAIR THE RIGHT OF INSPECTION AND REJECTION AT THE SITE DURING PROGRESS OF THE WORK OR AFTER COMPLETION FOR SIZE AND CONDITION OF ROOT BALLS OR ROOTS, LATENT DEFECTS OR INJURIES. REJECTED PLANTS SHALL BE REMOVED IMMEDIATELY FROM THE SITE. NOTICE REQUESTING INSPECTION SHALL BE SUBMITTED IN WRITING BY THE CONTRACTOR AT LEAST ONE (1) WEEK PRIOR TO ANTICIPATED DATE.
    - f. TREES WITH DAMAGED, CROOKED, OR MULTIPLE LEADERS; TIGHT VERTICAL BRANCHES WHERE BARK IS SQUEEZED BETWEEN TWO BRANCHES OR BETWEEN BRANCH AND TRUNK ("INCLUDED BARK"); CROSSING TRUNKS; CUT-OFF LIMBS MORE THAN 1/2 INCH (19 MM) IN DIAMETER, OR WITH STEM GIRDLING WOUNDS WILL BE REJECTED.
    - g. FURNISH TREES AND SHRUBS WITH ROOT BALLS MEASURED FROM TOP OF ROOT BALL, WHICH SHALL BEGIN AT ROOT FLARE ACCORDING TO ANSI Z60.1 AND COLORADO NURSERY ACT. ROOT FLARE SHALL BE VISIBLE BEFORE PLANTING.
    - h. LABEL AT LEAST ONE PLANT OF EACH VARIETY, SIZE, AND CALIPER WITH A SECURELY ATTACHED, WATERPROOF TAG BEARING LEGIBLE DESIGNATION OF COMMON NAME AND FULL SCIENTIFIC NAME, INCLUDING GENUS AND SPECIES, INCLUDE NOMENCLATURE FOR HYBRID, VARIETY, OR CULTIVAR, IF APPLICABLE FOR THE PLANT AS SHOWN ON DRAWINGS.
    - i. IF FORMAL ARRANGEMENTS OR CONSECUTIVE ORDER OF PLANTS IS SHOWN ON DRAWINGS, SELECT STOCK FOR UNIFORM HEIGHT AND SPREAD, AND NUMBER THE LABELS TO ASSURE SYMMETRY IN PLANTING.
- E. SOIL MIXTURE
1. CONTRACTOR SHALL TEST EXISTING SOIL AND AMEND AS NECESSARY IN ACCORDANCE WITH THE GUIDELINES BELOW:
  2. SOIL MIXTURE SHALL CONSIST OF TWO PARTS OF TOPSOIL AND ONE PART SAND, AS DESCRIBED BELOW. CONTRACTOR TO SUBMIT SAMPLES AND PH TESTING RESULTS OF SOIL MIXTURE FOR OWNER'S REPRESENTATIVE APPROVAL PRIOR TO PLANT INSTALLATION OPERATIONS COMMENCE.
    - a. TOPSOIL FOR USE IN PREPARING SOIL MIXTURE FOR BACKFILLING PLANT OPENINGS SHALL BE FERTILE, FRIABLE, AND OF A LOAMY CHARACTER, REASONABLY FREE OF SUBSOIL, CLAY LUMPS, BRUSH WEEDS, AND OTHER LITTER, FREE OF ROOTS, STUMPS, STONES LARGER THAN 2" IN ANY DIRECTION, AND OTHER EXTRANEIOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH. IT SHALL CONTAIN THREE (3) TO FIVE (5) PERCENT DECOMPOSED ORGANIC MATTER, HAVE A PH BETWEEN 5.5 AND 8.0, AND SOLUBLE SALTS LESS THAN 3.0 MMHOS/CM. SUBMIT SOIL SAMPLE AND PH TESTING RESULTS FOR APPROVAL.
    - b. SAND SHALL BE COARSE, CLEAN, WELL-DRAINING, NATIVE SAND.
  3. TREES SHALL BE PLANTED IN THE EXISTING NATIVE SOIL ON SITE, UNLESS DETERMINED TO BE UNSUITABLE - AT WHICH POINT THE CONTRACTOR SHALL CONTACT THE PROJECT LANDSCAPE ARCHITECT TO DISCUSS ALTERNATE RECOMMENDATION PRIOR TO PLANTING.
- F. WATER
1. WATER NECESSARY FOR PLANTING AND MAINTENANCE SHALL BE OF SATISFACTORY QUALITY TO SUSTAIN ADEQUATE PLANT GROWTH AND SHALL NOT CONTAIN HARMFUL, NATURAL OR MAN-MADE ELEMENTS DETRIMENTAL TO PLANTS. WATER MEETING THE ABOVE STANDARD SHALL BE OBTAINED ON THE SITE (IF AVAILABLE). IF AVAILABLE, THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE ARRANGEMENTS FOR ITS USE BY HIS TANKS, HOSES, SPRINKLERS, ETC.... IF SUCH WATER IS NOT AVAILABLE AT THE SITE, THE CONTRACTOR SHALL PROVIDE SATISFACTORY WATER FROM SOURCES OFF THE SITE AT NO ADDITIONAL COST TO THE OWNER.  
  
\* WATERING/IRRIGATION RESTRICTIONS MAY APPLY - REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.
- G. FERTILIZER
1. CONTRACTOR SHALL PROVIDE FERTILIZER APPLICATION SCHEDULE TO OWNER, AS APPLICABLE TO SOIL TYPE, PLANT INSTALLATION TYPE, AND SITE'S PROPOSED USE. SUGGESTED FERTILIZER TYPES SHALL BE ORGANIC OR OTHERWISE NATURALLY-DERIVED.  
  
\* FERTILIZER RESTRICTIONS MAY APPLY - REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.

- H. MULCH
1. MULCH MATERIAL SHALL BE MOISTENED AT THE TIME OF APPLICATION TO PREVENT WIND DISPLACEMENT, AND APPLIED AT A DEPTH OF THREE (3) INCHES CLEAR MULCH FROM EACH PLANT'S CROWN (BASE) OR AS SHOWN IN PLANTING DETAILS. MULCH SHALL BE DOUBLE SHREDDED HARDWOOD MULCH. DYED MULCH IS NOT ACCEPTABLE. SUBMIT SAMPLES TO PROJECT LANDSCAPE ARCHITECT FOR APPROVAL. MULCH SHALL BE PROVIDED OVER THE ENTIRE AREA OF EACH SHRUB BED, GROUND COVER, VINE BED, AND TREE RING (6" MINIMUM) PLANTED UNDER THIS CONTRACT, AS WELL AS FOR ANY EXISTING LANDSCAPE AREAS AS SHOWN ON PLANS.
- I. DIGGING AND HANDLING
1. ALL TREES SPECIFIED SHALL BE BALLED AND BURLAPPED (B&B) UNLESS OTHERWISE APPROVED BY PROJECT LANDSCAPE ARCHITECT.
  2. PROTECT ROOTS OR ROOT BALLS OF PLANTS AT ALL TIMES FROM SUN, DRYING WINDS, WATER AND FREEZING. AS NECESSARY UNTIL PLANTING. PLANT MATERIALS SHALL BE ADEQUATELY PACKED TO PREVENT DAMAGE DURING TRANSIT. TREES TRANSPORTED MORE THAN TEN (10) MILES OR WHICH ARE NOT PLANTED WITHIN THREE (3) DAYS OF DELIVERY TO THE SITE SHALL BE SPRAYED WITH AN ANTITRANSPIRANT PRODUCT ("WILTRFUP" OR EQUAL) TO MINIMIZE TRANSPIRATIONAL WATER LOSS.
  3. B&B AND FIELD GROWN (FG) PLANTS SHALL BE DUG WITH FIRM, NATURAL BALLS OF SOIL OF SUFFICIENT SIZE TO ENCOMPASS THE FIBROUS AND FEEDING ROOTS OF THE PLANTS. NO PLANTS MOVED WITH A ROOT BALL SHALL BE PLANTED IF THE BALL IS CRACKED OR BROKEN. PLANTS SHALL NOT BE HANDLED BY STEMS.
- J. CONTAINER GROWN STOCK
1. ALL CONTAINER GROWN MATERIAL SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED PLANTS ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THE PLANTS SHALL HAVE TOPS WHICH ARE OF GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION.
  2. AN ESTABLISHED CONTAINER GROWN PLANT SHALL BE TRANSPLANTED INTO A CONTAINER AND GROWN IN THAT CONTAINER SUFFICIENTLY LONG ENOUGH FOR THE NEW FIBROUS ROOTS TO HAVE DEVELOPED SO THAT THE ROOT MASS WILL RETAIN ITS SHAPE AND HOLD TOGETHER WHEN REMOVED FROM THE CONTAINER. CONTAINER GROWN STOCK SHALL NOT BE HANDLED BY THEIR STEMS.
  3. ROOT BOUND PLANTS ARE NOT ACCEPTABLE AND WILL BE REJECTED.
- K. MATERIALS LIST
1. QUANTITIES NECESSARY TO COMPLETE THE WORK ON THE DRAWINGS SHALL BE FURNISHED BY THE CONTRACTOR. QUANTITY ESTIMATES HAVE BEEN MADE CAREFULLY, BUT THE LANDSCAPE ARCHITECT OR OWNER ASSUMES NO LIABILITY FOR OMISSIONS OR ERRORS. SHOULD A DISCREPANCY OCCUR BETWEEN THE PLANS AND THE PLANT LIST QUANTITY, THE PLANS SHALL GOVERN. ALL DIMENSIONS AND/OR SIZES SPECIFIED SHALL BE THE MINIMUM ACCEPTABLE SIZE.
- L. FINE GRADING
1. FINE GRADING UNDER THIS CONTRACT SHALL CONSIST OF FINAL FINISHED GRADING OF LAWN AND PLANTING AREAS THAT HAVE BEEN DISTURBED DURING CONSTRUCTION.
  2. THE CONTRACTOR SHALL FINE GRADE THE LAWN AND PLANTING AREAS TO BRING THE ROUGH GRADE UP TO FINAL FINISHED GRADE ALLOWING FOR THICKNESS OF SOD AND/OR MULCH DEPTH.
  3. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED FOR POSITIVE DRAINAGE TO SURFACE/SUBSURFACE STORM DRAIN SYSTEMS. AREAS ADJACENT TO BUILDINGS SHALL SLOPE AWAY FROM THE BUILDINGS. REFER TO CIVIL ENGINEER'S PLANS FOR FINAL GRADES, IF APPLICABLE.
- M. PLANTING PROCEDURES
1. THE CONTRACTOR SHALL CLEAN WORK AND SURROUNDING AREAS OF ALL RUBBISH OR OBJECTIONABLE MATTER DAILY. ALL MORTAR, CEMENT, BUILDING MATERIALS, AND TOXIC MATERIAL SHALL BE COMPLETELY REMOVED FROM PLANTING AREAS. THESE MATERIALS SHALL NOT BE MIXED WITH THE SOIL. SHOULD THE CONTRACTOR FIND SUCH SOIL CONDITIONS IN PLANTING AREAS WHICH WILL ADVERSELY AFFECT THE PLANT GROWTH, THE CONTRACTOR SHALL IMMEDIATELY CALL IT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE. FAILURE TO DO SO BEFORE PLANTING SHALL MAKE THE CORRECTIVE MEASURES THE RESPONSIBILITY OF THE CONTRACTOR.
  2. VERIFY LOCATIONS OF ALL UTILITIES, CONDUITS, SUPPLY LINES AND CABLES, INCLUDING BUT NOT LIMITED TO: ELECTRIC, GAS (LINES AND TANKS), WATER, SANITARY SEWER, STORMWATER SYSTEMS, CABLE AND TELEPHONE. PROPERLY MAINTAIN AND PROTECT EXISTING UTILITIES. CALL COLORADO (811) TO LOCATE UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
  3. CONTRACTOR IS RESPONSIBLE TO REMOVE ALL EXISTING AND IMPORTED LIMEROCK AND LIMEROCK SUB-BASE FROM ALL PLANTING AREAS TO A MINIMUM DEPTH OF 36" OR TO NATIVE SOIL. CONTRACTOR IS RESPONSIBLE TO BACKFILL THESE PLANTING AREAS TO ROUGH FINISHED GRADE WITH CLEAN TOPSOIL FROM AN ON-SITE SOURCE OR AN IMPORTED SOURCE. IF LIMEROCK OR OTHER ADVERSE CONDITIONS OCCUR IN PLANTED AREAS AFTER 36" DEEP EXCAVATION BY THE CONTRACTOR, AND POSITIVE DRAINAGE CAN NOT BE ACHIEVED, CONTRACTOR SHALL UTILIZE POOR DRAINAGE CONDITION PLANTING DETAIL.
  4. FURNISH NURSERY'S CERTIFICATE OF COMPLIANCE WITH ALL REQUIREMENTS AS SPECIFIED HEREIN. INSPECT AND SELECT PLANT MATERIALS BEFORE PLANTS ARE DUG AT NURSERY OR GROWING SITE.
  5. COMPLY WITH APPLICABLE FEDERAL, STATE, COUNTY, AND LOCAL REGULATIONS GOVERNING LANDSCAPE MATERIALS AND WORK. UPON ARRIVAL AT THE SITE, PLANTS SHALL BE THOROUGHLY WATERED AND PROPERLY MAINTAINED UNTIL PLANTED. PLANTS STORED ON-SITE SHALL NOT REMAIN UNPLANTED OR INAPPROPRIATELY HEATED FOR A PERIOD EXCEEDING TWENTY-FOUR (24) HOURS. AT ALL TIMES WORKMANLIKE METHODS CUSTOMARY IN ACCEPTED HORTICULTURAL PRACTICES AS USED IN THE TRADE SHALL BE EXERCISED.
  6. WORK SHALL BE COORDINATED WITH OTHER TRADES TO PREVENT CONFLICTS. COORDINATE PLANTING WITH IRRIGATION WORK TO ASSURE AVAILABILITY OF WATER AND PROPER LOCATION OF IRRIGATION APPURTENANCES AND PLANTS.
  7. ALL PLANTING OPENINGS SHALL BE EXCAVATED TO SIZE AND DEPTH IN ACCORDANCE WITH ANSI Z60.1-2014 AMERICAN STANDARD FOR NURSERY STOCK.
  8. TEST ALL TREE OPENINGS WITH WATER BEFORE PLANTING TO ASSURE PROPER DRAINAGE PERCOLATION IS AVAILABLE. NO ALLOWANCE WILL BE MADE FOR LOST PLANTS DUE TO IMPROPER DRAINAGE. IF POOR DRAINAGE EXISTS, UTILIZE "POOR DRAINAGE CONDITION" PLANTING DETAIL.
  9. TREES SHALL BE SET PLUMB AND HELD IN POSITION UNTIL THE PLANTING MIXTURE HAS BEEN FLUSHED INTO PLACE WITH A SLOW, FULL HOSE STREAM. ALL PLANTING SHALL BE PERFORMED BY PERSONNEL FAMILIAR WITH PLANTING PROCEDURES AND UNDER THE SUPERVISION OF A QUALIFIED LANDSCAPE FOREMAN.
  10. PRIOR TO EXCAVATION OF TREE OPENINGS, AN AREA EQUAL TO TWO TIMES THE DIAMETER OF THE ROOT BALL SHALL BE ROTO-TILLED TO A DEPTH EQUAL TO THE DEPTH OF THE ROOT BALL.
  11. EXCAVATION OF TREE OPENINGS SHALL BE PERFORMED USING EXTREME CARE TO AVOID DAMAGE TO SURFACE AND SUBSURFACE ELEMENTS SUCH AS UTILITIES OR HARDSCAPE ELEMENTS, FOOTERS AND PREPARED SUB-BASES.
  12. IN CONTINUOUS SHRUB AND GROUND COVER BEDS, THE ROTO-TILLED PERIMETER SHOULD EXTEND TO A DISTANCE OF ONE FOOT BEYOND THE DIAMETER OF A SINGLE ROOT BALL. THE BED SHALL BE TILLED TO A DEPTH EQUAL TO THE ROOT BALL DEPTH PLUS 6".
  13. TREE OPENINGS FOR WELL DRAINED SOILS SHALL BE DUG SO THAT THE BOTTOM OF THE ROOT BALL WILL REST ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL WILL BE WITH FINISH GRADE. IN POORLY DRAINED SOILS THE TREE OPENING SHALL BE DUG SO THAT THE ROOT BALL RESTS ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL IS 1" ABOVE FINISH GRADE. PLANT PIT WALLS SHALL BE SCARIFIED PRIOR TO PLANT INSTALLATION.
  14. TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO BUILDINGS AND BUILDING STRUCTURES WHILE INSTALLING TREES.
  15. SOIL MIXTURE SHALL BE AS SPECIFIED IN SECTION "E".
  16. TREES AND SHRUBS SHALL BE SET STRAIGHT AT AN ELEVATION THAT, AFTER SETTLEMENT, THE PLANT CROWN WILL STAND ONE (1) TO TWO (2) INCHES ABOVE GROUND. EACH PLANT SHALL BE SET IN THE CENTER OF THE PIT. SOIL MIXTURE SHALL BE BACK FILLED, THOROUGHLY TAMPED AROUND THE BALL, AND SETTLED BY WATER (AFTER TAMPING).
  17. AMEND PINE AND OAK PLANT OPENINGS WITH ECTOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. ALL OTHER PLANT OPENINGS SHALL BE AMENDED WITH ENDOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. PROVIDE PRODUCT INFORMATION SUBMITTAL PRIOR TO INOCULATION.

18. FILL HOLE WITH SOIL MIXTURE, MAKING CERTAIN ALL SOIL IS SATURATED. TO DO THIS, FILL HOLE WITH WATER AND ALLOW TO SOAK MINIMUM TWENTY (20) MINUTES, STIRRING IF NECESSARY TO GET SOIL THOROUGHLY WET. PACK LIGHTLY WITH FEET, ADD MORE WET SOIL MIXTURE. DO NOT COVER TOP OF BALL WITH SOIL MIXTURE.
  19. ALL BURLAP, ROPE, WIRES, BASKETS, ETC., SHALL BE REMOVED FROM THE SIDES AND TOPS OF BALLS, BUT NO BURLAP SHALL BE PULLED FROM UNDERNEATH.
  20. TREES SHALL BE PRUNED, IN ACCORDANCE WITH ANSI A-300, TO PRESERVE THE NATURAL CHARACTER OF THE PLANT. ALL SOFT WOOD OR SUCKER GROWTH AND ALL BROKEN OR BADLY DAMAGED BRANCHES SHALL BE REMOVED WITH A CLEAN CUT. ALL PRUNING TO BE PERFORMED BY CERTIFIED ARBORIST.
  21. SHRUBS AND GROUND COVER PLANTS SHALL BE EVENLY SPACED IN ACCORDANCE WITH THE DRAWINGS AND AS INDICATED ON THE PLANT LIST. MATERIALS INSTALLED SHALL MEET MINIMUM SPECIMEN REQUIREMENTS OR QUANTITIES SHOWN ON PLANS, WHICHEVER IS GREATER. CULTIVATE ALL PLANTING AREAS TO A MINIMUM DEPTH OF 6". REMOVE AND DISPOSE ALL DEBRIS. MIX TOP 4" THE PLANTING SOIL MIXTURE AS SPECIFIED IN SECTION E. THOROUGHLY WATER ALL PLANTS AFTER INSTALLATION.
  22. TREE GUYING AND BRACING SHALL BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH THE PLANS TO INSURE STABILITY AND MAINTAIN TREES IN AN UPRIGHT POSITION. IF THE CONTRACTOR AND OWNER DECIDE TO WAIVE THE TREE GUYING AND BRACING, THE OWNER SHALL NOTIFY THE PROJECT LANDSCAPE ARCHITECT IN WRITING AND AGREE TO INDEMNIFY AND HOLD HARMLESS THE PROJECT LANDSCAPE ARCHITECT IN THE EVENT UNSUPPORTED TREES PLANTED UNDER THIS CONTRACT FALL AND DAMAGE PERSON OR PROPERTY.
  23. ALL PLANT BEDS SHALL BE KEPT FREE OF NOXIOUS WEEDS UNTIL FINAL ACCEPTANCE OF WORK. IF DIRECTED BY THE OWNER, "ROUND-UP" SHALL BE APPLIED FOR WEED CONTROL BY QUALIFIED PERSONNEL TO ALL PLANTING AREAS IN SPOT APPLICATIONS PER MANUFACTURER'S RECOMMENDATIONS. PRIOR TO FINAL INSPECTION, TREAT ALL PLANTING BEDS WITH AN APPROVED PRE-EMERGENT HERBICIDE AT AN APPLICATION RATE RECOMMENDED BY THE MANUFACTURER. (AS ALLOWED BY JURISDICTIONAL AUTHORITY).
- N. LAWN SODDING
1. THE WORK CONSISTS OF LAWN BED PREPARATION, SOIL PREPARATION, AND SODDING COMPLETE, IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND THE APPLICABLE DRAWINGS TO PRODUCE A TURF GRASS LAWN ACCEPTABLE TO THE OWNER.
  2. ALL AREAS THAT ARE TO BE SODDED SHALL BE CLEARED OF ANY ROUGH GRASS, WEEDS, AND DEBRIS BY MEANS OF A SOD CUTTER TO A DEPTH OF THREE (3) INCHES, AND THE GROUND BROUGHT TO AN EVEN GRADE. THE ENTIRE SURFACE SHALL BE ROLLED WITH A ROLLER WEIGHING NOT MORE THAN ONE HUNDRED (100) POUNDS PER FOOT OF WIDTH. DURING THE ROLLING, ALL DEPRESSIONS CAUSED BY SETTLEMENT SHALL BE FILLED WITH ADDITIONAL SOIL, AND THE SURFACE SHALL BE REGRADED AND ROLLED UNTIL PRESENTING A SMOOTH AND EVEN FINISH TO THE REQUIRED GRADE.
  3. PREPARE LOOSE BED FOUR (4) INCHES DEEP. HAND RAKE UNTIL ALL BUMPS AND DEPRESSIONS ARE REMOVED. WET PREPARED AREA THOROUGHLY.
  4. SODDING
    - a. THE CONTRACTOR SHALL SOD ALL AREAS THAT ARE NOT PAVED OR PLANTED AS DESIGNATED ON THE DRAWINGS WITHIN THE CONTRACT LIMITS, UNLESS SPECIFICALLY NOTED OTHERWISE.
    - b. SOD PANELS SHALL BE LAID TIGHTLY TOGETHER SO AS TO MAKE A SOLID SODDED LAWN AREA. SOD SHALL BE LAID UNIFORMLY AGAINST THE EDGES OF ALL CURBS AND OTHER HARDSCAPE ELEMENTS, PAVED AND PLANTED AREAS, ADJACENT TO BUILDINGS. A 24 INCH STONE MULCH STRIP SHALL BE PROVIDED, IMMEDIATELY FOLLOWING SOD LAYING. THE LAWN AREAS SHALL BE ROLLED WITH A LAWN ROLLER CUSTOMARILY USED FOR SUCH PURPOSES, AND THEN THOROUGHLY IRRIGATED. IF, IN THE OPINION OF THE OWNER, TOP-DRESSING IS NECESSARY AFTER ROLLING TO FILL THE VOIDS BETWEEN THE SOD PANELS AND TO EVEN OUT INCONSISTENCIES IN THE SOD, CLEAN SAND, AS APPROVED BY THE OWNER'S REPRESENTATIVE, SHALL BE UNIFORMLY SPREAD OVER THE ENTIRE SURFACE OF THE SOD AND THOROUGHLY WATERED IN. FERTILIZE INSTALLED SOD AS ALLOWED BY PROPERTY'S JURISDICTIONAL AUTHORITY.
  5. DURING DELIVERY, PRIOR TO, AND DURING THE PLANTING OF THE LAWN AREAS, THE SOD PANELS SHALL AT ALL TIMES BE PROTECTED FROM EXCESSIVE DRYING AND UNNECESSARY EXPOSURE OF THE ROOTS TO THE SUN. ALL SOD SHALL BE STACKED SO AS NOT TO BE DAMAGED BY SWEATING OR EXCESSIVE HEAT AND MOISTURE.
  6. LAWN MAINTENANCE
    - a. WITHIN THE CONTRACT LIMITS, THE CONTRACTOR SHALL PRODUCE A DENSE, WELL ESTABLISHED LAWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AND RE-SODDING OF ALL ERODED, SUNKEN OR BARE SPOTS (LARGER THAN 12"x12") UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE. REPAIRED SODDING SHALL BE ACCOMPLISHED AS IN THE ORIGINAL WORK, INCLUDING REGRAIDDING IF NECESSARY.
    - b. CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SOD/LAWN UNTIL ACCEPTANCE BY THE OWNER'S REPRESENTATIVE. PRIOR TO AND UPON ACCEPTANCE, CONTRACTOR TO PROVIDE WATERING/IRRIGATION SCHEDULE TO OWNER. OBSERVE ALL APPLICABLE WATERING RESTRICTIONS AS SET FORTH BY THE PROPERTY'S JURISDICTIONAL AUTHORITY.
- O. EDGING
- a. CONTRACTOR SHALL INSTALL 4"x4" ROLLED TOP STEEL EDGING BETWEEN ALL SOD/SEED AREAS AND PLANTING BEDS.
- P. CLEANUP
1. UPON COMPLETION OF ALL PLANTING WORK AND BEFORE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL MATERIAL, EQUIPMENT, AND DEBRIS RESULTING FROM CONTRACTORS WORK. ALL PAVED AREAS SHALL BE CLEANED AND THE SITE LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER'S REPRESENTATIVE.
- Q. PLANT MATERIAL MAINTENANCE
1. ALL PLANTS AND PLANTING INCLUDED UNDER THIS CONTRACT SHALL BE MAINTAINED BY WATERING, CULTIVATING, SPRAYING, PRUNING, AND ALL OTHER OPERATIONS (SUCH AS RE-STAKING OR REPAIRING GUY SUPPORTS) NECESSARY TO INSURE A HEALTHY PLANT CONDITION BY THE CONTRACTOR UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.
- R. FINAL INSPECTION AND ACCEPTANCE OF WORK
1. FINAL INSPECTION AT THE END OF THE WARRANTY PERIOD SHALL BE ON PLANTING, CONSTRUCTION AND ALL OTHER INCIDENTAL WORK PERTAINING TO THIS CONTRACT. ANY REPLACEMENT AT THIS TIME SHALL BE SUBJECT TO THE SAME ONE (1) YEAR WARRANTY (OR AS SPECIFIED BY THE LANDSCAPE ARCHITECT OR OWNER IN WRITING) BEGINNING WITH THE TIME OF REPLACEMENT AND ENDING WITH THE SAME INSPECTION AND ACCEPTANCE HEREIN DESCRIBED.
- S. WARRANTY
1. THE LIFE AND SATISFACTORY CONDITION OF ALL PLANT MATERIAL INSTALLED (INCLUDING SOD) BY THE LANDSCAPE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A MINIMUM OF ONE (1) CALENDAR YEAR COMMENCING AT THE TIME OF CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.
  2. ANY PLANT NOT FOUND IN A HEALTHY GROWING CONDITION AT THE END OF THE WARRANTY PERIOD SHALL BE REMOVED FROM THE SITE AND REPLACED AS SOON AS WEATHER CONDITIONS PERMIT. ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE AS SPECIFIED IN THE PLANT LIST. THEY SHALL BE FURNISHED PLANTED AND MULCHED AS SPECIFIED AT NO ADDITIONAL COST TO THE OWNER.
  3. IN THE EVENT THE OWNER DOES NOT CONTRACT WITH THE CONTRACTOR FOR LANDSCAPE AND IRRIGATION MAINTENANCE, THE CONTRACTOR SHOULD VISIT THE PROJECT SITE PERIODICALLY DURING THE ONE (1) YEAR WARRANTY PERIOD TO EVALUATE MAINTENANCE PROCEDURES BEING PERFORMED BY THE OWNER. CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING OF MAINTENANCE PROCEDURES OR CONDITIONS WHICH THREATEN VIGOROUS AND HEALTHY PLANT GROWTH.

**Kimley»Horn**

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
300 NORTH NEWARK AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN  
LANDSCAPE PLAN

PROJECT NO.  
096956009

SHEET

9 OF 11

County File Number: PUDSP208

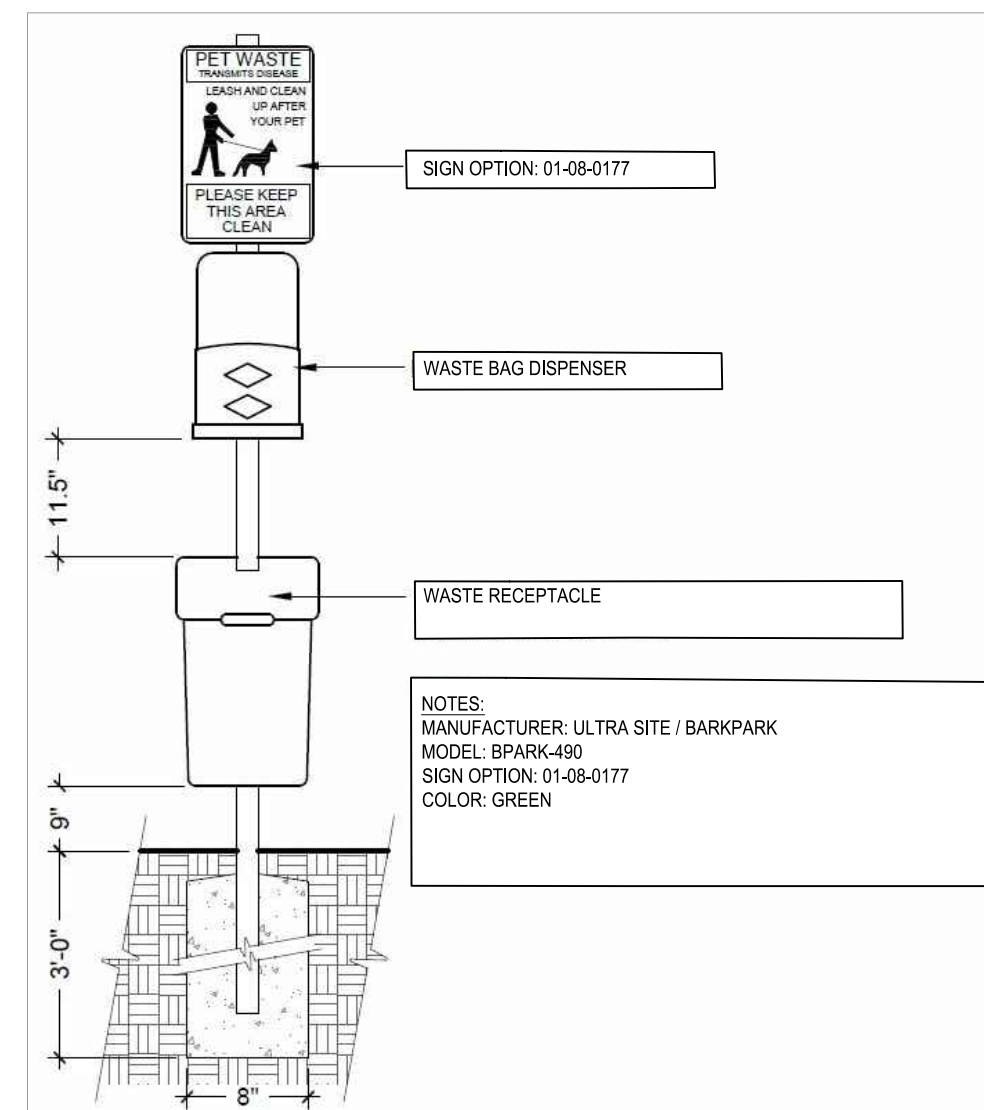
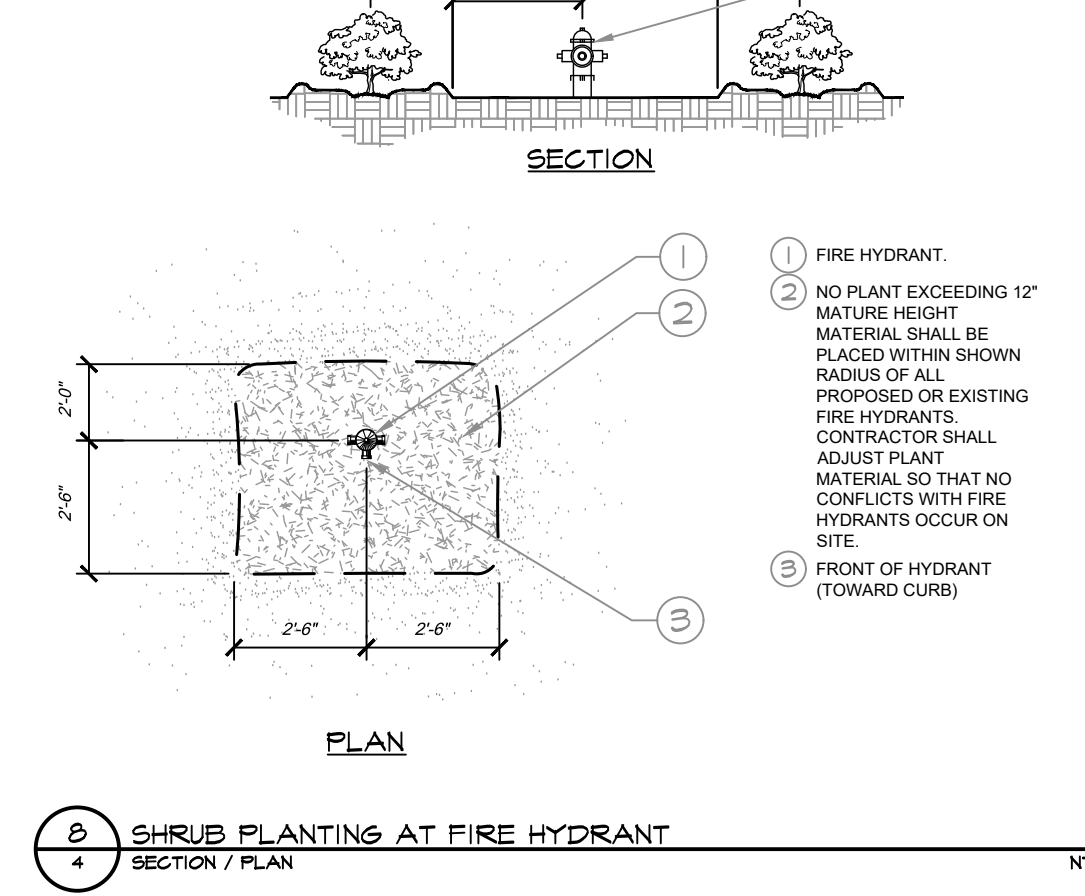
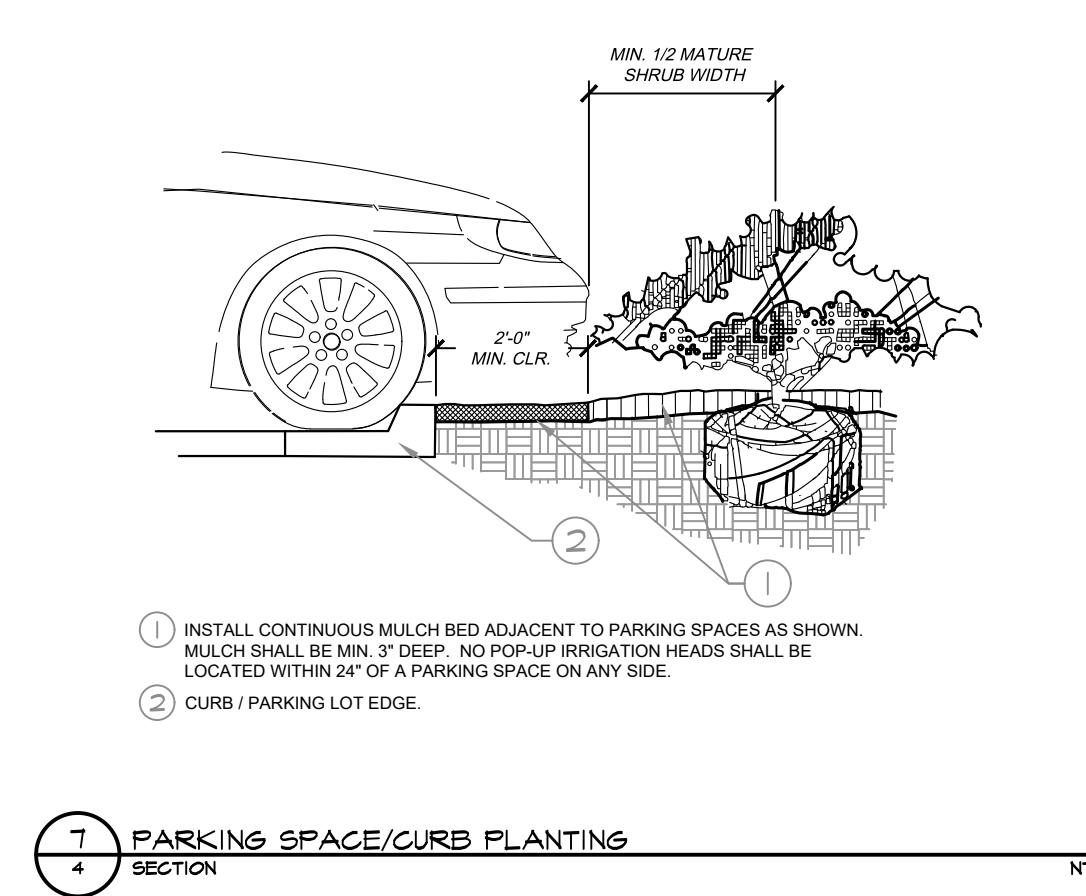
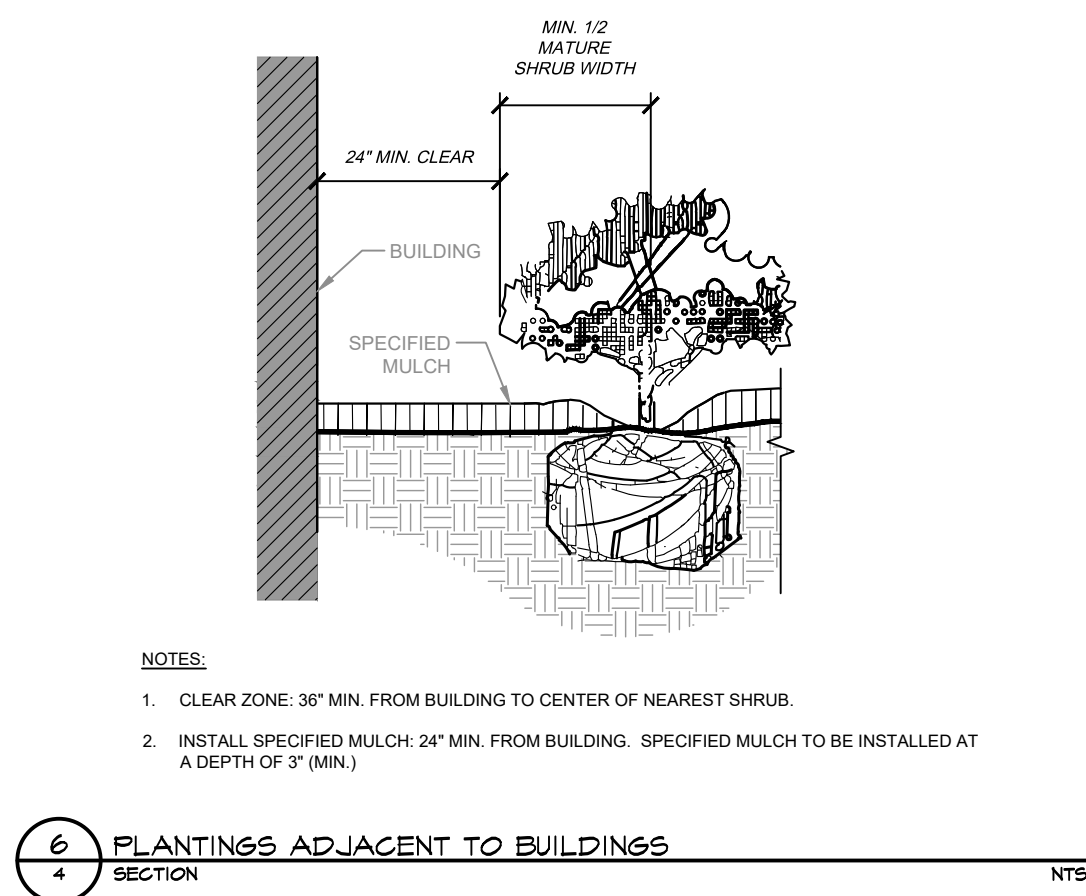
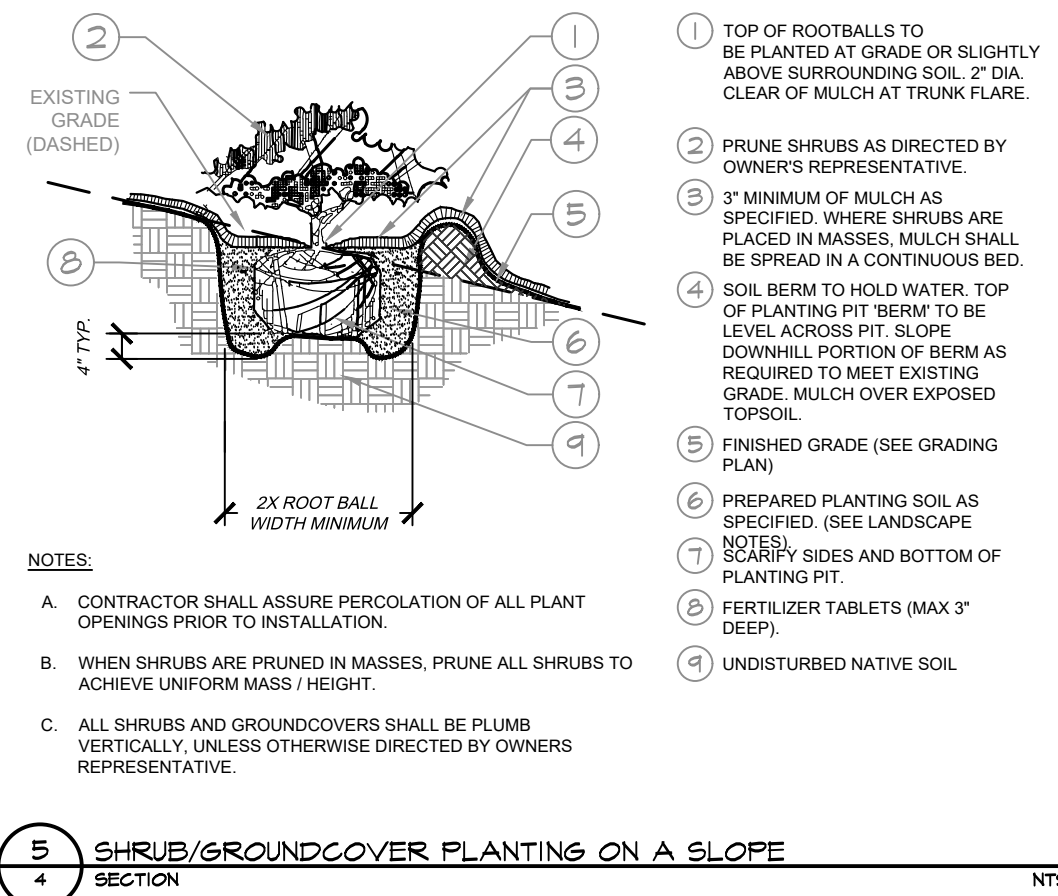
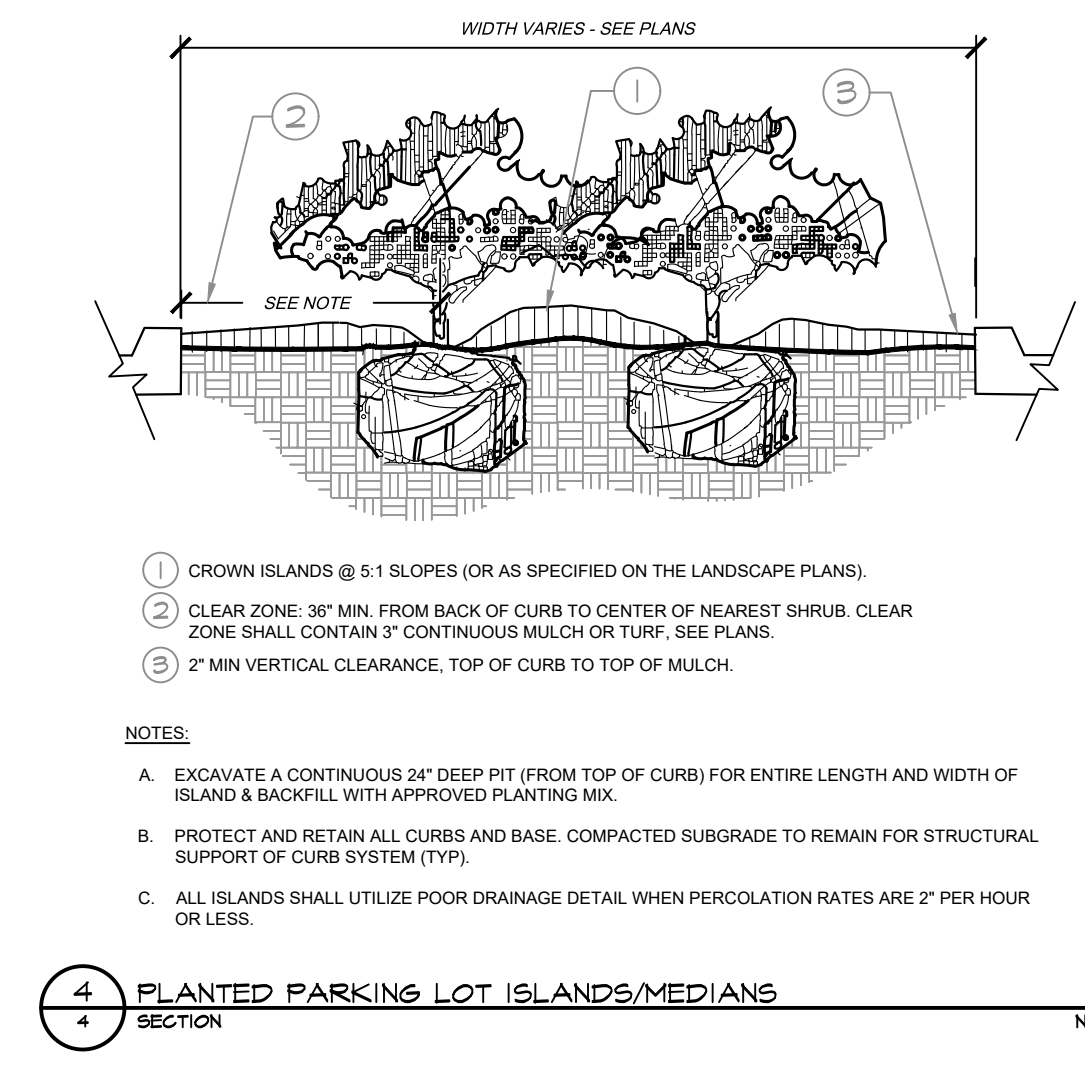
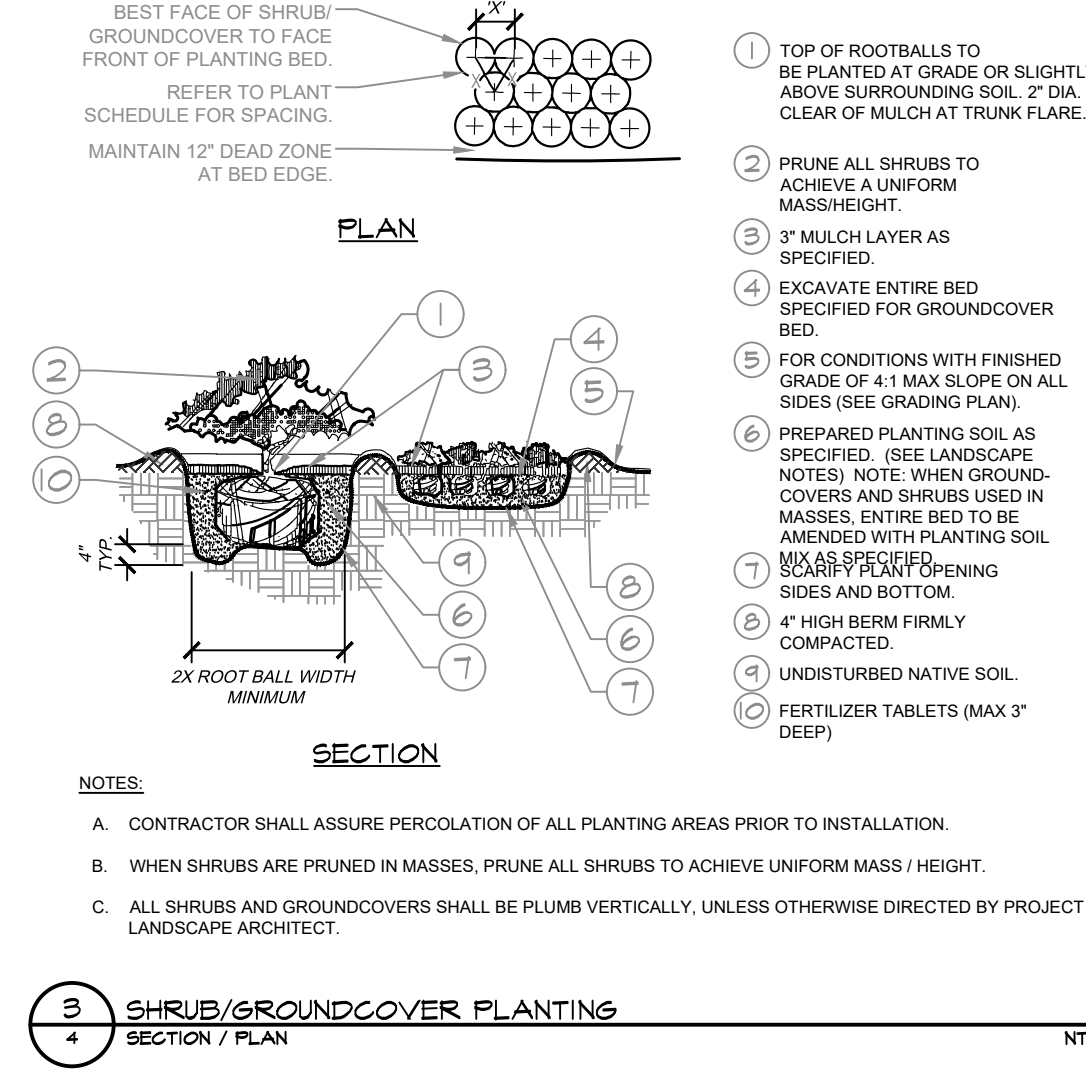
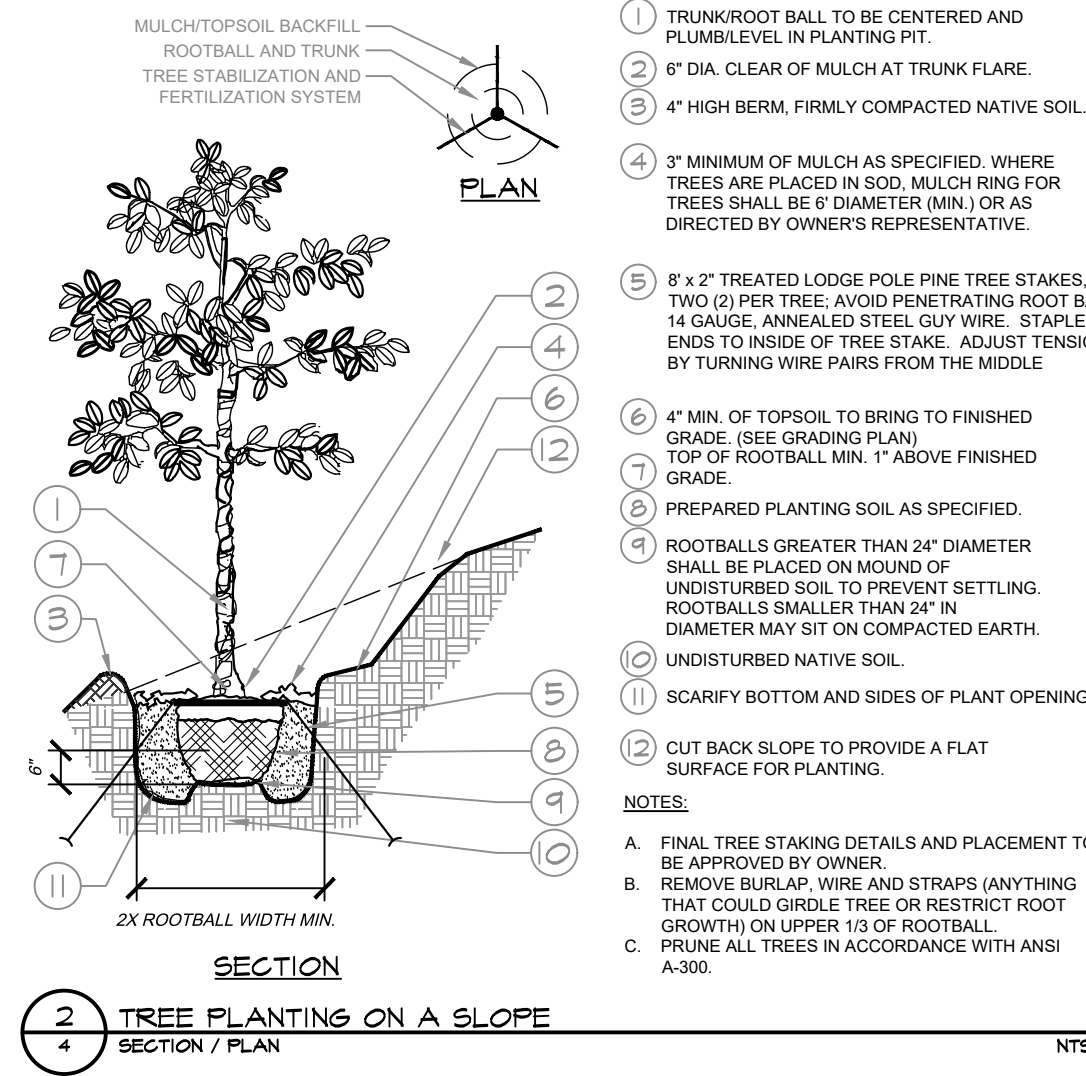
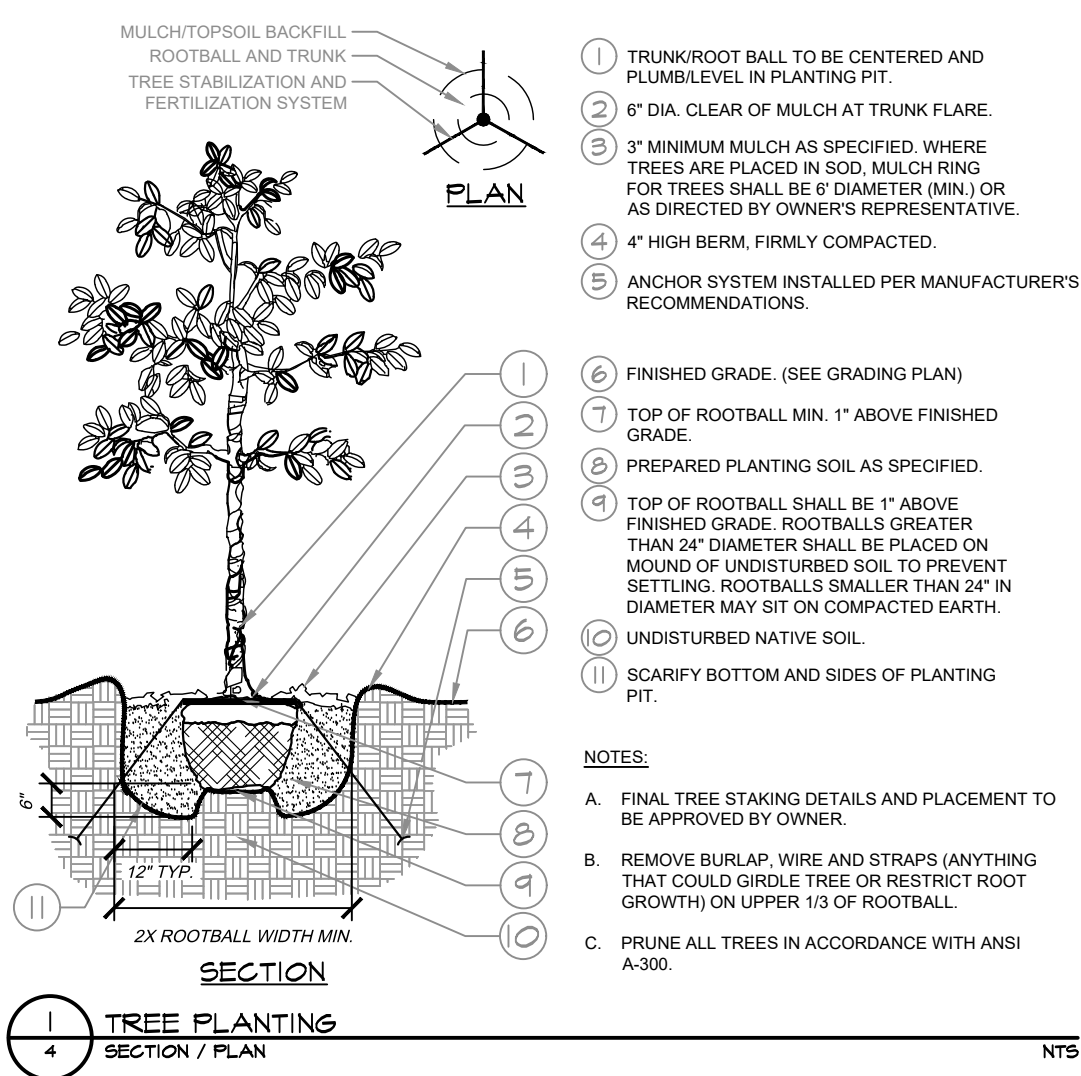


K:\COS\_LA\096956009 - Meadowbrook Park\CADD\PlanSheets\096956009-LA.dwg Salazar, Larry 3/19/2021 1:57 PM

# MEADOWBROOK PARK

## PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN

LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO



### INTERNAL LANDSCAPING:

NET SITE AREA (AREAS A & C):	348,971 SF (8.01 AC)
PERCENT MINIMUM INTERNAL AREA:	15%
INTERNAL AREA REQUIRED/PROVIDED:	52,345 SF / 123,175 SF
TREE/SQUARE FEET REQUIRED:	1/500
INTERNAL TREES REQUIRED/PROVIDED:	105 / 57
SHRUB SUBSTITUTES REQUIRED/PROVIDED:	480 / 480
ORN. GRASS SUBSTITUTES REQ./PROV.:	0 / 0
INTERNAL PLANT ABBREVIATED ON PLAN:	IN
% GROUND PLANE VEG. REQUIRED/PROVIDED:	75%/75%

### LANDSCAPE SETBACKS & BUFFERS:

STREET NAME OR ZONE BOUNDARY:	MEADOWBROOK PW	HWY 24	NORTH SIDE	SOUTH SIDE
STREET CLASSIFICATION:	MINOR ARTERIAL	EXPRESSWAY	N/A	N/A
SETBACK DEPTH REQUIRED/PROVIDED:	20' / 20'	25' / 25'	15' / 15'	15' / 15'
LINEAR FOOTAGE:	788'	1161'	541'	378'
TREE/FEET REQUIRED:	1 / 25	1 / 20'	1 / 15'	1 / 15'
NUMBER OF TREES REQUIRED/PROVIDED:	32 / 32	58 / 58	35 / 35	26 / 26
SHRUB SUBSTITUTES REQUIRED/PROVIDED:	0 / 0	0 / 0	0 / 0	0 / 0
ORNAMENTAL GRASS SUBSTITUTES REQ./PROV.:	0 / 0	0 / 0	0 / 0	0 / 0
EVERGREEN TREES REQ./PROV.:	N/A	N/A	12 / 23	9 / 10
PLANT ABBREVIATION DENOTED ON PLAN:	MP	HW	NS	SS
% GROUND PLANE VEG. REQUIRED/PROVIDED:	75%/75%	75%/75%	75%/75%	75%/75%

### MEADOWBROOK PARK PLANNED UNIT DEVELOPMENT (PUD) PLAN LANDSCAPE PLAN

**Kimley»Horn**

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
200 NORTH NEW YORK AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
DATE: XX/XX/21

PROJECT NO.  
096956009

SHEET

10 OF 11

County File Number: PUDSP208





Planning and Community  
Development Department  
2880 International Circle  
Colorado Springs, Colorado 80910  
Phone: 719.520.6300  
Fax: 719.520.6695  
Website [www.elpasoco.com](http://www.elpasoco.com)

**DEVIATION REQUEST  
AND DECISION FORM IN  
ASSOCIATION WITH  
A REQUEST FOR A PUD  
MODIFICATION FROM  
THE ECM**

Updated: 6/26/2019

Pursuant to the El Paso County Land Development Code, the Board of County Commissioners may approve as part of the Planned Unit Development (PUD) approval a Modification to the Engineering Criteria Manual standards provided the Board can make the findings listed Section 4.2.6.F.2.h of the Land Development Code:

The proposal provides for the general health, safety, and welfare of the citizens and at least one of the following benefits:

- Preservation of natural features;
- Provision of a more livable environment, such as the installment of street furniture, decorative street lighting or decorative paving materials;
- Provision of a more efficient pedestrian system;
- Provision of additional open space;
- Provision of other public amenities not otherwise required by the Code; or
- The proposed modification is granted in exchange for the open space and/or amenity designs provided in the PUD development plan and/or development guide.

The review and approval of this Deviation does not authorize construction of the requested improvements until and unless the Board of County Commissioners approves the Modifications in association with the Planned Unit Development request, the applicant has received approval of all associated engineering documents, the applicant has provided the necessary financial assurances, and a construction permit has been issued by the Planning and Community Development Department.



**PROJECT INFORMATION**

Project Name : MEADOWBROOK PARK

Schedule No.(s) : 5408008002, 5408403001, 5408001029

Legal Description : TRACT A 24/94 BUSINESS PARK FIL NO 1; TR I MEADOWBROOK CROSSING FILING NO 1, AS AMENDED BY AFFIDAVIT OF CORRECTION REC #218068301; & TRACT IN SE4 SEC 08-14-65 AS FOLS, BEG AT A PT ON N BDRY LN OF SD SE4 WHENCE THE E4 COR BEARS S 89<33' E 2023.0 FT, TH S 89<33' E 598.6 FT, S 33<35' W 508.5 FT, S 56<25' E 30.0 FT, S 37<48' W 375.0 FT, S 17<09' W 148.2 FT, N 02<16' W 417.0 FT, N 06<38' E 358.0 FT, TH N 17<04' E 15.7 FT TO POB, EX THAT PT PLATTED TO CLAREMONT BUSINESS PARK FIL NO 2, EX THAT PT CONV TO D.O.T. FOR R/W BY REC # 205077959

**APPLICANT INFORMATION**

Company : COLORADO SPRINGS EQUITIES, LLC; MEADOWBROOK CROSSING, LLC; & MEADOWBROOK DEVELOPMENT, LLC

Name : ATTN: DANNY MIENTKA

☒ Owner   ☐ Consultant   ☐ Contractor

Mailing Address : 90 S. NEVADA AVE, COLORADO SPRINGS, CO 80903

Phone Number : 719-475-7621

FAX Number :

Email Address : danny@theequitygroup.com

**ENGINEER INFORMATION**

Company : KIMLEY-HORN

Name : JOHN HEIBERGER

Colorado P.E. Number : 0050096

Mailing Address : 2 S. NEVADA AVENUE, SUITE 300, COLORADO SPRINGS, CO 80903

Phone Number : (719) 453-0180

FAX Number :

Email Address : john.heiberger@kimley-horn.com



**OWNER, APPLICANT, AND ENGINEER DECLARATION**

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

\_\_\_\_\_  
Signature of owner (or authorized representative)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Engineer's Seal, Signature  
And Date of Signature

**DEVIATION REQUEST** (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Section **2.1.3 Standard Drawings, 2.3 ROADWAY DESIGN; & 2.4 ROADWAY ACCESS CRITERIA** of the Engineering Criteria Manual (ECM) is requested.

Identify the specific ECM standard which a deviation is requested:

Section 2.1.3 Standard Drawings  
Section 2.3 Roadway Design  
Section 2.4 Roadway Access Criteria  
Section 8.6.C.2 Easement Location and Dimensions

Removed references to the  
LDC section

There is no Ch8 in the ECM. If this is an LDC section please remove as this is not part of the ECM. Contact Kari as to how this modification needs to be requested.

Added reference that  
the changes are to  
the proposed  
roadways

Please specify that the changes  
requested are to the proposed  
roadways

State the reason for the requested deviation:

This deviation request is to document the process of design criteria changes associated with the PUD process. The planned PUD maximizes planned densities by reducing the typical lot

A PUD Design Modification is requested to propose the use of private roads within a 50' private road easement and tract. The easement includes drainage/public improvement/public utility/landscaping/sidewalks& pedestrian easement as identified on the PUDSP and within the supporting tract table and notes. Ownership and maintenance of the private road facilities will be the responsibility of the Meadowbrook Park Homeowners' Association (MPHOA).

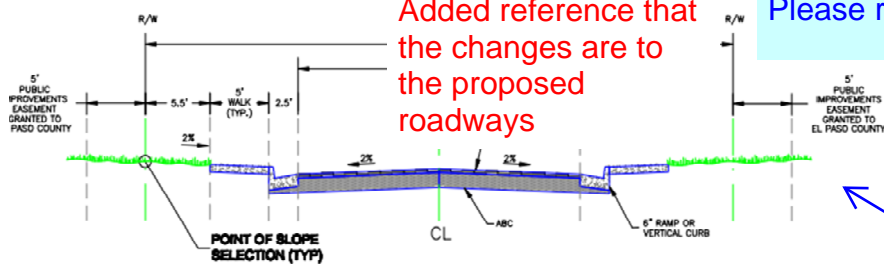
Section 8.6.C.2 Easement Location and Dimensions requires utility easements be placed along lot and tract lines, specifically five-feet (5') side and seven-feet (7') rear lot lines. The plan provides 3' side easements. Respective utility providers have reviewed the easement widths and locations and have "approved" their locations with as documented with the submittal .

MVEA, CSU, BHE, & CMD have reviewed the proposed easements and support the locations and widths as depicted on the PUDSP. Documentation of their support has been provided with the submittal.



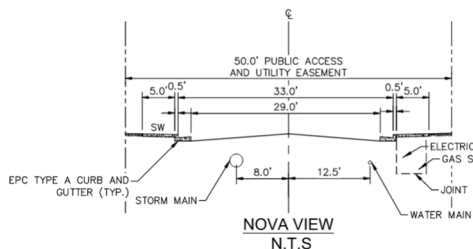
A PUD Design Modification is requested to propose the use of private roads within a 50' private road easement. The easement includes drainage/public improvement/public utility/landscaping/sidewalks & pedestrian access as identified on the PUDSP and within the supporting tract table and notes. Ownership and maintenance of the private road facilities will be the responsibility of the Meadowbrook Crossing Metropolitan District. ← The previous page indicates that the

STANDARD COUNTY URBAN LOCAL (LOW VOLUME CROSS SECTION)



Please also provide the urban local road cross section for comparison. Per the ADT to be generated at least one roadway will not meet the 300 ADT threshold of the urban local low volume road.

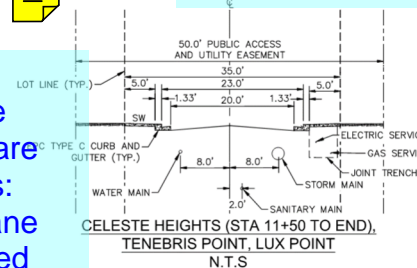
## PROPOSED MEADOWBROOK PARK PUD PRIVATE ROAD CROSS SECTIONS



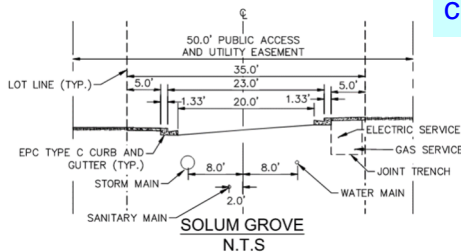
LOT LIN

RVISE  
CE  
NCH

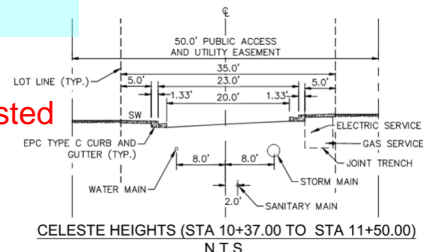
Please list the deviations from the standard that you are requesting such as: pavement width, lane width, superelevated roadway and roadway termination without a cul-de-sac.



Urban Local  
Roadway Section  
was also added.



All Deviations Requested are listed below the cross sections.



PCD File No.



|



Add the urban local roadway deviations and also included justification for the other deviations to the cross section. Also a mention to the fire department endorsement is included and attached to the end of the deviation request.

- ☒ The ECM standard is inapplicable to the particular situation.
- ☐ Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- ☐ A change to a standard is required to address a specific design or construction condition and does not compromise public safety or accessibility.
- impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

No standard is provided in the ECM for a private roadway. County Land Development Code and PUD provisions permit the use of private streets/roads with BOCC approval of a PUD modification. The modification process may include Private streets/roads are required to be constructed and maintained to applicable ECM standards and cross sections except as may be otherwise determined in the waiver or PUD modification. The ECM/LDC do not contemplate emerging development, industry, and market trends for higher urban densities

The Code states that private roads shall generally be "constructed and maintained to ECM standards except as may be otherwise determined in the waiver". Per the Code, private road waivers may only include design standards for the following:

- *Right-of-way width where suitable alternative provisions are made for pedestrian walkways and utilities;*
- *Design speed where it is unlikely the road will be needed for use by the general public;*
- *Standard section thickness minimums and pavement type where suitable and perpetual maintenance provisions are made;*
- *Maximum and minimum block lengths; and*
- *Maximum grade.*

The proposed private road network includes modification of the following components:

- Right-of-way width where suitable alternative provisions are made for pedestrian walkways and utilities: Proposed cross sections are within a 50' public access and utility easement. Pavement widths have been reduced to 20-feet (with two (2) 10-foot travel lanes). Required sidewalks and easements for utility providers has been identified within each cross section

- Design speed where it is unlikely the road will be needed for use by the general public;
- Maximum and minimum block lengths;

Please indicate also indicate that a 29' paved width as opposed to 30' is also proposed in one of the roadway cross sections. Please also discuss justification for the other deviations from the County standard cross section.

A written endorsement from the fire district will be required for the roadway terminations and the reduced paved width of 20ft. Also please discuss the fire lanes that will be proposed.

## CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

The roadway design criteria have been reviewed and found to result in a comparable design and performance as the standard urban local low volume roadway cross sections. A modified cross section has been provided for the private streets that includes all required pedestrian facilities and utilities to serve the subdivision in addition to each individual lot.

Not all roadways will meet the local low volume threshold of 300 ADT per the TIS. Please revise accordingly to include the urban local roadway.

Urban Local Roadway Section was also added.



The deviation will not adversely affect safety or operations.

The proposed modifications will not adversely affect safety or operations of the proposed private roads. Adequate alternate pedestrian access and circulation has been provided via internal pedestrian walkways which are connected to public sidewalks along planned private roads. Individual lot access and vehicular circulation has been analyzed to ensure compliance with applicable sight distance and driveway spacing requirements. Road widths and associated geometries accommodate emergency vehicle use and maneuverability.

Please revise. This section is regarding maintenance and cost.

Section was revised to address cost and maintenance, not safety.

The deviation will not adversely affect maintenance and its associated cost.

The deviation will not adversely affect safety or operations. Adequate alternate pedestrian access and circulation has been provided via attached sidewalks on either side of private street and internal pedestrian walkways which are connected to public sidewalks adjacent to the development. The modification does not include any component or features which require specialized maintenance activities and/or equipment. The modification which results in a reduced (private) cross section width, consolidates facilities planned therein thereby reducing overall construction and maintenance costs.

The deviation will not adversely affect aesthetic appearance.

The planned private roads will not adversely affect aesthetic appearances within the proposed development. The private street and modified cross section (reduced width) is incorporated into the overall design concept of higher density, smaller footprint product. The scale of the street realm is proportionate to the scale and massing of residential structures in the private (lot) realm. The overall design is consistent, compatible, and competitive with current market driven subdivision and housing development design and aesthetics.



The deviation meets the design intent and purpose of the ECM standards.

Proposed private street/road design modifications meet the design intent and purpose of the ECM standards. All required roadway, pedestrian, and utility components are included with the proposed cross sections.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, as applicable.

The proposed PUD roadway design modifications will meet the control measure requirements of the County MS4 Permit.

Please elaborate and indicate how it meets the requirements such as a water quality facility has been provided for the entire site.

A discussion of Water Quality and Detention was added and indicated that it covers for the entire Site.

**REVIEW AND RECOMMENDATION:**

**Approved by the ECM Administrator**

This request has been determined to have met the criteria for approval. A deviation from Section \_\_\_\_\_ hereby granted based on the justification provided.

┌

┐

L

J

**Denied by the ECM Administrator**

This request has been determined not to have met criteria for approval. A deviation from Section \_\_\_\_\_ of the ECM is hereby denied.

┌

┐

L

J

**ECM ADMINISTRATOR COMMENTS/CONDITIONS:**

The Deviation is only valid until and unless the Board of County Commissioners approves the Planned Unit Development Modifications.







## **1.1. PURPOSE**

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

## **1.2. BACKGROUND**

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

## **1.3. APPLICABLE STATUTES AND REGULATIONS**

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

## **1.4. APPLICABILITY**

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

## **1.5. TECHNICAL GUIDANCE**

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

## **1.6. LIMITS OF APPROVAL**

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

## **1.7. REVIEW FEES**

A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.





Preliminary/Final Drainage Report

# Meadowbrook Park El Paso County, Colorado

PCD File No.: PUDSP208

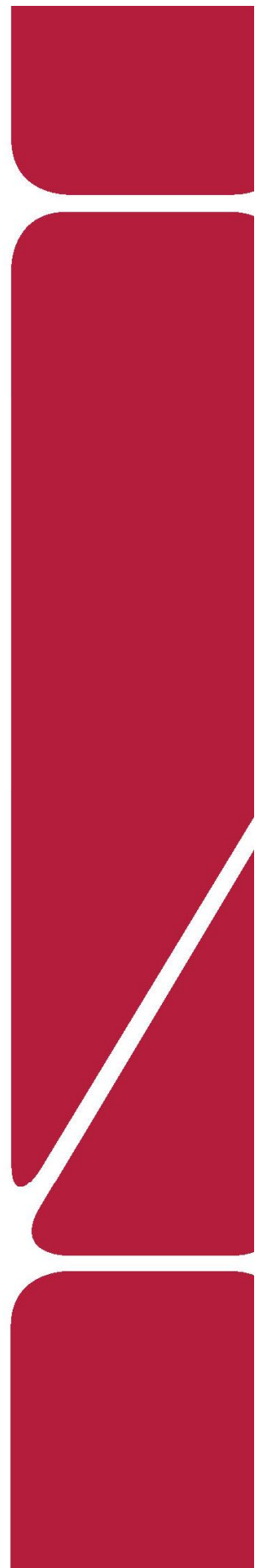
Prepared for:  
**Danny Mientka**  
**Meadowbrook Development, LLC.**  
**90 South Cascade Avenue**  
**Suite 1500**  
**Colorado Springs, Colorado 80903**

Prepared by:  
**Kimley-Horn and Associates, Inc.**  
**2 North Nevada Ave**  
**Suite 300**  
**Colorado Springs, CO 80903**  
**(719) 284-7272**  
**Contact: John Heiberger, P.E.**

Project #: 096956009

Prepared: March 18, 2021

**Kimley»Horn**





## **CERTIFICATION**

### ***ENGINEERS STATEMENT***

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City/County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

SIGNATURE (Affix Seal): \_\_\_\_\_  
Colorado P.E. No. 50096 Date

### ***DEVELOPER'S STATEMENT***

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

\_\_\_\_\_  
Business Name

\_\_\_\_\_  
By:

\_\_\_\_\_  
Title:

\_\_\_\_\_  
Address:

### ***EL PASO COUNTY STATEMENT***

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code, as amended.

\_\_\_\_\_  
Jennifer Irving, P.E. Date  
County Engineer/ECM Administrator

Conditions:

Approval is only for the PUDSP; The report will need to be verified with the final plat and CDs. If the report needs revisions, the whole report will need to be approved again.



**TABLE OF CONTENTS**

<b>CERTIFICATION.....</b>	<b>1</b>
ENGINEERS STATEMENT .....	1
DEVELOPER'S STATEMENT .....	1
EL PASO COUNTY STATEMENT .....	1
<b>TABLE OF CONTENTS .....</b>	<b>2</b>
<b>GENERAL LOCATION AND DESCRIPTION .....</b>	<b>3</b>
PURPOSE AND SCOPE OF STUDY .....	3
LOCATION .....	3
VICINITY MAP .....	3
DESCRIPTION OF PROPERTY .....	4
PROJECT CHARACTERISTICS .....	4
<b>DRAINAGE BASINS AND SUB-BASINS .....</b>	<b>4</b>
MAJOR BASIN DESCRIPTIONS .....	4
SUB-BASIN DESCRIPTION .....	5
<i>Historic Drainage Patterns</i> .....	5
<i>Off-Site Drainage Flow Patterns</i> .....	5
<b>DRAINAGE DESIGN CRITERIA .....</b>	<b>5</b>
DEVELOPMENT CRITERIA REFERENCE .....	5
HYDROLOGIC CRITERIA .....	6
<b>DRAINAGE FACILITY DESIGN.....</b>	<b>7</b>
GENERAL CONCEPT .....	7
COMPLIANCE WITH OFF-SITE RUNOFF .....	7
PROPOSED DRAINAGE PATTERNS.....	7
<i>Sub-Basin A</i> .....	8
<i>Sub-Basin B</i> .....	8
<i>Sub-Basin C</i> .....	8
<i>Sub-Basin D</i> .....	8
<i>Sub-Basin E</i> .....	8
<i>Sub-Basin F</i> .....	9
<i>Sub-Basin G</i> .....	9
<i>Sub-Basin H</i> .....	9
<i>Sub-Basin I</i> .....	9
<i>Sub-Basin J</i> .....	9
<i>Sub-Basin OS-A</i> .....	9
<i>Sub-Basin OS-B</i> .....	10
<i>Sub-Basin OS-C</i> .....	10
EMERGENCY OVERFLOW ROUTING .....	10
DETENTION AND WATER QUALITY.....	10
<i>Four-Step Process</i> .....	10
<i>Detention and Water Quality Design</i> .....	11
<i>Outlet Requirements</i> .....	11
<i>Channel Design and Soil Erodibility</i> .....	12
<i>Emergency Spillway Path</i> .....	12
<b>COST OF PROPOSED DRAINAGE FACILITIES .....</b>	<b>12</b>
<b>DRAINAGE AND BRIDGE FEES .....</b>	<b>12</b>
<b>OTHER GOVERNMENT AGENCY REQUIREMENTS .....</b>	<b>12</b>
<b>SUMMARY .....</b>	<b>12</b>
COMPLIANCE WITH STANDARDS.....	12
<b>REFERENCES .....</b>	<b>13</b>
<b>APPENDIX .....</b>	<b>14</b>



## GENERAL LOCATION AND DESCRIPTION

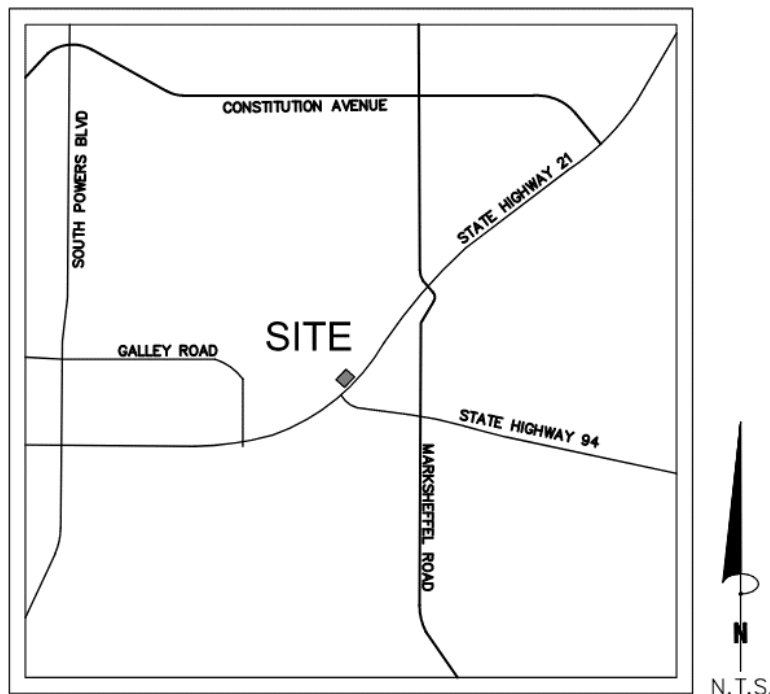
### **PURPOSE AND SCOPE OF STUDY**

The purpose of this Preliminary/Final Drainage Report (FDR) is to provide the hydrologic and hydraulic calculations and to document and finalize the drainage design methodology in support of the proposed Meadowbrook Park development (“the Project”) for Meadowbrook Development LLC. The Project is located within the jurisdictional limits of El Paso County (“the County”). Thus, the guidelines for the hydrologic and hydraulic design components were based on the criteria outlined by the County.

### **LOCATION**

The Project is located northwest of the Meadowbrook Parkway and US Highway 24 intersection in El Paso County, Colorado. More specifically, the Project is made up of Tract A 94/24 Business Park Filing No. 1, Tract I Meadowbrook Crossing Filing No. 1, and a Tract within the Claremont Business park Filing No. 2 (parcel number 5408000053) plat within the southeast quarter of Section 8, Township 14 South, Range 65 West of the 6<sup>th</sup> Principal Meridian, County of El Paso, State of Colorado. The site is bounded by Meadowbrook Parkway and the Meadowbrook Crossing Filings No. 1 and No. 2 to the west, Lot 46A Claremont Business Park Filing No. 2A, a commercial storage development to the north, US Highway 24 (CDOT Right of Way) to the east, and Lot 1 24/94 Business Park Filing No. 1, a commercial gas station to the south. A vicinity map has been provided in the Appendix of this report.

### **VICINITY MAP**



VICINITY MAP  
N.T.S



### ***DESCRIPTION OF PROPERTY***

The Project is located on approximately 8.01 acres of undeveloped land with limited vegetation and grass cover. The site currently does not provide stormwater quality or detention and there are no known major drainage ways or irrigation facilities on the site. The site generally drains from the east to west with slopes ranging from 2% to 25% with the steeper slopes along the east side of the site adjacent to US Highway 24 and Lot 46A Claremont Business Park Filing No. 2A, the commercial storage facility to the north. There is an existing 30" CMP CDOT culvert that outfalls onto the site, conveying flow from the median of Hwy 24. This runoff flows across the Site to an existing storm area inlet located in the southwest corner of the Site. The Project is not adjacent to any major drainageways and does not outfall directly to any major drainageways.

NRCS soil data is available for the Site (See Appendix) and the onsite soils are USCS Hydrologic Soil Group A. Group A soils have higher infiltration rates compared to other soil groups and are generally made up of well drained, cohesive sands or gravelly sands. A Soils and Geology Study has also been prepared for the site by Rocky Mountain Group dated August 26, 2020 and is attached in the Appendix of this report for reference.

### ***PROJECT CHARACTERISTICS***

The Project is a proposed single family development that will include 67 lots. The project will include the construction of private streets, sidewalks, driveways, hardscape/landscape, and associated utility infrastructure required to serve each lot. Water quality and detention is required for the site improvements and will be accomplished with the construction of a Full Spectrum Extended Detention Basin located in the southeast corner of the site and a water quality Rain Garden located in the southwest corner of the Site. As part of the utility infrastructure improvements, a proposed storm sewer system will be constructed to collect runoff. Stormwater will be conveyed via overland flow across the lots, within the curb and gutter of the proposed streets before being captured in proposed storm inlets. The storm sewer system will then convey runoff into the Full Spectrum Extended Detention Basin before being discharged offsite. A small portion of the Site drains to curb chase that outfalls into the Rain Garden for water quality treatment, only. The Full Spectrum Extended Detention Basin will overdetain to include the area flowing to the Rain Garden to provide detention volume.

## **DRAINAGE BASINS AND SUB-BASINS**

### ***MAJOR BASIN DESCRIPTIONS***

The site is located within the Sand Creek Drainage Basin Study (DBPS). It is not directly adjacent to East Fork Sand Creek, but East Fork Sand Creek is the ultimate receiving water for the discharge from this Site. The Sand Creek DBPS calls for bank stabilization improvements and two drop structures which were constructed with the Meadowbrook Crossing Filings No. 1 and No. 2 developments. No additional creek improvements are included with the development of this Project.



The Site is also located outside the 100-year floodplain and within Zone X (an area of minimal flood hazard) as noted on the FEMA FIRM Map No. 08041C0752G revised on December 7, 2018 (See Appendix).

There are no identified nearby irrigation facilities or other obstructions which could influence the local drainage, other than the CDOT off-site flow from the 30" CMP culvert previously mentioned.

## ***SUB-BASIN DESCRIPTION***

### **Historic Drainage Patterns**

The existing runoff onsite generally drains from east to west and is collected by an existing storm area inlet located in the southwest corner of the site. The runoff is then conveyed via storm sewer through the neighboring site to the southwest before discharging into the County storm sewer system within Meadowbrook Parkway. Runoff from offsite enters to the east of the site from US Highway 24 and drains to the same inlet as the onsite runoff in the southeast corner.

The existing drainage is divided into three sub-basins, Basin EX-A, EX-B, and EX-C. Sub-Basin EX-A is approximately 8.18 acres on consists of most of the on-site area within the property line. Runoff generated from this Sub-Basin drains overland from east to west towards the existing storm area inlet. The weighted imperviousness for Sub-Basin EX-A with existing conditions is 2% and the runoff for the 5-year and 100-year storm events are 2.49 cfs and 16.70 cfs respectively.

### **Off-Site Drainage Flow Patterns**

Sub-Basin EX-B is approximately 1.34 acres and consists of the area within the CDOT Right of Way, downstream of the existing 30" CMP culvert and area inlet within the median. It comprises of the west portion of US Highway 24 (US-24) travel lanes, shoulder and existing 4:1 slope down to Site. The flows generated from the east portion of US-24 and within the median flow south to another area inlet and culvert away from the project area. The weighted imperviousness for Sub-Basin EX-A with existing conditions is 51.1% and the runoff for the 5-year and 100-year storm events are 3.01 cfs and 6.73 cfs respectively.

Sub-Basin EX-C is approximately 3.87 acres and consists of the area within the CDOT Right of Way upstream of the existing 30" CMP culvert and area inlet within the median. It comprises of runoff generated from all four travel lanes on US-24 and runoff generated within the existing median. Runoff is either conveyed overland onto the Site or through an existing area inlet within the median and then into a 30" CMP culvert. The culvert outfalls onto the Site and flows overland to the southwest corner to the existing storm area inlet. The weighted imperviousness for Sub-Basin EX-C with existing conditions is 54.0%% and the runoff for the 5-year and 100-year storm events are 7.71 cfs and 16.89 cfs respectively.

## **DRAINAGE DESIGN CRITERIA**

### ***DEVELOPMENT CRITERIA REFERENCE***

The proposed storm facilities follow the El Paso County Drainage Criteria Manual (the



“CRITERIA”), El Paso Engineering Criteria Manual (the “ECM”), and the Mile High Flood District Urban Storm Drainage Criteria Manual (the “MANUAL”). Site drainage is not significantly impacted by such constraints as utilities or existing development. Further detail regarding onsite drainage patterns is provided in the Proposed Drainage Conditions Section.

There are previous drainage studies that include portions of the Project Site limits:

24/94 Business Park Final Drainage Report- This report completed by Core Engineering Group, LLC dated, July 14, 2016 details the existing 2- Type D inlets in the southwest corner of the Site. It also shows the storm alignment from the existing Type D inlet, across Meadowbrook Parkway and to the outfall in East Fork Sand Creek. This alignment will be the ultimate outfall for the discharge from this project. Proposed flows from the Site are less than the historic flows through the existing infrastructure shown in this drainage report.

Claremont Business Park Filing No. 2 Final Drainage Report- This report completed by Matrix Design Group, Inc. dated, November 2006. This report shows that the runoff from Lot 46A Claremont Business Park Filing No. 2A is maintained on the lot as does not generate runoff onto the Site that would be classified as off-site drainage for this Project.

Meadowbrook Crossing Filings No. 1 and No. 2 Preliminary and Final Drainage Report- This report completed by Kiowa Engineering Corporation dated, July 25, 2017 does not specifically include area on Site on the Drainage Map, but provides details about the improvements made to East Fork Sand Creek for stabilization and documents the extension of Meadowbrook Parkway f

## **HYDROLOGIC CRITERIA**

The 5-year and 100-year design storm events were used in determining rainfall and runoff for the proposed drainage system per chapter 6 of the CRITERIA. Table 6-2 of the CRITERIA is the source for rainfall data for the 5-year and 100-year design storm events. Design runoff was calculated using the Rational Method for developed conditions as established in the CRITERIA and MANUAL. Runoff coefficients for the proposed development were determined using Table 6-6 of the CRITERIA by calculating weighted impervious values for each specific site basin. The detention storage requirement was calculated using Full Spectrum Detention methods as specified in the CRITERIA and MANUAL. The Full Spectrum Extended Detention Basin’s outlet structure was designed to release the Water Quality Capture Volume (WQCV) in 40 hours. The Rain Garden was designed to release the WQCV in 12 hours. Based upon this approach, we feel that the drainage design provided for the Site is conservative and in keeping with the historic drainage patterns for the Site.

The proposed drainage facilities are designed in accordance with the CRITERIA and MANUAL. Floodplain identification was determined using FIRM panels by FEMA and information provided in the CRITERIA. Hydraulic calculations were computed using StormCAD for the proposed storm sewer system. Results of the hydraulic calculations are summarized in the Appendix.



## **DRAINAGE FACILITY DESIGN**

### **GENERAL CONCEPT**

#### **COMPLIANCE WITH OFF-SITE RUNOFF**

The runoff generated from US-24 currently outfalls onto the Site through an existing 30" CMP culvert. The off-site drainage basins were analyzed and found to include parts of the travel lanes, median and Right of Way. Currently, there is not a CDOT stormwater quality and detention facility that captures and treats this area. For that reason, each off-site Sub-Basin is collected in a swale parallel to US-24 roadway and within the CDOT Right of Way and conveyed to the southeast property corner of the Site. Off-site flows will be captured from the proposed swale by a proposed private CDOT Type D inlet (depressed and in series) and by-pass the property in a proposed 36" RCP storm pipe. This storm pipe runs along the southern property line within a proposed 15' private drainage easement and will connect to the existing 36" RCP storm pipe with a proposed manhole. Hydrologic and hydraulic analysis was completed to verify the capacity of the downstream facilities to handle the by-passed flows. All generated from the off-site Sub-Basins will be by-passed through the Site.

#### **PROPOSED DRAINAGE PATTERNS**

The developed runoff from the Project will generally be collected by means of a private storm sewer system with inlets located in the private streets (Nova View, Tenebris Point, Spatium View, Solum Grove and Lux Point) within each delineated sub-basin area. The runoff collected from each Sub-Basin A, C-J will be captured by storm inlets and conveyed through storm pipes to a Full Spectrum Extended Detention Basin located in the southeast corner of the site. The controlled stormwater will be treated, detained, and released from an outlet structure which will convey stormwater through a proposed storm pipe that runs along the southern property line with a 15' private drainage easement. Eventually the outfall pipe connects to the existing private storm sewer in the southwest corner. A portion of the site Sub-Basin B, surface drains to the southwest corner, entering a proposed rain garden through a concrete chase. The WQCV in the rain garden will be treated and released through an outlet structure and conveyed through a storm pipe to a connection in the existing private 36" RCP pipe.

The existing 36" extends long the northern property line of Lot 1 24/94 Business Park Filing No. 1, a commercial gas station to the north east corner of the lot and stubbed into an existing public 10' Type R Inlet. The inlet is used as a junction structure and runoff is conveyed through an existing public 42" RCP storm pipe across Meadowbrook Parkway and long Newt Drive until it ultimately outfalls into the East Fork Sand Creek. This is depicted in the proposed drainage map as part of the Meadowbrook Crossing Filings No. 1 and No. 2 Preliminary and Final Drainage Report

### **SPECIFIC DETAILS**

The property has been divided into fourteen sub-basins, A through J and OS-A- OS-C. Sub-basins A through J make up the Project on-site area and Sub-Basins OS-A -OS-C are the offsite basins consisting of runoff from US Highway 24.

The weighted imperviousness of the Site area (Sub-basins A through J) with proposed conditions is 43.3%. Cumulative runoff for the 5-year and 100-year storm events are 15.15 cfs and 34.11 cfs, respectively. The weighted imperviousness of the offsite area (Sub-basin OS-A-



OS-C) with Sub-Basins A through J on site is 46.8%. Cumulative runoff for the 5-year and 100-year storm events are 25.84 cfs and 59.19 cfs, respectively.

### Sub-Basin A

Sub-basin A consists of approximately 2.47 acres and is the area along the eastern property line, north of the Extended Detention Basin, and captures the runoff from the back of lots on the east side of Nova View. The runoff is collected in swales along the back of the lots and is conveyed directly into a grass lined swale that conveys runoff to the Extended Detention Basin down a riprap rundown/ rock chute into a forebay (Design Point 1). Additionally, this area comprises of the areas uphill of the proposed big block retaining walls. Runoff not captured from the off-site Sub-Basins is captured in a swale on top of the retaining walls and is conveyed towards the Extended Detention Basin down a riprap rundown/ rock chute into a forebay. Developed runoff during the 5-year and 100-year events are 2.08 cfs and 7.19 cfs respectively.

not shown on plans?

### Sub-Basin B

Sub-basin B consists of approximately 1.85 acres and is made up of a majority of the Solum Grove runoff and the lots adjacent to Solum Grove. The lots on the south side of Tenebris Point are also included within this sub-basin. This Sub-Basin is the only Sub-Basin contributing to the Rain Garden. The runoff from the lots drains into the Solum Grove and is conveyed in the curb and gutter to a curb chase (Design Point 2) in the southwest corner of the Site and it conveyed into the proposed Rain Garden. Developed runoff during the 5-year and 100-year events are 4.04 cfs and 8.86 cfs respectively.

**KHA  
RESPONSE:**  
All swales  
have been  
clearly  
labeled and  
shown on  
plans.

### Sub-Basin C

Sub-basin C consists of approximately 0.20 acres and consists of driveway runoff from six lots and the west portion of Nova View between Spatium View and Tenebris Point. The runoff from the lots drains into the Celeste Heights and is conveyed in the curb and gutter before being collected a private 5-foot curb Type R inlet (Design Point 3). Developed runoff during the 5-year and 100-year events are 0.82 cfs and 1.53 cfs respectively.

### Sub-Basin D

Sub-basin D consists of approximately 0.87 acres and consists of Tenebris Point runoff and the lots adjacent to Tenebris Point and the tract behind the associated lots. To prevent the runoff from the Tract to drain out towards Meadowbrook Parkway, a swale will collect runoff along the west property line and convey to a small area inlet. This area inlet will connect to the 5' Type R inlet at the end of Tenebris Point (Design Point 4). The runoff from the lots drains into the Tenebris Point and is conveyed in the curb and gutter before being collected by a 5-foot curb Type R inlet at the end of the road (Design Point 4). Developed runoff during the 5-year and 100-year events are 1.43 cfs and 3.43 cfs respectively.

### Sub-Basin E

Sub-basin E consists of approximately 0.42 acres and consists of the eastern half of the Nova View from Tenebris Point to Lux Point and the adjacent driveway sections. The runoff flows along Nova View and is conveyed in the curb and gutter before being collected by a 5-foot Type R inlet (Design Point 5). Developed runoff during the 5-year and 100-year events are 1.38 cfs and 2.70 cfs respectively.



### **Sub-Basin F**

Sub-basin F consists of approximately 0.10 acres and consists of the southern half of Spatium View. The runoff from Spatium View and is conveyed in the curb and gutter before being collected by a 5-foot curb Type R inlet (Design Point 6). Developed runoff during the 5-year and 100-year events are 0.44 cfs and 0.80 cfs respectively.

### **Sub-Basin G**

Sub-basin G consists of approximately 0.92 acres and consists of the northern half of Spatium View, the adjacent tract, and the western half of Nova View from Spatium View to Lux Point. The runoff from the lots and driveways drain into Spatium View and Nova View and is conveyed in the curb and gutter before being collected by a 5-foot curb Type R inlet (Design Point 7). To prevent the runoff from the Tract to drain out towards Meadowbrook Parkway, a swale will collect runoff along the west property line and convey to a small area inlet. This area inlet will connect to the 5' Type R inlet withing Spatium View (Design Point 7). Developed runoff during the 5-year and 100-year events are 1.72 cfs and 4.02 cfs respectively.

### **Sub-Basin H**

Sub-basin H consists of approximately 0.83 acres and consists of Lux Point and the adjacent driveways to the west and entire lots to the east. The runoff from the lots drains into Lux Point and is conveyed in the curb and gutter before being collected by a 5-foot curb Type R inlet (Design Point 8). Developed runoff during the 5-year and 100-year events are 1.66 cfs and 3.85 cfs respectively.

### **Sub-Basin I**

Sub-basin I consists of approximately 0.28 acres and consists of the western half of Nova view north of Lux Point. It also included the driveways directly adjacent to the west. The runoff from the driveways drains into Nova View and is conveyed in the curb and gutter and collected by a 5-foot curb Type R inlet (Design Point 9). Developed runoff during the 5-year and 100-year events are 0.82 cfs and 1.73 cfs respectively.

### **Sub-Basin J**

Sub-basin J consists of approximately 0.23 acres and consists of the eastern half of Nova View north of Lux Point. It also included the driveways directly adjacent to the east. The runoff from the driveways drains into Nova View and is conveyed in the curb and gutter and is collected by a 5-foot curb Type R inlet (Design Point 10). Developed runoff during the 5-year and 100-year events are 0.77 cfs and 1.54 cfs respectively.

### **Sub-Basin OS-A**

Sub-basin OS-A consists of approximately 1.77 acres and consists of the eastern half of US 24 (both travel lanes, shoulder and Right of Way) upstream and north of the existing CDOT 30" CMP culvert. Runoff from this Sub-Basin is conveyed in an already existing roadside ditch that converges with the outfall of the CMP culvert at Design Point 11. From Design Point 11 the flows will be routed through a proposed swale on CDOT Right of Way parallel to the property line and will eventually be captured into a Type D inlet and by-passed through the Site in a 36"

RCP storm pipe. Developed runoff during the 5-year and 100-year events are 3.76 cfs and 8.14 cfs respectively.

### **Sub-Basin OS-B**

Sub-basin OS-B consists of approximately 1.34 acres and consists of the eastern half of US 24 (both travel lanes, shoulder and Right of Way) downstream and south of the existing CDOT 30" CMP culvert. Runoff from this Sub-Basin be captured and routed through a proposed swale on CDOT Right of Way parallel to the property line and will eventually be captured into a Type D inlet and by-passed through the Site in a 36" RCP storm pipe. Developed runoff during the 5-year and 100-year events are 3.01 cfs and 6.73 cfs respectively.

### **Sub-Basin OS-C**

Sub-basin OS-C consists of approximately 2.10 acres and consists of the western half of US 24 (both travel lanes and vegetated median) upstream and north of the existing CDOT 30" CMP culvert. Runoff from this Sub-Basin is collected in the already existing swale within the roadway median and is conveyed through the 30" CMP culvert to Design Point 11. From Design Point 11 the flows will be routed through a proposed swale on CDOT Right of Way parallel to the property line and will eventually be captured into a Type D inlet and by-passed through the Site in a 36" RCP storm pipe. Developed runoff during the 5-year and 100-year events are 3.92 cfs and 8.67 cfs respectively.

## ***EMERGENCY OVERFLOW ROUTING***

Emergency overflow routing consists of flows following the proposed drainage pattern of northeast to southwest along the proposed roadways. Once the flows reach the southwest portion of the site, they will flow through the access driveway to Meadowbrook Parkway for Lot 1 24/94 Business Park Filing No. 1.

## ***DETENTION AND WATER QUALITY***

The WQCV and 100-year detention is required for this Project. This is accomplished through the proposed private Full Spectrum Extended Detention Basin on the southeast corner of the Site and a private Rain Garden on the southwest corner of the Site. The Extended Detention Basin was sized to provide detention for the entire Site (Sub-Basins A-J) per UDFCD criteria. WQCV will be provided in the Extended Detention Basin for Sub-Basins A, C-J only. WQCV for Sub-Basin B will be provided by the Rain Garden. The water quality and detention calculations are provided in the Appendix of this report. The proposed Extended Detention Basin and Rain Garden will be maintained by the Owner.

← (Meadowbrook Park HOA)

KHA RESPONSE:  
"Owner" has been  
replaced w/ "Meadowbrook  
Park HOA".

### **Four-Step Process**

The four-step process per the MANUAL provides guidance and requirements for the selection of siting of structural Construction Control Measures (CCMs) for new development and significant redevelopment.

#### **Step 1: Employ Runoff Reduction Practices**

Currently the site is vacant undeveloped land with surrounding development. Development of the site will increase current runoff conditions due to increased imperviousness values. However, implementation the of landscaping throughout the site, the proposed storm sewer



infrastructure, and the proposed Extended Detention Basin will help slow runoff and encourage infiltration.

**Step 2: Provide Water Quality Capture Volume (WQCV)**

The water quality capture volume will be detained using Full Spectrum Extended Detention Basin on the southeast corner of the Site and a Rain Garden on the southwest corner of the Site. The outfall pipes from the water quality outlet structures will control the release of stormwater to less than historic rates.

**Step 3: Stabilize Drainageways**

There are no current drainageways conveyed through this property. No improvements to stabilize drainageways are a part of this Project.

**Step 4: Consider need for Industrial and Commercial BMPs**

Erosion control features for the final stages of the Project will be designed to reduce contamination. Source control BMPs will include the use of, inlet protection, silt fences, concrete washout areas, stockpile management, and stabilized staging areas. The Grading and Erosion Control Plans will be submitted as a separate construction document set.

**Detention and Water Quality Design**

The proposed private Full Spectrum Extended Detention Basin is designed with an outlet structure that is fitted with an orifice plat and restrictor plate to release the WQCV in a 40-hour time period per the MANUAL. The proposed private Rain Garden is designed with an outlet structure that is fitted with a restrictor plate to release the WQCV in a 12-hour time period per the MANUAL.

Calculations included in the Appendix provide details regarding the private water quality and detention basins design. The calculations include determination of the storage volumes required for full spectrum detention for the WQCV and 100 year detention and allowable release rates.

Overall, 0.101 acre-feet of WQCV is required for Sub-Basins A, C-J, and 0.648 acre-feet of detention volume is required for the proposed Extended Detention Basin (Sub-Basins A-J). The total area contributing to the Extended Detention Basin consists of 8.17 acres (43.3% imperviousness). The outlet structure and orifice releases approximately 0.1 cfs in the 5-year event and 5.5 cfs in the 100-year event. This is less than the historic flows of 2.49 cfs in the 5-year event and 16.70 cfs in the 100-year event.

The WQCV requirement for Sub-Basin B (1.85 acres and 54.5% imperviousness), is 1,176 cubic feet and is provided by a Rain Garden with this a 1,215 Square Foot bottom and 12" WQCV depth. See the Appendix for calculations.

**Outlet Requirements**

The water quality standards established by the CRITERIA are met by the proposed Full Spectrum Extended Detention Basin and Rain Garden. The water quality outlet structures were designed per the specifications in the CRITERIA. The outlet structure for the Extended Detention Basin meets the micro-pool requirement that it be integrated into the design of the structure with an additional initial surcharge volume. The orifice plates of the structures were designed based on the CRITERIA. The orifice plates will allow the WQCV to be drained from the structure in 40 hours for the Extended Detention Basin and 12 hours for the Rain Garden. The calculations for the design of the outlet structures are presented in the Appendix.

## Channel Design and Soil Erodibility

A proposed concrete lined trickle channel within the basin was designed per the MANUAL. A forebay structure is located at both upstream entrances to the Extended Detention Base. The forebay structures were designed per the MANUAL. The surrounding protection is designed as Type L riprap. Calculations detailing the design and dimensions of the trickle channel and forebay structure are included in the Appendix. Additionally, a riprap rundown or rock chute is provided to stabilize the flows coming from swales and entering the Extended Detention Basin. Calculations for the rock chute are included in the Appendix.

## Emergency Spillway Path

The emergency overflow from the Extended Detention Basin is designed to spill over the sidewalk and curb and gutter into Solum Grove and run west towards the access to Lot 1 24/94 Business Park Filing No. 1. Calculations are provided in the Appendix, showing that the flow from the emergency spillway will not overtop the curb in the 500-year event.

## COST OF PROPOSED DRAINAGE FACILITIES

An Opinion of Probable Construction Cost (OPCC) is provided in the Appendix of the report. There are no public drainage facilities. All improvements with this Project will be private.

## DRAINAGE AND BRIDGE FEES

All portions of the Site were previously platted and no drainage or bridge fees are due with this project.

## OTHER GOVERNMENT AGENCY REQUIREMENTS

Approval from other agencies such as the FEMA, the Army Corps of Engineers, Colorado State Engineer, Colorado Water Conservation Board, and others are not needed with this Project.

## SUMMARY

## COMPLIANCE WITH STANDARDS

The drainage design presented within this report for Meadowbrook Park, conforms to the El Paso County Drainage Criteria Manual and the Mile High Flood District Urban Storm Drainage Criteria Manual. Additionally, the Site runoff and storm drain facilities will not adversely affect the downstream and surrounding developments. The proposed developed flows entering the Extended Detention Basin and are greater than the existing ultimate outfall of the site due to the greater imperviousness of the site, however the implementation of the drainage basins will disperse the flow of an extended period of time therefore releasing at equal to or less than the historic rate.

This is not the case. If part of the site has been platted (Plat #14112) and fees deferred, the proportionate fee amount can remain deferred if credits have been finalized. Verify and provide in report.

Replace the "Erosion Control Plan" and "Maintenance and Operations" sections. Mention the O&M manual that will be required.

KHA RESPONSE:  
The O&M manual has been referenced properly.

KHA RESPONSE:  
The drainage fees have not been paid and will be paid during this filing process.

FEES: *Sand Creek*  
*Pre-Credits / No Cash / Drainage Fee Only*  
Drainage Fee: *\$154,143.00* *Pre-Credit* School Fee:  
Bridge Fee: *\$46,694.00* *Credit Paid* Urban Park F:  
Regional Park Fee: *Area 2 \$32,153.00*



## REFERENCES

1. City of Colorado Springs Drainage Criteria Manual, May 2014.
2. El Paso County Drainage Criteria Manual, Vol. 1 and 2, October 1994.
3. Urban Drainage and Flood Control District Drainage Criteria Manual (UDFCDCM), Vol. 1, prepared by Wright-McLaughlin Engineers, June 2001, with latest revisions.
4. Flood Insurance Rate Map, El Paso County, Colorado and Incorporated Areas, Map Number 08041C0459G, Effective Date December 7, 2018, prepared by the Federal Emergency Management Agency (FEMA).

## APPENDIX



***SOILS MAP AND FEMA FIRM PANEL***

## NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations** shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services  
NOAA, NIMS12  
National Geodetic Survey  
SSMC-3, #9202  
1315 East-West Highway  
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at <http://www.ngs.noaa.gov/>.

**Base Map** information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, City of Fountain, Bureau of Land Management, National Oceanic and Atmospheric Administration, United States Geological Survey, and Anderson Consulting Engineers, Inc. These data are current as of 2006.

This map reflects more detailed and up-to-date **stream channel configurations** and **floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

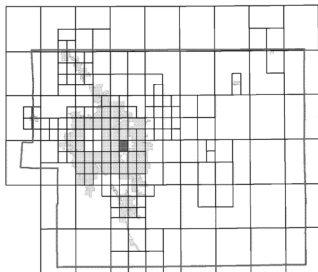
Contact **FEMA Map Service Center (MSC)** via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msc.fema.gov/>.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfp>.

El Paso County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

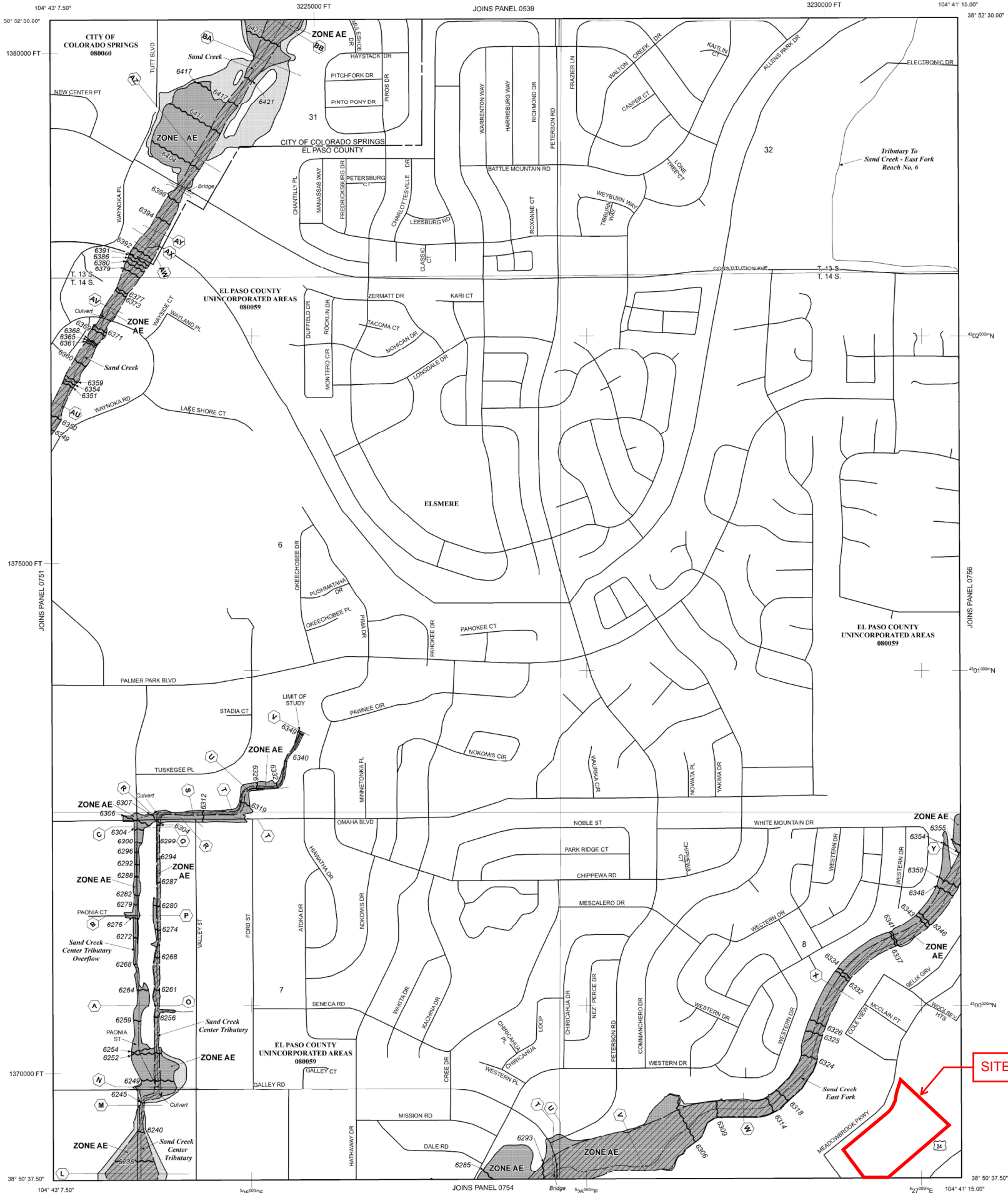
Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).



Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 SOUTH, RANGE 65 WEST, AND TOWNSHIP 14 SOUTH, RANGE 65 WEST.

## LEGEND

**SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area primarily protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

**ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

**OTHER AREAS**

**ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.

**ZONE D** Areas in which flood hazards are undetermined, but possible.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

Base Flood Elevation line and value; elevation in feet\*  
Base Flood Elevation value where uniform within zone; elevation in feet\*

\* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

Cross section line

Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

1000-meter Universal Transverse Mercator grid ticks, zone 13

5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPS ZONE 0502), Lambert Conformal Conic Projection

Bench mark (see explanation in Notes to Users section of this FIRM panel)

River Mile

MAP REPOSITORIES  
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP  
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL  
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000  
150 0 150 300  
FEET  
METERS



PANEL 0752G

**FIRM**

FLOOD INSURANCE RATE MAP

EL PASO COUNTY,

COLORADO

AND INCORPORATED AREAS

PANEL 752 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY NUMBER PANEL SUFFIX

COLORADO SPRINGS, CITY OF 080060 0752 G

EL PASO COUNTY 080059 0752 G

Notice: This map was released on 06/15/2020 to make a correction. This version replaces any previous versions. See the Notice-to-User Letter that accompanied this correction for details.

Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER  
08041C0752G

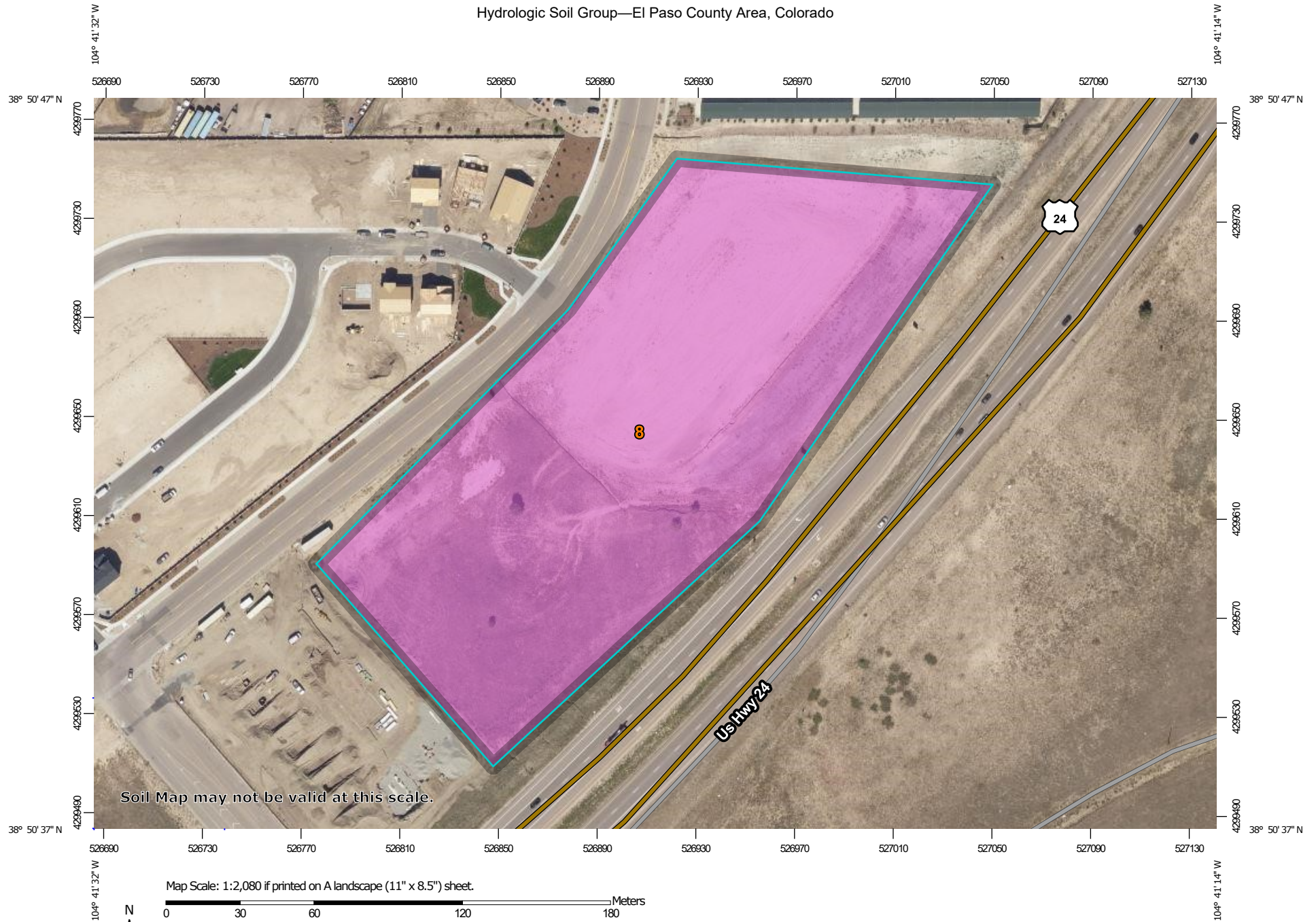
MAP REVISED  
DECEMBER 7, 2018

Federal Emergency Management Agency





# Hydrologic Soil Group—El Paso County Area, Colorado



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado  
 Survey Area Data: Version 18, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 19, 2018—Sep 23, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	A	7.4	100.0%
<b>Totals for Area of Interest</b>			<b>7.4</b>	<b>100.0%</b>

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher



***EXISTING HYDROLOGIC CALCULATIONS***

## IDF Equations:

$$I_{100} = -2.52\ln(D) + 12.735$$

$$I_{50} = -2.25\ln(D) + 11.375$$

$$I_{25} = -2.00\ln(D) + 10.111$$

$$I_{10} = -1.75\ln(D) + 8.847$$

$$I_5 = -1.50\ln(D) + 7.583$$

$$I_2 = -1.19\ln(D) + 6.035$$

Where:

I = Rainfall Intensity (in/hr)

D= Duration (minutes)

	<u>2-yr</u>	<u>5-yr</u>	<u>10-yr</u>	<u>100-yr</u>
P <sub>1</sub> =	1.19	1.5	1.75	2.52

Time Intensity Frequency Tabulation

Time	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
5	4.12	5.17	6.03	6.89	7.75	8.68
10	3.29	4.13	4.82	5.51	6.19	6.93
15	2.81	3.52	4.11	4.69	5.28	5.91
30	1.99	2.48	2.89	3.31	3.72	4.16
60	1.16	1.44	1.68	1.92	2.16	2.42
120	0.34	0.40	0.47	0.54	0.60	0.67

\*The Design Point Rainfall Values and Time Intensity Frequency Tabulation are found in Table 6-2 and Figure 6-5 respectively, of the Colorado Springs Drainage Criteria Manual, Volume 1



Weighted Imperviousness Calculations (Existing Conditions)

SUB-BASIN	AREA (SF)	AREA (Acres)	ROOF AREA	ROOF IMPERVIOUSNESS	ROOF				LANDSCAPE AREA	LANDSCAPE IMPERVIOUSNESS	LANDSCAPE				PAVEMENT AREA	PAVEMENT IMPERVIOUSNESS	PAVEMENT				WEIGHTED IMPERVIOUSNESS	WEIGHTED COEFFICIENTS			
					C2	C5	C10	C100			C2	C5	C10	C100			C2	C5	C10	C100		C2	C5	C10	C100
EX-A	356,327	8.18	0	90%	0.71	0.73	0.75	0.81	356,327	2%	0.03	0.09	0.17	0.36	0	100%	0.89	0.90	0.92	0.96	2.0%	0.03	0.09	0.17	0.36
EX-B	58,532	1.34	0	90%	0.71	0.73	0.75	0.81	29,227	2%	0.03	0.09	0.17	0.36	29,305	100%	0.89	0.90	0.92	0.96	51.1%	0.46	0.50	0.55	0.66
EX-C	168,766	3.87	0	90%	0.71	0.73	0.75	0.81	79,173	2%	0.03	0.09	0.17	0.36	89,593	100%	0.89	0.90	0.92	0.96	54.0%		0.52	0.57	0.68
TOTAL	583,625	13.40	0	90%	0.71	0.73	0.75	0.81	385,554	2%	0.03	0.09	0.17	0.36	29,305	100%	0.89	0.90	0.92	0.96	6.3%	0.06	0.10	0.16	0.29

Meadowbrook Park - Drainage Report															
Existing Runoff Calculations															
Time of Concentration															
DESIGN POINT	SUB-BASIN DATA				INITIAL / OVERLAND TIME			TRAVEL TIME T(t)				T(c) CHECK (URBANIZED BASINS)			
	DRAIN BASIN	AREA sq. ft.	AREA ac.	C(5)	Length ft.	Slope %	T(t) min	Length ft.	Slope %	Coeff.	Velocity fps	T(t) min.	COMP. T(c)	TOTAL LENGTH	L/180+10 min.
1	EX-A	356,327	8.18	0.09	300	11.5%	14.2	867	2.0%	15.00	2.1	6.8	21.0	1167	16.5
2	EX-B	58,532	1.34	0.50	65	4.5%	5.4	405	3.8%	15.00	2.9	2.3	7.7	470	12.6
3	EX-C	168,766	3.87	0.52	65	4.5%	5.2	1000	2.5%	15.00	2.4	7.0	12.2	1065	15.9



<div>Meadowbrook Park - Drainage Report</div> <div>Existing Runoff Calculations</div> <div>(Rational Method Procedure)</div> <div>Design Storm 5 Year</div>												
BASIN INFORMATION				DIRECT RUNOFF				CUMULATIVE RUNOFF				NOTES
DESIGN POINT	DRAIN BASIN	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	C x A	I in/hr	Q cfs	
1	EX-A	8.18	0.09	16.5	0.74	3.38	2.49					Existing On-Site Property (Vacant Undeveloped Land)
2	EX-B	1.34	0.50	7.7	0.67	4.52	3.01					Flows from CDOT ROW, sheet flowing onto property
3	EX-C	3.87	0.52	12.2	2.01	3.83	7.71					Flows from CDOT ROW at the culvert outlet design point

Meadowbrook Park - Drainage Report											
Existing Runoff Calculations											
Design Storm 100 Year											
(Rational Method Procedure)											
BASIN INFORMATION				DIRECT RUNOFF				CUMULATIVE RUNOFF			
DESIGN POINT	DRAIN BASIN	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	C x A	I in/hr	Q cfs
1	EX-A	8.18	0.36	16.5	2.94	5.67	16.70				Existing On-Site Property (Vacant Undeveloped Land)
2	EX-B	1.34	0.66	7.7	0.89	7.59	6.73				Flows from CDOT ROW, sheet flowing onto property
3	EX-C	3.87	0.68	12.2	2.63	6.43	16.89				Flows from CDOT ROW at the culvert outlet design point



SUMMARY - EXISTING RUNOFF TABLE						
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE 5-YR RUNOFF (CFS)	CUMULATIVE 100-YR RUNOFF (CFS)
1	EX-A	8.18	2.49	16.70		
2	EX-B	1.34	3.01	6.73		
3	EX-C	3.87	7.71	16.89		
TOTAL		13.40	13.21	40.32		

***PROPOSED HYDROLOGIC CALCULATIONS***



## IDF Equations:

$$I_{100} = -2.52\ln(D) + 12.735$$

$$I_{50} = -2.25\ln(D) + 11.375$$

$$I_{25} = -2.00\ln(D) + 10.111$$

$$I_{10} = -1.75\ln(D) + 8.847$$

$$I_5 = -1.50\ln(D) + 7.583$$

$$I_2 = -1.19\ln(D) + 6.035$$

Where:

I = Rainfall Intensity (in/hr)

D= Duration (minutes)

	<u>2-yr</u>	<u>5-yr</u>	<u>10-yr</u>	<u>100-yr</u>
P <sub>1</sub> =	1.19	1.5	1.75	2.52

Time Intensity Frequency Tabulation

Time	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
5	4.12	5.17	6.03	6.89	7.75	8.68
10	3.29	4.13	4.82	5.51	6.19	6.93
15	2.81	3.52	4.11	4.69	5.28	5.91
30	1.99	2.48	2.89	3.31	3.72	4.16
60	1.16	1.44	1.68	1.92	2.16	2.42
120	0.34	0.40	0.47	0.54	0.60	0.67

\*The Design Point Rainfall Values and Time Intensity Frequency Tabulation are found in Table 6-2 and Figure 6-5 respectively, of the Colorado Springs Drainage Criteria Manual, Volume 1

Weighted Imperviousness Calculations

SUB-BASIN	AREA (SF)	AREA (Acres)	ROOF AREA	ROOF IMPERVIOUSNESS	ROOF				LANDSCAPE AREA	LANDSCAPE IMPERVIOUSNESS	LANDSCAPE				PAVEMENT AREA	PAVEMENT IMPERVIOUSNESS	PAVEMENT				WEIGHTED IMPERVIOUSNESS	WEIGHTED COEFFICIENTS			
					C2	C5	C10	C100			C2	C5	C10	C100			C2	C5	C10	C100		C2	C5	C10	C100
A	107,496	2.47	21,654	90%	0.71	0.73	0.75	0.81	85,842	0%	0.03	0.09	0.17	0.36	0	100%	0.89	0.90	0.92	0.96	18.1%	0.17	0.22	0.29	0.45
B	80,559	1.85	22,073	90%	0.71	0.73	0.75	0.81	34,457	0%	0.03	0.09	0.17	0.36	24,029	100%	0.89	0.90	0.92	0.96	54.5%	0.47	0.51	0.55	0.66
C	8,878	0.20	0	90%	0.71	0.73	0.75	0.81	1,377	0%	0.03	0.09	0.17	0.36	7,501	100%	0.89	0.90	0.92	0.96	84.5%	0.76	0.77	0.80	0.87
D	38,113	0.87	10,260	90%	0.71	0.73	0.75	0.81	20,629	0%	0.03	0.09	0.17	0.36	7,224	100%	0.89	0.90	0.92	0.96	43.2%	0.38	0.42	0.47	0.59
E	18,246	0.42	0	90%	0.71	0.73	0.75	0.81	4,546	0%	0.03	0.09	0.17	0.36	13,700	100%	0.89	0.90	0.92	0.96	75.1%	0.68	0.70	0.73	0.81
F	4,229	0.10	0	90%	0.71	0.73	0.75	0.81	79	0%	0.03	0.09	0.17	0.36	4,150	100%	0.89	0.90	0.92	0.96	98.1%	0.87	0.88	0.91	0.95
G	40,228	0.92	8,808	90%	0.71	0.73	0.75	0.81	20,973	0%	0.03	0.09	0.17	0.36	10,447	100%	0.89	0.90	0.92	0.96	45.7%	0.40	0.44	0.49	0.61
H	35,948	0.83	6,289	90%	0.71	0.73	0.75	0.81	18,616	0%	0.03	0.09	0.17	0.36	11,043	100%	0.89	0.90	0.92	0.96	46.5%	0.41	0.45	0.50	0.62
I	12,368	0.28	0	90%	0.71	0.73	0.75	0.81	5,168	0%	0.03	0.09	0.17	0.36	7,200	100%	0.89	0.90	0.92	0.96	58.2%	0.53	0.56	0.61	0.71
J	9,994	0.23	0	90%	0.71	0.73	0.75	0.81	3,127	0%	0.03	0.09	0.17	0.36	6,867	100%	0.89	0.90	0.92	0.96	68.7%	0.62	0.65	0.69	0.77
OS-A	77,099	1.77	0	90%	0.71	0.73	0.75	0.81	34,833	2%	0.03	0.09	0.17	0.36	42,266	100%	0.89	0.90	0.92	0.96	55.7%	0.50	0.53	0.58	0.69
OS-B	58,532	1.34	0	90%	0.71	0.73	0.75	0.81	29,227	2%	0.03	0.09	0.17	0.36	29,305	100%	0.89	0.90	0.92	0.96	51.1%		0.50	0.55	0.66
OS-C	91,667	2.10	0	90%	0.71	0.73	0.75	0.81	44,340	2%	0.03	0.09	0.17	0.36	47,327	100%	0.89	0.90	0.92	0.96	52.6%		0.51	0.56	0.67
TOTAL (A-J)	356,059	8.17	69,084	90%	0.71	0.73	0.75	0.81	194,814	0%	0.03	0.09	0.17	0.36	92,161	100%	0.89	0.90	0.92	0.96	43.3%		0.42	0.48	0.60
TOTAL	583,357	13.39	69084	90%	0.71	0.73	0.75	0.81	303,214	0%	0.03	0.09	0.17	0.36	211,059	100%	0.89	0.90	0.92	0.96	46.8%	0.42	0.46	0.51	0.63



Meadowbrook Park - Drainage Report																
Proposed Runoff Calculations																
Time of Concentration																
Watercourse Coefficient																
Forest & Meadow 2.50 Short Grass Pasture & Lawns 7.00 Grassy Waterway 15.00																
Fallow or Cultivation 5.00 Nearly Bare Ground 10.00 Paved Area & Shallow Gutter 20.00																
DESIGN POINT	SUB-BASIN DATA				INITIAL / OVERLAND TIME			TRAVEL TIME T(t)				T(c) CHECK (URBANIZED BASINS)				FINAL T(c)
	DRAIN BASIN	AREA sq. ft.	AREA ac.	C(5)	Length ft.	Slope %	T(t) min	Length ft.	Slope %	Coeff.	Velocity fps	T(t) min.	COMP. T(c)	TOTAL LENGTH	L/180+10	min.
1	A	107,496	2.47	0.22	100	15.0%	6.5	745	2.3%	15.00	2.3	5.5	12.0	845	14.7	12.0
2	B	80,559	1.85	0.51	90	2.9%	7.2	200	1.0%	20.00	2.0	1.7	8.9	290	11.6	8.9
3	C	8,878	0.20	0.77	30	1.3%	3.0	225	3.0%	20.00	3.5	1.1	5.0	255	11.4	5.0
4	D	38,113	0.87	0.42	100	3.0%	8.7	235	0.5%	20.00	1.4	2.8	11.5	335	11.9	11.5
5	E	18,246	0.42	0.70	70	2.8%	4.4	420	2.3%	20.00	3.0	2.3	6.7	490	12.7	6.7
6	F	4,229	0.10	0.88	6	2.0%	0.8	150	2.0%	20.00	2.8	0.9	5.0	156	10.9	5.0
7	G	40,228	0.92	0.44	100	3.0%	8.4	170	2.0%	20.00	2.8	1.0	9.4	270	11.5	9.4
8	H	35,948	0.83	0.45	100	8.5%	5.8	190	0.5%	20.00	1.4	2.2	8.0	290	11.6	8.0
9	I	12,368	0.28	0.56	100	10.0%	4.6	109	2.7%	20.00	3.3	0.6	5.2	209	11.2	5.2
10	J	9,994	0.23	0.65	70	5.5%	3.9	160	2.8%	20.00	3.3	0.8	5.0	230	11.3	5.0
11	OS-A	77,099	1.77	0.53	100	4.3%	6.4	665	2.5%	15.00	2.4	4.7	11.1	765	14.3	11.1
12	OS-B	58,532	1.34	0.50	65	4.5%	5.4	405	3.8%	15.00	2.9	2.3	7.7	470	12.6	7.7
13	OS-C	91,667	2.10	0.51	65	4.5%	5.3	1035	1.9%	15.00	2.1	8.3	13.6	1100	16.1	13.6

Meadowbrook Park - Drainage Report Proposed Runoff Calculations (Rational Method Procedure)												
Design Storm 5 Year												
BASIN INFORMATION				DIRECT RUNOFF				CUMULATIVE RUNOFF				NOTES
DESIGN POINT	DRAIN BASIN	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	C x A	I in/hr	Q cfs	
1	A	2.47	0.22	12.0	0.54	3.85	2.08					
2	B	1.85	0.51	8.9	0.94	4.31	4.04					
3	C	0.20	0.77	5.0	0.16	5.17	0.82					
4	D	0.87	0.42	11.5	0.36	3.92	1.43					
5	E	0.42	0.70	6.7	0.29	4.73	1.38					
6	F	0.10	0.88	5.0	0.09	5.17	0.44					
7	G	0.92	0.44	9.4	0.41	4.22	1.72					
8	H	0.83	0.45	8.0	0.37	4.46	1.66					
9	I	0.28	0.56	5.2	0.16	5.12	0.82					
10	J	0.23	0.65	5.0	0.15	5.17	0.77					
11	OS-A	1.77	0.53	11.1	0.95	3.98	3.76					
12	OS-B	1.34	0.50	7.7	0.67	4.52	3.01					
13	OS-C	2.10	0.51	13.6	1.07	3.66	3.92					

Meadowbrook Park - Drainage Report												
Proposed Runoff Calculations												
Design Storm 100 Year												
(Rational Method Procedure)												
BASIN INFORMATION				DIRECT RUNOFF				CUMULATIVE RUNOFF				NOTES
DESIGN POINT	DRAIN BASIN	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	C x A	I in/hr	Q cfs	
1	A	2.47	0.45	12.0	1.11	6.47	7.19					
2	B	1.85	0.66	8.9	1.22	7.24	8.86					
3	C	0.20	0.87	5.0	0.18	8.68	1.53					
4	D	0.87	0.59	11.5	0.52	6.59	3.43					
5	E	0.42	0.81	6.7	0.34	7.94	2.70					
6	F	0.10	0.95	5.0	0.09	8.68	0.80					
7	G	0.92	0.61	9.4	0.57	7.09	4.02					
8	H	0.83	0.62	8.0	0.51	7.48	3.85					
9	I	0.28	0.71	5.2	0.20	8.60	1.73					
10	J	0.23	0.77	5.0	0.18	8.68	1.54					
11	OS-A	1.77	0.69	11.1	1.22	6.68	8.14					
12	OS-B	1.34	0.66	7.7	0.89	7.59	6.73					
13	OS-C	2.10	0.67	13.6	1.41	6.15	8.67					

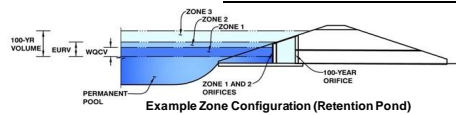


SUMMARY - PROPOSED RUNOFF TABLE						
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE 5-YR RUNOFF (CFS)	CUMULATIVE 100-YR RUNOFF (CFS)
1	A	2.47	2.08	7.19		
2	B	1.85	4.04	8.86		
3	C	0.20	0.82	1.53		
4	D	0.87	1.43	3.43		
5	E	0.42	1.38	2.70		
6	F	0.10	0.44	0.80		
7	G	0.92	1.72	4.02		
8	H	0.83	1.66	3.85		
9	I	0.28	0.82	1.73		
10	J	0.23	0.77	1.54		
11	OS-A	1.77	3.76	8.14		
12	OS-B	1.34	3.01	6.73		
13	OS-C	2.10	3.92	8.67		
14	POND OUTFALL		0.10	5.50		
TOTAL		13.39	25.84	59.19		

***HYDRAULIC CALCULATIONS***

## MHFD-Detention, Version 4.04 (February 2021)

Basin ID: \_\_\_\_\_



### Example Zone Configuration (Retention Pond)

Selected BMP Type =	EDB	
Watershed Area =	8.17	acres
Watershed Length =	1,090	ft
Watershed Length to Centroid =	350	ft
Watershed Slope =	0.040	ft/ft
Watershed Imperviousness =	43.30%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

Water Quality Capture Volume (WQCV)	0.101	acre-feet
Excess Urban Runoff Volume (EUCV)	0.392	acre-feet
2-yr Runoff Volume ( $P1 = 1.19$ in.)	0.288	acre-feet
5-yr Runoff Volume ( $P1 = 1.5$ in.)	0.386	acre-feet
10-yr Runoff Volume ( $P1 = 1.75$ in.)	0.463	acre-feet
25-yr Runoff Volume ( $P1 = 2.1$ in.)	0.600	acre-feet
50-yr Runoff Volume ( $P1 = 2.25$ in.)	0.734	acre-feet
100-yr Runoff Volume ( $P1 = 2.52$ in.)	0.908	acre-feet
500-yr Runoff Volume ( $P1 = 3.14$ in.)	1.282	acre-feet
Approximate 2-yr Detention Volume	0.250	acre-feet
Approximate 5-yr Detention Volume	0.331	acre-feet
Approximate 10-yr Detention Volume	0.406	acre-feet
Approximate 25-yr Detention Volume	0.502	acre-feet
Approximate 50-yr Detention Volume	0.565	acre-feet
Approximate 100-yr Detention Volume	0.648	acre-feet

Zone 1 Volume ( $WCV_1$ )	=	0.101	acre-feet
Zone 2 Volume ( $EURV - Zone 1$ )	=	0.291	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2)	=	0.256	acre-feet
Total Detention Basin Volume	=	0.648	acre-feet
Initial Surge Volume ( $ISV$ )	=	user	ft <sup>3</sup>
Initial Surge Depth ( $ISD$ )	=	user	ft
Total Available Detention Depth ( $H_{TAD}$ )	=	user	ft
Depth of Trickle Channel ( $H_{TC}$ )	=	user	ft
Slope of Trickle Channel ( $Str$ )	=	user	ft/ft
Slopes of Main Basin Sides ( $S_{Main}$ )	=	user	H:V
Basin Length-to-Width Ratio ( $R_{L/W}$ )	=	user	
Initial Surge Area ( $A_{ISV}$ )	=	user	ft <sup>2</sup>
Surcharge Volume Length ( $LV_S$ )	=	user	ft
Surcharge Volume Width ( $WS_V$ )	=	user	ft
Depth of Basin Floor ( $H_{1LOOR}$ )	=	user	ft
Length of Basin Floor ( $L_{1LOOR}$ )	=	user	ft
Width of Basin Floor ( $W_{1LOOR}$ )	=	user	ft
Area of Basin Floor ( $A_{1LOOR}$ )	=	user	ft <sup>2</sup>
Volume of Basin Floor ( $V_{1LOOR}$ )	=	user	ft <sup>3</sup>
Depth of Main Basin ( $H_{MAIN}$ )	=	user	ft
Length of Main Basin ( $L_{MAIN}$ )	=	user	ft
Width of Main Basin ( $W_{MAIN}$ )	=	user	ft
Area of Main Basin ( $A_{MAIN}$ )	=	user	ft <sup>2</sup>
Volume of Main Basin ( $V_{MAIN}$ )	=	user	ft <sup>3</sup>
Calculated Total Basin Volume ( $V_{TAD}$ )	=	user	acre-feet

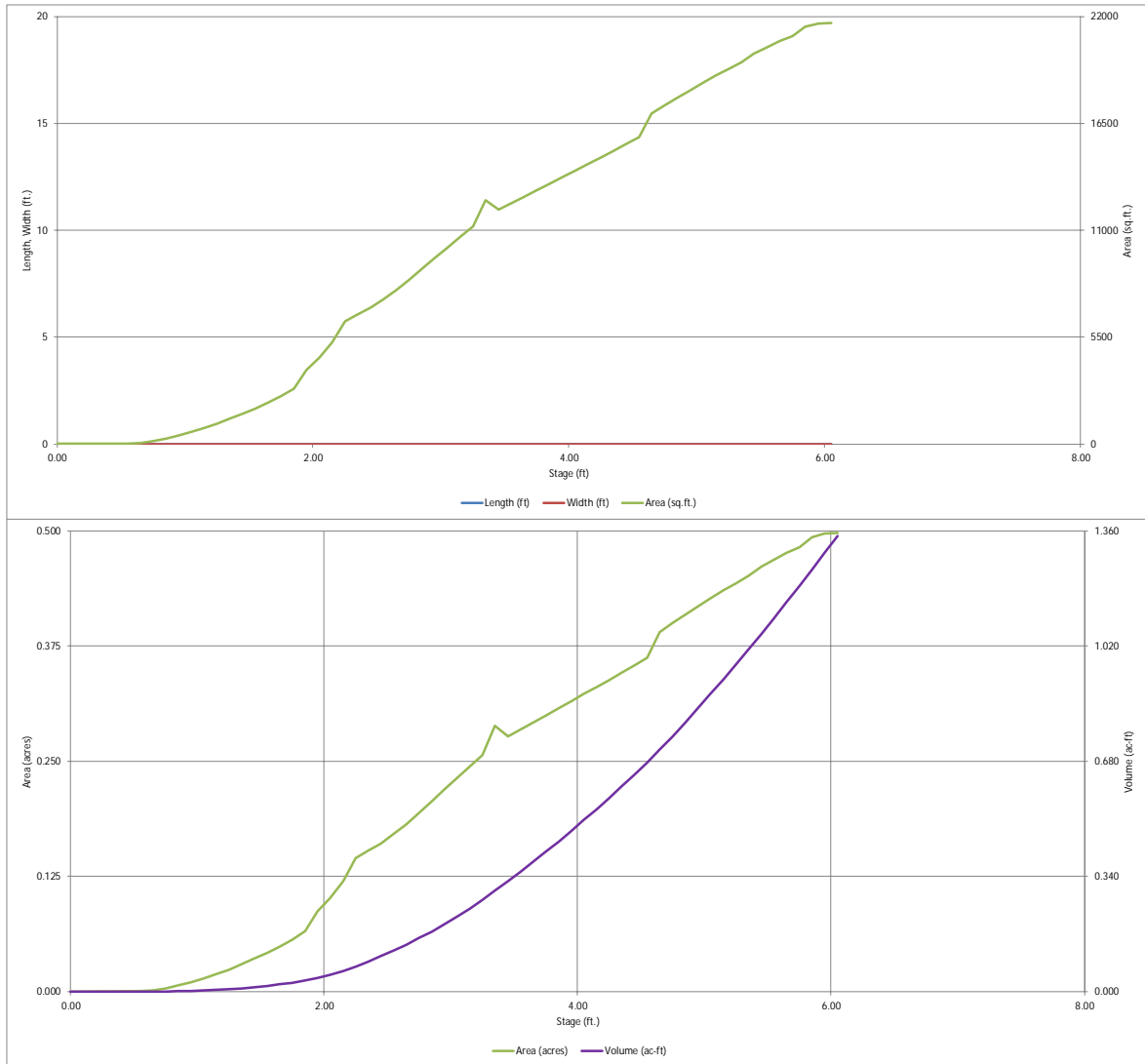
Optional User Overrides	
0.101	acre-feet
	acre-feet
1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
	inches

Depth Increment =									
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft <sup>2</sup> )	Optional Override Area (ft <sup>2</sup> )	Area (acre)	Volume (ft <sup>3</sup> )	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	16	0.000		
Top of ISV	--	0.55	--	--	--	22	0.001	10	0.000
	--	0.65	--	--	--	57	0.001	14	0.000
	--	0.75	--	--	--	147	0.003	25	0.001
	--	0.85	--	--	--	278	0.006	46	0.001
	--	0.95	--	--	--	434	0.010	81	0.002
	--	1.05	--	--	--	615	0.014	134	0.003
	--	1.15	--	--	--	814	0.019	205	0.005
	--	1.25	--	--	--	1,026	0.024	297	0.007
	--	1.35	--	--	--	1,287	0.030	413	0.009
	--	1.45	--	--	--	1,556	0.036	555	0.013
	--	1.55	--	--	--	1,823	0.042	724	0.017
	--	1.65	--	--	--	2,124	0.049	921	0.021
	--	1.75	--	--	--	2,458	0.056	1,151	0.026
	--	1.85	--	--	--	2,846	0.065	1,416	0.033
	--	1.95	--	--	--	3,816	0.088	1,749	0.040
	--	2.05	--	--	--	4,437	0.102	2,161	0.050
	--	2.15	--	--	--	5,224	0.120	2,644	0.061
	--	2.25	--	--	--	6,307	0.145	3,221	0.074
	--	2.35	--	--	--	6,666	0.153	3,870	0.089
	--	2.45	--	--	--	7,002	0.161	4,553	0.105
	--	2.55	--	--	--	7,449	0.171	5,276	0.121
	--	2.65	--	--	--	7,916	0.182	6,044	0.139
	--	2.75	--	--	--	8,441	0.194	6,862	0.158
	--	2.85	--	--	--	9,005	0.207	7,734	0.178
	--	2.95	--	--	--	9,556	0.219	8,662	0.199
	--	3.05	--	--	--	10,096	0.232	9,645	0.221
	--	3.15	--	--	--	10,634	0.244	10,681	0.245
	--	3.25	--	--	--	11,191	0.257	11,772	0.270
	--	3.35	--	--	--	12,559	0.288	12,960	0.298
	--	3.45	--	--	--	12,056	0.277	14,191	0.326
	--	3.55	--	--	--	12,386	0.284	15,413	0.354
	--	3.65	--	--	--	12,718	0.292	16,668	0.383
	--	3.75	--	--	--	13,050	0.300	17,956	0.412
	--	3.85	--	--	--	13,384	0.307	19,278	0.443
	--	3.95	--	--	--	13,720	0.315	20,633	0.474
	--	4.05	--	--	--	14,057	0.323	22,022	0.506
	--	4.15	--	--	--	14,395	0.330	23,445	0.538
	--	4.25	--	--	--	14,734	0.338	24,901	0.572
	--	4.35	--	--	--	15,080	0.346	26,392	0.606
	--	4.45	--	--	--	15,434	0.354	27,918	0.641
	--	4.55	--	--	--	15,793	0.363	29,479	0.677
	--	4.65	--	--	--	17,002	0.390	31,119	0.714
	--	4.75	--	--	--	17,444	0.400	32,841	0.754
	--	4.85	--	--	--	17,833	0.409	34,605	0.794
	--	4.95	--	--	--	18,199	0.418	36,406	0.836
	--	5.05	--	--	--	18,586	0.427	38,246	0.878
	--	5.15	--	--	--	18,965	0.435	40,123	0.921
	--	5.25	--	--	--	19,308	0.443	42,037	0.965
	--	5.35	--	--	--	19,656	0.451	43,985	1.010
	--	5.45	--	--	--	20,089	0.461	45,972	1.055
	--	5.55	--	--	--	20,410	0.469	47,997	1.102
	--	5.65	--	--	--	20,747	0.476	50,055	1.149
	--	5.75	--	--	--	21,001	0.482	52,143	1.197
	--	5.85	--	--	--	21,480	0.493	54,267	1.246
	--	5.95	--	--	--	21,646	0.497	56,423	1.295
	--	6.05	--	--	--	21,700	0.498	58,590	1.345
	--		--	--	--				



# DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

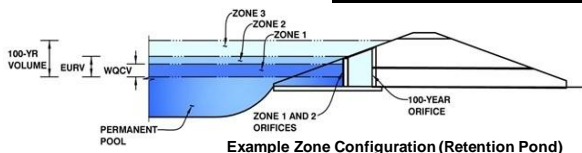


# DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: Meadowbrook Park

Basin ID:



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.43	0.101	Orifice Plate
Zone 2 (EURV)	3.69	0.291	Circular Orifice
Zone 3 (100-year)	4.48	0.256	Weir&Pipe (Restrict)
Total (all zones)		0.648	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =  ft (distance below the filtration media surface)  
Underdrain Orifice Diameter =  inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =  ft<sup>2</sup>  
Underdrain Orifice Centroid =  feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Calculated Parameters for Plate

Invert of Lowest Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
Depth at top of Zone using Orifice Plate =  ft (relative to basin bottom at Stage = 0 ft)  
Orifice Plate: Orifice Vertical Spacing =  inches  
Orifice Plate: Orifice Area per Row =  sq. inches (diameter = 3/4 inch)

WQ Orifice Area per Row =  ft<sup>2</sup>  
Elliptical Half-Width =  feet  
Elliptical Slot Centroid =  feet  
Elliptical Slot Area =  ft<sup>2</sup>

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.50						
Orifice Area (sq. inches)	0.47	0.47						

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected		Zone 2 Circular	Not Selected
Invert of Vertical Orifice =	2.43	N/A	ft (relative to basin bottom at Stage = 0 ft)	0.02	N/A
Depth at top of Zone using Vertical Orifice =	3.69	N/A	ft (relative to basin bottom at Stage = 0 ft)	0.08	N/A
Vertical Orifice Diameter =	1.88	N/A	inches		

Vertical Orifice Area =  ft<sup>2</sup>  
Vertical Orifice Centroid =  feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Gate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected		Zone 3 Weir	Not Selected
Overflow Weir Front Edge Height, H <sub>o</sub> =	3.69	N/A	ft (relative to basin bottom at Stage = 0 ft)	3.69	N/A
Overflow Weir Front Edge Length =	3.67	N/A	feet	2.79	N/A
Overflow Weir Gate Slope =	0.00	N/A	H:V	13.24	N/A
Horiz. Length of Weir Sides =	2.79	N/A	feet	7.12	N/A
Overflow Gate Type =	Type C Gate	N/A		3.56	N/A
Debris Clogging % =	50%	N/A	%		

Height of Gate Upper Edge, H<sub>1</sub> =  feet  
Overflow Weir Slope Length =  feet  
Grate Open Area / 100-yr Orifice Area =  ft<sup>2</sup>  
Overflow Gate Open Area w/o Debris =  ft<sup>2</sup>  
Overflow Gate Open Area w/ Debris =  ft<sup>2</sup>

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected		Zone 3 Restrictor	Not Selected
Depth to Invert of Outlet Pipe =	0.50	N/A	ft (distance below basin bottom at Stage = 0 ft)	0.54	N/A
Outlet Pipe Diameter =	30.00	N/A	inches	0.25	N/A
Restrictor Plate Height Above Pipe Invert =	5.00		inches	0.84	N/A

Outlet Orifice Area =  ft<sup>2</sup>  
Outlet Orifice Centroid =  feet  
Half-Central Angle of Restrictor Plate on Pipe =  radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Calculated Parameters for Spillway

Spillway Invert Stage =	4.52	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth =	0.35
Spillway Crest Length =	25.00	feet	Stage at Top of Freeboard =	5.87
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	0.49
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	1.25

Basin Area at Top of Freeboard =  acres  
Basin Volume at Top of Freeboard =  acre-ft

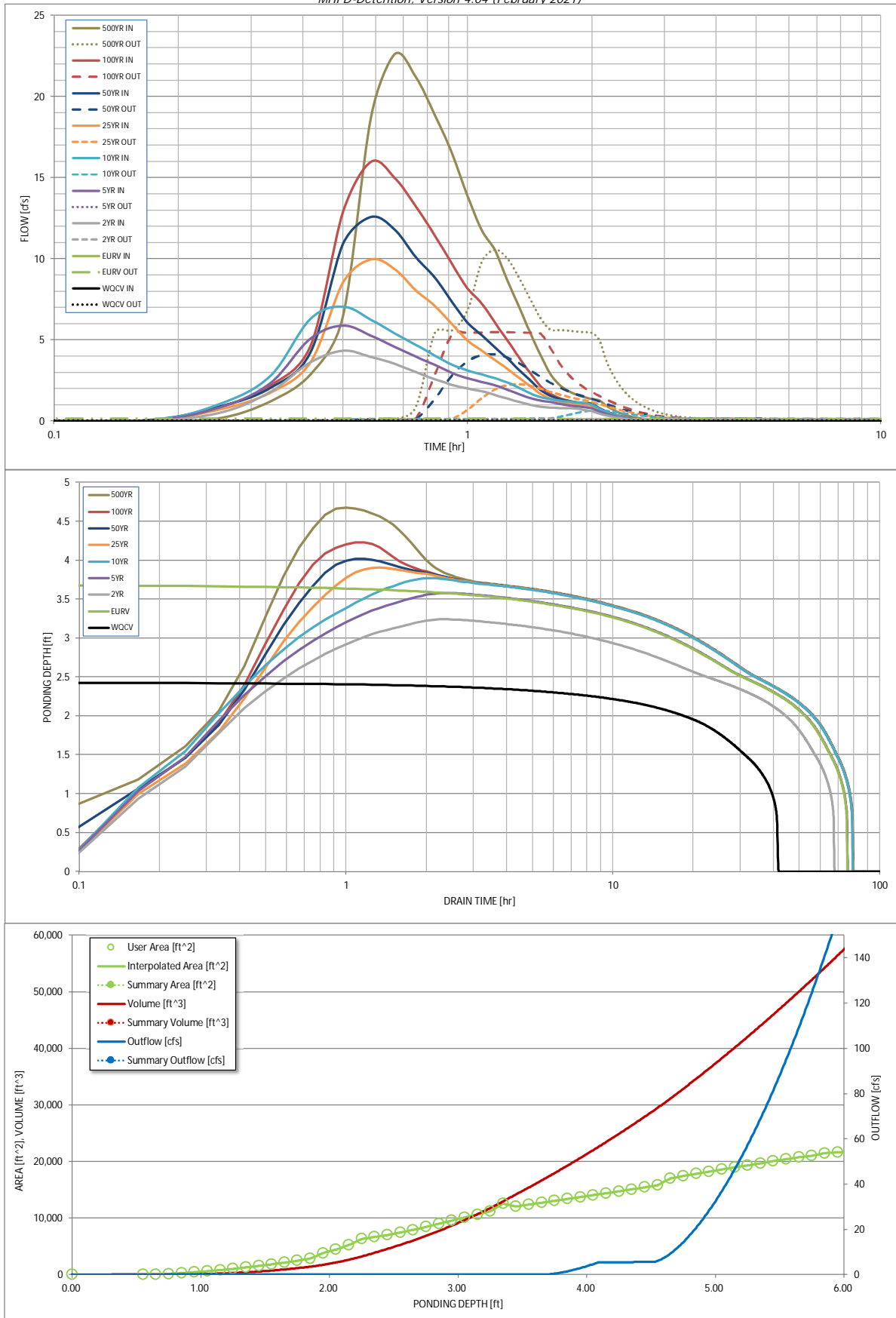
Routed Hydrograph Results

The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.101	0.392	0.288	0.386	0.463	0.600	0.734	0.908	1.282
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.288	0.386	0.463	0.600	0.734	0.908	1.282
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.1	0.1	0.2	1.7	3.4	5.6	9.9
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.02	0.02	0.21	0.42	0.68	1.22
Peak Inflow Q (cfs) =	N/A	N/A	4.3	5.9	7.1	10.0	12.6	16.0	22.6
Peak Outflow Q (cfs) =	0.0	0.2	0.1	0.1	0.7	2.3	4.1	5.5	10.6
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.1	3.5	1.3	1.2	1.0	1.1
Structure Controlling Flow =	Plate	Overflow Weir 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Gate 1 (fps) =	N/A	N/A	N/A	N/A	0.1	0.3	0.6	0.7	0.8
Max Velocity through Gate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	39	67	61	67	69	67	65	63	59
Time to Drain 99% of Inflow Volume (hours) =	41	72	65	73	76	75	74	73	70
Maximum Ponding Depth (ft) =	2.43	3.69	3.24	3.58	3.77	3.91	4.02	4.23	4.68
Area at Maximum Ponding Depth (acres) =	0.16	0.30	0.26	0.29	0.30	0.31	0.32	0.34	0.39
Maximum Volume Stored (acre-ft) =	0.101	0.394	0.268	0.360	0.418	0.458	0.493	0.565	0.722

# DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)



S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			



# DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

## Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00_min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.01	0.19
	0:15:00	0.00	0.00	0.51	0.83	1.04	0.70	0.88	0.86	1.23
	0:20:00	0.00	0.00	1.81	2.36	2.78	1.76	2.05	2.21	2.88
	0:25:00	0.00	0.00	3.63	5.09	6.31	3.63	4.24	4.65	6.44
	0:30:00	0.00	0.00	4.33	5.88	7.06	8.53	10.91	12.87	18.68
	0:35:00	0.00	0.00	3.97	5.27	6.26	9.98	12.58	15.98	22.60
	0:40:00	0.00	0.00	3.53	4.58	5.41	9.37	11.81	15.00	21.21
	0:45:00	0.00	0.00	3.02	3.98	4.71	8.06	10.11	13.23	18.88
	0:50:00	0.00	0.00	2.59	3.47	4.04	7.11	8.85	11.45	16.50
	0:55:00	0.00	0.00	2.24	2.98	3.47	5.97	7.35	9.69	13.89
	1:00:00	0.00	0.00	2.01	2.65	3.13	4.98	6.08	8.19	11.76
	1:05:00	0.00	0.00	1.84	2.42	2.88	4.34	5.28	7.24	10.49
	1:10:00	0.00	0.00	1.61	2.21	2.63	3.75	4.52	6.03	8.64
	1:15:00	0.00	0.00	1.39	1.94	2.39	3.23	3.86	4.98	7.04
	1:20:00	0.00	0.00	1.18	1.66	2.06	2.66	3.15	3.91	5.47
	1:25:00	0.00	0.00	1.01	1.42	1.71	2.17	2.53	2.98	4.10
	1:30:00	0.00	0.00	0.90	1.27	1.48	1.69	1.94	2.19	2.94
	1:35:00	0.00	0.00	0.84	1.19	1.36	1.38	1.57	1.69	2.26
	1:40:00	0.00	0.00	0.81	1.07	1.27	1.21	1.37	1.43	1.89
	1:45:00	0.00	0.00	0.80	0.98	1.21	1.10	1.25	1.26	1.64
	1:50:00	0.00	0.00	0.79	0.91	1.17	1.03	1.16	1.16	1.47
	1:55:00	0.00	0.00	0.69	0.86	1.12	0.99	1.11	1.08	1.36
	2:00:00	0.00	0.00	0.61	0.80	1.02	0.95	1.07	1.02	1.28
	2:05:00	0.00	0.00	0.47	0.61	0.77	0.73	0.81	0.76	0.95
	2:10:00	0.00	0.00	0.35	0.45	0.57	0.54	0.60	0.56	0.70
	2:15:00	0.00	0.00	0.26	0.34	0.42	0.40	0.44	0.42	0.52
	2:20:00	0.00	0.00	0.19	0.25	0.31	0.29	0.33	0.31	0.38
	2:25:00	0.00	0.00	0.14	0.18	0.23	0.21	0.23	0.22	0.27
	2:30:00	0.00	0.00	0.10	0.13	0.16	0.15	0.17	0.16	0.19
	2:35:00	0.00	0.00	0.07	0.09	0.12	0.11	0.12	0.11	0.14
	2:40:00	0.00	0.00	0.05	0.06	0.08	0.07	0.08	0.08	0.09
	2:45:00	0.00	0.00	0.03	0.04	0.05	0.05	0.05	0.05	0.06
	2:50:00	0.00	0.00	0.01	0.02	0.02	0.03	0.03	0.02	0.03
	2:55:00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	3:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

	Stage	Area	Area	Volume	Volume	Total
--	-------	------	------	--------	--------	-------

[illegible]

## Design Procedure Form: Rain Garden (RG)

UD-BMP (Version 3.07, March 2018) Sheet 1 of 2

<b>Designer:</b>	<b>KRK</b>
<b>Company:</b>	<b>Kimley-Horn and Associates</b>
<b>Date:</b>	<b>March 12, 2021</b>
<b>Project:</b>	<b>Meadowbrook Park</b>
<b>Location:</b>	<b>RG SWC of Site</b>

<p>1. Basin Storage Volume</p> <p>A) Effective Imperviousness of Tributary Area, <math>I_a</math> (100% if all paved and roofed areas upstream of rain garden)</p> <p>B) Tributary Area's Imperviousness Ratio (<math>i = I_a/100</math>)</p> <p>C) Water Quality Capture Volume (WQCV) for a 12-hour Drain Time (<math>WQCV = 0.8 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i)</math>)</p> <p>D) Contributing Watershed Area (including rain garden area)</p> <p>E) Water Quality Capture Volume (WQCV) Design Volume <math>Vol = (WQCV / 12) * Area</math></p> <p>F) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm</p> <p>G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume</p> <p>H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)</p>	<p><math>I_a = </math> <input type="text" value="54.5"/> %</p> <p><math>i = </math> <input type="text" value="0.545"/></p> <p>WQCV = <input type="text" value="0.18"/> watershed inches</p> <p>Area = <input type="text" value="80,559"/> sq ft</p> <p><math>V_{WQCV} = </math> <input type="text" value=""/> cu ft</p> <p><math>d_6 = </math> <input type="text" value="0.43"/> in</p> <p><math>V_{WQCV \text{ OTHER}} = </math> <input type="text" value="1,176"/> cu ft</p> <p><math>V_{WQCV \text{ USER}} = </math> <input type="text" value=""/> cu ft</p>
<p>2. Basin Geometry</p> <p>A) WQCV Depth (12-inch maximum)</p> <p>B) Rain Garden Side Slopes (<math>Z = 4</math> min., horiz. dist per unit vertical) (Use "0" if rain garden has vertical walls)</p> <p>C) Minimum Flat Surface Area</p> <p>D) Actual Flat Surface Area</p> <p>E) Area at Design Depth (Top Surface Area)</p> <p>F) Rain Garden Total Volume (<math>V_T = ((A_{Top} + A_{Actual}) / 2) * Depth</math>)</p>	<p><math>D_{WQCV} = </math> <input type="text" value="12"/> in</p> <p><math>Z = </math> <input type="text" value="0.00"/> ft / ft</p> <p><math>A_{Min} = </math> <input type="text" value="878"/> sq ft</p> <p><math>A_{Actual} = </math> <input type="text" value="1215"/> sq ft</p> <p><math>A_{Top} = </math> <input type="text" value="1215"/> sq ft</p> <p><math>V_T = </math> <input type="text" value="1,215"/> cu ft</p>
<p>3. Growing Media</p>	<div> <p>Choose One</p> <p><input checked="" type="radio"/> 18" Rain Garden Growing Media</p> <p><input type="radio"/> Other (Explain):</p> </div> <hr/> <hr/>
<p>4. Underdrain System</p> <p>A) Are underdrains provided?</p> <p>B) Underdrain system orifice diameter for 12 hour drain time</p> <p>i) Distance From Lowest Elevation of the Storage Volume to the Center of the Orifice</p> <p>ii) Volume to Drain in 12 Hours</p> <p>iii) Orifice Diameter, 3/8" Minimum</p>	<div> <p>Choose One</p> <p><input checked="" type="radio"/> YES</p> <p><input type="radio"/> NO</p> </div> <p><math>y = </math> <input type="text" value="0.3"/> ft</p> <p><math>Vol_{12} = </math> <input type="text" value="1,176"/> cu ft</p> <p><math>D_o = </math> <input type="text" value="1 3/16"/> in</p>



# Design Procedure Form: Rain Garden (RG)

Sheet 2 of 2

Designer: KRK  
 Company: Kimley-Horn and Associates  
 Date: March 12, 2021  
 Project: Meadowbrook Park  
 Location: RG SWC of Site

## 5. Impermeable Geomembrane Liner and Geotextile Separator Fabric

- A) Is an impermeable liner provided due to proximity of structures or groundwater contamination?

Choose One

- ☒ YES  
☐ NO

PROVIDE A 30 MIL (MIN) PVC LINER WITH CDOT CLASS B GEOTEXTILE ABOVE IT. USE THE SAME GEOTEXTILE BELOW THE LINER IF THE SUBGRADE IS ANGULAR

## 6. Inlet / Outlet Control

- A) Inlet Control

Choose One

- ☐ Sheet Flow- No Energy Dissipation Required  
☒ Concentrated Flow- Energy Dissipation Provided

## 7. Vegetation

Choose One

- ☒ Seed (Plan for frequent weed control)  
☐ Plantings  
☐ Sand Grown or Other High Infiltration Sod

## 8. Irrigation

- A) Will the rain garden be irrigated?

Choose One

- ☐ YES  
☐ NO

Notes:

	<u>Required</u>	Flow: $Q_{100}$ = (cfs)	<u>Forebay A</u> <u>Release Rate</u>
Forebay Release and Configuration	Release 2% of the undetained 100-year peak discharge by way of a wall/notch or berm/pipe configuration	19.60	0.39

Minimum Forebay Volume Required		40hr drain time $a = 1$ $I = 0.641$ $A = 3.85$ AC	<u>Required (CF)</u>	<u>Provided (CF)</u>
	2% of the WQCV		70.07	84.00

Maximum Forebay Depth	<u>Required</u> 18" Max	<u>Provided</u> 18"	Concrete Forebay Structure
-----------------------	----------------------------	------------------------	----------------------------

Forebay Notch Calculations			
$Q = C_o A_o (2gH_o)^{0.5}$			
$Q_a$	0.39 cfs		2% of Peak 100 YR Discharge for contributing Sub-Basins
$C_o$	0.6		
$H_o$	0.5 ft		
$g$	32.2 ft/s <sup>2</sup>		
$A_a$	0.12 ft <sup>2</sup>		
$L_a$	0.08 ft		
	0.92 in		3" Minimum per Criteria

$$WQCV = a(0.91I^3 - 1.19I^2 + 0.78I)$$

Equation 3-1

Where:

- WQCV = Water Quality Capture Volume (watershed inches)  
 $a$  = Coefficient corresponding to WQCV drain time (Table 3-2)  
 $I$  = Imperviousness (%/100) (see Figures 3-3 through 3-5 [single family land use] and /or the *Runoff* chapter of Volume 1[other typical land uses])

**Table 3-2. Drain Time Coefficients for WQCV Calculations**

Drain Time (hrs)	Coefficient, $a$
12 hours	0.8
24 hours	0.9
40 hours	1.0

Forebay Release and Configuration	Required	Flow: $Q_{100}$ = (cfs)	Forebay B Release Rate
	Release 2% of the undetained 100-year peak discharge by way of a wall/notch or berm/pipe configuration	7.19	0.14

Minimum Forebay Volume Required	Required (CF)	Provided (CF)
2% of the WQCV	20.52	154.00
40hr drain time $a = 1$ $I = 0.197$ $A = 2.47$ AC		

Maximum Forebay Depth	Required	Provided	Concrete Berm
	12" Max	12"	

Forebay Notch Calculations		
$Q = C_o A_o (2gH_o)^{0.5}$		
$Q_a$	0.14 cfs	2% of Peak 100 YR Discharge for contributing Sub-Basins
$C_o$	0.6	
$H_o$	0.5 ft	
$g$	32.2 ft/s <sup>2</sup>	
$A_a$	0.04 ft <sup>2</sup>	
$L_a$	0.03 ft	
	0.34 in	3" Minimum per Criteria

$$WQCV = a(0.91I^3 - 1.19I^2 + 0.78I) \quad \text{Equation 3-1}$$

Where:

- WQCV = Water Quality Capture Volume (watershed inches)  
 $a$  = Coefficient corresponding to WQCV drain time (Table 3-2)  
 $I$  = Imperviousness (%/100) (see Figures 3-3 through 3-5 [single family land use] and /or the *Runoff* chapter of Volume 1 [other typical land uses])

**Table 3-2. Drain Time Coefficients for WQCV Calculations**

Drain Time (hrs)	Coefficient, $a$
12 hours	0.8
24 hours	0.9
40 hours	1.0



# Rock Chute Design - Cut/Paste Plan

(Version WI-Nov. 2017, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Meadowbrook Park  
 Designer: KRK  
 Date: 3/12/2021

County: El Paso County  
 Checked by: \_\_\_\_\_  
 Date: \_\_\_\_\_

## Design Values

$D_{50}$  dia. = 9.0 in.  
 Rock<sub>chute</sub> thickness = 18.0 in.  
 Inlet apron length = 10 ft.  
 Outlet apron length = 15 ft.  
 Radius = 25 ft.  
 Will bedding be used? No

## Rock Gradation Envelope

% Passing	Diameter, in. (weight, lbs.)
$D_{100}$ -----	14 - 18 (174 - 413)
$D_{85}$ -----	12 - 16 (113 - 301)
$D_{50}$ -----	9 - 14 (52 - 174)
$D_{10}$ -----	7 - 12 (26 - 113)

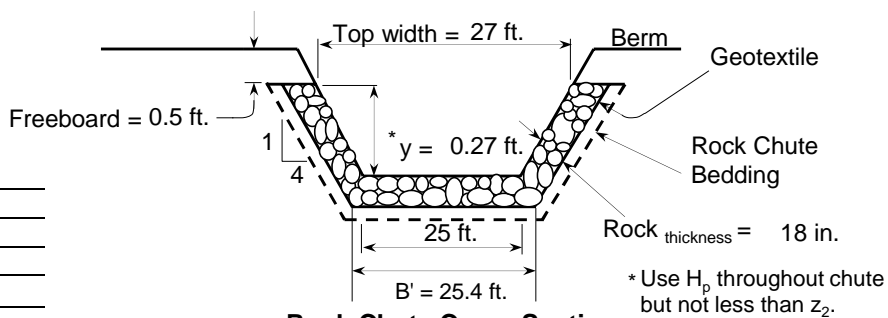
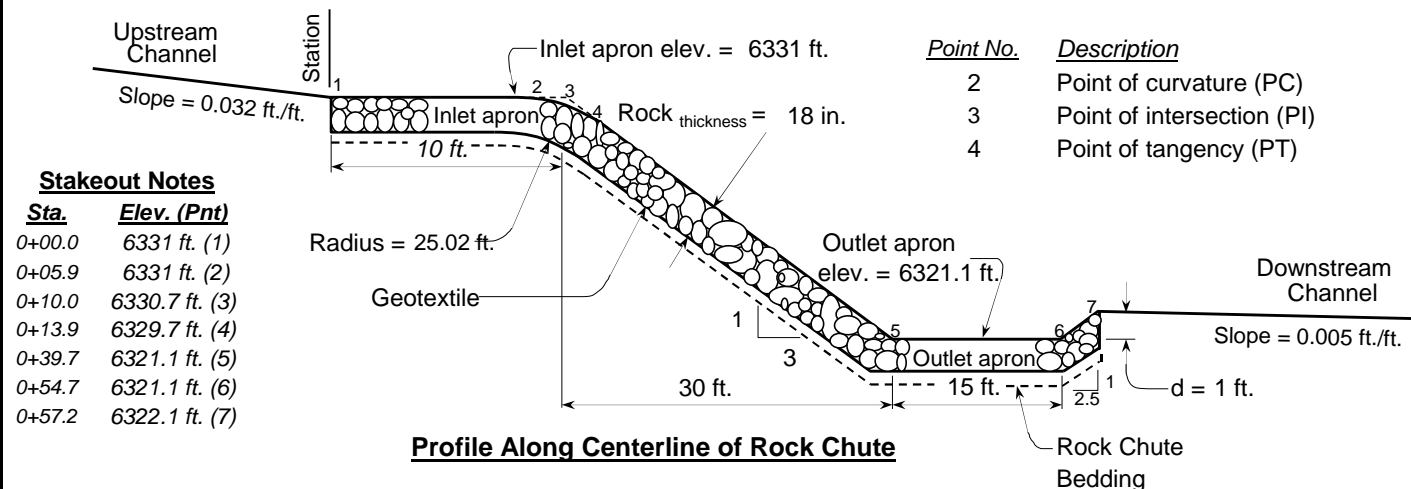
Coefficient of Uniformity,  $(D_{60})/(D_{10}) < 1.7$

## Quantities<sup>a</sup>

Rock = 111 yd<sup>3</sup>  
 Geotextile (WCS-13)<sup>b</sup> = 263 yd<sup>2</sup>  
 Bedding = 0 yd<sup>3</sup>  
 Excavation = 0 yd<sup>3</sup>  
 Earthfill = 0 yd<sup>3</sup>  
 Seeding = 0.0 acres

**Notes:** <sup>a</sup> Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).

<sup>b</sup> Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.



## Profile, Cross Sections, and Quantities



Meadowbrook Park  
 El Paso County County

Date		File Name
Designed	KRK	
Drawn		
Checked		
Approved		
		Drawing Name
		Sheet ___ of ___

Figure 13-12c. Emergency Spillway Protection

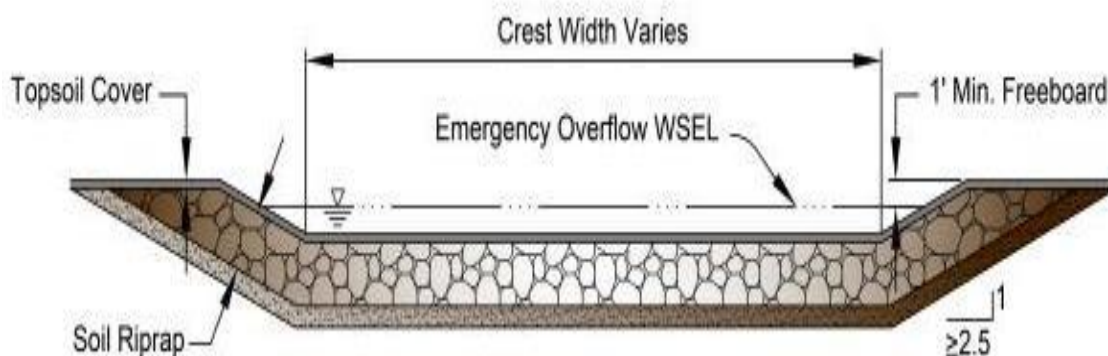
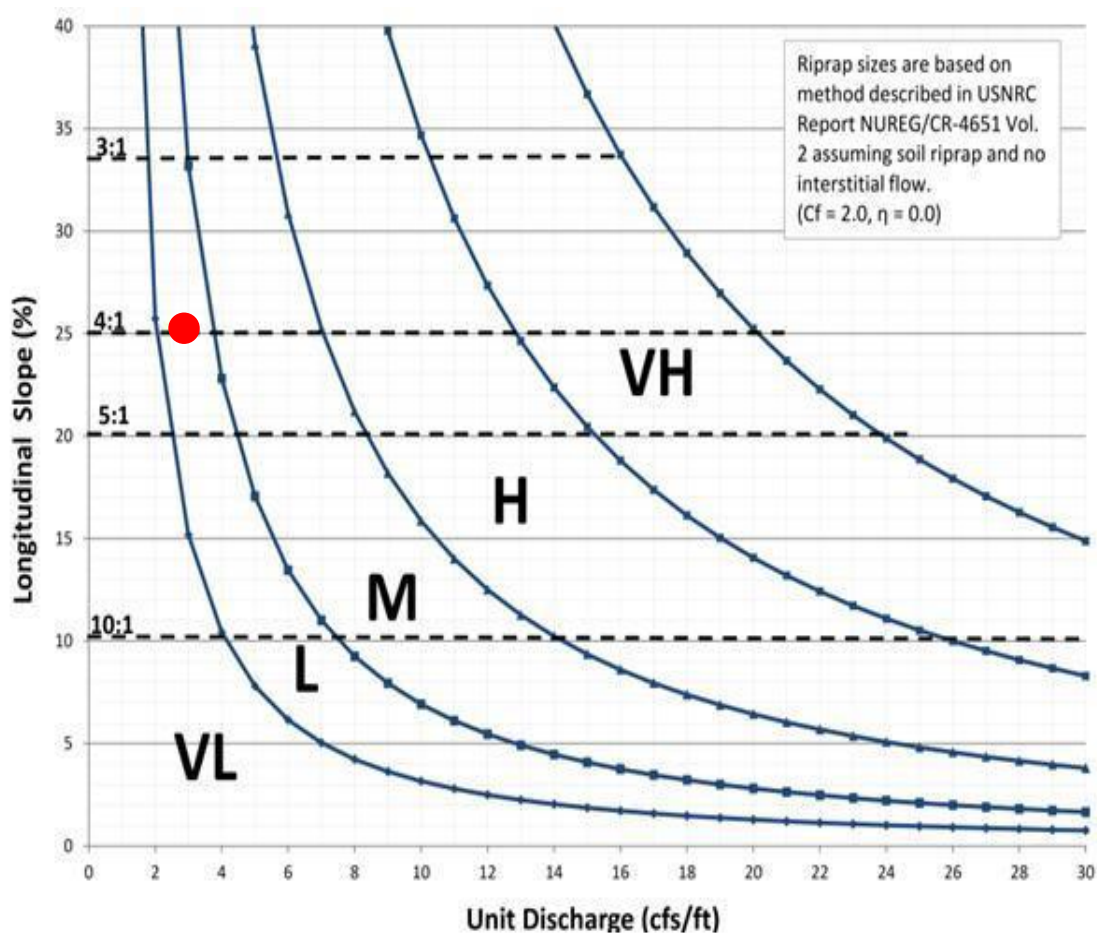
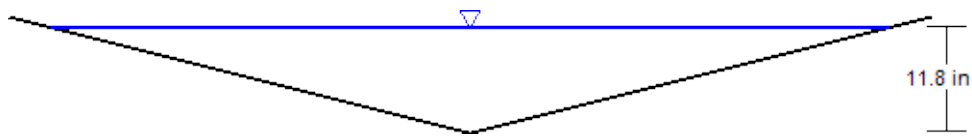


Figure 13-12d. Riprap Types for Emergency Spillway Protection



## Cross Section for CDOT By Pass Ditch

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.030
Channel Slope	0.040 ft/ft
Normal Depth	11.8 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	23.53 cfs



Address velocity, shear, lining required.

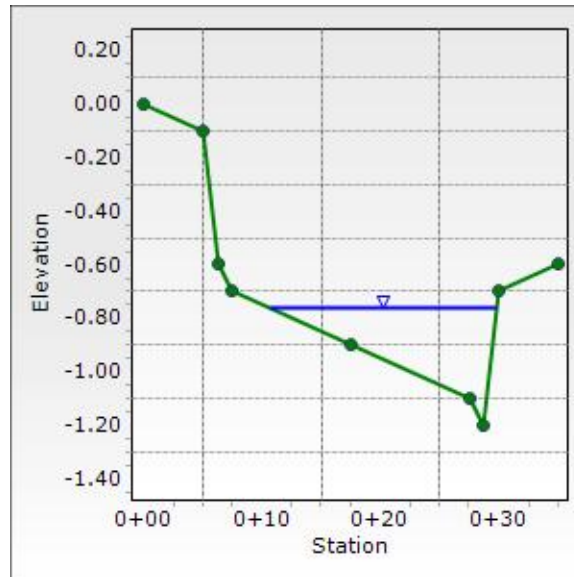
**KHA RESPONSE:**  
Additional tables for all  
swales have been added  
and include the velocity,  
shear, and lining (if  
applicable).

V: 1  
H: 1



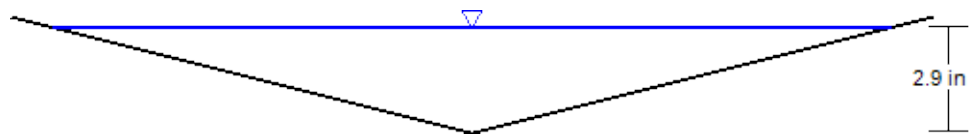
## Cross Section for Emergency Overflow Spillway

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.011 ft/ft
Normal Depth	5.2 in
Discharge	11.20 cfs



## Cross Section for Meadowbrook Ditch North

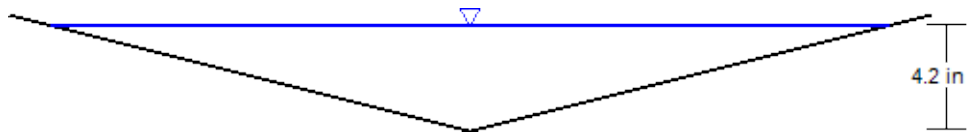
Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.030
Channel Slope	0.010 ft/ft
Normal Depth	2.9 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	0.27 cfs



V: 1  
H: 1

## Cross Section for Meadowbrook Ditch-South

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.030
Channel Slope	0.010 ft/ft
Normal Depth	4.2 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	0.73 cfs

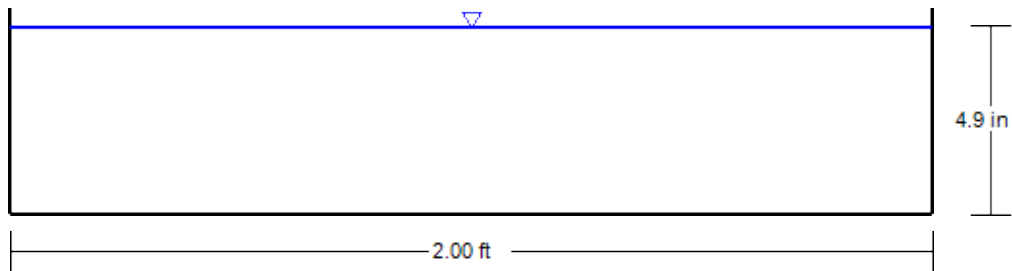


V: 1  
H: 1



## Cross Section for Rain Garden- Curb Chase

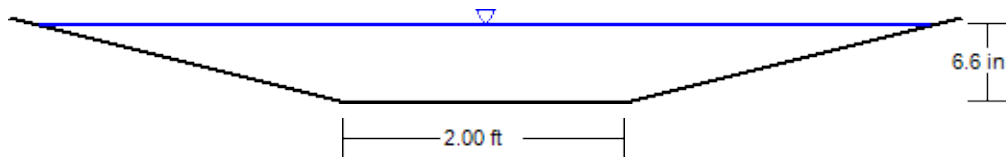
Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Normal Depth	4.9 in
Bottom Width	2.00 ft
Discharge	4.04 cfs



V: 1  
H: 1

## Cross Section for Trapezoidal Channel -Sub-Basin A

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.030
Channel Slope	0.016 ft/ft
Normal Depth	6.6 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	2.00 ft
Discharge	7.19 cfs



V: 1  
H: 1

### 5 Year FlexTable: Conduit Table

Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Capacity (Full Flow) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Flow / Capacity (Design) (%)
MH A7	MH A6	6,328.09	6,327.34	55.4	0.014	18.0	0.013	2.48	5.42	12.22	6,328.69	6,328.03	20.3
MH A6	MH A5	6,327.14	6,326.74	29.9	0.013	18.0	0.013	2.48	5.40	12.15	6,327.74	6,327.50	20.4
INLET G1	MH A5	6,326.78	6,326.74	4.5	0.009	18.0	0.013	0.77	3.33	9.90	6,327.50	6,327.50	7.8
INLET H1	MH A7	6,328.34	6,328.29	4.7	0.011	18.0	0.013	0.82	3.62	10.87	6,328.91	6,328.91	7.5
MH A5	MH A4	6,326.54	6,323.95	191.1	0.014	18.0	0.013	3.25	5.85	12.23	6,327.23	6,324.48	26.6
INLET A8	MH A7	6,330.70	6,328.29	177.6	0.014	18.0	0.013	1.66	4.84	12.24	6,331.18	6,328.91	13.6
MH E1	MH A4	6,325.66	6,323.68	196.6	0.010	18.0	0.013	2.16	4.69	10.54	6,326.21	6,324.59	20.5
MH A4	MH A3	6,323.45	6,321.67	148.3	0.012	24.0	0.013	5.41	6.31	24.78	6,324.27	6,322.30	21.8
INLET F1	MH E1	6,326.00	6,325.86	25.0	0.006	18.0	0.013	0.44	2.39	7.82	6,326.53	6,326.53	5.6
INLET F2	MH E1	6,325.99	6,325.94	9.0	0.006	18.0	0.013	1.72	3.55	7.83	6,326.52	6,326.53	22.0
MH A3	MH A2	6,321.47	6,320.19	106.8	0.012	24.0	0.013	5.41	6.31	24.77	6,322.29	6,321.44	21.8
MH A2	Outfall A1	6,319.99	6,319.85	46.0	0.003	36.0	0.013	9.04	4.31	36.79	6,321.00	6,320.80	24.6
MH C1	MH A2	6,320.30	6,320.19	56.3	0.002	18.0	0.013	2.25	2.61	4.64	6,321.46	6,321.44	48.5
MH B1	MH A2	6,320.34	6,320.19	31.0	0.005	18.0	0.013	1.38	3.18	7.31	6,321.44	6,321.44	18.9
INLET B2	MH B1	6,320.57	6,320.54	4.5	0.007	18.0	0.013	1.38	3.56	8.58	6,321.46	6,321.46	16.1
MH C1	INLET D1	6,320.50	6,320.55	5.4	-0.009	18.0	0.013	0.82	3.45	10.14	6,321.50	6,321.50	8.1
INLET C2	MH C1	6,320.78	6,320.50	137.6	0.002	18.0	0.013	1.43	2.35	4.74	6,321.55	6,321.50	30.2
MH J3	INLET K1	6,317.16	6,317.25	18.0	-0.005	30.0	0.013	0.10	1.37	29.00	6,318.69	6,318.69	0.3
MH J3	MH J2	6,317.16	6,315.21	270.6	0.007	30.0	0.013	10.79	6.26	34.82	6,318.26	6,317.25	31.0
MH J3	INLET J4	6,317.16	6,318.31	43.2	-0.027	30.0	0.013	10.69	9.99	66.94	6,319.40	6,318.69	16.0
MH J2	MH J1	6,315.01	6,314.62	43.2	0.009	30.0	0.013	10.79	6.79	38.96	6,317.25	6,317.23	27.7
O-2	MH J1	6,314.18	6,314.40	53.8	-0.004	36.0	0.013	10.82	5.04	42.65	6,317.19	6,317.18	25.4
INLET I1	MH J1	6,315.40	6,314.62	162.5	0.005	18.0	0.013	0.03	0.02	7.28	6,317.23	6,317.23	0.4



### 5 Year FlexTable: Catch Basin Table

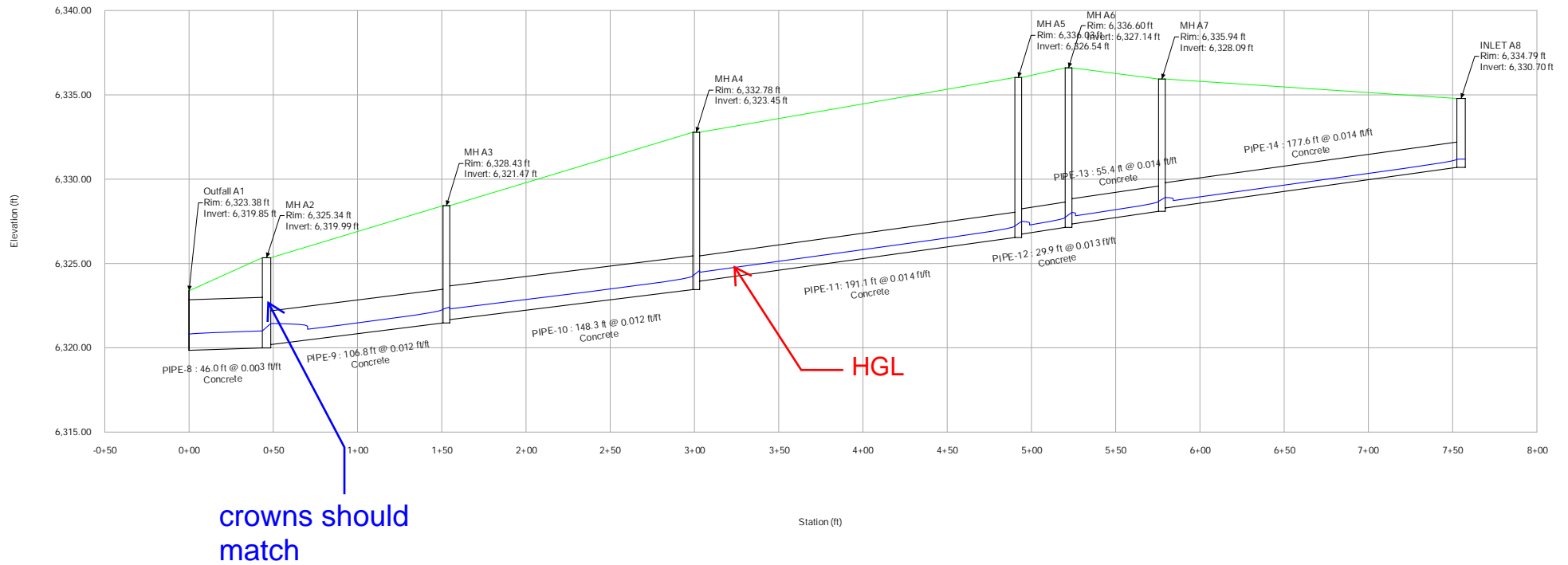
Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Flow (Total Out) (cfs)	Headloss Coefficient (Standard)
INLET A8	6,334.79	6,330.70	6,331.19	6,331.18	1.66	0.050
INLET B2	6,324.98	6,320.57	6,321.46	6,321.46	1.38	0.050
INLET C2	6,324.27	6,320.78	6,321.55	6,321.55	1.43	0.050
INLET D1	6,324.79	6,320.55	6,321.50	6,321.50	0.82	0.050
INLET F1	6,329.50	6,325.99	6,326.53	6,326.53	0.44	0.050
INLET F2	6,329.50	6,325.99	6,326.52	6,326.52	1.72	0.050
INLET G1	6,336.35	6,326.78	6,327.50	6,327.50	0.77	0.050
INLET H1	6,336.24	6,328.34	6,328.91	6,328.91	0.82	0.050
INLET I1	6,318.36	6,315.40	6,317.23	6,317.23	0.03	0.050
INLET J4	6,323.01	6,318.31	6,319.42	6,319.40	10.69	0.050
INLET K1	6,320.21	6,317.25	6,318.69	6,318.69	0.10	0.050

### 5 Year FlexTable: Manhole Table

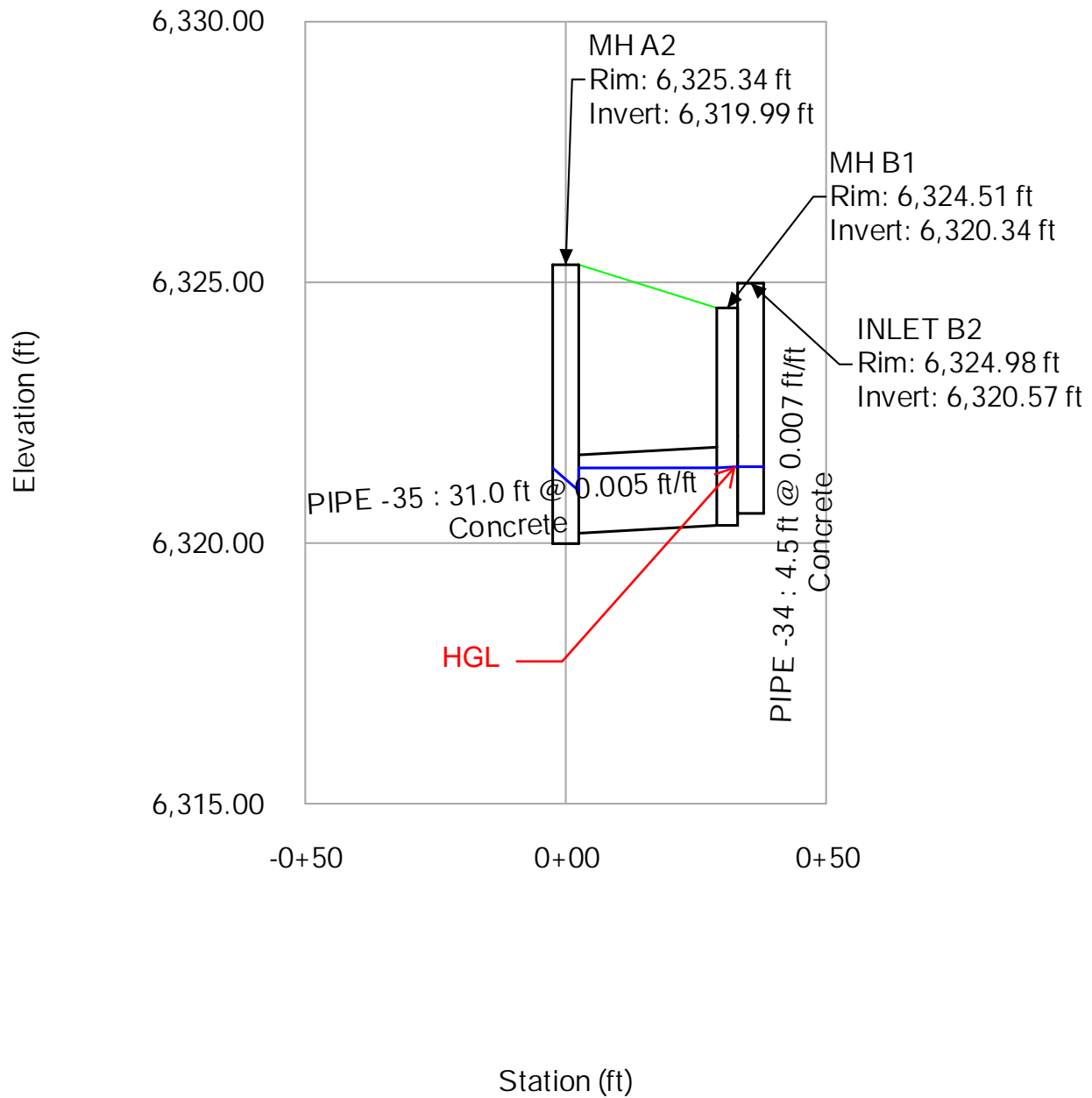
Label	Elevation (Rim) (ft)	Flow (Total Out) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Headloss Coefficient (Standard)	Headloss (ft)
MH A6	6,336.60	2.48	6,328.03	6,327.74	1.320	0.29
MH A5	6,336.03	3.25	6,327.50	6,327.23	1.020	0.27
MH A7	6,335.94	2.48	6,328.91	6,328.69	1.020	0.23
MH A4	6,332.78	5.41	6,324.59	6,324.27	1.020	0.31
MH E1	6,329.29	2.16	6,326.53	6,326.21	1.520	0.31
MH A3	6,328.43	5.41	6,322.41	6,322.29	0.400	0.12
MH A2	6,325.34	9.04	6,321.44	6,321.00	1.520	0.44
MH B1	6,324.51	1.38	6,321.46	6,321.44	1.320	0.02
MH C1	6,324.51	2.25	6,321.50	6,321.46	1.020	0.04
MH J3	6,323.40	10.79	6,318.69	6,318.26	1.020	0.43
MH J2	6,321.76	10.79	6,317.25	6,317.25	0.040	0.00
MH J1	6,320.86	10.82	6,317.23	6,317.19	1.020	0.04

# Profile Report

## 5 Year Engineering Profile - STRM LINE A (Meadowbrook Park.stsw)

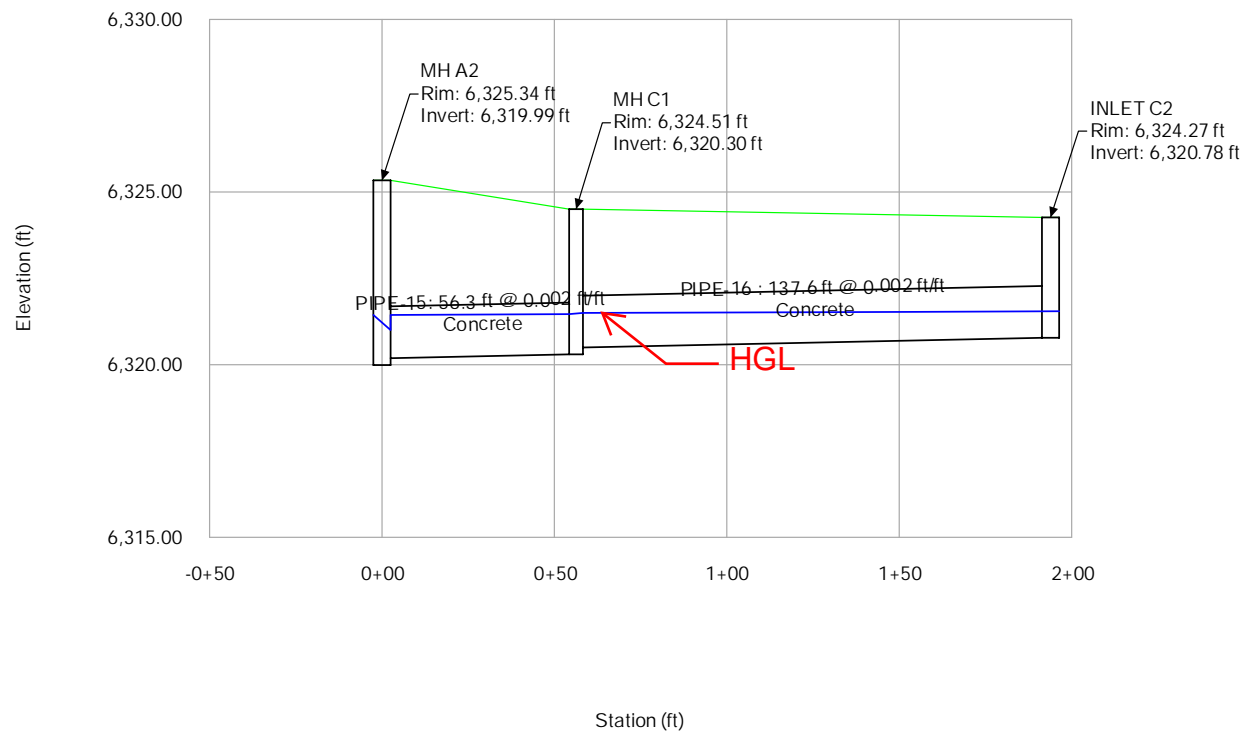


# Profile Report **5 Year** Engineering Profile - STRM LINE B (Meadowbrook Park.stsw)



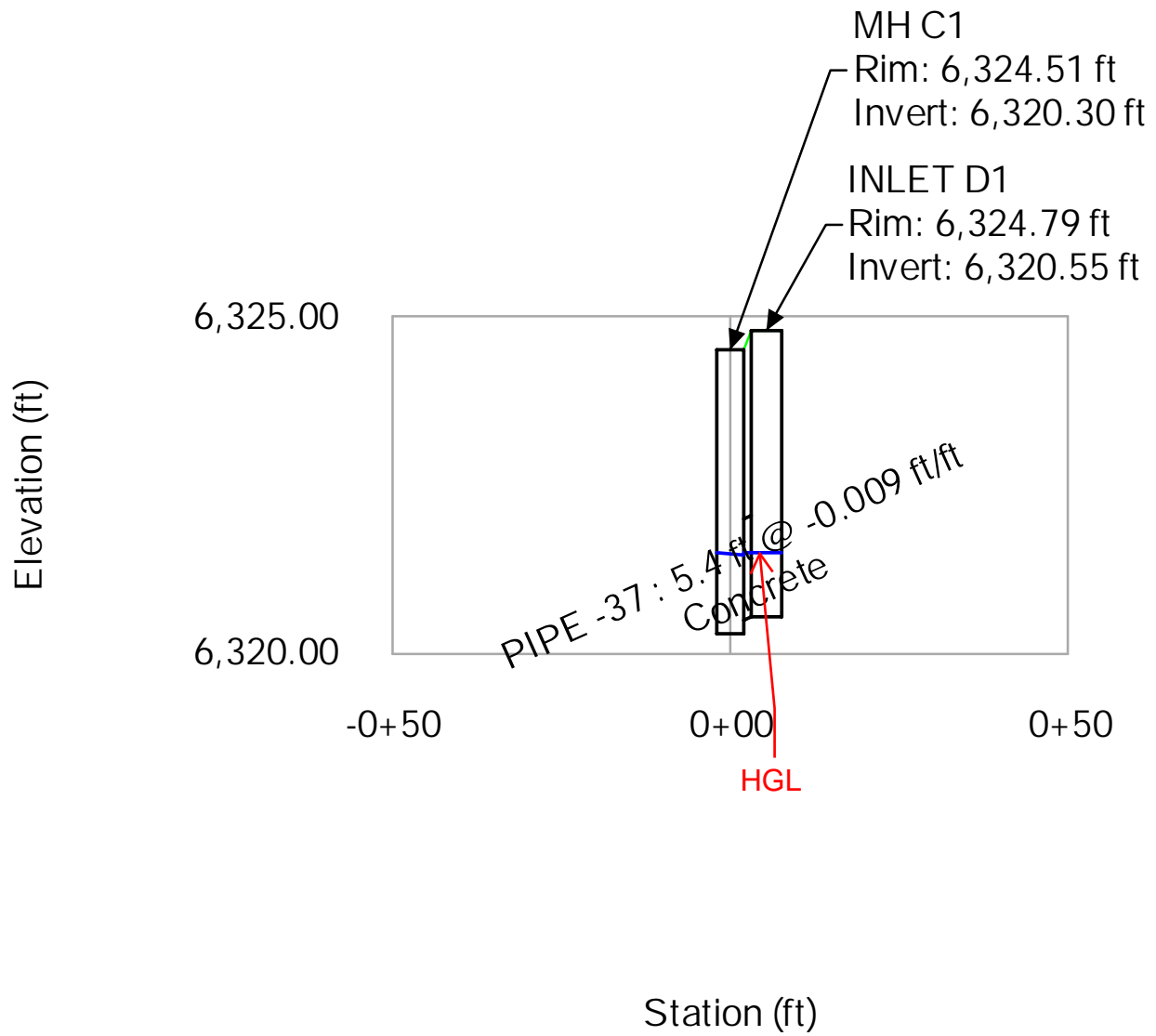


# Profile Report **5 Year** Engineering Profile - STRM LINE C (Meadowbrook Park.stsw)

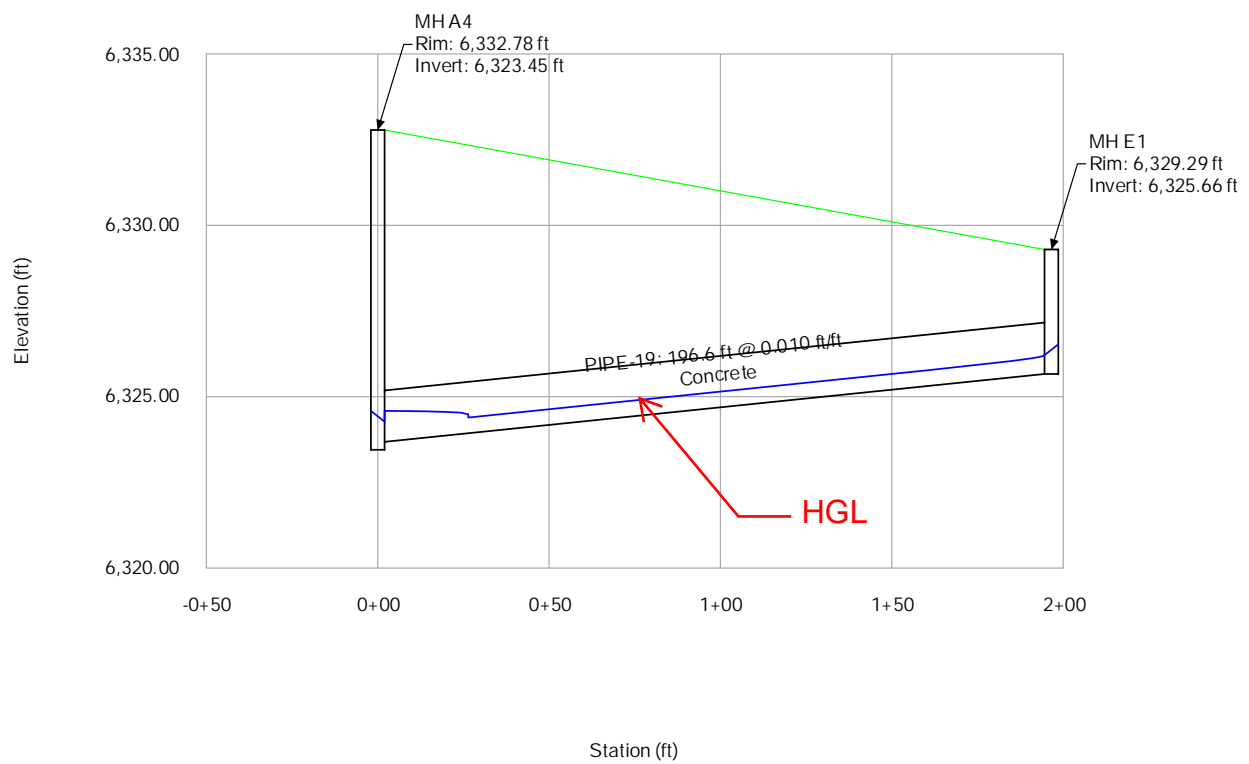


# Profile Report

**5 Year** Engineering Profile - STRM LINE D (Meadowbrook Park.stsw)

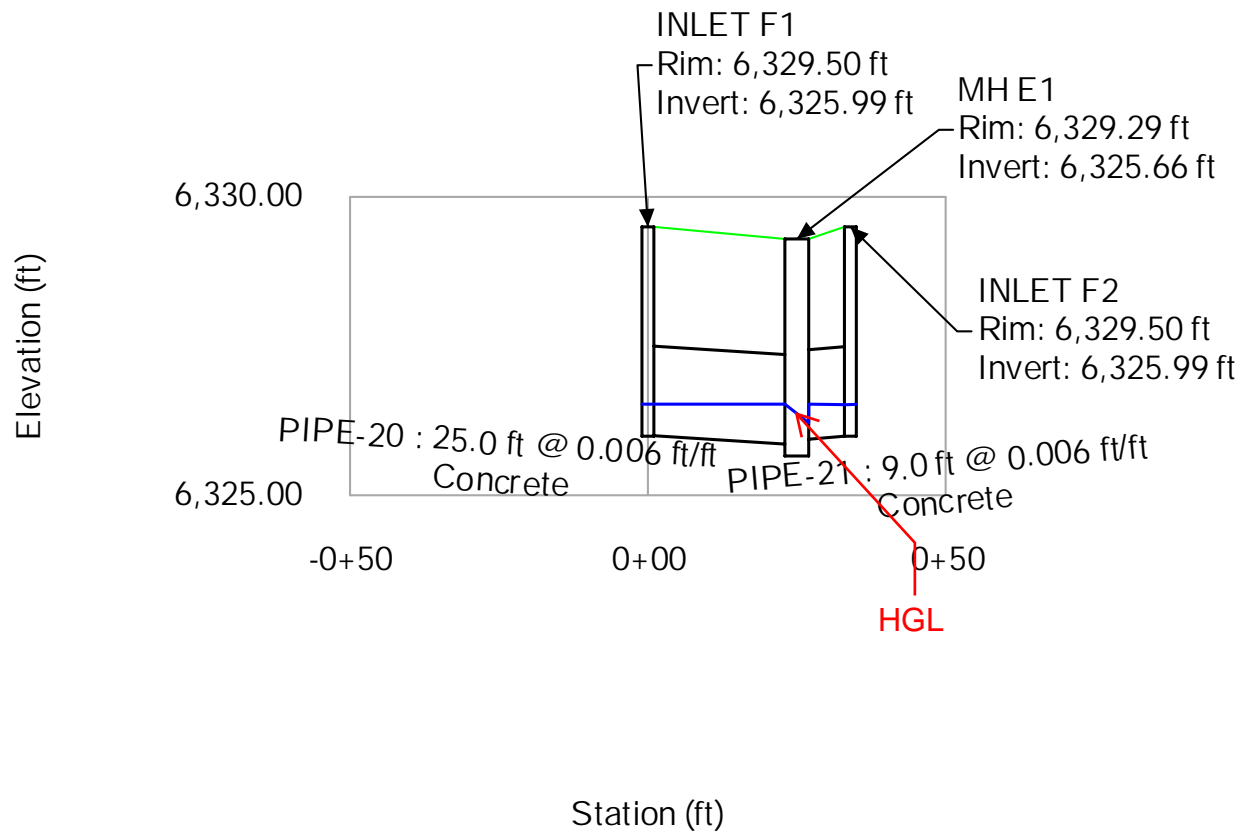


# Profile Report **5 Year** Engineering Profile - STRM LINE E (Meadowbrook Park.stsw)



## Profile Report

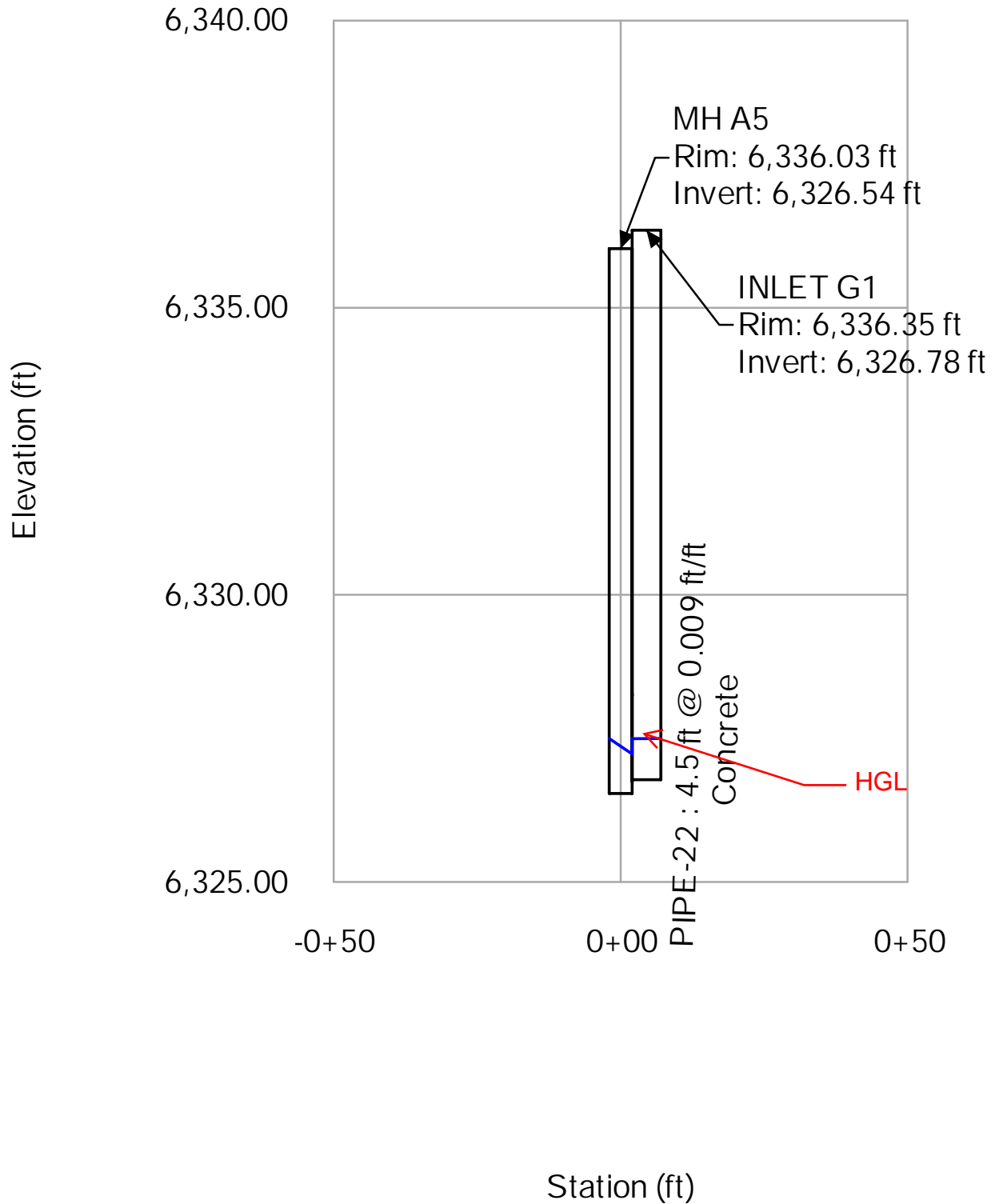
### 5 Year Engineering Profile - STRM LINE F (Meadowbrook Park.stsw)





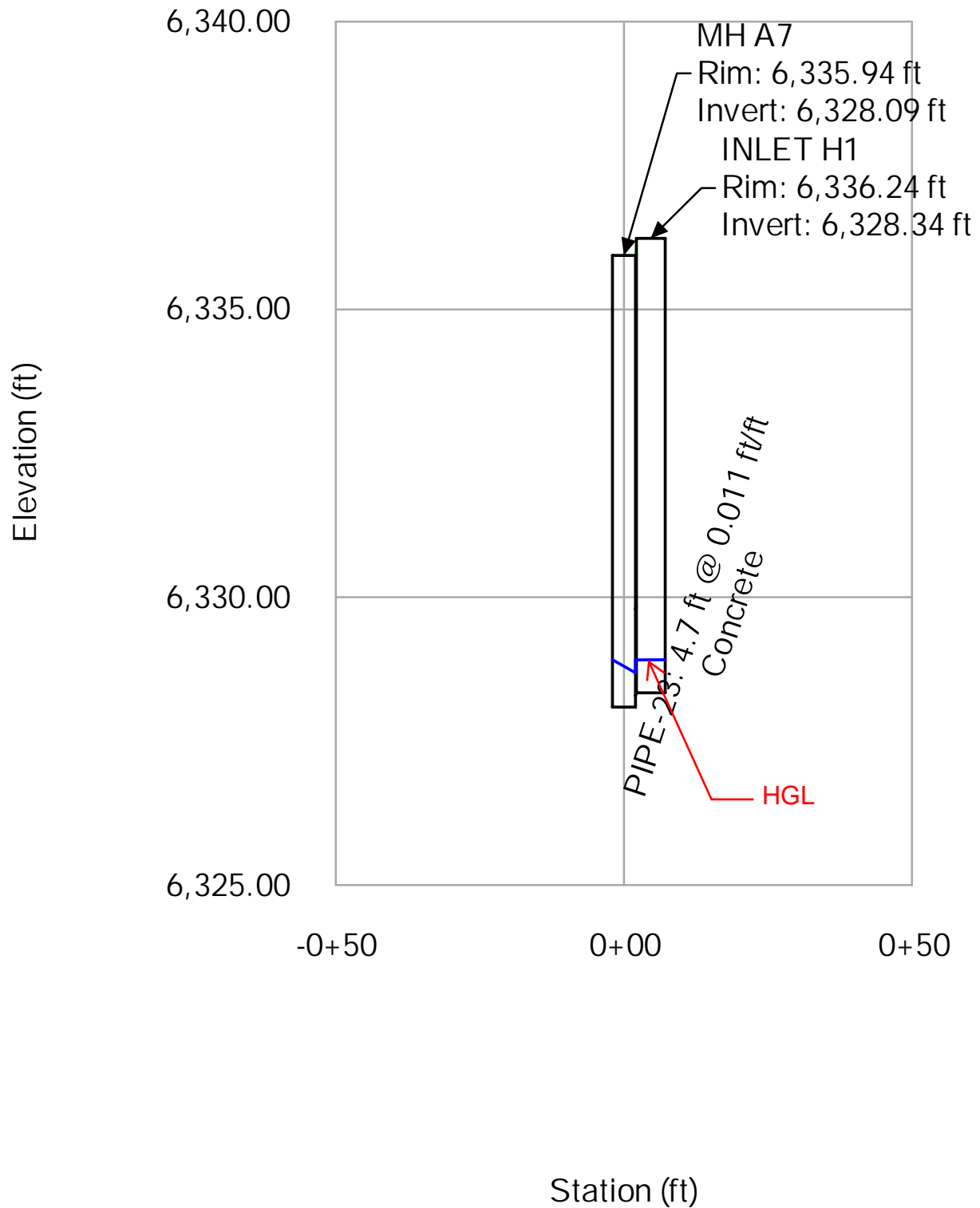
# Profile Report

**5 Year** Engineering Profile - STRM LINE G (Meadowbrook Park.stsw)



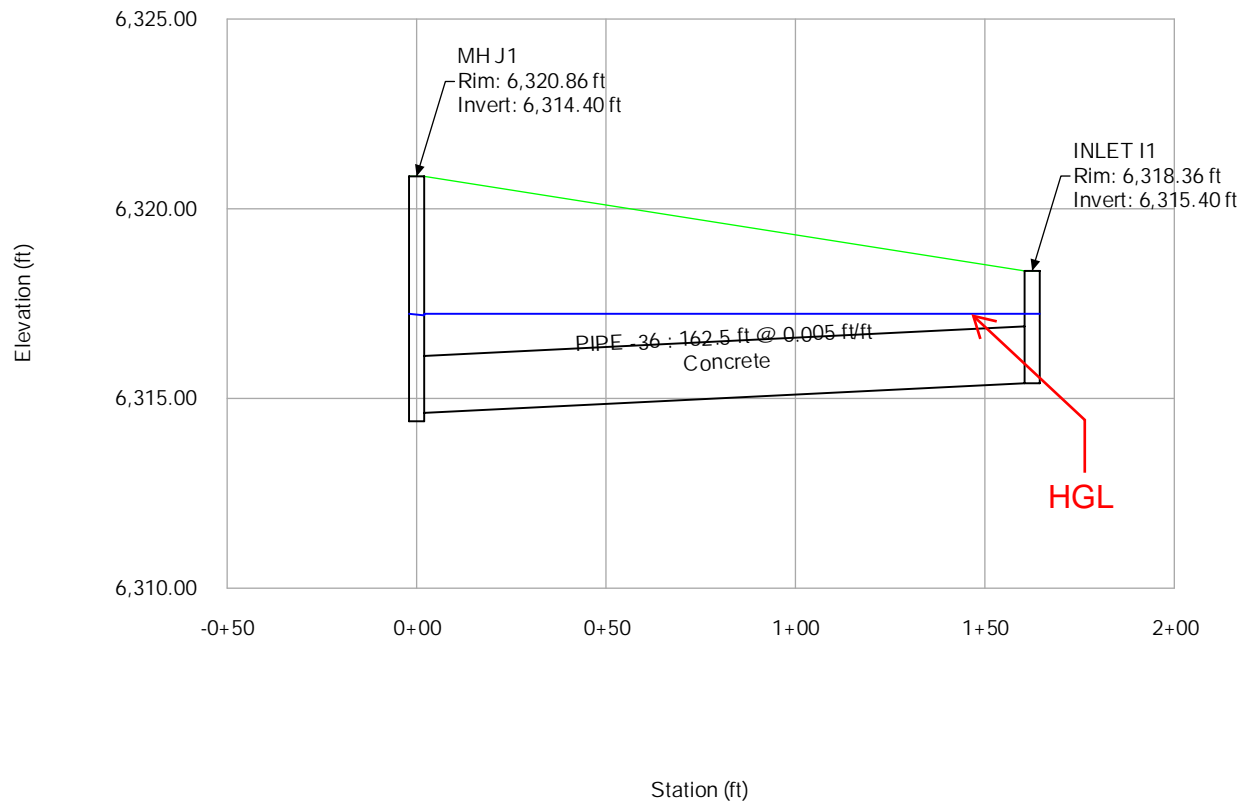
# Profile Report

**5 Year** Engineering Profile - STRM LINE H (Meadowbrook Park.stsw)

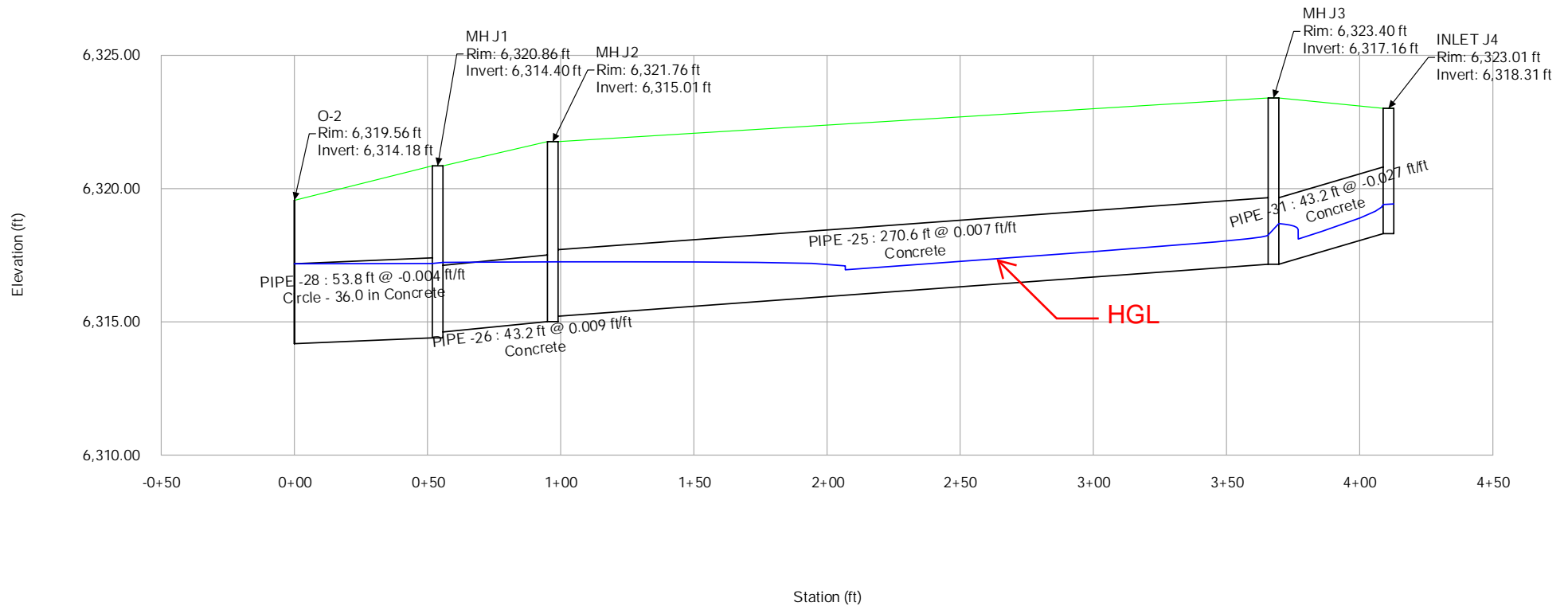


# Profile Report

## 5 Year Engineering Profile - STRM LINE I (Meadowbrook Park.stsw)



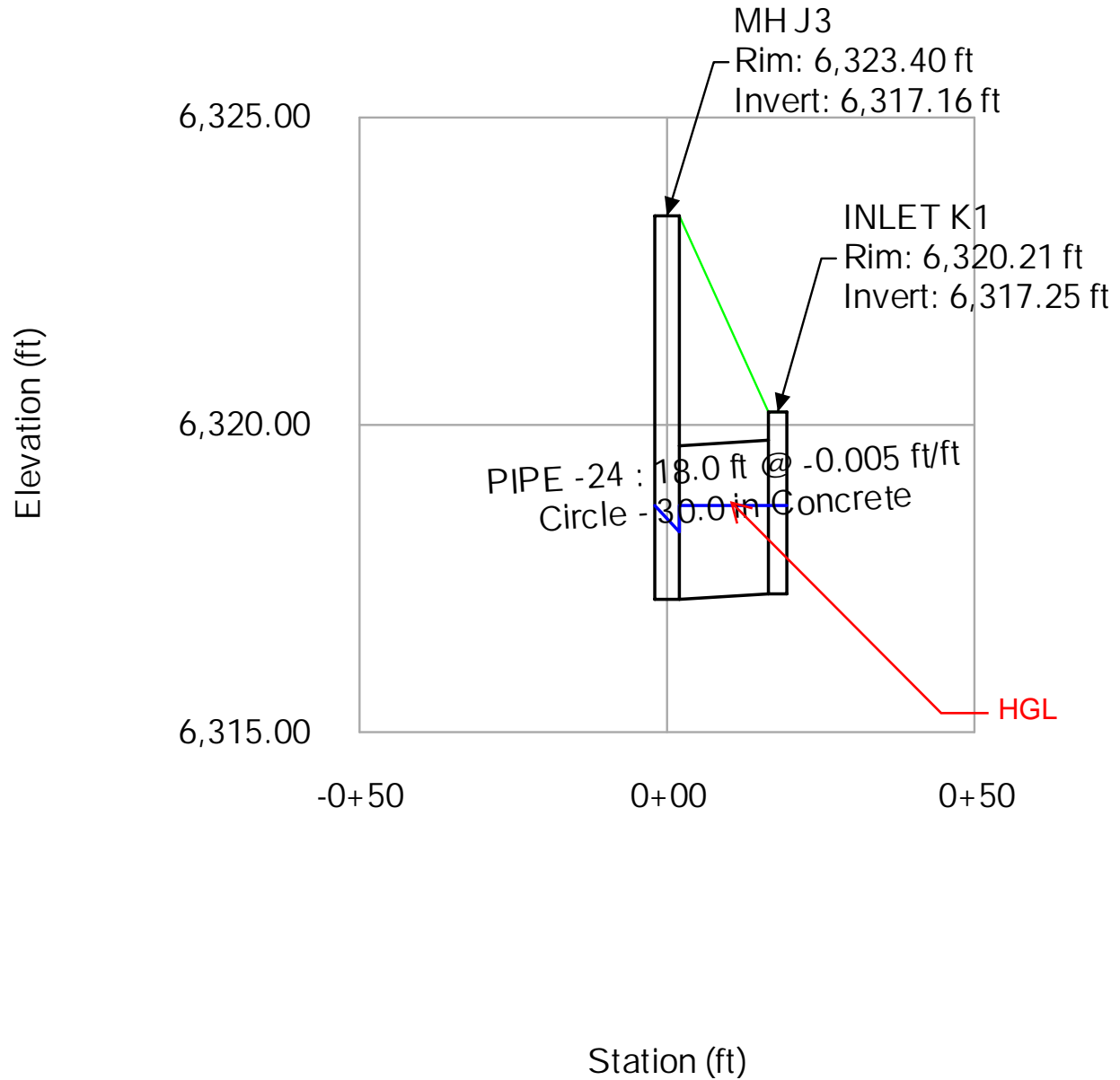
# Profile Report **5 Year** Engineering Profile - STRM LINE J (Meadowbrook Park.stsw)





# Profile Report

## 5 Year Engineering Profile - STRM LINE K (Meadowbrook Park.stsw)



## 100 Year FlexTable: Conduit Table

Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Capacity (Full Flow) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Flow / Capacity (Design) (%)
MH A7	MH A6	6,328.09	6,327.34	55.4	0.014	18.0	0.013	5.57	6.76	12.22	6,329.00	6,328.56	45.6
MH A6	MH A5	6,327.14	6,326.74	29.9	0.013	18.0	0.013	5.57	6.73	12.15	6,328.05	6,328.05	45.8
INLET G1	MH A5	6,326.78	6,326.74	4.5	0.009	18.0	0.013	1.53	4.07	9.90	6,328.05	6,328.05	15.5
INLET H1	MH A7	6,328.34	6,328.29	4.7	0.011	18.0	0.013	1.72	4.49	10.87	6,329.39	6,329.39	15.8
MH A5	MH A4	6,326.54	6,323.95	191.1	0.014	18.0	0.013	7.10	7.18	12.23	6,327.57	6,325.23	58.1
INLET A8	MH A7	6,330.70	6,328.29	177.6	0.014	18.0	0.013	3.85	6.13	12.24	6,331.45	6,329.39	31.5
MH E1	MH A4	6,325.66	6,323.68	196.6	0.010	18.0	0.013	4.82	5.83	10.54	6,326.50	6,325.23	45.7
MH A4	MH A3	6,323.45	6,321.67	148.3	0.012	24.0	0.013	11.92	7.81	24.78	6,324.69	6,322.92	48.1
INLET F1	MH E1	6,326.00	6,325.86	25.0	0.006	18.0	0.013	0.80	2.85	7.82	6,327.03	6,327.03	10.2
INLET F2	MH E1	6,325.99	6,325.94	9.0	0.006	18.0	0.013	4.02	4.46	7.83	6,327.03	6,327.03	51.3
MH A3	MH A2	6,321.47	6,320.19	106.8	0.012	24.0	0.013	11.92	7.81	24.77	6,322.71	6,322.21	48.1
MH A2	Outfall A1	6,319.99	6,319.85	46.0	0.003	36.0	0.013	19.57	5.29	36.79	6,321.53	6,321.27	53.2
MH C1	MH A2	6,320.30	6,320.19	56.3	0.002	18.0	0.013	4.95	2.80	4.64	6,322.33	6,322.21	106.6
MH B1	MH A2	6,320.34	6,320.19	31.0	0.005	18.0	0.013	2.70	1.53	7.31	6,322.23	6,322.21	37.0
INLET B2	MH B1	6,320.57	6,320.54	4.5	0.007	18.0	0.013	2.70	1.53	8.58	6,322.28	6,322.28	31.5
MH C1	INLET D1	6,320.50	6,320.55	5.4	-0.009	18.0	0.013	1.52	0.86	10.14	6,322.46	6,322.46	15.0
INLET C2	MH C1	6,320.78	6,320.50	137.6	0.002	18.0	0.013	3.43	1.94	4.74	6,322.60	6,322.46	72.4
MH J3	INLET K1	6,317.16	6,317.25	18.0	-0.005	30.0	0.013	5.10	1.04	29.00	6,319.87	6,319.87	17.6
MH J3	MH J2	6,317.16	6,315.21	270.6	0.007	30.0	0.013	28.64	7.92	34.82	6,318.98	6,317.77	82.3
MH J3	INLET J4	6,317.16	6,318.31	43.2	-0.027	30.0	0.013	23.54	12.45	66.94	6,319.96	6,319.87	35.2
MH J2	MH J1	6,315.01	6,314.62	43.2	0.009	30.0	0.013	28.64	5.83	38.96	6,317.74	6,317.53	73.5
O-2	MH J1	6,314.18	6,314.40	53.8	-0.004	36.0	0.013	28.67	6.47	42.65	6,317.26	6,317.18	67.2
INLET I1	MH J1	6,315.40	6,314.62	162.5	0.005	18.0	0.013	0.03	0.02	7.28	6,317.53	6,317.53	0.4

can this be increased?

**KHA RESPONSE:**  
The pipe slope was increased slightly to .003 ft/ft. The slope for this line is limited due to cover. See profiles for reference.

### 100 Year FlexTable: Catch Basin Table

Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Flow (Total Out) (cfs)	Headloss Coefficient (Standard)
INLET A8	6,334.79	6,330.70	6,331.47	6,331.45	3.85	0.050
INLET B2	6,324.98	6,320.57	6,322.28	6,322.28	2.70	0.050
INLET C2	6,324.27	6,320.78	6,322.61	6,322.60	3.43	0.050
INLET D1	6,324.79	6,320.55	6,322.46	6,322.46	1.52	0.050
INLET F1	6,329.50	6,325.99	6,327.03	6,327.03	0.80	0.050
INLET F2	6,329.50	6,325.99	6,327.04	6,327.03	4.02	0.050
INLET G1	6,336.35	6,326.78	6,328.05	6,328.05	1.53	0.050
INLET H1	6,336.24	6,328.34	6,329.39	6,329.39	1.72	0.050
INLET I1	6,318.36	6,315.40	6,317.53	6,317.53	0.03	0.050
INLET J4	6,323.01	6,318.31	6,320.00	6,319.96	23.54	0.050
INLET K1	6,320.21	6,317.25	6,319.87	6,319.87	5.10	0.050

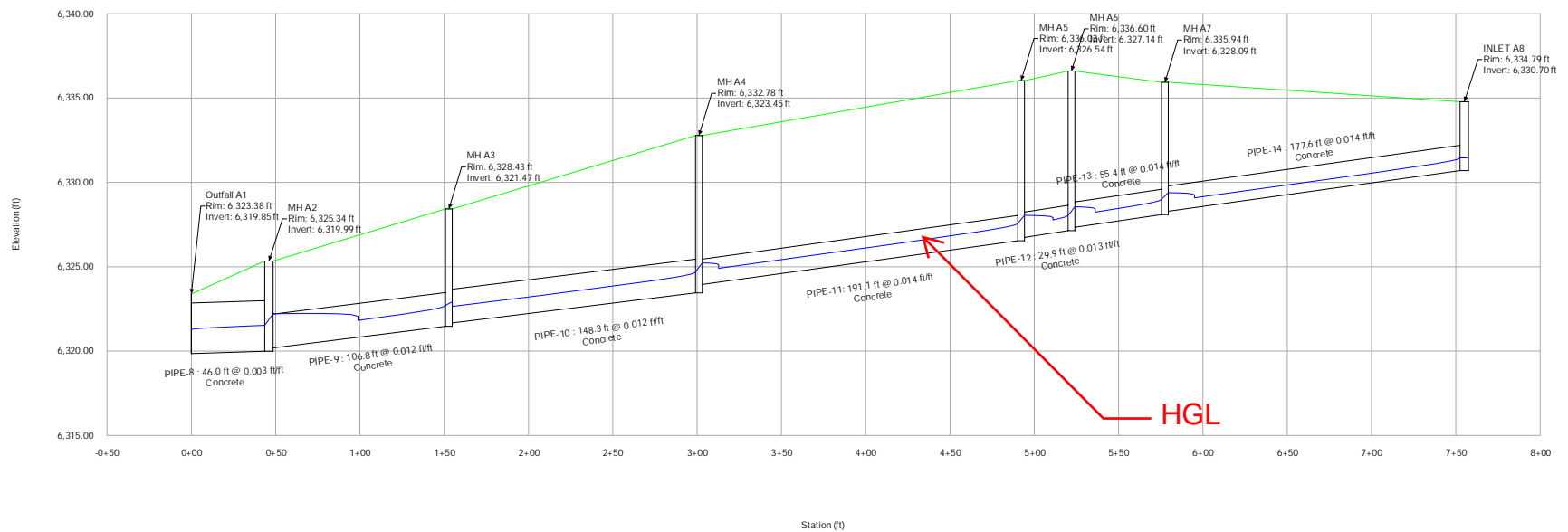
### 100 Year FlexTable: Manhole Table

Label	Elevation (Rim) (ft)	Flow (Total Out) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Headloss Coefficient (Standard)	Headloss (ft)
MH A6	6,336.60	5.57	6,328.56	6,328.05	1.320	0.51
MH A5	6,336.03	7.10	6,328.05	6,327.57	1.020	0.48
MH A7	6,335.94	5.57	6,329.39	6,329.00	1.020	0.39
MH A4	6,332.78	11.92	6,325.23	6,324.69	1.020	0.54
MH E1	6,329.29	4.82	6,327.03	6,326.50	1.520	0.52
MH A3	6,328.43	11.92	6,322.92	6,322.71	0.400	0.21
MH A2	6,325.34	19.57	6,322.21	6,321.53	1.520	0.68
MH B1	6,324.51	2.70	6,322.28	6,322.23	1.320	0.05
MH C1	6,324.51	4.95	6,322.46	6,322.33	1.020	0.12
MH J3	6,323.40	28.64	6,319.87	6,318.98	1.020	0.88
MH J2	6,321.76	28.64	6,317.77	6,317.74	0.040	0.02
MH J1	6,320.86	28.67	6,317.53	6,317.26	1.020	0.27

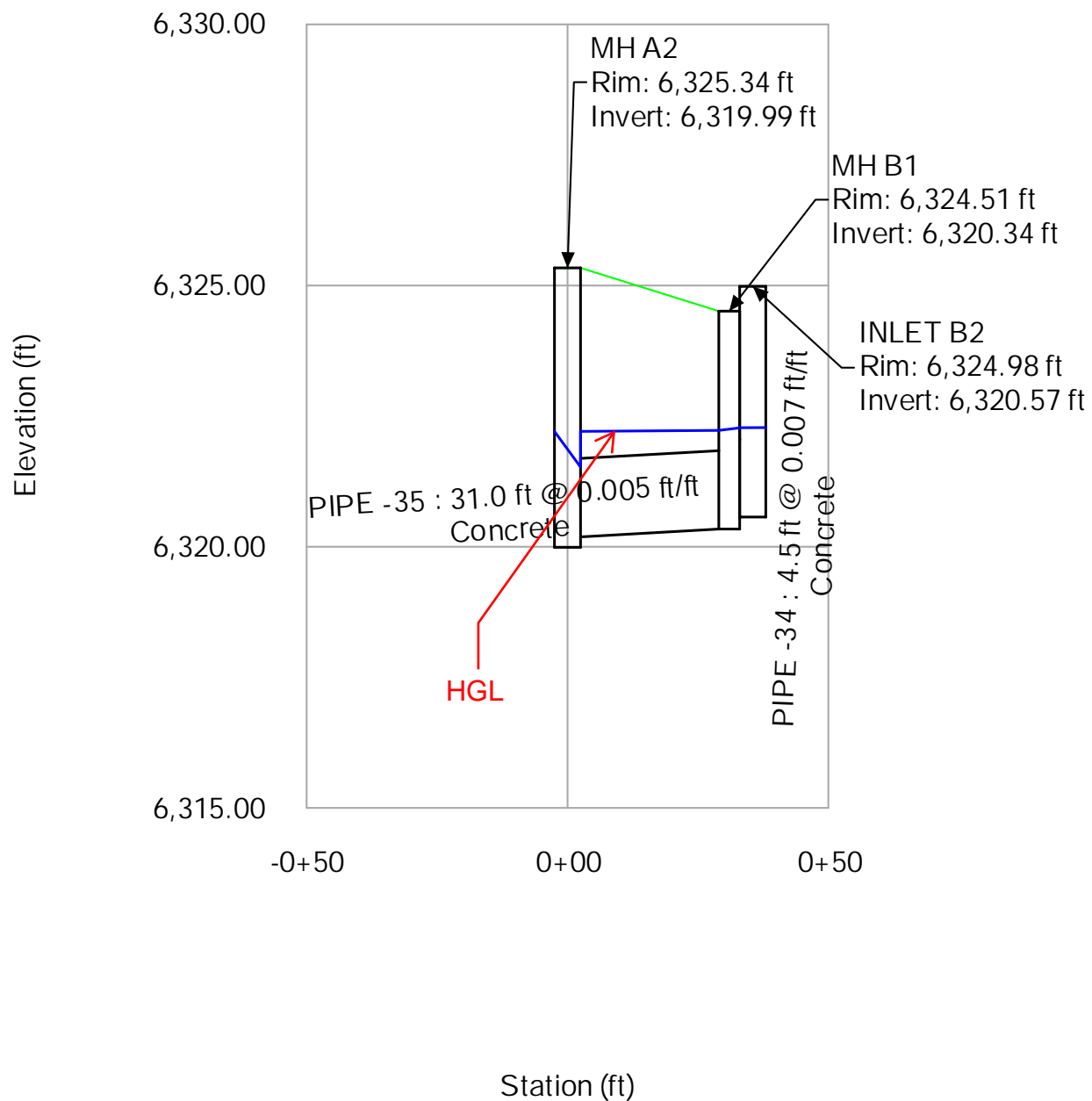


# Profile Report

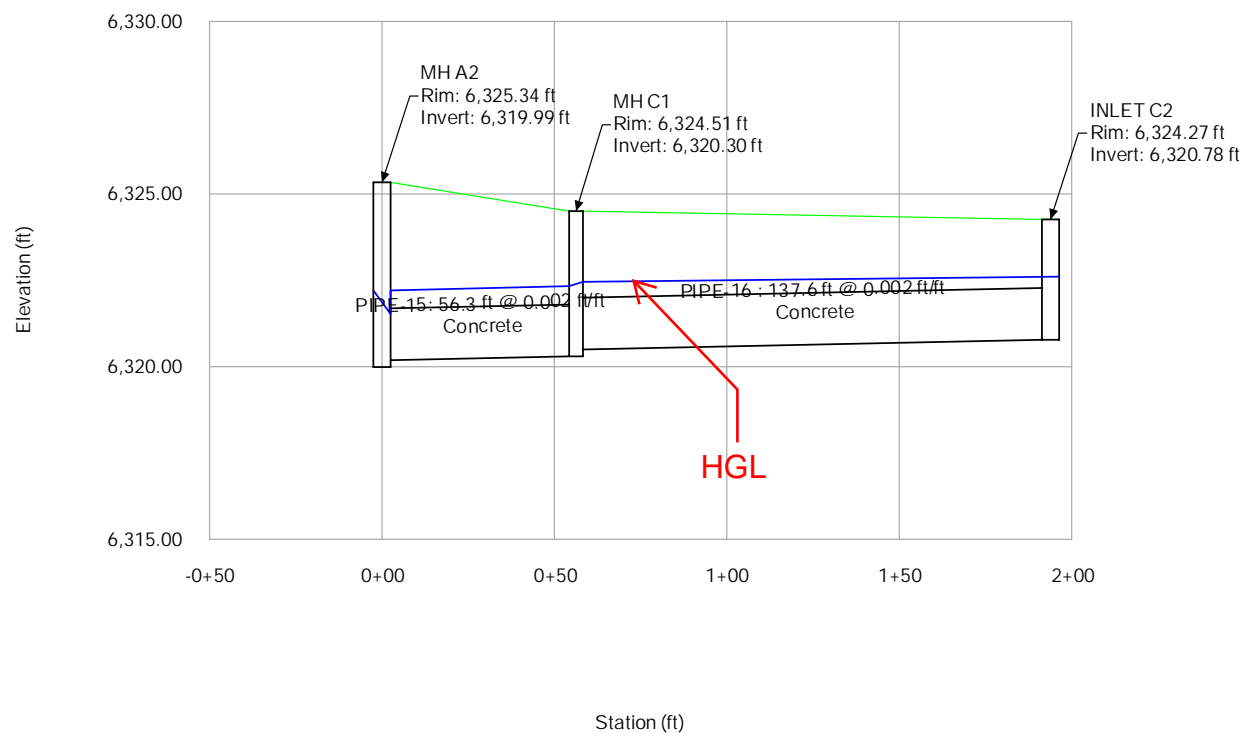
## 100 Year Engineering Profile - STRM LINE A (Meadowbrook Park.stsw)



# Profile Report **100 Year** Engineering Profile - STRM LINE B (Meadowbrook Park.stsw)

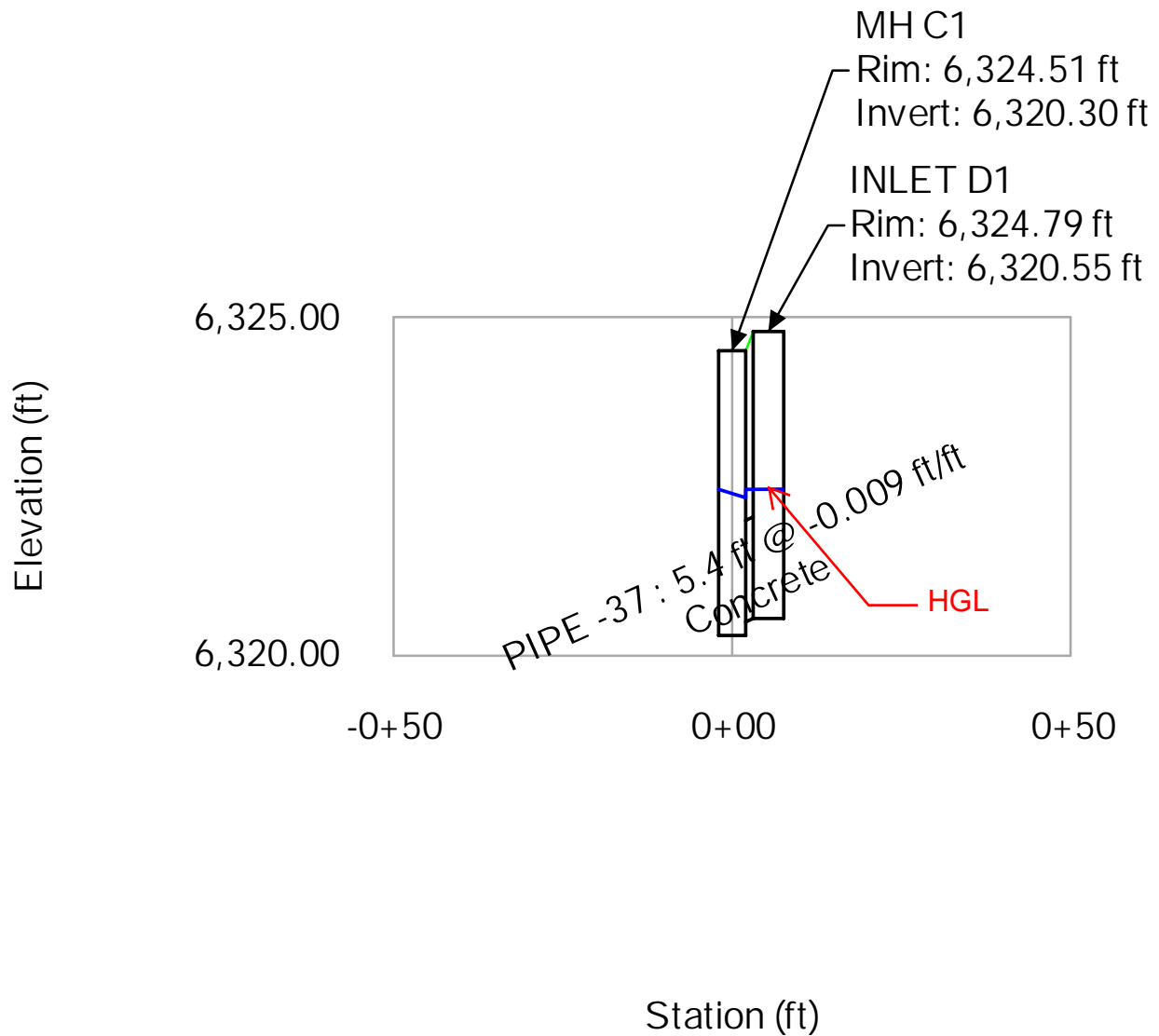


# Profile Report **100 Year** Engineering Profile - STRM LINE C (Meadowbrook Park.stsw)



# Profile Report

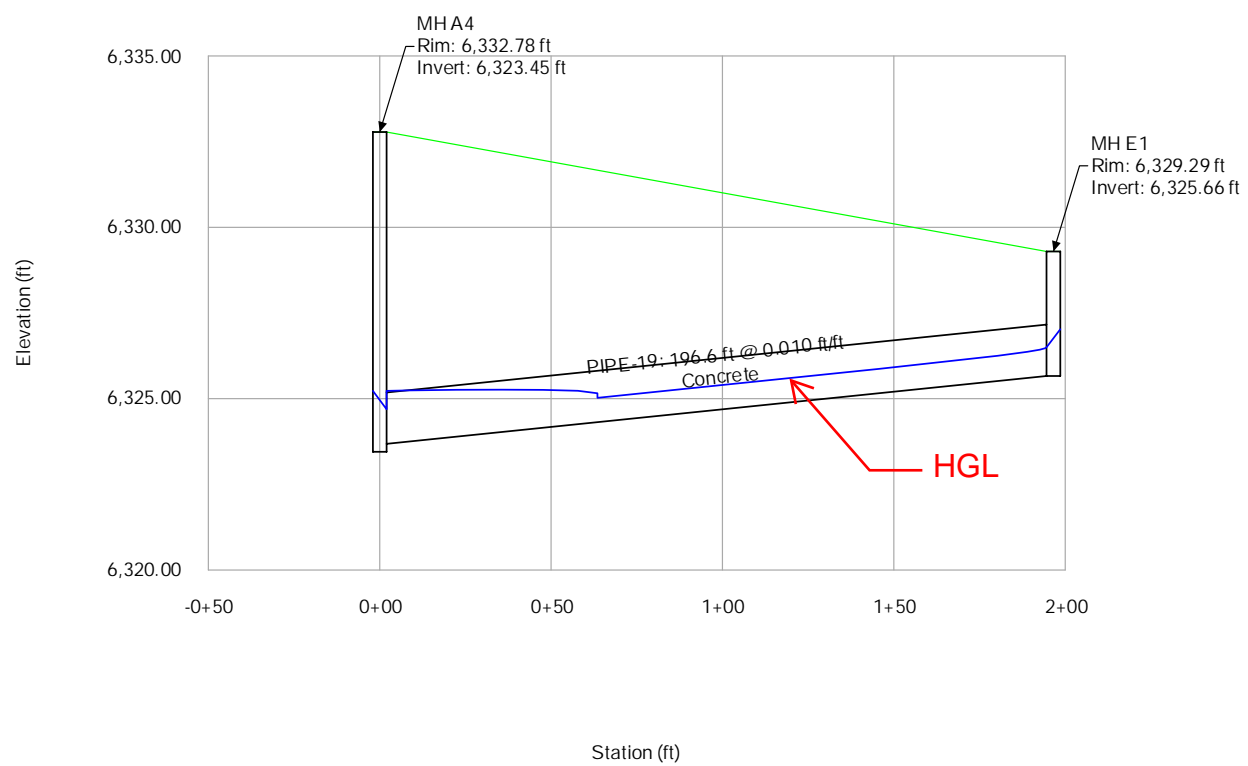
**100 Year** Engineering Profile - STRM LINE D (Meadowbrook Park.stsw)



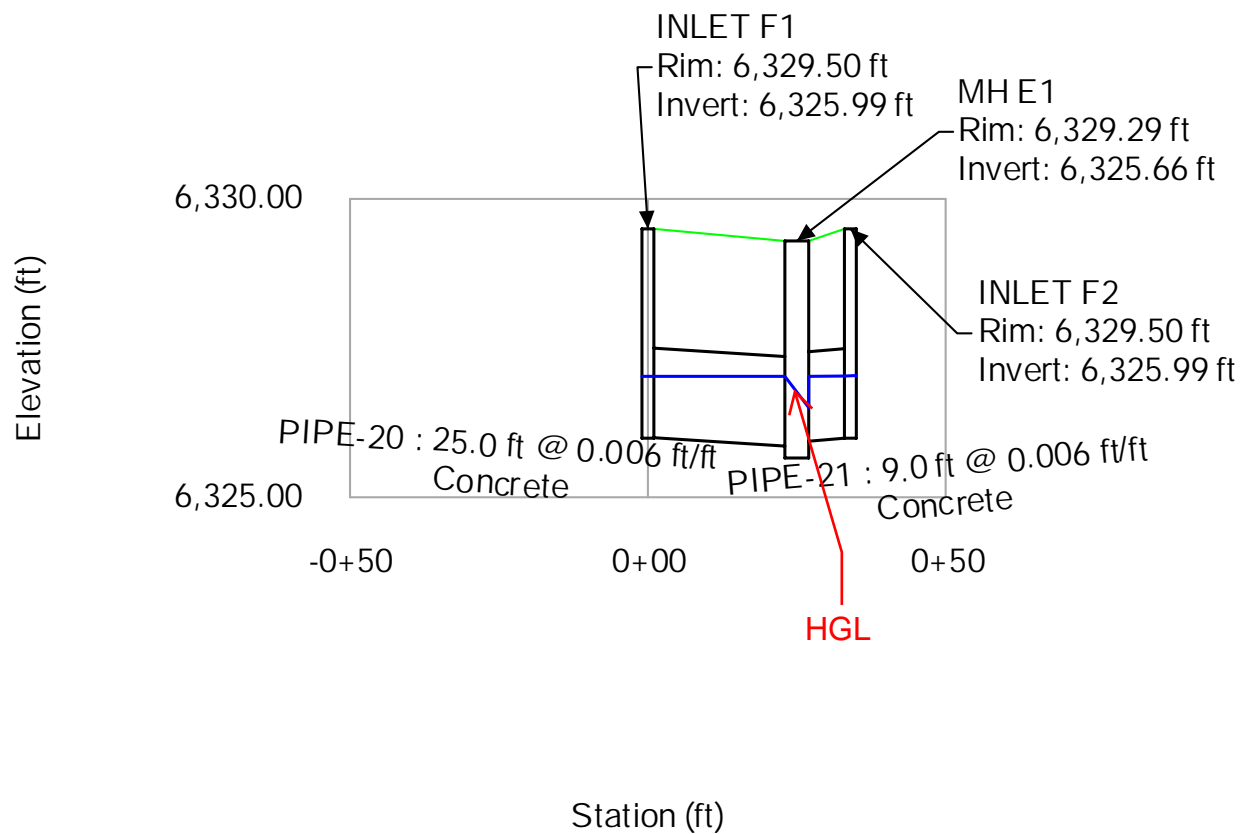


# Profile Report

## 100 Year Engineering Profile - STRM LINE E (Meadowbrook Park.stsw)

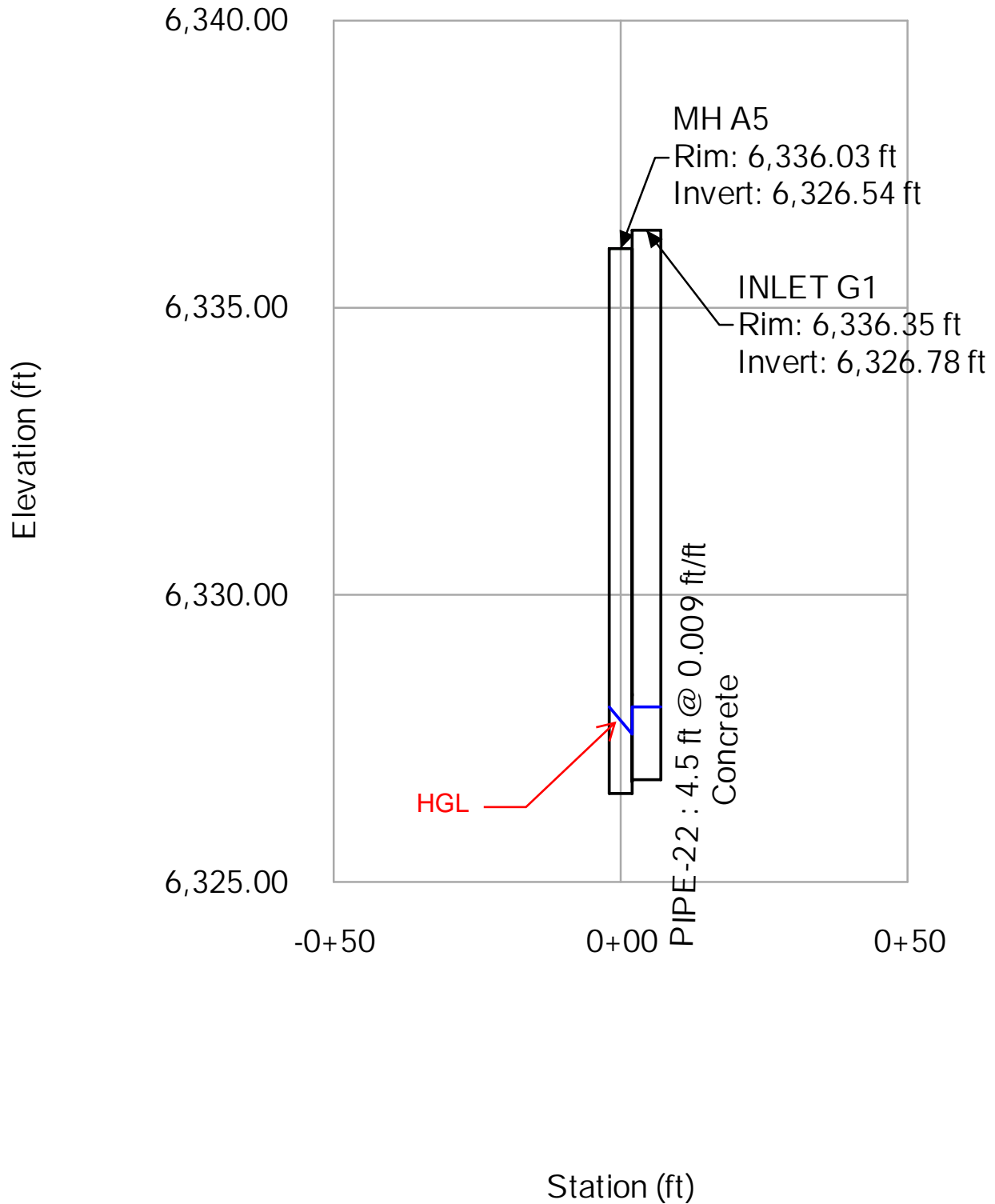


# Profile Report **100 Year** Engineering Profile - STRM LINE F (Meadowbrook Park.stsw)



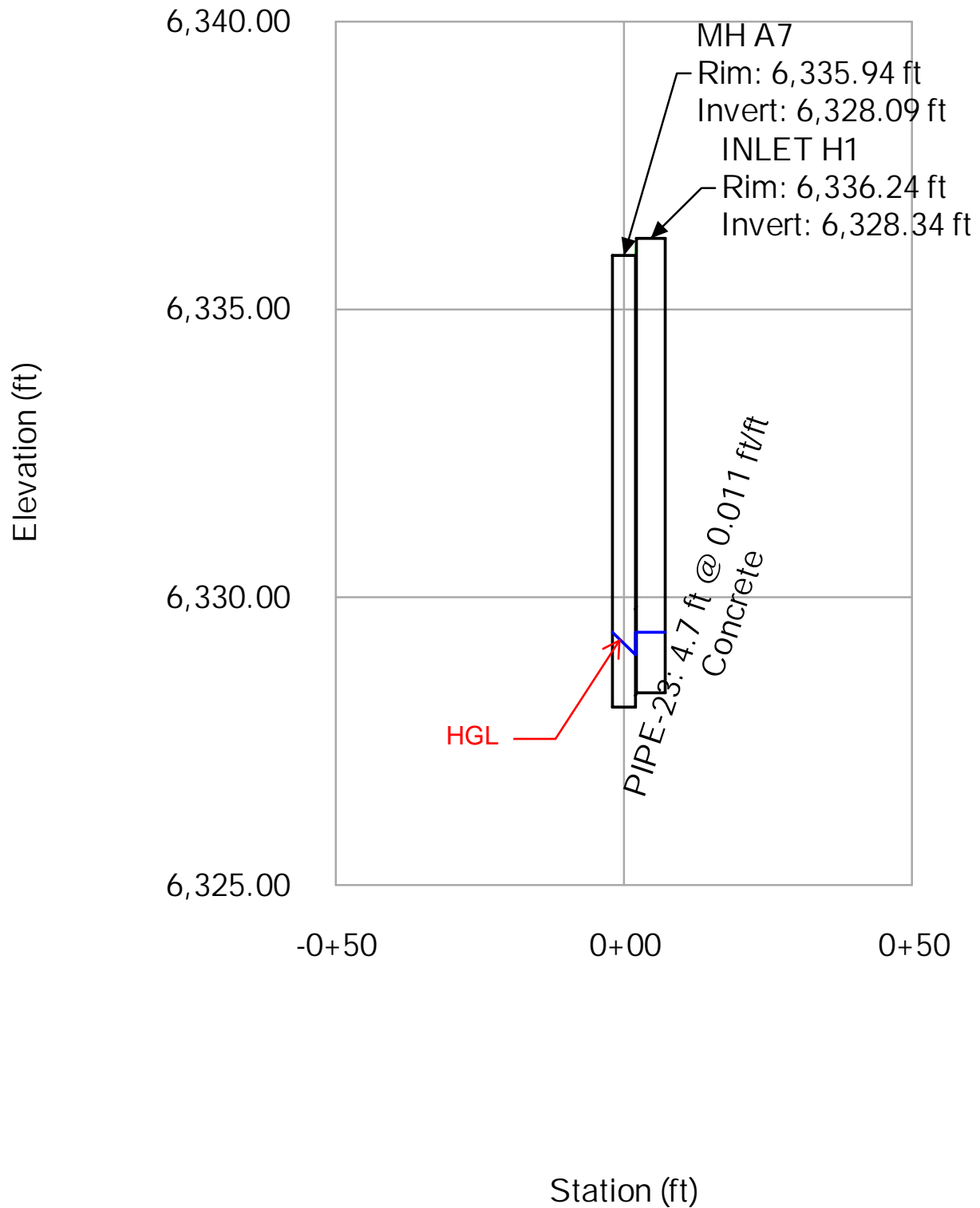
# Profile Report

**100 Year** Engineering Profile - STRM LINE G (Meadowbrook Park.stsw)



# Profile Report

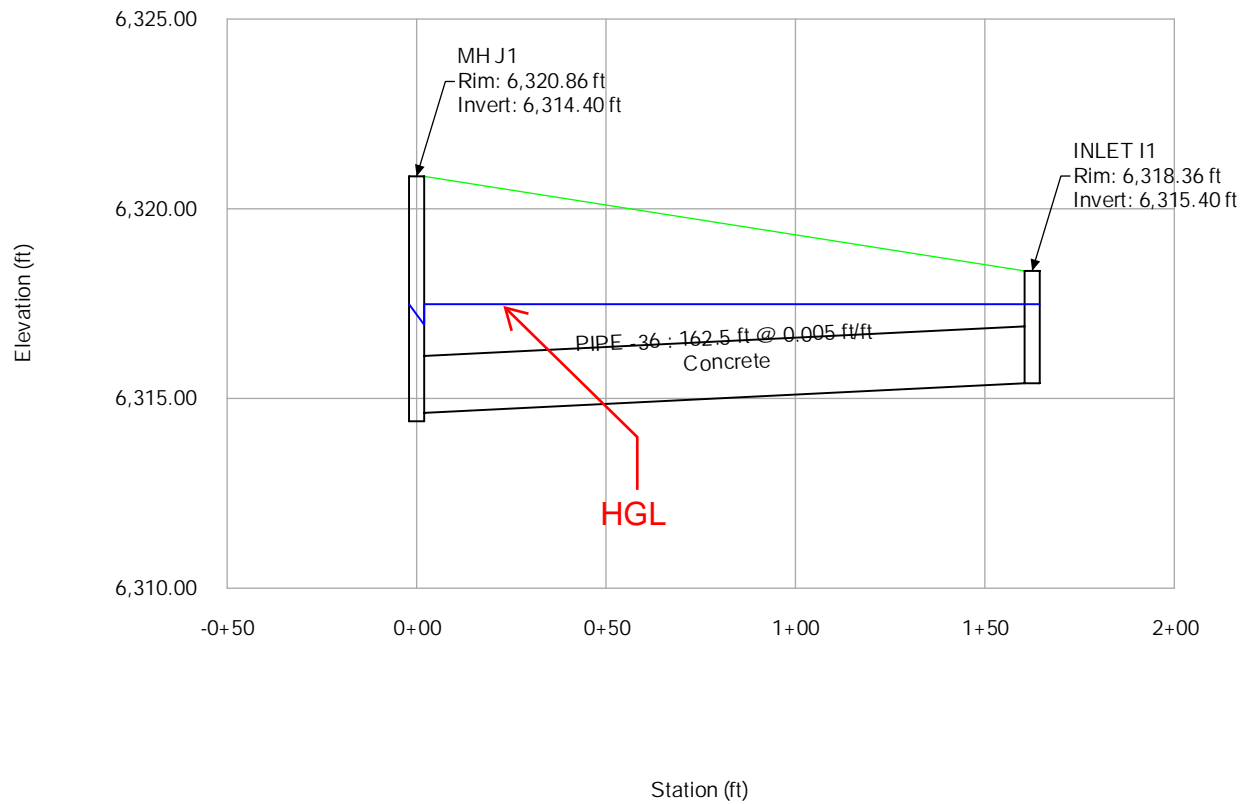
**100 Year** Engineering Profile - STRM LINE H (Meadowbrook Park.stsw)



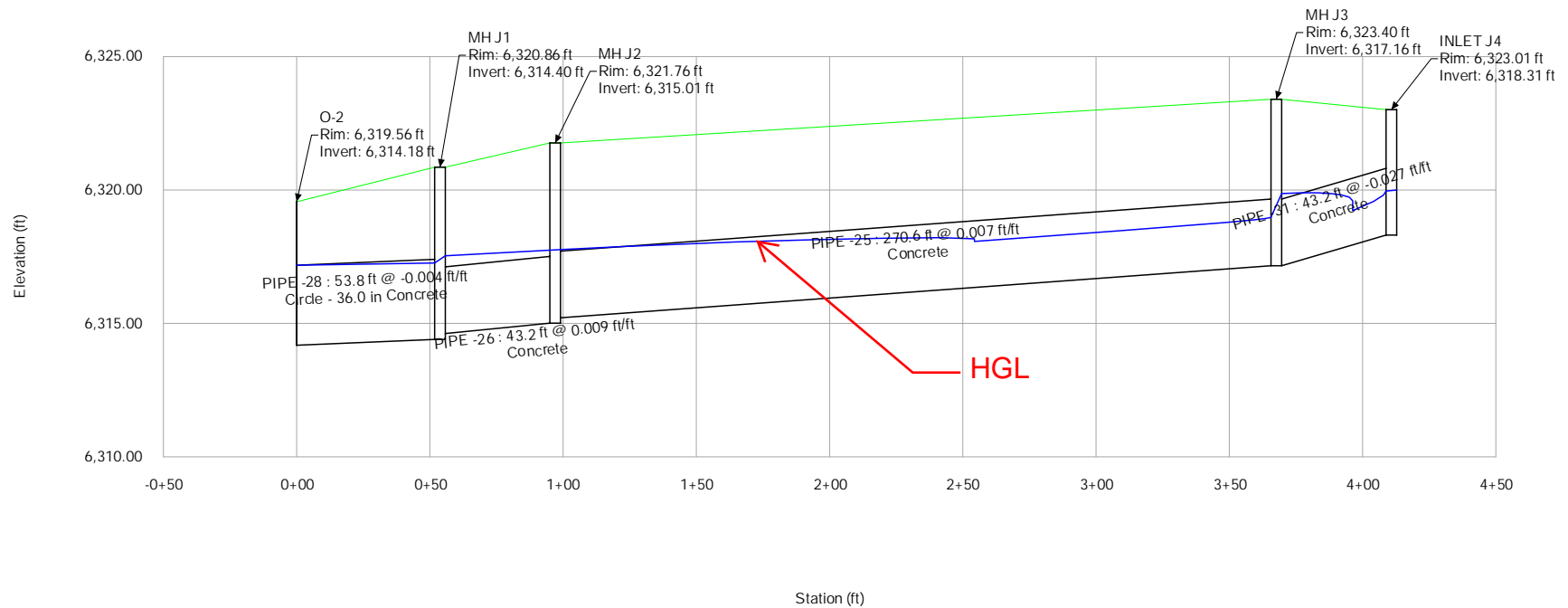


# Profile Report

## 100 Year Engineering Profile - STRM LINE I (Meadowbrook Park.stsw)

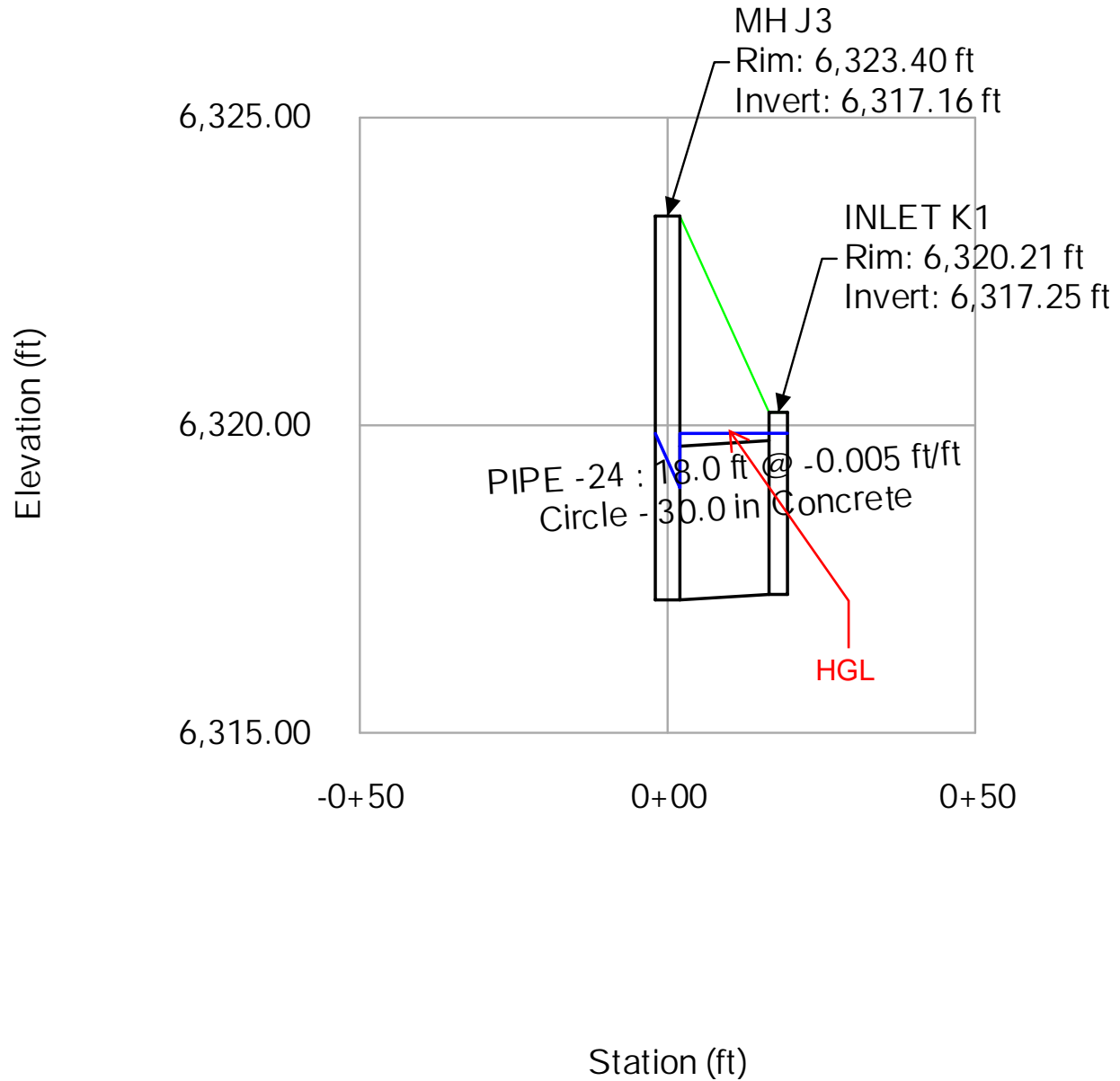


# Profile Report **100 Year** Engineering Profile - STRM LINE J (Meadowbrook Park.stsw)



# Profile Report

**100 Year** Engineering Profile - STRM LINE K (Meadowbrook Park.stsw)



(Inlets not checked in detail)

Version 4.06 Released August 2018

## INLET MANAGEMENT

Worksheet Protected

INLET NAME	Design Point 3	Design Point 4	Design Point 5	Design Point 6	Design Point 7	Design Point 8
Site Type (Urban or Rural)						
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	On Grade	In Sump	On Grade	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

### USER-DEFINED INPUT

#### User-Defined Design Flows

Minor $Q_{known}$ (cfs)	0.8	1.4	1.4	0.4	1.7	1.7
Major $Q_{known}$ (cfs)	1.5	3.4	2.7	0.8	4.0	3.9

#### Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	User-Defined	User-Defined	No Bypass Flow Received	No Bypass Flow Received	User-Defined
Minor Bypass Flow Received, $Q_b$ (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Bypass Flow Received, $Q_b$ (cfs)	0.0	0.1	0.1	0.0	0.0	0.2

#### Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

#### Watershed Profile

Overland Slope (ft/ft)						
Overland Length (ft)						
Channel Slope (ft/ft)						
Channel Length (ft)						

#### Minor Storm Rainfall Input

Design Storm Return Period, $T_r$ (years)						
One-Hour Precipitation, $P_1$ (inches)						

#### Major Storm Rainfall Input

Design Storm Return Period, $T_r$ (years)						
One-Hour Precipitation, $P_1$ (inches)						

### CALCULATED OUTPUT

Minor Total Design Peak Flow, $Q$ (cfs)	0.8	1.4	1.4	0.4	1.7	1.7
Major Total Design Peak Flow, $Q$ (cfs)	1.5	3.5	2.8	0.8	4.0	4.1
Minor Flow Bypassed Downstream, $Q_b$ (cfs)	0.0	N/A	0.0	N/A	N/A	N/A
Major Flow Bypassed Downstream, $Q_b$ (cfs)	0.1	N/A	0.7	N/A	N/A	N/A

#### Minor Storm (Calculated) Analysis of Flow Time

C	N/A	N/A	N/A	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, $V_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, $T_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Regional $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, $I$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_p$	N/A	N/A	N/A	N/A	N/A	N/A

#### Major Storm (Calculated) Analysis of Flow Time

C	N/A	N/A	N/A	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, $V_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, $T_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Regional $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, $I$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_p$	N/A	N/A	N/A	N/A	N/A	N/A

**INLET MANAGEMENT**

Worksheet Protected

INLET NAME	Design Point 9	Design Point 10	Design Point 11
Site Type (Urban or Rural)			RURAL
Inlet Application (Street or Area)	STREET	STREET	AREA
Hydraulic Condition	On Grade	On Grade	Swale
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type D (In Series & Depressed)

**USER-DEFINED INPUT**

<b>User-Defined Design Flows</b>			
Minor $Q_{known}$ (cfs)	0.8	0.8	10.7
Major $Q_{known}$ (cfs)	1.7	1.5	23.5
<b>Bypass (Carry-Over) Flow from Upstream</b>			
Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, $Q_b$ (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, $Q_b$ (cfs)	0.0	0.0	0.0
<b>Watershed Characteristics</b>			
Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			
<b>Watershed Profile</b>			
Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			
<b>Minor Storm Rainfall Input</b>			
Design Storm Return Period, $T_r$ (years)			
One-Hour Precipitation, $P_1$ (inches)			
<b>Major Storm Rainfall Input</b>			
Design Storm Return Period, $T_r$ (years)			
One-Hour Precipitation, $P_1$ (inches)			

**CALCULATED OUTPUT**

<b>Minor Total Design Peak Flow, Q (cfs)</b>	0.8	0.8	10.7
<b>Major Total Design Peak Flow, Q (cfs)</b>	1.7	1.5	23.5
Minor Flow Bypassed Downstream, $Q_b$ (cfs)	0.0	0.0	0.0
Major Flow Bypassed Downstream, $Q_b$ (cfs)	0.2	0.1	0.0
<b>Minor Storm (Calculated) Analysis of Flow T</b>			
C	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A
Overland Flow Velocity, $V_i$	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A
Overland Flow Time, $T_i$	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A
Regional $T_c$	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_p$	N/A	N/A	N/A
<b>Major Storm (Calculated) Analysis of Flow T</b>			
C	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A
Overland Flow Velocity, $V_i$	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A
Overland Flow Time, $T_i$	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A
Regional $T_c$	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_p$	N/A	N/A	N/A



**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Meadowbrook Park

Inlet ID:

Design Point 3

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor &amp; Major Storm

Max. Allowable Depth at Gutter Flowline for Minor &amp; Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

$T_{BACK} = 8.0$  ft  
 $S_{BACK} = 0.018$  ft/ft  
 $n_{BACK} = 0.013$

$H_{CURB} = 6.00$  inches  
 $T_{CROWN} = 22.0$  ft  
 $W = 2.00$  ft  
 $S_x = 0.020$  ft/ft  
 $S_w = 0.083$  ft/ft  
 $S_o = 0.005$  ft/ft  
 $n_{STREET} = 0.016$

	Minor Storm	Major Storm	
$T_{MAX} =$	13.0	22.0	ft
$d_{MAX} =$	6.0	6.0	inches
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	check = yes

MINOR STORM Allowable Capacity is based on Spread Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

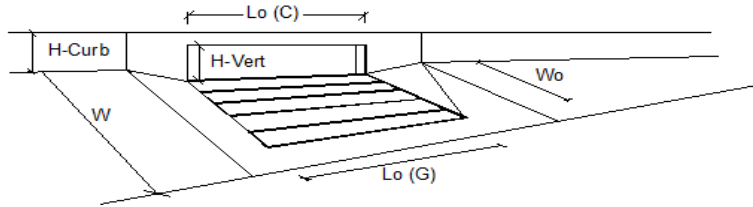
	Minor Storm	Major Storm	
$Q_{allow} =$	4.0	9.7	cfs

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

# INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)	CDOT Type R Curb Opening	MINOR	MAJOR
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening
Local Depression (additional to continuous gutter depression 'a')		$a_{LOCAL} =$	3.0 3.0 inches
Total Number of Units in the Inlet (Grate or Curb Opening)		$N_o =$	1 1
Length of a Single Unit Inlet (Grate or Curb Opening)		$L_o =$	5.00 5.00 ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		$W_o =$	N/A N/A ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_r G =$	N/A N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_r C =$	0.10 0.10
<b>Street Hydraulics: OK - <math>Q &lt; \text{Allowable Street Capacity}</math></b>		MINOR	MAJOR
Total Inlet Interception Capacity		$Q =$	0.8 1.4 cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		$Q_b =$	0.0 0.1 cfs
Capture Percentage = $Q_i/Q_o =$		$C\% =$	100 94 %

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

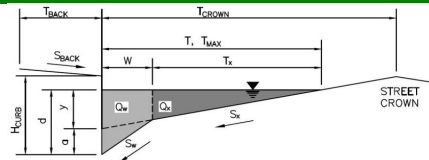
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Meadowbrook Park

Inlet ID:

Design Point 4

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor &amp; Major Storm

Max. Allowable Depth at Gutter Flowline for Minor &amp; Major Storm

Check boxes are not applicable in SUMP conditions

**MINOR STORM** Allowable Capacity is based on Depth Criterion**MAJOR STORM** Allowable Capacity is based on Depth Criterion

$T_{BACK} =$  6.0 ft  
 $S_{BACK} =$  0.018 ft/ft  
 $n_{BACK} =$  0.013

$H_{CURB} =$  6.00 inches  
 $T_{CROWN} =$  22.0 ft  
 $W =$  2.00 ft  
 $S_x =$  0.020 ft/ft  
 $S_w =$  0.083 ft/ft  
 $S_o =$  0.000 ft/ft  
 $n_{STREET} =$  0.016

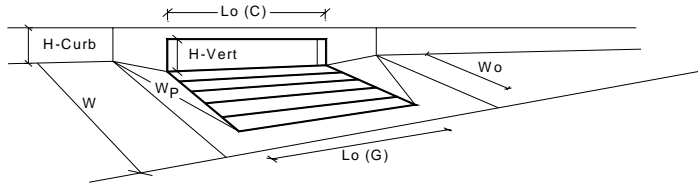
	Minor Storm	Major Storm
$T_{MAX} =$	11.0	22.0
$d_{MAX} =$	6.0	6.0

inches

$Q_{allow} =$  **SUMP** **SUMP** cfs

# INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018

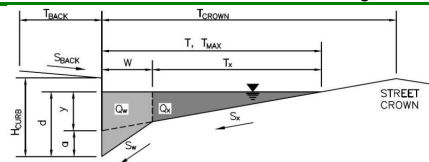


Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a <sub>local</sub> =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	4.2	6.0	inches
<b>Grate Information</b>			MINOR	MAJOR	<input type="checkbox"/> Override Depths
Length of a Unit Grate		L <sub>o</sub> (G) =	N/A	N/A	feet
Width of a Unit Grate		W <sub>o</sub> =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A <sub>ratio</sub> =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C <sub>l</sub> (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C <sub>w</sub> (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C <sub>o</sub> (G) =	N/A	N/A	
<b>Curb Opening Information</b>			MINOR	MAJOR	
Length of a Unit Curb Opening		L <sub>o</sub> (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H <sub>vert</sub> =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H <sub>throat</sub> =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W <sub>p</sub> =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C <sub>l</sub> (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C <sub>w</sub> (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C <sub>o</sub> (C) =	0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>			MINOR	MAJOR	
Depth for Grate Midwidth		d <sub>Grate</sub> =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d <sub>Curb</sub> =	0.18	0.33	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF <sub>Combination</sub> =	0.53	0.77	
Curb Opening Performance Reduction Factor for Long Inlets		RF <sub>Curb</sub> =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF <sub>Grate</sub> =	N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>			MINOR	MAJOR	
		Q <sub>a</sub> =	2.1	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q <sub>PEAK REQUIRED</sub> =	1.4	3.5	cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Meadowbrook Park  
 Inlet ID: Design Point 5

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor &amp; Major Storm

Max. Allowable Depth at Gutter Flowline for Minor &amp; Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

$T_{BACK} = 6.0$  ft  
 $S_{BACK} = 0.018$  ft/ft  
 $n_{BACK} = 0.013$

$H_{CURB} = 6.00$  inches  
 $T_{CROWN} = 22.0$  ft  
 $W = 2.00$  ft  
 $S_x = 0.020$  ft/ft  
 $S_w = 0.083$  ft/ft  
 $S_o = 0.030$  ft/ft  
 $n_{STREET} = 0.016$

	Minor Storm	Major Storm	
$T_{MAX} =$	11.0	22.0	ft
$d_{MAX} =$	6.0	6.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	check = yes

MINOR STORM Allowable Capacity is based on Spread Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	6.7	17.8	cfs

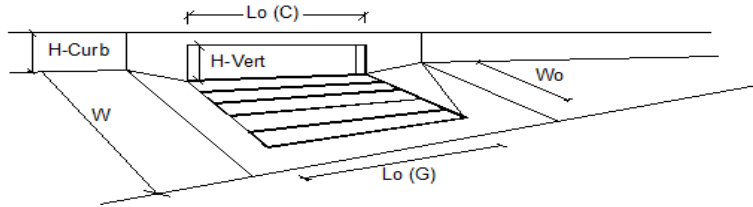
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'



## INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018

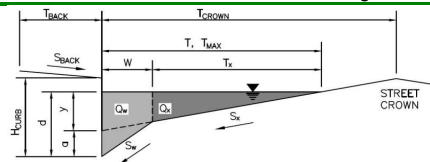


Design Information (Input)	MINOR	MAJOR
Type of Inlet	CDOT Type R Curb Opening	
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>		
Total Inlet Interception Capacity	1.3	2.1
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.7
Capture Percentage = $Q_i/Q_o$ =	97	76

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Meadowbrook Park  
 Inlet ID: Design Point 6

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor &amp; Major Storm

Max. Allowable Depth at Gutter Flowline for Minor &amp; Major Storm

Check boxes are not applicable in SUMP conditions

**MINOR STORM** Allowable Capacity is based on Depth Criterion**MAJOR STORM** Allowable Capacity is based on Depth Criterion

$T_{BACK} =$  6.0 ft  
 $S_{BACK} =$  0.018 ft/ft  
 $n_{BACK} =$  0.013

$H_{CURB} =$  6.00 inches  
 $T_{CROWN} =$  17.0 ft  
 $W =$  2.00 ft  
 $S_x =$  0.020 ft/ft  
 $S_w =$  0.083 ft/ft  
 $S_o =$  0.000 ft/ft  
 $n_{STREET} =$  0.016

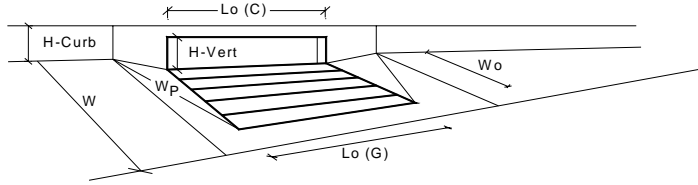
	Minor Storm	Major Storm	
$T_{MAX} =$	17.0	17.0	ft
$d_{MAX} =$	6.0	6.0	inches

☐ ☐

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

# INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a <sub>local</sub> =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	5.6	5.6	inches
<b>Grate Information</b>			MINOR	MAJOR	<input type="checkbox"/> Override Depths
Length of a Unit Grate		L <sub>o</sub> (G) =	N/A	N/A	feet
Width of a Unit Grate		W <sub>o</sub> =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A <sub>ratio</sub> =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C <sub>l</sub> (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C <sub>w</sub> (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C <sub>o</sub> (G) =	N/A	N/A	
<b>Curb Opening Information</b>			MINOR	MAJOR	
Length of a Unit Curb Opening		L <sub>o</sub> (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H <sub>vert</sub> =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H <sub>throat</sub> =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W <sub>p</sub> =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C <sub>l</sub> (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C <sub>w</sub> (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C <sub>o</sub> (C) =	0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>			MINOR	MAJOR	
Depth for Grate Midwidth		d <sub>Grate</sub> =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d <sub>Curb</sub> =	0.30	0.30	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF <sub>Combination</sub> =	0.72	0.72	
Curb Opening Performance Reduction Factor for Long Inlets		RF <sub>Curb</sub> =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF <sub>Grate</sub> =	N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>			MINOR	MAJOR	
		Q <sub>a</sub> =	4.6	4.6	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q <sub>PEAK REQUIRED</sub> =	0.4	0.8	cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

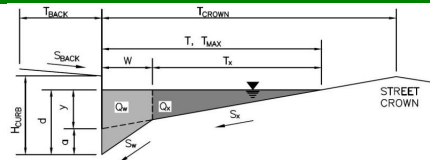
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Meadowbrook Park

Inlet ID:

Design Point 7

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor &amp; Major Storm

Max. Allowable Depth at Gutter Flowline for Minor &amp; Major Storm

Check boxes are not applicable in SUMP conditions

**MINOR STORM** Allowable Capacity is based on Depth Criterion**MAJOR STORM** Allowable Capacity is based on Depth Criterion

$T_{BACK} = 6.0$  ft  
 $S_{BACK} = 0.018$  ft/ft  
 $n_{BACK} = 0.013$

$H_{CURB} = 6.00$  inches  
 $T_{CROWN} = 17.0$  ft  
 $W = 2.00$  ft  
 $S_x = 0.020$  ft/ft  
 $S_w = 0.083$  ft/ft  
 $S_o = 0.000$  ft/ft  
 $n_{STREET} = 0.016$

	Minor Storm	Major Storm
$T_{MAX} =$	17.0	17.0
$d_{MAX} =$	6.0	6.0

inches

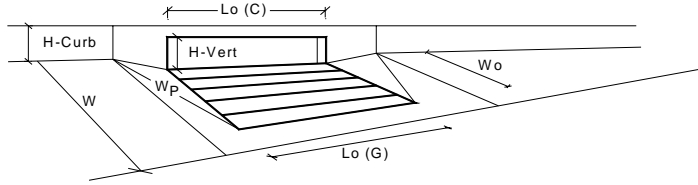
$Q_{allow} =$

	Minor Storm	Major Storm
	SUMP	SUMP

cfs

# INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a <sub>local</sub> =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	5.6	5.6	inches
<b>Grate Information</b>			MINOR	MAJOR	<input type="checkbox"/> Override Depths
Length of a Unit Grate		L <sub>o</sub> (G) =	N/A	N/A	feet
Width of a Unit Grate		W <sub>o</sub> =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A <sub>ratio</sub> =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C <sub>l</sub> (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C <sub>w</sub> (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C <sub>o</sub> (G) =	N/A	N/A	
<b>Curb Opening Information</b>			MINOR	MAJOR	
Length of a Unit Curb Opening		L <sub>o</sub> (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H <sub>vert</sub> =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H <sub>throat</sub> =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W <sub>p</sub> =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C <sub>l</sub> (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C <sub>w</sub> (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C <sub>o</sub> (C) =	0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>			MINOR	MAJOR	
Depth for Grate Midwidth		d <sub>Grate</sub> =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d <sub>Curb</sub> =	0.30	0.30	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF <sub>Combination</sub> =	0.72	0.72	
Curb Opening Performance Reduction Factor for Long Inlets		RF <sub>Curb</sub> =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF <sub>Grate</sub> =	N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>			MINOR	MAJOR	
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q <sub>a</sub> =	4.6	4.6	cfs
		Q <sub>PEAK REQUIRED</sub> =	1.7	4.0	cfs



**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Meadowbrook Park

Inlet ID:

Design Point 8

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor &amp; Major Storm

Max. Allowable Depth at Gutter Flowline for Minor &amp; Major Storm

Check boxes are not applicable in SUMP conditions

**MINOR STORM** Allowable Capacity is based on Depth Criterion**MAJOR STORM** Allowable Capacity is based on Depth Criterion

$T_{BACK} = 8.0$  ft  
 $S_{BACK} = 0.018$  ft/ft  
 $n_{BACK} = 0.013$

$H_{CURB} = 6.00$  inches  
 $T_{CROWN} = 17.0$  ft  
 $W = 2.00$  ft  
 $S_x = 0.020$  ft/ft  
 $S_w = 0.083$  ft/ft  
 $S_o = 0.000$  ft/ft  
 $n_{STREET} = 0.016$

	Minor Storm	Major Storm
$T_{MAX} =$	17.0	17.0
$d_{MAX} =$	6.0	6.0

inches

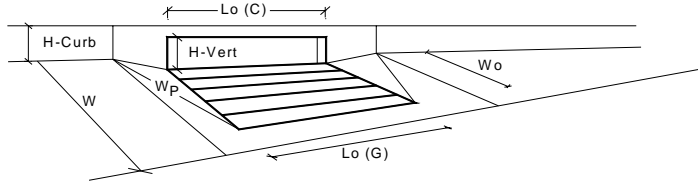
$Q_{allow} =$

Minor Storm	Major Storm
SUMP	SUMP

cfs

# INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR		
Type of Inlet	CDOT Type R Curb Opening	Type =		CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a <sub>local</sub> =		3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =		1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =		5.6	5.6	inches
<b>Grate Information</b>		MINOR		MAJOR		<input type="checkbox"/> Override Depths
Length of a Unit Grate		L <sub>o</sub> (G) =		N/A	N/A	feet
Width of a Unit Grate		W <sub>o</sub> =		N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A <sub>ratio</sub> =		N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C <sub>l</sub> (G) =		N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C <sub>w</sub> (G) =		N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C <sub>o</sub> (G) =		N/A	N/A	
<b>Curb Opening Information</b>		MINOR		MAJOR		
Length of a Unit Curb Opening		L <sub>o</sub> (C) =		5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H <sub>vert</sub> =		6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H <sub>throat</sub> =		6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =		63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W <sub>p</sub> =		2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C <sub>l</sub> (C) =		0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C <sub>w</sub> (C) =		3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C <sub>o</sub> (C) =		0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>		MINOR		MAJOR		
Depth for Grate Midwidth		d <sub>Grate</sub> =		N/A	N/A	ft
Depth for Curb Opening Weir Equation		d <sub>Curb</sub> =		0.30	0.30	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF <sub>Combination</sub> =		0.72	0.72	
Curb Opening Performance Reduction Factor for Long Inlets		RF <sub>Curb</sub> =		1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF <sub>Grate</sub> =		N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>		MINOR		MAJOR		
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q <sub>a</sub> =		4.6	4.6	cfs
		Q <sub>PEAK REQUIRED</sub> =		1.7	4.1	cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Meadowbrook Park

Inlet ID:

Design Point 9

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor &amp; Major Storm

Max. Allowable Depth at Gutter Flowline for Minor &amp; Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

$T_{BACK} = 6.0$  ft  
 $S_{BACK} = 0.018$  ft/ft  
 $n_{BACK} = 0.013$

$H_{CURB} = 6.00$  inches  
 $T_{CROWN} = 22.0$  ft  
 $W = 2.00$  ft  
 $S_x = 0.020$  ft/ft  
 $S_w = 0.083$  ft/ft  
 $S_o = 0.010$  ft/ft  
 $n_{STREET} = 0.016$

	Minor Storm	Major Storm	
$T_{MAX} =$	11.0	22.0	ft
$d_{MAX} =$	6.0	6.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	check = yes

MINOR STORM Allowable Capacity is based on Spread Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

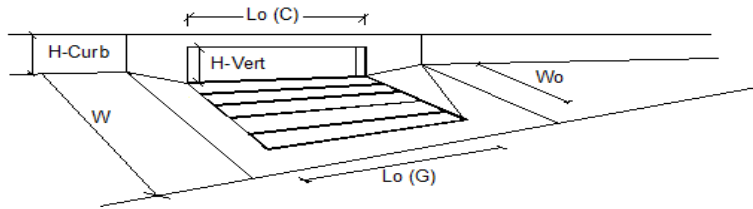
	Minor Storm	Major Storm	
$Q_{allow} =$	3.9	13.8	cfs

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

## INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)	MINOR	MAJOR
Type of Inlet	CDOT Type R Curb Opening	
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0 inches
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00 ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10
<b>Street Hydraulics: OK - <math>Q &lt; \text{Allowable Street Capacity}</math></b>		
Total Inlet Interception Capacity	0.8	1.6 cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.2 cfs
Capture Percentage = $Q_i/Q_o$ =	100	91 %

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

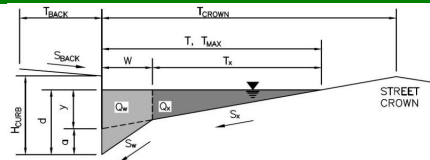
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Meadowbrook Park

Inlet ID:

Design Point 10

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$T_{BACK} = 6.0$  ft  
 $S_{BACK} = 0.018$  ft/ft  
 $n_{BACK} = 0.013$

$H_{CURB} = 6.00$  inches  
 $T_{CROWN} = 11.0$  ft  
 $W = 2.00$  ft  
 $S_x = 0.020$  ft/ft  
 $S_w = 0.083$  ft/ft  
 $S_o = 0.027$  ft/ft  
 $n_{STREET} = 0.016$

Max. Allowable Spread for Minor &amp; Major Storm

Max. Allowable Depth at Gutter Flowline for Minor &amp; Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

	Minor Storm	Major Storm	
$T_{MAX} =$	11.0	11.0	ft
$d_{MAX} =$	6.0	6.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	check = yes

MINOR STORM Allowable Capacity is based on Spread Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	6.3	6.3	cfs

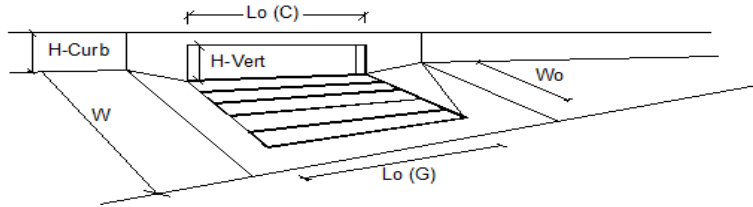
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'



## INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018

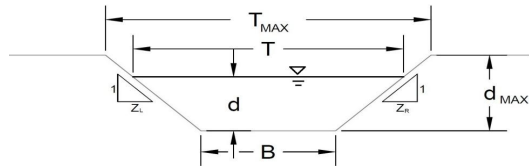


Design Information (Input)	MINOR	MAJOR
Type of Inlet	CDOT Type R Curb Opening	
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10
<b>Street Hydraulics: OK - <math>Q &lt; \text{Allowable Street Capacity}</math></b>		
Total Inlet Interception Capacity	0.7	1.5
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.1
Capture Percentage = $Q_i/Q_o$ =	100	95

## AREA INLET IN A SWALE

Meadowbrook Park

Design Point 11



This worksheet uses the NRCS  
vegetal retardance method to  
determine Manning's n.

For more information see  
Section 7.2.3 of the USDCM.

**Analysis of Trapezoidal Grass-Lined Channel Using SCS Method**

NRCS Vegetal Retardance (A, B, C, D, or E)

Manning's n (Leave cell D16 blank to manually enter an n value)

Channel Invert Slope

Bottom Width

Left Side Slope

Right Side Slope

Check one of the following soil types:

Soil Type:	Max. Velocity ( $V_{MAX}$ )	Max Froude No. ( $F_{MAX}$ )
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

A, B, C, D or E

n =	0.030	
$S_0$ =	0.0340	ft/ft
B =	0.00	ft
Z1 =	4.00	ft/ft
Z2 =	4.00	ft/ft

Choose One:

- ☐ Non-Cohesive  
☒ Cohesive  
☐ Paved

Max. Allowable Top Width of Channel for Minor &amp; Major Storm

Max. Allowable Water Depth in Channel for Minor &amp; Major Storm

	Minor Storm	Major Storm	
$T_{MAX}$ =	20.00	20.00	feet
$d_{MAX}$ =	1.00	1.25	feet

**Allowable Channel Capacity Based On Channel Geometry**

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow}$ =	22.6	41.0	cfs
$d_{allow}$ =	1.00	1.25	ft

**Water Depth in Channel Based On Design Peak Flow**

Design Peak Flow

Water Depth

$Q_c$ =	10.7	23.5	cfs
d =	0.76	1.02	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

# AREA INLET IN A SWALE

Meadowbrook Park

Design Point 11

**Inlet Design Information (Input)**

Type of Inlet

CDOT Type D (In Series &amp; Depressed)

Inlet Type =

CDOT Type D (In Series &amp; Depressed)

Angle of Inclined Grate (must be  $\leq 30$  degrees)

Width of Grate

Length of Grate

Open Area Ratio

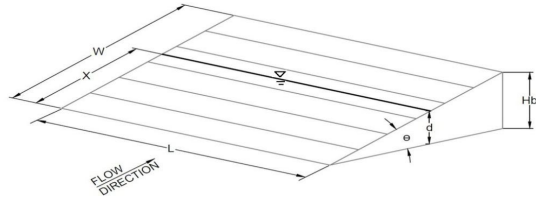
Height of Inclined Grate

Clogging Factor

Grate Discharge Coefficient

Orifice Coefficient

Weir Coefficient

 $\theta =$  0.00 degrees

W = 3.00 feet

L = 6.00 feet

 $A_{\text{RATIO}} =$  0.70 $H_B =$  0.00 feet $C_1 =$  0.38 $C_d =$  0.72 $C_o =$  0.48 $C_w =$  1.53

Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)

	MINOR	MAJOR	
d =	1.76	2.02	
$Q_a =$	39.9	42.8	cfs
Bypassed Flow, $Q_b =$	0.0	0.0	cfs
Capture Percentage = $Q_a/Q_o = C\%$	100	100	%

**Total Inlet Interception Capacity (assumes clogged condition)**

Warning 04: Froude No. exceeds USDCM Volume I recommendation.

***OPINION OF PROBABLE CONSTRUCTION COST***



Kimley-Horn &amp; Associates, Inc.

Opinion of Probable Construction Cost

<b>Client:</b> Meadowbrook Development, LLC	<b>Date:</b> 3/12/2021
<b>Project:</b> Meadowbrook Park	<b>Prepared By:</b> KRK
<b>KHA No.:</b> 096956009	<b>Checked By:</b> EJG

Sheet: 1 of 1

This OPC is not intended for basing financial decisions, or securing funding. Review all notes and assumptions. Since Kimley-Horn & Associates, Inc. has no control over the cost of labor, materials, equipment, or services furnished by others, or over methods of determining price, or over competitive bidding or market conditions, any and all opinions as to the cost herein, including but not limited to opinions as to the costs of construction materials, shall be made on the basis of experience and best available data. Kimley-Horn & Associates, Inc. cannot and does not guarantee that proposals, bids, or actual costs will not vary from the opinions on costs shown herein. The total costs and other numbers in this Opinion of Probable Cost have been rounded.

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
<b>Private Storm Sewer - Non-Reimbursable</b>					
1	18" RCP	1,092	LF	\$65.00	\$70,980
2	24" RCP	254	LF	\$78.00	\$19,812
3	30" RCP	375	LF	\$97.00	\$36,375
4	36" RCP	46	LF	\$120.00	\$960
5	5' Type R Inlet	8	EA	\$5,736.00	\$45,888
6	CDOT Type D Inlet	2	EA	\$5,932.00	\$11,864
7	CDOT Type C Inlet	1	EA	\$4,802.00	\$4,802
8	Modified Type C Inlet	1	EA	\$10,000.00	\$10,000
9	8" Area Drain	2	EA	\$500.00	\$1,000
10	4' Type II Manhole	8	EA	\$6,619.00	\$52,952
11	5' Type II Manhole	4	EA	\$12,034.00	\$48,136
12	Concrete Forebay	2	EA	\$7,500.00	\$15,000
13	Concrete Trickle Channel	330	LF	\$10.00	\$3,300
14	Maintenance Road Material (CDOT Class 6 Base)	36	CY	\$85.00	\$3,060
15	Emergency Overflow (Type L Riprap)	20	Ton	\$83.00	\$1,660
16	Rock Chute (Type L Riprap)	110	Ton	\$83.00	\$9,130
Subtotal:					\$334,919
Contingency (%,+/-) 10%					\$33,492
<b>Project Total:</b>					<b>\$368,411</b>

**Basis for Cost Projection:**

- ☐ No Design Completed  
☐ Preliminary Design  
☒ Final Design

Design Engineer:

John Heiberger

Registered Professional Engineer, State of Colorado No. 50096



***EXISTING AND PROPOSED DRAINAGE MAP***

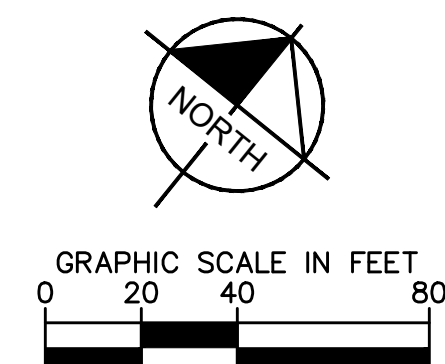
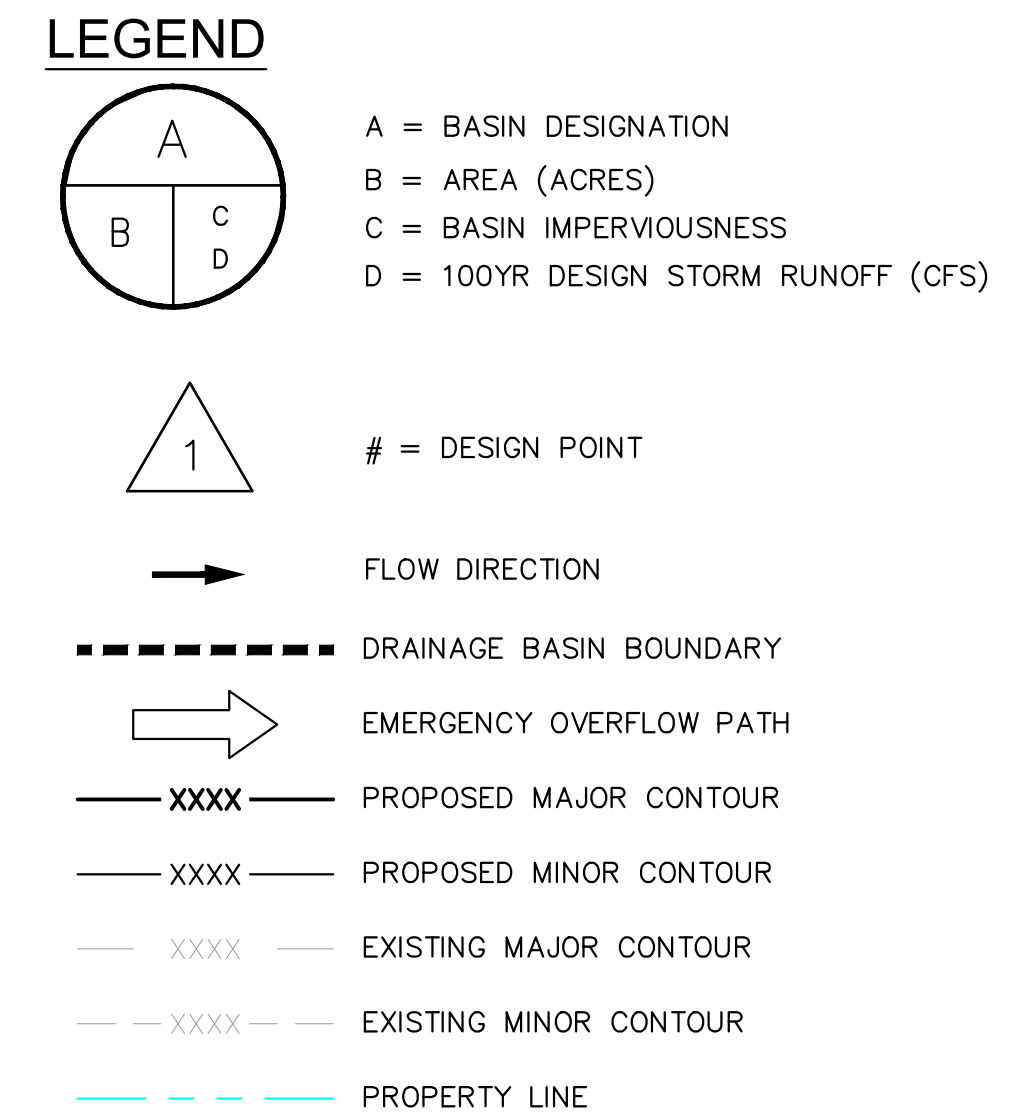
3/13/2021 9:21 PM  
MATCHLINE- SEE EXDR-2



LOT 46A CLAREMONT  
BUSINESS PARK FIL NO 2A

EX. INLET IN  
CDOT MEDIAN-

SUMMARY - EXISTING RUNOFF TABLE						
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE 5-YR RUNOFF (CFS)	CUMULATIVE 100-YR RUNOFF (CFS)
1	EX-A	8.18	2.49	16.70		
2	EX-B	1.34	3.01	6.73		
3	EX-C	3.87	7.71	16.89		
TOTAL		13.40	13.21	40.32		



**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO  
CONSTRUCTION DOCUMENTS  
EXISTING DRAINAGE MAP

**Kimley»»Horn**  
2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/9/2020

**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

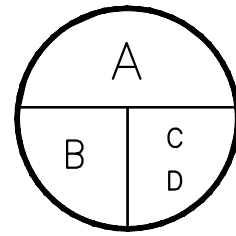
SHEET  
EXDR-1

2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

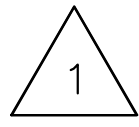


K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\096956009-EXIST DRMP.dwg Kofford, Kevin 3/13/2021 9:20 PM

LEGEND



A = BASIN DESIGNATION  
B = AREA (ACRES)  
C = BASIN IMPERVIOUSNESS  
D = 100YR DESIGN STORM RUNOFF (CFS)



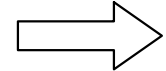
# = DESIGN POINT



FLOW DIRECTION



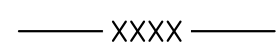
DRAINAGE BASIN BOUNDARY



EMERGENCY OVERFLOW PATH



PROPOSED MAJOR CONTOUR



PROPOSED MINOR CONTOUR



EXISTING MAJOR CONTOUR

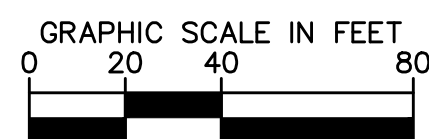
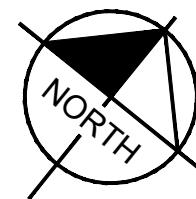
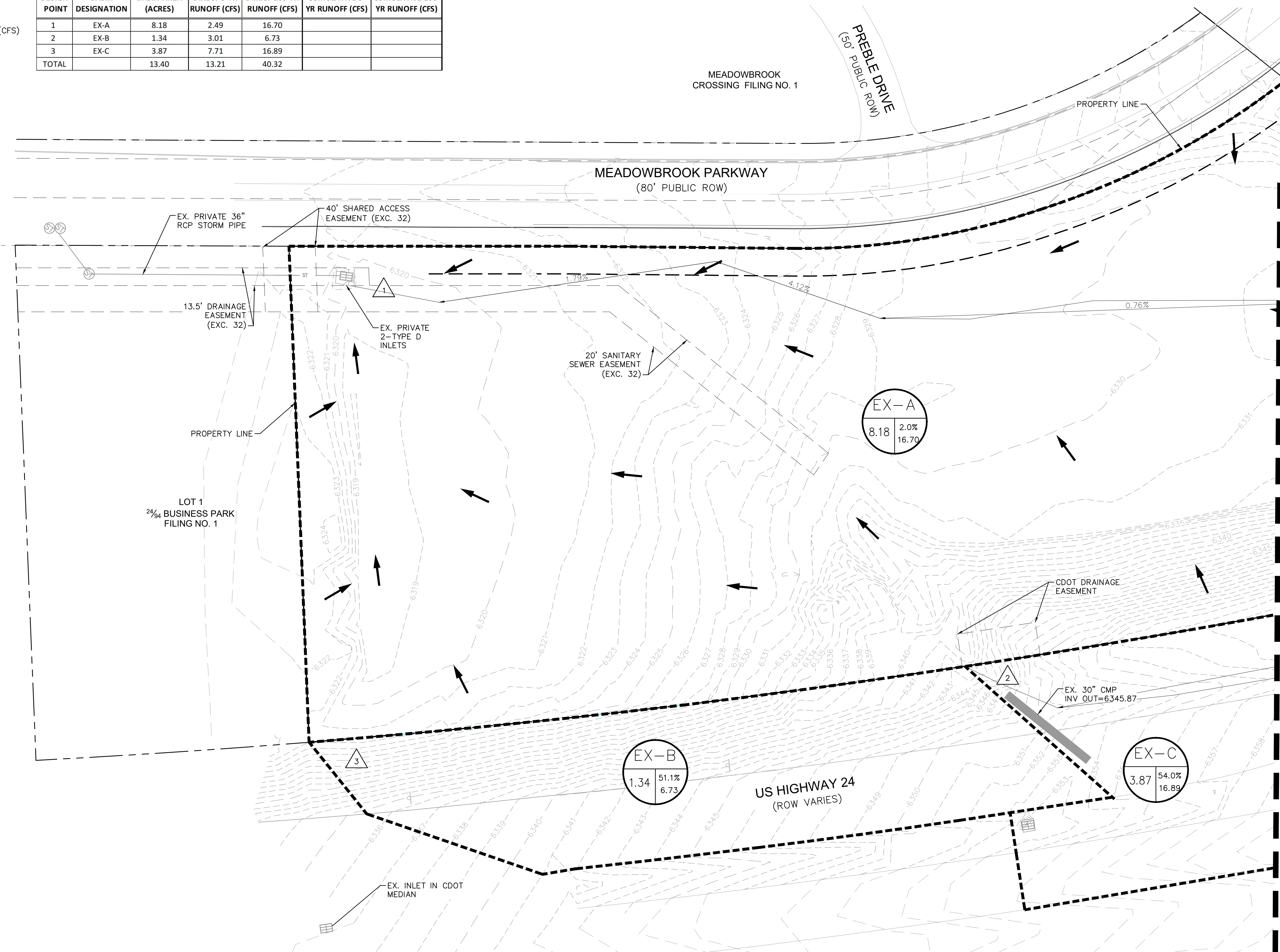


EXISTING MINOR CONTOUR



PROPERTY LINE

SUMMARY - EXISTING RUNOFF TABLE					
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE 5-YR RUNOFF (CFS)
1	EX-A	8.18	2.49	16.70	
2	EX-B	1.34	3.01	6.73	
3	EX-C	3.87	7.71	16.89	
TOTAL		13.40	13.21	40.32	



**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/9/2020

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
CONSTRUCTION DOCUMENTS  
EXISTING DRAINAGE MAP

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET

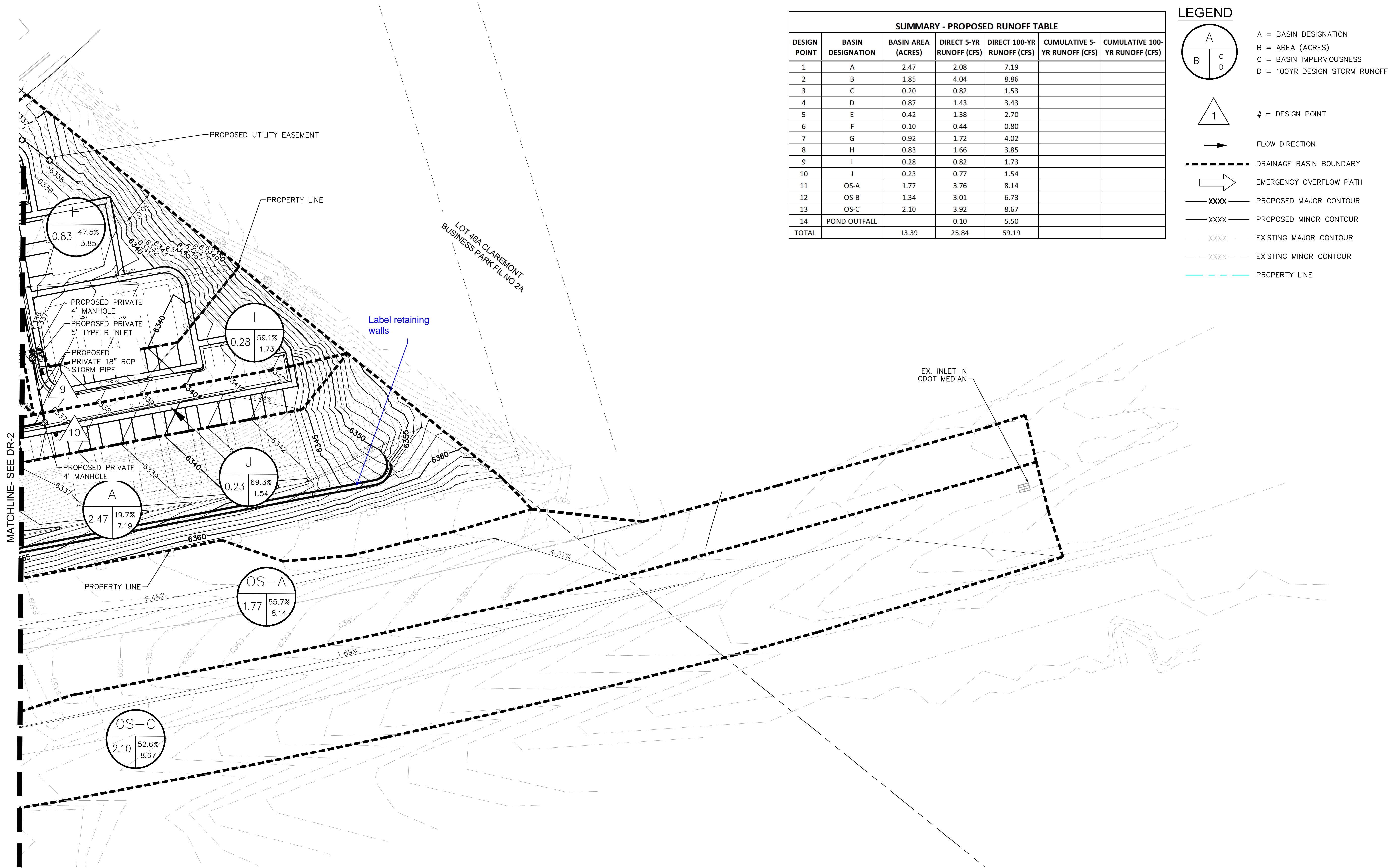
EXDR-2

NO. BY DATE APPR.

REVISION

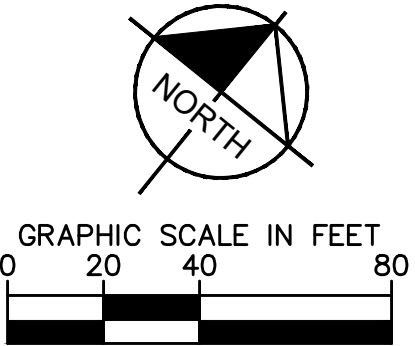


K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\096956009-PROP DRMP.dwg Kofford, Kevin 3/13/2021 9:50 PM



SUMMARY - PROPOSED RUNOFF TABLE					
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE 5-YR RUNOFF (CFS)
1	A	2.47	2.08	7.19	
2	B	1.85	4.04	8.86	
3	C	0.20	0.82	1.53	
4	D	0.87	1.43	3.43	
5	E	0.42	1.38	2.70	
6	F	0.10	0.44	0.80	
7	G	0.92	1.72	4.02	
8	H	0.83	1.66	3.85	
9	I	0.28	0.82	1.73	
10	J	0.23	0.77	1.54	
11	OS-A	1.77	3.76	8.14	
12	OS-B	1.34	3.01	6.73	
13	OS-C	2.10	3.92	8.67	
14	POND OUTFALL		0.10	5.50	
TOTAL		13.39	25.84	59.19	

- LEGEND**
- A = BASIN DESIGNATION
  - B = AREA (ACRES)
  - C = BASIN IMPERVIOUSNESS
  - D = 100YR DESIGN STORM RUNOFF (CFS)
  - # = DESIGN POINT
  - FLOW DIRECTION
  - DRAINAGE BASIN BOUNDARY
  - EMERGENCY OVERFLOW PATH
  - PROPOSED MAJOR CONTOUR
  - PROPOSED MINOR CONTOUR
  - EXISTING MAJOR CONTOUR
  - EXISTING MINOR CONTOUR
  - PROPERTY LINE



DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/9/2020

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
CONSTRUCTION DOCUMENTS  
PROPOSED DRAINAGE MAP

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR CONSTRUCTION  
Kimley»Horn  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009  
SHEET  
DR-1

Kimley»Horn

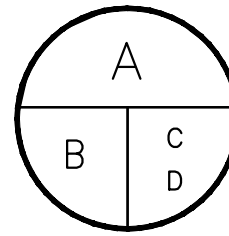
2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

NO. BY DATE APPR.

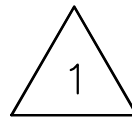


K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\096956009-PROP DRMP.dwg Kofford, Kevin 3/13/2021 9:51 PM

## LEGEND



A = BASIN DESIGNATION  
B = AREA (ACRES)  
C = BASIN IMPERVIOUSNESS  
D = 100YR DESIGN STORM RUNOFF (CFS)



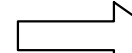
# = DESIGN POINT



FLOW DIRECTION



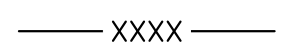
DRAINAGE BASIN BOUNDARY



EMERGENCY OVERFLOW PATH



PROPOSED MAJOR CONTOUR



PROPOSED MINOR CONTOUR



EXISTING MAJOR CONTOUR



EXISTING MINOR CONTOUR



PROPERTY LINE

SUMMARY - PROPOSED RUNOFF TABLE

DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE 5-YR RUNOFF (CFS)	CUMULATIVE 100-YR RUNOFF (CFS)
1	A	2.47	2.08	7.19		
2	B	1.85	4.04	8.86		
3	C	0.20	0.82	1.53		
4	D	0.87	1.43	3.43		
5	E	0.42	1.38	2.70		
6	F	0.10	0.44	0.80		
7	G	0.92	1.72	4.02		
8	H	0.83	1.66	3.85		
9	I	0.28	0.82	1.73		
10	J	0.23	0.77	1.54		
11	OS-A	1.77	3.76	8.14		
12	OS-B	1.34	3.01	6.73		
13	OS-C	2.10	3.92	8.67		
14	POND OUTFALL		0.10	5.50		
TOTAL		13.39	25.84	59.19		

KHA RESPONSE:  
A comparison note has been added to this sheet under the table.

Provide a comparison of released flows to existing flows (13.21 cfs / 40.32 cfs).

KHA RESPONSE:  
The final grading and inlet details will be included upon final plat submittal.

final grading and inlet details will need to be provided at final plat

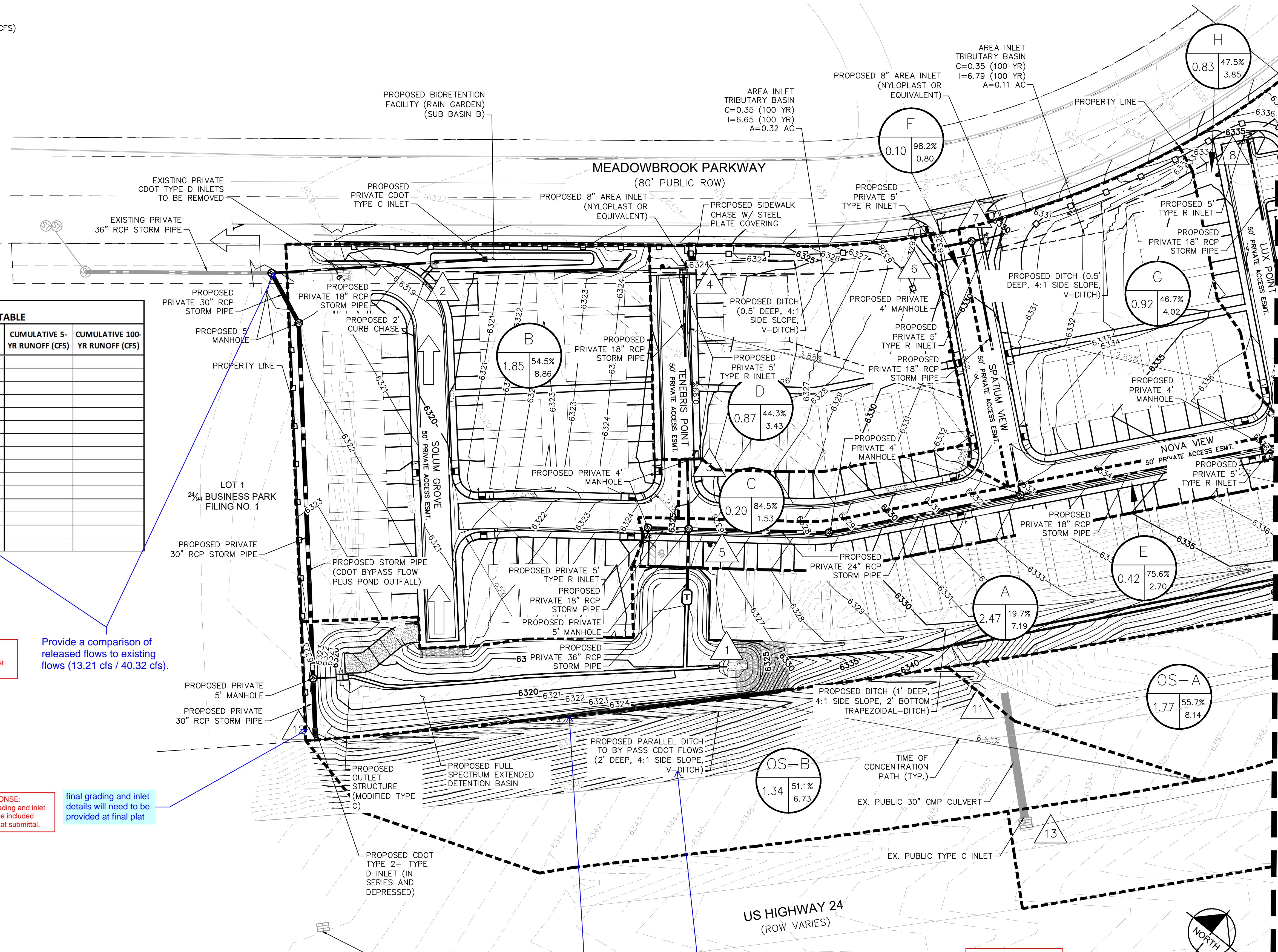
Label retaining walls  
KHA RESPONSE:  
All retaining walls have been labeled on plan.

Provide complete analysis and cross-section showing lining

KHA RESPONSE:  
See appendix for cross section and lining analysis.

KHA RESPONSE:  
The scale has been adjusted to show proper values.  
Provide values

GRAPHIC SCALE IN FEET  
0 10 20 30 40 50 60 70 80 90 100



**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/9/2020

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
CONSTRUCTION DOCUMENTS  
PROPOSED DRAINAGE MAP

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET

DR-2

NO. REVISION BY DATE APPR.



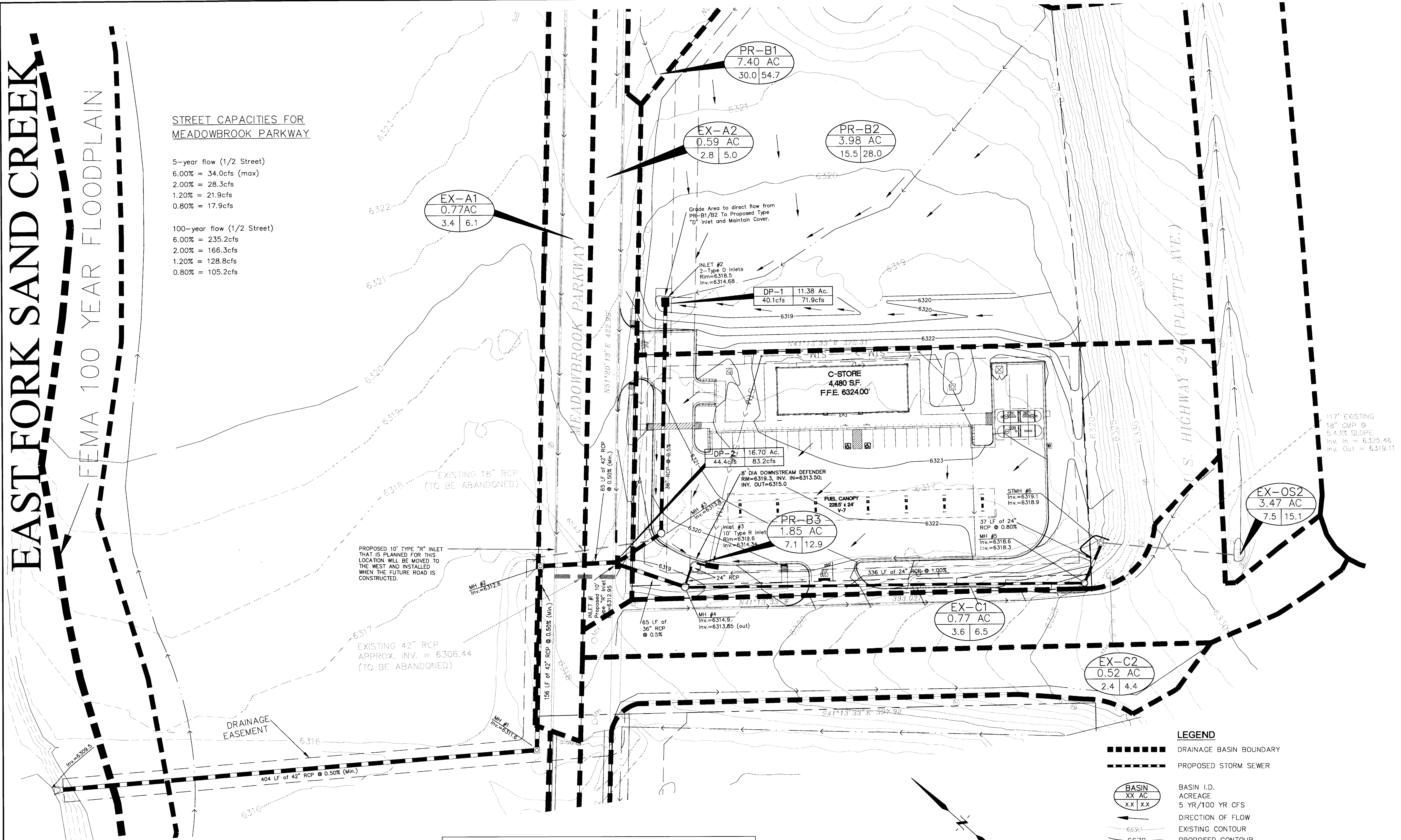
# EASTFORK SAND CREEK

## FEMA 100 YEAR FLOODPLAIN

### STREET CAPACITIES FOR MEADOWBROOK PARKWAY

5-year flow (1/2 Street)  
6.00% = 34.0cfs (max)  
2.00% = 28.3cfs  
1.20% = 21.9cfs  
0.80% = 17.9cfs

100-year flow (1/2 Street)  
6.00% = 235.2cfs  
2.00% = 166.3cfs  
1.20% = 128.8cfs  
0.80% = 105.2cfs



DESIGN POINT SUMMARY TABLE			
DESIGN POINT	RUNOFF 5 YR (cfs)	RUNOFF 100 YR (cfs)	COMMENTS
DP-1	40.1	71.9	FLOW IN PIPE
DP-2	44.4	83.2	FLOW IN PIPE
INLET #3	7.1	12.9	ON-SITE INLET, 24" RCP TO WQ. VAULT
STMH #6	7.5	15.1	FROM BASIN EX-OS2

LEGEND

DRAINAGE BASIN BOUNDARY

PROPOSED STORM SEWER

BASIN  
XX AC  
x.x | x.x

BASIN I.D.  
ACREAGE  
5 YR/100 YR CFS

DIRECTION OF FLOW

EXISTING CONTOUR

PROPOSED CONTOUR

HP

LP

GB

TC

FL

HIGH POINT  
LOW POINT  
GRADE BREAK  
TOP BACK OF CURB  
FLOWLINE  
TIME OF CONCENTRATION

CORE  
ENGINEERING GROUP

15004 1ST AVENUE S.  
BURNSVILLE, MN 55306  
PH: 763-255-1000  
FAX: 763-255-1001  
CONTACT: RICHARD L. SCHINDLER, P.E.  
EMAIL: Rich@cegi.com

DATE

DESCRIPTION

NO.

PROJECT

Circle K Stores, Inc.  
1199 S. BANKERS BUILDING  
COPPELL, TEXAS 75019  
(940) 453-0015  
CONTACT: Tim Peters

PREPARED FOR

Circle K Stores, Inc.  
1199 S. BANKERS BUILDING  
COPPELL, TEXAS 75019  
(940) 453-0015  
CONTACT: Tim Peters

PROJECT

24/94 BUSINESS PARK  
Meadowbrook Parkway & Platte Avenue  
COLORADO SPRINGS, COLORADO

DRAWN: LAB, 9/9/15  
DESIGNED: LAB, 9/9/15  
CHECKED: RLS, 9/10/15

DATE:  
JULY, 2016

PROJECT NO.  
319.001

SHEET NUMBER  
1

TOTAL SHEETS: 2

There will be one Temporary SB and permanent BMP is removed to be with Final Plat

2021 Financial Assurance Estimate Form  
(with pre-plat construction)

Permanent BMPs will be with the final plat.  
Include as many TSBs as appropriate.

Updated: 11/16/2020

PROJECT INFORMATION							
Meadowbrook Park	4/14/2021		PUDSP208				
Project Name	Date		PCD File No.				
Description	Quantity	Units	Unit Cost			Total	(with Pre-Plat Construction) % Complete Remaining
<b>SECTION 1 - GRADING AND EROSION CONTROL (Construction and Permanent BMPs)</b>							
* Earthwork							
less than 1,000; \$5,300 min		CY	\$ 8.00	=	\$	-	\$ -
1,000-5,000; \$8,000 min		CY	\$ 6.00	=	\$	-	\$ -
5,001-20,000; \$30,000 min		CY	\$ 5.00	=	\$	-	\$ -
20,001-50,000; \$100,000 min	43,656	CY	\$ 3.50	=	\$	152,796.00	\$ 152,796.00
50,001-200,000; \$175,000 min		CY	\$ 2.50	=	\$	-	\$ -
greater than 200,000; \$500,000 min		CY	\$ 2.00	=	\$	-	\$ -
* Permanent Seeding (inc. noxious weed mgmnt.)	4	AC	\$ 828.00	=	\$	3,312.00	\$ 3,312.00
* Mulching	4	AC	\$ 777.00	=	\$	3,108.00	\$ 3,108.00
* Permanent Erosion Control Blanket	0	SY	\$ 6.20	=	\$	-	\$ -
* Permanent Pond/BMP Construction	1	CY	\$ 21.00	=	\$	21.00	\$ 21.00
* Permanent Pond/BMP (provide engineer's estimate)	1	EA		=	\$	-	\$ -
		EA		=	\$	-	\$ -
Safety Fence	2,837	LF	\$ 3.10	=	\$	8,794.70	\$ 8,794.70
Temporary Erosion Control Blanket	6,434	SY	\$ 3.10	=	\$	19,945.40	\$ 19,945.40
Vehicle Tracking Control	2	EA	\$ 2,453.00	=	\$	4,906.00	\$ 4,906.00
Silt Fence	0	LF	\$ 2.60	=	\$	-	\$ -
Temporary Seeding	4	AC	\$ 650.00	=	\$	2,600.00	\$ 2,600.00
Temporary Mulch	4	AC	\$ 777.00	=	\$	3,108.00	\$ 3,108.00
Erosion Bales	0	EA	\$ 26.00	=	\$	-	\$ -
Erosion Logs/Straw Waddle	0	LF	\$ 5.20	=	\$	-	\$ -
Rock Check Dams	33	EA	\$ 518.00	=	\$	17,094.00	\$ 17,094.00
Inlet Protection	9	EA	\$ 173.00	=	\$	1,557.00	\$ 1,557.00
Sediment Basin	1	EA	\$ 1,824.00	=	\$	1,824.00	\$ 1,824.00
Concrete Washout Basin	1	EA	\$ 932.00	=	\$	932.00	\$ 932.00
[insert items not listed but part of construction plans]				=	\$	-	\$ -
<b>MAINTENANCE (35% of Construction BMPs)</b>						18,188.24	\$ 18,188.24
<b>Section 1 Subtotal</b>						<b>\$ 238,186.34</b>	<b>\$ 238,186.34</b>
<b>SECTION 2 - PUBLIC IMPROVEMENTS *</b>							
<b>ROADWAY IMPROVEMENTS</b>							
Construction Traffic Control		LS		=	\$	-	\$ -
Aggregate Base Course (135 lbs/cf)		Tons	\$ 29.00	=	\$	-	\$ -
Aggregate Base Course (135 lbs/cf)		CY	\$ 52.00	=	\$	-	\$ -
Asphalt Pavement (3" thick)		SY	\$ 14.50	=	\$	-	\$ -
Asphalt Pavement (4" thick)		SY	\$ 20.00	=	\$	-	\$ -
Asphalt Pavement (6" thick)		SY	\$ 30.00	=	\$	-	\$ -
Asphalt Pavement (147 lbs/cf) _" thick		Tons	\$ 91.00	=	\$	-	\$ -
Raised Median, Paved		SF	\$ 8.30	=	\$	-	\$ -
Regulatory Sign/Advisory Sign		EA	\$ 311.00	=	\$	-	\$ -
Guide/Street Name Sign		EA		=	\$	-	\$ -
Epoxy Pavement Marking		SF	\$ 14.00	=	\$	-	\$ -
Thermoplastic Pavement Marking		SF	\$ 24.00	=	\$	-	\$ -
Barricade - Type 3		EA	\$ 207.00	=	\$	-	\$ -
Delineator - Type I		EA	\$ 25.00	=	\$	-	\$ -
Curb and Gutter, Type A (6" Vertical)		LF	\$ 30.00	=	\$	-	\$ -
Curb and Gutter, Type B (Median)		LF	\$ 30.00	=	\$	-	\$ -
Curb and Gutter, Type C (Ramp)		LF	\$ 30.00	=	\$	-	\$ -
4" Sidewalk (common areas only)		SY	\$ 50.00	=	\$	-	\$ -
5" Sidewalk		SY	\$ 62.00	=	\$	-	\$ -
6" Sidewalk		SY	\$ 75.00	=	\$	-	\$ -
8" Sidewalk		SY	\$ 99.00	=	\$	-	\$ -
Pedestrian Ramp		EA	\$ 1,190.00	=	\$	-	\$ -
Cross Pan, local (8" thick, 6' wide to include return)		LF	\$ 63.00	=	\$	-	\$ -
Cross Pan, collector (9" thick, 8' wide to include return)		LF	\$ 95.00	=	\$	-	\$ -
Curb Chase		EA	\$ 1,532.00	=	\$	-	\$ -
Guardrail Type 3 (W-Beam)		LF	\$ 51.00	=	\$	-	\$ -
Guardrail Type 7 (Concrete)		LF	\$ 75.00	=	\$	-	\$ -
Guardrail End Anchorage		EA	\$ 2,172.00	=	\$	-	\$ -
Guardrail Impact Attenuator		EA	\$ 3,899.00	=	\$	-	\$ -
Sound Barrier Fence (CMU block, 6' high)		LF	\$ 81.00	=	\$	-	\$ -
Sound Barrier Fence (panels, 6' high)		LF	\$ 83.00	=	\$	-	\$ -
Electrical Conduit, Size =		LF	\$ 17.00	=	\$	-	\$ -
Traffic Signal, complete intersection		EA	\$ 439,875	=	\$	-	\$ -

PROJECT INFORMATION							
Meadowbrook Park	4/14/2021			PUDSP208			
Project Name	Date			PCD File No.			
Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining
[insert items not listed but part of construction plans]				=	\$ -		\$ -
				=	\$ -		\$ -
<b>STORM DRAIN IMPROVEMENTS</b>							
Concrete Box Culvert (M Standard), Size ( W x H )		LF		=	\$ -		\$ -
18" Reinforced Concrete Pipe		LF	\$ 65.00	=	\$ -		\$ -
24" Reinforced Concrete Pipe		LF	\$ 78.00	=	\$ -		\$ -
30" Reinforced Concrete Pipe		LF	\$ 97.00	=	\$ -		\$ -
36" Reinforced Concrete Pipe		LF	\$ 120.00	=	\$ -		\$ -
42" Reinforced Concrete Pipe		LF	\$ 160.00	=	\$ -		\$ -
48" Reinforced Concrete Pipe		LF	\$ 195.00	=	\$ -		\$ -
54" Reinforced Concrete Pipe		LF	\$ 254.00	=	\$ -		\$ -
60" Reinforced Concrete Pipe		LF	\$ 298.00	=	\$ -		\$ -
66" Reinforced Concrete Pipe		LF	\$ 344.00	=	\$ -		\$ -
72" Reinforced Concrete Pipe		LF	\$ 393.00	=	\$ -		\$ -
18" Corrugated Steel Pipe		LF	\$ 84.00	=	\$ -		\$ -
24" Corrugated Steel Pipe		LF	\$ 96.00	=	\$ -		\$ -
30" Corrugated Steel Pipe		LF	\$ 122.00	=	\$ -		\$ -
36" Corrugated Steel Pipe		LF	\$ 147.00	=	\$ -		\$ -
42" Corrugated Steel Pipe		LF	\$ 168.00	=	\$ -		\$ -
48" Corrugated Steel Pipe		LF	\$ 178.00	=	\$ -		\$ -
54" Corrugated Steel Pipe		LF	\$ 260.00	=	\$ -		\$ -
60" Corrugated Steel Pipe		LF	\$ 280.00	=	\$ -		\$ -
66" Corrugated Steel Pipe		LF	\$ 340.00	=	\$ -		\$ -
72" Corrugated Steel Pipe		LF	\$ 400.00	=	\$ -		\$ -
78" Corrugated Steel Pipe		LF	\$ 460.00	=	\$ -		\$ -
84" Corrugated Steel Pipe		LF	\$ 550.00	=	\$ -		\$ -
Flared End Section (FES) RCP Size = (unit cost = 6x pipe unit cost)		EA		=	\$ -		\$ -
Flared End Section (FES) CSP Size = (unit cost = 6x pipe unit cost)		EA		=	\$ -		\$ -
End Treatment- Headwall		EA		=	\$ -		\$ -
End Treatment- Wingwall		EA		=	\$ -		\$ -
End Treatment - Cutoff Wall		EA		=	\$ -		\$ -
Curb Inlet (Type R) L=5', Depth < 5'		EA	\$ 5,736.00	=	\$ -		\$ -
Curb Inlet (Type R) L=5', 5' ≤ Depth < 10'		EA	\$ 7,440.00	=	\$ -		\$ -
Curb Inlet (Type R) L =5', 10' ≤ Depth < 15'		EA	\$ 8,637.00	=	\$ -		\$ -
Curb Inlet (Type R) L =10', Depth < 5'		EA	\$ 7,894.00	=	\$ -		\$ -
Curb Inlet (Type R) L =10', 5' ≤ Depth < 10'		EA	\$ 8,136.00	=	\$ -		\$ -
Curb Inlet (Type R) L =10', 10' ≤ Depth < 15'		EA	\$ 10,185.00	=	\$ -		\$ -
Curb Inlet (Type R) L =15', Depth < 5'		EA	\$ 10,265.00	=	\$ -		\$ -
Curb Inlet (Type R) L =15', 5' ≤ Depth < 10'		EA	\$ 11,005.00	=	\$ -		\$ -
Curb Inlet (Type R) L =15', 10' ≤ Depth < 15'		EA	\$ 12,034.00	=	\$ -		\$ -
Curb Inlet (Type R) L =20', Depth < 5'		EA	\$ 10,940.00	=	\$ -		\$ -
Curb Inlet (Type R) L =20', 5' ≤ Depth < 10'		EA	\$ 12,075.00	=	\$ -		\$ -
Grated Inlet (Type C), Depth < 5'		EA	\$ 4,802.00	=	\$ -		\$ -
Grated Inlet (Type D), Depth < 5'		EA	\$ 5,932.00	=	\$ -		\$ -
Storm Sewer Manhole, Box Base		EA	\$ 12,034.00	=	\$ -		\$ -
Storm Sewer Manhole, Slab Base		EA	\$ 6,619.00	=	\$ -		\$ -
Geotextile (Erosion Control)		SY	\$ 6.20	=	\$ -		\$ -
Rip Rap, d50 size from 6" to 24"		Tons	\$ 83.00	=	\$ -		\$ -
Rip Rap, Grouted		Tons	\$ 98.00	=	\$ -		\$ -
Drainage Channel Construction, Size ( W x H )		LF		=	\$ -		\$ -
Drainage Channel Lining, Concrete		CY	\$ 590.00	=	\$ -		\$ -
Drainage Channel Lining, Rip Rap		CY	\$ 116.00	=	\$ -		\$ -
Drainage Channel Lining, Grass		AC	\$ 1,520.00	=	\$ -		\$ -
Drainage Channel Lining, Other Stabilization				=	\$ -		\$ -
				=	\$ -		\$ -
[insert items not listed but part of construction plans]				=	\$ -		\$ -
Section 2 Subtotal				=	\$ -		\$ -

\* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)

Delete roadway improvements for EGP. Roads can't be constructed with early grading. Roadway improvements deleted.

PROJECT INFORMATION									
Meadowbrook Park				4/14/2021			PUDSP208		
Project Name				Date			PCD File No.		
Description	Quantity	Units	Unit Cost			Total	(with Pre-Plat Construction)		
							% Complete	Remaining	
<b>SECTION 3 - COMMON DEVELOPMENT IMPROVEMENTS (Private or District and NOT Maintained by EPC) **</b>									
<b>ROADWAY IMPROVEMENTS</b>									
Aggregate Base Course (135 lbs/cf)	747	CY	\$ 50.00	=	\$	37,350.00		\$	37,350.00
Asphalt Pavement (4" thick)	4,481	SY	\$ 19.00	=	\$	85,139.00		\$	85,139.00
Regulatory Sign/Advisory Sign	32	EA	\$ 300.00	=	\$	9,600.00		\$	9,600.00
Guide/Street Name Sign	8	EA	\$ 200.00	=	\$	1,600.00		\$	1,600.00
Curb and Gutter, Type A (6" Vertical)	1,916	LF	\$ 30.00	=	\$	57,480.00		\$	57,480.00
Curb and Gutter, Type C (Ramp)	1,908	LF	\$ 30.00	=	\$	57,249.00		\$	57,249.00
5" Sidewalk	2,184	SY	\$ 60.00	=	\$	131,040.00		\$	131,040.00
Pedestrian Ramp	21	EA	\$ 1,150.00	=	\$	24,150.00		\$	24,150.00
Cross Pan, local (8" thick, 6' wide to include return)	144	LF	\$ 61.00	=	\$	8,784.00		\$	8,784.00
<b>STORM DRAIN IMPROVEMENTS</b> (Exception: Permanent Flood/DME shall be entered under Section 1)									
18" Reinforced Concrete Pipe	1,383	LF	\$ 65.00	=	\$	89,895.00		\$	89,895.00
24" Reinforced Concrete Pipe	0	LF	\$ 78.00	=	\$	-		\$	-
30" Reinforced Concrete Pipe	352	LF	\$ 97.00	=	\$	34,144.00		\$	34,144.00
36" Reinforced Concrete Pipe	0	LF	\$ 120.00	=	\$	-		\$	-
Curb Inlet (Type R) L=5', Depth < 5'	6	EA	\$ 5,542.00	=	\$	33,252.00		\$	33,252.00
Curb Inlet (Type R) L=5', 5' ≤ Depth < 10'	2	EA	\$ 7,188.00	=	\$	14,376.00		\$	14,376.00
CDOT Type D Inlet	2	EA	\$ 5,932.00	=	\$	11,864.00		\$	11,864.00
CDOT Type C Inlet	1	EA	\$ 4,802.00	=	\$	4,802.00		\$	4,802.00
Modified Type C Inlet	1	EA	\$ 10,000.00	=	\$	10,000.00		\$	10,000.00
8" Area Drain	2	EA	\$ 500.00	=	\$	1,000.00		\$	1,000.00
4' Type II Manhole	8	EA	\$ 6,619.00	=	\$	52,952.00		\$	52,952.00
5' Type II Manhole	4	EA	\$ 12,034.00	=	\$	48,136.00		\$	48,136.00
Maintenance Road Material (CDOT Class 6 Base)	36	CY	\$ 85.00	=	\$	3,060.00		\$	3,060.00
Rip Rap, Type L	130	Tons	\$ 80.00	=	\$	10,400.00		\$	10,400.00
<b>WATER SYSTEM IMPROVEMENTS</b>									
Water Main Pipe (PVC), Size 6"	1,789	LF	\$ 66.00	=	\$	118,074.00		\$	118,074.00
Water Main Pipe (Ductile Iron), Size 8"	0	LF	\$ 78.00	=	\$	-		\$	-
Gate Valves, 8"	19	EA	\$ 1,923.00	=	\$	36,537.00		\$	36,537.00
Fire Hydrant Assembly, w/ all valves	7	EA	\$ 6,828.00	=	\$	47,796.00		\$	47,796.00
Water Service Line Installation, inc. tap and valves	67	EA	\$ 1,370.00	=	\$	91,790.00		\$	91,790.00
Fire Cistern Installation, complete	0	EA		=	\$	-		\$	-
[insert items not listed but part of construction plans]									
<b>SANITARY SEWER IMPROVEMENTS</b>									
Sewer Main Pipe (PVC), Size 8"	1,466	LF	\$ 66.00	=	\$	96,756.00		\$	96,756.00
Sanitary Sewer Manhole, Depth < 15 feet	10	EA	\$ 4,540.00	=	\$	45,400.00		\$	45,400.00

Costs of utilities are not required with the EGP. The % complete values will be needed with the final plat.

Utility improvements removed.

Any storm drain needed (only to make the site drain properly) with EGP needs to be moved to Section 1. Discuss with staff.

Stormdrain removed. All stormwater in EGP phase will be conveyed via diversion ditches

PROJECT INFORMATION							
Meadowbrook Park	4/14/2021			PUDSP208			
Project Name	Date			PCD File No.			
Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining
Sanitary Service Line Installation, complete	70	EA	\$ 1,451.00	=	\$ 101,570.00		\$ 101,570.00
Sanitary Sewer Lift Station, complete	0	EA		=	\$ -		\$ -
				=	\$ -		\$ -
[insert items not listed but part of construction plans]				=	\$ -		\$ -
LANDSCAPING IMPROVEMENTS (For subdivision specific condition of approval, or PUD)							
		EA		=	\$ -		\$ -
		EA		=	\$ -		\$ -
		EA		=	\$ -		\$ -
		EA		=	\$ -		\$ -
		EA		=	\$ -		\$ -
Section 3 Subtotal				=	\$ 1,264,196.00		\$ 1,264,196.00
** - Section 3 is not subject to defect warranty requirements							
AS-BUILT PLANS (Public Improvements inc. Permanent WQCV BMPs)		LS		=	\$ -		\$ -
POND/BMP CERTIFICATION (inc. elevations and volume calculations)		LS		=	\$ -		\$ -
Total Construction Financial Assurance					\$ 1,502,382.34		
(Sum of all section subtotals plus as-builts and pond/BMP certification)							
Total Remaining Construction Financial Assurance (with Pre-Plat Construction)					\$ 1,502,382.34		
(Sum of all section totals less credit for items complete plus as-builts and pond/BMP certification)							
Total Defect Warranty Financial Assurance					\$ 31,847.40		
(20% of all items identified as (*). To be collateralized at time of preliminary acceptance)							

### Approvals

I hereby certify that this is an accurate and complete estimate of costs for the work as shown on the Grading and Erosion Control Plan and Construction Drawings associated with the Project.

\_\_\_\_\_  
Engineer (P.E. Seal Required)

\_\_\_\_\_  
Approved by Owner / Applicant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Approved by El Paso County Engineer / ECM Administrator

\_\_\_\_\_  
Date





## **Meadowbrook Park**

**PUD Development Plan, Preliminary Plan, Pre-Development Site Grading &  
Wet Utilities**

### **Letter of Intent**

#### **APPLICANT-OWNER/CONSULTANT INFORMATION:**

##### **OWNERS**

COLORADO SPRINGS EQUITIES, LLC  
90 S. CASCADE AVENUE, SUITE 1500  
COLORADO SPRINGS, CO 80903

MEADOWBROOK CROSSING, LLC  
90 S. CASCADE AVENUE, SUITE 1500  
COLORADO SPRINGS, CO 80903

MEADOWBROOK DEVELOPMENT, LLC  
90 S. CASCADE AVENUE, SUITE 1500  
COLORADO SPRINGS, CO 80903

##### **PLANNING**

KIMLEY-HORN & ASSOCIATES  
2. NORTH NEVADA AVENUE, SUITE 300  
COLORADO SPRINGS, CO 80903

##### **ENGINEERING**

MS CIVIL CONSULTANTS  
102 E. PIKES PEAK, 5TH FLOOR  
COLORADO SPRINGS, CO 80903

##### **SURVEYING**

CLARK LAND SURVEYING, INC  
177 S. TIFFANY DRIVE, UNIT 1  
PUEBLO WEST, CO 81007

**KHA RESPONSE:**  
The state water form has been updated to match the PUD amount of 67 lots.

The pud states 67 lots, the sub division summary form states 67; the state water form states 70 so does the water report. which is it? check the density calculation on PUD notes and LOI

**Meadowbrook Park PUD Site Location, 1**

**Parcel ID Nos.:** 5408000053, 5408008002

**Area/Acreage:** ±8.01 AC

**Existing Zoning:** RR-5 CAD-O, I-2 CAD-C, 3000 square foot lots with limited opportunities for individual landscaping. Based on si

**Location:** The development limits are generally defined by US Highway 24 on the southern boundary, Meadowbrook Parkway on the western and northernmost boundaries, and the Claremont Business Park Filing 2(A) subdivision boundary on the easternmost edge.

**Calculation of Anticipated water Demand**

The subdivision will have 70 residential lots with 0.88 acres of fully irrigated co space and 1.07 acres of 60% reduced watering native grass. This development will have

**Request & Justification**

This Meadowbrook Park PUDSP application includes the following requests:

- Combination of the preliminary plan map with the PUD for concurrent BOCC approval to develop 70 single-family residential lots and seven (7) tracts (Tracts A-G) for public improvements and utilities, private roads and pedestrian facilities (sidewalks), drainage, landscaping and open space uses, and future development;
- Approval of PUD Modifications to Sections 8.4.4.C (Public Roads Required/Frontage) 8.4.4.E (Private Road Allowances), 8.4.6.C.1 (Standards for Easements), & 8.4.6.C.2 (Easement Location and Dimensions);,
- Findings of sufficient water quality, quantity, and dependability with the PUD approval are requested with the preliminary plan approval;
- Authorization to submit a final plat(s) for administrative approval subject to findings that the location and design of the public improvements proposed in connection with the subdivision are adequate to serve the needs and mitigate the effects of the development;
- BOCC authorization of pre-development site grading, which includes authorization to install wet and dry utilities.

**PUD Development Plan Summary**

The PUD provides development standards and layout for 70 detached single-family residential lots, subdivision access to public rights of way, private streets, pedestrian facilities, landscape buffers and screening, open space, and tracts for public utilities and drainage on a 8.01-acre development site with a planned density of 8.74 DU/AC ( $70 / 8.01 = 8.74$ ). The application includes PUD modifications (and associated deviations) for the use of private streets (with modified cross sections) and to permit a 3' modified side yard setback and utility easements on residential lots.

**Access:** Vehicular access to the Meadowbrook Park development is proposed at two full movement accesses along Meadowbrook Parkway. Meadowbrook Parkway provides access to the external transportation network easterly to Marksheffel Road and southerly from the intersection of Newt Drive (located west of the development site) to US Highway 24 & SH 94.

**Land Use:** The minimum lot size is 2,085 SF for all urban density lots. Some lot sizes exceed the minimum lot size due to adjacent tract configuration and private improvements contained in easements for public drainage, utilities, access and circulation, open space, and landscape buffer.

Permitted and accessory single-family residential uses are identified on the PUD Development Plan and include single family detached dwellings, residential accessory uses, open spaces, and transportation and stormwater facilities. Privately owned detached accessory structures are not permitted on individual residential lots. A complete listing of permitted uses is provided on the PUD development plan.

**Density:** The PUD proposes a residential density of 8.74 DU/AC (70 lots/8.01 AC)..

**Lot Dimensional Standards:**

Typical lots have been planned to meet the following dimensional standards:

- **Minimum lot size: 2,085 SF**
- **Maximum Height: 30'**
- **Setbacks:**
  - **Front Yard: 10'**
  - **Side Yard: 3'**
  - **Rear Yard: 10'**
  - **Secondary Front Yards (Corner Lots): 5'**

67?

**KHA RESPONSE:**  
The density has been updated to match the PUD amount of 67 lots.

**Public Services and Utilities**

Public services and utilities are, or will be, provided by the following

- |                                |   |
|--------------------------------|---|
| • Water & Wastewater Services: | Cherokee Metropolitan District          |
| • Natural Gas:                 | Colorado Springs Utilities              |
| • Electric Service:            | Mountain View Electric Association      |
| • Fire Protection:             | Cimarron Hills Fire Protection District |
| • Public Schools:              | Colorado Springs District #11           |
| • Library Services:            | Pikes Peak Library District:            |
| • Roads:                       | El Paso County Road and Bridge          |
| • Police Protection:           | El Paso County Sheriff's Department     |
| • Special District Services:   | Meadowbrook Crossing Metro District     |

**PUD MODIFICATIONS:**

The following Modifications are proposed and discussed in detail below:

LDC/ECM SECTION	CATEGORY	STANDARD	MODIFICATION	JUSTIFICATION
LDC SECTION 8.4.4.E	PRIVATE ROAD ALLOWANCES	MODIFICATION REQUIRED	PERMIT USE	FACILITATE REDUCTION OF AUTOMOBILE DOMINANCE; INCREASED PEDESTRIAN EMPHASIS
LDC SECTION 8.4.3	MINIMUM [LOT] FRONTAGE	30' MIN. FRONTAGE ON & ACCESS TO PUBLIC ROAD (UNLESS PRIVATE ROADS APPROVED BY BOCC)	PERMIT USE OF PRIVATE ROADS WHICH PROVIDE SAME FUNCTIONALITY AS PUBLIC ROADS	
LDC SECTION 8.4.4.E.3	DESIGNED TO COUNTY STANDARDS	BUILT TO EPC OR APPROVED MODIFICATION STANDARD	MODIFICATION INCLUDES DESIGN FOR PRIVATE RD CROSS SECTION, INCLUDING PEDESTRIAN RAMPS	
LDC SECTION 8.4.6.C.2	EASEMENT LOCATIONS AND DIMENSIONS	EASEMENTS ALONG LOT/TRACT LINES	PERMIT 3' SIDE YARD UTILITY EASEMENT INSTEAD OF 5'	ADEQUATE UTILITY EASEMENTS HAVE BEEN PROVIDED IN LOT/TRACT NETWORK AND ROADWAY CROSS SECTIONS FOR DESIGN, INSTALLATION, DELIVERY, AND MAINTENANCE

Review 1 comment: Deviations from the County standards such as the pavement width proposed will require that deviation request forms be submitted.

Justification must be identified in the Letter of Intent as an

attachment which addresses criterias in the deviation request form. Please refer to the ECM Section 5.8. For an example of how this has been done by other consultants please refer to the letter of intent(page12) of PCD file No. PUDSP204

**Review 2:** Unresolved. Please also submit the deviation request form addressing the review 1 comments.

(\*Specific Approval Criteria and Findings are identified in the Modification Approval Criteria, Summary, & Conclusion discussion at the end of the PUD Modifications of this report section below.)

#### **Modification of Private Road Standards:**

Private Road Allowances Section 8.4.4.E limits private road use to closed loops and dead ends that are not likely to be needed for the convenience and safety of the general public. The proposed private street network provides access to detached lots/units lots for residents and guests of the development from the public Meadowbrook Parkway into the subdivision, not for general public use, convenience, or access to adjacent properties or land uses.

Section 8.4.4.E.3 Private Roads to Meet County Standards, generally requires private roads to be constructed to an ECM standard cross section except as otherwise determined in the modification request.

The request includes proposed private road sections where no standard private cross section exists in the ECM. The proposed cross sections have been included for review by the ECM and LDC administrators for their consideration and recommendation to the PC and BOCC.

#### **KHA RESPONSE:**

The Deviations have been specified with justifications in the LOI and the Deviation Request form has been included.

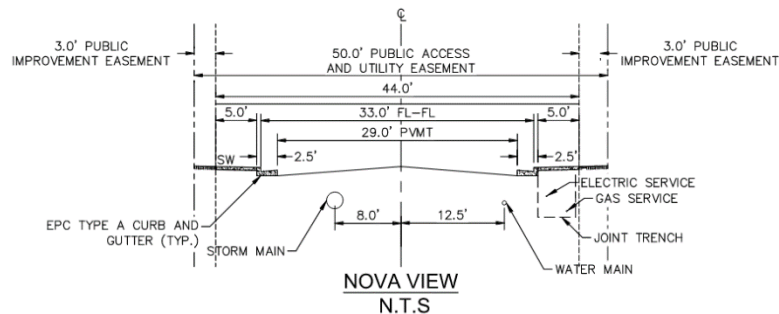
Private road design modifications may include:

- right-of-way (not public) width where suitable alternative provisions are made for pedestrian walkways and utilities
- design speed where it is unlikely the road will be needed for use by the general public
- standard section thickness minimums and pavement type where suitable and perpetual maintenance provisions are made
- maximum/minim block lengths; and
- maximum grade

All private streets will be constructed within a 50' private access easement and tract, with all standard public improvement/utility and drainage easement allotments that correspond with approved County public roadway cross sections. All cross sections accommodate required utility, stormwater, and pedestrian facilities. The reduced travel lane widths include private pedestrian walkways (sidewalks) and wet and dry utilities within the proposed cross sections.

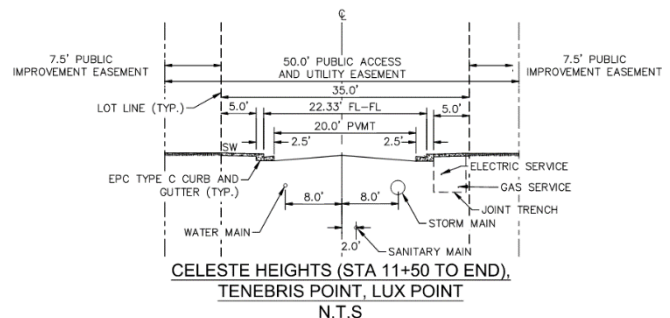
Modified “**Nova View**” Cross Section:

- 50' public access easement
- 29' pavement width
- Two (2) 14.5' travel lanes
- Standard curb/gutter (2.5' Type C/typical)
- 5' attached sidewalks
- Two (2) 3' public improvement easements



Modified “**Celeste Heights (from STA 11+50 to end), Tenebris Point, & Lux Point**” Cross Section:

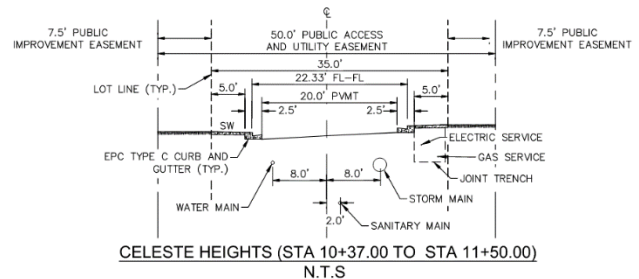
- 50' public access and utility easement (broad)
- 20' pavement width
- Two (2) 10' travel lanes
- Standard curb/gutter (2.5' Type C/typical)
- 5' attached sidewalks
- Two (2) 7.5' public improvement/utility & access easements (specific)





Modified “**Celeste Heights**” (from STA 10+37.00 to STA 11+50.00) Cross Section:

- 50’ public access and utility easement (broad)
- 35’ public access easement
- 20’ pavement width
- Two (2) 10’ travel lanes
- Standard curb/gutter (2.5’ Type C/typical)
- 5’ attached sidewalks
- Two (2) 7.5’ public improvement/utility & access easements (specific)

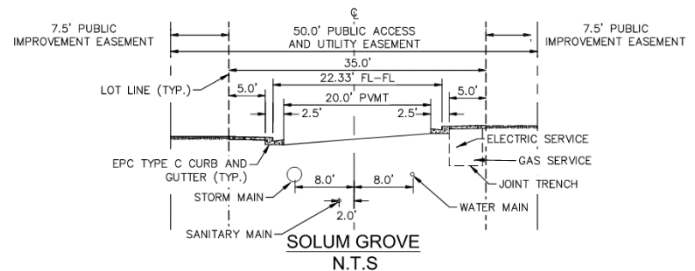


**KHA RESPONSE:**  
The line has been removed.

Text line not needed?

Modified “**Solum Grove**” Cross Section:

- 50’ public access and utility easement (broad)
- 35’ public access easement
- Two (2) 10’ travel lanes
- Standard curb/gutter (2.5’ Type C/typical)
- 5’ attached sidewalks
- Two (2) 7.5’ public improvement/utility & access easements (specific)



The ‘Modified Private Road Cross Sections’ reduced the pavement widths to allow minimum 10-foot travel lanes of the typical local urban low volume cross section of the private roads equivalent travel surface/lanes width same pavement width as. As depicted on the PUD and associated private road cross sections and details, adequate provision has been made for water/wastewater utility lines within the private road easement.

Private roads will be owned and maintained by the Meadowbrook Crossing Metropolitan District.

The modified cross sections shown do not match the urban local low volume cross section. The urban local low volume has a pavement width of 24' with (2) 12' travel lanes. Please revise the statement.

**Modification of Utility Easement Standards**

Section 8.6.C.2 Easement Location and Dimensions requires utility easements be placed along lot and tract lines, specifically five-feet (5') side and seven-feet (7') rear lot lines. The plan provides 3' side yard and 10' rear yard easements. Additional utility easements ranging from 7.5' to 12.5' have been included on the front yard to provide additional flexibility for respective utility providers to design and deliver service to individual lots with varying lot and unit model configuration.

and 8.4.5.G(4)(b) for drainage easements.  
There shall be no window wells within the side yard easements.

**KHA REDSPONSE:**  
The drainage easement code requirement has been considered during the design process.

**KHA RESPONSE:**  
"Typical" has been removed from the proposed cross section description.

## Modification Approval Criteria

The Code states, “For approval of a modification of a general development standard in the LDC or criteria or standard of the ECM, the BoCC shall find that the proposal provides for the general health, safety, and welfare of the citizens and at least one of the following benefits:”

- **Preservation of natural features;**
- **Provision of a more livable environment, such as the installment of street furniture, decorative street lighting or decorative paving materials;**  
*The modified street section allows an alternate configuration of associated elements (pavement width, easement location, pedestrian facilities) in a manner which maximizes proposed residential density, the amount of development area that can be devoted to lots, open spaces, and other amenities. Pedestrian paths in connection with sidewalks located in the private road cross section provide access to community open spaces and amenities together access to the surrounding pedestrian network, employment, retail, and recreation opportunities with non-motorized links to the external pedestrian network.*  
  
*Residential densities are maximized as reflected in the reduced lot size and building footprints/envelopes. The proposed housing types reflect market trends and demand for more efficiently designed homes on reduced square foot lots which allows the unit to be more attainable for a wider cross section of the consumer market. The design reflects smaller lot/unit sizes in exchange for the on-site amenities and proximity to community and regional amenities and attractions (employment, retail, recreation centers and nodes)*
- **Provision of a more efficient pedestrian system;**  
Residents have multiple options for walking via sidewalks provided with the proposed private streets and semi-public pedestrian paths provided which connect the internal greenways and open spaces.
- **Provision of additional open space;**  
1.949 AC of the 8.01 AC (24.3 % where min. 10% is required) site has been set aside and incorporated as open space to conform to residential PUD landscape/open space standards.
- **Provision of other public amenities not otherwise required by the Code; or (N/A)**

- ***The proposed modification is granted in exchange for the open space and/or amenity designs provided in the PUD development plan and/or development guide.***

The proposed PUD Plan reflects a variation on product type, community design and pedestrian circulation that is unique to El Paso County, the lots width is dictated by a notable vertical home design targeted to a generation of home buyer desiring a more contemporary feel while also being attainable. In addition, two park sites have been provided at either side of the primary subdivision entrance at Nova View and Meadowbrook Parkway.

### **Modification Summary & Conclusion**

In exchange for the requested PUD modifications, the applicant proposes to enhance pedestrian amenities for use in connection with internal pedestrian paths leading to existing public pedestrian facilities.

On-site pedestrian amenities include outdoor benches and seating, wayfinding enhancements, and additional open space amenities as detailed in the PUD development plan. Tract A (1.6 AC), Tract C (0.25 AC), and Tract G (0.05 AC) collectively provide 1.949 AC of designated open space where 0.801 acres is required to meet PUD open space requirements. Portions of the drainage improvements and facilities are located within Tracts A and B. Stormwater storage and treatment occur within a 16,000 SF detention/water quality facility located on a portion of the 1.6 AC Tract A (69,696 SF). The pond occupies approximately 23% of Tract A. Other stormwater facilities and appurtenance is located under the street sections of Tract B.

Off-site pedestrian amenity improvements within the adjacent Meadowbrook Parkway ROW which will be provided by this development include intersection and pedestrian crossing enhancements at the existing Meadowbrook Parkway and Newt Drive (and by extension US Highway 24). Tracts containing stormwater facilities, including the detention/water quality pond, and roadway landscaping will be owned by the Meadowbrook Park HOA; The Meadowbrook Crossing Metropolitan District will jointly own but solely maintain roadway landscaping and stormwater facilities.

### **PUD REVIEW/APPROVAL CRITERIA & JUSTIFICATION**

- ***The proposed PUD District zoning advances the stated purposes set forth in this Section;***  
The Meadowbrook Park PUD advances the following selected stated purposes set forth in this Section:
  - a. ***To permit adjustment to changing public and private needs and to foster the ability to provide development patterns which are more compatible with and effective in meeting such needs;***

The PUD design and layout is a response to current market demands for affordable and attainable single-family housing within a traditionally designed neighborhood. The proposed unit types provide for both single/multiple car garages with select rear loading options, side entry, and optional third story floor plans, that maximize the amount of living space within a reduced building footprint and lot area. The urban density and more compact sites and housing designs provide alternative housing selections for purchasers within a more desired affordability range (index) within the existing housing market. This may include variations of neo-traditional neighborhood options that provide flexibility and the possibility for rental and home ownership opportunities for a wider and more diverse range of income groups.

The development responds to the growing demand for attainable housing that is either purchased as an affordable selection or as transitional housing via rental opportunities or long-term leasing with purchase options. The development creates opportunities for consumers to transition from nearby and planned multifamily and attached housing in the immediate and surrounding area, to single-family housing within the Meadowbrook Park and onward/inward transition to permanent housing within the Meadowbrook Crossing development.

***b. To encourage innovations in residential, commercial, and industrial development and renewal so that the growing demands of the population may be met by greater variety in type, design, and layout of buildings including mixed use and traditional neighborhood design and by the conservation and more efficient use of open space ancillary to said buildings;***

The PUD provides housing selection options within the target homebuyer market for urban lots within planned communities located near or within proximity to employment, education, health care, entertainment, and retail centers. Proximity to major thoroughfares facilitates increased accessibility to desired services and uses as well as urban and rural recreation opportunities.

Meadowbrook Park provides a more urban lot size (2,085 vs. County suburban 5,000 SF lot) in response to market demands for attainable housing. Proposed urban lots are 41% smaller than the suburban 5000 SF allowance of the RS-5000. The PUD process encourages increased density (8.7DU/AC) in response to changing market demands as a trade-off in exchange for additional open space amenities. The development incorporates the 10% open space requirement of 0.801 AC of active and passive open spaces conveniently located to be accessible within one-quarter mile of all planned lots. An additional 1.949 AC of open space has been provided as a trade-off for increased densities, reduced setbacks, and PUD modifications for private streets with alternate cross section designs.

- ***The application is in general conformity with the Master Plan;***

Findings of Master Plan conformity have been made in support of the adjacent Meadowbrook Crossing Development with the previous underlying Sketch Plan approval of the land uses and densities for the Meadowbrook Park area. This application remains consistent with those findings; and with the following policies from the County Policy Plan and County Water Master Plan:

#### **Policy Plan Conformance**

***Policy 6.1.3 Encourage new development which is contiguous and compatible with previously developed areas in terms of factors such as density, land use and access.***

Meadowbrook Park and proposed densities (8.7DU/AC) are compatible with contiguous and surrounding land uses and densities (residential/commercial) reflected in the Meadowbrook Crossing and Claremont Business Park and US 24/94 Subdivision Developments.

***Policy 6.1.6 Direct development toward areas where the necessary urban-level supporting facilities and services are available or will be developed concurrently. (Addressed below with Policy 6.1.10)***

***Policy 6.1.10 Ensure that new development will not create a disproportionately high demand on public services and facilities by virtue of its location, design or timing.***

Urban services including water, wastewater, electric service, natural gas service, fire protection, roadway and transportation, and drainage and stormwater management services are currently available and are serving residential development within Meadowbrook Park. Additional facilities and services will be extended to or constructed within the planned development in fulfillment of this policy criterion.

***Policy 6.1.8 Encourage incorporating buffers or transitions between areas of varying use or density where possible.***

Buffers and density transitions have been incorporated into the PUD design between areas of differing density within and adjacent to the Meadowbrook Park boundaries.

#### **Water Master Plan Conformance:**

Required analysis, reports, and documentation of service commitments, including available water supply information has been provided in support of the objectives, goals and policies of the El Paso County Water Master Plan.

- **Goal 1.1 – Ensure an adequate water supply in terms of quantity, dependability and quality for existing and future development.**
- **Goal 6.0 – Require adequate water availability for proposed development.**
- ***Policy 6.0.7 – Encourage the submission of a water supply plan documenting an adequate supply of water to serve a proposed development at the earliest stage of the development process as allowed under state law. The water supply plan should be prepared by the applicant in collaboration with the respective water provider.***

A water supply plan (resources report) including water supply information summary that documents the planned and committed water supply from Cherokee Metropolitan District is adequate to meet the needs of the development.

- ***Policy 6.0.8 – Encourage development patterns and higher density, mixed use developments in appropriate locations that propose to incorporate meaningful water conservation measures.***

The development proposes higher residential densities of 8.7 DU/AC compared to 4-6 DU/AC densities achieved with more conventional urban density PUD's. Higher densities are achievable in part by the availability of central water and sewer from Cherokee Metro District (CMD).

- ***Policy 6.0.10 – Encourage land use proposals to expressly declare water source(s), quality, quantity, and sustainability in terms of years and number of single-family equivalents.***

Water service is planned from Cherokee Metropolitan District. Adequate water resources in terms of quality, quantity, and sustainability are available to adequately serve the proposed development as documented in the District's service commitment letter and water resource report submitted in support of the PUDSP application. Water resources are available to meet County 300 yr. rules to serve the planned 70 single-family units/lots.

- ***Policy 6.0.11– Continue to limit urban level development to those areas served by centralized utilities.***

All development within the overall Meadowbrook Park is served by centralized utilities. Utility extensions, improvements, or upgrades necessary to support the proposed development will be the sole responsibility of the developer and shall be installed in accordance with the respective service provider requirements and procedures.

- ***Policy 6.0.11– Continue to limit urban level development to those areas served by centralized utilities.***

A water supply plan including water supply information summary that documents the planned and committed water supply from Cherokee Metropolitan District is adequate to meet the needs of the development.

The development area is in REGION 5 as identified on the El Paso County Water Master Plan Planning Regions Map and is within the Cherokee Metropolitan District



(CMD) Service Area. Region 5 consists of areas served by CMD and is not expected to experience significant growth by 2060. However, the District may expand water and sewer service to growth areas outside of Region 5. No specific growth map was created for Region 5; these areas are shown in other maps.

CMD provides services outside District boundaries to Schriever AFB and the Woodmen Hills/Meridian Ranch Development. System/infrastructure interconnections exist between CMD, CSU, Meridian Ranch MD, Meridian Service MD, and Woodmen Hills MD. Per the Water Master Plan, water supplies in Region 5 from current to 2060 build out are as follows:

Planning Region	Current Supplies (AF per year)	2040 Supplies (AF per year)	2060 Build-Out Supplies (AF per year)
<b>Region 5</b>	<b>4,849</b>	<b>6,800</b>	<b>10,131</b>

Table 5-2: Current, 2040, and Build-Out Water Supply by El Paso County Planning Region

Planning Region	Demand (AF)	Supplies (AF)	Average-Year Surplus** (AF)	Need (AF)	Need (%)
<b>Region 5</b>	<b>4,396</b>	<b>4,849</b>	<b>453</b>	<b>0</b>	<b>0%</b>

Table 5-3: Current Demand and Current Supplies by El Paso County Planning Region

Planning Region	2040 Demand (AF) Need (AF) Need (%)	Current Supplies (AF)	(AF) Average-Year Surplus**	Need (AF)	Need (%)
<b>Region 5</b>	<b>6,468</b>	<b>4,849</b>	<b>0</b>	<b>1,619</b>	<b>25%</b>

Table 5-4: Future (2040) Demand and Current Supplies by El Paso County Planning Region

Planning Region	2060 Demand (AF)	Current Supplies (AF)	Average-Year Surplus** (AF)	Need (AF)	Need (%)
<b>Region 5</b>	<b>9,608</b>	<b>4,849</b>	<b>0</b>	<b>4,759</b>	<b>50%</b>

Table 5-5 – Build-out (2060) Demand and Current Supplies by El Paso County Planning Region

Water supplies in Region 5 should be sufficient to meet the current development demand; however, additional resources will be required to meet the full projected development demand within the Region by the 2060 target build out date. The District has been planning to reduce demand through its conservation and reuse programs. Additional water resources are planned through CMD interconnections and regional collaboration with partner and/or neighboring water providers. through acquisition and reallocation of other resources

The subdivision will have 67 residential lots with 0.88 acres of fully irrigated common space and 1.07 acres of 60% reduced watering native grass. This development will have lots 3000 square foot lots with limited opportunities for individual landscaping. Based on similar small lot developments in the District and elsewhere, a lower presumptive water use value is used than with traditional single-family subdivisions.

Water demand for the 1.95 AFY of common space was calculated using El Paso County's fully irrigated landscaping estimate of 2.53 feet of water per year. Applying this to the 0.88 acres of fully irrigated common space and the 1.07 acres of 60% reduced watering common space yields an irrigation use estimate of 3.3 AFY. The total for irrigation and domestic use across the development is projected to be 18.7 AFY.

#### **Water Commitments**

**(Note: Please refer to the Water Provider Supplement to Water Resource Report for Meadowbrook Park, prepared by CMD District Engineering Staff for detailed information regarding the District. This information was specifically provided by the District to address elements of the County Water Master Plan with reference to this specific project.)**

CMD's water commitments stand at 4,111.7 AFY before the addition of the proposed development. These commitments are broken down below in Table 3. The Tipton and Kane commitments are related to an arrangement from the mid-2000's where developers reserved commitments on two new wells. The water from these wells is considered fully committed to these developers even if they have not yet begun the projects associated with the reserved commitments. Due to a complex legal history, the "Kane" water right was not tied to a specific physical water well but instead operates as a commitment served from CMD's general supply portfolio.

Commitments	AFY
In-District (2015)	2693
Committed Since 2015	406.7
Schriever Air Force Base	537
Kane	200
Tipton	225
Construction	25
Parks	25
<b>Total</b>	<b>4111.7</b>

*CMD Commitments before addition of new development*

#### **Water Balance**

With 4,443.0 AFY of exportable supply and 4,111.7 AFY of commitments, CMD has a water balance of 331.3 AFY before the subject development. After commitment of 18.7 AFY to this development, the District will have 312.6 AFY remaining for additional commitments.

Water Balance Before New Commitment	331.3AFY
New Commitment: Meadowbrook Park	18.7
Water Balance Remaining	312.6 AFY

- ***The proposed development is in compliance with the requirements of this Code and all applicable statutory provisions and will not otherwise be detrimental to the health, safety, or welfare of the present or future inhabitants of El Paso County;***

The Plan and supporting submittal documents and reports comply with the requirements and allowances of the County Code including the subdivision and zoning ordinances, together with the PUD criteria, PUD Design Modification Criteria, and Engineering and Drainage Criteria Manuals. Approval and implementation of the Plan will not be detrimental to the health, safety, or welfare of the present or future residents of El Paso County.

- ***The subject property is suitable for the intended uses and the use is compatible with both the existing and allowed land uses on the neighboring properties, will be in harmony and responsive with the character of the surrounding area and natural environment; and will not have a negative impact upon the existing and future development of the surrounding area;***

Pre-planning analysis of this site which was conducted in the preparation of supporting reports and documents such as soils and geology, drainage & stormwater runoff, and traffic impacts, have determined the site to be suitable for the planned development.

The planned uses are compatible with existing and allowed uses adjacent to and surrounding the property.

- ***The proposed development provides adequate consideration for any potentially detrimental use to use relationships (e.g. commercial use adjacent to single family use) and provides an appropriate transition or buffering between uses of differing intensities both on-site and off-site which may include innovative treatments of use to use relationships;***

No potentially detrimental adjacent land uses exist, nor are the planned uses detrimental to any existing surrounding land uses. The Plan provides adequate buffering and transitions between adjacent land uses with differing intensities and residential densities.

The site is located adjacent to US Highway 24 which is classified as a six (6) lane expressway. The proposed subdivision will not be impacted by noise generated from motor traffic in a manner which triggers mitigation. No specific sound mitigation is proposed or required adjacent to the expressway boundary to mitigate sound trespass and nuisance from highway operations.

- ***The allowed uses, bulk requirements and required landscaping and buffering are appropriate to and compatible with the type of development, the surrounding neighborhood or area and the community;***

Planned uses, dimensional and bulk requirements established in the have been identified in the PUD that establish a defined uniform community character while being comparable to surrounding residential uses. Landscaping and buffering are appropriate and compatible with the existing mixed-use commercial, industrial, and residential development in the immediate vicinity and the physical and aesthetic character of the contiguous area.

Allowed and permitted uses include, but are not necessarily limited to, detached dwellings, mail kiosks, trail corridors and linkages, development signage, pedestrian walkways and paths, public sidewalks, public rights-of-way, fencing, stormwater facilities, open spaces, landscaping improvements, and park spaces with associated equipment and improvements.

- ***Areas with unique or significant historical, cultural, recreational, aesthetic or natural features are preserved and incorporated into the design of the project;***  
No areas with unique or significant features impact the site.

- ***Open spaces and trails are integrated into the development plan to serve as amenities to residents and provide a reasonable walking and biking opportunities;***

Open spaces and pedestrian access have been provided via an internal private sidewalk and pedestrian path network throughout the subdivision. These spaces and paths are planned to provide maximum access for Meadowbrook Park residents to the 1.949 AC of open space within the filing, community and public access to the open space network, and connections to the nearby County Trail network adjacent to the Meadowbrook Park boundaries. (see attached Trail Master Plan for details)

- ***The proposed development will not overburden the capacities of existing or planned roads, utilities and other public facilities (e.g., fire protection, police protection, emergency services, and water and sanitation), and the required public services and facilities will be provided to support the development when needed;***

Existing major roads and infrastructure facilities (including wet/dry utilities) within Meadowbrook Park have been planned to meet the demand of the densities proposed with this PUD. The project area will be served by more than two (2) points of access to public roads from internal private streets.

The intersection of SH-94 and US-24 is projected to operate poorly in 2025 with the existing intersection configuration. Therefore, US-24 may need to provide three through lanes in each direction through this intersection. It is recommended that a third northeast bound through lane along US-24 be designated while constructing a separate 600-foot plus 225-foot taper right turn lane to maintain free right turn movements to eastbound SH-94. The third southwest bound through lane along US-24 can be designated by absorbing the existing right turn lane. The six-lane section of US-24 can occur between the Peterson Road interchange to the west and transition back to a four-lane roadway east of SH-94. In addition to these improvements, it is recommended that a 935-foot plus 225-foot taper dual left turn lanes be provided on northeast bound US-24 for the turn to Newt Drive. The area for these dual lefts is presently mostly available; however, the lane is striped out which will require restriping and a slight extension may also need to be constructed. A traffic signal modification will be required at the intersection to incorporate these improvements.

Meadowbrook Parkway will be extended westward along the plan frontage from the existing Newt Drive/Highway 94/Meadowbrook Parkway "T" as an offsite improvement. The TIS recommends that this roadway be designated as a three-lane roadway with a center two-way left turn lane.

According to the TIS, in 2040, "[At] the SH-94 and Marksheffel Road intersection, dual eastbound left turn lanes operating with protected only phasing may be needed to provide acceptable operations".



All on-site and off-site roadway, signing, striping, and signal improvements shall be incorporated into the Civil Drawings, and conform to El Paso County and/or CDOT standards as applicable, as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

The following letters of service commitment have been received and provided in support of this development application:

- a. MVEA
- b. Black Hills Energy
- c. Cherokee Metropolitan District
- d. Cimarron Hills Fire Protection District

- ***The proposed development would be a benefit through the provision of interconnected open space, conservation of environmental features, aesthetic features and harmonious design, and energy efficient site design;***

The proposed development will be a benefit through the provision of interconnected open space, conservation of environmental features, aesthetic features and harmonious design. Public sidewalks have been provided for open space access. Access to open spaces will be further augmented by planned pedestrian walkways that are provided to interconnect residents and guests with planned greenway and open spaces within the development filing. Access to open spaces located throughout Meadowbrook Park is provided via existing and planned public sidewalks and pedestrian trails network.

- ***The proposed land use does not permit the use of any area containing a commercial mineral deposit in a manner which would unreasonably interfere with the present or future extraction of such deposit unless acknowledged by the mineral rights owner;***

The proposed land use does not permit the use of any area containing a commercial mineral deposit in a manner which would unreasonably interfere with the present or future extraction of such deposit unless acknowledged by the mineral rights owner

- ***Any proposed exception or deviation from the requirements of the zoning resolution or the subdivision regulations is warranted by virtue of the design and amenities incorporated in the development plan and development guide; and***

Proposed deviations, exceptions, and/or modifications from the requirements of the zoning resolution or the subdivision regulations are warranted by virtue of the design and amenities incorporated in the development plan and proposed development standards. The subdivision design is intended maximize densities to capture a specific target consumer market demand for smaller housing footprint, aesthetically enhanced community environment, pedestrian and bicycles access to nearby recreation and retail destinations.

Open space amenities include neighborhood park, community gazebo and gathering space, outdoor seating areas, bicycle racks near pedestrian path connections and seating areas. PUD Modifications and supporting justification have been presented earlier in this letter.

- ***The owner has authorized the application.***  
The owner has authorized the application

#### PRELIMINARY PLAN REVIEW/APPROVAL CRITERIA & JUSTIFICATION

- ***The proposed subdivision is in general conformance with the goals, objectives, and policies of the Master Plan;***  
The subdivision generally conforms to the goals conformance with the goals, objectives, and policies of the Master Plan. ***(See previous Master Plan discussion provided with the PUD approval criteria)***

#### Policy Plan Conformance (Preliminary Plan):

- ***Policy 6.1.3 Encourage new development which is contiguous and compatible with previously developed areas in terms of factors such as density, land use and access.***  
Meadowbrook Park and its proposed densities are compatible with contiguous land uses and densities in the adjacent mixed-use Meadowbrook Crossing, Claremont Business Park Filings 1 & 2, and US 24/94 Subdivisions. The proposed densities are consistent with the overall residential densities along the nearby Peterson Rd, Marksheffel, and Constitution corridors.
- ***Policy 6.1.6 Direct development toward areas where the necessary urban-level supporting facilities and services are available or will be developed concurrently.***
- ***Policy 6.1.10 Ensure that new development will not create a disproportionately high demand on public services and facilities by virtue of its location, design or timing.***  
Urban services which include, but not necessarily limited to water, wastewater, electric service, natural gas service, fire protection, roadway and transportation, and drainage and stormwater management services are currently available. Additional facilities and services will be extended to or constructed within the planned development in accordance with the impacts and/or demands generated by the development.

- **Policy 6.1.11 Plan and implement land development so that it will be functionally and aesthetically integrated within the context of adjoining properties and uses.**
- ***Policy 6.1.8 Encourage incorporating buffers or transitions between areas of varying use or density where possible.***  
Landscape setbacks and buffer areas have been planned to provide appropriate and practical buffers and transitions between differing land uses to mitigate impacts between adjacent properties and land uses.
- **The subdivision is consistent with the purposes of this Code;**  
The stated purpose of the preliminary plan is to provide an in-depth analysis of the proposed division of land including a refinement of the design considering the geologic hazards, environmentally sensitive areas, source of required services, vehicular and pedestrian circulation, and relationship to surrounding land uses. Necessary reports including, but not limited to drainage, grading and erosion control, water/wastewater resource reports, traffic impact analysis, and the PUD development plan have been provided in order to review and refine the design of the subdivision taking into account the review of the referenced documents, plans, and reports in order to guide the design of the development to meet the intent and purposes of the preliminary plan as stated in the Code.
- **The subdivision is in conformance with the subdivision design standards and any approved sketch plan;**  
The subdivision conforms to the “Subdivision Design Standards” of the Code the property is not within the boundaries of an approved Sketch Plan.
- **A sufficient water supply has been acquired in terms of quantity, quality, and dependability for the type of subdivision proposed, as determined in accordance with the standards set forth in the water supply standards [C.R.S. § 30-28-133(6)(a)] and the requirements of Chapter 8 of this Code**  
A commitment to provide water service has been provided by Widefield Water & Sanitation District which has adequate water resources to serve the proposed development. It is anticipated that the BCC will be able to make the required water findings during the preliminary plan review of the PUD development plan application.
- **A public sewage disposal system has been established and, if other methods of sewage disposal are proposed, the system complies with state and local laws and regulations, [C.R.S. § 30-28-133(6) (b)] and the requirements of Chapter 8 of this Code;**  
The subdivision will connect into an existing public sewage disposal system what has been installed together with other public improvements associated with Meadowbrook Crossing and Claremont Business Park developments and its varied development phases and filings. The existing system complies with state and local

laws and regulations, statutory requirements, and the requirements of Chapter 8 of the County Land Development Code.

- **All areas of the proposed subdivision, which may involve soil or topographical conditions presenting hazards or requiring special precautions, have been identified and the proposed subdivision is compatible with such conditions. [C.R.S. § 30-28-133(6)(c)];**

All areas of the proposed subdivision which may involve soil or topographical conditions presenting hazards or requiring special precautions, have been identified and the proposed subdivision is compatible with such conditions or will achieve compatibility through compliance with recommendations of corresponding reports and plans or by conditions of approval by the BOCC. Areas adjacent to the creek have been placed in tracts for ownership and maintenance by the District to manage these features and management for long term preservation of these natural features.

- **Adequate drainage improvements complying with State law [C.R.S. § 30-28-133(3)(c)(VIII)] and the requirements of this Code and the ECM are provided by the design;**

Adequate drainage improvements have been provided by the subdivision design, including but not limited to, stormwater, detention, and/or water quality control facilities, all of which meet stormwater requirements established by the state in addition to meeting the requirements of the County Code and ECM. Detention facilities have been designated within Tract A on the PUD Plan. Ownership and maintenance of all drainage facilities and improvements shall be provided by the Meadowbrook Crossing Metropolitan District.

- **The location and design of the public improvements proposed in connection with the subdivision are adequate to serve the needs and mitigate the effects of the development;**

The location and design of the public improvements proposed in connection with the subdivision are adequate to serve the needs and mitigate the effects of the development. referenced public improvements include, but are not necessarily limited to, grading and erosion control, stormwater runoff and drainage and detention/water quality facilities, transportation and roadway related improvements, utility service delivery infrastructure and related improvements. The PUD provides the private extension of local public residential roads into the subdivision which provide access and frontage to lots, open spaces, and detention facilities. Public road cross sections include ADA compliant sidewalk improvements (per local conditions and standards), together with all required wet and dry public utilities.

- **Legal and physical access is or will be provided to all parcels by public rights-of-way or recorded easement, acceptable to the County in compliance with this Code and the ECM;**

Legal and physical access is and will be provided to all parcels by planned public rights-of-way into the subdivision and via private streets within dedicated access easements located within Tract B.

- **The proposed subdivision has established an adequate level of compatibility by (1) incorporating natural physical features into the design and providing sufficient open spaces considering the type and intensity of the subdivision; (2) incorporating site planning techniques to foster the implementation of the County's plans, and encourage a land use pattern to support a balanced transportation system, including auto, bike and pedestrian traffic, public or mass transit if appropriate, and the cost effective delivery of other services consistent with adopted plans, policies and regulations of the County; (3) incorporating physical design features in the subdivision to provide a transition between the subdivision and adjacent land uses; (4) incorporating identified environmentally sensitive areas, including but not limited to, wetlands and wildlife corridors, into the design; and (5) incorporating public facilities or infrastructure, or provisions therefore, reasonably related to the proposed subdivision so the proposed subdivision will not negatively impact the levels of service of County services and facilities;**

The proposed subdivision has established an adequate level of compatibility by (1) incorporating natural physical features into the design and providing sufficient open spaces considering the type and intensity of the subdivision where practical; (2) incorporating site planning techniques to foster the implementation of the County's plans, and encourage a land use pattern to support a balanced transportation system, including auto, bike and pedestrian traffic, public or mass transit where available and/or appropriate, and the cost effective delivery of other services via subdivision layout and land use orientation in a manner that is consistent with adopted plans, policies and regulations of the County; (3) incorporating physical design features in the subdivision to provide a transition between the subdivision and adjacent land uses; (4) incorporating identified environmentally sensitive areas into the design; and (5) required public utilities and infrastructure has been provided proportionate to the impact of development and the demand for service based on the proposed land use and densities.

- **Necessary services, including police and protection, recreation, utilities, open space and transportation system, are or will be available to serve the proposed subdivision;**

Necessary services which include, police and fire protection, recreation, utilities, open space and transportation system, are and will be available to serve the proposed subdivision. Required service commitments have been provided in support of the development application. The subdivision provides two (2) park sites, pedestrian paths with outdoor seating/gathering and pet amenities. The site is also conveniently located within proximity to the Sand Creek Trail system.



- **The subdivision provides evidence to show that the proposed methods for fire protection comply with Chapter 6 of this Code; and**  
The subdivision provides evidence to show that the proposed methods for fire protection comply with Chapter 6 of the County Code.
- **The proposed subdivision meets other applicable sections of Chapter 6 and 8 of this Code.**  
The proposed subdivision meets other applicable sections of Chapter 6 and 8 of the County Code or otherwise approved with conditions imposed by the BOCC.

VICINITY MAP

CONSTITUTION AVE.

HWY 24

SITE

MARKSCHEFFEL RD.

HWY 84

PETERSON AFB

HWY 24

GALLEY RD.

N. POWERS BLVD.

NORTH

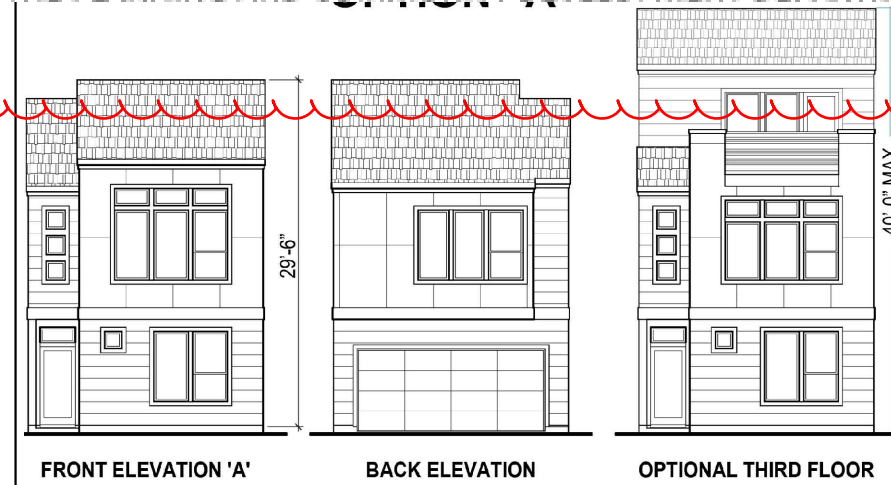
## 01 OF 10



- 2.1. THE PROPERTY IS LOCATED IN THE AIRPORT OVERLAY ZONE. THIS SERVES AS NOTICE OF POTENTIAL AIRCRAFT OVERFLIGHT AND NOISE IMPACTS ON THIS PROPERTY DUE TO ITS CLOSE PROXIMITY TO AN AIRPORT, WHICH IS BEING DISCLOSED TO ALL PROSPECTIVE PURCHASERS CONSIDERING THE USE OF THIS PROPERTY FOR RESIDENTIAL AND OTHER PURPOSES. THIS PROPERTY IS SUBJECT TO THE OVERFLIGHT AND ASSOCIATED NOISE OF ARRIVING AND DEPARTING AIRCRAFT DURING THE COURSE OF NORMAL AIRPORT OPERATIONS. ALL PROPERTY WITHIN THIS SUBDIVISION IS SUBJECT TO AN AVIGATION EASEMENT AS RECORDED IN BOOK 2478 AT PAGE 304, OF THE RECORDS OF THE EL PASO COUNTY CLERK AND RECORDER.

1. THE FOLLOWING REPORTS HAVE BEEN SUBMITTED IN ASSOCIATION WITH THE PUD PLAN FOR THIS SUBDIVISION AND ARE ON FILE AT THE COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT: TRANSPORTATION IMPACT STUDY; DRAINAGE REPORT; WATER RESOURCES REPORT; WASTEWATER DISPOSAL REPORT; GEOLOGY AND SOILS REPORT; FIRE PROTECTION REPORT; NATURAL FEATURES REPORT.
2. ALL PROPERTY OWNERS ARE RESPONSIBLE FOR MAINTAINING PROPER STORM WATER DRAINAGE IN AND THROUGH THEIR PROPERTY. PUBLIC DRAINAGE EASEMENTS AS SPECIFICALLY NOTED ON THE PLAT SHALL BE MAINTAINED BY THE LOT OWNERS UNLESS OTHERWISE INDICATED. STRUCTURES, FENCES, MATERIALS OR LANDSCAPING THAT COULD IMPAIR THE FLOW OR RUNOFF SHALL NOT BE ERECTED.
3. UNLESS OTHERWISE INDICATED, ALL FRONT, SIDE AND REAR LOT LINES ARE HEREBY PLATTED WITH AN ALTERNATING 1' AND 5' SIDE, 20' FRONT AND 10' REAR, PUBLIC UTILITY AND DRAINAGE EASEMENT. ALL EXTERIOR SUBDIVISION BOUNDARIES ARE HEREBY PLATTED WITH A 10 FOOT PUBLIC UTILITY AND DRAINAGE EASEMENT. THE SOLE RESPONSIBILITY FOR MAINTENANCE OF THESE EASEMENTS IS HEREBY VESTED WITH THE INDIVIDUAL PROPERTY OWNERS.
4. DEVELOPER SHALL COMPLY WITH FEDERAL AND STATE LAWS, REGULATIONS, ORDINANCES, RESOLVE AND PERMIT REQUIREMENTS, AND OTHER AGENCY REQUIREMENTS, IF ANY, OF APPLICABLE AGENCIES INCLUDING, BUT NOT LIMITED TO, THE COLORADO DIVISION OF WILDLIFE, COLORADO DEPARTMENT OF TRANSPORTATION, U.S. ARMY CORPS OF ENGINEERS, AND THE ARIZONA DIVISION OF WATER REGARDING THE ENDANGERED SPECIES ACT, PARTICULARLY AS RELATED TO THE LISTED SPECIES IDENTIFIED IN THE PROJECTS ENVIRONMENTAL ASSESSMENT.
5. NO DRIVEWAY SHALL BE ESTABLISHED UNLESS AN ACCESS PERMIT WAIVER HAS BEEN GRANTED BY EL PASO COUNTY. PRIVATE ROADS ARE SUBJECT TO BOCC APPROVAL OF PUD MODIFICATION TO AUTHORIZE USE OF PRIVATE ROADS, FOR DRIVEWAYS ACCESSING STATED PRIVATE ROAD.
6. MAILBOXES SHALL BE INSTALLED IN ACCORDANCE WITH EL PASO COUNTY AND US POSTAL SERVICE REGULATIONS.
7. EXCEPT AS OTHERWISE NOTED ON THE PUD PLAN, INDIVIDUAL LOT PURCHASERS ARE RESPONSIBLE FOR CONSTRUCTING DRIVEWAYS.
8. AT THE TIME OF APPROVAL OF THIS PROJECT, THIS PROPERTY IS LOCATED WITHIN THE CIMARRON HILLS FIRE PROTECTION DISTRICT, WHICH HAS ADOPTED A FIRE CODE WITH FIRE MITIGATION REQUIREMENTS DEPENDING UPON THE LEVEL OF FIRE RISK ASSOCIATED WITH THE PROPERTY AND STRUCTURES. THE OWNER OF ANY LOT SHOULD CONTACT THE FIRE DISTRICT TO DETERMINE THE EXACT DEVELOPMENT REQUIREMENTS RELATIVE TO THE ADOPTED FIRE CODE.
9. NO-BUILD AREAS AS ARE SHOWN ON THE PLANS. NO-BUILD AREAS INCLUDE, BUT ARE NOT LIMITED TO, DESIGNATED DRAINAGE EASEMENTS, NO-BUILD AREAS WITHIN INDIVIDUAL LOTS ARE THE RESPONSIBILITY OF THE PROPERTY OWNER. ALL OTHER NO-BUILD AREAS SHALL BE THE RESPONSIBILITY OF THE METRO DISTRICT.
10. THIS PROPERTY MAY BE ADVERSELY IMPACTED BY NOISE, DUST, FUMES, AND LIGHT POLLUTION CAUSED BY ADJACENT INDUSTRIAL PROPERTIES AND ADJACENT US-19 CIMARRON EXPRESSWAY. THE BUYER SHOULD RESEARCH AND BE AWARE OF THE POTENTIALITY AND THE RAMIFICATIONS THEREOF.
11. SIGNAGE IS NOT APPROVED WITH THIS PLAN. A SEPARATE SIGN PERMIT IS REQUIRED. CONTACT THE EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT AT 2880 INTERNATIONAL CIRCLE FOR A SIGN PLAN APPLICATION.
12. RETAINING WALLS EXCEEDING 4-FEET WILL NEED TO BE STRUCTURALLY ENGINEERED.
13. ALL "STOP SIGNS" AND OTHER TRAFFIC CONTROL SIGNAGE SHALL BE INSTALLED BY THE DEVELOPER AT LOCATIONS SHOWN ON THE SITE DEVELOPMENT PLAN TO MEET MUTED STANDARDS.
14. LOT AND ARCHITECTURE OPTIONS A-D REFLECT THE GENERAL CONFORMATIONS TO THE UNIT TYPES. WITHIN EACH FOOTPRINT OF UNIT TYPE (A-D) THE FINAL ARCHITECTURAL UNITS WILL VARY IN COLOR, MATERIAL MIX AND PENETRATION.

Where did the airport Noise mitigation during construction, airport notice, special district notice & water notes go?



LOT DIMENSIONS SUBJECT TO CHANGE TO FIT GRADE  
CHANGES OR RIGHT-OF-WAY AND EASEMENT.



LOT DIMENSIONS SUBJECT TO CHANGE TO FIT GRADE  
CHANGES OR RIGHT-OF-WAY AND EASEMENT.



LOT DIMENSIONS SUBJECT TO CHANGE TO FIT GRADE  
CHANGES OR RIGHT-OF-WAY AND EASEMENT.



LOT DIMENSIONS SUBJECT TO CHANGE TO FIT GRADE  
CHANGES OR RIGHT-OF-WAY AND EASEMENT.

- ALL PLANNED DRIVEWAYS WITHIN THE PUD ARE FOR THE PURPOSE OF FACILITATING VEHICULAR PASSAGE FROM PRIVATE STREETS TO THE INDIVIDUAL LOTS, SPECIFICALLY, TO THE DESIGNATED PARKING AREAS FOR EACH LOT WHICH IS LOCATED WITHIN THE DETACHED 1-CAR OR 2-CAR GARAGE.
- ALL PLANNED DRIVEWAYS WITHIN THE PUD WILL HAVE A TWENTY-FOOT (20') MINIMUM LENGTH, FROM FACE OF GARAGE TO SIDEWALK.
- DRIVEWAYS WITHIN THE PUD DRIVEWAYS WHICH ARE TWENTY-FOOT (20') IN LENGTH AND HAVE BEEN IDENTIFIED ON THE PUD MAP.
- PARKING OR ANY FORM OF VEHICLE STORAGE IS NOT PERMITTED ON DRIVEWAYS LESS THAN TWENTY-FOOT (20') IN LENGTH, AS RESTRICTED BY THE PUD AND ASSOCIATED NOTES.
- ALL GARAGE UNITS ARE TO BE ADA ACCESSIBLE PARKING AND MEET ADA PARKING CRITERIA.

	DU	SPACES/UNIT REQUIRED	SPACES REQUIRED	GARAGE PARKING PROVIDED	DRIVEWAY PARKING PROVIDED	TOTAL PARKING PROVIDED
**2 CAR GARAGE	38	2/DU	76 SPACES (38*2/DU)	76 SPACES (38*2/DU)	76 SPACES (38*2/DU)	152 SPACES
**1 CAR GARAGE	29	2/DU	58 SPACES (30*2/DU)	29 SPACES (29*1/DU)	29 SPACES (29*1/DU)	58 SPACES
ADDITIONAL SHARED/ADA SPACES						19 GUEST/ 2/ADA
TOTAL	67		134 SPACES (67*2/DU)	105	105	239 SPACES

\*\* SUBTOTAL PARKING SPACES MAY BE SUBJECT TO CHANGE BASED OFF OF FINAL BUILDING DEVELOPMENT COUNT

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/20XX

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN

PROJECT NO.  
096956009

SHEET

02 OF 10



K:\COS\_LA\096956009 - Meadowbrook Park\Working\096956009-PPUDSP-10.27.20.dwg Salazar, Larry 3/19/2021 1:56 PM



LANDSCAPE ARCHITECT TO SELECT COLOR AND FINISH 2" THICK PRE-CAST CONCRETE CAP

19"

20.0"

SURFACE TO MATCH EXISTING FENCING ALONG FOUNTAIN BLVD. TYP

2-#4 RE-BAR 5' LONG

SLOPE SOIL AWAY FROM WALL TYP

CONC. GROUT TO COVER RE-BAR- APPROX. 36"

24"x24"x36" DP-PCC FTG.

3.0"

4.0"

SECTION VIEW: 6' VERTI CRETE PRE-CAST COLUMN

LANDSCAPE ARCHITECT TO SELECT COLOR AND FINISH 2" THICK PRE-CAST CONCRETE CAP

12"

4'

SURFACE TO MATCH EXISTING FENCING ALONG FOUNTAIN BLVD. TYP

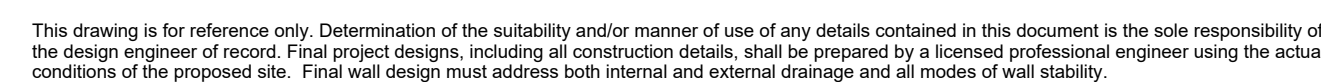
FINISHED GRADE

FRONT VIEW: 6' VERTI CRETE PRE-CAST FENCE

NOTE:

1. FENCING, COLUMNS, CAP, ETC. TO MATCH EXISTING FENCING WITHIN Meadowbrook Park, TYP.
2. FENCE AND COLUMN COLOR, TEXTURE, PATTERN, ETC. TO MATCH EXISTING FENCING WITHIN Meadowbrook Park, TYP.
3. COLUMNS, WALL, STEEL FENCING PER MANUFACTURERS SPECIFICATIONS.
4. SOUND WALL SHALL BE SETBACK ONE-FOOT (1') FROM PROPERTY/YEOW LINE, AS DEPICTED HEREBY.

is this noise wall as  
noted on sheet 1  
along Meadowbrook  
Parkway?



**G RETAINING WALL WALL DETAIL**  
NTS

03 OF 10



K:\COS\_LA\096956009 - Meadowbrook Park\Working\096956009--PUDSP-10.27.20.dwg Solazar, Larry 3/19/2021 1:56 PM

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN  
LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO

TRACT TABLE

TRACT	SIZE (ACRES)	OWNERSHIP	MAINTENANCE	USE
A	0.884 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
B	1.597 AC±	MCMD #1	MCMD #1	PRIVATE ACCESS/ROAD/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
C	0.224 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE/HARDSCAPE/SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
D	0.216 AC±	MCMD #1	MCMD #1	DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
E	0.128 AC±	MCMD #1	MCMD #1	PRIVATE ROAD, DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
F	0.448 AC±	MCMD #1	MCMD #1	DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
G	0.040 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE, ENTRY FEATURE, HARDSCAPING, SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
H	0.237 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE, ENTRY FEATURE, HARDSCAPING, SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
I	0.091 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE, ENTRY FEATURE, HARDSCAPING, SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
J	0.608 AC±	MCMD #1	MCMD #1	PARK/OPEN SPACE, ENTRY FEATURE, HARDSCAPING, SIGNAGE/DRAINAGE/PUBLIC IMPROVEMENT/PUBLIC UTILITY/LANDSCAPING/SIDEWALKS & PEDESTRIAN EASEMENT
TOTAL	4.493 AC±			

MCMD #1 = MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1

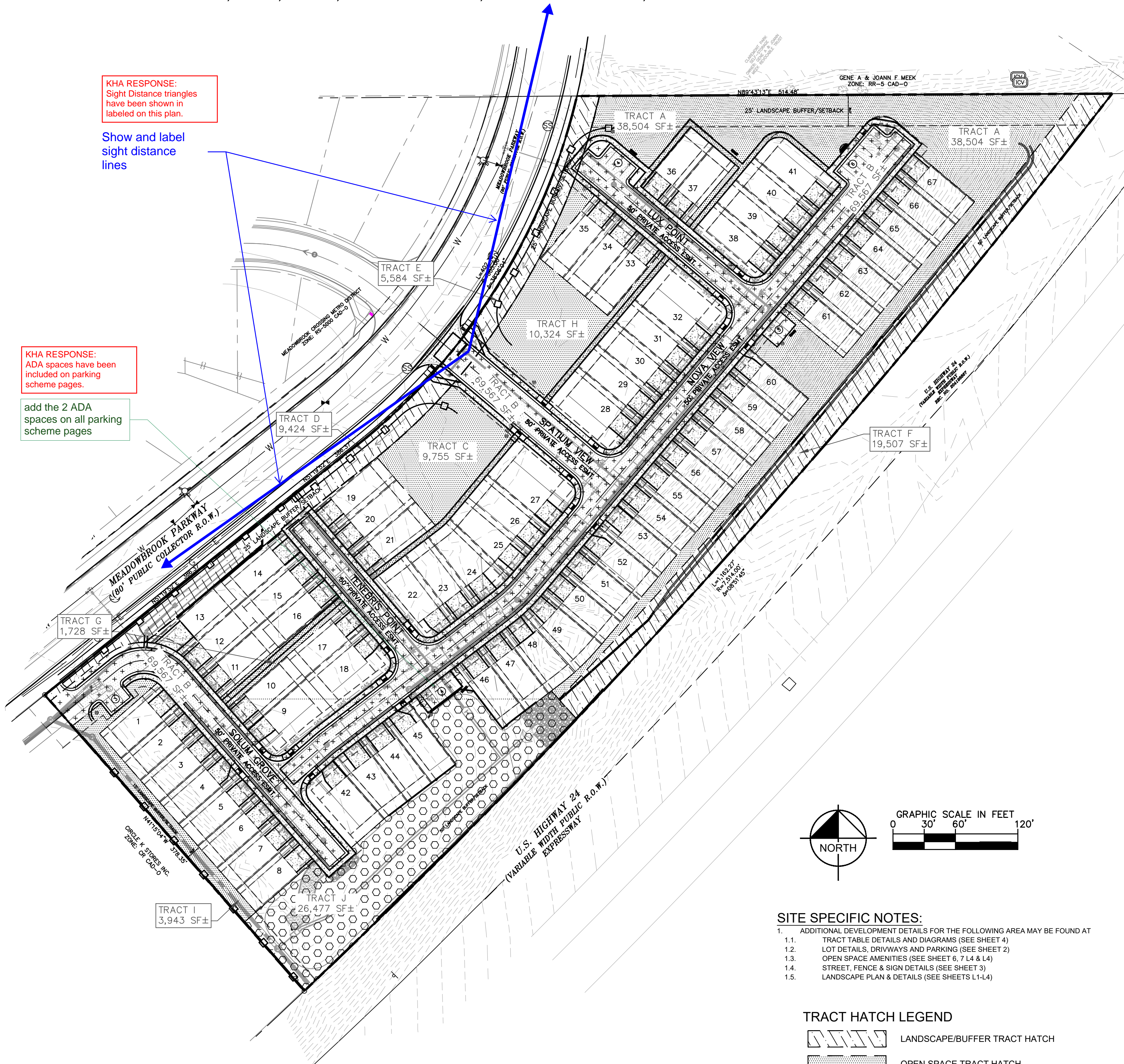
DETENTION POND AREA (TRACT J): 26,477 SF (0.608 AC)  
5% OPEN SPACE ALLOWED IN DETENTION AREA (TRACT J) x 5% = 1,324 SF (0.030 AC)  
TOTAL OPEN SPACE TRACT AREA (TRACTS A, C, G, H, I & 5% J): 65,578 SF (1.506 AC)  
NOTE: TOTAL OPEN SPACE REQUIRED IS 10% OF TOTAL ACREAGE (8.01 AC), 8.01 AC x 10% = 0.801 ACRES  
TOTAL OPEN SPACE PROVIDED: 1.506 ACRES OPEN SPACE/8.01 ACRE SITE= 18.8% OPEN SPACE PROVIDED

LANDSCAPE

- LANDSCAPING AREAS, TRAILS, COMMON OPEN SPACE AND BUFFERS SHALL BE INSTALLED BY THE DEVELOPER WITH PRIVATE/PUBLIC IMPROVEMENTS REQUIRED BY THIS PUD AND ASSOCIATED FINAL PLATS. LANDSCAPING SHALL BE OWNED AND MAINTAINED BY THE MEADOWBROOK CROSSINGS METROPOLITAN DISTRICT.
- NO LANDSCAPING SHALL OBSTRUCT SIGHT DISTANCE TRIANGLES OR PEDESTRIAN FACILITIES PER ENGINEERING CRITERIA MANUAL REFERENCE 2.3.6 G 2 & 2.5.3 H AS AMENDED RESPECTIVELY. THE MINIMUM HORIZONTAL CLEARANCE FOR SIDEWALKS AROUND UTILITY STRUCTURES, FURNITURE, AND OTHER ENCROACHMENTS SHALL BE 4 FEET OR GREATER TO PROVIDE SAFE CONDITIONS FOR PEDESTRIANS AND BICYCLISTS PER THE ENGINEERING CRITERIA MANUAL.
- ROADWAY LANDSCAPE BUFFERS: A TWENTY-FOOT (20') LANDSCAPE BUFFER ADJACENT TO MEADOWBROOK PARKWAY FOR MINOR ARTERIAL ROAD/STREET LANDSCAPING AND BUFFERING. REQUIRED ROADWAY TREES TO BE INSTALLED WITHIN THE BUFFER AT A RATIO OF 1/25 FEET OF LINEAR FRONTAGE ALONG THE MEADOWBROOK PARKWAY FRONTAGE. A TWENTY-FIVE-FOOT (25') LANDSCAPE BUFFER IS REQUIRED ADJACENT TO US HIGHWAY 24 FOR EXPRESSWAY/PRINCIPAL ARTERIAL ROAD/STREET LANDSCAPING AND BUFFERING. A FIFTY-FOOT (50') BUFFER HAS BEEN PROVIDED. REQUIRED ROADWAY TREES TO BE INSTALLED WITHIN THE BUFFER AT A RATIO OF 1/20 FEET OF LINEAR FRONTAGE ALONG THE US HIGHWAY 24 FRONTAGE.
- ZONING DISTRICT BOUNDARY LANDSCAPE BUFFER: A FIFTEEN-FOOT (15') ZONING DISTRICT (RS 5000 ZONED) LOTS TO THE NORTH IN MEADOWBROOK CROSSING FILING NO 1 ADJACENT TO THE NORTH SIDE OF MEADOWBROOK PARKWAY AND THE PROPOSED PUDSP, REQUIRED LANDSCAPE BUFFER TREES IS 1/30 LINEAR FEET OF AFFECTED PROPERTY BOUNDARY. CIRCLE K (CR ZONE) TO THE SOUTHWEST, AND MINI WAREHOUSE STORAGE FACILITY (CS ZONE) TO THE NORTH EAST, AND US HIGHWAY 24 (EXPRESSWAY) LOCATED ON THE SOUTHERN PROPERTY BOUNDARY.
- A MINIMUM 1/3 OF ALL LANDSCAPE BUFFER TREES IN ALL LANDSCAPE BUFFER CATEGORIES SHALL BE EVERGREEN.

TRACT USE STANDARDS:

- PERMITTED TRACT USES INCLUDE: ACCESS (INGRESS/EGRESS), MAIL KIOSKS, DEVELOPMENT SIGNAGE, FENCING, UTILITIES, STORMWATER FACILITIES, DRAINAGE IMPROVEMENTS, OPEN SPACE/PARK AND LANDSCAPE IMPROVEMENTS, PARKS AND ASSOCIATED PARK RELATED EQUIPMENT, TRAIL CORRIDORS, PRIVATE PEDESTRIAN WALKWAYS & PUBLIC SIDEWALKS, AND ON-STREET PARKING WHERE DESIGNATED.
- TRACTS "A" THROUGH "G" INCLUSIVE, SHALL BE DEDICATED AS AND PLATTED WITH UTILITY EASEMENTS FOR ADDITIONAL UTILITY LINES AND APPURTENANCE WITHIN THE PROPOSED TRACTS. ALL PRELIMINARY FINAL UTILITY DESIGN SHALL BE COORDINATED WITH THE RESPECTIVE UTILITY SERVICE PROVIDER AND SUBJECT TO REVIEW BY THE PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT AND PUBLIC WORKS (COUNTY ENGINEER) FOR COMPLIANCE WITH ESTABLISHED LDC AND ECM CRITERIA. UTILITY PROVIDERS INCLUDE: COLORADO SPRINGS UTILITIES, AND CHEROKEE METRO DISTRICT. ALL ENTITIES HAVE REVIEWED THIS PUD WITH RESPECT TO THE LOCATION OF PROPOSED UTILITIES WITHIN THE PROPOSED LOT, TRACT, STREET AND DRIVE NETWORK.
- STRUCTURES SHALL BE SETBACK A MINIMUM 10' FROM OPEN SPACES AND TRAILS. THE REQUIRED 10' SEPARATION IS PROVIDED VIA LANDSCAPE BUFFER/SETBACK TRACTS "A" THROUGH "G", INCLUSIVE.
- ALL OPEN SPACE AMENITIES, INCLUDING OUTDOOR FURNITURE AND ASSOCIATED EQUIPMENT, SHALL BE OWNED AND MAINTAINED BY THE MEADOWBROOK CROSSING METRO DISTRICT NO. 1.
- PRIVATE ROAD (INGRESS/EGRESS): TRACT "B" IS DESIGNATED FOR USE AS PRIVATE ROADS TO PROVIDE ACCESS INTO THE SUBDIVISION AND TO (FRONT/REAR) LOADED GARAGES ATTACHED TO EACH DETACHED UNIT. ALL ROADS SHALL BE CONSTRUCTED TO THE APPROVED CROSS SECTION LOCATED ON THE STREET/ROAD DETAIL SHEET OF THIS PLAN. THE USE OF PRIVATE ROADS AND PRIVATE ROADS WHICH DO NOT MEET ECM STANDARDS WITHIN THE PUD REQUIRES AUTHORIZATION BY THE BOCC.
- THE FOLLOWING TRACTS HAVE BEEN PLANNED FOR USE AS PRIVATE ROADS AND WILL BE OWNED AND MAINTAINED BY THE MEADOWBROOK CROSSING METRO DISTRICT NO. 1:
  - TRACT B: SOLUM GROVE
  - TRACT B: TENEBRIS POINT
  - TRACT B: NOVA VIEW
  - TRACT B & TRACT E: LUX POINT
  - TRACT B: CELESTE HEIGHTS
- ON-STREET PARKING IS NOT PERMITTED ON PRIVATE ROADS WITHIN TRACT "B" (SOLUM GROVE, TENEBRIS POINT, NOVA VIEW, LUX POINT AND CELESTE HEIGHTS), DESIGNATED PARKING OFF VIA STRIPED GUEST PARKING AREAS WHICH ARE LOCATED WITHIN TRACT "B" BUT OUTSIDE OF THE PRIVATE ROAD CROSS SECTIONS.
- TRACT "B" IS TO BE OWNED ENTIRELY BY THE MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1, TO INCLUDE DETENTION AND LANDSCAPING LOCATED THEREIN. A LICENSE AGREEMENT FOR LANDSCAPE MAINTENANCE AND DETENTION POND MAINTENANCE AGREEMENT SHALL BE ESTABLISHED WITH THE METRO DISTRICT WITH ANY ASSOCIATED FINAL PLATS.
- TRACT "B" IS TO BE OWNED ENTIRELY BY MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1, TO INCLUDE DETENTION AND LANDSCAPING LOCATED THEREIN. A LICENSE AGREEMENT FOR LANDSCAPE MAINTENANCE AND DETENTION POND MAINTENANCE AGREEMENT SHALL BE ESTABLISHED WITH THE MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1 WITH ANY ASSOCIATED FINAL PLATS.
- GAZEBOES, PAVILIONS, PLAY GROUND EQUIPMENT, OUTDOOR SEATING AND OTHER ACCESSORY STRUCTURES SHALL BE EXCLUDED FROM RESTRICTIONS IN ANY OPEN SPACE AND LANDSCAPE TRACTS, AND IS TO BE INSTALLED AND MAINTAINED BY THE DEVELOPER, OR MEADOWBROOK CROSSING METROPOLITAN DISTRICT NO. 1, ARE PERMITTED.
- OPEN SPACE/LANDSCAPING IMPROVEMENTS LOCATED IN TRACTS WHICH MEET THE CLASSIFICATION OF STRUCTURES AS DEFINED IN THE LDC MAY BE SUBJECT TO A BUILDING PERMIT, PRIOR TO CONSTRUCTION.



SITE SPECIFIC NOTES:

- ADDITIONAL DEVELOPMENT DETAILS FOR THE FOLLOWING AREA MAY BE FOUND AT:
  - TRACT TABLE DETAILS AND DIAGRAMS (SEE SHEET 4)
  - LOT DETAILS, DRIVEWAYS AND PARKING (SEE SHEET 2)
  - OPEN SPACE AMENITIES (SEE SHEET 6, 7 L4 & L4)
  - STREET, FENCE & SIGN DETAILS (SEE SHEET 3)
  - LANDSCAPE PLAN & DETAILS (SEE SHEETS L1-L4)

TRACT HATCH LEGEND

- |  |                              |
|--|------------------------------|
|  | LANDSCAPE/BUFFER TRACT HATCH |
|  | OPEN SPACE TRACT HATCH       |
|  | PRIVATE ROAD TRACT HATCH     |
|  | DETENTION POND TRACT HATCH   |

County File Number: PUDSP208

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN

Kimley»Horn

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
1970 NORTH NEW YORK AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

PROJECT NO.  
096956009

SHEET

04 OF 10

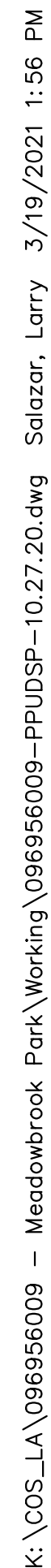
REVISION NO. BY DATE APPR.



[illegible]

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

PROJECT NO. 096956009
SHEET  05 OF 10





[illegible]

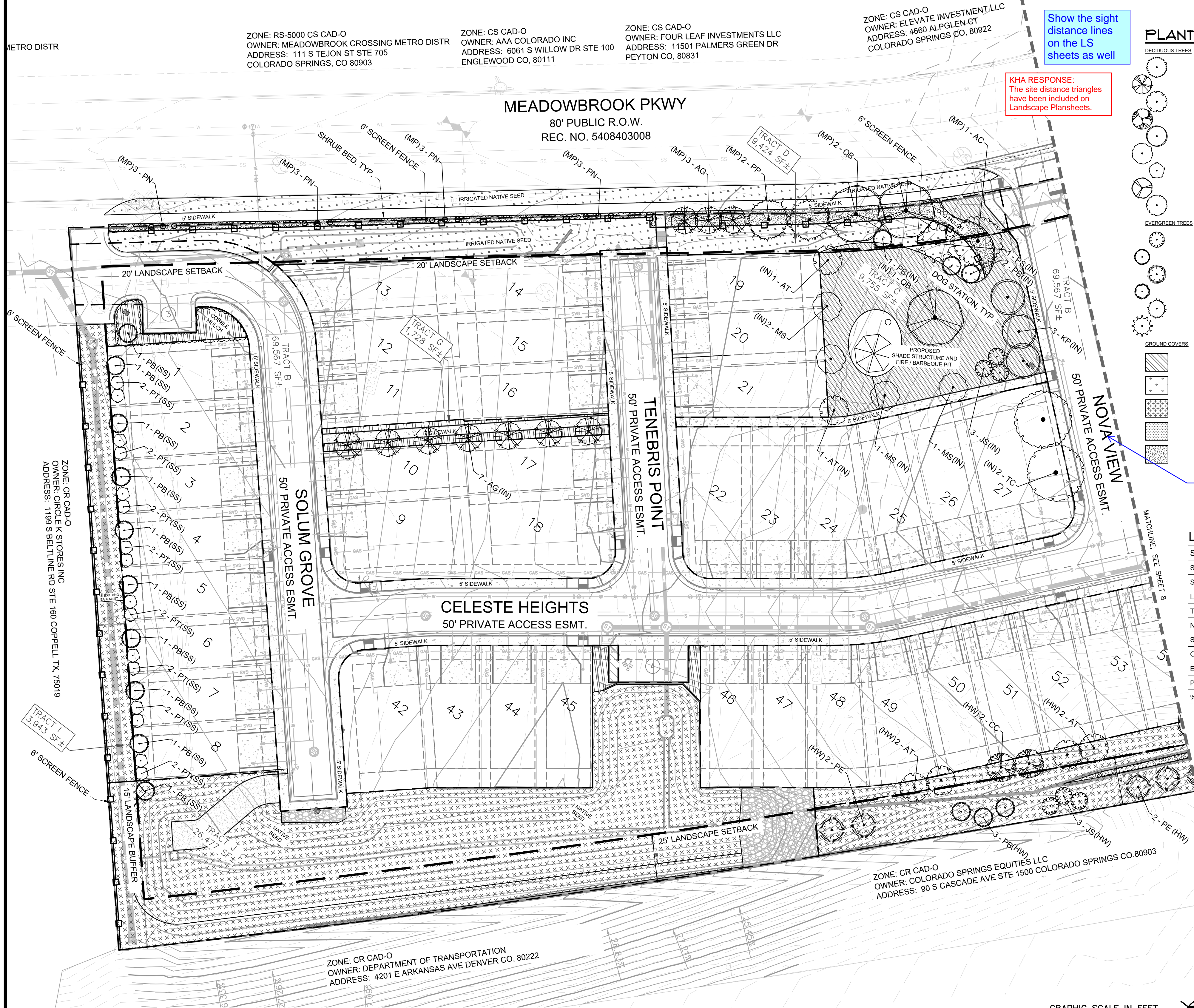
DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

PROJECT NO. 096956009
SHEET  06 OF 10





MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN  
LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO



PLANT SCHEDULE

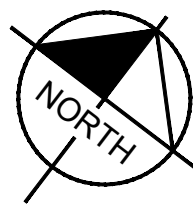
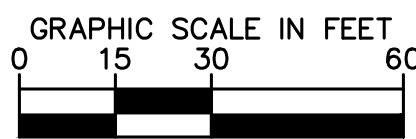
DECIDUOUS TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	SIZE/CAL	WIDTH	HEIGHT
AC	2		AESCULUS X CARNEA 'BRIOTI'	BRIOTI RED HORSECHESTNUT	B & B	2" CAL MIN	25'-35'	25'-35'
AG	25		AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLANCE'	AUTUMN BRILLANCE SERVICEBERRY	B & B	2" CAL MIN	15'-20'	15'-25'
AT	19		ACER TATARICUM 'HOT WINGS'	HOT WINGS TATARIAN MAPLE	B & B	2" CAL MIN	15'-20'	15'-20'
CC	15		CRATAEGUS CRUS-GALLI 'INERMIS'	THORNLESS HAWTHORN	B & B	2" CAL MIN	20'-30'	20'-30'
KP	12		KOELREUTERIA PANICULATA	GOLDEN RAIN TREE	B & B	2" CAL MIN	20'-30'	20'-30'
MS	6		MALUS X 'SPRING SNOW'	SPRING SNOW CRABAPPLE	B & B	2" CAL MIN	15'-20'	15'-25'
PT	16		POPULUS X CANESCENS 'TOWER'	TOWER POPLAR	B & B	2" CAL MIN	8'-10'	30'-35'
QB	10		QUERCUS BICOLOR	SWAMP WHITE OAK	B & B	2" CAL MIN	40'-50'	40'-60'
TC	4		TILIA CORDATA	LITTLELEAF LINDEN	B & B	2" CAL MIN	30'-40'	40'-50'
EVERGREEN TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	SIZE/CAL	WIDTH	HEIGHT
JS	8		JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER	B & B	6" HGT.	8'-12'	20'-30'
PB	29		PICEA PLUNGENS 'BABY BLUE EYES'	BABY BLUE EYES COLORADO BLUE SPRUCE	B & B	6" HGT.	10'-15'	20'-30'
PE	31		PINUS EDULIS	PINON PINE	B & B	6" HGT.	15'-20'	20'-30'
PN	12		PINUS NIGRA 'KOMET'	KOMET AUSTRIAN PINE	B & B	6" HGT.	3'-5'	15'-20'
PP	8		PINUS PONDEROSA	PONDEROSA PINE	B & B	6" HGT.	30'-40'	60'+
PR	11		PINUS SYLVESTRIS	SCOTCH PINE	B & B	6" HGT.	20'-30'	35'-50'
GROUND COVERS	CODE	QTY	BOTANICAL NAME	COMMON NAME	TYPE	INSTALL RATE	WEED FABRIC	MFL
ROCK		5,189 SF		3/4" TO 1-1/2" ROCK MULCH	ROCK MULCH	4"	YES	PIONEER SAND
SEED A		11,559 SF		PBSI LOW GROW MIX	SEED			PAWNEE BUTTES SEED INC.
SEED B		79,567 SF		PBSI NATIVE PRAIRIE MIX	SEED			PAWNEE BUTTES SEED INC.
SOD		20,722 SF		SURVIVALIST TALL FESCUE	SOD			GREEN BELT TURF FARM
WM		6,138 SF		WOOD MULCH	MULCH	4" DEPTH	YES	C&C SAND

LANDSCAPE SETBACKS & BUFFERS:

STREET NAME OR ZONE BOUNDARY:	MEADOWBROOK PW	HWY 24	NORTH SIDE	SOUTH SIDE
STREET CLASSIFICATION:	MINOR ARTERIAL	EXPRESSWAY	N/A	N/A
SETBACK DEPTH REQUIRED/PROVIDED:	20' / 20'	25' / 25'	15' / 15'	15' / 15'
LINEAR FOOTAGE:	788'	1161'	541'	378'
TREE/FEET REQUIRED:	1 / 25	1 / 20'	1 / 15'	1 / 15'
NUMBER OF TREES REQUIRED/PROVIDED:	32 / 32	58 / 58	35 / 35	26 / 26
SHRUB SUBSTITUTES REQUIRED/PROVIDED:	0 / 0	0 / 0	0 / 0	0 / 0
ORNAMENTAL GRASS SUBSTITUTES REQ./PROV.	0 / 0	0 / 0	0 / 0	0 / 0
EVERGREEN TREES REQ./PROV.	N/A	N/A	12 / 23	9 / 10
PLANT ABBREVIATION DENOTED ON PLAN:	MP	HW	NS	SS
% GROUND PLANE VEG. REQUIRED/PROVIDED:	75%/75%	75%/75%	75%/75%	75%/75%

INTERNAL LANDSCAPING:

NET SITE AREA (AREAS A & C):	348,971 SF (8.01 AC)
PERCENT MINIMUM INTERNAL AREA:	15%
INTERNAL AREA REQUIRED/PROVIDED:	52,345 SF / 123,175 SF
TREE/SQUARE FEET REQUIRED:	1/500
INTERNAL TREES REQUIRED/PROVIDED:	105 / 57
SHRUB SUBSTITUTES REQUIRED/PROVIDED:	480 / 480
ORN. GRASS SUBSTITUTES REQ./PROV.:	0 / 0
INTERNAL PLANT ABBREVIATED ON PLAN:	IN
% GROUND PLANE VEG. REQUIRED/PROVIDED:	75%/75%



County File Number: PUDSP208

Kimley»Horn

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
2021 KIMLEY-HORN AND ASSOCIATES, INC.  
2021 KIMLEY-HORN AND ASSOCIATES, INC.

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN  
LANDSCAPE PLAN

PROJECT NO.  
096956009

SHEET

7 OF 11

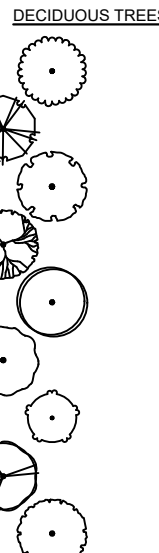
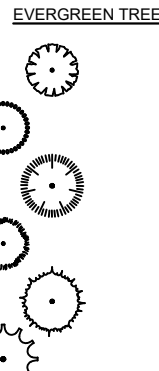
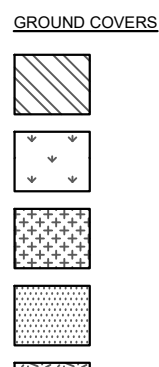
BY DATE APPR

REVISION NO.

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

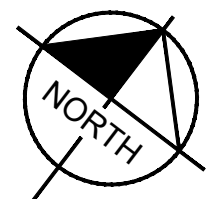


[illegible]

DECIDUOUS TREES		CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	SIZE/CAL	WIDTH	HEIGHT
	AC	2	AESCULUS X CARNIEA 'BRIOTI'	BROTH RED HORSECHESTNUT	8.8.8	2" CAL MIN	25'-35'	25'-35'	
	AG	25	AMELANCHER X GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	8.8.8	2" CAL MIN	15'-20'	15'-25'	
	AT	19	ACER TATARICUM 'HOT WINGS'	HOT WINGS TATARIAN MAPLE	8.8.8	2" CAL MIN	15'-20'	15'-20'	
	CC	15	CRATAEGUS CRUS-GALLI 'INFERMIS'	THORNLESS HAWTHORN	8.8.8	2" CAL MIN	20'-30'	20'-30'	
	KP	12	KOELREUTERIA PANCULATA	GOLDEN RAIN TREE	8.8.8	2" CAL MIN	20'-30'	20'-30'	
	MS	6	MALUS X 'SPRING SNOW'	SPRING SNOW CRABAPPLE	8.8.8	2" CAL MIN	15'-20'	15'-25'	
	PT	16	POPULUS X CANESCENS 'TOWER'	TOWER POPLAR	8.8.8	2" CAL MIN	8'-10'	30'-35'	
	QB	10	QUERCUS BICOLOR	SWAMP WHITE OAK	8.8.8	2" CAL MIN	40'-50'	40'-60'	
	TC	4	TILIA CORDATA	LITTLELEAF LINDEN	8.8.8	2" CAL MIN	30'-40'	45'-50'	
EVERGREEN TREES									
	JS	8	JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER	8.8.8	6' HGT.	8'-12'	20'-30'	
	PB	29	PICEA PUNGENS 'BABY BLUE EYES'	BABY BLUE EYES COLORADO BLUE SPRUCE	8.8.8	6' HGT.	10'-15'	20'-30'	
	PE	31	PIRUS EDULIS	PINON PINE	8.8.8	6' HGT.	15'-20'	20'-30'	
	PN	12	PIRUS NIGRA 'KOMET'	KOMET AUSTRIAN PINE	8.8.8	6' HGT.	3'-5'	15'-20'	
	PP	8	PIRUS PONDEROSA	PONDEROSA PINE	8.8.8	6' HGT.	30'-40'	60'+	
	PS	11	PIRUS SYLVESTRIS	SCOTCH PINE	8.8.8	6' HGT.	20'-30'	35'-50'	
GROUND COVERS									
	ROCK	5,189 SF		3/4" TO 1-1/2" ROCK MULCH	ROCK MULCH	4"	YES	PIONEER SAND	
	SEED A	11,559 SF		PBSI LOW GROW MIX	SEED			PAWNEE BUTTE	
	SEED B	79,567 SF		PBSI NATIVE PRAIRIE MIX	SEED			PAWNEE BUTTE	
	SOD	20,722 SF		SURVIVALIST TALL FESCUE	SOD			GREEN BELT TURF	
	WM	6,138 SF		WOOD MULCH	MULCH	4" DEPTH	YES	C&S SAND	

GRAPHIC SCALE IN FEET

A horizontal scale bar with tick marks at 0, 15, 30, and 60 feet. The bar is divided into three equal segments of 15 feet each. The first segment (0 to 15) is white, the second (15 to 30) is black, and the third (30 to 60) is white.



**MEADOWBROOK PARK**  
**PLANNED UNIT DEVELOPMENT (PUD) PLAN**  
**LANDSCAPE PLAN**

SHEET

8 OF 11

**Kimley»»Horn**  
2021 KIMLEY-HORN AND ASSOCIATES, INC.

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
2 NORTH NEVADA AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80907 (719)

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

[illegible]



K:\COS\_LA\096956009 - Meadowbrook Park\CADD\PlanSheets\096956009-LA.dwg Salazar, Larry 3/19/2021 1:57 PM

# MEADOWBROOK PARK

## PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN

LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO

### GENERAL LANDSCAPE SPECIFICATIONS

- A. SCOPE OF WORK
1. THE WORK CONSISTS OF: FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, TRANSPORTATION, AND ANY OTHER APPURTENANCES NECESSARY FOR THE COMPLETION OF THIS PROJECT AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.
  2. WORK SHALL INCLUDE MAINTENANCE AND WATERING OF ALL CONTRACT PLANTING AREAS UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER.
- B. PROTECTION OF EXISTING STRUCTURES
1. ALL EXISTING BUILDINGS, WALKS, WALLS, PAVING, PIPING, OTHER SITE CONSTRUCTION ITEMS, AND PLANTING ALREADY COMPLETED OR ESTABLISHED AND DESIGNATED TO REMAIN SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. ALL DAMAGE RESULTING FROM NEGLIGENCE SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER, AT NO COST TO THE OWNER.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL NECESSARY BEST MANAGEMENT PRACTICES (BMP) DEVICES ACCORDING TO ALL REGULATORY AGENCY'S STANDARDS THROUGHOUT THE DURATION OF ALL CONSTRUCTION ACTIVITIES.
  3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MAINTENANCE OF TRAFFIC (MOT) THAT MAY BE REQUIRED FOR THE PROJECT.
  4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES, WHETHER PUBLIC OR PRIVATE, PRIOR TO EXCAVATION. THE OWNER AND DESIGN PROFESSIONAL SHALL NOT BE RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF ANY SUCH INFORMATION OR DATA. THE CONTRACTOR SHALL HAVE FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL SUCH INFORMATION AND DATA, LOCATING ALL UNDERGROUND FACILITIES DURING CONSTRUCTION, THE SAFETY AND PROTECTION THEREOF, REPAIRING ANY DAMAGE THERETO RESULTING FROM THE WORK. THE COST OF ALL WILL BE CONSIDERED AS HAVING BEEN INCLUDED IN THE CONTRACT PRICE. THE CONTRACTOR SHALL NOTIFY ANY AFFECTED UTILITY COMPANIES OR AGENCIES IN WRITING AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
- C. PROTECTION OF EXISTING PLANT MATERIALS
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UNAUTHORIZED CUTTING OR DAMAGE TO TREES AND SHRUBS EXISTING OR OTHERWISE, CAUSED BY CARELESS EQUIPMENT OPERATION, MATERIAL STOCKPILING, ETC.. THIS SHALL INCLUDE COMPACTION BY DRIVING OR PARKING INSIDE THE DRIP-LINE AND SPILLING OIL, GASOLINE, OR OTHER DELETERIOUS MATERIALS WITHIN THE DRIP-LINE. NO MATERIALS SHALL BE BURNED ON SITE. EXISTING TREES KILLED OR DAMAGED SO THAT THEY ARE MISSHAPEN AND/OR UNSIGHTLY SHALL BE REPLACED AT THE COST TO THE CONTRACTOR OF FOUR HUNDRED DOLLARS (\$400) PER CALIPER INCH ON AN ESCALATING SCALE WHICH ADDS AN ADDITIONAL TWENTY (20) PERCENT PER INCH OVER FOUR (4) INCHES CALIPER AS FIXED AND AGREED LIQUIDATED DAMAGES. CALIPER SHALL BE MEASURED SIX (6) INCHES ABOVE GROUND LEVEL FOR TREES UP TO AND INCLUDING FOUR (4) INCHES IN CALIPER AND TWELVE (12) INCHES ABOVE GROUND LEVEL FOR TREES OVER FOUR (4) INCHES IN CALIPER.
  2. SEE TREE MITIGATION PLAN AND NOTES, IF APPLICABLE.
- D. MATERIALS
1. GENERAL  
MATERIAL SAMPLES LISTED BELOW SHALL BE SUBMITTED FOR APPROVAL, ON SITE OR AS DETERMINED BY THE OWNER. UPON APPROVAL, DELIVERY OF MATERIALS MAY COMMENCE.  

MATERIAL	SAMPLE SIZE
MULCH	ONE (1) CUBIC FOOT
TOPSOIL MIX	ONE (1) CUBIC FOOT
PLANTS	ONE (1) OF EACH VARIETY (OR TAGGED IN NURSERY)
  2. PLANT MATERIALS
    - a. FURNISH NURSERY-GROWN PLANTS TRUE TO GENUS, SPECIES, VARIETY, CULTIVAR, STEM FORM, SHEARING, AND OTHER FEATURES INDICATED IN PLANT SCHEDULE SHOWN ON DRAWINGS AND COMPLYING WITH ANSI Z60.1 AND THE COLORADO NURSERY ACT; AND WITH HEALTHY ROOT SYSTEMS DEVELOPED BY TRANSPLANTING OR ROOT PRUNING. PROVIDE WELL-SHAPED, FULLY BRANCHED, HEALTHY, VIGOROUS STOCK, DENSELY FOLIATED WHEN IN LEAF AND FREE OF DISEASE, PESTS, EGGS, LARVAE, AND DEFECTS SUCH AS KNOTS, SUN SCALD, INJURIES, ABRASIONS, AND DISFIGUREMENT.
    - b. TREES FOR PLANTING IN ROWS SHALL BE UNIFORM IN SIZE AND SHAPE.
    - c. NO SUBSTITUTIONS SHALL BE MADE WITHOUT WRITTEN PERMISSION FROM THE PROJECT LANDSCAPE ARCHITECT. ANY ROW TREES MUST BE APPROVED BY OFFICE OF THE CITY FORESTER.
    - d. PROVIDE PLANTS OF SIZES, GRADES, AND BALL OR CONTAINER SIZES COMPLYING WITH ANSI Z60.1 AND COLORADO NURSERY ACT FOR TYPES AND FORM OF PLANTS REQUIRED. PLANTS OF A LARGER SIZE MAY BE USED IF ACCEPTABLE TO PROJECT LANDSCAPE ARCHITECT WITH A PROPORTIONATE INCREASE IN SIZE OF ROOTS OR BALLS.
    - e. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, OR UPON DELIVERY TO THE SITE, AS DETERMINED BY THE OWNER. FOR QUALITY, SIZE, AND VARIETY, SUCH APPROVAL SHALL NOT IMPAIR THE RIGHT OF INSPECTION AND REJECTION AT THE SITE DURING PROGRESS OF THE WORK OR AFTER COMPLETION FOR SIZE AND CONDITION OF ROOT BALLS OR ROOTS, LATENT DEFECTS OR INJURIES. REJECTED PLANTS SHALL BE REMOVED IMMEDIATELY FROM THE SITE. NOTICE REQUESTING INSPECTION SHALL BE SUBMITTED IN WRITING BY THE CONTRACTOR AT LEAST ONE (1) WEEK PRIOR TO ANTICIPATED DATE.
    - f. TREES WITH DAMAGED, CROOKED, OR MULTIPLE LEADERS; TIGHT VERTICAL BRANCHES WHERE BARK IS SQUEEZED BETWEEN TWO BRANCHES OR BETWEEN BRANCH AND TRUNK ("INCLUDED BARK"); CROSSING TRUNKS; CUT-OFF LIMBS MORE THAN 1/2 INCH (19 MM) IN DIAMETER, OR WITH STEM GIRDLING WOUNDS WILL BE REJECTED.
    - g. FURNISH TREES AND SHRUBS WITH ROOT BALLS MEASURED FROM TOP OF ROOT BALL, WHICH SHALL BEGIN AT ROOT FLARE ACCORDING TO ANSI Z60.1 AND COLORADO NURSERY ACT. ROOT FLARE SHALL BE VISIBLE BEFORE PLANTING.
    - h. LABEL AT LEAST ONE PLANT OF EACH VARIETY, SIZE, AND CALIPER WITH A SECURELY ATTACHED, WATERPROOF TAG BEARING LEGIBLE DESIGNATION OF COMMON NAME AND FULL SCIENTIFIC NAME, INCLUDING GENUS AND SPECIES, INCLUDE NOMENCLATURE FOR HYBRID, VARIETY, OR CULTIVAR, IF APPLICABLE FOR THE PLANT AS SHOWN ON DRAWINGS.
    - i. IF FORMAL ARRANGEMENTS OR CONSECUTIVE ORDER OF PLANTS IS SHOWN ON DRAWINGS, SELECT STOCK FOR UNIFORM HEIGHT AND SPREAD, AND NUMBER THE LABELS TO ASSURE SYMMETRY IN PLANTING.
- E. SOIL MIXTURE
1. CONTRACTOR SHALL TEST EXISTING SOIL AND AMEND AS NECESSARY IN ACCORDANCE WITH THE GUIDELINES BELOW:
  2. SOIL MIXTURE SHALL CONSIST OF TWO PARTS OF TOPSOIL AND ONE PART SAND, AS DESCRIBED BELOW. CONTRACTOR TO SUBMIT SAMPLES AND PH TESTING RESULTS OF SOIL MIXTURE FOR OWNER'S REPRESENTATIVE APPROVAL PRIOR TO PLANT INSTALLATION OPERATIONS COMMENCE.
    - a. TOPSOIL FOR USE IN PREPARING SOIL MIXTURE FOR BACKFILLING PLANT OPENINGS SHALL BE FERTILE, FRIABLE, AND OF A LOAMY CHARACTER, REASONABLY FREE OF SUBSOIL, CLAY LUMPS, BRUSH WEEDS AND OTHER LITTER, FREE OF ROOTS, STUMPS, STONES LARGER THAN 2" IN ANY DIRECTION, AND OTHER EXTRANEIOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH. IT SHALL CONTAIN THREE (3) TO FIVE (5) PERCENT DECOMPOSED ORGANIC MATTER, HAVE A PH BETWEEN 5.5 AND 8.0, AND SOLUBLE SALTS LESS THAN 3.0 MMHOS/CM. SUBMIT SOIL SAMPLE AND PH TESTING RESULTS FOR APPROVAL.
    - b. SAND SHALL BE COARSE, CLEAN, WELL-DRAINING, NATIVE SAND.
  3. TREES SHALL BE PLANTED IN THE EXISTING NATIVE SOIL ON SITE, UNLESS DETERMINED TO BE UNSUITABLE - AT WHICH POINT THE CONTRACTOR SHALL CONTACT THE PROJECT LANDSCAPE ARCHITECT TO DISCUSS ALTERNATE RECOMMENDATION PRIOR TO PLANTING.
- F. WATER
1. WATER NECESSARY FOR PLANTING AND MAINTENANCE SHALL BE OF SATISFACTORY QUALITY TO SUSTAIN ADEQUATE PLANT GROWTH AND SHALL NOT CONTAIN HARMFUL, NATURAL OR MAN-MADE ELEMENTS DETRIMENTAL TO PLANTS. WATER MEETING THE ABOVE STANDARD SHALL BE OBTAINED ON THE SITE (IF AVAILABLE). IF AVAILABLE, THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE ARRANGEMENTS FOR ITS USE BY HIS TANKS, HOSES, SPRINKLERS, ETC.... IF SUCH WATER IS NOT AVAILABLE AT THE SITE, THE CONTRACTOR SHALL PROVIDE SATISFACTORY WATER FROM SOURCES OFF THE SITE AT NO ADDITIONAL COST TO THE OWNER.  
  
\* WATERING/IRRIGATION RESTRICTIONS MAY APPLY - REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.
- G. FERTILIZER
1. CONTRACTOR SHALL PROVIDE FERTILIZER APPLICATION SCHEDULE TO OWNER, AS APPLICABLE TO SOIL TYPE, PLANT INSTALLATION TYPE, AND SITE'S PROPOSED USE. SUGGESTED FERTILIZER TYPES SHALL BE ORGANIC OR OTHERWISE NATURALLY-DERIVED.  
  
\* FERTILIZER RESTRICTIONS MAY APPLY - REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.

- H. MULCH
1. MULCH MATERIAL SHALL BE MOISTENED AT THE TIME OF APPLICATION TO PREVENT WIND DISPLACEMENT, AND APPLIED AT A DEPTH OF THREE (3) INCHES CLEAR MULCH FROM EACH PLANT'S CROWN (BASE) OR AS SHOWN IN PLANTING DETAILS. MULCH SHALL BE DOUBLE SHREDDED HARDWOOD MULCH. DYED MULCH IS NOT ACCEPTABLE. SUBMIT SAMPLES TO PROJECT LANDSCAPE ARCHITECT FOR APPROVAL. MULCH SHALL BE PROVIDED OVER THE ENTIRE AREA OF EACH SHRUB BED, GROUND COVER, VINE BED, AND TREE RING (6" MINIMUM) PLANTED UNDER THIS CONTRACT, AS WELL AS FOR ANY EXISTING LANDSCAPE AREAS AS SHOWN ON PLANS.
- I. DIGGING AND HANDLING
1. ALL TREES SPECIFIED SHALL BE BALLED AND BURLAPPED (B&B) UNLESS OTHERWISE APPROVED BY PROJECT LANDSCAPE ARCHITECT.
  2. PROTECT ROOTS OR ROOT BALLS OF PLANTS AT ALL TIMES FROM SUN, DRYING WINDS, WATER AND FREEZING. AS NECESSARY UNTIL PLANTING. PLANT MATERIALS SHALL BE ADEQUATELY PACKED TO PREVENT DAMAGE DURING TRANSIT. TREES TRANSPORTED MORE THAN TEN (10) MILES OR WHICH ARE NOT PLANTED WITHIN THREE (3) DAYS OF DELIVERY TO THE SITE SHALL BE SPRAYED WITH AN ANTITRANSPIRANT PRODUCT ("WILTRFUP" OR EQUAL) TO MINIMIZE TRANSPIRATIONAL WATER LOSS.
  3. B&B AND FIELD GROWN (FG) PLANTS SHALL BE DUG WITH FIRM, NATURAL BALLS OF SOIL OF SUFFICIENT SIZE TO ENCOMPASS THE FIBROUS AND FEEDING ROOTS OF THE PLANTS. NO PLANTS MOVED WITH A ROOT BALL SHALL BE PLANTED IF THE BALL IS CRACKED OR BROKEN. PLANTS SHALL NOT BE HANDLED BY STEMS.
- J. CONTAINER GROWN STOCK
1. ALL CONTAINER GROWN MATERIAL SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED PLANTS ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THE PLANTS SHALL HAVE TOPS WHICH ARE OF GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION.
  2. AN ESTABLISHED CONTAINER GROWN PLANT SHALL BE TRANSPLANTED INTO A CONTAINER AND GROWN IN THAT CONTAINER SUFFICIENTLY LONG ENOUGH FOR THE NEW FIBROUS ROOTS TO HAVE DEVELOPED SO THAT THE ROOT MASS WILL RETAIN ITS SHAPE AND HOLD TOGETHER WHEN REMOVED FROM THE CONTAINER. CONTAINER GROWN STOCK SHALL NOT BE HANDLED BY THEIR STEMS.
  3. ROOT BOUND PLANTS ARE NOT ACCEPTABLE AND WILL BE REJECTED.
- K. MATERIALS LIST
1. QUANTITIES NECESSARY TO COMPLETE THE WORK ON THE DRAWINGS SHALL BE FURNISHED BY THE CONTRACTOR. QUANTITY ESTIMATES HAVE BEEN MADE CAREFULLY, BUT THE LANDSCAPE ARCHITECT OR OWNER ASSUMES NO LIABILITY FOR OMISSIONS OR ERRORS. SHOULD A DISCREPANCY OCCUR BETWEEN THE PLANS AND THE PLANT LIST QUANTITY, THE PLANS SHALL GOVERN. ALL DIMENSIONS AND/OR SIZES SPECIFIED SHALL BE THE MINIMUM ACCEPTABLE SIZE.
- L. FINE GRADING
1. FINE GRADING UNDER THIS CONTRACT SHALL CONSIST OF FINAL FINISHED GRADING OF LAWN AND PLANTING AREAS THAT HAVE BEEN DISTURBED DURING CONSTRUCTION.
  2. THE CONTRACTOR SHALL FINE GRADE THE LAWN AND PLANTING AREAS TO BRING THE ROUGH GRADE UP TO FINAL FINISHED GRADE ALLOWING FOR THICKNESS OF SOD AND/OR MULCH DEPTH.
  3. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED FOR POSITIVE DRAINAGE TO SURFACE/SUBSURFACE STORM DRAIN SYSTEMS. AREAS ADJACENT TO BUILDINGS SHALL SLOPE AWAY FROM THE BUILDINGS. REFER TO CIVIL ENGINEER'S PLANS FOR FINAL GRADES, IF APPLICABLE.
- M. PLANTING PROCEDURES
1. THE CONTRACTOR SHALL CLEAN WORK AND SURROUNDING AREAS OF ALL RUBBISH OR OBJECTIONABLE MATTER DAILY. ALL MORTAR, CEMENT, BUILDING MATERIALS, AND TOXIC MATERIAL SHALL BE COMPLETELY REMOVED FROM PLANTING AREAS. THESE MATERIALS SHALL NOT BE MIXED WITH THE SOIL. SHOULD THE CONTRACTOR FIND SUCH SOIL CONDITIONS IN PLANTING AREAS WHICH WILL ADVERSELY AFFECT THE PLANT GROWTH, THE CONTRACTOR SHALL IMMEDIATELY CALL IT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE. FAILURE TO DO SO BEFORE PLANTING SHALL MAKE THE CORRECTIVE MEASURES THE RESPONSIBILITY OF THE CONTRACTOR.
  2. VERIFY LOCATIONS OF ALL UTILITIES, CONDUITS, SUPPLY LINES AND CABLES, INCLUDING BUT NOT LIMITED TO: ELECTRIC, GAS (LINES AND TANKS), WATER, SANITARY SEWER, STORMWATER SYSTEMS, CABLE AND TELEPHONE. PROPERLY MAINTAIN AND PROTECT EXISTING UTILITIES. CALL COLORADO (811) TO LOCATE UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
  3. CONTRACTOR IS RESPONSIBLE TO REMOVE ALL EXISTING AND IMPORTED LIMEROCK AND LIMEROCK SUB-BASE FROM ALL PLANTING AREAS TO A MINIMUM DEPTH OF 36" OR TO NATIVE SOIL. CONTRACTOR IS RESPONSIBLE TO BACKFILL THESE PLANTING AREAS TO ROUGH FINISHED GRADE WITH CLEAN TOPSOIL FROM AN ON-SITE SOURCE OR AN IMPORTED SOURCE. IF LIMEROCK OR OTHER ADVERSE CONDITIONS OCCUR IN PLANTED AREAS AFTER 36" DEEP EXCAVATION BY THE CONTRACTOR, AND POSITIVE DRAINAGE CAN NOT BE ACHIEVED, CONTRACTOR SHALL UTILIZE POOR DRAINAGE CONDITION PLANTING DETAIL.
  4. FURNISH NURSERY'S CERTIFICATE OF COMPLIANCE WITH ALL REQUIREMENTS AS SPECIFIED HEREIN. INSPECT AND SELECT PLANT MATERIALS BEFORE PLANTS ARE DUG AT NURSERY OR GROWING SITE.
  5. COMPLY WITH APPLICABLE FEDERAL, STATE, COUNTY, AND LOCAL REGULATIONS GOVERNING LANDSCAPE MATERIALS AND WORK. UPON ARRIVAL AT THE SITE, PLANTS SHALL BE THOROUGHLY WATERED AND PROPERLY MAINTAINED UNTIL PLANTED. PLANTS STORED ON-SITE SHALL NOT REMAIN UNPLANTED OR INAPPROPRIATELY HEATED FOR A PERIOD EXCEEDING TWENTY-FOUR (24) HOURS. AT ALL TIMES WORKMANLIKE METHODS CUSTOMARY IN ACCEPTED HORTICULTURAL PRACTICES AS USED IN THE TRADE SHALL BE EXERCISED.
  6. WORK SHALL BE COORDINATED WITH OTHER TRADES TO PREVENT CONFLICTS. COORDINATE PLANTING WITH IRRIGATION WORK TO ASSURE AVAILABILITY OF WATER AND PROPER LOCATION OF IRRIGATION APPURTENANCES AND PLANTS.
  7. ALL PLANTING OPENINGS SHALL BE EXCAVATED TO SIZE AND DEPTH IN ACCORDANCE WITH ANSI Z60.1-2014 AMERICAN STANDARD FOR NURSERY STOCK.
  8. TEST ALL TREE OPENINGS WITH WATER BEFORE PLANTING TO ASSURE PROPER DRAINAGE PERCOLATION IS AVAILABLE. NO ALLOWANCE WILL BE MADE FOR LOST PLANTS DUE TO IMPROPER DRAINAGE. IF POOR DRAINAGE EXISTS, UTILIZE "POOR DRAINAGE CONDITION" PLANTING DETAIL.
  9. TREES SHALL BE SET PLUMB AND HELD IN POSITION UNTIL THE PLANTING MIXTURE HAS BEEN FLUSHED INTO PLACE WITH A SLOW, FULL HOSE STREAM. ALL PLANTING SHALL BE PERFORMED BY PERSONNEL FAMILIAR WITH PLANTING PROCEDURES AND UNDER THE SUPERVISION OF A QUALIFIED LANDSCAPE FOREMAN.
  10. PRIOR TO EXCAVATION OF TREE OPENINGS, AN AREA EQUAL TO TWO TIMES THE DIAMETER OF THE ROOT BALL SHALL BE ROTO-TILLED TO A DEPTH EQUAL TO THE DEPTH OF THE ROOT BALL.
  11. EXCAVATION OF TREE OPENINGS SHALL BE PERFORMED USING EXTREME CARE TO AVOID DAMAGE TO SURFACE AND SUBSURFACE ELEMENTS SUCH AS UTILITIES OR HARDSCAPE ELEMENTS, FOOTERS AND PREPARED SUB-BASES.
  12. IN CONTINUOUS SHRUB AND GROUND COVER BEDS, THE ROTO-TILLED PERIMETER SHOULD EXTEND TO A DISTANCE OF ONE FOOT BEYOND THE DIAMETER OF A SINGLE ROOT BALL. THE BED SHALL BE TILLED TO A DEPTH EQUAL TO THE ROOT BALL DEPTH PLUS 6".
  13. TREE OPENINGS FOR WELL DRAINED SOILS SHALL BE DUG SO THAT THE BOTTOM OF THE ROOT BALL WILL REST ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL WILL BE WITH FINISH GRADE. IN POORLY DRAINED SOILS THE TREE OPENING SHALL BE DUG SO THAT THE ROOT BALL RESTS ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL IS 1" ABOVE FINISH GRADE. PLANT PIT WALLS SHALL BE SCARIFIED PRIOR TO PLANT INSTALLATION.
  14. TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO BUILDINGS AND BUILDING STRUCTURES WHILE INSTALLING TREES.
  15. SOIL MIXTURE SHALL BE AS SPECIFIED IN SECTION "E".
  16. TREES AND SHRUBS SHALL BE SET STRAIGHT AT AN ELEVATION THAT, AFTER SETTLEMENT, THE PLANT CROWN WILL STAND ONE (1) TO TWO (2) INCHES ABOVE FINISH GRADE. EACH PLANT SHALL BE SET IN THE CENTER OF THE PIT. SOIL MIXTURE SHALL BE BACK FILLED, THOROUGHLY TAMPED AROUND THE BALL, AND SETTLED BY WATER (AFTER TAMPING).
  17. AMEND PINE AND OAK PLANT OPENINGS WITH ECTOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. ALL OTHER PLANT OPENINGS SHALL BE AMENDED WITH ENDOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. PROVIDE PRODUCT INFORMATION SUBMITTAL PRIOR TO INOCULATION.

18. FILL HOLE WITH SOIL MIXTURE, MAKING CERTAIN ALL SOIL IS SATURATED. TO DO THIS, FILL HOLE WITH WATER AND ALLOW TO SOAK MINIMUM TWENTY (20) MINUTES, STIRRING IF NECESSARY TO GET SOIL THOROUGHLY WET. PACK LIGHTLY WITH FEET, ADD MORE WET SOIL MIXTURE. DO NOT COVER TOP OF BALL WITH SOIL MIXTURE.
  19. ALL BURLAP, ROPE, WIRES, BASKETS, ETC., SHALL BE REMOVED FROM THE SIDES AND TOPS OF BALLS, BUT NO BURLAP SHALL BE PULLED FROM UNDERNEATH.
  20. TREES SHALL BE PRUNED, IN ACCORDANCE WITH ANSI A-300, TO PRESERVE THE NATURAL CHARACTER OF THE PLANT. ALL SOFT WOOD OR SUCKER GROWTH AND ALL BROKEN OR BADLY DAMAGED BRANCHES SHALL BE REMOVED WITH A CLEAN CUT. ALL PRUNING TO BE PERFORMED BY CERTIFIED ARBORIST.
  21. SHRUBS AND GROUND COVER PLANTS SHALL BE EVENLY SPACED IN ACCORDANCE WITH THE DRAWINGS AND AS INDICATED ON THE PLANT LIST. MATERIALS INSTALLED SHALL MEET MINIMUM SPECIMEN REQUIREMENTS OR QUANTITIES SHOWN ON PLANS, WHICHEVER IS GREATER. CULTIVATE ALL PLANTING AREAS TO A MINIMUM DEPTH OF 6". REMOVE AND DISPOSE ALL DEBRIS. MIX TOP 4" THE PLANTING SOIL MIXTURE AS SPECIFIED IN SECTION E. THOROUGHLY WATER ALL PLANTS AFTER INSTALLATION.
  22. TREE GUYING AND BRACING SHALL BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH THE PLANS TO INSURE STABILITY AND MAINTAIN TREES IN AN UPRIGHT POSITION. IF THE CONTRACTOR AND OWNER DECIDE TO WAIVE THE TREE GUYING AND BRACING, THE OWNER SHALL NOTIFY THE PROJECT LANDSCAPE ARCHITECT IN WRITING AND AGREE TO INDEMNIFY AND HOLD HARMLESS THE PROJECT LANDSCAPE ARCHITECT IN THE EVENT UNSUPPORTED TREES PLANTED UNDER THIS CONTRACT FALL AND DAMAGE PERSON OR PROPERTY.
  23. ALL PLANT BEDS SHALL BE KEPT FREE OF NOXIOUS WEEDS UNTIL FINAL ACCEPTANCE OF WORK. IF DIRECTED BY THE OWNER, "ROUND-UP" SHALL BE APPLIED FOR WEED CONTROL BY QUALIFIED PERSONNEL TO ALL PLANTING AREAS IN SPOT APPLICATIONS PER MANUFACTURER'S RECOMMENDATIONS. PRIOR TO FINAL INSPECTION, TREAT ALL PLANTING BEDS WITH AN APPROVED PRE-EMERGENT HERBICIDE AT AN APPLICATION RATE RECOMMENDED BY THE MANUFACTURER. (AS ALLOWED BY JURISDICTIONAL AUTHORITY).
- N. LAWN SODDING
1. THE WORK CONSISTS OF LAWN BED PREPARATION, SOIL PREPARATION, AND SODDING COMPLETE, IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND THE APPLICABLE DRAWINGS TO PRODUCE A TURF GRASS LAWN ACCEPTABLE TO THE OWNER.
  2. ALL AREAS THAT ARE TO BE SODDED SHALL BE CLEARED OF ANY ROUGH GRASS, WEEDS, AND DEBRIS BY MEANS OF A SOD CUTTER TO A DEPTH OF THREE (3) INCHES, AND THE GROUND BROUGHT TO AN EVEN GRADE. THE ENTIRE SURFACE SHALL BE ROLLED WITH A ROLLER WEIGHING NOT MORE THAN ONE HUNDRED (100) POUNDS PER FOOT OF WIDTH. DURING THE ROLLING, ALL DEPRESSIONS CAUSED BY SETTLEMENT SHALL BE FILLED WITH ADDITIONAL SOIL, AND THE SURFACE SHALL BE REGRADED AND ROLLED UNTIL PRESENTING A SMOOTH AND EVEN FINISH TO THE REQUIRED GRADE.
  3. PREPARE LOOSE BED FOUR (4) INCHES DEEP. HAND RAKE UNTIL ALL BUMPS AND DEPRESSIONS ARE REMOVED. WET PREPARED AREA THOROUGHLY.
  4. SODDING
    - a. THE CONTRACTOR SHALL SOD ALL AREAS THAT ARE NOT PAVED OR PLANTED AS DESIGNATED ON THE DRAWINGS WITHIN THE CONTRACT LIMITS, UNLESS SPECIFICALLY NOTED OTHERWISE.
    - b. SOD PANELS SHALL BE LAID TIGHTLY TOGETHER SO AS TO MAKE A SOLID SODDED LAWN AREA. SOD SHALL BE LAID UNIFORMLY AGAINST THE EDGES OF ALL CURBS AND OTHER HARDSCAPE ELEMENTS, PAVED AND PLANTED AREAS, ADJACENT TO BUILDINGS. A 24 INCH STONE MULCH STRIP SHALL BE PROVIDED, IMMEDIATELY FOLLOWING SOD LAYING. THE LAWN AREAS SHALL BE ROLLED WITH A LAWN ROLLER CUSTOMARILY USED FOR SUCH PURPOSES, AND THEN THOROUGHLY IRRIGATED. IF, IN THE OPINION OF THE OWNER, TOP-DRESSING IS NECESSARY AFTER ROLLING TO FILL THE VOIDS BETWEEN THE SOD PANELS AND TO EVEN OUT INCONSISTENCIES IN THE SOD, CLEAN SAND, AS APPROVED BY THE OWNER'S REPRESENTATIVE, SHALL BE UNIFORMLY SPREAD OVER THE ENTIRE SURFACE OF THE SOD AND THOROUGHLY WATERED IN. FERTILIZE INSTALLED SOD AS ALLOWED BY PROPERTY'S JURISDICTIONAL AUTHORITY.
  5. DURING DELIVERY, PRIOR TO, AND DURING THE PLANTING OF THE LAWN AREAS, THE SOD PANELS SHALL AT ALL TIMES BE PROTECTED FROM EXCESSIVE DRYING AND UNNECESSARY EXPOSURE OF THE ROOTS TO THE SUN. ALL SOD SHALL BE STACKED SO AS NOT TO BE DAMAGED BY SWEATING OR EXCESSIVE HEAT AND MOISTURE.
  6. LAWN MAINTENANCE
    - a. WITHIN THE CONTRACT LIMITS, THE CONTRACTOR SHALL PRODUCE A DENSE, WELL ESTABLISHED LAWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AND RE-SODDING OF ALL ERODED, SUNKEN OR BARE SPOTS (LARGER THAN 12"x12") UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE. REPAIRED SODDING SHALL BE ACCOMPLISHED AS IN THE ORIGINAL WORK, INCLUDING REGRAIDDING IF NECESSARY.
    - b. CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SOD/LAWN UNTIL ACCEPTANCE BY THE OWNER'S REPRESENTATIVE. PRIOR TO AND UPON ACCEPTANCE, CONTRACTOR TO PROVIDE WATERING/IRRIGATION SCHEDULE TO OWNER. OBSERVE ALL APPLICABLE WATERING RESTRICTIONS AS SET FORTH BY THE PROPERTY'S JURISDICTIONAL AUTHORITY.
- O. EDGING
- a. CONTRACTOR SHALL INSTALL 4"x1/2" ROLLED TOP STEEL EDGING BETWEEN ALL SOD/SEED AREAS AND PLANTING BEDS.
- P. CLEANUP
1. UPON COMPLETION OF ALL PLANTING WORK AND BEFORE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL MATERIAL, EQUIPMENT, AND DEBRIS RESULTING FROM CONTRACTORS WORK. ALL PAVED AREAS SHALL BE CLEANED AND THE SITE LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER'S REPRESENTATIVE.
- Q. PLANT MATERIAL MAINTENANCE
1. ALL PLANTS AND PLANTING INCLUDED UNDER THIS CONTRACT SHALL BE MAINTAINED BY WATERING, CULTIVATING, SPRAYING, PRUNING, AND ALL OTHER OPERATIONS (SUCH AS RE-STAKING OR REPAIRING GUY SUPPORTS) NECESSARY TO INSURE A HEALTHY PLANT CONDITION BY THE CONTRACTOR UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.
- R. FINAL INSPECTION AND ACCEPTANCE OF WORK
1. FINAL INSPECTION AT THE END OF THE WARRANTY PERIOD SHALL BE ON PLANTING, CONSTRUCTION AND ALL OTHER INCIDENTAL WORK PERTAINING TO THIS CONTRACT. ANY REPLACEMENT AT THIS TIME SHALL BE SUBJECT TO THE SAME ONE (1) YEAR WARRANTY (OR AS SPECIFIED BY THE LANDSCAPE ARCHITECT OR OWNER IN WRITING) BEGINNING WITH THE TIME OF REPLACEMENT AND ENDING WITH THE SAME INSPECTION AND ACCEPTANCE HEREIN DESCRIBED.
- S. WARRANTY
1. THE LIFE AND SATISFACTORY CONDITION OF ALL PLANT MATERIAL INSTALLED (INCLUDING SOD) BY THE LANDSCAPE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A MINIMUM OF ONE (1) CALENDAR YEAR COMMENCING AT THE TIME OF CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.
  2. ANY PLANT NOT FOUND IN A HEALTHY GROWING CONDITION AT THE END OF THE WARRANTY PERIOD SHALL BE REMOVED FROM THE SITE AND REPLACED AS SOON AS WEATHER CONDITIONS PERMIT. ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE AS SPECIFIED IN THE PLANT LIST. THEY SHALL BE FURNISHED PLANTED AND MULCHED AS SPECIFIED AT NO ADDITIONAL COST TO THE OWNER.
  3. IN THE EVENT THE OWNER DOES NOT CONTRACT WITH THE CONTRACTOR FOR LANDSCAPE AND IRRIGATION MAINTENANCE, THE CONTRACTOR SHOULD VISIT THE PROJECT SITE PERIODICALLY DURING THE ONE (1) YEAR WARRANTY PERIOD TO EVALUATE MAINTENANCE PROCEDURES BEING PERFORMED BY THE OWNER. CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING OF MAINTENANCE PROCEDURES OR CONDITIONS WHICH THREATEN VIGOROUS AND HEALTHY PLANT GROWTH.

**Kimley»Horn**

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
300 NORTH NEW AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
CHECKED BY: JEH  
DATE: XX/XX/21

MEADOWBROOK PARK  
PLANNED UNIT DEVELOPMENT (PUD) PLAN  
LANDSCAPE PLAN

PROJECT NO.  
096956009

SHEET

9 OF 11

County File Number: PUDSP208

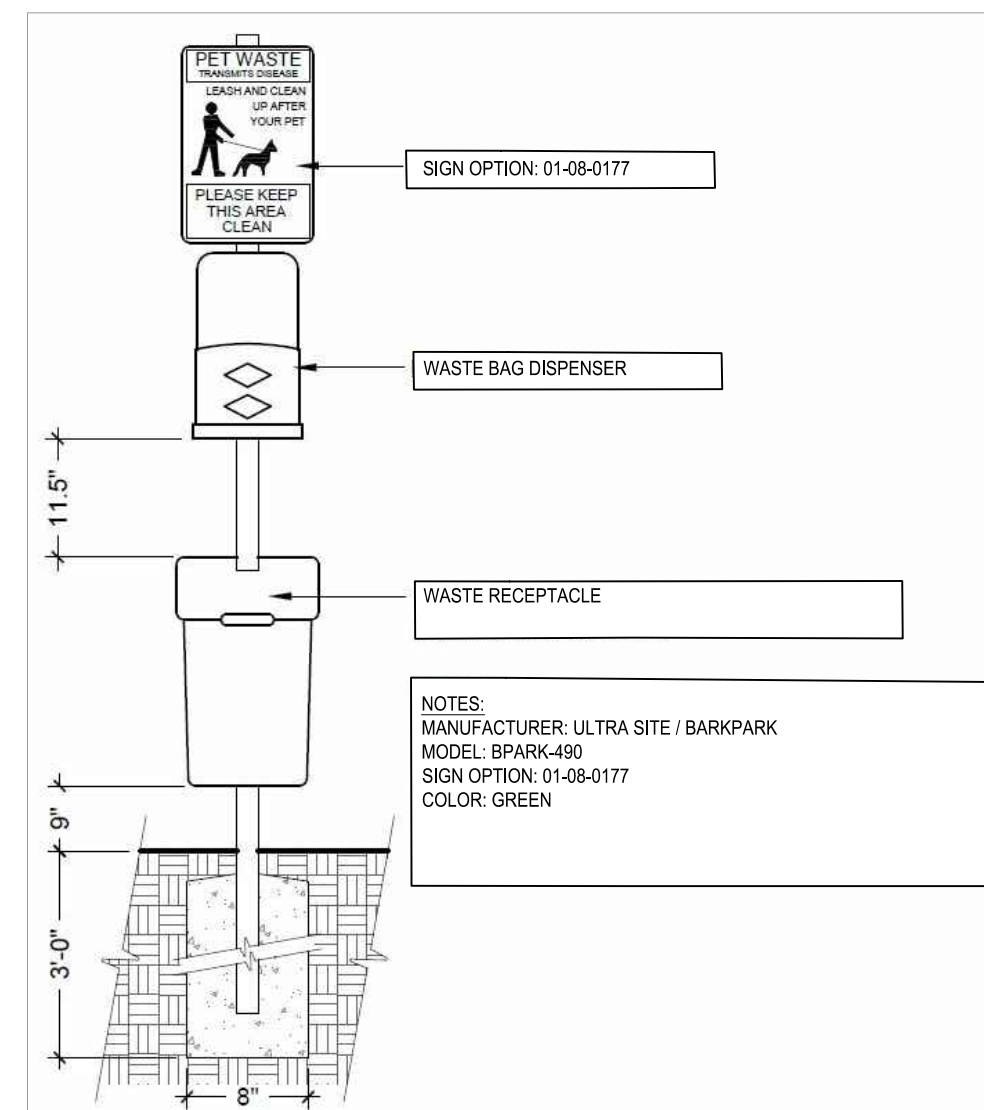
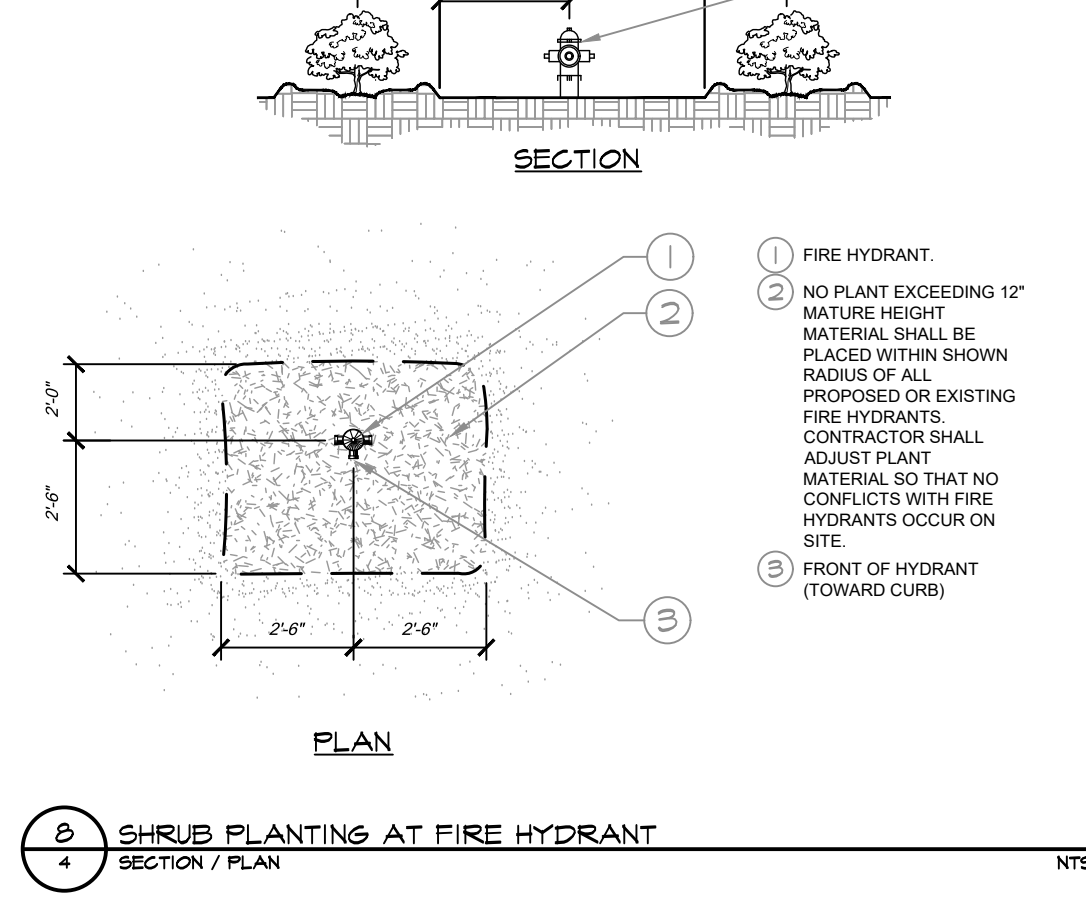
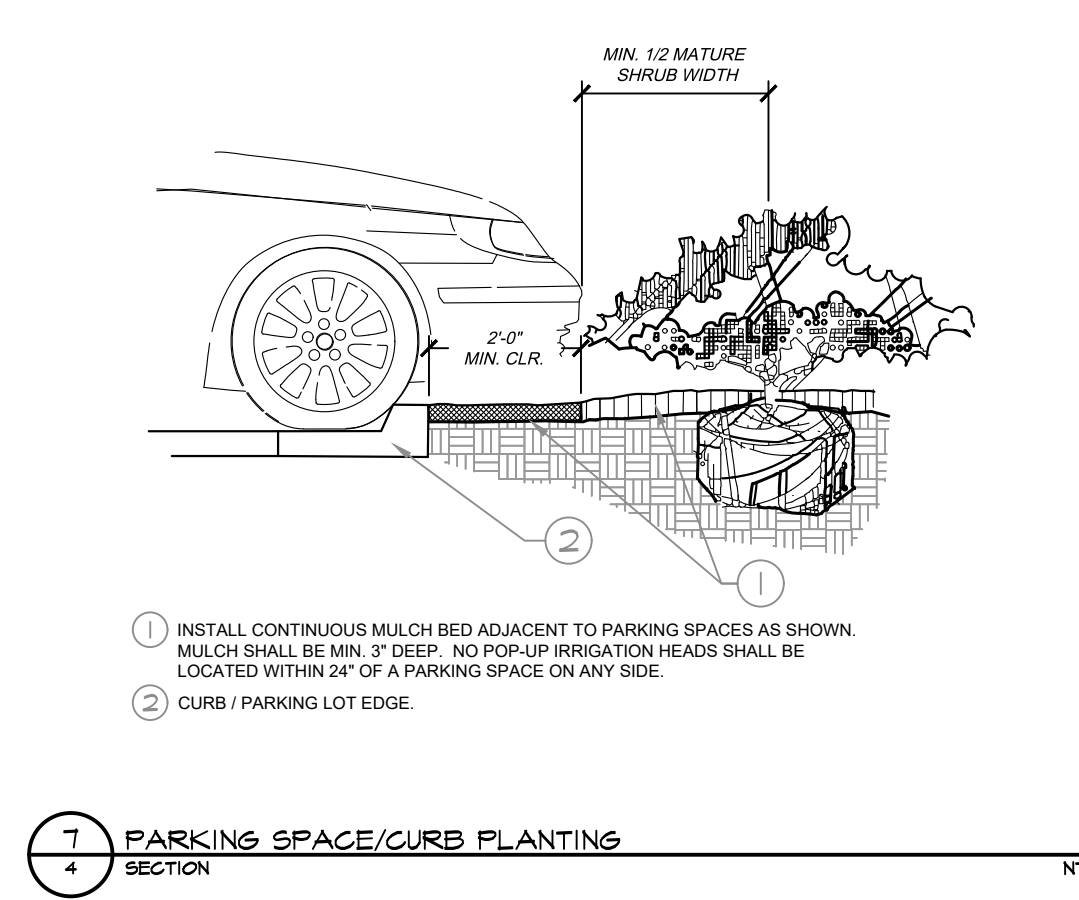
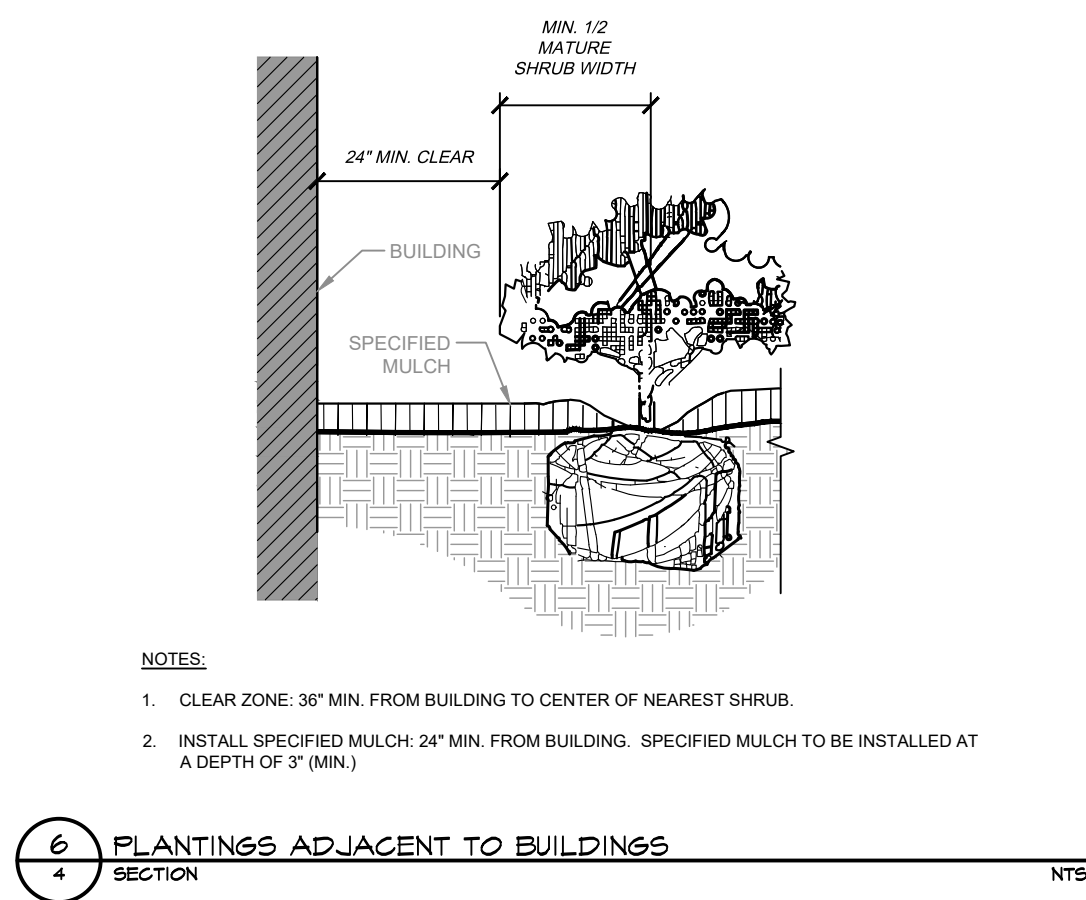
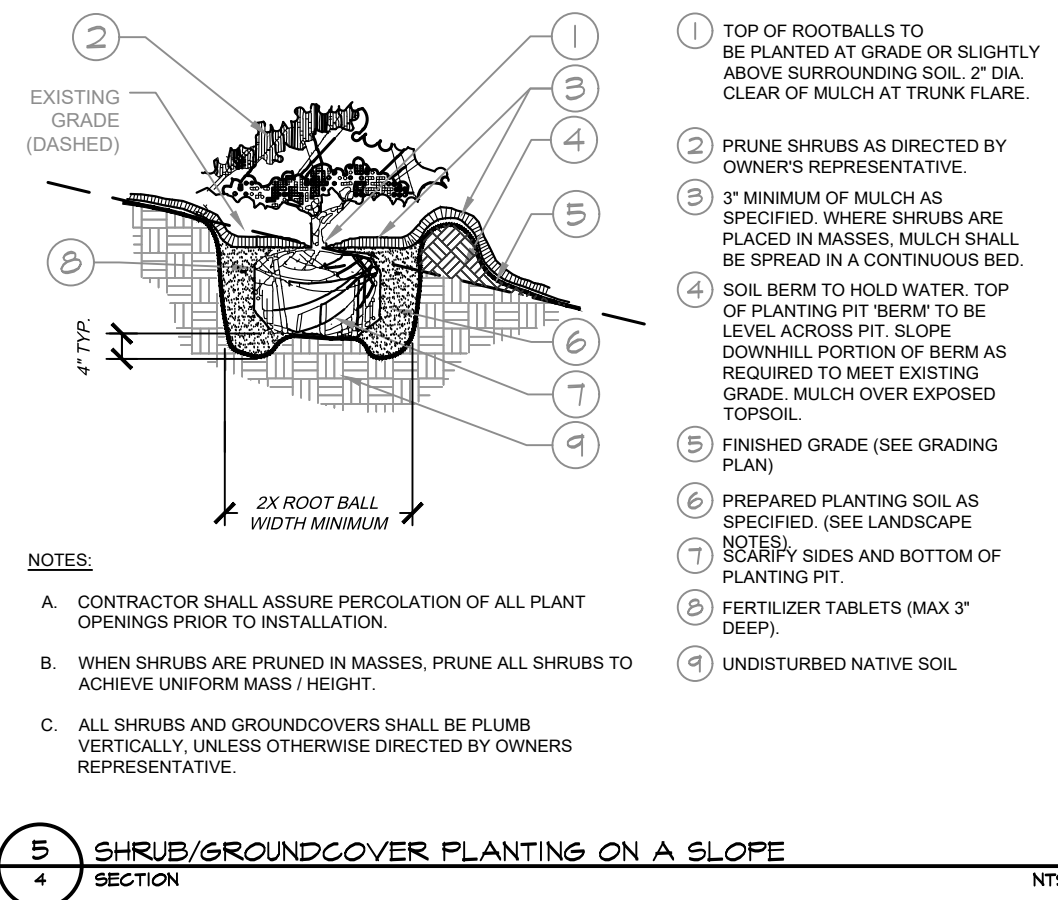
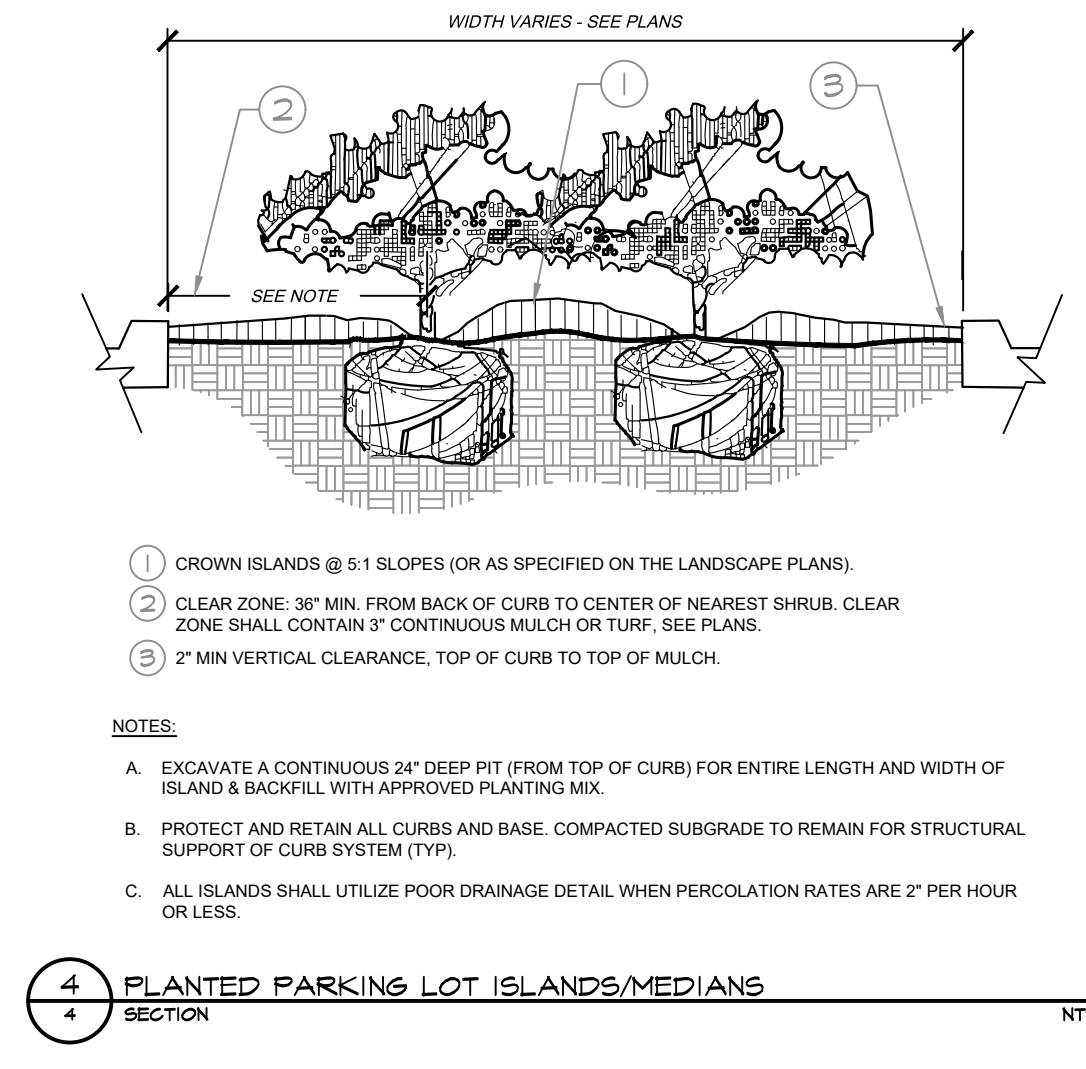
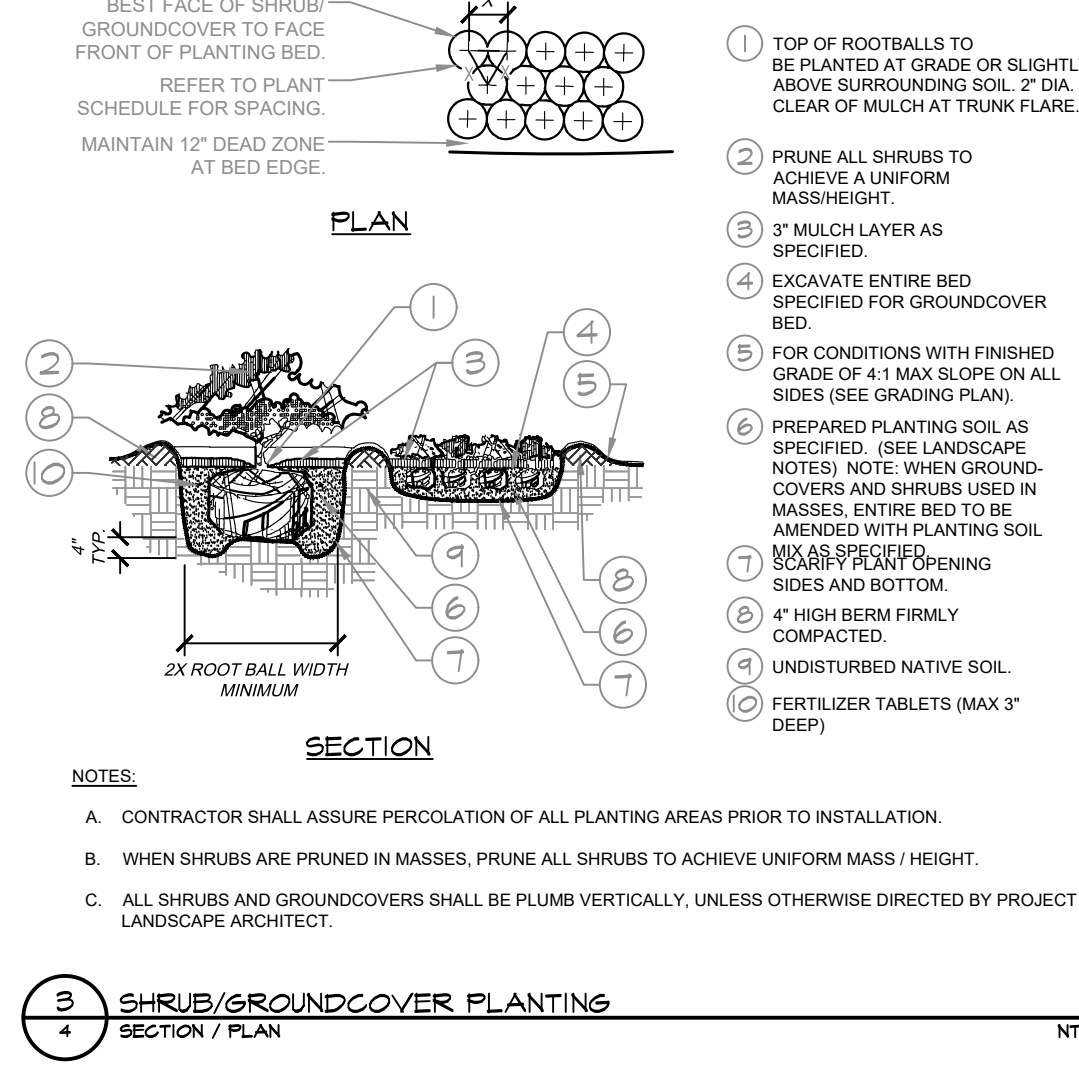
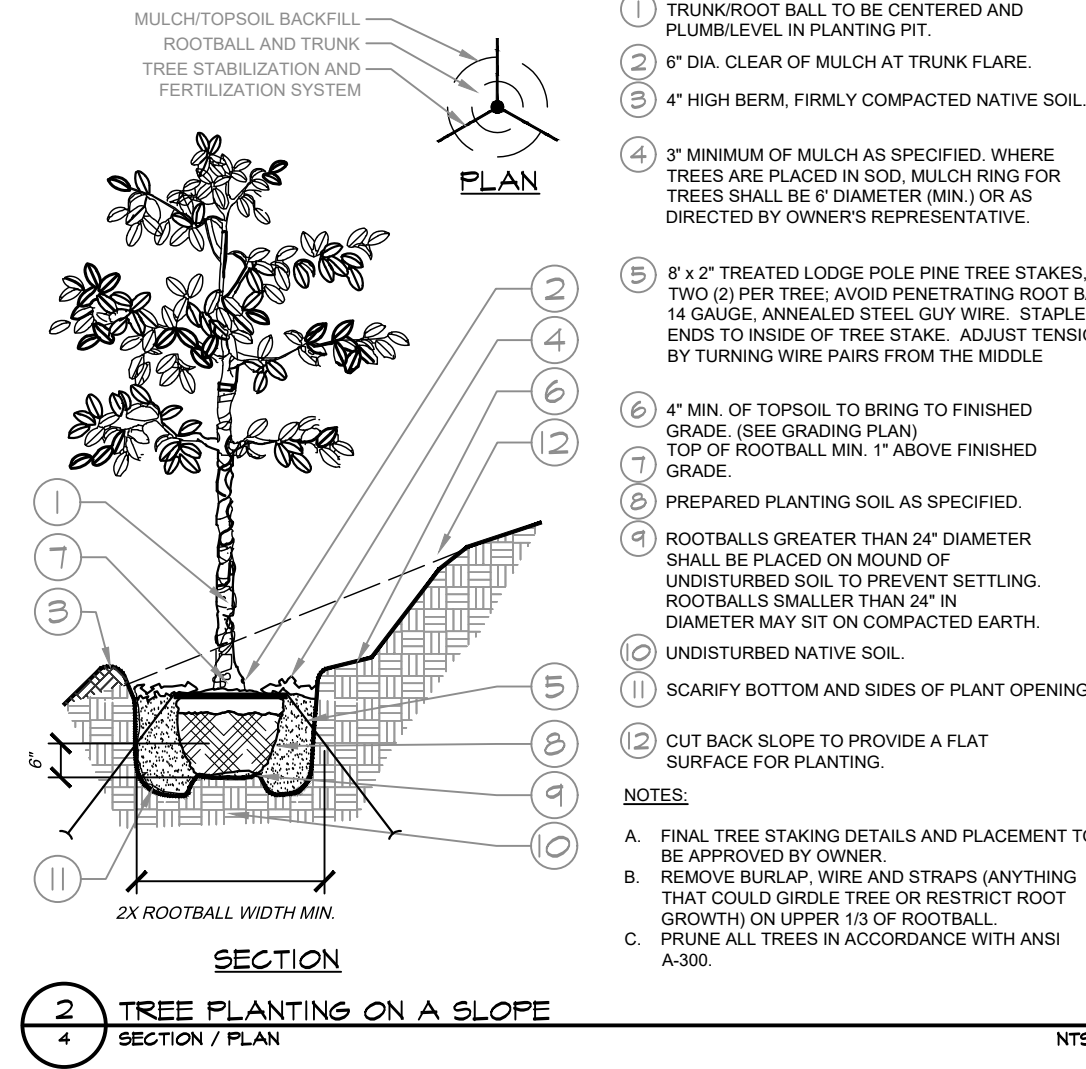
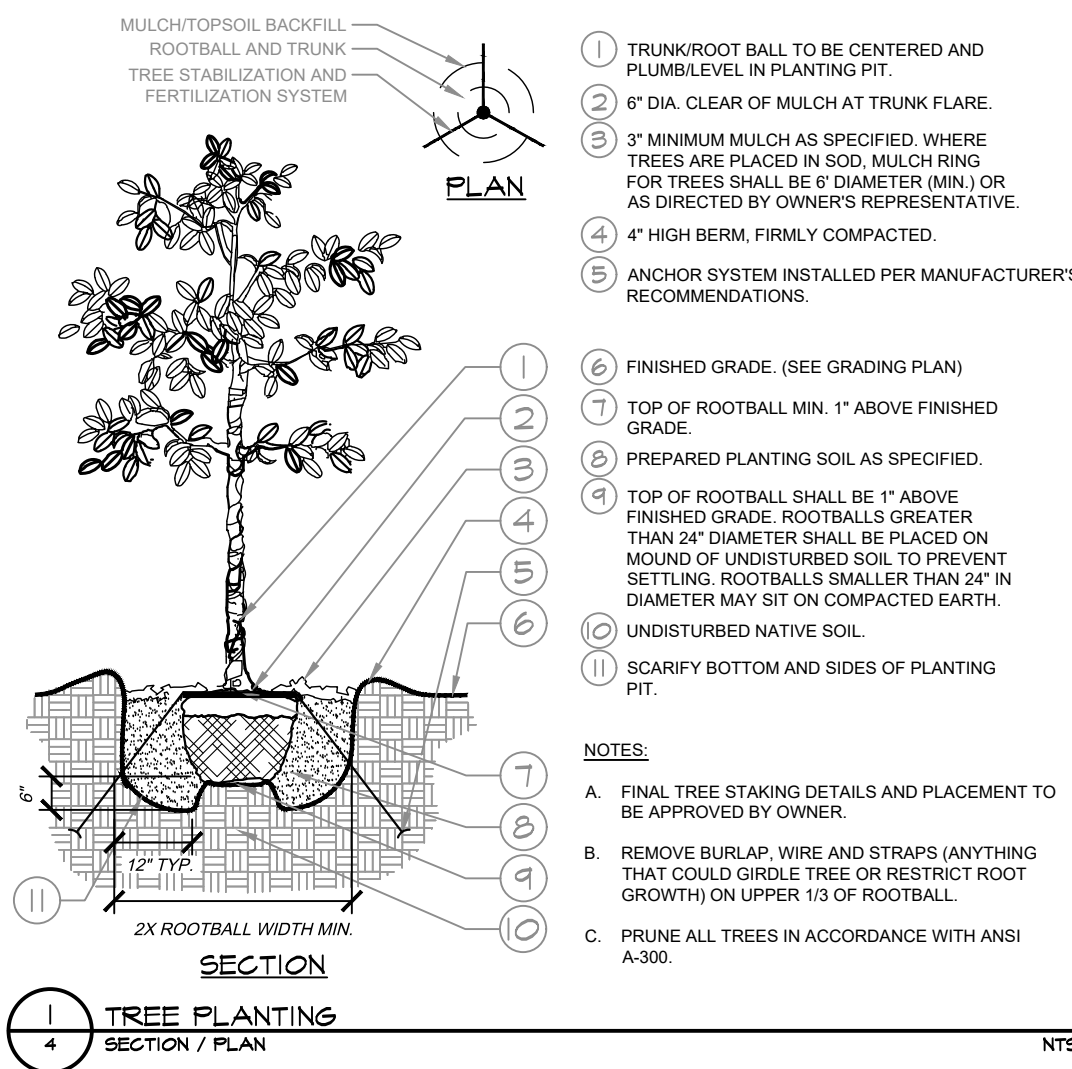


K:\COS\_LA\096956009 - Meadowbrook Park\CADD\PlanSheets\096956009-LA.dwg Salazar, Larry 3/19/2021 1:57 PM

# MEADOWBROOK PARK

## PLANNED UNIT DEVELOPMENT (PUD) AND PRELIMINARY PLAN

LOCATED IN THE SOUTHEAST 1/4 OF SECTION 8, T14S, R65W, OF THE 6th P.M., EL PASO COUNTY, COLORADO



### INTERNAL LANDSCAPING:

NET SITE AREA (AREAS A & C):	348,971 SF (8.01 AC)
PERCENT MINIMUM INTERNAL AREA:	15%
INTERNAL AREA REQUIRED/PROVIDED:	52,345 SF / 123,175 SF
TREE/SQUARE FEET REQUIRED:	1/500
INTERNAL TREES REQUIRED/PROVIDED:	105 / 57
SHRUB SUBSTITUTES REQUIRED/PROVIDED:	480 / 480
ORN. GRASS SUBSTITUTES REQ./PROV.:	0 / 0
INTERNAL PLANT ABBREVIATED ON PLAN:	IN
% GROUND PLANE VEG. REQUIRED/PROVIDED:	75%/75%

### LANDSCAPE SETBACKS & BUFFERS:

STREET NAME OR ZONE BOUNDARY:	MEADOWBROOK PW	HWY 24	NORTH SIDE	SOUTH SIDE
STREET CLASSIFICATION:	MINOR ARTERIAL	EXPRESSWAY	N/A	N/A
SETBACK DEPTH REQUIRED/PROVIDED:	20' / 20'	25' / 25'	15' / 15'	15' / 15'
LINEAR FOOTAGE:	788'	1161'	541'	378'
TREE/FEET REQUIRED:	1 / 25	1 / 20'	1 / 15'	1 / 15'
NUMBER OF TREES REQUIRED/PROVIDED:	32 / 32	58 / 58	35 / 35	26 / 26
SHRUB SUBSTITUTES REQUIRED/PROVIDED:	0 / 0	0 / 0	0 / 0	0 / 0
ORNAMENTAL GRASS SUBSTITUTES REQ./PROV.:	0 / 0	0 / 0	0 / 0	0 / 0
EVERGREEN TREES REQ./PROV.:	N/A	N/A	12 / 23	9 / 10
PLANT ABBREVIATION DENOTED ON PLAN:	MP	HW	NS	SS
% GROUND PLANE VEG. REQUIRED/PROVIDED:	75%/75%	75%/75%	75%/75%	75%/75%

### MEADOWBROOK PARK PLANNED UNIT DEVELOPMENT (PUD) PLAN LANDSCAPE PLAN

**Kimley»Horn**

2021 KIMLEY-HORN AND ASSOCIATES, INC.  
200 NORTH NEW YORK AVE., SUITE 300  
COLORADO SPRINGS, COLORADO 80903 (719) 453-0180

DESIGNED BY: LMS  
DRAWN BY: LMS  
DATE: XX/XX/21

PROJECT NO.  
096956009

SHEET

10 OF 11

County File Number: PUDSP208



Traffic Impact Study

# Crossroads-Meadowbrook & Reagan Ranch Colorado Springs, Colorado

PCD File No. CR201 & SP207

Prepared for:

**Pikes Peak Investments LLC**

c/o The Equity Group

**Kimley»Horn**

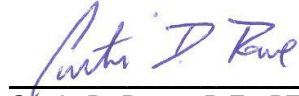




# T R A F F I C   I M P A C T   S T U D Y

## Traffic Engineer's Statement

The attached traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



Curtis D. Rowe, P.E., PTOE, PE #36355

February 26, 2021

Date

## Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

Ms. Kelly Nelson  
Pikes Peak Investments LLC  
c/o The Equity Group  
90 South Cascade Avenue, Suite 1500  
Colorado Springs, Colorado 80903

Date

## **Crossroads-Meadowbrook-Reagan Ranch**

PCD File No. CR201 & SP207

Colorado Springs, Colorado  
El Paso County, Colorado

**Prepared for**  
**Pikes Peak Investments LLC**  
**c/o The Equity Group**  
90 South Cascade Avenue  
Suite 1500  
Colorado Springs, Colorado 80903

**Prepared by**  
**Kimley-Horn and Associates, Inc.**  
**Curtis D. Rowe, P.E., PTOE**  
4582 South Ulster Street  
Suite 1500  
Denver, Colorado 80237  
(303) 228-2300



February 2021

*This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.*

## TABLE OF CONTENTS

TABLE OF CONTENTS .....	i
LIST OF TABLES .....	ii
LIST OF FIGURES .....	iii
1.0 EXECUTIVE SUMMARY .....	1
2.0 INTRODUCTION.....	9
3.0 EXISTING AND FUTURE CONDITIONS .....	12
3.1 Existing and Future Study Area .....	12
3.2 Existing and Future Roadway Network .....	12
3.3 Existing Traffic Volumes .....	16
3.4 Unspecified Development Traffic Growth .....	17
4.0 PROJECT TRAFFIC CHARACTERISTICS .....	23
4.1 Trip Generation.....	23
4.2 Trip Distribution .....	26
4.3 Traffic Assignment and Total (Background Plus Project) Traffic .....	26
5.0 TRAFFIC OPERATIONS ANALYSIS .....	32
5.1 Analysis Methodology .....	32
5.2 Key Intersection Operational Analysis .....	33
5.3 Project Access Operational Analysis .....	41
5.4 Sight Distance Evaluation .....	48
5.5 Bicycle and Pedestrian Access.....	49
5.6 CDOT Turn Lane Evaluation.....	50
5.7 Queuing Analysis.....	56
5.8 Crossroads North: North Access Sensitivity Analysis.....	60
5.9 Improvement Summary .....	64
6.0 CONCLUSIONS AND RECOMMENDATIONS .....	68

## APPENDICES

Appendix A – Intersection Count Sheets / COVID Adjustment Calculations

Appendix B – CDOT Annual Traffic Data / 2040 PPACOG Model

Appendix C – Trip Generation Worksheets

Appendix D – Intersection Analysis Worksheets

Appendix E – Signal Warrant Analysis / Signal Clearance Intervals

Appendix F – Queueing Analysis Worksheets

Appendix G – Time-Space Diagrams

Appendix H – Conceptual Site Plans

## LIST OF TABLES

Table 1 – Phase 1 Project Traffic Generation.....	24
Table 2 – Full Buildout Project Traffic Generation .....	25
Table 3 – Level of Service Definitions .....	32
Table 4 – Meadowbrook Parkway and Marksheffel Road (#1) LOS Results.....	33
Table 5 – US-24 and Marksheffel Road (#2) LOS Results .....	34
Table 6 – Newt Drive and Meadowbrook Parkway (#3) LOS Results .....	35
Table 7 – SH-94/Newt Drive and US-24 (#4) LOS Results.....	37
Table 8 – SH-94 and Marksheffel Road (#5) LOS Results .....	38
Table 9 – SH-94 and Space Village Avenue (#6) LOS Results .....	39
Table 10 – Space Village Avenue and Marksheffel Road (#7) LOS Results .....	40
Table 11 – Project Access LOS Results.....	45
Table 12 – Turn Lane Storage Length Analysis Results.....	56
Table 13 – Crossroads North Access Scenarios LOS Results .....	60
Table 14 – Crossroads North Access Scenarios Vehicle Queueing Results.....	61
Table 15 – Signal Progression Comparison .....	63
Table 16 – Crossroads-Meadowbrook-Reagan Ranch Improvement Summary .....	67



## LIST OF FIGURES

Figure 1 – Vicinity Map.....	10
Figure 2 – Site Area .....	13
Figure 3 – Existing Lane Configurations.....	17
Figure 4 – 2020 Existing Traffic Volumes .....	18
Figure 5 – 2020 Adjusted Existing Traffic Volumes .....	19
Figure 6 – 2026 Background Traffic Volumes.....	21
Figure 7 – 2040 Background Traffic Volumes.....	22
Figure 8 – Project Trip Distribution .....	27
Figure 9 – Phase 1 Project Traffic Assignment.....	28
Figure 10 – Full Buildout Project Traffic Assignment .....	29
Figure 11 – 2026 Background Plus Project Traffic Volumes.....	30
Figure 12 – 2040 Background Plus Project Traffic Volumes.....	31
Figure 13 – Crossroads North Street Classification Map .....	47
Figure 14 – 2026 Recommended Lane Configurations .....	65
Figure 15 – 2040 Recommended Lane Configurations .....	66

## 1.0 EXECUTIVE SUMMARY

---

The proposed development areas of Crossroads North, Crossroads Mix Use, Meadowbrook Park, and Reagan Ranch are combined in this study to represent one Master Traffic Impact Study for all project areas. These development areas are located in the City of Colorado Springs and El Paso County, Colorado. Crossroads North is proposed to be located on the northwest corner of the SH-94 and Marksheffel Road intersection while Crossroads Mix Use and Meadowbrook Park are proposed to be located on the southwest and northwest corners of the SH-94/Newt Dr and US-24 intersection, respectively. Reagan Ranch is evaluated with three distinct project areas; one area is located on the southwest corner of the SH-94 and Marksheffel Road intersection, a second area is located on the southeast corner of the SH-94 and Marksheffel Road intersection, while a third development area is located on the southeast corner of the intersection of Space Village Avenue and Marksheffel Road. Crossroads-Meadowbrook is expected to be a 10-year build while Reagan Ranch is anticipated to be a 15 to 20-year build. As such, an initial phase of development was evaluated in a 2026 horizon while full buildout was evaluated in the long-term 2040 horizon.

Crossroads North proposes to contain retail uses and a park/sports complex while Crossroads Mix Use will contain multifamily housing and retail uses. Meadowbrook Park will include single family residences. The northwest area of Reagan Ranch will contain industrial uses while the northeast area will include retail uses and single-family residences. The southeast region of Reagan Ranch proposes retail, office, multifamily housing, and single-family residences.

The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. The following intersections were incorporated into this traffic study in accordance with City of Colorado Springs, El Paso County, and Colorado Department of Transportation (CDOT) standards and requirements:

- Meadowbrook Parkway and Marksheffel Road (Intersection #1)
- US-24 and Marksheffel Road (#2)
- Newt Drive and Meadowbrook Parkway (#3)
- SH-94/Newt Drive and US-24 (#4)
- SH-94 and Marksheffel Road (#5)

- SH-94 and Space Village Avenue (#6)
- Space Village Avenue and Marksheffel Road (#7)

In addition, 14 project accesses (Intersections #8-21) proposed along Meadowbrook Parkway, Marksheffel Road, and Space Village Avenue were included for evaluation. Further, and as requested by El Paso County, four (4) internal intersections (#22-25) along public roadways proposed within Crossroads North were also included for evaluation.

Regional access to the project is provided by Interstate 25 (I-25) and US-24. Primary access to the project will be provided by SH-94, Marksheffel Road, and Space Village Avenue. Direct access to the proposed project is to be provided by 14 project accesses located along Meadowbrook Parkway, Marksheffel Road, and Space Village Avenue.

Phase 1 development of the projects in 2026 is expected to generate approximately 34,458 daily weekday external vehicle trips with 2,748 of these trips occurring during the morning peak hour and 2,806 trips occurring during the afternoon peak hour. With full buildout of the developments by 2040, the projects are expected to generate approximately 58,582 daily weekday external vehicle trips with 3,481 of these trips occurring during the morning peak hour and 5,121 trips occurring during the afternoon peak hour.

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns and volumes, anticipated surrounding development areas, expected roadway improvements, and the proposed access system for the project. Separate distributions were prepared for each development area to accurately identify the amount of traffic to be assigned to each project. Assignment of project traffic was based upon the trip generation described previously and the distributions developed for each project area. Assigned traffic was added to future traffic volumes projected at the study area intersections to conduct a traffic analysis for the determination of possible improvements needed.

Based on the complete global analysis of the project area including existing and background traffic volumes from other sources and developments presented in this report, Kimley-Horn believes the Crossroads-Meadowbrook-Reagan Ranch developments will be successfully incorporated into

the existing and future roadway network. All of the area traffic combined including the proposed background traffic volume growth, project development, and expected future traffic volumes in each of the 2026 Phase 1 and 2040 full buildout horizons resulted in the following recommendations/conclusions:

**2026 Recommendations:**

- CDOT will likely require Access Permits for the intersections of SH-94/US-24 (#4) SH-94/Marksheffel Road (#5), and SH-94/Space Village Avenue (#6) in association with the project.
- Southwestbound dual left turn lanes were found to be needed along US-24 at the Marksheffel Road intersection (#2). Presently there is a single left turn lane with a striped-out area to shadow the dual left turn lanes on northeastbound US-24. These new southwestbound dual left turn lanes should be designated with a length of 1,100 feet plus 600-foot taper (25 to 1).
- It is recommended that a single lane roundabout be constructed at the Meadowbrook Parkway and Newt Drive intersection (#3) with development of the Crossroads Mix Use project. The roundabout should have single lane approaches on the eastbound Newt Drive, northbound Meadowbrook Parkway, and southbound Meadowbrook Parkway approaches and a two-lane approach on westbound Newt Drive with a shared left turn/through lane into the roundabout and a separate right turn lane.
- The intersection of SH-94/US-24 (#4) currently operates poorly during the peak hours in the existing condition. As a regional capacity improvement, it was found that US-24 may need to provide three through lanes in each direction from the Peterson Road interchange through this intersection with SH-94 in the near-term horizon. The additional through lanes should be considered by CDOT and El Paso County in the near future. If and when US-24 is improved to provide three through lanes in each direction, it is recommended that a separate 600-foot plus 225-foot taper right turn deceleration lane be constructed to maintain free right turn movements to eastbound SH-94. For southwestbound US-24 at SH-94 (#4), the existing acceleration lane along US-24 will need to be reconstructed with 960 feet of length plus a 225-foot taper if and when US-24 is improved to provide three through lanes along westbound US-

24. For northeastbound US-24 at SH-94, it is recommended that this acceleration lane be converted to the third northbound through lane as the acceleration lane is not warranted. Further, the northeastbound US-24 third through lane needs to continue for 1,200 feet plus provide a 660-foot taper based on MUTCD standards. In addition to these regional improvements, it is recommended that the existing single 900-foot left turn lane be changed to 850-feet plus 225-foot taper with dual left turn lanes on the northeastbound US-24 approach for the left turn to Newt Drive. The area for these dual lefts is presently available (mostly); however, the lane is striped out which will require restriping with a slight extension that may also need to be constructed. Also, at the intersection of US-24 and SH-94 (#4), the existing dual westbound left turn lanes on SH-94 should be converted to triple left turn lanes by restriping the inside westbound through lane to a left turn lane. The inside two westbound left turn lanes should be extended to a length of 760 feet plus a 225-foot taper per CDOT SHAC requirements. Three receiving lanes will be available with the expansion of US-24 to three westbound lanes to the Peterson Road interchange off-ramp. A traffic signal modification will be required at the intersection to incorporate all of these improvements.

- At SH-94 and Marksheffel Road (#5), it was found that the eastbound and westbound right turns should operate with overlap phasing, while the northbound and southbound right turns should operate with free movements with acceleration lanes constructed in accordance with the CDOT State Highway Access Code (SHAC). The acceleration lane along westbound SH-94 is recommended to tie into the outside through lane on the approach to US-24. The eastbound left turn lane shall be extended to a length of 750 feet with a 225-foot taper while the westbound left turn lane should be extended to a length of 650 feet with a 225-foot taper. The eastbound and westbound right turn lanes should be extended to 600 feet. The eastbound acceleration lane from the Marksheffel Road northbound right turn should be constructed to 1,380 feet with a 300-foot taper. These improvements at this intersection may already be identified with the SH-94 improvements already being planned by CDOT.
- In order to comply with the CDOT State Highway Access Code, it was found that the existing 150-foot westbound left turn lane at the intersection of SH-94 and Space Village Avenue (#6) does not meet current CDOT standards with a length need of 900 feet and a 300-foot taper. An eastbound acceleration lane along SH-94 from the Space Village Avenue northbound right



turn is also warranted based on existing traffic. This existing 300-foot with 200-foot taper acceleration lane would need to be extended to a length of 1,380 feet with a 300-foot taper to meet current CDOT standards. Extension of these lanes may not be feasible due to the bridge along SH-94 to the east, which is likely why CDOT constructed to lengths shorter than standard.

- Currently the intersection of Space Village Avenue and Marksheffel Road (#7) is unsignalized. By 2026, this intersection is anticipated to meet the Four-Hour Vehicle Volume signal warrant with development of Reagan Ranch; therefore, it is recommended that a traffic signal be installed at this intersection.
- With completion of the Crossroads Mix Use project, the site proposes three accesses along the southeast side of Meadowbrook Parkway. The northeastern access along Meadowbrook Parkway for Crossroads Mix Use may be right-in/right-out while the two southern most access will provide full movements with stop control on the minor legs. All three project access driveways to Crossroads Mix Use are recommended to have R1-1 “STOP” signs installed for the exiting approaches.
- The Meadowbrook Park development area has one proposed driveway access (#8) along the east side of Meadowbrook Parkway that will align with Preble Drive. Left turn movements for entering this project access will be provided from an existing two-way left turn lane along Meadowbrook Parkway. The westbound exiting approach of this driveway should provide stop control with installation of a R1-1 “STOP” sign.
- Traffic signals are anticipated to be needed and warranted at both full movement access intersections (#9 and #10) along Marksheffel Road for Crossroads North. Therefore, traffic signals are recommended for installation at these two access intersections with development of Crossroads North. It is recommended that a 235-foot with 200-foot taper (based on El Paso County standards for 50 mph) southbound right turn lane be constructed at both access intersections along Marksheffel Road due to the volume of traffic entering Crossroads North at this access. Likewise, northbound left turn lanes with 235 feet of length plus 200-foot tapers should also be constructed at both full movement access intersections along Marksheffel

Road for Crossroads North. Lastly, separate eastbound left turn and right turn lanes are recommended to serve exiting traffic out of Crossroads North. As requested by El Paso County, a sensitivity analysis has been prepared later in Section 5.8 comparing the north access along Marksheffel Road as a full movement signalized intersection and a three-quarter movement unsignalized intersection due to these accesses not meeting El Paso County standards for intersection spacing.

- For the northwest development area of Reagan Ranch, a right-in/right access is proposed along Marksheffel Road (#11) between SH-94 and Space Village Avenue (to also serve the northeast development area of Reagan Ranch) and a full movement access is proposed along Space Village Avenue (#12). It is likely that rights to an easement for a proposed new access along Space Village Avenue will be acquired and was evaluated as such in this traffic study. It is recommended that the access along Space Village Avenue (#12) to the northwest region of Reagan Ranch have a 200-foot plus 180-foot taper eastbound left turn lane to accommodate volumes entering the northwest region of Reagan Ranch.
- Three accesses are proposed to serve the northeast development area of Reagan Ranch. These include a right-in/right-out access on the east side of Marksheffel Road between SH-94 and Space Village Avenue (to align with the previously mentioned access intersection #11) and two roundabouts providing full turning movements along Space Village Avenue between Marksheffel Road and SH-94 (#13 and #14). It is recommended that the roundabouts have single lane approaches on all entering legs.
- For the southeast development area of Reagan Ranch, access will be gained at these same two roundabouts along Space Village Avenue (#13 and #14) as well as seven (7) accesses (#15-21) planned along the east side of Marksheffel Road south of Space Village Avenue at the standard City 600-foot spacing. The access intersection at the approximate half-mile spacing (#18) is expected to require signalization by 2040 while the access in alignment with Peterson Air Force Base (#21) is expected to need signalization by the short-term 2026 horizon. The accesses at the quarter-mile spacing are proposed as three-quarter movement accesses (#16 and #20) while the accesses at the eighth-mile spacing are proposed as right-in/right-out accesses (#15 and #17 and #19).

- It is recommended that the two three-quarter movement accesses along Marksheffel Road (#16 and #20) as well as the northern full movement access (#18) along Marksheffel Road provide 235-foot plus 200-foot taper southbound left turn lanes to accommodate volumes entering the southeast region of Reagan Ranch.
- The southern full movement access intersection (#21) for Reagan Ranch is proposed to align with the existing Peterson Air Force Base High-T intersection (Intersection #21). With this access alignment, it is recommended that the intersection be signalized. This intersection will need to be reconfigured so that a southbound left turn lane and dual eastbound left turn lanes can be provided. The southbound left turn lane is recommended to include a length of 235 feet plus 200-foot taper and the dual eastbound left turn lanes are recommended to provide a length of 400 feet.
- As requested by El Paso County, an internal street evaluation was conducted for the Crossroads North development area. The south access to Crossroads North along Marksheffel Road is proposed to be named Air Lane and is expected to be classified as an El Paso County Urban Non-Residential Collector roadway with a 60-foot right-of-way (ROW). Air Lane extends east-west and is proposed to connect with a north-south extending Non-Residential Collector street (#24) and a north-south extending Urban Local street (#25). Intersection #25 (collector to collector) is proposed to be located approximately 660 feet west of Marksheffel Road while Intersection #24 (collector to local street) is located approximately 380 feet west of Marksheffel Road. These distances meet the El Paso County Urban Non-Residential Collector spacing standards of 660 feet to other collectors and 330 feet to intersections with a local street. The north-south extending Non-Residential Collector street also connects with an east-west collector street (#22) that extends from the north access to Marksheffel Road as well as with an Urban Local street on site (#23). The north access street connecting with Marksheffel Road is proposed to be classified as an El Paso County Urban Non-Residential Collector roadway. The recommended left-turn lanes internal to Crossroads North should provide 115 feet of length plus 120-foot tapers to meet El Paso County standards.

**2040 Recommendations:**

- If future traffic volume projections are realized, US-24 may need to provide three through lanes in each direction through the Marksheffel Road intersection. Likewise, Marksheffel Road between US-24 and Peterson Air Force Base East Gate may need to provide three through lanes in each direction. It is recommended that traffic volumes continue to be monitored by CDOT, the City of Colorado Springs, and El Paso County, as applicable, to determine if and when these regional improvements will be needed.
- A traffic signal is anticipated to be needed at the northern full movement access intersection for Reagan Ranch (#18) along Marksheffel Road by 2040.
- A westbound right turn lane may be needed at the southern full movement access intersection for Reagan Ranch (#21) proposed to align with the existing Peterson Air Force Base Access by 2040.
- Several extensions of auxiliary turn lanes may be needed by 2040 and should be monitored by CDOT, the City of Colorado Springs, and El Paso County, as applicable, to determine if and when the recommended turn lane lengths will be needed.

**General Recommendations:**

- Any on-site and off-site roadway, signing, striping, and signal improvements should be incorporated into the Civil Drawings, and conform to City of Colorado Springs, El Paso County, and/or CDOT standards as applicable, as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

## 2.0 INTRODUCTION

---

Kimley-Horn and Associates, Inc. (Kimley-Horn) has prepared this report to document the results of a Master Traffic Impact Study of future traffic conditions associated with Crossroads North, Crossroads Mix Use, Meadowbrook Park, and Reagan Ranch development areas to be located in the City of Colorado Springs and El Paso County, Colorado. A vicinity map illustrating the location of each development area is shown in **Figure 1**.

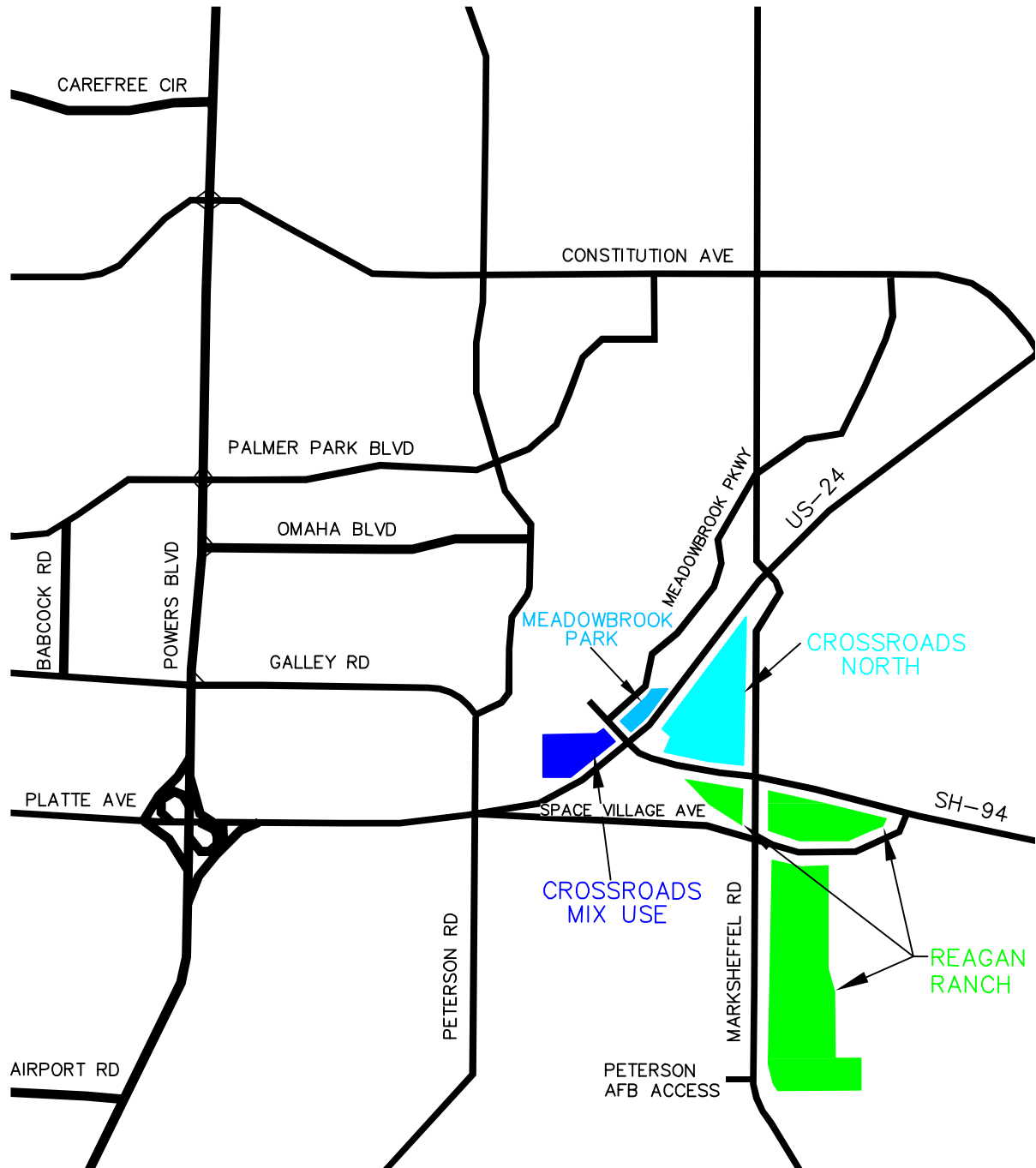
Crossroads North is proposed to be located on the northwest corner of the SH-94 and Marksheffel Road intersection while Crossroads Mix Use and Meadowbrook Park are proposed to be located on the southwest and northwest corners of the SH-94/Newt Dr and US-24 intersection, respectively. Reagan Ranch is evaluated with three distinct project areas; one area is located on the southwest corner of the SH-94 and Marksheffel Road intersection, a second area is located on the southeast corner of the SH-94 and Marksheffel Road intersection, while a third development area is located on the southeast corner of the intersection of Space Village Avenue and Marksheffel Road. Trip generation, trip distribution, and traffic assignment were calculated separately for these areas to accurately identify the amount of entering and exiting traffic into each development area. Crossroads-Meadowbrook is expected to be a 10-year build while Reagan Ranch is anticipated to be a 15 to 20-year build. As such, an initial phase of development was evaluated in a five-year 2026 horizon while full buildout was evaluated in the long-term twenty-year 2040 horizon.

Crossroads North proposes to contain retail uses and a park/sports complex while Crossroads Mix Use will contain multifamily housing and retail uses. Meadowbrook Park will include single family residences. The northwest area of Reagan Ranch will contain industrial uses while the northeast area will include retail uses and single-family residences. The southeast region of Reagan Ranch proposes retail, office, multifamily housing, and single-family residences. Conceptual site plans for each development area is attached in **Appendix H**.

using private  
internal roads

**KHA RESPONSE:**  
"Using private internal  
roads" has been added to  
the description.





CROSSROADS—MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
VICINITY MAP

FIGURE 1

The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. The following intersections were incorporated into this traffic study in accordance with City of Colorado Springs, El Paso County, and Colorado Department of Transportation (CDOT) standards and requirements:

- Meadowbrook Parkway and Marksheffel Road (Intersection #1)
- US-24 and Marksheffel Road (#2)
- Newt Drive and Meadowbrook Parkway (#3)
- SH-94/Newt Drive and US-24 (#4)
- SH-94 and Marksheffel Road (#5)
- SH-94 and Space Village Avenue (#6)
- Space Village Avenue and Marksheffel Road (#7)

In addition, 14 project accesses (Intersections #8-21) proposed along Meadowbrook Parkway, Marksheffel Road, and Space Village Avenue were included for evaluation. Further, and as requested by El Paso County, four (4) internal intersections (#22-25) along public roadways proposed within Crossroads North were also included for evaluation.

Regional access to the project is provided by Interstate 25 (I-25) and US-24. Primary access to the project will be provided by SH-94, Marksheffel Road, and Space Village Avenue. Direct access to the proposed project is to be provided by 14 project accesses located along Meadowbrook Parkway, Marksheffel Road, and Space Village Avenue.

### 3.0 EXISTING AND FUTURE CONDITIONS

---

#### 3.1 Existing and Future Study Area

The existing site areas are comprised of vacant land. The surrounding area contains a mix of uses. Directly east of Crossroads North and north of Regan Ranch is an existing water treatment plant. The surrounding area to the east and south is vacant land. Directly to the west is mainly residential neighborhoods. Other industrial uses are proposed north of Meadowbrook Park. Outside of these uses, Peterson Air Force Base and the Colorado Springs Airport exists to the south and southwest. The site area is shown in the aerial of **Figure 2**.

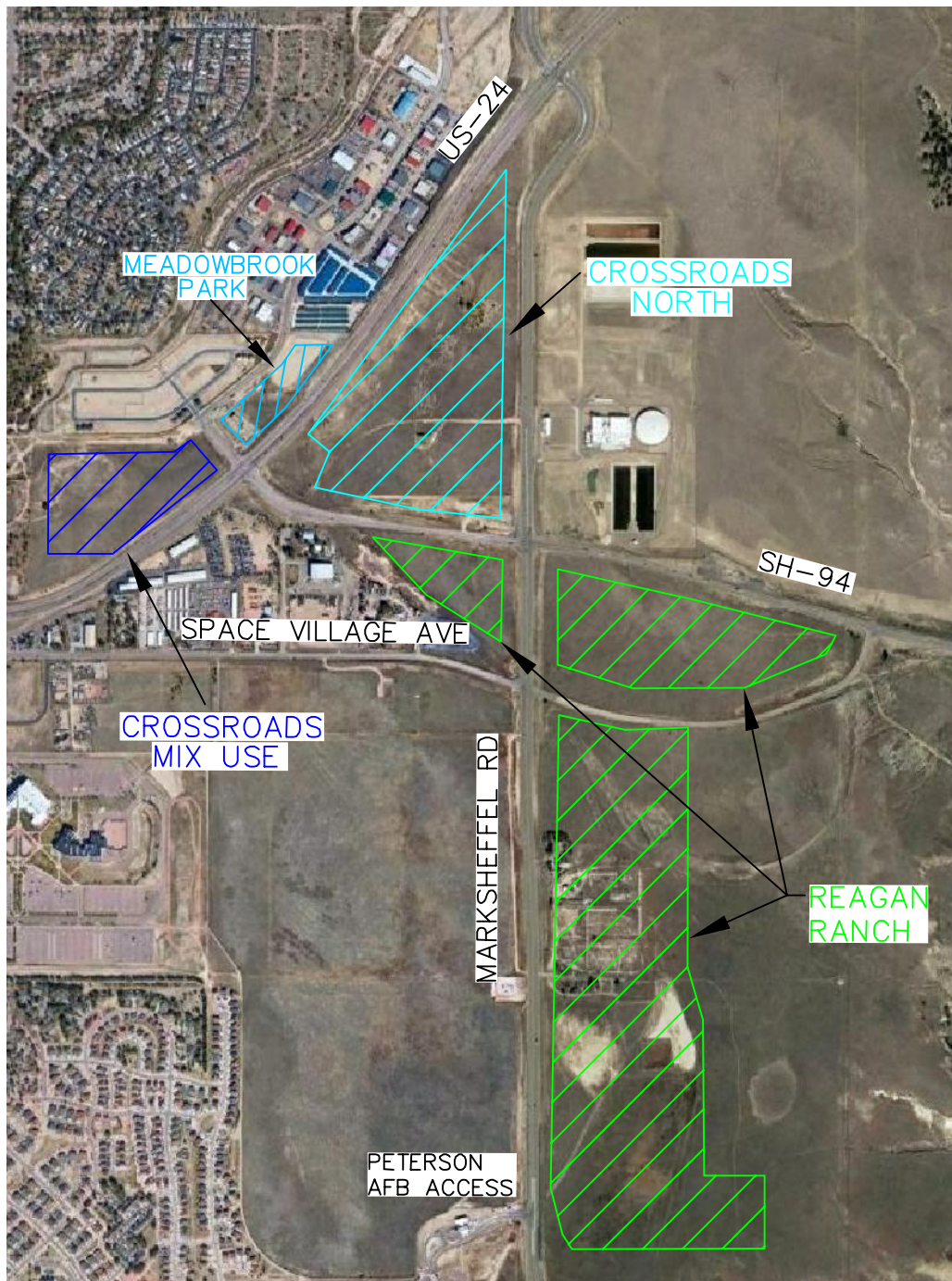
#### 3.2 Existing and Future Roadway Network

Regional access to the project is provided by Interstate 25 (I-25) and US-24. Primary access to the project will be provided by SH-94, Marksheffel Road, and Space Village Avenue. Direct access to the proposed project is to be provided by 14 project accesses located along Meadowbrook Parkway, Marksheffel Road, and Space Village Avenue.

Direct access to Meadowbrook Park is proposed at one full movement access along Meadowbrook Parkway to align with the existing Preble Drive (#8). Direct access to Crossroads North is proposed from two full movement accesses (#9 and #10) along Marksheffel Road approximately 2,000 feet and 1,000 feet north of SH-94. Access to Crossroad Mix Use will be provided by a future south leg to the intersection of Newt Drive and Meadowbrook Parkway (#3) while direct access is proposed along the future extension of Meadowbrook Parkway at two full movement accesses and an eastern right-in/right-out access.

For the Reagan Ranch northwest development area, a right-in/right access is proposed along Marksheffel Road (#11) between SH-94 and Space Village Avenue and a full movement access is proposed along Space Village Avenue (#12).

Three accesses are proposed to serve the northeast development area of Reagan Ranch. These include a right-in/right-out access on the east side of Marksheffel Road between SH-94 and Space Village Avenue (previously mentioned #11) and two roundabouts providing full turning movements along Space Village Avenue between Marksheffel Road and SH-94 (#13 and #14).



CROSSROADS—MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
SITE AREA

FIGURE 2

For the southeast development area of Reagan Ranch, access will be gained at these same two roundabouts along Space Village Avenue (#13 and #14) as well as seven (7) accesses (#15-21) planned along the east side of Marksheffel Road south of Space Village Avenue at the standard City 600-foot spacing. The access intersection at the approximate half-mile spacing (#18) as well as the access in alignment with Peterson Air Force Base (#21) will be full movement signalized intersections. The accesses at the quarter-mile spacing are proposed as three-quarter movement accesses (#16 and #20) while the accesses at the eighth-mile spacing are proposed as right-in/right-out accesses (#15 and #17 and #19).

SH-94 is a CDOT Highway, categorized E-X: Expressway, Major Bypass that provides one through lane of travel both eastbound and westbound in the vicinity of the site. SH-94 has a 40 mile per hour speed limit at US-24, a 55-mph speed limit through the Marksheffel Road intersection and a 65-mph speed limit east of Marksheffel Road. US-24 is a CDOT Highway, categorized E-X: Expressway, Major Bypass that provides two through lanes of travel with a 55 mile per hour speed limit through the study area. Marksheffel Road is classified as an El Paso County 4-Lane Urban Principal Arterial north of SH-94. Marksheffel Road provides two through lanes of travel in each direction, northbound and southbound, with a 55 mile per hour speed limit through the study area. It should be noted that this study determines that Marksheffel Road may need to provide three through lanes in each direction by 2040 which would categorize as an El Paso County 6-Lane Urban Principal Arterial. Likewise, the El Paso County Major Transportation Corridors Plan identifies Marksheffel within the preservation plan to be a 6-lane roadway in the long term future. Space Village Avenue provides one lane of travel in each direction, eastbound and westbound, with a 45 mile per hour speed limit through the study area. Meadowbrook Parkway is an El Paso County Non-Residential Collector roadway that provides one lane of travel in each direction, with a 35 mile per hour speed limit through the study area.

The Meadowbrook Parkway and Marksheffel Road (#1) intersection is a four-leg signalized intersection. The eastbound Meadowbrook Parkway approach consists of dual left turn lanes, one through lane, and a right turn lane. The westbound approach consists of a left turn lane, a through lane, and one right turn lane. The northbound and southbound approaches of Marksheffel Road consist of one left turn lane, two through lanes, and a right turn lane.



The US-24 and Marksheffel Road (#2) intersection is a four-leg signalized intersection. The traffic software for this intersection assigned Marksheffel Road as east-west and US-24 as north-south based on roadway alignment. The southbound US-24 and the eastbound and westbound Marksheffel Road approaches consist of a left turn lane, two through lanes, and separate right turn lanes operating with free right turn movements. The northbound US-24 approach consists of dual left turn lanes, two through lanes, and a right turn lane with free movements.

The Newt Drive and Meadowbrook Parkway (#3) intersection is a T-intersection with stop control on the eastbound and westbound approaches of Newt Drive. The westbound approach consists of one through lane and a right turn lane. The eastbound approach consists of one left turn lane and one through lane. The southbound approach consists of a two-way left turn lane and a right turn lane. With the construction of the Crossroads Mix Use project, a southwest leg will be constructed at this intersection by extension of Meadowbrook Parkway adjacent to the development area.

The intersection of SH-94 and US-24 (#4) is signalized with four-legs. Both state highways run east-west, however the traffic software for this intersection assigned SH-94 as east-west and US-24 as north-south. The eastbound Newt Drive approach consists of dual left turn lanes, one through lane, and a free right turn lane. The westbound SH-94 approach consists of dual left turn lanes, two through lanes, and a free right turn lane. The US-24 approaches each consist of a left turn lane, two through lanes, and a right turn lane.

The SH-94 and Marksheffel Road (#5) intersection is a four-leg signalized intersection. The eastbound and westbound approaches consist of a left turn lane, one through lane, and one right turn lane. The northbound and southbound approaches consist of a left turn lane, two through lanes, and a right turn lane.

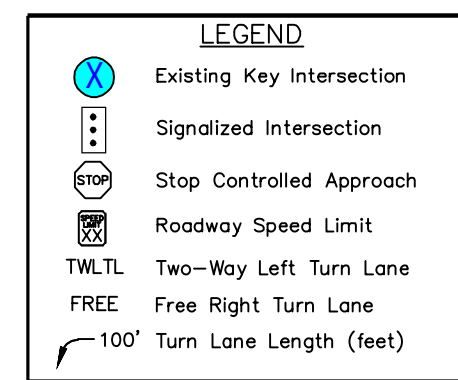
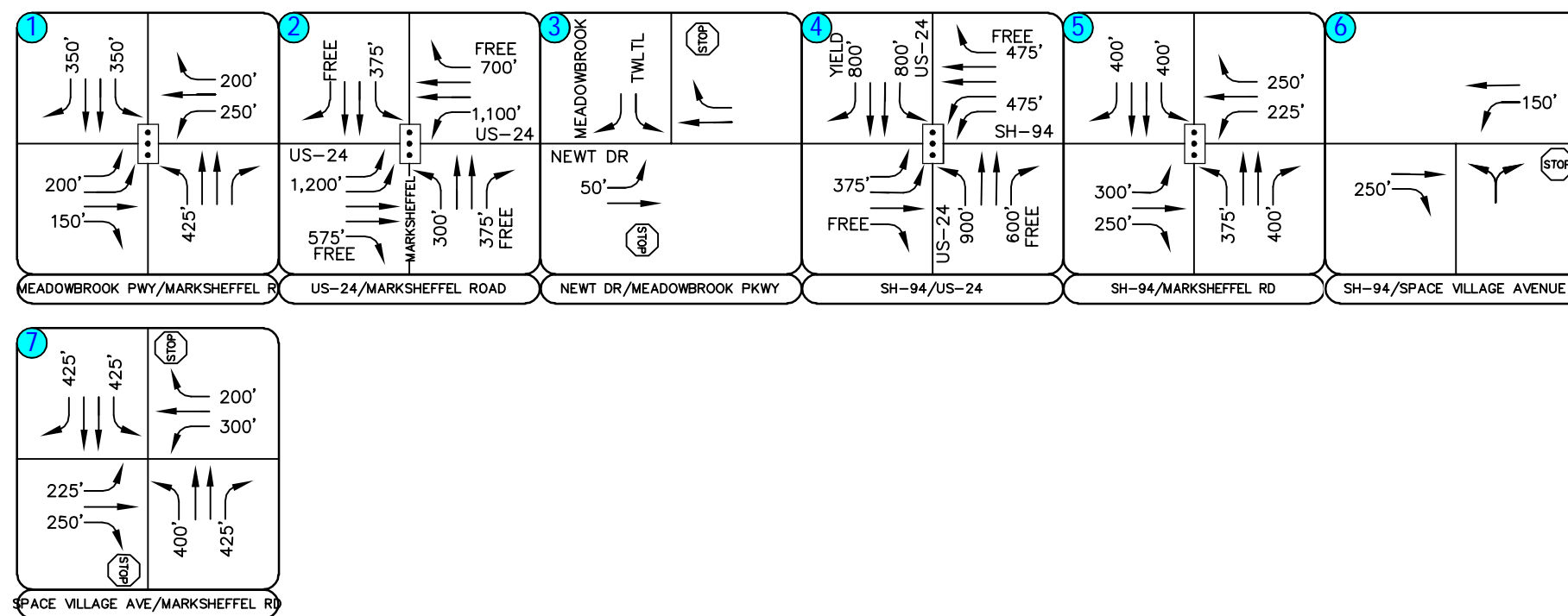
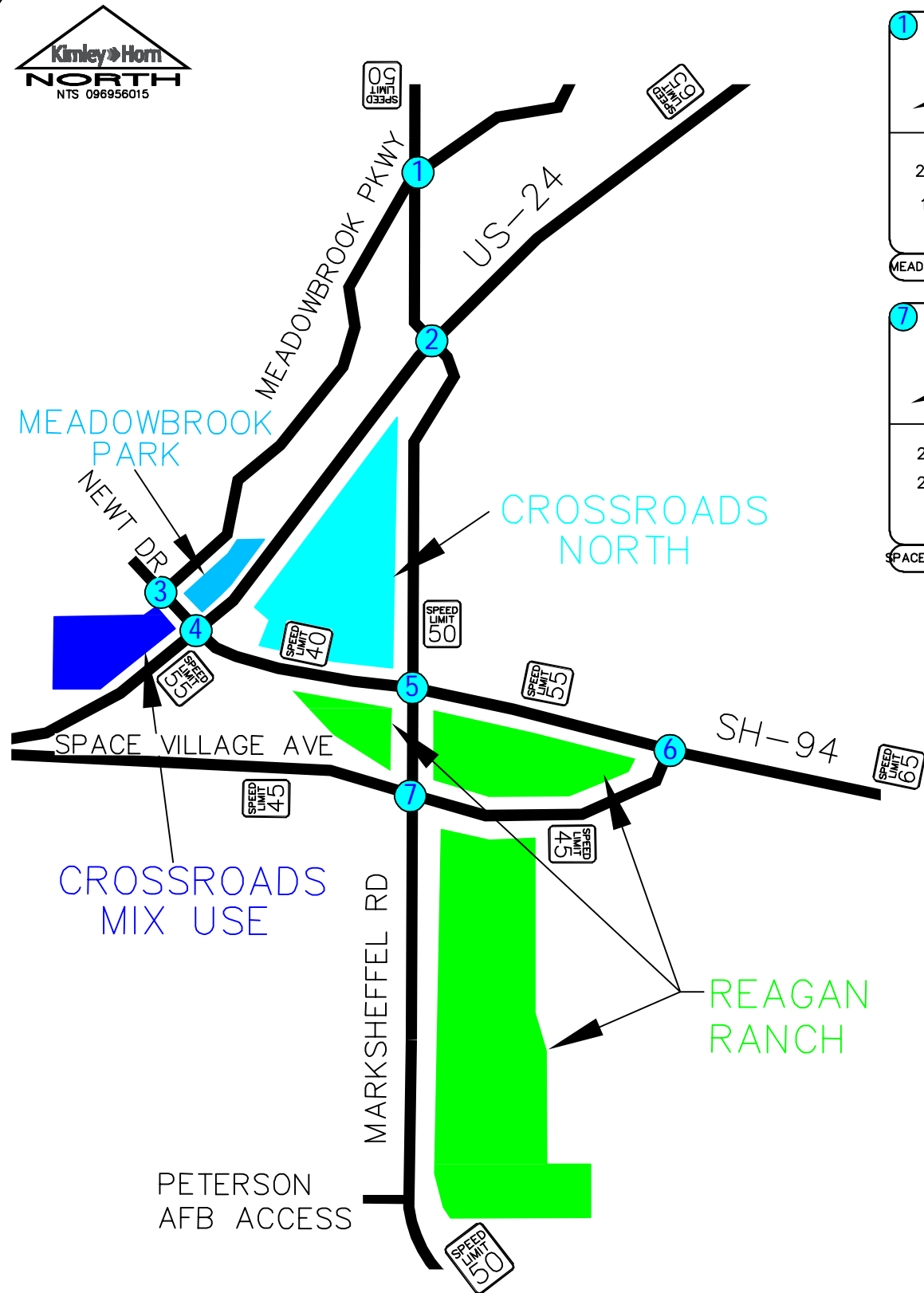
The SH-94 and Space Village Avenue (#6) intersection is a T-intersection with stop control on the northbound approach. The eastbound approach consists of one through lane and a right turn lane. The westbound approach consists of one left turn lane and one through lane. The northbound approach consists of a single lane for shared left turn and right turn movements.

The Space Village Avenue and Marksheffel Road (#7) intersection is a four-leg intersection that operates with stop-control on the eastbound and westbound approaches. The eastbound and westbound approaches consist of a left turn lane, one through lane, and one right turn lane. The northbound and southbound approaches each consist of one left turn lane, two through lanes, and one right turn lane. Existing intersection lane configurations and control for the study area are shown in **Figure 3**.

### 3.3 Existing Traffic Volumes

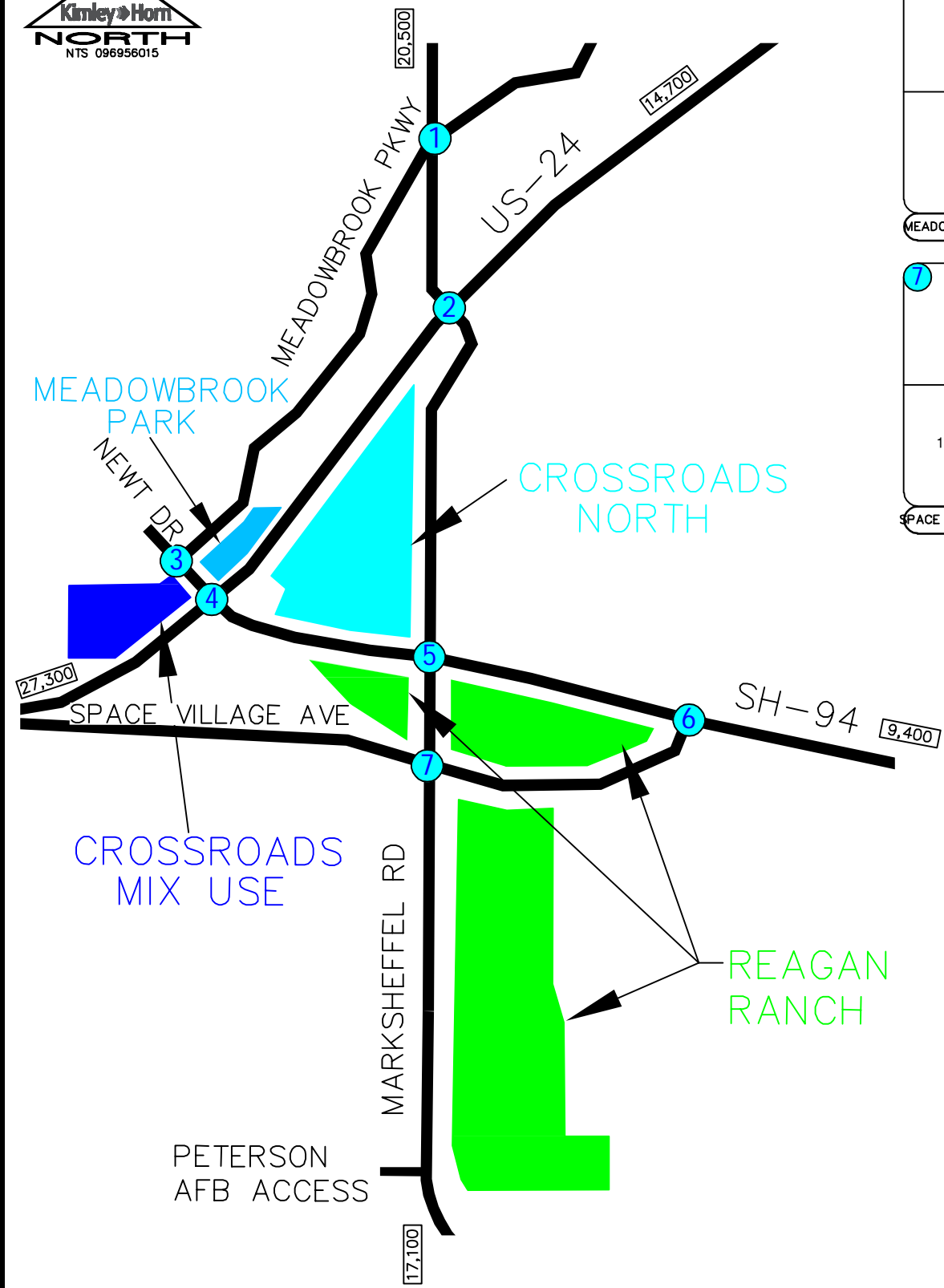
Due to the effects on traffic from COVID-19, traffic counts at each intersection were derived by different methodologies. Existing peak hour turning movement counts, pedestrian counts, heavy vehicle percentages, and bicycle counts were conducted at the intersections of Meadowbrook Parkway/Marksheffel Road (#1) and US-24/Marksheffel Road (#2) on Thursday, June 4, 2020, and at the intersections of Newt Drive/Meadowbrook Parkway (#3), SH-94/US-24 (#4), SH-94/Marksheffel Road (#5) and SH-94/Space Village Avenue (#6) on Tuesday, June 2, 2020. The weekday counts were conducted in 15-minute intervals during the AM and PM peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. The turning movement counts were grown based on data obtained from hourly counts from the CDOT OTIS database and additional historical CDOT traffic information provided to Kimley-Horn to account for a COVID-19 adjustment for this area. Based on this information and through coordination with CDOT, the morning and afternoon peak hour counts were adjusted by 35 percent except for the counts at the intersection of SH-94 and Marksheffel Road which were not adjusted in the morning peak hour but were adjusted by 44 percent for the afternoon peak hour.

The existing peak hour turning movements for the intersection of Marksheffel Road and Space Village Avenue (#7) were obtained from a signal warrant study and were conducted on Thursday, March 12, 2020. The counts at the intersection of Marksheffel Road and Space Village Avenue were used without adjustment since the counts were conducted before the COVID-19 pandemic. Existing turning movement counts are shown in **Figure 4** while the adjusted turning movement counts are shown in **Figure 5** with count sheets and COVID-19 count adjustment data provided in **Appendix A**. It should be noted that heavy vehicle percentages are documented in the count sheets and these percentages were used in the intersection operational analysis.



CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
EXISTING LANE CONFIGURATIONS AND CONTROL

FIGURE 3



<div>1</div> <table><tr><td>126(97) 1029(703) 6(30)</td><td>19(25) 14(9) 27(14)</td></tr><tr><td>78(131) 4(8) 26(37)</td><td>20(31) 569(1061) 12(54)</td></tr></table> <div>MEADOWBROOK PWY/MARKSHEFFEL RD</div>	126(97) 1029(703) 6(30)	19(25) 14(9) 27(14)	78(131) 4(8) 26(37)	20(31) 569(1061) 12(54)	<div>2</div> <table><tr><td>MARKSHEFFEL 522(350) 524(410) 7(12)</td><td>13(11) 820(389) 209(104)</td></tr><tr><td>248(461) 360(815) 0(5)</td><td>1(9) 336(615) 40(132)</td></tr></table> <div>US-24</div> <div>US-24/MARKSHEFFEL ROAD</div>	MARKSHEFFEL 522(350) 524(410) 7(12)	13(11) 820(389) 209(104)	248(461) 360(815) 0(5)	1(9) 336(615) 40(132)	<div>3</div> <table><tr><td>MEADOWBROOK 1(7) 149(195)</td><td>90(70) 7(26)</td></tr><tr><td>4(8) 20(24)</td><td></td></tr></table> <div>NEWT DR</div> <div>NEWT DR/MEADOWBROOK PKWY</div>	MEADOWBROOK 1(7) 149(195)	90(70) 7(26)	4(8) 20(24)		<div>4</div> <table><tr><td>US-24 27(27) 1285(691) 3(3)</td><td>1(5) 29(17) 326(259)</td></tr><tr><td>12(21) 21(29) 145(176)</td><td>107(117) 591(1250) 281(237)</td></tr></table> <div>SH-94</div> <div>SH-94/US-24</div>	US-24 27(27) 1285(691) 3(3)	1(5) 29(17) 326(259)	12(21) 21(29) 145(176)	107(117) 591(1250) 281(237)	<div>5</div> <table><tr><td>3(5) 501(398) 256(110)</td><td>77(238) 297(247) 28(27)</td></tr><tr><td>254(204) 54(65)</td><td>54(53) 270(569) 18(16)</td></tr></table> <div>SH-94/MARKSHEFFEL RD</div>	3(5) 501(398) 256(110)	77(238) 297(247) 28(27)	254(204) 54(65)	54(53) 270(569) 18(16)	<div>6</div> <table><tr><td></td><td>402(512) 21(41)</td></tr><tr><td>528(330)</td><td>62(49)</td></tr></table> <div>SH-94/SPACE VILLAGE AVENUE</div>		402(512) 21(41)	528(330)	62(49)
126(97) 1029(703) 6(30)	19(25) 14(9) 27(14)																												
78(131) 4(8) 26(37)	20(31) 569(1061) 12(54)																												
MARKSHEFFEL 522(350) 524(410) 7(12)	13(11) 820(389) 209(104)																												
248(461) 360(815) 0(5)	1(9) 336(615) 40(132)																												
MEADOWBROOK 1(7) 149(195)	90(70) 7(26)																												
4(8) 20(24)																													
US-24 27(27) 1285(691) 3(3)	1(5) 29(17) 326(259)																												
12(21) 21(29) 145(176)	107(117) 591(1250) 281(237)																												
3(5) 501(398) 256(110)	77(238) 297(247) 28(27)																												
254(204) 54(65)	54(53) 270(569) 18(16)																												
	402(512) 21(41)																												
528(330)	62(49)																												
<div>7</div> <table><tr><td>119(23) 859(530) 8(1)</td><td>2(1) 11(10) 8(30)</td></tr><tr><td>7(8) 42(31) 114(225)</td><td>273(203) 472(917) 12(17)</td></tr></table> <div>SPACE VILLAGE AVE/MARKSHEFFEL RD</div>						119(23) 859(530) 8(1)	2(1) 11(10) 8(30)	7(8) 42(31) 114(225)	273(203) 472(917) 12(17)																				
119(23) 859(530) 8(1)	2(1) 11(10) 8(30)																												
7(8) 42(31) 114(225)	273(203) 472(917) 12(17)																												

LEGEND

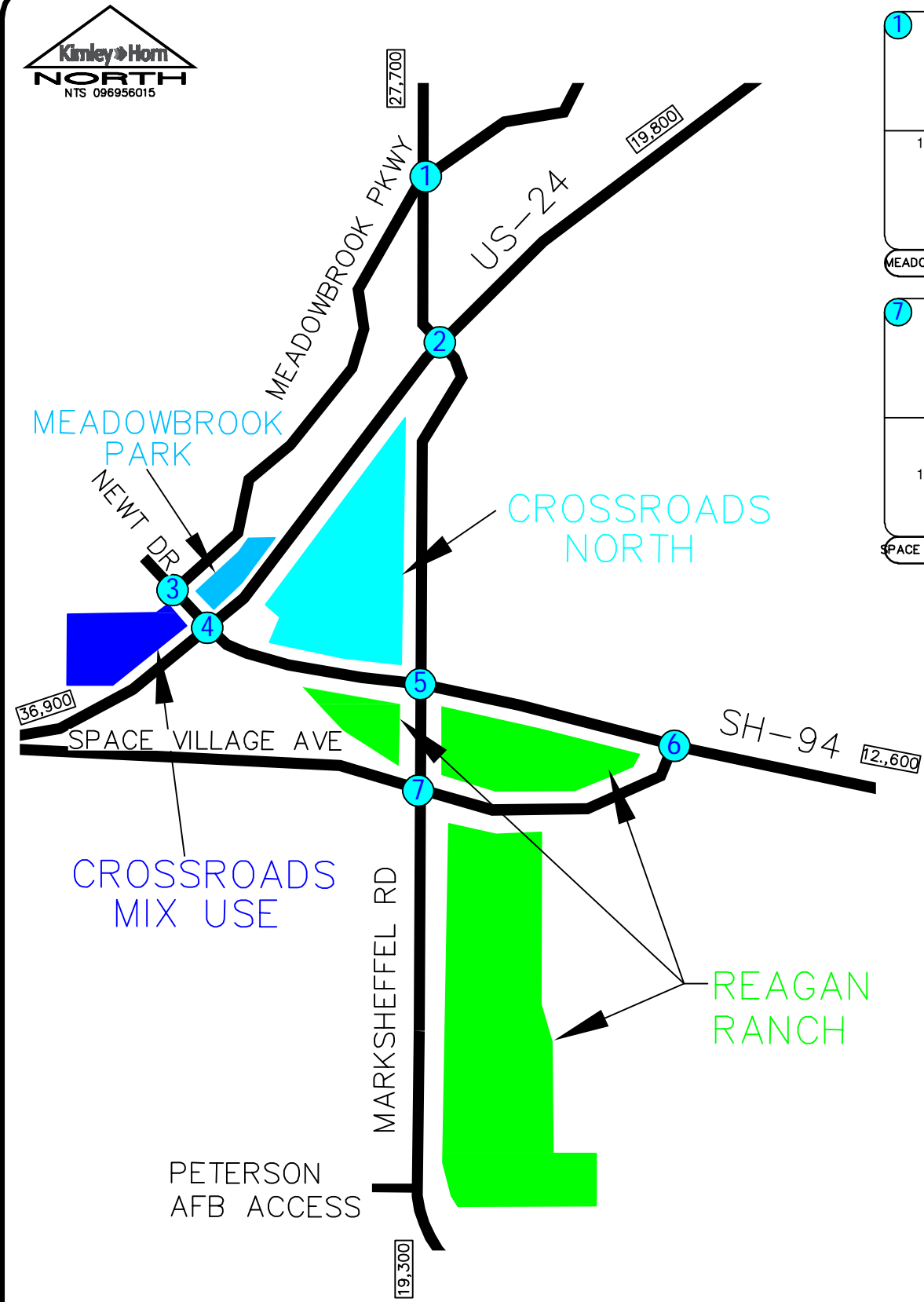
X

 Existing Key Intersection

XXX(XXX) Weekday AM(PM)  
Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2020 EXISTING TRAFFIC VOLUMES



<div>1</div> <table><tr><td>170(131) 1389(949) 8(41)</td><td>26(34) 19(12) 36(19)</td></tr><tr><td>105(177) 5(11) 35(50)</td><td>27(42) 768(1432) 16(73)</td></tr></table> <div>MEADOWBROOK PWY/MARKSHEFFEL RD</div>	170(131) 1389(949) 8(41)	26(34) 19(12) 36(19)	105(177) 5(11) 35(50)	27(42) 768(1432) 16(73)	<div>2</div> <table><tr><td>MARKSHEFFEL 705(473) 707(554) 9(16)</td><td>18(15) 1107(525) 282(140)</td></tr><tr><td>335(622) 486(1100) 0(7)</td><td>1(12) 454(830) 54(178)</td></tr></table> <div>US-24</div> <div>US-24/MARKSHEFFEL ROAD</div>	MARKSHEFFEL 705(473) 707(554) 9(16)	18(15) 1107(525) 282(140)	335(622) 486(1100) 0(7)	1(12) 454(830) 54(178)	<div>3</div> <table><tr><td>MEADOWBROOK 1(9) 201(263)</td><td>122(95) 9(35)</td></tr><tr><td>5(11) 27(32)</td><td></td></tr></table> <div>NEWT DR</div> <div>NEWT DR/MEADOWBROOK PKWY</div>	MEADOWBROOK 1(9) 201(263)	122(95) 9(35)	5(11) 27(32)		<div>4</div> <table><tr><td>US-24 36(36) 1735(933) 4(4)</td><td>1(7) 39(23) 440(350)</td></tr><tr><td>16(28) 28(39) 196(238)</td><td>144(158) 798(1688) 379(320)</td></tr></table> <div>SH-94</div> <div>SH-94/US-24</div>	US-24 36(36) 1735(933) 4(4)	1(7) 39(23) 440(350)	16(28) 28(39) 196(238)	144(158) 798(1688) 379(320)	<div>5</div> <table><tr><td>3(7) 501(573) 256(158)</td><td>77(343) 297(356) 28(39)</td></tr><tr><td>254(294) 54(94)</td><td>54(76) 270(819) 18(23)</td></tr></table> <div>SH-94/MARKSHEFFEL RD</div>	3(7) 501(573) 256(158)	77(343) 297(356) 28(39)	254(294) 54(94)	54(76) 270(819) 18(23)	<div>6</div> <table><tr><td></td><td>543(691) 28(55)</td></tr><tr><td>713(446)</td><td>84(66)</td></tr></table> <div>SH-94/SPACE VILLAGE AVENUE</div>		543(691) 28(55)	713(446)	84(66)
170(131) 1389(949) 8(41)	26(34) 19(12) 36(19)																												
105(177) 5(11) 35(50)	27(42) 768(1432) 16(73)																												
MARKSHEFFEL 705(473) 707(554) 9(16)	18(15) 1107(525) 282(140)																												
335(622) 486(1100) 0(7)	1(12) 454(830) 54(178)																												
MEADOWBROOK 1(9) 201(263)	122(95) 9(35)																												
5(11) 27(32)																													
US-24 36(36) 1735(933) 4(4)	1(7) 39(23) 440(350)																												
16(28) 28(39) 196(238)	144(158) 798(1688) 379(320)																												
3(7) 501(573) 256(158)	77(343) 297(356) 28(39)																												
254(294) 54(94)	54(76) 270(819) 18(23)																												
	543(691) 28(55)																												
713(446)	84(66)																												
<div>7</div> <table><tr><td>119(23) 859(530) 8(1)</td><td>2(1) 11(10) 8(30)</td></tr><tr><td>7(8) 42(31) 114(225)</td><td>273(203) 472(917) 12(17)</td></tr></table> <div>SPACE VILLAGE AVE/MARKSHEFFEL RD</div>	119(23) 859(530) 8(1)	2(1) 11(10) 8(30)	7(8) 42(31) 114(225)	273(203) 472(917) 12(17)																									
119(23) 859(530) 8(1)	2(1) 11(10) 8(30)																												
7(8) 42(31) 114(225)	273(203) 472(917) 12(17)																												

LEGEND

X

 Existing Key Intersection

XXX(XXX) Weekday AM(PM)  
Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

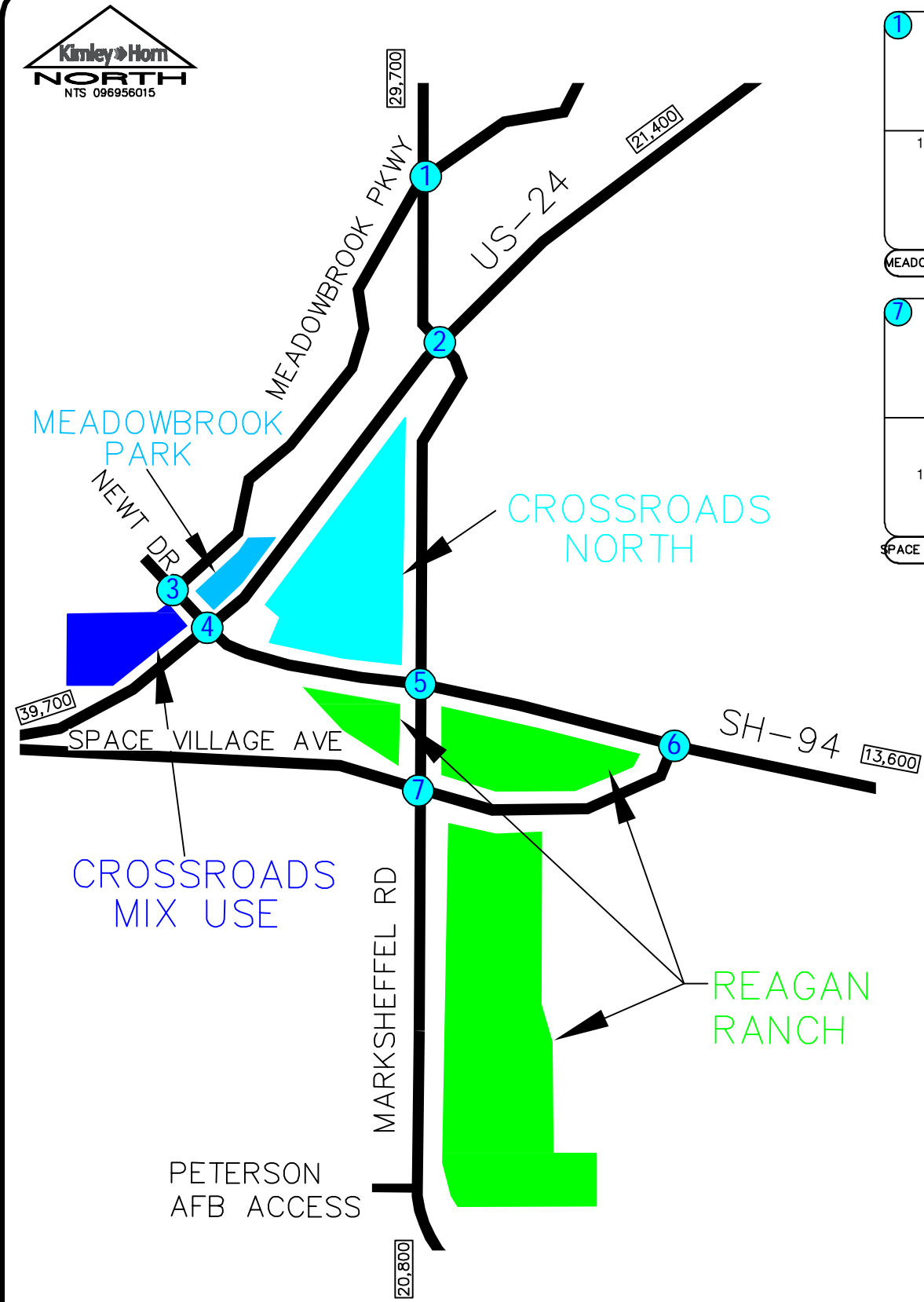
CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2020 ADJUSTED EXISTING TRAFFIC VOLUMES

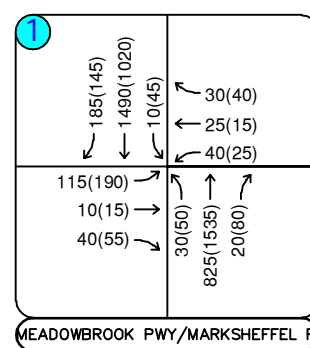
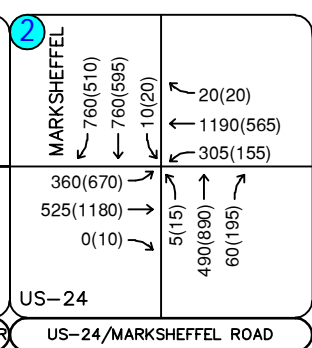
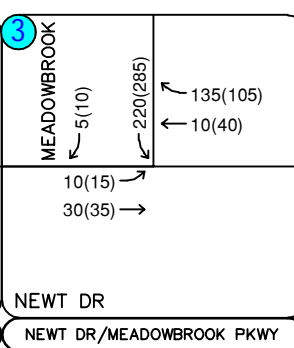
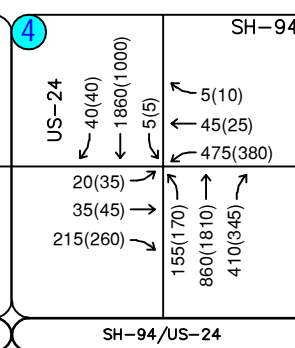
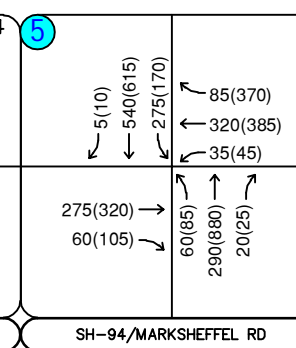
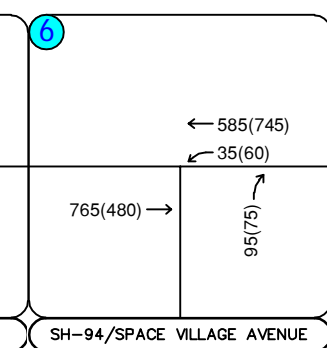
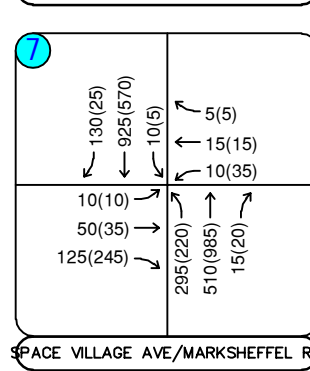


### 3.4 Unspecified Development Traffic Growth


According to information provided on the website for the Colorado Department of Transportation (CDOT), the average 20-year growth factor along SH-94 in the vicinity of the site is 1.29. This value equates to an annual growth rate of 1.16 percent. SH-94 traffic information from the CDOT Online Transportation Information System (OTIS) website is included in **Appendix B**. Based on this, an annual growth rate of 1.16 percent was used to calculate future traffic volumes within the project study area. This annual growth rate was used to estimate near term 2026 and long term 2040 traffic volume projections at the key intersections.

Along with the annual growth, calculated trips from an additional 1,123 single family detached housing units, located in the parcels east of the southeast area of Reagan Ranch, were added to the 2040 background volumes. Further, project traffic from the single-family housing development to the west at Newt Drive were estimated based on the number of homes yet to be occupied and added to the background traffic volumes. The Pikes Peak Area Council of Governments (PPACOG) 2040 traffic volume projections were used as a comparison to future traffic volume projections with this study. All future average daily traffic volume projections in this study exceed the PPACOG projections; therefore, the annual growth rate of 1.16 percent should be conservative. As requested by El Paso County, it should be noted that all known development traffic studies have been included in this study and this includes the Kimley-Horn traffic studies completed in the immediate area in the last five years. Background traffic volumes for 2026 and 2040 are shown in **Figures 6** and **7**, respectively.



<b>1</b> 	<b>2</b> 	<b>3</b> 	<b>4</b> 	<b>5</b> 	<b>6</b> 
MEADOWBROOK PKWY/MARKSHEFFEL RD	US-24/MARKSHEFFEL ROAD	NEWT DR/MEADOWBROOK PKWY	SH-94/US-24	SH-94/MARKSHEFFEL RD	SH-94/SPACE VILLAGE AVENUE
<b>7</b> 					
SPACE VILLAGE AVE/MARKSHEFFEL RD					

LEGEND

 Existing Key Intersection

XXX(XXX)

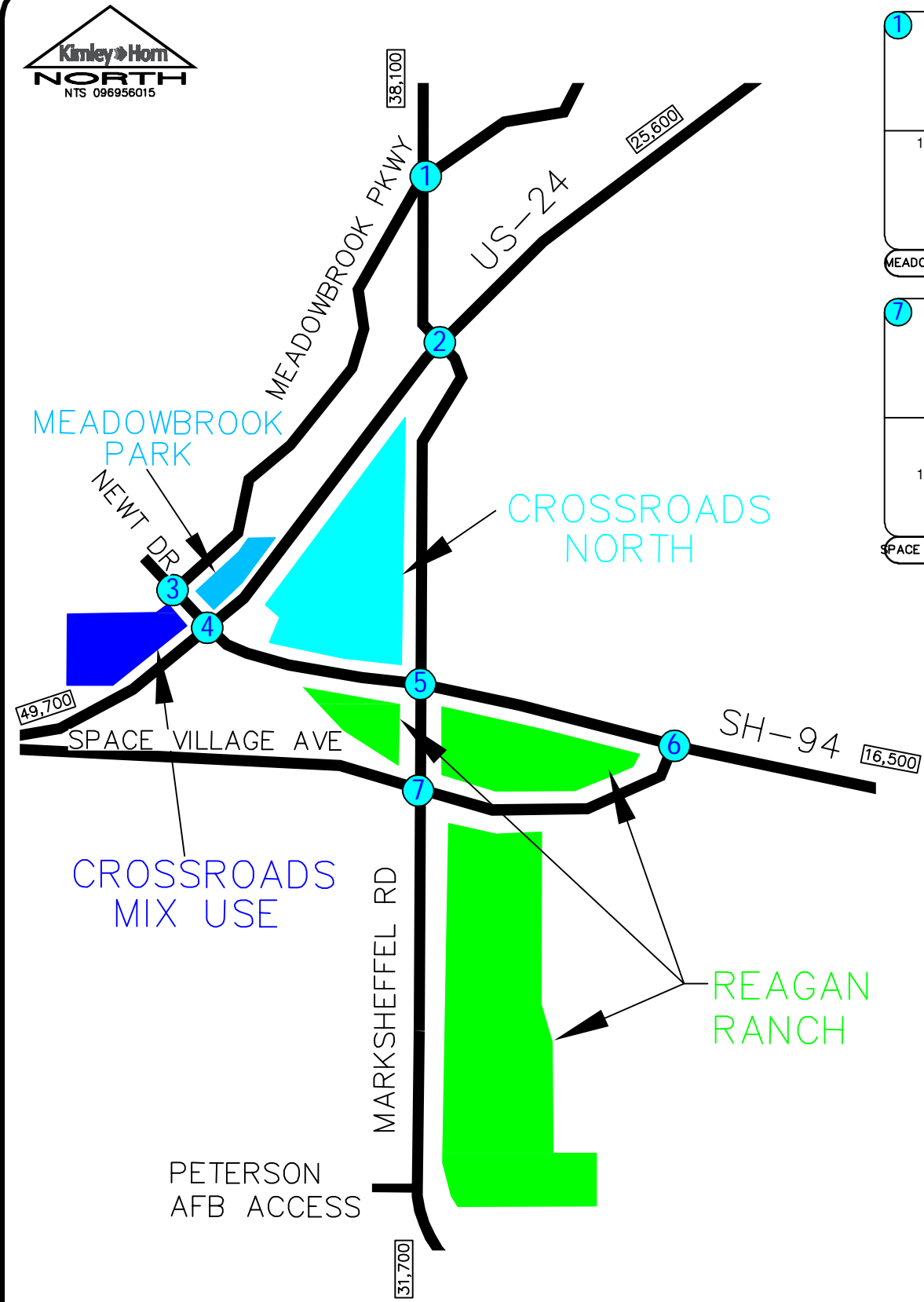
Weekday AM(PM)

Peak Hour Traffic Volumes

XX,X00

Estimated Daily Traffic Volume

CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2026 BACKGROUND TRAFFIC VOLUMES



<div>1</div> <table><tr><td>215(165) 1810(1395) 15(55)</td><td>35(45) 25(20) 50(25)</td></tr><tr><td>135(225) 10(15) 45(65)</td><td>35(55) 1150(1920) 25(95)</td></tr></table> <div>MEADOWBROOK PWY/MARKSHEFFEL RD</div>	215(165) 1810(1395) 15(55)	35(45) 25(20) 50(25)	135(225) 10(15) 45(65)	35(55) 1150(1920) 25(95)	<div>2</div> <table><tr><td>MARKSHEFFEL 890(600) 955(895) 15(25)</td><td>25(20) 1395(665) 370(210)</td></tr><tr><td>425(785) 615(1390) 0(10)</td><td>5(20) 755(1165) 100(245)</td></tr></table> <div>US-24</div> <div>US-24/MARKSHEFFEL ROAD</div>	MARKSHEFFEL 890(600) 955(895) 15(25)	25(20) 1395(665) 370(210)	425(785) 615(1390) 0(10)	5(20) 755(1165) 100(245)	<div>3</div> <table><tr><td>MEADOWBROOK 5(15) 255(335)</td><td>155(120) 15(45)</td></tr><tr><td>10(15) 35(45)</td><td></td></tr></table> <div>NEWT DR</div> <div>NEWT DR/MEADOWBROOK PKWY</div>	MEADOWBROOK 5(15) 255(335)	155(120) 15(45)	10(15) 35(45)		<div>4</div> <table><tr><td>US-24 50(50) 2190(1180) 10(10)</td><td>5(10) 50(30) 735(560)</td></tr><tr><td>25(40) 40(50) 250(300)</td><td>185(200) 1010(2130) 540(600)</td></tr></table> <div>SH-94</div> <div>SH-94/US-24</div>	US-24 50(50) 2190(1180) 10(10)	5(10) 50(30) 735(560)	25(40) 40(50) 250(300)	185(200) 1010(2130) 540(600)	<div>5</div> <table><tr><td>SH-94 5(10) 705(955) 325(200)</td><td>100(435) 375(450) 40(50)</td></tr><tr><td>320(375) 130(315)</td><td>250(215) 555(1170) 25(30)</td></tr></table> <div>SH-94/MARKSHEFFEL RD</div>	SH-94 5(10) 705(955) 325(200)	100(435) 375(450) 40(50)	320(375) 130(315)	250(215) 555(1170) 25(30)	<div>6</div> <table><tr><td></td><td>685(875) 50(105)</td></tr><tr><td>900(565)</td><td>140(105)</td></tr></table> <div>SH-94/SPACE VILLAGE AVENUE</div>		685(875) 50(105)	900(565)	140(105)
215(165) 1810(1395) 15(55)	35(45) 25(20) 50(25)																												
135(225) 10(15) 45(65)	35(55) 1150(1920) 25(95)																												
MARKSHEFFEL 890(600) 955(895) 15(25)	25(20) 1395(665) 370(210)																												
425(785) 615(1390) 0(10)	5(20) 755(1165) 100(245)																												
MEADOWBROOK 5(15) 255(335)	155(120) 15(45)																												
10(15) 35(45)																													
US-24 50(50) 2190(1180) 10(10)	5(10) 50(30) 735(560)																												
25(40) 40(50) 250(300)	185(200) 1010(2130) 540(600)																												
SH-94 5(10) 705(955) 325(200)	100(435) 375(450) 40(50)																												
320(375) 130(315)	250(215) 555(1170) 25(30)																												
	685(875) 50(105)																												
900(565)	140(105)																												
<div>7</div> <table><tr><td>150(30) 1210(1080) 15(15)</td><td>15(10) 45(35) 20(60)</td></tr><tr><td>10(15) 65(75) 155(320)</td><td>375(275) 975(1400) 35(35)</td></tr></table> <div>SPACE VILLAGE AVE/MARKSHEFFEL RD</div>	150(30) 1210(1080) 15(15)	15(10) 45(35) 20(60)	10(15) 65(75) 155(320)	375(275) 975(1400) 35(35)																									
150(30) 1210(1080) 15(15)	15(10) 45(35) 20(60)																												
10(15) 65(75) 155(320)	375(275) 975(1400) 35(35)																												

LEGEND

X

 Existing Key Intersection

XXX(XXX) Weekday AM(PM)  
Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2040 BACKGROUND TRAFFIC VOLUMES

## 4.0 PROJECT TRAFFIC CHARACTERISTICS

---

### 4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*<sup>1</sup> published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses.

As mentioned previously, the projects were evaluated with a Phase 1 2026 horizon and a full buildout 2040 horizon. For this study, Kimley-Horn used the ITE Trip Generation Manual average rates and fitted curve equations that apply to Industrial Park (ITE Code 130), Single-Family Detached House (ITE 210), Mid-Rise Multifamily Housing (ITE 221), Public Park (ITE 411), Movie Theater (ITE 444), General Office Building (ITE 710), Shopping Center (ITE 820), Tire Superstore (ITE 849), Home Improvement Superstore (ITE 862), Pharmacy (ITE 881), Furniture Store (ITE 890), Sit-Down Restaurant (ITE 932), Fast-Food Restaurant with Drive Through (ITE 934), Coffee/Donut Shop with Drive Through (ITE 937), and Gasoline Station with Convenience Market (ITE 960) for traffic associated with all development areas of the project.

Since the project is proposed to contain a mix of uses, internal capture trips are expected to occur on site as well. These internal capture trips are shared trips from vehicles already within the internal street network. These shared trips reduce the number of total external trips and were calculated directly per the ITE procedure but were capped based on thresholds set forth by CDOT. Based on the CDOT access code, internal trip reductions cannot not exceed two percent for the AM peak or eight percent for PM peaks unless clearly justified and documented by actual studies. As such, an internal capture rate of two (2) percent was used during the morning peak hour and a rate of eight (8) percent during the afternoon peak for areas that apply. Phase 1 development of the projects in 2026 is expected to generate approximately 34,458 daily weekday external vehicle trips with 2,748 of these trips occurring during the morning peak hour and 2,806 trips occurring during the afternoon peak hour. Calculations were based on the procedure and

---

<sup>1</sup> Institute of Transportation Engineers, *Trip Generation Manual*, Tenth Edition, Washington DC, 2017.

information provided in the ITE *Trip Generation Manual, 10<sup>th</sup> Edition – Volume 1: User's Guide and Handbook*, 2017. **Table 1** provides the estimated trip generation for Phase 1 of the project. The trip generation calculations are included in **Appendix C**.

**Table 1 – Phase 1 Project Traffic Generation**

Use	Quantity	Daily	Weekday Vehicle Trips					
			AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Crossroads North								
Public Park (ITE 411)	20 Acres	16	0	0	0	1	1	2
Tire Superstore (ITE 849)	7,000 SF	144	6	3	9	7	8	15
Home Improvement Superstore (ITE 862)	127,000 SF	3,904	113	86	199	145	151	296
Furniture Store (ITE 890)	114,000 SF	720	21	9	30	28	31	59
Sit Down Restaurant (ITE 932)	11,000 SF	1,234	60	49	109	66	41	107
Fast-Food Restaurant (ITE 934)	2,500 SF	1,178	51	49	100	43	39	82
Gas Station Super Convenience (ITE 960)	6,000 SF	5,026	249	250	499	208	208	416
Total Crossroads North Trips		12,222	500	446	946	498	479	977
Crossroads North Trips after Internal Capture		11,246	490	437	927	458	441	899
Meadowbrook Park								
Single Family Housing (ITE 210)	67 Units	720	13	39	52	43	26	69
Meadowbrook Park Total Trips		720	13	39	52	43	26	69
Crossroads Mix Use								
Mid-Rise Multifamily Housing (ITE 221)	300 Units	1,634	26	74	100	77	50	127
Shopping Center (ITE 820)	10,000 SF	1,256	97	60	157	48	51	99
Sit Down Restaurant (ITE 932)	4,000 SF	450	22	18	40	24	15	39
Fast Food Restaurant (ITE 934)	11,000 SF	5,182	225	217	442	187	172	359
Coffee Shop (ITE 937)	2,500 SF	2,050	113	109	222	55	55	110
Total Crossroads Mix Use Trips		10,572	483	478	961	391	343	734
Crossroads Mix Use Trips after Internal Capture		9,726	474	468	942	359	316	675
Reagan Ranch Northwest Area								
Industrial Park (ITE 130)	220,000 SF	742	71	17	88	18	70	88
Reagan Ranch Northwest Area Total Trips		742	71	17	88	18	70	88
Reagan Ranch Northeast Area								
Single Family Housing (ITE 210)	125 Units	1,276	22	72	94	79	47	126
Shopping Center (ITE 820)	30,000 SF	2,652	104	63	167	107	116	223
Total Reagan Ranch Northeast Area Trips		3,928	126	135	261	186	163	349
Reagan Ranch NE Area Trips after Internal Capture		3,614	124	132	256	171	150	321
Reagan Ranch Southeast Area								
Single Family Housing (ITE 210)	255 Units	2,460	45	141	186	156	94	250
Mid-Rise Multifamily Housing (ITE 221)	360 Units	1,962	31	89	120	93	59	152
Shopping Center (ITE 820)	70,000 SF	4,718	116	71	187	200	217	417
Total Reagan Ranch Southeast Area Trips		9,140	192	301	493	449	370	819
Reagan Ranch SE Area Trips after Internal Capture		8,410	188	295	483	413	340	753
Total Site Generated Trips		37,324	1,385	1,416	2,801	1,585	1,451	3,036
Total Site External Trips after Internal Capture		34,458	1,360	1,389	2,748	1,462	1,343	2,806



With full project buildout by 2040, the three development areas are expected to generate approximately 58,582 daily weekday external vehicle trips with 3,481 of these trips occurring during the morning peak hour and 5,121 trips occurring during the afternoon peak hour. **Table 2** provides the estimated trip generation for full buildout of the project.

**Table 2 – Full Buildout Project Traffic Generation**

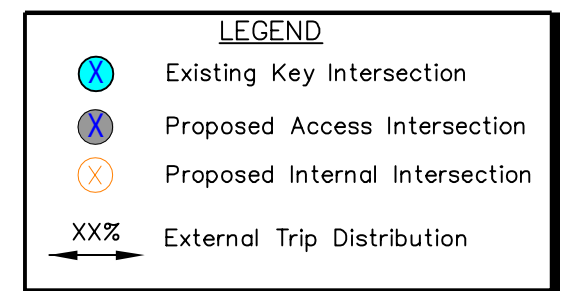
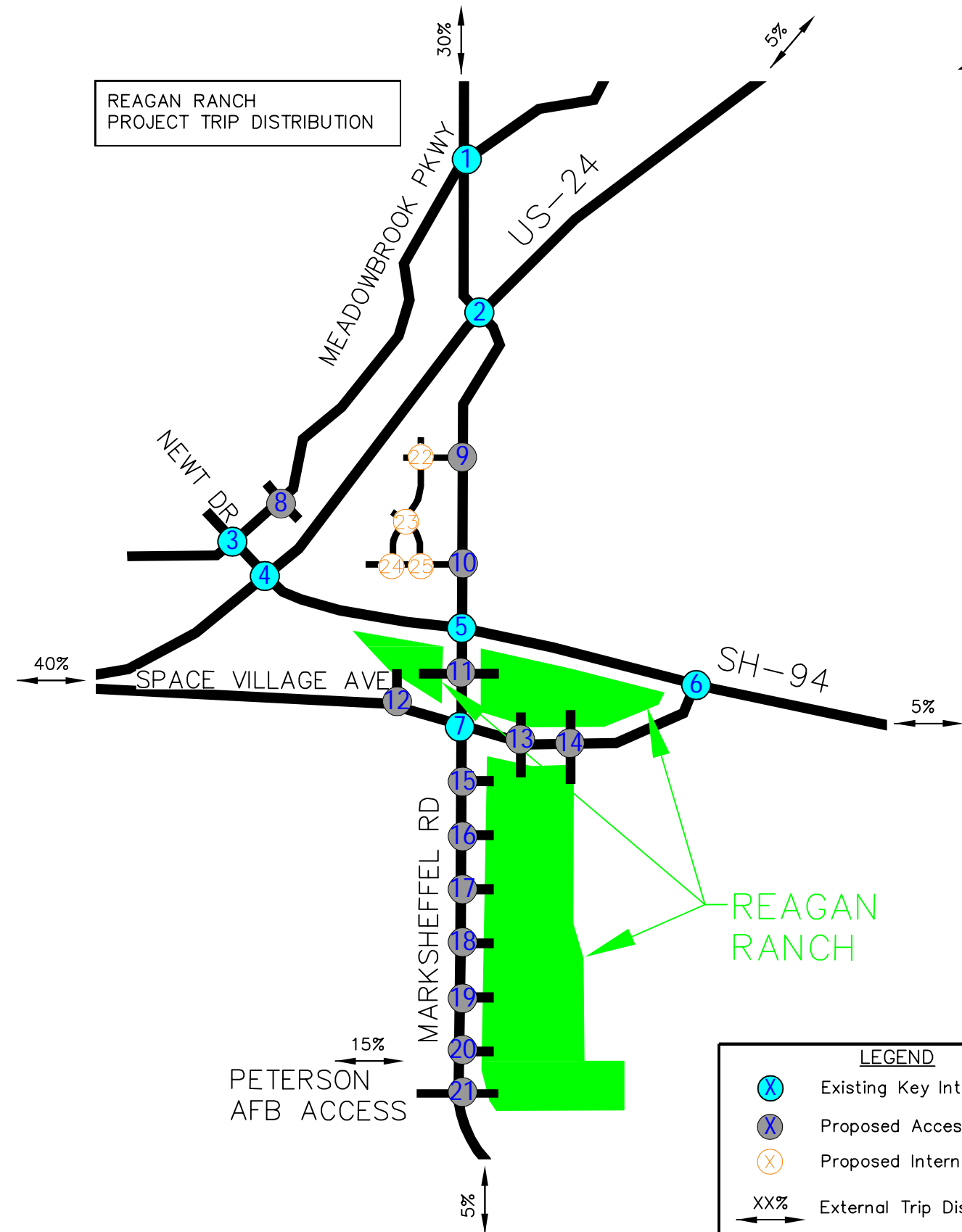
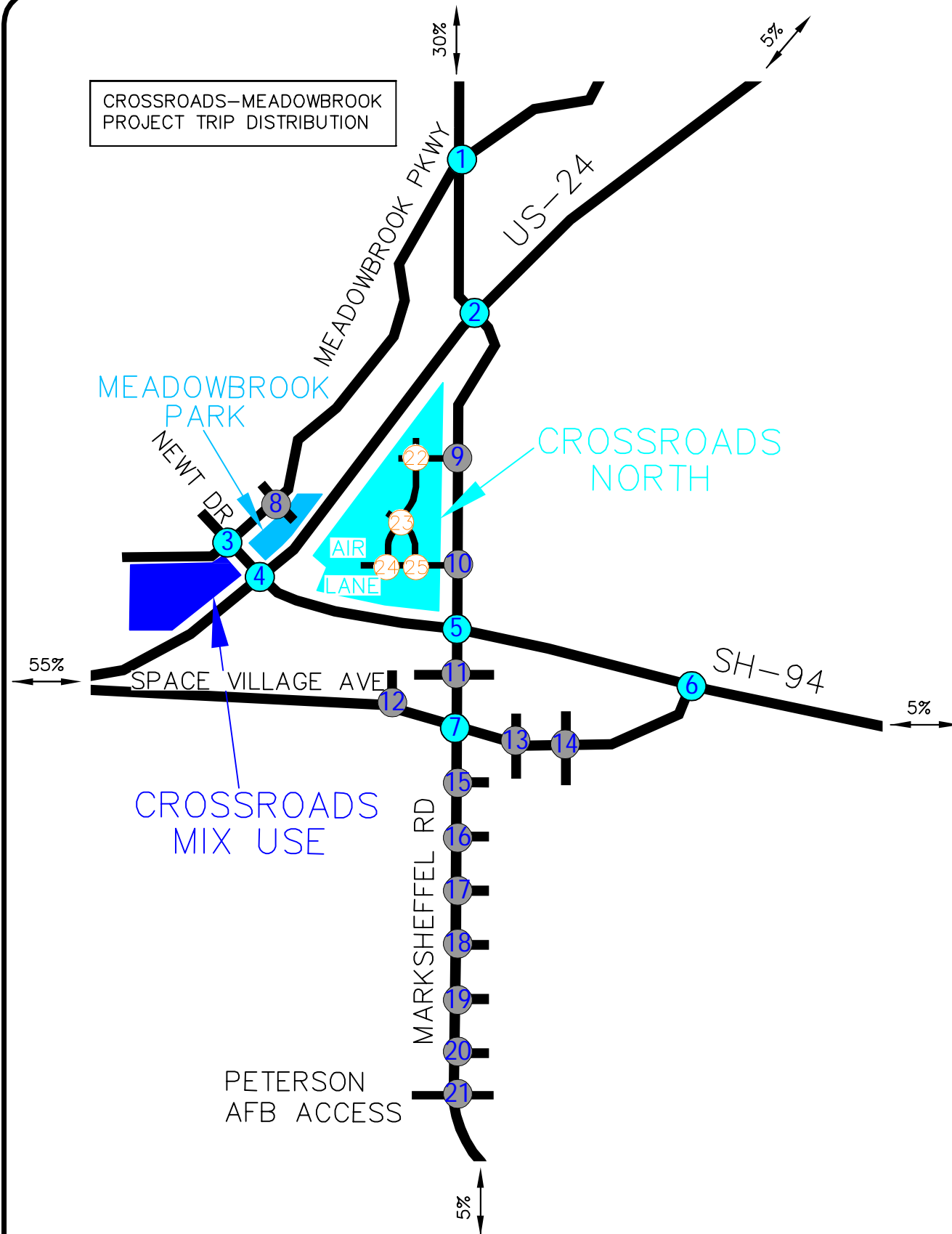
Use	Quantity	Daily	Weekday Vehicle Trips					
			AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Crossroads North								
Public Park (ITE 411)	20 Acres	16	0	0	0	1	1	2
Movie Theatre (ITE 444)	52,000 SF	4,062	5	6	11	302	19	321
Tire Superstore (ITE 849)	7,000 SF	144	6	3	9	7	8	15
Home Improvement Superstore (ITE 862)	127,000 SF	3,904	113	86	199	145	151	296
Furniture Store (ITE 890)	114,000 SF	720	21	9	30	28	31	59
Sit Down Restaurant (ITE 932)	11,000 SF	1,234	60	49	109	66	41	107
Fast-Food Restaurant (ITE 934)	5,000 SF	2,356	103	98	201	85	78	163
Gas Station Super Convenience (ITE 960)	6,000 SF	5,026	249	250	499	208	208	416
Total Crossroads North Trips		17,462	557	501	1,058	842	537	1,379
Crossroads North Trips after Internal Capture		16,066	546	491	1,037	775	494	1,269
Meadowbrook Park								
Single Family Housing (ITE 210)	67 Units	720	13	39	52	43	26	69
Meadowbrook Park Total Trips		720	13	39	52	43	26	69
Crossroads Mix Use								
Mid-Rise Multifamily Housing (ITE 221)	300 Units	1,634	26	74	100	77	50	127
Shopping Center (ITE 820)	10,000 SF	1,256	97	60	157	48	51	99
Pharmacy (ITE 881)	14,000 SF	1,528	29	25	54	72	72	144
Sit Down Restaurant (ITE 932)	8,000 SF	898	44	36	80	48	30	78
Fast Food Restaurant (ITE 934)	11,000 SF	5,182	225	217	442	187	172	359
Coffee Shop (ITE 937)	2,500 SF	2,050	113	109	222	55	55	110
Total Crossroads Mix Use Trips		12,548	534	521	1,055	487	430	917
Crossroads Mix Use Trips after Internal Capture		11,544	523	511	1,034	448	396	844
Reagan Ranch Northwest Area								
Industrial Park (ITE 130)	365,000 SF	1,232	118	28	146	31	115	146
Reagan Ranch Northwest Area Total Trips		1,232	118	28	146	31	115	146
Reagan Ranch Northeast Area								
Single Family Housing (ITE 210)	200 Units	1,968	37	110	147	125	73	198
Shopping Center (ITE 820)	175,000 SF	8,796	148	91	239	395	427	822
Total Reagan Ranch Northeast Area Trips		10,764	185	201	386	520	500	1,020
Reagan Ranch NE Area Trips after Internal Capture		9,904	181	197	378	478	460	938
Reagan Ranch Southeast Area								
Single Family Housing (ITE 210)	393 Units	3,662	71	213	284	238	140	378
Mid-Rise Multifamily Housing (ITE 221)	360 Units	1,962	31	89	120	93	59	152
Office (ITE 710)	100,000 SF	1,062	103	17	120	18	96	114
Shopping Center (ITE 820)	350,000 SF	14,092	203	124	327	659	714	1,373
Total Reagan Ranch Southeast Area Trips		20,778	408	443	851	1,008	1,009	2,017
Reagan Ranch SE Area Trips after Internal Capture		19,116	400	434	834	928	928	1,856
Total Site Generated Trips		63,504	1,815	1,733	3,548	2,931	2,617	5,548
Total Site External Trips after Internal Capture		58,582	1,781	1,700	3,481	2,703	2,419	5,121

## 4.2 Trip Distribution

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding demographic information, expected roadway improvements, and the proposed access system for the project. Separate distributions were prepared for each development area to accurately identify the amount of traffic to be assigned to each project. Assignment of project traffic was based upon the trip generation described previously and the distributions developed for each project area. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. The project trip distribution is illustrated in **Figure 8**.

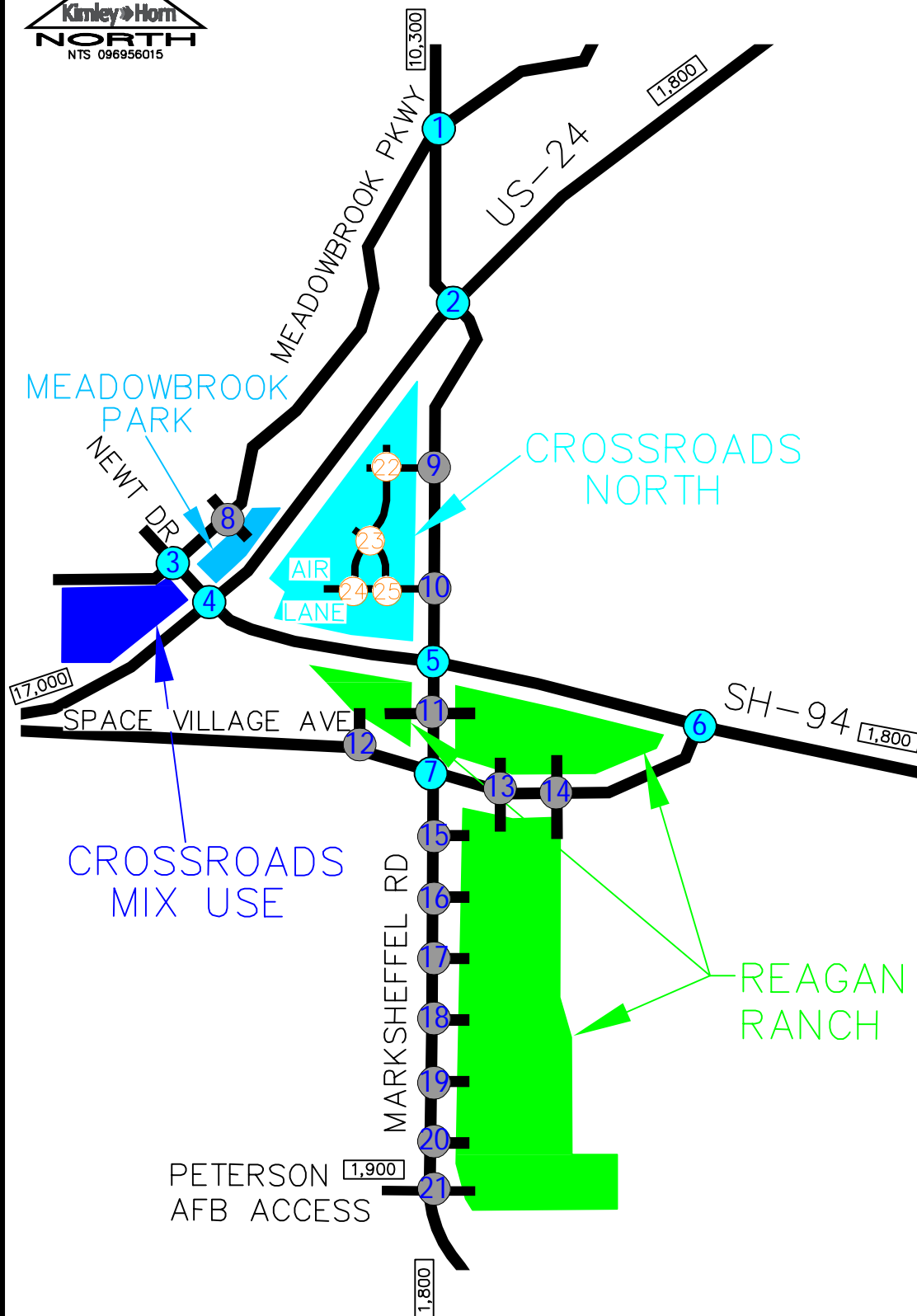
## 4.3 Traffic Assignment and Total (Background Plus Project) Traffic

Traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1** and **Table 2**. Phase 1 project traffic assignment for all development areas is shown in **Figure 9** while full buildout traffic assignment is shown in **Figure 10**. Project traffic volumes were added to the background volumes to represent estimated traffic conditions for the short term 2026 horizon and long term 2040 horizon. These background plus project (total) traffic volumes for the project are illustrated for the 2026 and 2040 horizon years in **Figures 11** and **12**, respectively.



CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
PROJECT TRIP DISTRIBUTION

FIGURE 8



CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2026 PROJECT TRAFFIC ASSIGNMENT

<div>1</div> <div><div>146(121) ← 261(318)</div><div>152(103) →</div><div>264(300) →</div></div> <div>MEADOWBROOK PWY/MARKSHEFFEL RD</div>	<div>2</div> <div><div>MARKSHEFFEL</div><div>← 261(318)</div><div>← 25(20) ← 44(54)</div><div>25(17) → 123(115) →</div><div>264(300) → 45(50) →</div></div> <div>US-24</div> <div>MARKSHEFFEL</div>	<div>3</div> <div><div>MEADOWBROOK</div><div>← 142(108) ← 27(18)</div><div>← 9(30) ← 332(251)</div><div>140(95) → 328(221) →</div></div> <div>NEWT DR</div> <div>MEADOWBROOK</div>	<div>4</div> <div><div>US-24</div><div>← 25(20)</div><div>25(17) → 51(35) → 278(188) →</div><div>268(221) → 123(115) → 222(280) →</div></div> <div>SH-94/US-24</div> <div>SH-94</div>	<div>5</div> <div><div>SH-94</div><div>← 48(40) ← 342(360)</div><div>240(243) → 155(230) → 23(26) →</div><div>29(25) → 25(20) →</div></div> <div>SH-94/MARKSHEFFEL RD</div> <div>SH-94</div>	<div>6</div> <div><div>SH-94</div><div>← 50(43) ← 19(31)</div><div>50(44) → 1(4) →</div><div>4(2) → 20(23) →</div></div> <div>SH-94/SPACE VILLAGE AVENUE</div> <div>SH-94</div>
<div>7</div> <div><div>168(312) ← 58(83)</div><div>27(45) → 26(55) → 9(22) →</div><div>34(23) → 58(63) → 32(42) →</div><div>29(21) → 257(277) → 13(24) →</div></div> <div>SPACE VILLAGE AVE/MARKSHEFFEL RD</div> <div>MARKSHEFFEL</div>	<div>8</div> <div><div>MEADOWBROOK</div><div>← 208(253) ← 4(13)</div><div>12(8) → 27(18) →</div><div>243(214) → 9(30) →</div></div> <div>MEADOWBROOK PARKWAY ACCESS</div> <div>ACCESS</div>	<div>9</div> <div><div>196(183) ← 232(303)</div><div>87(88) → 87(88) →</div><div>49(46) → 221(262) →</div></div> <div>MARKSHEFFEL RD NORTH ACCESS</div> <div>MARKSHEFFEL</div>	<div>10</div> <div><div>98(92) ← 221(299)</div><div>66(66) → 197(198) →</div><div>147(137) → 204(242) →</div></div> <div>MARKSHEFFEL RD/AIR LANE ACCESS</div> <div>MARKSHEFFEL</div>	<div>11</div> <div><div>32(8) ← 223(381)</div><div>3(14) →</div><div>31(55) →</div><div>276(305) → 41(40) →</div></div> <div>MARKSHEFFEL ROAD RIRO ACCESS</div> <div>MARKSHEFFEL</div>	<div>12</div> <div><div>7(28) ← 7(28)</div><div>21(5) → 56(93) →</div><div>18(5) → 69(79) →</div></div> <div>SPACE VILLAGE AVE FULL ACCESS</div> <div>SPACE VILLAGE AVE</div>
<div>13</div> <div><div>31(55) ← 2(2)</div><div>57(54) → 33(87) → 9(21) →</div><div>5(5) → 80(57) → 2(4) →</div><div>15(17) → 3(3) →</div></div> <div>SPACE VILLAGE AVE W FULL ACCESS</div> <div>SPACE VILLAGE AVE</div>	<div>14</div> <div><div>64(37) ← 7(4)</div><div>19(65) → 13(18) → 4(8) →</div><div>2(7) → 17(23) → 2(4) →</div><div>6(7) → 3(3) →</div></div> <div>SPACE VILLAGE AVE E FULL ACCESS</div> <div>SPACE VILLAGE AVE</div>	<div>15</div> <div><div>209(376) ←</div><div>281(302) → 2(4) →</div><div>18(20) →</div></div> <div>MARKSHEFFEL ROAD RIRO ACCESS</div> <div>MARKSHEFFEL</div>	<div>16</div> <div><div>178(306) ← 32(70)</div><div>253(272) → 6(7) →</div><div>30(34) →</div></div> <div>MARKSHEFFEL ROAD 3/4 ACCESS</div> <div>MARKSHEFFEL</div>	<div>17</div> <div><div>178(306) ←</div><div>219(236) → 6(12) →</div><div>38(44) →</div></div> <div>MARKSHEFFEL ROAD RIRO ACCESS</div> <div>MARKSHEFFEL</div>	<div>18</div> <div><div>142(228) ← 36(78)</div><div>197(218) → 6(12) →</div><div>27(31) → 27(31) →</div></div> <div>MARKSHEFFEL ROAD FULL ACCESS</div> <div>MARKSHEFFEL</div>
<div>19</div> <div><div>169(259) ←</div><div>186(210) → 6(12) →</div><div>18(20) →</div></div> <div>MARKSHEFFEL ROAD RIRO ACCESS</div> <div>MARKSHEFFEL</div>	<div>20</div> <div><div>133(180) ← 36(78)</div><div>156(182) → 4(8) →</div><div>35(41) →</div></div> <div>MARKSHEFFEL ROAD 3/4 ACCESS</div> <div>MARKSHEFFEL</div>	<div>21</div> <div><div>44(57) ← 61(57) ← 30(66)</div><div>48(70) → 9(21) →</div><div>44(51) → 24(27) → 9(10) →</div><div>68(70) → 2(4) →</div></div> <div>MARKSHEFFEL RD FULL ACCESS</div> <div>MARKSHEFFEL</div>	<div>22</div> <div><div>2(2) ← 2(2) ← 44(44)</div><div>44(44) → 2(2) →</div><div>49(46) → 49(46) → 147(137) →</div><div>2(2) → 2(2) → 87(88) →</div></div> <div>CROSSROADS NORTH INT #22</div> <div>CROSSROADS NORTH</div>	<div>23</div> <div><div>49(46) ← 69(67) ← 25(23)</div><div>22(22) → 4(4) → 44(44) →</div><div>22(22) → 5(5) → 2(2) →</div><div>25(23) → 47(45) → 2(2) →</div></div> <div>CROSSROADS NORTH INT #23</div> <div>CROSSROADS NORTH</div>	<div>24</div> <div><div>2(2) ← 109(110)</div><div>44(44) →</div><div>98(92) → 49(46) →</div></div> <div>AIR LANE WEST INTERSECTION</div> <div>AIR LANE</div>
<div>25</div> <div><div>2(2) ← 109(110)</div><div>153(154) →</div><div>98(92) → 147(137) →</div></div> <div>AIR LANE EAST INTERSECTION</div> <div>AIR LANE</div>					

LEGEND

X

Existing Key Intersection

X

Proposed Access Intersection

X




Proposed Internal Intersection

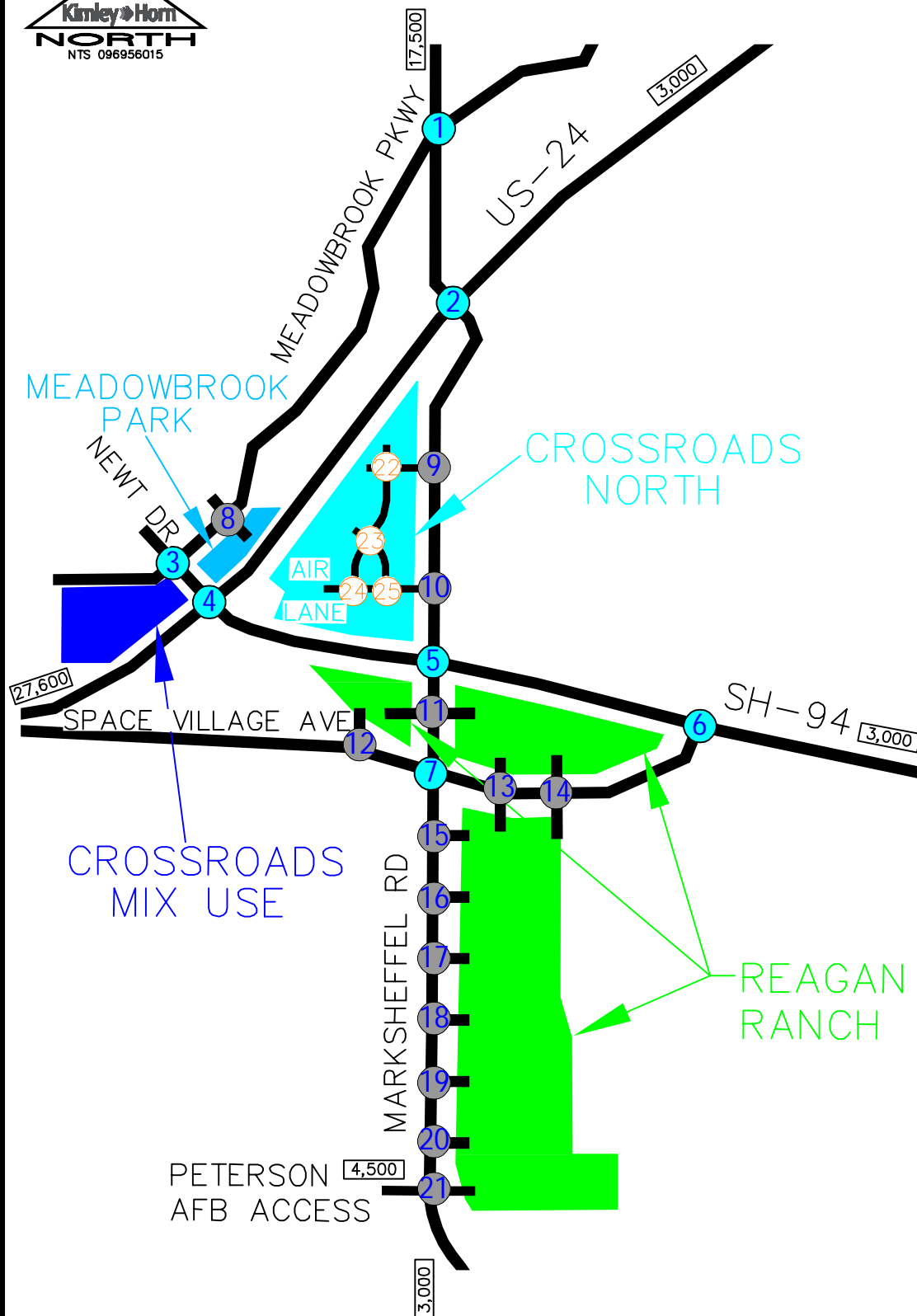
XXX(XXX)  
Weekday AM(PM)  
Peak Hour Traffic Volumes

XX,X00  
Estimated Daily Traffic Volume

FIGURE 9

**LEGEND**

-  Existing Key Intersection
-  Proposed Access Intersection
-  Proposed Internal Intersection
- XXX(XXX) Weekday AM(PM)  
Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume



<div>1</div> <div><div><div>161(147) 374(664)</div><div>165(127) →</div><div>344(599) →</div></div><div>MEADOWBROOK PWY/MARKSHEFFEL RD</div></div>	<div>2</div> <div><div><div>MARKSHEFFEL</div><div>374(664)</div><div>27(24) 62(111)</div></div><div><div>28(21) → 137(194) ↘</div><div>344(599) → 57(100) ↗</div><div>US-24</div></div><div>US-24/MARKSHEFFEL ROAD</div></div>	<div>3</div> <div><div><div>MEADOWBROOK</div><div>157(134) 27(18)</div><div>9(30) 366(314)</div></div><div><div>153(119) → 358(277) ↗</div><div>NEWT DR</div></div><div>NEWT DR/MEADOWBROOK PKWY</div></div>	<div>4</div> <div><div><div>US-24</div><div>27(24)</div><div>28(21) → 55(43) → 302(232) ↘</div></div><div><div>53(49) 420(596)</div><div>295(270) → 137(194) → 315(562) ↗</div><div>SH-94</div></div><div>SH-94/US-24</div></div>	<div>5</div> <div><div><div>270(272) 268(524) 27(30)</div><div>32(42) 27(24)</div><div>164(233) → 28(21) → 179(350) →</div></div><div><div>177(348) → 252(562) → 4(20) ↗</div><div>SH-94/MARKSHEFFEL RD</div></div></div>	<div>6</div> <div><div><div>54(63) 35(72)</div><div>57(66) → 2(5) ↘</div><div>5(3) → 28(55) ↗</div><div>SH-94/SPACE VILLAGE AVENUE</div></div></div>
<div>7</div> <div><div><div>310(652) 89(231)</div><div>52(40) 87(186) 52(120)</div><div>39(115) → 47(118) → 21(48) ↘</div></div><div><div>46(52) → 356(723) → 20(49) ↗</div><div>SPACE VILLAGE AVE/MARKSHEFFEL RD</div></div></div>	<div>8</div> <div><div><div>MEADOWBROOK</div><div>297(459) 4(13)</div><div>12(8) 27(18)</div></div><div><div>305(444) → 9(30) ↗</div><div>MEADOWBROOK PARKWAY ACCESS</div></div></div>	<div>9</div> <div><div><div>218(310) 353(659)</div><div>98(99) → 98(99) ↘</div><div>55(78) → 305(600) →</div><div>MARKSHEFFEL RD NORTH ACCESS</div></div></div>	<div>10</div> <div><div><div>109(155) 342(603)</div><div>74(74) → 221(222) →</div><div>164(233) → 286(604) →</div><div>MARKSHEFFEL RD/AIR LANE ACCESS</div></div></div>	<div>11</div> <div><div><div>53(14) 393(859)</div><div>45(203)</div><div>6(23) ↘ 389(727) → 58(150) ↗</div><div>MARKSHEFFEL ROAD RIRO ACCESS</div></div></div>	<div>12</div> <div><div><div>11(46) 11(46)</div><div>30(8) 102(231)</div><div>35(9) → 95(237) →</div><div>SPACE VILLAGE AVE FULL ACCESS</div></div></div>
<div>13</div> <div><div><div>45(203) 2(2)</div><div>7(19) 124(97) 4(9)</div><div>80(206) → 54(148) → 20(46) ↘</div></div><div><div>22(46) → 4(9) ↗</div><div>SPACE VILLAGE AVE W FULL ACCESS</div></div></div>	<div>14</div> <div><div><div>97(48) 11(5)</div><div>4(11) 29(58) 4(9)</div><div>32(95) → 18(43) → 8(19) ↘</div></div><div><div>9(19) → 4(9) ↗</div><div>SPACE VILLAGE AVE E FULL ACCESS</div></div></div>	<div>15</div> <div><div><div>383(820)</div><div>26(56)</div><div>396(768) → 4(9) ↗</div><div>MARKSHEFFEL ROAD RIRO ACCESS</div></div></div>	<div>16</div> <div><div><div>315(662) 68(158)</div><div>43(93)</div><div>357(684) → 9(19) ↗</div><div>MARKSHEFFEL ROAD 3/4 ACCESS</div></div></div>	<div>17</div> <div><div><div>315(662)</div><div>56(121)</div><div>308(583) → 12(28) ↗</div><div>MARKSHEFFEL ROAD RIRO ACCESS</div></div></div>	<div>18</div> <div><div><div>239(486) 76(176)</div><div>39(84) 39(84)</div><div>281(527) → 12(28) ↗</div><div>MARKSHEFFEL ROAD FULL ACCESS</div></div></div>
<div>19</div> <div><div><div>278(570)</div><div>26(56)</div><div>267(500) → 12(28) ↗</div><div>MARKSHEFFEL ROAD RIRO ACCESS</div></div></div>	<div>20</div> <div><div><div>202(393) 76(176)</div><div>52(111)</div><div>227(415) → 8(19) ↗</div><div>MARKSHEFFEL ROAD 3/4 ACCESS</div></div></div>	<div>21</div> <div><div><div>63(151) 72(94) 64(148)</div><div>65(139) 35(74) 13(28)</div><div>85(170) → 20(46) →</div></div><div><div>85(126) → 4(9) ↗</div><div>MARKSHEFFEL RD FULL ACCESS</div></div></div>	<div>22</div> <div><div><div>2(2) 2(2) 49(49)</div><div>55(78) 55(78) 164(233)</div><div>2(2) → 49(49) → 2(2) ↘</div></div><div><div>2(2) 2(2) 98(99)</div><div>CROSSROADS NORTH INT #22</div></div></div>	<div>23</div> <div><div><div>55(78) 76(88) 27(39)</div><div>25(25) 5(8) 2(2)</div><div>25(25) → 5(5) → 49(49) →</div></div><div><div>27(39) → 52(64) → 2(2) ↗</div><div>CROSSROADS NORTH INT #23</div></div></div>	<div>24</div> <div><div><div>2(2) 123(124)</div><div>109(155) 55(78)</div><div>2(2) → 49(49) →</div><div>AIR LANE WEST INTERSECTION</div></div></div>
<div>25</div> <div><div><div>2(2) 123(124)</div><div>109(155) 164(233)</div><div>2(2) → 172(173) →</div><div>AIR LANE EAST INTERSECTION</div></div></div>					

LEGEND

X

Existing Key Intersection

X

Proposed Access Intersection

X

Proposed Internal Intersection

XXX(XXX)

Weekday AM(PM)  
Peak Hour Traffic Volumes

XX,X00

Estimated Daily Traffic Volume

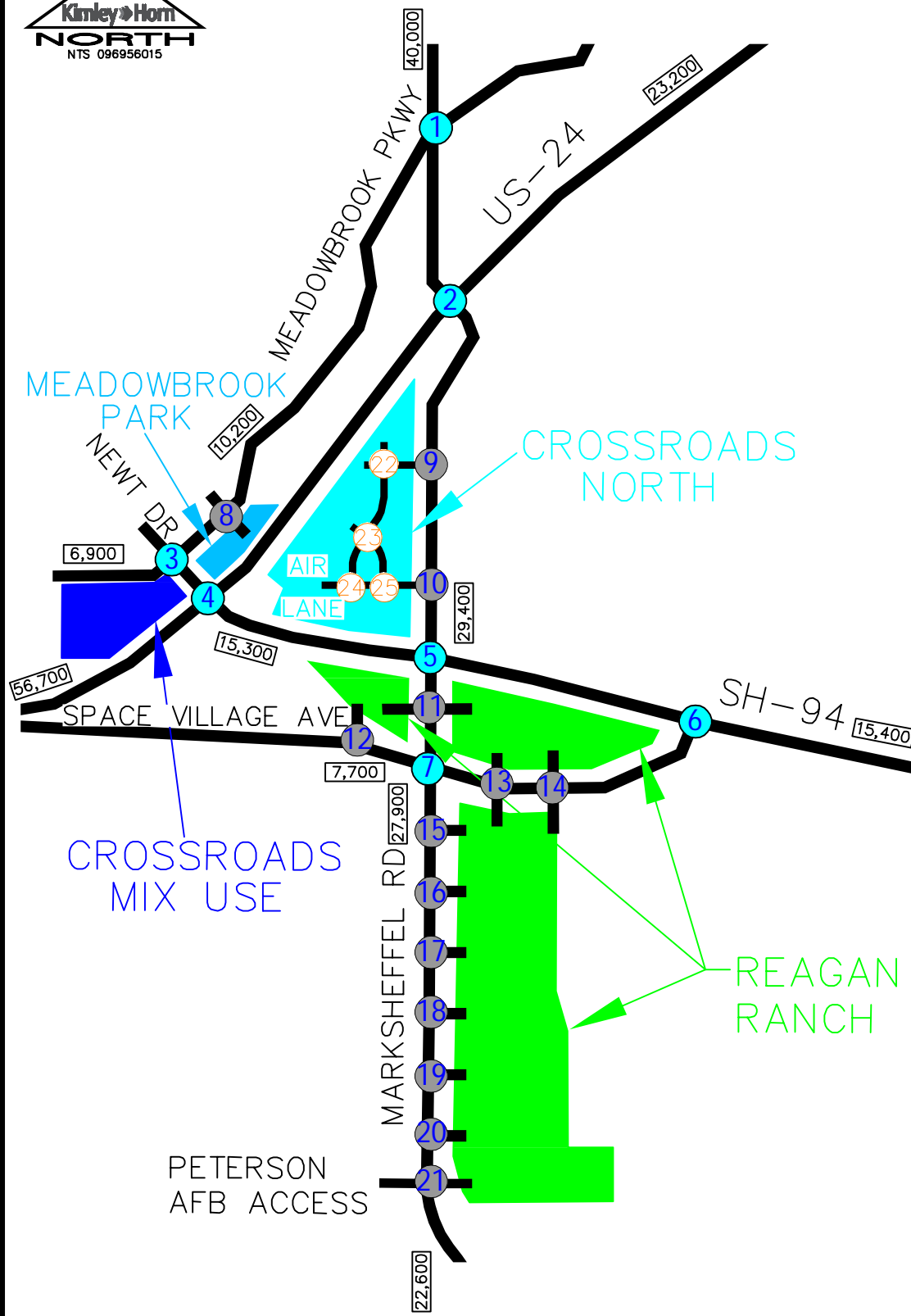
FIGURE 10

**LEGEND**

- Existing Key Intersection
- Proposed Access Intersection
- Proposed Internal Intersection
- XXX(XXX) Weekday AM(PM)  
Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2040 PROJECT TRAFFIC ASSIGNMENT



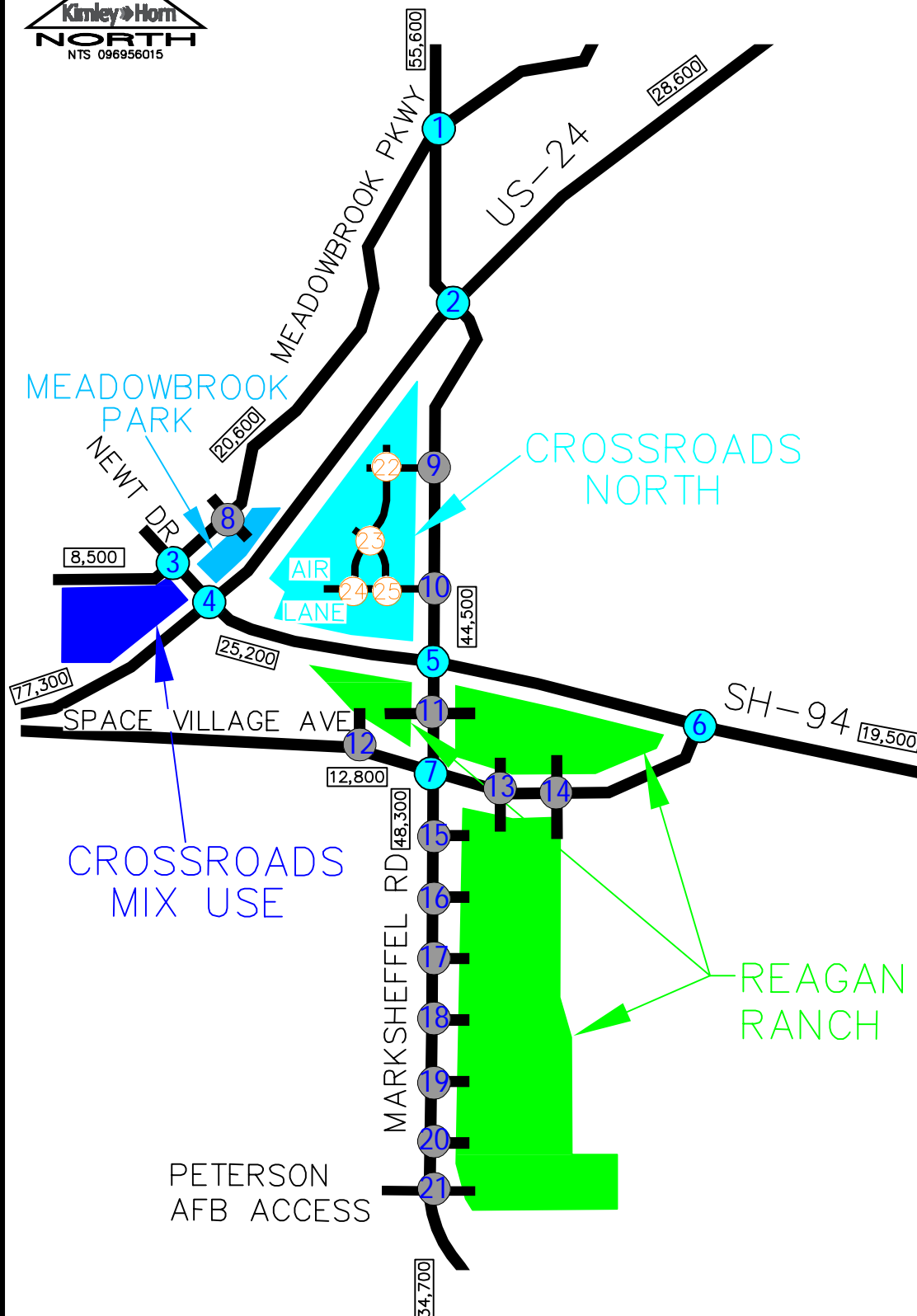


CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2026 TOTAL TRAFFIC VOLUMES

<b>1</b> MEADOWBROOK PKWY/MARKSHEFFEL RD 335(270) → 1755(1340) → 10(15) → 40(55) → 270(295) → 10(15) → 40(55) → 30(40) → 25(15) → 40(25) → 1090(1835) → 20(80) → 30(50) →	<b>2</b> US-24/MARKSHEFFEL ROAD MARKSHEFFEL 760(510) → 1025(915) → 10(20) → 20(20) → 1215(585) → 350(210) → 5(15) → 755(1190) → 105(245) → 360(670) → 550(1200) → 125(125) →	<b>3</b> NEWT DR/MEADOWBROOK PKWY MEADOWBROOK 5(10) → 145(110) → 250(305) → 145(135) → 10(40) → 335(255) → 10(15) → 30(35) → 140(95) → 330(225) →	<b>4</b> SH-94/US-24 US-24 65(60) → 1860(1000) → 5(5) → 5(10) → 95(65) → 820(740) → 45(55) → 90(80) → 495(450) → 425(395) → 985(1925) → 635(625) →	<b>5</b> SH-94/MARKSHEFFEL RD MARKSHEFFEL 245(255) → 695(845) → 300(200) → 115(395) → 345(405) → 35(45) → 150(140) → 300(340) → 160(265) → 190(225) → 470(1100) → 25(30) →	<b>6</b> SH-94/SPACE VILLAGE AVENUE SPACE VILLAGE AVENUE 635(790) → 55(95) → 815(525) → 5(5) → 5(5) → 115(100) →
<b>7</b> SPACE VILLAGE AVE/MARKSHEFFEL RD MARKSHEFFEL RD 130(25) → 1095(885) → 70(90) → 40(30) → 75(80) → 45(80) → 40(55) → 80(90) → 135(270) → 325(245) → 770(1265) → 30(45) →	<b>8</b> MEADOWBROOK PARKWAY ACCESS MEADOWBROOK 5(5) → 430(550) → 5(15) → 15(10) → 30(20) → 5(5) → 10(10) → 5(10) → 385(330) → 10(30) →	<b>9</b> MARKSHEFFEL RD NORTH ACCESS MARKSHEFFEL RD NORTH 200(185) → 1300(1045) → 90(90) → 90(90) → 50(50) → 775(1365) →	<b>10</b> MARKSHEFFEL RD/AIR LANE ACCESS MARKSHEFFEL RD/AIR LANE 100(95) → 1290(1040) → 70(70) → 200(200) → 150(140) → 755(1345) →	<b>11</b> MARKSHEFFEL ROAD RIRO ACCESS MARKSHEFFEL ROAD RIRO 35(10) → 1285(980) → 35(55) → 5(15) → 800(1300) → 45(40) →	<b>12</b> SPACE VILLAGE AVE FULL ACCESS SPACE VILLAGE AVE FULL 10(30) → 20(5) → 505(335) → 25(5) → 235(380) →
<b>13</b> SPACE VILLAGE AVE W FULL ACCESS SPACE VILLAGE AVE W FULL 35(55) → 5(5) → 105(105) → 5(5) → 60(55) → 105(145) → 10(25) → 15(20) → 5(5) →	<b>14</b> SPACE VILLAGE AVE E FULL ACCESS SPACE VILLAGE AVE E FULL 65(40) → 10(5) → 5(10) → 45(70) → 5(5) → 20(65) → 85(75) → 5(10) → 10(10) → 5(5) →	<b>15</b> MARKSHEFFEL ROAD RIRO ACCESS MARKSHEFFEL ROAD RIRO 1265(1225) → 20(20) → 1100(1525) → 5(5) →	<b>16</b> MARKSHEFFEL ROAD 3/4 ACCESS MARKSHEFFEL ROAD 3/4 1235(1155) → 35(70) → 30(35) → 1070(1495) → 10(10) →	<b>17</b> MARKSHEFFEL ROAD RIRO ACCESS MARKSHEFFEL ROAD RIRO 1235(1155) → 40(45) → 1035(1460) → 10(15) →	<b>18</b> MARKSHEFFEL ROAD FULL ACCESS MARKSHEFFEL ROAD FULL 1200(1075) → 40(80) → 30(35) → 1015(1440) → 10(15) →
<b>19</b> MARKSHEFFEL ROAD RIRO ACCESS MARKSHEFFEL ROAD RIRO 1225(1105) → 20(20) → 1005(1430) → 10(15) →	<b>20</b> MARKSHEFFEL ROAD 3/4 ACCESS MARKSHEFFEL ROAD 3/4 1190(1025) → 40(80) → 35(45) → 975(1405) → 5(10) →	<b>21</b> MARKSHEFFEL RD FULL ACCESS MARKSHEFFEL RD FULL 680(565) → 490(400) → 30(70) → 45(55) → 25(30) → 10(10) → 540(805) → 10(25) → 125(185) → 160(130) → 395(560) → 5(5) →	<b>22</b> CROSSROADS NORTH INT #22 CROSSROADS NORTH INT #22 2(2) → 2(2) → 45(45) → 50(50) → 50(50) → 150(140) → 2(2) → 2(2) → 90(90) →	<b>23</b> CROSSROADS NORTH INT #23 CROSSROADS NORTH INT #23 50(50) → 70(70) → 25(25) → 25(25) → 5(5) → 45(45) → 25(25) → 50(45) → 2(2) →	<b>24</b> AIR LANE WEST INTERSECTION AIR LANE WEST INTERSECTION 2(2) → 110(110) → 100(95) → 50(50) →
<b>25</b> AIR LANE EAST INTERSECTION AIR LANE EAST INTERSECTION 5(5) → 110(110) → 100(95) → 150(140) → 5(5) → 155(155) →					

**LEGEND**

- X Existing Key Intersection
- X Proposed Access Intersection
- X Proposed Internal Intersection
- XXX(XXX) Weekday AM(PM)  
Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume



CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2040 TOTAL TRAFFIC VOLUMES

<p>1</p> <p>380(315) 2185(2060) 15(55)</p> <p>300(355) 10(15) 45(65)</p> <p>35(45) 25(20) 50(25)</p> <p>1495(2520) 25(95)</p> <p>MEADOWBROOK PKWY/MARKSHEFFEL RD</p>	<p>2</p> <p>MARKSHEFFEL 890(600) 1330(1560) 15(25)</p> <p>425(785) 645(1415) 140(205)</p> <p>25(20) 1425(690) 435(325)</p> <p>5(20) 1100(1765) 160(345)</p> <p>US-24</p>	<p>3</p> <p>MEADOWBROOK 5(15) 160(135) 285(355)</p> <p>10(15) 35(45)</p> <p>165(150) 15(45) 370(315)</p> <p>155(120) 360(280)</p> <p>NEWT DR</p>	<p>4</p> <p>US-24 80(75) 2190(1180) 10(10)</p> <p>55(65) 95(95) 555(535)</p> <p>5(10) 105(80) 1155(1160)</p> <p>SH-94</p>	<p>5</p> <p>275(285) 975(1480) 355(230)</p> <p>165(235) 350(400) 310(665)</p> <p>135(480) 405(475) 40(50)</p> <p>430(565) 810(1735) 30(50)</p> <p>SH-94/MARKSHEFFEL RD</p>	<p>6</p> <p>740(940) 85(180)</p> <p>960(635) 5(5)</p> <p>5(5) 170(160)</p> <p>SH-94/SPACE VILLAGE AVENUE</p>
<p>7</p> <p>150(30) 1520(1735) 105(250)</p> <p>50(130) 115(195) 180(370)</p> <p>70(50) 135(225) 75(180)</p> <p>425(330) 1335(2125) 55(85)</p> <p>SPACE VILLAGE AVE/MARKSHEFFEL RD</p>	<p>8</p> <p>MEADOWBROOK 5(5) 630(1035) 5(15)</p> <p>5(5) 10(10)</p> <p>15(10) 30(20)</p> <p>5(10) 675(715) 10(30)</p> <p>MEADOWBROOK PARKWAY ACCESS</p>	<p>9</p> <p>220(310) 1675(1760)</p> <p>100(100) 100(100)</p> <p>55(80) 1160(2025)</p> <p>MARKSHEFFEL RD NORTH ACCESS</p>	<p>10</p> <p>110(155) 1665(1705)</p> <p>75(75) 225(225)</p> <p>165(235) 1145(2030)</p> <p>MARKSHEFFEL RD/AIR LANE ACCESS</p>	<p>11</p> <p>55(15) 1770(1985)</p> <p>10(25)</p> <p>45(205)</p> <p>MARKSHEFFEL ROAD RIRO ACCESS</p>	<p>12</p> <p>15(50) 15(50)</p> <p>30(10) 675(575)</p> <p>35(10) 325(640)</p> <p>SPACE VILLAGE AVE FULL ACCESS</p>
<p>13</p> <p>45(205) 5(5)</p> <p>80(210) 160(240) 30(85)</p> <p>10(20) 170(180) 10(20)</p> <p>55(70) 15(15)</p> <p>SPACE VILLAGE AVE W FULL ACCESS</p>	<p>14</p> <p>100(50) 15(5)</p> <p>35(95) 125(125) 15(35)</p> <p>25(30) 15(15)</p> <p>SPACE VILLAGE AVE E FULL ACCESS</p>	<p>15</p> <p>1765(2275) 70(85)</p> <p>1745(2455) 10(20)</p> <p>MARKSHEFFEL ROAD RIRO ACCESS</p>	<p>16</p> <p>1660(2010) 105(275)</p> <p>105(135) 1650(2335) 25(30)</p> <p>MARKSHEFFEL ROAD 3/4 ACCESS</p>	<p>17</p> <p>1660(2010) 140(175)</p> <p>1525(2200) 25(50)</p> <p>MARKSHEFFEL ROAD RIRO ACCESS</p>	<p>18</p> <p>1550(1710) 120(305)</p> <p>95(120) 95(120)</p> <p>1450(2130) 25(50)</p> <p>MARKSHEFFEL ROAD FULL ACCESS</p>
<p>19</p> <p>1640(1825) 70(85)</p> <p>1405(2095) 25(50)</p> <p>MARKSHEFFEL ROAD RIRO ACCESS</p>	<p>20</p> <p>1530(1825) 120(305)</p> <p>130(165) 1300(1985) 15(35)</p> <p>MARKSHEFFEL ROAD 3/4 ACCESS</p>	<p>21</p> <p>850(780) 585(500) 100(255)</p> <p>155(200) 85(110) 35(45)</p> <p>680(1095) 30(85) 145(220)</p> <p>190(150) 475(730) 10(20)</p> <p>MARKSHEFFEL RD FULL ACCESS</p>	<p>22</p> <p>2(2) 2(2) 50(50) 2(2)</p> <p>55(80) 55(80) 165(235)</p> <p>2(2) 2(2) 100(100)</p> <p>CROSSROADS NORTH INT #22</p>	<p>23</p> <p>55(80) 80(90) 30(40)</p> <p>25(25) 5(5) 50(50)</p> <p>30(40) 55(65) 2(2)</p> <p>CROSSROADS NORTH INT #23</p>	<p>24</p> <p>2(2) 125(125)</p> <p>110(155) 55(80)</p> <p>50(50)</p> <p>AIR LANE WEST INTERSECTION</p>
<p>25</p> <p>5(5) 125(125)</p> <p>5(5) 175(175)</p> <p>110(155) 165(235)</p> <p>AIR LANE EAST INTERSECTION</p>	<p><b>LEGEND</b></p> <p>X Existing Key Intersection</p> <p>X Proposed Access Intersection</p> <p>X Proposed Internal Intersection</p> <p>XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes</p> <p>XX,X00 Estimated Daily Traffic Volume</p>				

FIGURE 12

## 5.0 TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2026 and 2040 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the *Highway Capacity Manual*<sup>2</sup>.

### 5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, standard traffic engineering practice recommends intersection LOS D as the minimum threshold for acceptable operations for signalized intersections and LOS E for movements of unsignalized intersections. **Table 3** shows the definition of level of service for signalized and unsignalized intersections.

**Table 3 – Level of Service Definitions**

Level of Service	Signalized Intersection Average Total Control Delay (sec/veh)	Unsignalized Intersection Average Total Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Study area intersections were analyzed based on average total control delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the level of service (LOS) for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. Level of service for a two-way stop-controlled intersection is not defined for the intersection as a whole. Level of service for a signalized and four-way stop controlled intersection is defined for the overall intersection.

<sup>2</sup> Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.

## 5.2 Key Intersection Operational Analysis

Calculations for the level of service at the key intersections identified for study are provided in **Appendix D**. The existing and background traffic analyses are based on the lane geometry and intersection control shown in **Figure 3**. The signalized intersection analysis utilizes the observed cycle lengths with existing phasing and timing. Based on increased national attention given to setting appropriate yellow and all-red clearance intervals to improve intersection safety, these have been calculated and are applied for the approaches to the signalized intersections. The increase in the yellow and all red time sacrifices intersection capacity for improved safety. These yellow and all red time calculations are also included in **Appendix E**. Existing peak hour factors were used for all horizons while the recommended HCM urban area peak hour factor of 0.92 was used for the project accesses. Synchro traffic analysis software was used to analyze the study area intersections and access drives for level of service. The Synchro Highway Capacity Manual (HCM) methodology reports were used to analyze intersection control delay and level of service.

### Meadowbrook Parkway and Marksheffel Road (#1)

Meadowbrook Parkway and Marksheffel Road (#1) is a four-leg signalized intersection. This intersection currently operates with LOS B during the morning and afternoon peak hours under the existing lane configuration and signal control. With or without the completion of the proposed developments, the intersection is anticipated to operate acceptably with LOS D or better during both the morning and afternoon peak hours throughout 2040. **Table 4** provides the results of the level of service at this intersection.

**Table 4 – Meadowbrook Parkway and Marksheffel Road (#1) LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
2020 Adjusted Existing	10.5	B	14.0	B
2026 Background	11.4	B	14.0	B
2026 Background Plus Project	25.7	C	23.4	C
2040 Background	12.5	B	16.4	B
2040 Background Plus Project	24.9	C	35.5	D

### US-24 and Marksheffel Road (#2)

US-24 and Marksheffel Road (#2) is a four-leg signalized intersection. This intersection currently operates with a LOS D during the morning and afternoon peak hours under the existing lane configuration and signal control. During the afternoon peak hour in 2026, the intersection may operate with a LOS E, with the addition of development project traffic. Therefore, it is recommended that westbound dual left turn lanes be designated along US-24. With these improvements, the intersection is expected to operate with LOS D during both peak hours in the 2026 total condition.

By 2040, it is anticipated that the intersection will operate with long delays during the peak hours without the addition of project traffic. To improve operations at this intersection, both US-24 and Marksheffel Road may need to provide three through lanes on all approaches. With these improvements, the intersection is anticipated to operate at LOS D during the peak hours in 2040. **Table 5** provides the results of the level of service at this intersection.

**Table 5 – US-24 and Marksheffel Road (#2) LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
2020 Adjusted Existing	39.7	D	42.9	D
2026 Background	44.0	D	45.9	D
2026 Background Plus Project	53.9	D	58.7	E
2026 Background Plus Project #	53.7	D	54.2	D
2040 Background	71.7	E	74.6	E
2040 Background Plus Project ##	42.4	D	51.5	D

# = US-24 westbound dual left turn lanes, ## = Three through lanes on all approaches



### Newt Drive and Meadowbrook Parkway (#3)

The existing intersection of Newt Drive and Meadowbrook Parkway (#3) is a three-leg stop-controlled intersection with the east and west legs along Newt Drive providing stop control. This intersection currently operates with all movements at LOS B. In the 2026 background condition, the movements at this intersection are anticipated to continue to operate at LOS B. With the completion of phase 1 development in 2026, and specifically the Crossroads Mix Use development area in 2026, a south leg of Meadowbrook Parkway will be constructed and extended to the west limits of the Crossroads Mix Use property. The project does not have plans to extend Meadowbrook Parkway to Peterson Boulevard. Once this northbound leg is constructed, the westbound approach is anticipated to operate at LOS F during both peak hours. Based on projected traffic volumes, it is recommended that a roundabout with single lane approaches eastbound, northbound and southbound and a shared left turn/through lane with separate right turn lane on westbound Newt Drive be constructed at this intersection by 2026. With the recommended improvements, it is anticipated that the intersection will operate acceptably throughout 2040, with or without the addition of project traffic, with LOS B or better. **Table 6** provides the results of the level of service at this intersection.

**Table 6 – Newt Drive and Meadowbrook Parkway (#3) LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
<b>2020 Adjusted Existing</b>				
Eastbound Approach	12.3	B	14.0	B
Westbound Approach	12.0	B	14.1	B
<b>2026 Background</b>				
Eastbound Approach	12.7	B	14.7	B
Westbound Approach	12.3	B	14.7	B
<b>2026 Background Plus Project #</b>				
Eastbound Left	33.0	D	45.7	E
Eastbound Through/Right	30.1	D	33.6	D
Westbound Left	>300	F	>300	F
Westbound Through	20.3	C	27.0	D
Westbound Right	11.8	B	10.8	B
Southbound Left	9.9	A	9.4	A
<b>2026 Background Plus Project ##</b>	9.2	A	8.6	A
<b>2040 Background ##</b>	4.3	A	5.1	A
<b>2040 Background Plus Project ##</b>	11.2	A	12.3	B

# = South Leg and Associated Movements; ## = Roundabout

### **SH-94/Newt Drive and US-24 (#4)**

SH-94/Newt Drive and US-24 (#4) is a four-leg signalized intersection. Although both highways are east-west, the traffic software at this intersection assigned US-24 as north-south based on cardinal direction of existing roadway alignments. This intersection currently operates with LOS E during the morning and afternoon peak hours under the existing lane configuration and signal control. With or without the completion of the Phase 1 development in 2026, the intersection is anticipated to operate with LOS F during the morning and afternoon peak hours. If future project volumes are realized, it is recommended that an additional through lane be considered as a regional improvement on the US-24 approaches. The US-24 right turn to eastbound SH-94 is recommended to include a separate right turn lane operating with free movements. Acceleration lanes currently exist in both directions along US-24 from both Newt Drive and SH-94. For southwestbound US-24 at SH-94 (#4), the existing acceleration lane along US-24 will need to be reconstructed with 960 feet of length plus a 225-foot taper if and when US-24 is improved to provide three through lanes along northbound US-24. For northeastbound US-24 at SH-94, it is recommended that this acceleration lane be converted to the third northbound through lane as the acceleration lane is not warranted. Further, the northeastbound US-24 third through lane needs to continue for 1,200 feet plus provide a 660-foot taper based on MUTCD standards. Also, it is recommended that triple westbound left turns be designated by converting the inside westbound through lane to a left turn lane. It is believed that with these improvements, the intersection is at its ultimate at-grade configuration. With the ultimate configuration the intersection improves significantly and operates acceptably in 2026, but long delays may still occur during the peak hours in 2040. As such, and as requested by CDOT, an additional analysis was performed with an interchange grade separation including a westbound left turn flyover ramp condition. With this westbound left turn flyover ramp, this intersection is expected to operate acceptably with LOS D or better during the peak hours throughout the 2040 horizon. **Table 7** provides the results of the level of service at this intersection.

**Table 7 – SH-94/Newt Drive and US-24 (#4) LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
2020 Adjusted Existing	76.6	E	58.3	E
2026 Background	98.8	F	77.0	E
2026 Background Plus Project	207.1	F	153.3	F
2026 Background Plus Project #	54.7	D	46.0	D
2026 Background Plus Project ## (WBL Flyover)	32.4	C	28.1	C
2040 Background #	66.1	E	43.0	D
2040 Background Plus Project #	133.2	F	118.3	F
2040 Background Plus Project ## (WBL Flyover)	44.7	D	32.0	C

# = Three northbound and southbound through lanes, dual northbound left turn lanes, triple westbound left turn lanes.

## = Three northbound and southbound through lanes, dual northbound left turn lanes and westbound left flyover ramp

### SH-94 and Marksheffel Road (#5)

The existing intersection of SH-94 and Marksheffel Road (#5) is currently a four-leg signalized intersection. This intersection currently operates with LOS C during the morning and afternoon peaks hours with existing traffic volumes and lane configurations. With the completion of the first phase of development in 2026, the northbound and southbound right turns at this intersection are anticipated to be a free southbound right turn due to CDOT State Highway Access Code guidelines. By completion of Phase 1 development in 2026, this intersection is expected to continue to operate acceptably during the peak hours with existing lane configurations and control.

By 2040, the following improvements are recommended: eastbound and westbound right turn movements to implement permissive/overlap phasing, two eastbound and westbound through lanes, and three northbound and southbound through lanes. With these improvements, this intersection is anticipated to operate acceptable with LOS D or better during the peak hours in 2040. **Table 8** provides the results of the level of service at this intersection.

**Table 8 – SH-94 and Marksheffel Road (#5) LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
2020 Adjusted Existing	24.8	C	25.9	C
2026 Background	25.0	C	27.0	C
2026 Background Plus Project #	26.3	C	31.6	C
2040 Background	23.8	C	28.2	C
2040 Background Plus Project ##	31.6	C	49.3	D

# = NB to EB right turn acceleration lane, and SB to WB right turn acceleration lane

## = Two eastbound and westbound through lanes, three northbound and southbound through lanes, NB to EB right turn acceleration lane, and SB to WB right turn acceleration lane

### SH-94 and Space Village Avenue (#6)

The existing intersection of SH-94 and Space Village Avenue (#6) is a three-leg stop-controlled intersection with the northbound leg providing stop control. This intersection currently operates acceptably with all movements at LOS B or better during the peak hours. With or without the completion of the proposed development, all movements at the intersection are anticipated to operate acceptably during the peak hours throughout the 2040 horizon. **Table 9** provides the results of the level of service at this intersection.

**Table 9 – SH-94 and Space Village Avenue (#6) LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
<b>2020 Existing</b>				
Northbound Approach	14.4	B	10.6	B
Westbound Left	10.3	B	8.6	A
<b>2026 Background</b>				
Northbound Approach	16.3	C	11.0	B
Westbound Left	11.1	B	8.8	A
<b>2026 Background Plus Project</b>				
Northbound Approach	19.5	C	12.9	B
Westbound Left	11.8	B	9.3	A
<b>2040 Background</b>				
Northbound Approach	26.3	D	12.3	B
Westbound Left	13.6	B	9.6	A
<b>2026 Background Plus Project</b>				
Northbound Approach	48.6	E	16.2	C
Westbound Left	16.8	C	10.7	B

### Space Village Avenue and Marksheffel Road (#7)

The existing intersection of Space Village Avenue and Marksheffel Road (#7) is a four-leg two-way stop-controlled intersection with the east and west legs providing stop control. This intersection currently operates poorly with LOS F on the eastbound and westbound approaches during the morning and afternoon peak hours. By completion of Phase 1 development in 2026, a signal is expected to be warranted for this intersection. With construction of a traffic signal, the intersection operates acceptably with LOS B during the peak hours in 2026. By 2040, three through lanes northbound and southbound are recommended along Marksheffel Road north of



the Peterson Air Force Base Access. With construction of the additional through lanes, this intersection continues to operate acceptably with LOS C or better during both peak hours in 2040. A signal warrant analysis figure is included in **Appendix E** for this intersection. **Table 10** provides the results of the level of service at this intersection.

**Table 10 – Space Village Avenue and Marksheffel Road (#7) LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
<b>2020 Existing</b>				
Northbound Left	10.5	B	8.4	A
Eastbound Left	93.6	F	48.1	E
Eastbound Through	279.4	F	146.6	F
Eastbound Right	10.9	B	10.8	B
Westbound Left	V>C	F	>300	F
Westbound Through	154.0	F	87.5	F
Westbound Right	9.9	A	12.0	B
Southbound Left	8.6	A	10.3	B
<b>2026 Background</b>				
Northbound Left	11.2	B	8.5	A
Eastbound Left	>300	F	80.7	F
Eastbound Through	>300	F	277.4	F
Eastbound Right	11.3	B	11.1	B
Westbound Left	V>C	F	>300	F
Westbound Through	>300	F	151.3	F
Westbound Right	10.1	B	12.4	B
Southbound Left	8.7	A	10.7	B
<b>2026 Background Plus Project</b>				
Northbound Left	12.6	B	9.5	A
Eastbound Left	V>C	F	V>C	F
Eastbound Through	>300	F	>300	F
Eastbound Right	12.5	B	13.6	B
Westbound Left	V>C	F	V>C	F
Westbound Through	>300	F	>300	F
Westbound Right	11.8	B	15.0	C
Southbound Left	10.3	B	14.5	B
<b>2026 Background Plus Project #</b>	13.4	B	15.2	B
<b>2040 Background #</b>	27.1	C	17.4	B
<b>2040 Background Plus Project ##</b>	33.3	C	33.0	C

# Signalized; ## = Three northbound and southbound through lanes

### **5.3 Project Access Operational Analysis**

With completion of the Crossroads-Meadowbrook-Reagan Ranch project, direct access included for evaluation is proposed from 14 accesses (#8-21) along Meadowbrook Parkway (#8), Marksheffel Road (#9-11, and #15-21), and Space Village Avenue (#12-14). The following includes project access information and recommendations for each development area.

#### Crossroads Mix Use and Meadowbrook Park

With completion of the Crossroads Mix Use project, the site proposes three accesses along the east side of Meadowbrook Parkway. The northeastern access along Meadowbrook Parkway for Crossroads Mix Use may be right-in/right-out while the two southern most access will provide full movements with stop control on the minor legs. These three accesses to Crossroads Mix Use were not included for evaluation as Meadowbrook Parkway terminates to the west property limits and these are private streets. However, all three project access driveways to Crossroads Mix Use are recommended to have R1-1 “STOP” signs installed for the exiting approaches.

The Meadowbrook Park development area has one proposed driveway access (#8) along the east side of Meadowbrook Parkway that will align with Preble Drive. Left turn movements for entering this project access will be provided from an existing two-way left turn lane along Meadowbrook Parkway. The westbound exiting approach of this driveway should provide stop control with installation of a R1-1 “STOP” sign. With the recommended lane configurations and control at the Project Access (#8)/Preble Drive and Meadowbrook Parkway intersection, all movements are expected to operate acceptably during the peak hours throughout the 2040 horizon.

#### Crossroads North

Direct access to Crossroads North is proposed from two full movement accesses (#9 and #10) along Marksheffel Road approximately 2,000 feet and 1,000 feet north of SH-94. The south access is currently proposed to be named Air Lane which will provide east-west collector roadway connectivity to Crossroads North. These accesses do not meet the El Paso County standard of half-mile spacing for full movement accesses along Urban Principal Arterial roadways. The spacing of these proposed accesses is believed to be only deviations from El Paso County standards. As such and as requested by El Paso County, a sensitivity analysis has been prepared

later in Section 5.8 comparing the north access along Marksheffel Road as a full movement signalized intersection and a three-quarter movement unsignalized intersection due to these accesses not meeting El Paso County standards for full movement intersection spacing.

El Paso County uses the CDOT State Highway Access Code for determination of turn lanes. Based on this, a right turn lane is required for any access with a projected peak hour right ingress turning volume of 25 vehicles per hour or greater for principal arterials, therefore it is recommended that a southbound right turn lane be constructed at both intersections due to the volumes being 200 vehicles per hour at the north access and 100 vehicles per hour at the south access in 2026. Northbound left turn lanes will also be required at both of these accesses (#9 and #10) along Marksheffel Road. Based on El Paso County standards, the two northbound left turn lanes and two southbound right turns lanes should provide a turn lane length of 235 feet plus a 200-foot taper.

The eastbound left turn movements at these two proposed accesses along Marksheffel Road are expected to operate with LOS F during the peak hours in 2026 under stop control. As such, a signal warrant evaluation was performed, and warrants are expected to be met at these two accesses based on 2026 traffic volume projections. The signal warrant analysis is attached in **Appendix E**. With signal control, the two Crossroads North access intersections to Marksheffel Road are expected to operate acceptably with LOS A during the peak hours throughout the 2040 horizon. El Paso County does not have specified criteria for when acceleration lanes are required but references the AASHTO “Green Book” for when these lanes are not desirable. Based on acceptable operations of LOS A and vehicle queues being accommodated on-site, right turn acceleration lanes are not recommended at the two accesses to Crossroads North along Marksheffel Road.

#### Reagan Ranch

For the northwest development area of Reagan Ranch, a right-in/right access is proposed along Marksheffel Road (#11) between SH-94 and Space Village Avenue (to also serve the northeast development area of Reagan Ranch) and a full movement access is proposed along Space Village Avenue (#12). It is likely that rights to an easement for a proposed new access along Space Village Avenue will be acquired and was evaluated as such in this traffic study.

Three accesses are proposed to serve the northeast development area of Reagan Ranch. These include a right-in/right-out access on the east side of Marksheffel Road between SH-94 and Space Village Avenue (previously mentioned #11) and two roundabouts providing full turning movements along Space Village Avenue between Marksheffel Road and SH-94 (#13 and #14).

For the southeast development area of Reagan Ranch, access will be gained at these same two roundabouts along Space Village Avenue (#13 and #14) as well as seven (7) accesses (#15-21) planned along the east side of Marksheffel Road south of Space Village Avenue at the standard City 600-foot spacing. The access intersection at the approximate half-mile spacing (#18) is expected to require signalization by 2040 while the access in alignment with Peterson Air Force Base (#21) is expected to need signalization by the short-term 2026 horizon. The accesses at the quarter-mile spacing are proposed as three-quarter movement accesses (#16 and #20) while the accesses at the eighth-mile spacing are proposed as right-in/right-out accesses (#15 and #17 and #19).

By 2040, most of the accesses along Marksheffel Road to the south of SH-94 are anticipated to operate poorly. For these intersections to operate acceptably, it is recommended that three northbound and southbound through lanes be considered on Marksheffel Road, north of the Peterson Air Force Base Access throughout the project area if future traffic volume growth is realized.

With the recommended lane configurations and intersection control, all movements at the project accesses to Reagan Ranch (#11-21) are expected to operate acceptably during the peak hours in the 2026 and 2040 horizons. A four-hour vehicle volume signal warrant analysis was performed at the north and south full movement accesses to Reagan Ranch along Marksheffel Road. A traffic signal is expected to be needed at the south access (#21) aligning with the Air Force Base Access in 2026 while the north full movement access (#18) to Reagan Ranch along Marksheffel Road is expected to meet warrants in 2040. The signal warrant analysis graphs are attached in **Appendix E**. With the signal improvements at both full movement accesses along Marksheffel Road and dual eastbound left turns at the Peterson Air Force Base Access (#21), the intersections operate acceptably with LOS D or better throughout the 2026 horizon. With the additional northbound and southbound through lanes in 2040, the north signalized full movement access

(#18) along Marksheffel Road is anticipated to continue operating acceptably. For the south full access (#21) to operate acceptably in 2040, it is recommended that the westbound right turn lane be provided at this access.

#### Crossroads North Internal Intersections

As requested by El Paso County, an internal street evaluation was conducted for the Crossroads North development area. The south access to Crossroads North along Marksheffel Road is proposed to be named Air Lane and is expected to be classified as an El Paso County Urban Non-Residential Collector roadway with a 60-foot right-of-way (ROW). Air Lane extends east-west and is proposed to connect with a north-south extending Non-Residential Collector street (#24) and a north-south extending Urban Local street (#25). Intersection #25 (collector to collector) is proposed to be located approximately 660 feet west of Marksheffel Road while Intersection #24 (collector to local street) is located approximately 380 feet west of Marksheffel Road. These distances meet the El Paso County Urban Non-Residential Collector spacing standards of 660 feet to other collectors and 330 feet to intersections with a local street. The north-south extending Non-Residential Collector street also connects with an east-west collector street (#22) that extends from the north access to Marksheffel Road as well as with an Urban Local street on site (#23). The north access street connecting with Marksheffel Road is proposed to be classified as an El Paso County Urban Non-Residential Collector roadway. The recommended left-turn lanes internal to Crossroads North should provide 115 feet of length plus 120-foot tapers to meet El Paso County standards. With the recommended lane configurations and control, all movements at four internal intersections (#22-25) to Crossroads North expected to operate acceptably with LOS C or better during the peak hours throughout the 2040 horizon. As requested by El Paso County, **Figure 13** illustrates the street classification map for roadways internal to Crossroads North.

The operational analysis at the proposed project driveways of all four development areas as well as the internal intersections to Crossroads North is summarized in **Table 11** for phase 1 development in 2026 and for the long-term 2040 horizon. Detailed results of the operational analysis are also provided in **Appendix D**.

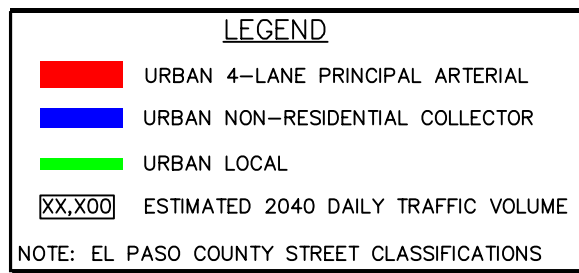
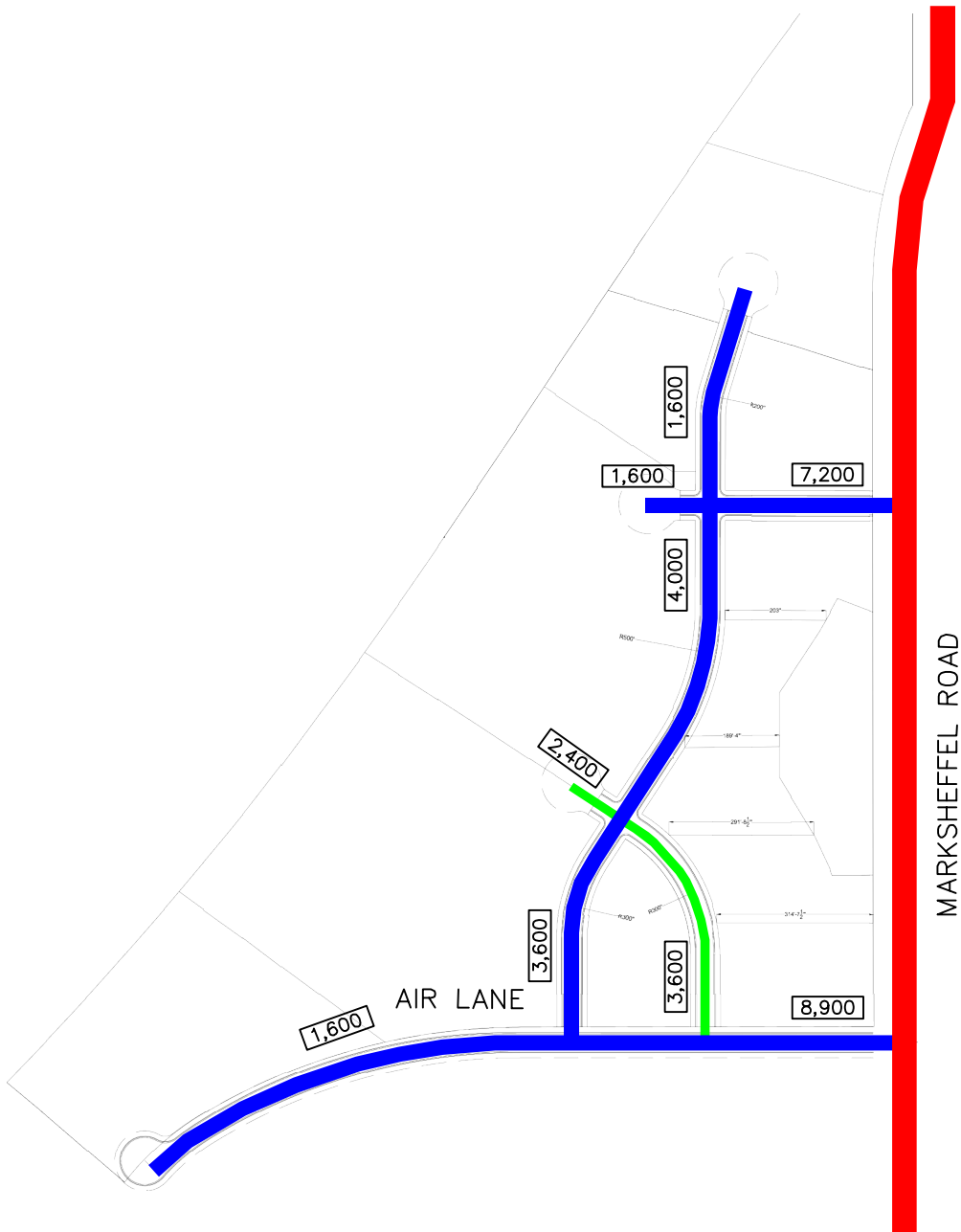


**Table 11 – Project Access LOS Results**

Access and Movement	2026 Total Traffic				2040 Total Traffic			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
<b>Meadowbrook Parkway Access (#8)</b>								
Northbound Left	8.3	A	8.7	A	9.0	A	10.9	B
Eastbound Approach	12.5	B	13.8	B	16.2	C	24.5	C
Westbound Approach	14.4	B	15.1	C	21.0	C	29.7	D
Southbound Left	8.2	A	8.1	A	9.2	A	9.5	A
<b>Crossroads North: Marksheffel Road North Access (#9)</b>								
Northbound Left	15.6	C	12.9	B	-	-	-	-
Eastbound Left	76.7	F	62.1	F				
Eastbound Right	17.8	C	14.8	B				
<b>Crossroads North: Marksheffel Rd North Access (#9 - Signal)</b>								
	8.6	A	6.7	A	# 3.9	# A	# 3.1	# A
<b>Crossroads North: Marksheffel Road South Access (#10)</b>								
Northbound Left	18.0	C	13.8	B	-	-	-	-
Eastbound Left	108.3	F	74.1	F				
Eastbound Right	26.3	D	19.2	C				
<b>Crossroads North: Marksheffel Rd South Access (#10 - Signal)</b>								
	8.2	A	9.4	A	# 8.7	# A	# 7.6	# A
<b>NW &amp; NE Reagan Ranch: Marksheffel Road RIRO Access (#11)</b>								
Eastbound Right	11.7	B	10.5	B	# 12.6	# B	# 13.7	# B
Westbound Right	12.4	B	17.5	C	11.7	B	25.3	D
<b>Northwest Reagan Ranch: Space Village Avenue Full Access (#12)</b>								
Eastbound Left	8.8	A	8.2	A	10.2	B	9.1	A
Southbound Left	13.9	B	13.4	B	17.6	C	21.0	C
Southbound Right	12.2	B	10.7	B	12.6	B	11.7	B
<b>Space Village Ave West Full Access (#13) (Roundabout)</b>								
	3.8	A	4.0	A	4.6	A	6.5	A
<b>Space Village Ave East Full Access (#14) (Roundabout)</b>								
	3.4	A	3.5	A	3.8	A	4.4	A
<b>Marksheffel Rd RIRO Access (#15)</b>								
Westbound Right	13.5	B	17.4	C	# 13.2	# B	# 19.7	# C
<b>Marksheffel Rd 3/4 Access (#16)</b>								
Westbound Right	13.6	B	17.8	C	# 13.5	# B	# 21.8	# C
Southbound Left	11.5	B	16.4	C	11.4	B	27.2	D
<b>Marksheffel Rd RIRO Access (#17)</b>								
Westbound Approach	13.5	B	17.9	C	# 13.9	# B	# 21.7	# C
<b>Marksheffel Rd Full Access (#18)</b>								
Westbound Approach	23.6	C	45.9	E	-	-	-	-
Southbound Left	11.2	B	16.1	C				

Access and Movement	2026 Total Traffic				2040 Total Traffic			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
<b>Marksheffel Rd Full Access (#18 - Signalized)</b>	-	-	-	-	# 4.2	# A	# 16.1	# B
<b>Marksheffel Rd RIRO Access (#19)</b> Westbound Right	12.9	B	16.5	C	# 12.1	# B	# 15.8	# C
<b>Marksheffel Rd Three-Quarter Access (#20)</b> Westbound Right Southbound Left	12.9 10.9	B B	17.2 15.5	C C	# 12.5 10.5	# B B	# 18.3 20.1	# C C
<b>Marksheffel Rd Peterson AFB / Access (#21)</b> Northbound Left Eastbound Left Eastbound Through/Right Westbound Left Westbound Through/Right Southbound Left	14.6 >300 15.9 295.3 120.5 8.3	B F C F F A	11.9 >300 19.9 220.4 48.4 9.1	B F C F E A	- - - - - -	- - - - - -	- - - - - -	- - - - - -
<b>Marksheffel Rd Peterson AFB / Access (#21) (Signalized)</b>	34.8	C	39.3	D	## 32.4	## C	## 54.5	## D
<b>Crossroads North Internal Intersections:</b> <b>North Intersection (#22)</b> Northbound Left Northbound Through/Right Eastbound Left Westbound Left Southbound Left Southbound Through/Right	12.4 9.0 7.4 7.6 13.6 10.7	B A A A B B	12.1 9.0 7.4 7.6 13.3 10.6	B A A A B B	12.9 9.1 7.5 7.6 14.5 11.0	B A A A B B	15.6 9.2 7.6 7.8 17.5 12.3	C A A A C B
<b>Crossroads North Internal Intersections:</b> <b>Middle Intersection (#23)</b> Northbound Left Eastbound Approach Westbound Approach Southbound Left	7.5 10.0 9.2 7.4	A B A A	7.5 10.0 9.2 7.4	A B A A	7.6 10.1 9.3 7.4	A B A A	7.7 10.5 9.9 7.4	A B A A
<b>Crossroads North Internal Intersections:</b> <b>Air Lane West Intersection (#24)</b> Eastbound Left Southbound Left Southbound Right	7.5 10.3 8.8	A B A	7.5 10.2 8.8	A B A	7.6 10.5 8.9	A B A	7.8 10.8 9.1	A B A
<b>Crossroads North Internal Intersections:</b> <b>Air Lane East Intersection (#25)</b> Eastbound Left Southbound Approach	7.8 11.7	A B	7.8 11.6	A B	7.9 12.2	A B	8.2 13.2	A B

# = Three northbound and southbound through lanes



Provide a similar figure for Meadowbrook Park showing Link ADTs

CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
CROSSROADS NORTH SITE CIRCULATION

FIGURE 13

## 5.4 Sight Distance Evaluation

It is recommended that appropriate sight distance triangles be provided at all site access points to give drivers exiting the development areas a clear view of oncoming traffic. Landscaping and objects within sight triangles must not obstruct drivers' views of the adjacent travel lanes. Intersection sight distances for left turn from stop and right turn from stop were analyzed for the proposed project accesses along Marksheffel Road, Meadowbrook Parkway, and Space Village Avenue.

With AASHTO standards and a design speed of 55 miles per hour along Marksheffel Road, the intersection sight distance for a vehicle turning left from stop is 610 feet, while the sight distance for a vehicle turning right from stop is 530 feet. Therefore, all obstructions for left turning vehicles from stop should be clear to the right within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way (typical position of the minor road driver's eye when stopped) and a line of sight distance of 610 feet located in the middle of the nearest lane opposite of the center median for both accesses along Marksheffel Road. Likewise, all obstructions for right turning vehicles from stop should be clear to the left within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way and a line of sight distance of 530 feet located in the middle of the nearest lane for all accesses along Marksheffel Road.

Along with the accesses along Marksheffel Road, the access along Meadowbrook Parkway was analyzed for sight distance requirements. With AASHTO standards and a design speed of 35 miles per hour along Meadowbrook Parkway, the intersection sight distance for a vehicle turning left from stop is 390 feet, while the sight distance for a vehicle turning right from stop is 335 feet. Therefore, all obstructions for left turning vehicles from stop should be clear to the right within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way and a line of sight distance of 390 feet located in the middle of the nearest lane opposite of the center median for the access along Meadowbrook Parkway. Likewise, all obstructions for right turning vehicles from stop should be clear to the left within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way and a line of sight distance of 335 feet located in the middle of the nearest lane for the access along Meadowbrook Parkway.



With AASHTO standards and a design speed of 45 miles per hour along Space Village Avenue, the intersection sight distance for a vehicle turning left from stop is 500 feet, while the sight distance for a vehicle turning right from stop is 430 feet. Therefore, all obstructions for left turning vehicles from stop should be clear to the right within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way and a line of sight distance of 500 feet located in the middle of the nearest lane opposite of the center median for both accesses along Space Village Avenue. Likewise, all obstructions for right turning vehicles from stop should be clear to the left within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way and a line of sight distance of 430 feet located in the middle of the nearest lane for the accesses along Space Village Avenue.

### **5.5 Bicycle and Pedestrian Access**

Bicycle and pedestrian access evaluations were conducted for the Crossroads-Meadowbrook-Reagan Ranch project. This focused on the areas of Meadowbrook Parkway, Marksheffel Road, US-24, SH-94, and Space Village Avenue adjacent to the site development areas. The following provides a description of the assessment.

Adjacent to the site, Meadowbrook Parkway provides the only sidewalks within the project area along both sides of the street. Pedestrian access is good along Meadowbrook Parkway between Newt Drive and Marksheffel Road with wide sidewalks with minimal gaps and signalized crossings of Marksheffel Road, where a great level of service exists for pedestrians. To the east of Marksheffel Road, Meadowbrook Parkway leads into a neighborhood with no sidewalks on either side of the road. Although the only sidewalks that exist within the study area are on Meadowbrook Parkway there are very few destinations outside of the ones provided on Meadowbrook Parkway. The only new sidewalks shown on the site plan are along the east side of Meadowbrook Parkway at the Meadowbrook Park development. Sidewalks will be provided internal to the development areas and connections will be made to the external public streets.

Transit within the Colorado Springs area is provided by Mountain Metropolitan Transit. From review of the most recent route map from August 1, 2019 there are currently no transit routes that run through the site area.

## 5.6 CDOT Turn Lane Evaluation

CDOT Access Permits will be required for the intersections of SH-94/US-24 (#4) SH-94/Marksheffel Road (#5), and SH-94/Space Village Avenue (#6) in association with the project.

Since US-24 and SH-94 are state owned and maintained facilities, it is recommended that auxiliary turn lanes along US-24 and SH-94 be constructed in accordance with the current CDOT State Highway Access Code (SHAC). CDOT categorizes the segments of US-24 and SH-94 through the study area as E-X: Expressway, Major Bypass. According to the State Highway Access Code for category E-X roadways, the following thresholds apply:

- A left turn deceleration lane is required for any access with a projected average daily left turn ingress volume greater than 10 with the transition taper included within the required deceleration length. If the projected peak hour left ingress turning volume is greater than 10 vehicles per hour (vph), a left turn deceleration, storage, and taper lane is required for any access.
- A right turn lane with deceleration and taper lengths is required for any access with a projected peak hour right ingress turning volume greater than 10 vph.
- A right turn lane with acceleration and taper lengths is required for any access with a project peak hour turning volume greater than 10 vph.

Based on traffic projections and the above thresholds, auxiliary turn lane requirements were calculated for the key intersections along SH-94. SH-94 provides one lane of travel in each direction and has a posted speed limit of 40 miles per hour at US-24, 55 miles per hour west of Marksheffel Road and 65 miles per hour east of Marksheffel Road. US-24 provides two lanes of travel in each direction and has a posted speed limit of 55 miles per hour through the SH-94 intersection. As such, turn lane requirements at the study area intersections along SH-94 to be impacted by project traffic are as follows:

### SH-94 and US-24 (#4)

Left Turn Deceleration Lanes:

- A westbound left turn deceleration lane exists and **is** warranted today and based on projected 2026 background plus project traffic being 820 westbound left turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the left turn

lane requirement is deceleration, storage, and taper lengths. Currently there are westbound dual left-turn lanes of approximately a 475-foot length with a 525-foot taper. Based on the 40-mile per hour speed limit, the deceleration lane length is 370 feet, plus a 150-foot taper. Since triple left turn lanes are recommended here with conversion of the inside westbound through lane to a left turn lane, the storage requirement is 275 feet per lane. Therefore, it is recommended that these two left turn lanes be constructed and designated to 645 feet plus a 200-foot taper, with the outside third left turn lane being continuous. By 2040, this turn lane may need to be 760 feet plus a 200-foot taper.

- A northbound left turn deceleration lane exists and **is** warranted along US-24 approach to Newt Drive/SH-94 today and based on projected 2026 background plus project traffic being 225 left turns during the peak hour. Since US-24 has a category of E-X the left turn lane requirement is deceleration, storage, and taper lengths. Currently the northbound left-turn lane is approximately 900 feet long and the taper is approximately 150 feet. Based on the 55-mile per hour speed limit, the deceleration lane length is 600 feet, plus a 225-foot taper, and 480 feet of storage for a total length of 1,080 feet plus 225-foot taper. However, by 2026 it is recommended that dual northbound US-24 left turn lanes be designated at this intersection. Dividing the storage in half results in 850-foot plus 225-foot taper northbound dual left turn lanes.
- A southbound US-24 left turn deceleration lane exists but **is not** warranted based on projected 2026 background plus project traffic being 5 southbound left turns during the peak hour and the threshold being greater than 10 vph.

#### Right Turn Deceleration Lanes:

- A northbound right turn deceleration lane along US-24 exists and **is** warranted today and based on projected 2026 background plus project traffic being 635 northbound right turns during the peak hour and the threshold being 10 vph. Since US-24 has a category of E-X the right turn lane requirement is deceleration and taper lengths. The northbound right turn lane is currently 600 feet with a 225-foot taper. Based on the 55-mile per hour speed limit, the deceleration lane length is 600 feet plus a 225-foot taper. Therefore, the existing northbound right turn lane meets current CDOT SHAC requirements.

- A southbound US-24 right turn deceleration lane exists and **is** warranted today and based on projected 2026 background plus project traffic being 65 southbound right turns during the peak hour and the threshold being 10 vph. Since US-24 has a category of E-X the right turn lane requirement is deceleration, and taper lengths. The southbound right turn lane is currently 800 feet long with a 200-foot taper. Based on the 55-mile per hour speed limit, the deceleration lane length is 600 feet plus a 225-foot taper. Therefore, the existing southbound right turn lane meets current CDOT SHAC requirements.
- A westbound right turn deceleration lane exists but **is not** warranted based on projected 2026 background plus project traffic being 10 westbound right turns during the peak hour and the threshold being greater than 10 vph. Since US-24 has a category of E-X the right turn lane requirement is deceleration, and taper lengths. The westbound right turn lane is currently 475 feet long with a 750-foot taper. Based on the 40-mile per hour speed limit, the deceleration lane length is 370 feet, plus a 150-foot taper. Therefore, the existing westbound right turn lane meets current CDOT SHAC requirements.

#### Acceleration Lanes:

- An eastbound acceleration lane along SH-94 from the US-24 northbound right turn exists and **is** warranted today and based on projected 2026 background plus project traffic being 635 northbound right turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is acceleration and taper length. Currently the eastbound acceleration lane is approximately 425 feet long with a 175-foot taper. Based on the 40-mile per hour speed limit, the acceleration lane length requirement is 380 feet plus a 145-foot taper. Therefore, no improvements are needed for this lane.
- A southwestbound right turn acceleration lane along US-24 from the Newt Drive right turn exists and **is** warranted today and based on projected 2026 background plus project traffic being 495 eastbound right turns during the peak hour and the threshold being 10 vph. Since US-24 has a category of E-X and a speed limit of 55 mph the right turn lane requirement is acceleration, and taper lengths. Based on the 55-mile per hour speed limit, the acceleration lane length requirement is 960 feet plus a 225-foot taper. This



acceleration lane exists today for a length of 760 feet plus 225-foot taper; therefore, this lane should be extended from 760 feet to 960 feet.

- A northeastbound acceleration lane along US-24 from the SH-94 westbound right turn exists but **is not** warranted based on projected 2026 background plus project traffic being 10 westbound right turns during the peak hour and the threshold being greater than 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is acceleration and taper length. Currently the eastbound acceleration lane is approximately 1,425 feet long with a 300-foot taper. Based on the 55-mile per hour speed limit, the acceleration lane length requirement is 960 feet plus a 225-foot taper. Therefore, no improvements are needed for this lane. However, if and when a third northbound through lane is provided along US-24 at SH-94, it is recommended that this acceleration lane be converted to the third northbound through lane as the acceleration lane is not warranted.

#### SH-94 and Marksheffel Road (#5)

##### Left Turn Deceleration Lanes:

- An eastbound left turn deceleration lane exists and **is** warranted based on projected 2026 background plus project traffic being 150 eastbound left turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the left turn lane requirement is deceleration, storage, and taper lengths. Currently the eastbound left-turn lanes are approximately 300 feet long with a 100-foot taper. Based on the 55-mile per hour speed limit, the deceleration lane length is 600 feet, plus a 225-foot taper. The storage requirement is 150 feet in 2026 and 235 feet in 2040 based on the projected left turning volume. Therefore, it is recommended that this left turn lane be constructed and designated to 750 feet plus a 225-foot taper in 2026 and 835 feet plus a 225-foot taper in 2040.
- A westbound left turn deceleration lane exists and **is** warranted today and based on projected 2026 background plus project traffic being 45 westbound left turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the left turn lane requirement is deceleration, storage, and taper lengths. Currently the westbound left-turn lanes are approximately 225 feet long with a 200-foot taper. Based on the 55-

mile per hour speed limit, the deceleration lane length is 600 feet, plus a 225-foot taper. The storage requirement is 50 feet based on the projected left turning volume. Therefore, it is recommended that this lane be constructed to 650 feet with a 225-foot taper.

#### Right Turn Deceleration Lanes:

- An eastbound right turn deceleration lane exists and is warranted today and based on projected 2026 background plus project traffic being 265 eastbound right turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is deceleration plus taper length. The eastbound right turn lane is currently 250 feet long with a 200-foot taper. Based on the 55-mile per hour speed limit, the deceleration lane length requirement is 600 feet plus a 225-foot taper. Therefore, the existing eastbound right turn lane does not meet current CDOT SHAC requirements. It is recommended that this lane be constructed to 600 feet plus a 225-foot taper.
- A westbound right turn deceleration lane exists and is warranted today and based on projected 2026 background plus project traffic being 395 westbound right turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is deceleration plus taper length. The westbound right turn lane is currently 250 feet long with a 275-foot taper. Based on the 55-mile per hour speed limit, the deceleration lane length requirement is 600 feet plus a 225-foot taper. Therefore, the existing westbound right turn lane does not meet current CDOT SHAC requirements. It is recommended that this lane be constructed to 600 feet plus a 225-foot taper.

#### Acceleration Lanes:

- An eastbound acceleration lane along SH-94 from the Marksheffel Road northbound right turn is warranted today and based on projected 2026 background plus project traffic being 30 northbound right turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is acceleration, and taper lengths. The right turn lane currently has no acceleration lane. Based on the 65-mile per hour speed limit, a 1,380-foot acceleration lane with 300-foot taper is recommended.

- A westbound acceleration lane along SH-94 from the Marksheffel Road southbound right turn **is** warranted based on projected 2026 background plus project traffic being 255 westbound right turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is acceleration, and taper lengths. The right turn lane currently has no acceleration lane. Based on the 40-mile per hour speed limit, a 380-foot acceleration lane with a 145-foot taper is required; however, it is recommended that this acceleration lane be a continuous lane to tie into the outside westbound through lane on the approach to US-24.

#### SH-94 and Space Village Avenue (#6)

- A westbound left turn deceleration lane exists and **is** warranted today and based on projected 2026 background plus project traffic being 95 westbound left turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X, the left turn lane requirement is deceleration, storage, and taper lengths. Currently the westbound left-turn lane is approximately 150 feet long with a 100-foot taper. Based on the 65-mile per hour speed limit, the deceleration lane length is 800 feet, plus a 300-foot taper. The storage requirement is 100 feet based on the projected 95 left turns. Therefore, it is recommended that this lane be constructed to 900 feet with a 300-foot taper by 2026.
- An eastbound right turn deceleration lane exists and **is not** warranted based on projected 2026 background plus project traffic being 5 eastbound right turns during the peak hour and the threshold being 10 vph. A short 250-foot with 225-foot taper eastbound right turn lane exists at this intersection already today and is recommended to remain in place as-is with development of the project.
- An eastbound acceleration lane along SH-94 from the Space Village Avenue northbound right turn exists and **is** warranted today and based on projected 2026 background plus project traffic being 50 northbound right turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is acceleration, and taper lengths. The right turn movement currently has a short 300-foot with 200-foot taper acceleration lane. Based on the 65-mile per hour speed limit, a 1,380-foot acceleration lane with 300-foot taper is recommended.

## 5.7 Queuing Analysis

A vehicle queuing analysis was conducted for the study area intersections. The queuing analysis was performed using Synchro presenting the results of the 95<sup>th</sup> percentile queue lengths. Results are shown in the following **Table 12** with calculations provided within the level of service operational sheets of **Appendix D** for the unsignalized intersections and **Appendix F** for signalized intersections.

**Table 12 – Turn Lane Storage Length Analysis Results**

Intersection Turn Lane	Existing Turn Lane Length (feet)	2026 Calculated Queue Length (feet)	2026 Recommended Turn Lane Length (feet)	2040 Calculated Queue Length (feet)	2040 Recommended Turn Lane Length (feet)
<b>Meadowbrook Parkway &amp; Marksheffel Road (#1)</b>					
Eastbound Left	200' DL	249' DL	200' DL*	310' DL	200' DL*
Eastbound Right	150'	25'	150'	36'	150'
Westbound Left	250'	60'	250'	70'	250'
Westbound Right	200'	25'	200'	25'	200'
Northbound Left	425'	25'	425'	57'	425'
Northbound Right	C	25'	C	25'	C
Southbound Left	350'	96'	350'	92'	350'
Southbound Right	350'	31'	350'	55'	350'
<b>US-24 (EB/WB) &amp; Marksheffel Road (NB/SB) (#2)</b>					
Eastbound Left	1200' DL	355' DL	1200' DL	423' DL	1200' DL
Eastbound Right	575'	FREE	575'	139'	575'
Westbound Left	1100'	184' DL	1,100' DL (CDOT)	235' DL	1,100' DL (CDOT)
Westbound Right	700'	FREE	700'	25'	700'
Northbound Left	300'	25'	300'	29'	300'
Northbound Right	375'	FREE	375'	FREE	375'
Southbound Left	375'	29'	375'	25'	375'
Southbound Right	C	FREE	C	FREE	C
<b>Newt Dr &amp; Meadowbrook Pkwy (#3) (Future Roundabout)</b>					
Eastbound Approach	NA	25'	C	25'	C
Westbound Left/Through		25'	C (425')	50'	C (425')
Westbound Right		25'	C (425')	25'	C (425')
Northbound Approach		100'	C	125'	C
Southbound Approach		75'	C	150'	C



Intersection Turn Lane	Existing Turn Lane Length (feet)	2026 Calculated Queue Length (feet)	2026 Recommended Turn Lane Length (feet)	2040 Calculated Queue Length (feet)	2040 Recommended Turn Lane Length (feet)
<b>SH-94 &amp; US-24 (#4)</b>					
Eastbound Newt Drive Left	375' DL	45'	375' DL	51'	375' DL
Eastbound Newt Drive Right	C	FREE	C	FREE	C
Westbound SH-94 Left	475' DL	314'	645' (CDOT) TL	587' TL	760' (CDOT) TL
Westbound SH-94 Right	475'	FREE	475'	FREE	475'
Northbound US-24 Left	900'	391' DL	900' DL	442'	900' DL
Northbound US-24 Right	600'	FREE	600'	FREE	600'
Southbound US-24 Left	800'	25'	800'	25'	800'
Southbound US-24 Right	800'	25'	800'	25'	800'
<b>SH-94 &amp; Marksheffel Road (#5)</b>					
Eastbound Left	300'	256'	750' (CDOT)	239'	835' (CDOT)
Eastbound Right	250'	90'	600' (CDOT)	439'	600' (CDOT)
Westbound Left	225'	60'	650' (CDOT)	56'	650' (CDOT)
Westbound Right	250'	275'	600' (CDOT)	371'	600' (CDOT)
Northbound Left	375'	157'	375'	260' DL	375' DL
Northbound Right	400'	FREE	400'	-	-
Southbound Left	400'	210'	400'	338'	400'
Southbound Right	400'	FREE	400'	FREE	400'
<b>SH-94 &amp; Space Village Avenue (#6)</b>					
Eastbound Right	250'	25'	250'	25'	250'
Northbound Approach	C	50'	C	125'	C
Westbound Left	150'	25'	900' (CDOT)	25'	980' (CDOT)
<b>Space Village Avenue &amp; Marksheffel Road (#7)</b>					
Eastbound Left	225'	83'	225'	178'	225'
Eastbound Right	250'	93'	250'	314'	325'
Westbound Left	300'	114'	300'	204'	300'
Westbound Right	200'	25'	200'	25'	200'
Northbound Left	400'	199'	400'	523'	525'
Northbound Right	425'	25'	425'	-	-
Southbound Left	425'	75'	425'	175'	425'
Southbound Right	425'	41'	425'	-	-
<b>Meadowbrook Pkwy Access (#8)</b>					
Eastbound Approach	C	25'	C	25'	C
Westbound Approach	DNE	25'	50'	25'	50'
Northbound Left	TWLTL	25'	TWLTL	25'	TWLTL
Southbound Left	TWLTL	25'	TWLTL	25'	TWLTL
<b>Crossroads North: Marksheffel Rd North Access (#9)</b>					
Eastbound Left	DNE	126'	150'	137'	150'
Eastbound Right	DNE	50'	C	52'	C
Northbound Left	DNE	35'	235'+200' T (EPC)	57'	235'+200' T (EPC)
Southbound Right	DNE	83'	235'+200' T (EPC)	120'	235'+200' T (EPC)

Intersection Turn Lane	Existing Turn Lane Length (feet)	2026 Calculated Queue Length (feet)	2026 Recommended Turn Lane Length (feet)	2040 Calculated Queue Length (feet)	2040 Recommended Turn Lane Length (feet)
<b>Crossroads North: Marksheffel Rd North Access (#10)</b>					
Eastbound Left	DNE	105'	150'	111'	150'
Eastbound Right	DNE	78'	C	77'	C
Northbound Left	DNE	106'	235'+200' T (EPC)	152'	235'+200' T (EPC)
Southbound Right	DNE	25'	235'+200' T (EPC)	25'	235'+200' T (EPC)
<b>Reagan NW &amp; NE: Marksheffel Rd RIRO Access (#11)</b>					
Eastbound Right	DNE	25'	C	25'	C
Westbound Right	DNE	25'	C	100'	C
<b>Space Village Ave Full Access (#12)</b>					
Eastbound Left	DNE	25'	200'+180'T (CS)	25'	200'+180'T (CS)
Southbound Left	DNE	25'	50'	25'	50'
Southbound Right	DNE	25'	50'	25'	50'
<b>Space Village Ave West Roundabout Access (#13)</b>					
Eastbound Approach	DNE	25'	C	50'	C
Westbound Approach	DNE	25'	C	25'	C
Northbound Approach	DNE	25'	C	25'	C
Southbound Approach	DNE	25'	C	25'	C
<b>Space Village Ave East Roundabout Access (#14)</b>					
Eastbound Approach	DNE	25'	C	25'	C
Westbound Approach	DNE	25'	C	25'	C
Northbound Approach	DNE	25'	C	25'	C
Southbound Approach	DNE	25'	C	25'	C
<b>Marksheffel Rd RIRO Access (#15)</b>					
Westbound Right	DNE	25'	50'	25'	50'
<b>Marksheffel Road 3/4 Access (#16)</b>					
Westbound Right	DNE	25'	C	50'	C
Southbound Left	DNE	25'	235' + 200' T (CS)	125'	235' + 200' T (CS)
<b>Marksheffel Rd RIRO Access (#17)</b>					
Westbound Right	DNE	25'	75'	75'	75'
<b>Marksheffel Road Full Access (#18)</b>					
Westbound Approach	DNE	75'	C	319'	C
Southbound Left	DNE	25'	235' + 200' T (CS)	304'	300'
<b>Marksheffel Rd RIRO Access (#19)</b>					
Westbound Right	DNE	25'	50'	25'	50'
<b>Marksheffel Road 3/4 Access (#20)</b>					
Westbound Right	DNE	25'	C	50'	C
Southbound Left	DNE	25'	235' + 200' T (CS)	100'	235' + 200' T (CS)

Intersection Turn Lane	Existing Turn Lane Length (feet)	2026 Calculated Queue Length (feet)	2026 Recommended Turn Lane Length (feet)	2040 Calculated Queue Length (feet)	2040 Recommended Turn Lane Length (feet)
<b>Marksheffel Road Full Access (#21) &amp; Air Force Base Access</b>					
Eastbound Left	175'	402' DL	<b>400' DL</b>	623' DL	<b>C DL</b>
Westbound Left	DNE	27'	<b>155'+160' T (CS)</b>	75'	155'+160' T (CS)
Westbound Right	DNE	-	DNE	114'	<b>155'+160' T (CS)</b>
Northbound Left	600'	107'	600'	142'	600'
Southbound Left	DNE	64'	<b>235' +200'T (CS)</b>	360'	<b>375'</b>
Southbound Right	C	93'	C	369'	C
<b>Crossroads North: Internal Access Intersection (#22)</b>					
Eastbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
Westbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
Northbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
Southbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
<b>Crossroads North: Internal Access Intersection (#23)</b>					
Eastbound Approach	DNE	25'	<b>C</b>	25'	C
Westbound Approach	DNE	25'	<b>C</b>	25'	C
Northbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
Southbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
<b>Crossroads North: Air Lane West Intersection (#24)</b>					
Eastbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
Southbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
Southbound Right	DNE	25'	<b>C</b>	25'	C
<b>Crossroads North: Air Lane East Intersection (#25)</b>					
Eastbound Left	DNE	25'	<b>115' (EPC)</b>	25'	115' (EPC)
Southbound Approach	DNE	25'	<b>C</b>	25'	C

\* = Maximum Possible Length, DL = Dual Left Turn Lanes, TL = Triple Left Turn Lanes, DNE = Does Not Exist, C = Continuous Lane, FREE = Free Right Turn Movement, NA = Not Applicable, (CDOT) = CDOT Standard, (EPC) = El Paso County Standard, (CS) = City of Colorado Springs Standard, **Blue text = Improvement or New Turn Lane**

Turn lane lengths along Meadowbrook Parkway and Marksheffel Road, north of SH-94 were derived from El Paso County standards while turn lane lengths along Space Village Avenue and Marksheffel Road south of SH-94 were recommended based on City of Colorado Springs standards. It should be noted that 95<sup>th</sup> percentile vehicle queue lengths were recommended if they were reporting lengths longer than design standards.

## 5.8 Crossroads North: North Access Sensitivity Analysis

As requested by El Paso County, a sensitivity analysis within Crossroads North has been prepared comparing the north access along Marksheffel Road as a full movement signalized intersection and a three-quarter movement unsignalized intersection due to the accesses along Marksheffel Road not meeting intersection spacing standards set forth by El Paso County. As such, an intersection operational, vehicle queuing, signal progression, and safety evaluation has been analyzed and prepared comparing both access scenarios.

### Intersection Operational Analysis

A traffic operational analysis comparing the north access along Marksheffel Road as a full movement signalized intersection and as a three-quarter movement unsignalized intersection has been evaluated to determine operational differences. **Table 13** provides the results of the level of service at the two control access intersections (#9 and #10) for both access scenarios to Crossroads North.

**Table 13 – Crossroads North Access Scenarios LOS Results**

Access and Movement	2026 Total Traffic				2040 Total Traffic			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
<b>Crossroads North: Marksheffel Road North Access (#9) (3/4 Movements – Unsignalized)</b>					#	#	#	#
Northbound Left	15.6	C	12.9	B	12.3	B	14.9	B
Eastbound Right	17.8	C	14.8	B	13.9	B	14.4	B
<b>Crossroads North: Marksheffel Rd North Access (#9) (Full Movements - Signal)</b>	8.6	A	6.7	A	3.9	A	3.1	A
<b>Crossroads North: Marksheffel Rd South Access (#10) (Signal w/ North Access 3/4 Movements)</b>	15.6	B	14.4	B	#	#	#	#
<b>Crossroads North: Marksheffel Rd South Access (#10) (Signal w/ North Access Signalized)</b>	8.2	A	9.4	A	8.7	A	7.6	A

# = Three northbound and southbound through lanes

As shown in **Table 13**, both proposed access intersections (#9 and #10) to Crossroads North along Mark are expected to operate acceptably with LOS C or better during the peak hours under



both access scenarios. It should be noted that the south access (#10) along Marksheffel Road is expected to have delays increase by approximately 20 seconds (from LOS A to LOS C) during the peak hours in 2040 if the north access is unsignalized.

#### Vehicle Queuing Analysis

A vehicle queuing analysis comparing the north access along Marksheffel Road as a full movement signalized intersection and as a three-quarter movement unsignalized intersection has been evaluated to determine potential vehicle queuing deficiencies. **Table 14** provides the results of the 95<sup>th</sup> percentile vehicle queues at the two control access intersections (#9 and #10) for both access scenarios to Crossroads North.

**Table 14 – Crossroads North Access Scenarios Vehicle Queuing Results**

Intersection Turn Lane	2026 Calculated Queue Length (feet)	2040 Calculated Queue Length (feet)
<b>Crossroads North: Marksheffel Rd North Access (#9) (3/4 Movements – Unsignalized)</b>		#
Eastbound Right	25'	25'
Northbound Left	25'	25'
<b>Crossroads North: Marksheffel Rd North Access (#9) (Full Movements - Signal)</b>		#
Eastbound Left	126'	137'
Eastbound Right	50'	52'
Northbound Left	35'	57'
Southbound Right	83'	120'
<b>Crossroads North: Marksheffel Rd North Access (#10) (Signal w/ North Access 3/4 Mvmts)</b>		#
Eastbound Left	192'	218'
Eastbound Right	70'	71'
Northbound Left	120'	171'
Southbound Right	41'	79'
<b>Crossroads North: Marksheffel Rd North Access (#10) (Signal w/ North Access Signalized)</b>		#
Eastbound Left	105'	111'
Eastbound Right	78'	77'
Northbound Left	106'	152'
Southbound Right	25'	25'

# = Three northbound and southbound through lanes

As shown in **Table 14**, vehicle queues are relatively uniform between the two access intersections when both are signalized. Eastbound left exiting vehicle queues are longer at the south access intersection when the north access intersection is stop control controlled as all traffic with destinations to the north are routed through the south access.

#### Signal Progression Analysis

A traffic signal progression analysis was conducted along the approximate 1.6-mile-long segment of Marksheffel Road from Meadowbrook Parkway to the north to the proposed Access Intersection #18 to the south due to the proposed signalization of the two access intersections (#9 and #10) to Crossroads North, the Space Village Avenue intersection (#7) as well as one of the proposed Reagan Ranch accesses (#18). As such, four (4) new signalized intersections and three (3) existing signalizations for a total of seven (7) signalized intersections were evaluated for progression along this corridor. Further, a comparison evaluation was conducted with the north access (#9) to Crossroads North along Marksheffel Road operating with stop control. In the second scenario, six (6) signalized intersections were evaluated for progression along the Marksheffel Road corridor.

The signal progression analysis was conducted to determine if the four traffic signals proposed along Marksheffel Road would interrupt the northbound and southbound bandwidth and platooning of vehicles along Marksheffel Road. Bandwidth is the window of time within the cycle length of a traffic signal that allows vehicles to travel through coordinated intersections without stopping. The goal of signal coordination is to provide sufficient bandwidth to allow for the progression of traffic along a corridor. Intersection coordination bandwidths for the study area were estimated using *Synchro 10* and were evaluated under full buildout 2040 total traffic conditions during the weekday morning and afternoon peak hours.

With the intersection of Space Village Avenue/Marksheffel Road (#7) and three proposed access intersections (#9, #10, and #18) along Marksheffel Road (two accesses to Crossroads North and one access to Reagan Ranch) as signalized intersections and coordinated with the intersections of Meadowbrook Parkway/Marksheffel Road (#1), US-24/Marksheffel Road (#2), and SH-94/Marksheffel Road (#5), the available vehicle bandwidth through the studied Marksheffel Road corridor is anticipated to be 43 seconds northbound and 44 seconds southbound during the

morning peak hour in 2040. Likewise, the bandwidth during the afternoon peak hour is anticipated to be 36 seconds northbound and 37 seconds southbound in 2040. These bandwidths equate to a platoon efficiency of approximately 36/37 percent and 30/31 percent in the morning and afternoon peak hours, respectively.

With the north access (#9) to Crossroads North along Marksheffel Road operating with stop control, the six (6) studied signalized intersections along the Marksheffel Road corridor are expected to have an available bandwidth of 45 seconds northbound and 49 seconds southbound during the morning peak hour in 2040. Likewise, the bandwidth during the afternoon peak hour is anticipated to be 36 seconds both northbound and southbound in 2040. These bandwidths equate to a platoon efficiency of approximately 38/41 percent and 30 percent in the morning and afternoon peak hours, respectively. The following **Table 15** summarizes the available bandwidths and platoon efficiencies for both access scenarios withing Crossroads North.

**Table 15 – Signal Progression Comparison**

Analysis Year and Peak	Bandwidth (seconds)		Platoon Efficiency (%)	
	Northbound	Southbound	Northbound	Southbound
<b>Crossroads North: Signalized North Access (7 studied signalized intersections)</b>				
2040 Total AM	43 sec.	44 sec.	36%	37%
2040 Total PM	36 sec.	37 sec.	30%	31%
<b>Crossroads North: Unsignalized North Access (6 studied signalized intersections)</b>				
2040 Total AM	45 sec.	49 sec.	38%	41%
2040 Total PM	36 sec.	36 sec.	30%	30%

Marksheffel Road is comparable to a NR-B: Non-Rural Arterial as defined in the State of Colorado State Highway Access Code. A goal platoon efficiency for an NR-B corridor is typically 30 percent or better, which has been achieved in 2040 for both directions of travel under both access scenarios. Therefore, it is believed that traffic signals at the intersections of Space Village Avenue/Marksheffel Road (#5), two Crossroads North accesses (#9 and #10) and Marksheffel Road, and Reagan Ranch Full Movement Access (#18)/Marksheffel Road would maintain an acceptable platoon efficiency along the Marksheffel Road corridor if coordinated with the adjacent traffic signals. Time-space diagrams for the corridor are attached in **Appendix G**.

### Safety Evaluation

The north access to Crossroads North along Marksheffel Road meets standards for capacity operations, vehicle queues, and signal progression under a signal control. Further, national standards are met for signal warrants, sight distance, and intersection spacing at this access. As such, it is believed that the north access to Crossroads North along Marksheffel Road should be considered for full movement signalized control.

### **5.9 Improvement Summary**

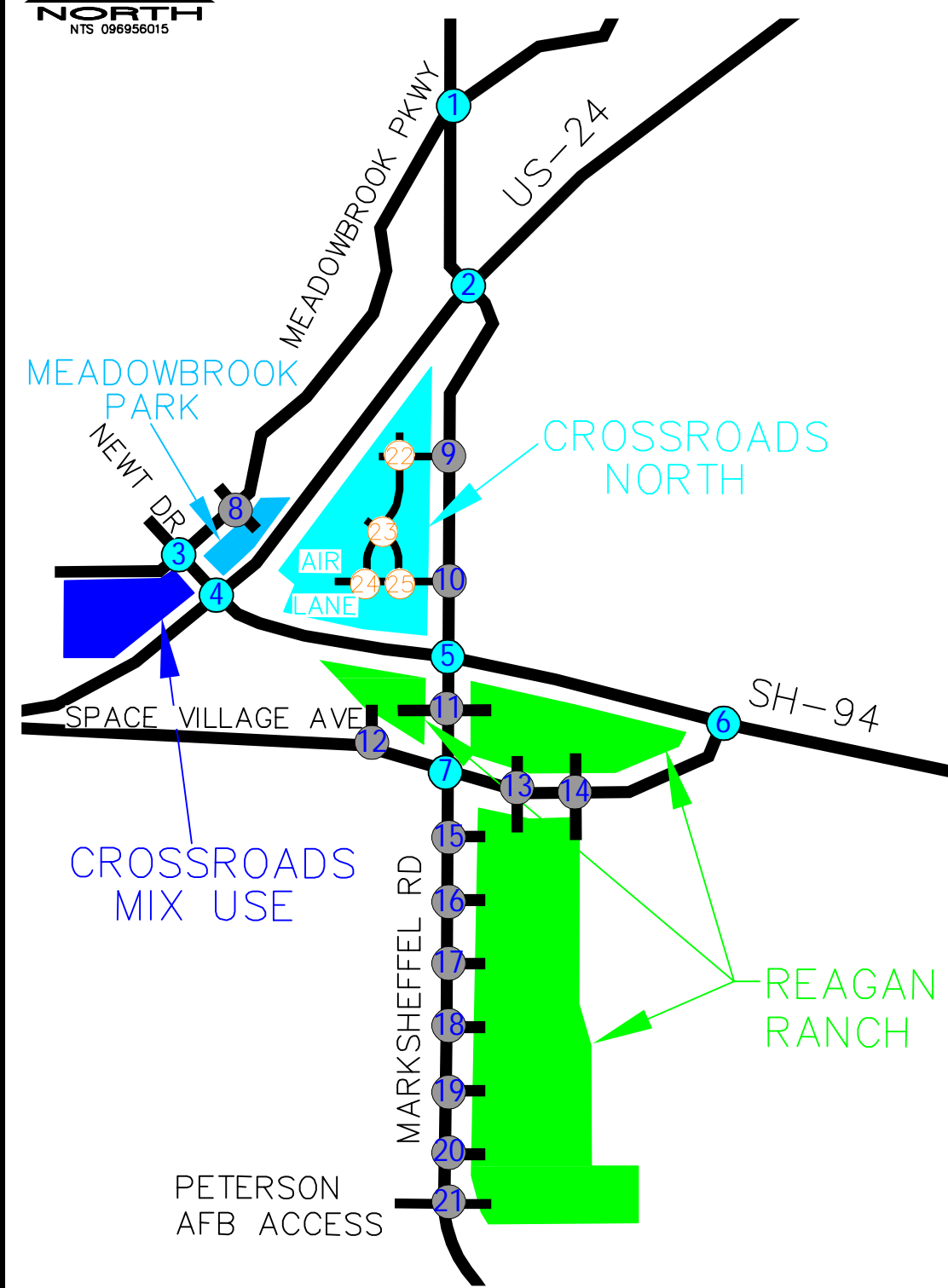
Based on the results of the level of service operational and turn lane analysis for the study area in the 2026 short term and 2040 long-term twenty-year horizons, anticipated improvements are identified as shown in **Figures 14** and **15**, respectively. Likewise, a recommended improvements summary table is provided in **Table 16**.

These recommended improvements are based on the complete global analysis provided by this study for this area of Colorado Springs and El Paso County considering existing traffic volumes, background traffic volume growth from other development projects as well as these three project areas of Crossroads, Meadowbrook, and Reagan Ranch. The improvements identified are not solely needed to accommodate Crossroads-Meadowbrook-Reagan Ranch developments, as it is the existing and background traffic volume growth that contribute to the improvement needs as well. Traffic contribution percentages were not defined in the improvement summary table due to multiple review agencies being involved with the project and the differing procedures in creating development agreements. Further, El Paso County road impact fees were not provided due to a portion of the project being located within the City of Colorado Springs and having studied roadways controlled by CDOT. These will be provided to the appropriate agency as needed through other deliverables.

This needs to be clarified. Fees will be paid on EPC developments; however, reimbursement may not be available for certain improvements.

**KHA RESPONSE:**  
The required fees to be paid and EPC vs. CDOT jurisdiction has been specified in the updated report.





CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2026 RECOMMENDED LANE CONFIGURATIONS

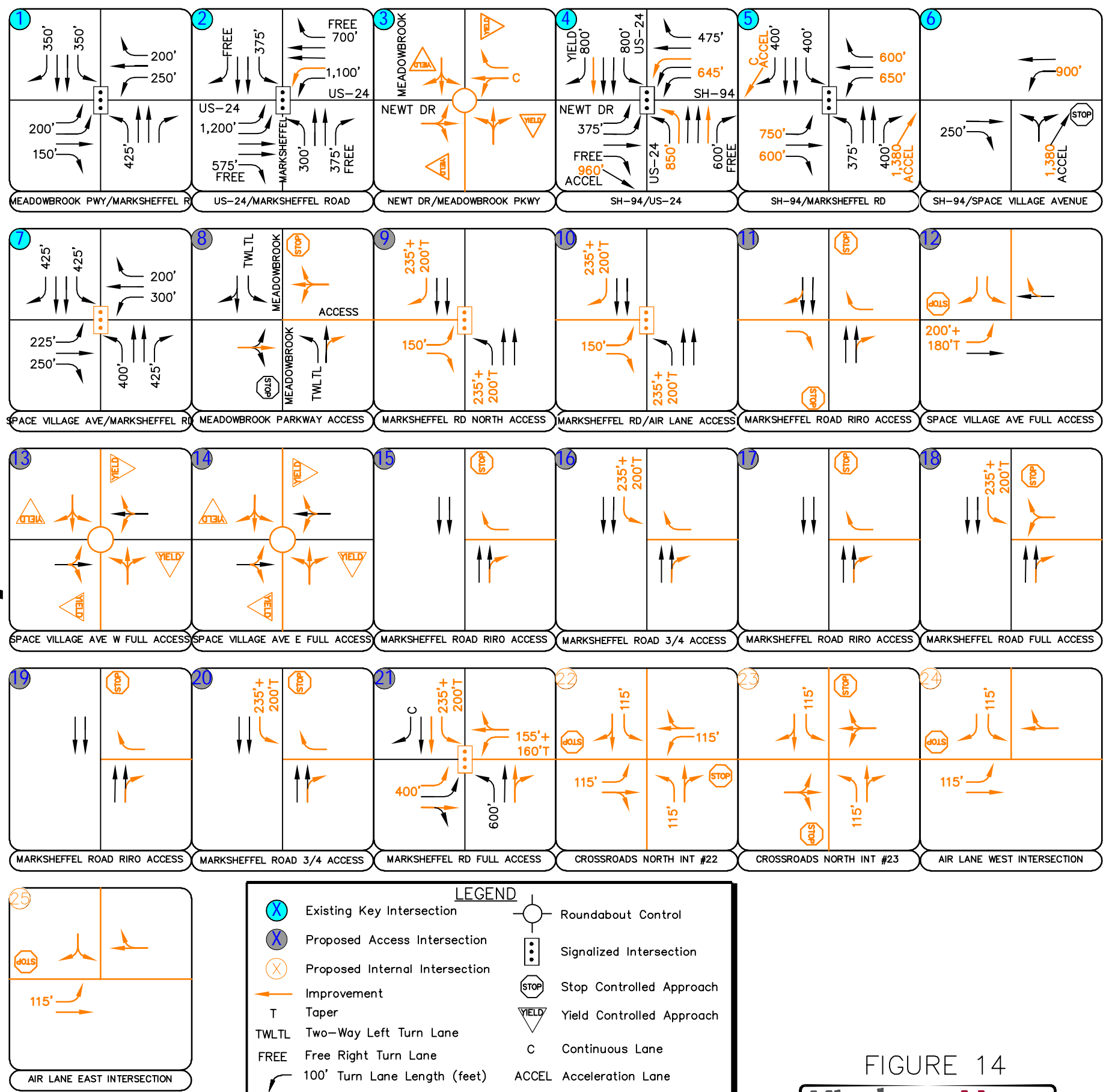
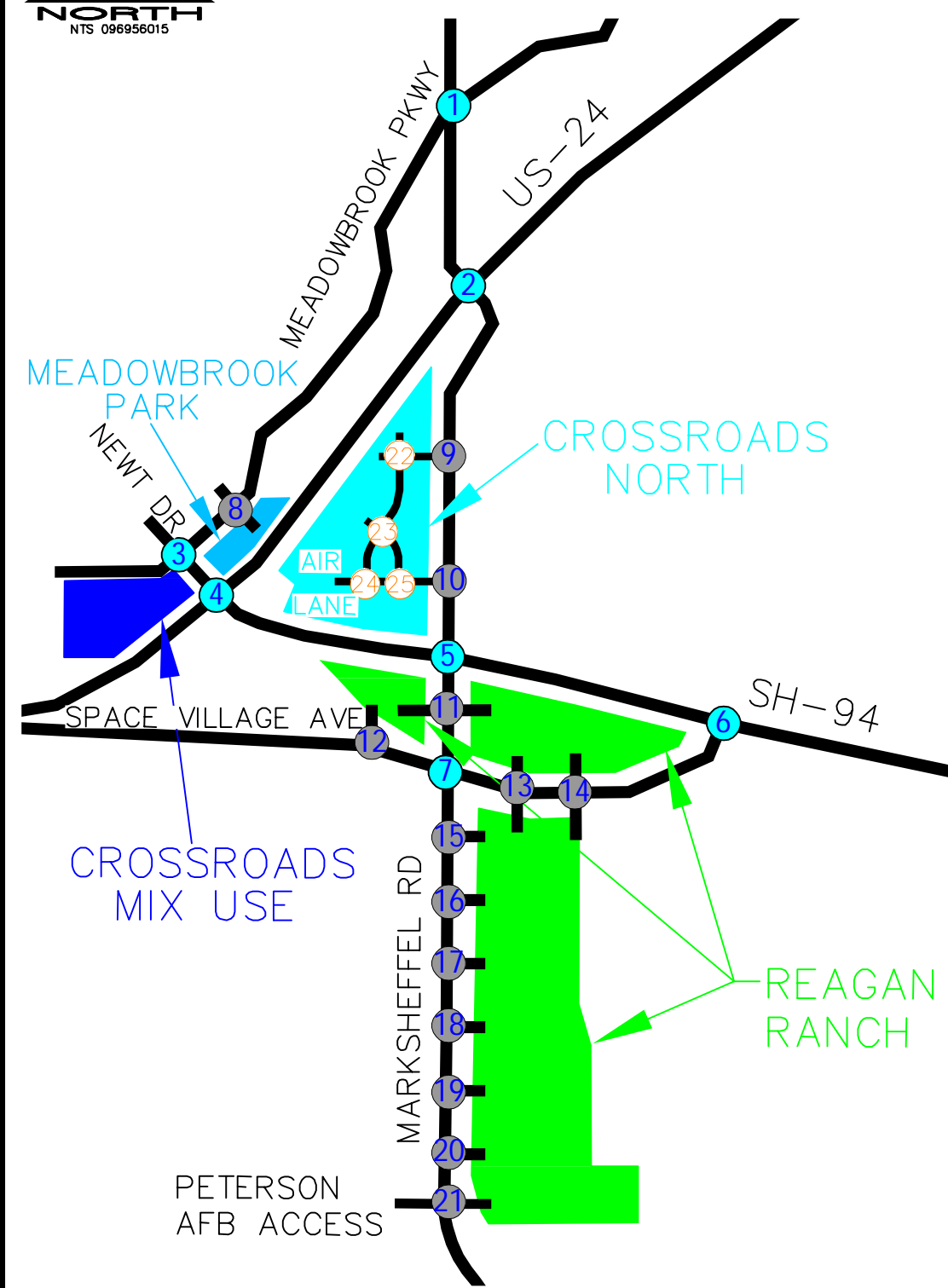


FIGURE 14



CROSSROADS-MEADOWBROOK & REAGAN RANCH  
COLORADO SPRINGS, CO  
2040 RECOMMENDED LANE CONFIGURATIONS

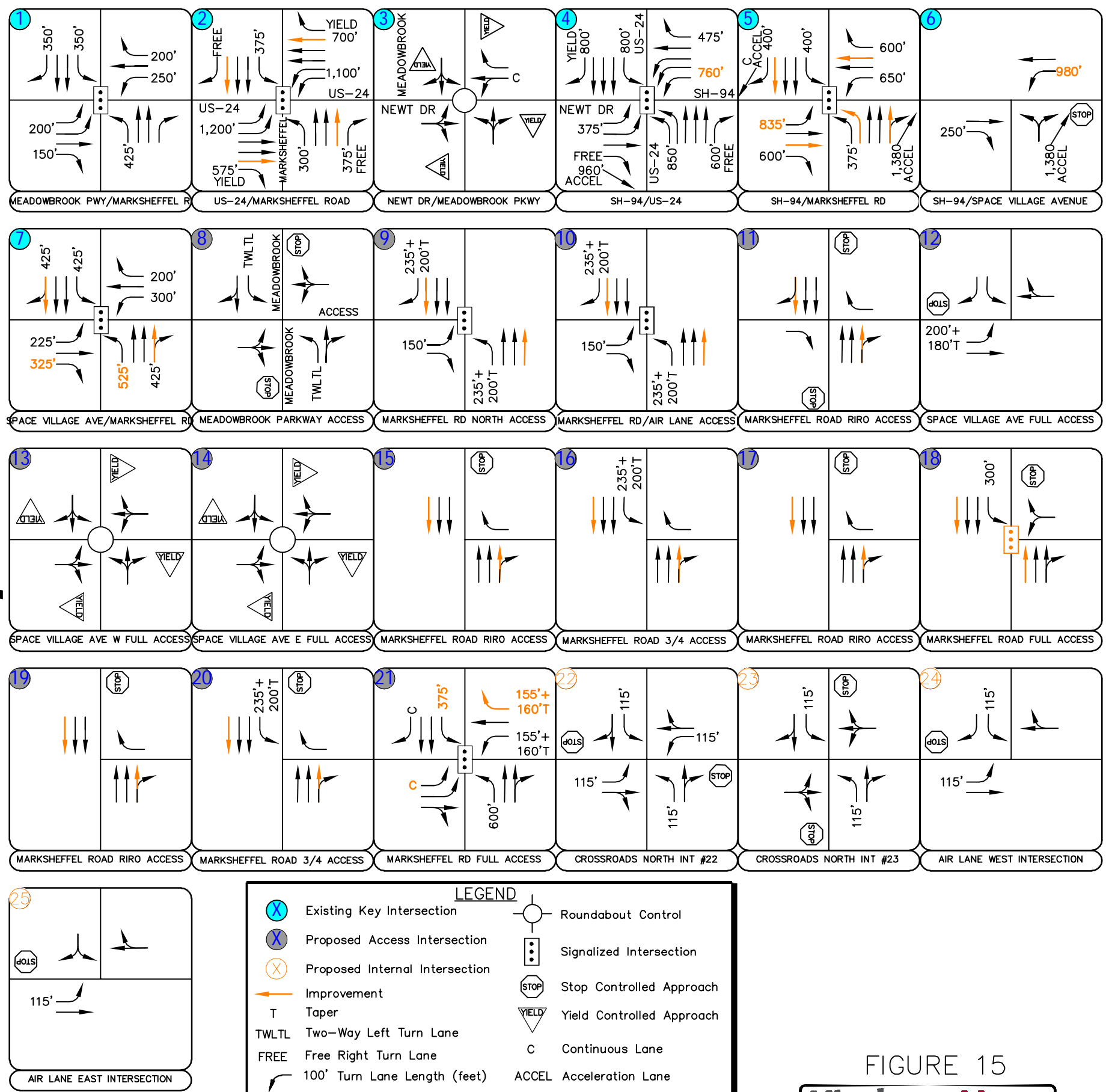


FIGURE 15

**Table 16 – Crossroads-Meadowbrook-Reagan Ranch Improvement Summary**

<b>Intersection</b>	<b>Improvements</b>	<b>Horizon Year Needed</b>
<b>Meadowbrook Pkwy &amp; Marksheffel Road (#1)</b>	No Improvements	-
<b>US-24 &amp; Marksheffel Road (#2)</b>	Designate westbound dual left turn lanes	2026
	Three through lanes on all four approaches	2040
<b>Newt Drive &amp; Meadowbrook Pkwy (#3)</b>	Roundabout Control	2026
<b>SH-94 &amp; US-24 (#4)</b>	Designate northbound dual left turn lanes with 850-foot plus 225-foot taper	2026
	Provide triple westbound left turn lanes with 760 feet plus 145-foot taper	2026
	Extend eastbound to southwestbound right turn acceleration lane from 760 feet to 960 feet	2026
	Three US-24 northbound and southbound through lanes	2026
<b>SH-94 &amp; Marksheffel Road (#5)</b>	Extend the 300-foot eastbound left turn lane to 835 feet with a 225-foot taper	2026
	Extend the 250-foot eastbound right turn lane to 600 feet with a 225-foot taper	2026
	Extend the 225-foot westbound left turn lane to 650 feet with a 225-foot taper	2026
	Extend the 250-foot westbound right turn lane to 600 feet with a 225-foot taper	2026
	Provide northbound to eastbound right turn acceleration lane	2026
	Provide southbound to westbound right turn acceleration lane	2026
	Provide northbound dual left turn lanes	2040
	Provide two through lane both eastbound and westbound and three through lanes both northbound and southbound	2040
<b>Space Village Avenue &amp; SH-94 (#6)</b>	Extend the 300-foot northbound to eastbound acceleration lane to 1,380 feet a 300-foot taper	2026
	Extend the 150-foot westbound left turn lane to 900 feet with a 300-foot taper	2026
	Extend westbound left turn lane to 980 feet with a 300-foot taper	2040
<b>Space Village Avenue &amp; Marksheffel Road (#7)</b>	Signalized control	2026
	Provide three northbound and southbound through lanes	2040
<b>All Development Accesses and Internal Intersections (#8-25)</b>	All Access and Internal Intersections	2026

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

---

Based on the complete global analysis of the project area including existing and background traffic volumes from other sources and developments presented in this report, Kimley-Horn believes the Crossroads-Meadowbrook-Reagan Ranch developments will be successfully incorporated into the existing and future roadway network. All of the area traffic combined including the proposed background traffic volume growth, project development, and expected future traffic volumes in each of the 2026 Phase 1 and 2040 full buildout horizons resulted in the following recommendations/conclusions:

### **2026 Recommendations:**

- CDOT will likely require Access Permits for the intersections of SH-94/US-24 (#4) SH-94/Marksheffel Road (#5), and SH-94/Space Village Avenue (#6) in association with the project.
- Southwestbound dual left turn lanes were found to be needed along US-24 at the Marksheffel Road intersection (#2). Presently there is a single left turn lane with a striped-out area to shadow the dual left turn lanes on northeastbound US-24. These new southwestbound dual left turn lanes should be designated with a length of 1,100 feet plus 600-foot taper (25 to 1).
- It is recommended that a single lane roundabout be constructed at the Meadowbrook Parkway and Newt Drive intersection (#3) with development of the Crossroads Mix Use project. The roundabout should have single lane approaches on the eastbound Newt Drive, northbound Meadowbrook Parkway, and southbound Meadowbrook Parkway approaches and a two-lane approach on westbound Newt Drive with a shared left turn/through lane into the roundabout and a separate right turn lane.
- The intersection of SH-94/US-24 (#4) currently operates poorly during the peak hours in the existing condition. As a regional capacity improvement, it was found that US-24 may need to provide three through lanes in each direction from the Peterson Road interchange through this intersection with SH-94 in the near-term horizon. The additional through lanes should be considered by CDOT and El Paso County in the near future. If and when US-24 is improved



to provide three through lanes in each direction, it is recommended that a separate 600-foot plus 225-foot taper right turn deceleration lane be constructed to maintain free right turn movements to eastbound SH-94. For southwestbound US-24 at SH-94 (#4), the existing acceleration lane along US-24 will need to be reconstructed with 960 feet of length plus a 225-foot taper if and when US-24 is improved to provide three through lanes along westbound US-24. For northeastbound US-24 at SH-94, it is recommended that this acceleration lane be converted to the third northbound through lane as the acceleration lane is not warranted. Further, the northeastbound US-24 third through lane needs to continue for 1,200 feet plus provide a 660-foot taper based on MUTCD standards. In addition to these regional improvements, it is recommended that the existing single 900-foot left turn lane be changed to 850-feet plus 225-foot taper with dual left turn lanes on the northeastbound US-24 approach for the left turn to Newt Drive. The area for these dual lefts is presently available (mostly); however, the lane is striped out which will require restriping with a slight extension that may also need to be constructed. Also, at the intersection of US-24 and SH-94 (#4), the existing dual westbound left turn lanes on SH-94 should be converted to triple left turn lanes by restriping the inside westbound through lane to a left turn lane. The inside two westbound left turn lanes should be extended to a length of 760 feet plus a 225-foot taper per CDOT SHAC requirements. Three receiving lanes will be available with the expansion of US-24 to three westbound lanes to the Peterson Road interchange off-ramp. A traffic signal modification will be required at the intersection to incorporate all of these improvements.

- At SH-94 and Marksheffel Road (#5), it was found that the eastbound and westbound right turns should operate with overlap phasing, while the northbound and southbound right turns should operate with free movements with acceleration lanes constructed in accordance with the CDOT State Highway Access Code (SHAC). The acceleration lane along westbound SH-94 is recommended to tie into the outside through lane on the approach to US-24. The eastbound left turn lane shall be extended to a length of 750 feet with a 225-foot taper while the westbound left turn lane should be extended to a length of 650 feet with a 225-foot taper. The eastbound and westbound right turn lanes should be extended to 600 feet. The eastbound acceleration lane from the Marksheffel Road northbound right turn should be constructed to 1,380 feet with a 300-foot taper. These improvements at this intersection may already be identified with the SH-94 improvements already being planned by CDOT.

- In order to comply with the CDOT State Highway Access Code, it was found that the existing 150-foot westbound left turn lane at the intersection of SH-94 and Space Village Avenue (#6) does not meet current CDOT standards with a length need of 900 feet and a 300-foot taper. An eastbound acceleration lane along SH-94 from the Space Village Avenue northbound right turn is also warranted based on existing traffic. This existing 300-foot with 200-foot taper acceleration lane would need to be extended to a length of 1,380 feet with a 300-foot taper to meet current CDOT standards. Extension of these lanes may not be feasible due to the bridge along SH-94 to the east, which is likely why CDOT constructed to lengths shorter than standard.
- Currently the intersection of Space Village Avenue and Marksheffel Road (#7) is unsignalized. By 2026, this intersection is anticipated to meet the Four-Hour Vehicle Volume signal warrant with development of Reagan Ranch; therefore, it is recommended that a traffic signal be installed at this intersection.
- With completion of the Crossroads Mix Use project, the site proposes three accesses along the southeast side of Meadowbrook Parkway. The northeastern access along Meadowbrook Parkway for Crossroads Mix Use may be right-in/right-out while the two southern most access will provide full movements with stop control on the minor legs. All three project access driveways to Crossroads Mix Use are recommended to have R1-1 "STOP" signs installed for the exiting approaches.
- The Meadowbrook Park development area has one proposed driveway access (#8) along the east side of Meadowbrook Parkway that will align with Preble Drive. Left turn movements for entering this project access will be provided from an existing two-way left turn lane along Meadowbrook Parkway. The westbound exiting approach of this driveway should provide stop control with installation of a R1-1 "STOP" sign.
- Traffic signals are anticipated to be needed and warranted at both full movement access intersections (#9 and #10) along Marksheffel Road for Crossroads North. Therefore, traffic signals are recommended for installation at these two access intersections with development of Crossroads North. It is recommended that a 235-foot with 200-foot taper (based on El Paso

County standards for 50 mph) southbound right turn lane be constructed at both access intersections along Marksheffel Road due to the volume of traffic entering Crossroads North at this access. Likewise, northbound left turn lanes with 235 feet of length plus 200-foot tapers should also be constructed at both full movement access intersections along Marksheffel Road for Crossroads North. Lastly, separate eastbound left turn and right turn lanes are recommended to serve exiting traffic out of Crossroads North. As requested by El Paso County, a sensitivity analysis has been prepared later in Section 5.8 comparing the north access along Marksheffel Road as a full movement signalized intersection and a three-quarter movement unsignalized intersection due to these accesses not meeting El Paso County standards for intersection spacing.

- For the northwest development area of Reagan Ranch, a right-in/right access is proposed along Marksheffel Road (#11) between SH-94 and Space Village Avenue (to also serve the northeast development area of Reagan Ranch) and a full movement access is proposed along Space Village Avenue (#12). It is likely that rights to an easement for a proposed new access along Space Village Avenue will be acquired and was evaluated as such in this traffic study. It is recommended that the access along Space Village Avenue (#12) to the northwest region of Reagan Ranch have a 200-foot plus 180-foot taper eastbound left turn lane to accommodate volumes entering the northwest region of Reagan Ranch.
- Three accesses are proposed to serve the northeast development area of Reagan Ranch. These include a right-in/right-out access on the east side of Marksheffel Road between SH-94 and Space Village Avenue (to align with the previously mentioned access intersection #11) and two roundabouts providing full turning movements along Space Village Avenue between Marksheffel Road and SH-94 (#13 and #14). It is recommended that the roundabouts have single lane approaches on all entering legs.
- For the southeast development area of Reagan Ranch, access will be gained at these same two roundabouts along Space Village Avenue (#13 and #14) as well as seven (7) accesses (#15-21) planned along the east side of Marksheffel Road south of Space Village Avenue at the standard City 600-foot spacing. The access intersection at the approximate half-mile spacing (#18) is expected to require signalization by 2040 while the access in alignment with

Peterson Air Force Base (#21) is expected to need signalization by the short-term 2026 horizon. The accesses at the quarter-mile spacing are proposed as three-quarter movement accesses (#16 and #20) while the accesses at the eighth-mile spacing are proposed as right-in/right-out accesses (#15 and #17 and #19).

- It is recommended that the two three-quarter movement accesses along Marksheffel Road (#16 and #20) as well as the northern full movement access (#18) along Marksheffel Road provide 235-foot plus 200-foot taper southbound left turn lanes to accommodate volumes entering the southeast region of Reagan Ranch.
- The southern full movement access intersection (#21) for Reagan Ranch is proposed to align with the existing Peterson Air Force Base High-T intersection (Intersection #21). With this access alignment, it is recommended that the intersection be signalized. This intersection will need to be reconfigured so that a southbound left turn lane and dual eastbound left turn lanes can be provided. The southbound left turn lane is recommended to include a length of 235 feet plus 200-foot taper and the dual eastbound left turn lanes are recommended to provide a length of 400 feet.
- As requested by El Paso County, an internal street evaluation was conducted for the Crossroads North development area. The south access to Crossroads North along Marksheffel Road is proposed to be named Air Lane and is expected to be classified as an El Paso County Urban Non-Residential Collector roadway with a 60-foot right-of-way (ROW). Air Lane extends east-west and is proposed to connect with a north-south extending Non-Residential Collector street (#24) and a north-south extending Urban Local street (#25). Intersection #25 (collector to collector) is proposed to be located approximately 660 feet west of Marksheffel Road while Intersection #24 (collector to local street) is located approximately 380 feet west of Marksheffel Road. These distances meet the El Paso County Urban Non-Residential Collector spacing standards of 660 feet to other collectors and 330 feet to intersections with a local street. The north-south extending Non-Residential Collector street also connects with an east-west collector street (#22) that extends from the north access to Marksheffel Road as well as with an Urban Local street on site (#23). The north access street connecting with Marksheffel Road is proposed to be classified as an El Paso County Urban

Non-Residential Collector roadway. The recommended left-turn lanes internal to Crossroads North should provide 115 feet of length plus 120-foot tapers to meet El Paso County standards.

#### **2040 Recommendations:**

- If future traffic volume projections are realized, US-24 may need to provide three through lanes in each direction through the Marksheffel Road intersection. Likewise, Marksheffel Road between US-24 and Peterson Air Force Base East Gate may need to provide three through lanes in each direction. It is recommended that traffic volumes continue to be monitored by CDOT, the City of Colorado Springs, and El Paso County, as applicable, to determine if and when these regional improvements will be needed.
- A traffic signal is anticipated to be needed at the northern full movement access intersection for Reagan Ranch (#18) along Marksheffel Road by 2040.
- A westbound right turn lane may be needed at the southern full movement access intersection for Reagan Ranch (#21) proposed to align with the existing Peterson Air Force Base Access by 2040.
- Several extensions of auxiliary turn lanes may be needed by 2040 and should be monitored by CDOT, the City of Colorado Springs, and El Paso County, as applicable, to determine if and when the recommended turn lane lengths will be needed.

#### **General Recommendations:**

- Any on-site and off-site roadway, signing, striping, and signal improvements should be incorporated into the Civil Drawings, and conform to City of Colorado Springs, El Paso County, and/or CDOT standards as applicable, as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

-List other traffic studies conducted by the traffic consultant in the area within the past five years such as "Reagan Ranch" prepared by Kimley Horn. Provide a statement confirming these studies were incorporated and consistent with the Cross Roads traffic study and explain any discrepancies

--List all PUD Modifications/deviations from the County Engineering Criteria per LOI. Include supporting information, together with a signed and stamped PUD Modification/deviation request form.

**KHA RESPONSE:**  
Traffic studies from the area by the traffic consultant have been included in this study. Additionally, Modifications/deviations from the Criteria has been included with supporting information and a request form.



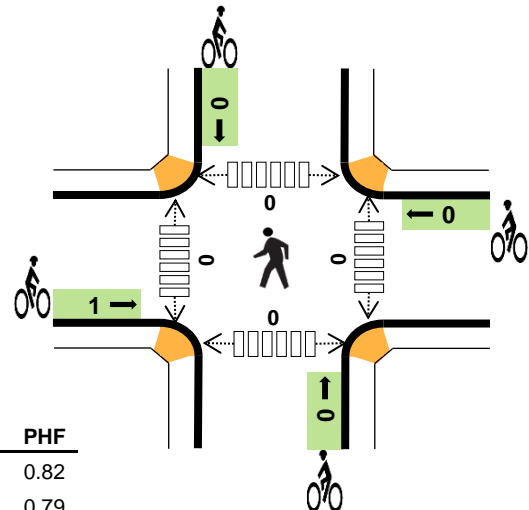
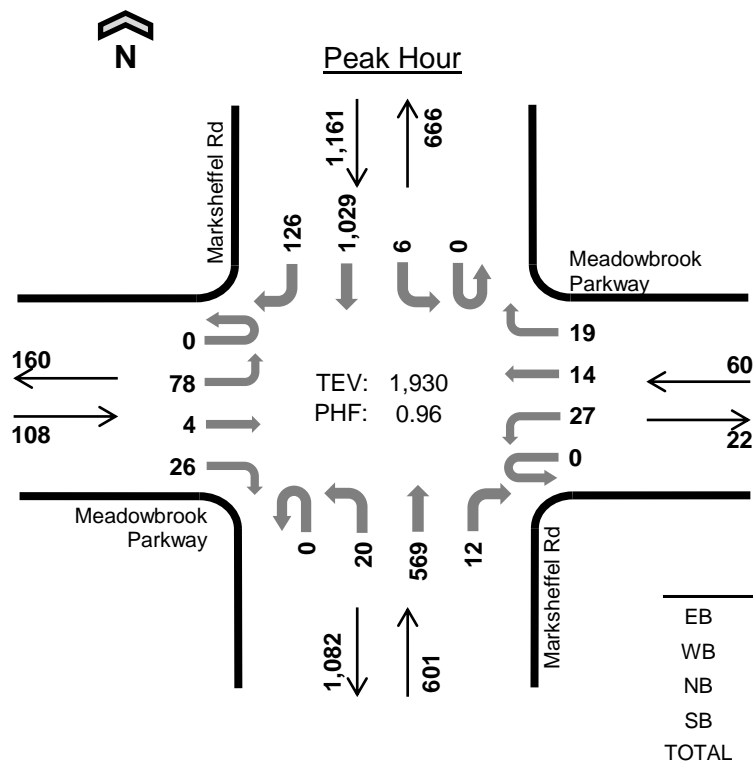
# APPENDICES

# APPENDIX A

Intersection Count Sheets

COVID-19 Count Adjustment Data

## Marksheffel Rd Meadowbrook Parkway



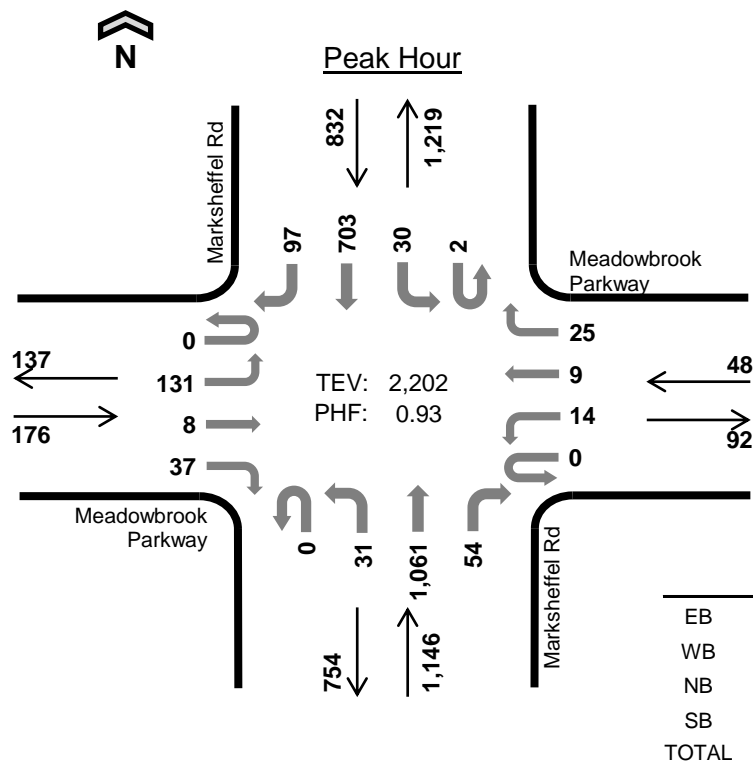
### Two-Hour Count Summaries

Interval Start	Meadowbrook Parkway				Meadowbrook Parkway				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	12	2	7	0	11	3	5	0	3	167	2	0	0	268	24	504	0
7:15 AM	0	24	1	5	0	5	3	2	0	4	144	4	0	0	256	26	474	0
7:30 AM	0	18	1	5	0	5	4	6	0	8	130	3	0	3	276	38	497	0
7:45 AM	0	24	0	9	0	6	4	6	0	5	128	3	0	3	229	38	455	1,930
8:00 AM	0	25	2	9	0	3	4	6	0	9	100	7	0	5	219	24	413	1,839
8:15 AM	0	21	1	3	0	4	2	8	0	2	98	3	1	3	159	25	330	1,695
8:30 AM	0	7	2	4	0	8	4	5	0	4	127	5	0	2	200	27	395	1,593
8:45 AM	0	24	1	4	0	11	2	6	0	4	103	4	0	2	158	30	349	1,487
Count Total	0	155	10	46	0	53	26	44	0	39	997	31	1	18	1,765	232	3,417	0
Peak Hour	0	78	4	26	0	27	14	19	0	20	569	12	0	6	1,029	126	1,930	0

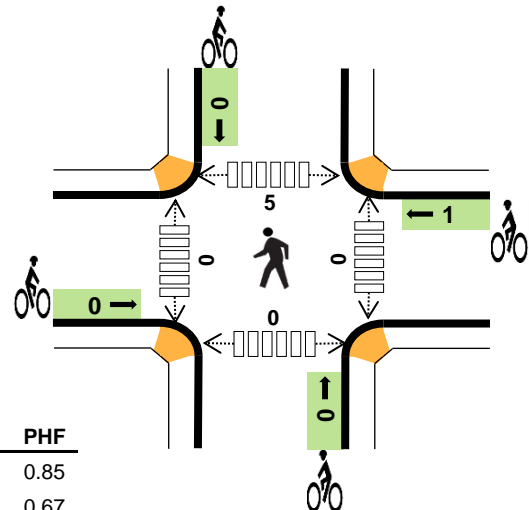
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	8	21	31	0	0	0	0	0	0	0	0	0	0
7:15 AM	3	0	9	14	26	0	0	0	0	0	0	0	0	0	0
7:30 AM	4	0	10	16	30	1	0	0	0	1	0	0	0	0	0
7:45 AM	2	0	13	15	30	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	0	12	10	25	0	0	0	0	0	0	0	0	0	0
8:15 AM	4	0	4	12	20	0	0	0	0	0	0	0	1	0	1
8:30 AM	2	0	6	7	15	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	9	12	22	0	0	0	0	0	0	0	0	0	0
Count Total	20	1	71	107	199	1	0	0	0	1	0	0	1	0	1
Peak Hour	11	0	40	66	117	1	0	0	0	1	0	0	0	0	0

## Marksheffel Rd Meadowbrook Parkway



Date: Thu, Jun 04, 2020  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 4:00 PM to 5:00 PM

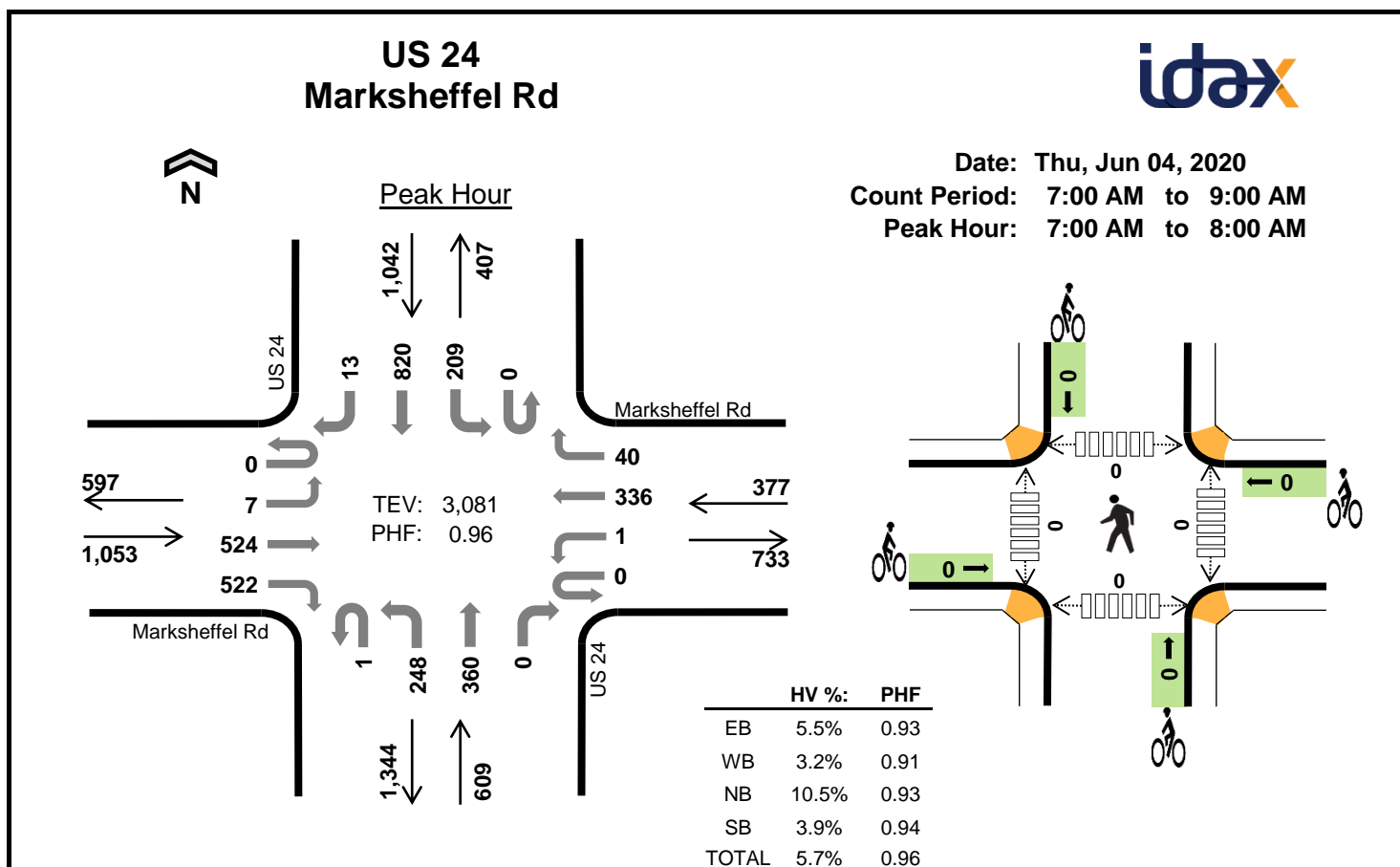


### Two-Hour Count Summaries

Interval Start	Meadowbrook Parkway				Meadowbrook Parkway				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	43	0	5	0	5	3	10	0	12	227	7	0	5	183	21	521	0
4:15 PM	0	29	3	9	0	5	2	6	0	8	294	16	1	6	164	25	568	0
4:30 PM	0	39	2	11	0	1	1	5	0	5	260	11	1	10	150	27	523	0
4:45 PM	0	20	3	12	0	3	3	4	0	6	280	20	0	9	206	24	590	2,202
5:00 PM	0	42	5	10	0	6	0	5	0	5	226	12	0	10	173	13	507	2,188
5:15 PM	0	29	3	10	0	4	0	9	0	3	260	14	0	7	193	23	555	2,175
5:30 PM	0	18	3	9	0	4	1	5	0	3	214	13	0	12	200	29	511	2,163
5:45 PM	0	24	0	4	0	3	0	8	1	4	194	10	0	7	123	12	390	1,963
Count Total	0	244	19	70	0	31	10	52	1	46	1,955	103	2	66	1,392	174	4,165	0
Peak Hour	0	131	8	37	0	14	9	25	0	31	1,061	54	2	30	703	97	2,202	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	5	12	17	0	0	0	0	0	0	0	0	0	0
4:15 PM	2	0	3	6	11	0	1	0	0	1	0	0	2	0	2
4:30 PM	0	0	4	7	11	0	0	0	0	0	0	0	3	0	3
4:45 PM	1	0	5	7	13	0	0	0	0	0	0	0	0	0	0
5:00 PM	2	0	2	6	10	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	5	6	11	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	0	2	8	12	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	5	7	0	0	0	0	0	0	0	0	0	0
Count Total	7	0	28	57	92	0	1	0	0	1	0	0	5	0	5
Peak Hour	3	0	17	32	52	0	1	0	0	1	0	0	5	0	5

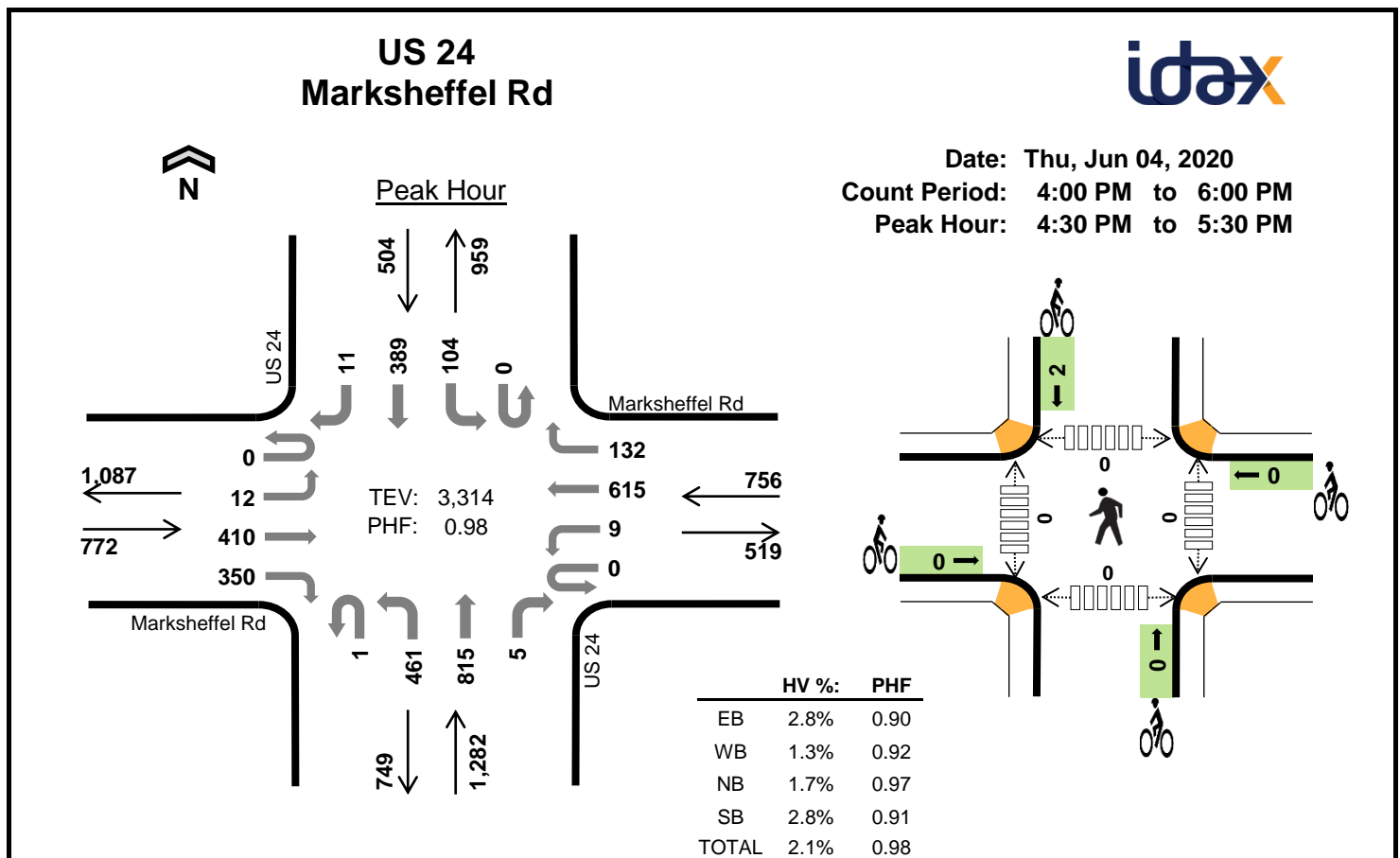
**Two-Hour Count Summaries**

Interval Start	Marksheffel Rd				Marksheffel Rd				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	122	138	0	0	94	6	0	68	96	0	0	50	203	1	778	0
7:15 AM	0	0	155	127	0	0	96	8	1	59	96	0	0	43	213	3	801	0
7:30 AM	0	3	123	142	0	1	80	14	0	62	78	0	0	59	214	5	781	0
7:45 AM	0	4	124	115	0	0	66	12	0	59	90	0	0	57	190	4	721	3,081
8:00 AM	0	8	106	109	0	2	57	17	0	50	75	0	0	37	125	7	593	2,896
8:15 AM	0	1	87	90	0	0	48	16	0	50	73	1	0	42	138	1	547	2,642
8:30 AM	0	3	83	105	0	1	84	13	0	48	71	0	0	30	155	1	594	2,455
8:45 AM	0	0	92	85	0	2	58	8	0	52	91	0	0	39	162	5	594	2,328
Count Total	0	19	892	911	0	6	583	94	1	448	670	1	0	357	1,400	27	5,409	0
Peak Hour	0	7	524	522	0	1	336	40	1	248	360	0	0	209	820	13	3,081	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	18	3	10	8	39	0	0	0	0	0	0	0	0	0	0
7:15 AM	12	3	17	10	42	0	0	0	0	0	0	0	0	0	0
7:30 AM	14	4	21	13	52	0	0	0	0	0	0	0	0	0	0
7:45 AM	14	2	16	10	42	0	0	0	0	0	0	0	0	0	0
8:00 AM	9	3	18	11	41	0	0	0	0	0	0	0	0	0	0
8:15 AM	9	1	12	7	29	0	0	0	0	0	0	0	0	0	0
8:30 AM	9	2	10	9	30	0	0	0	0	0	0	0	0	0	0
8:45 AM	11	4	22	21	58	0	0	0	0	0	0	0	0	0	0
Count Total	96	22	126	89	333	0	0	0	0	0	0	0	0	0	0
Peak Hour	58	12	64	41	175	0	0	0	0	0	0	0	0	0	0



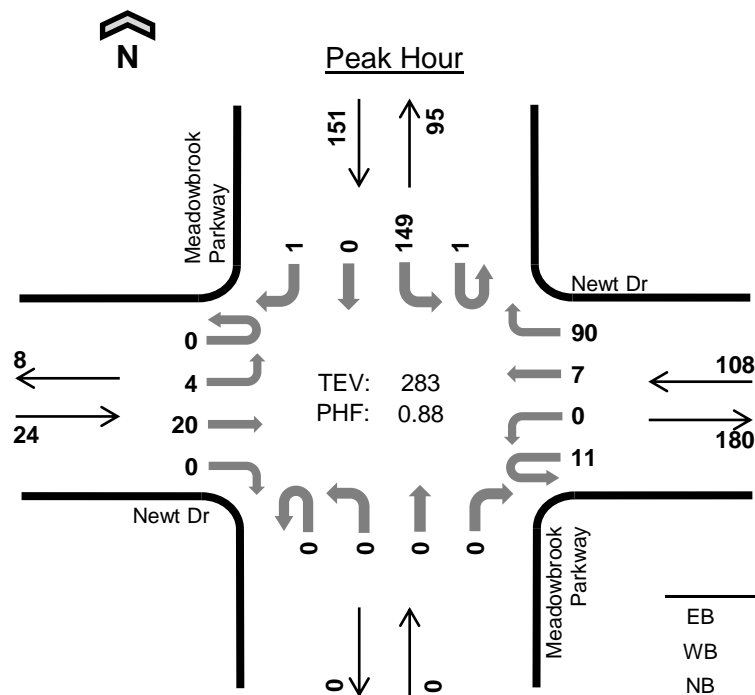
**Two-Hour Count Summaries**

Interval Start	Marksheffel Rd				Marksheffel Rd				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	102	84	0	3	163	33	0	78	159	0	1	21	132	0	778	0
4:15 PM	0	7	82	73	0	1	172	39	2	131	166	1	0	32	121	4	831	0
4:30 PM	0	4	92	73	0	4	165	37	0	119	207	0	0	23	100	2	826	0
4:45 PM	0	5	117	92	0	1	162	34	0	128	185	4	0	17	90	5	840	3,275
5:00 PM	0	3	96	92	0	2	140	34	1	96	210	1	0	27	101	1	804	3,301
5:15 PM	0	0	105	93	0	2	148	27	0	118	213	0	0	37	98	3	844	3,314
5:30 PM	0	3	111	87	0	1	115	29	0	108	178	1	0	15	109	2	759	3,247
5:45 PM	0	3	78	62	0	6	110	20	0	96	122	0	0	24	91	1	613	3,020
Count Total	0	27	783	656	0	20	1,175	253	3	874	1,440	7	1	196	842	18	6,295	0
Peak Hour	0	12	410	350	0	9	615	132	1	461	815	5	0	104	389	11	3,314	0

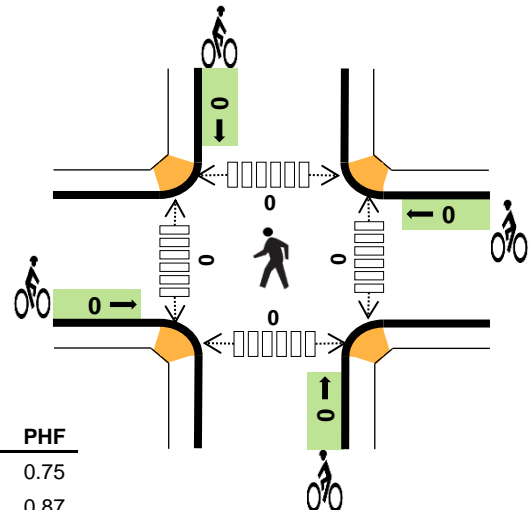
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	12	3	7	8	30	0	0	0	0	0	0	0	0	0	0
4:15 PM	6	2	10	5	23	0	0	0	0	0	0	0	0	0	0
4:30 PM	4	4	6	6	20	0	0	0	1	1	0	0	0	0	0
4:45 PM	6	2	6	1	15	0	0	0	0	0	0	0	0	0	0
5:00 PM	7	2	6	3	18	0	0	0	0	0	0	0	0	0	0
5:15 PM	5	2	4	4	15	0	0	0	1	1	0	0	0	0	0
5:30 PM	6	0	5	5	16	0	0	0	0	0	0	0	0	0	0
5:45 PM	2	2	3	2	9	0	0	0	1	1	0	0	0	0	0
Count Total	48	17	47	34	146	0	0	0	3	3	0	0	0	0	0
Peak Hour	22	10	22	14	68	0	0	0	2	2	0	0	0	0	0

## Meadowbrook Parkway Newt Dr



Date: Tue, Jun 02, 2020  
Count Period: 7:00 AM to 9:00 AM  
Peak Hour: 7:00 AM to 8:00 AM



	HV %:	PHF
EB	0.0%	0.75
WB	1.9%	0.87
NB	-	-
SB	6.0%	0.74
TOTAL	3.9%	0.88

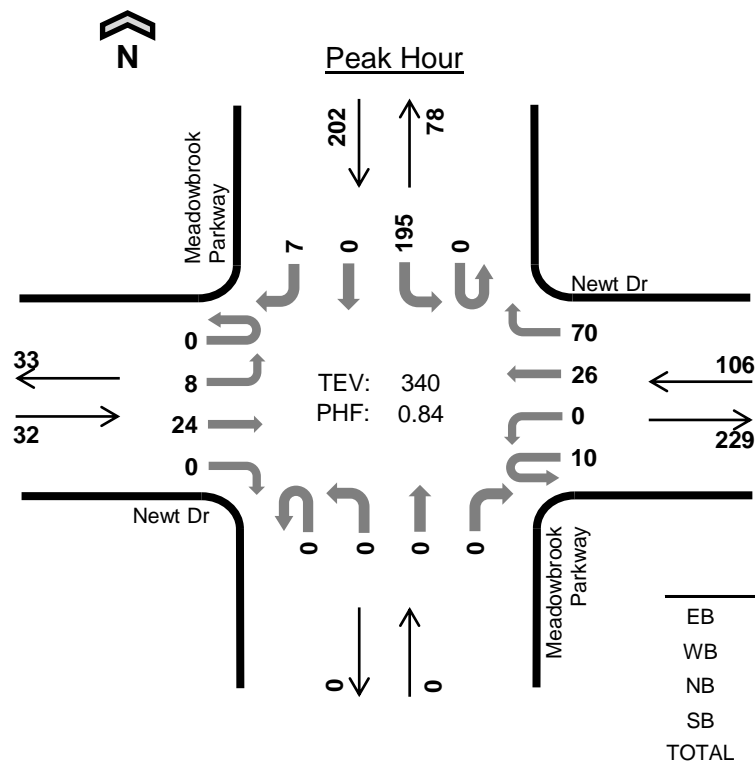
### Two-Hour Count Summaries

Interval Start	Newt Dr				Newt Dr				Meadowbrook Parkway				Meadowbrook Parkway				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	3	5	0	4	0	1	21	0	0	0	0	0	41	0	1	76	0
7:15 AM	0	0	5	0	4	0	0	22	0	0	0	0	1	31	0	0	63	0
7:30 AM	0	1	3	0	2	0	4	19	0	0	0	0	0	51	0	0	80	0
7:45 AM	0	0	7	0	1	0	2	28	0	0	0	0	0	26	0	0	64	283
8:00 AM	0	4	2	0	4	0	3	24	0	0	0	0	0	32	0	0	69	276
8:15 AM	0	0	4	0	0	0	3	11	0	0	0	0	0	34	0	0	52	265
8:30 AM	0	0	4	0	4	0	2	18	0	0	0	0	0	25	0	0	53	238
8:45 AM	0	1	5	0	4	0	2	17	0	0	0	0	0	30	0	0	59	233
Count Total	0	9	35	0	23	0	17	160	0	0	0	0	1	270	0	1	516	0
Peak Hour	0	4	20	0	11	0	7	90	0	0	0	0	1	149	0	1	283	0

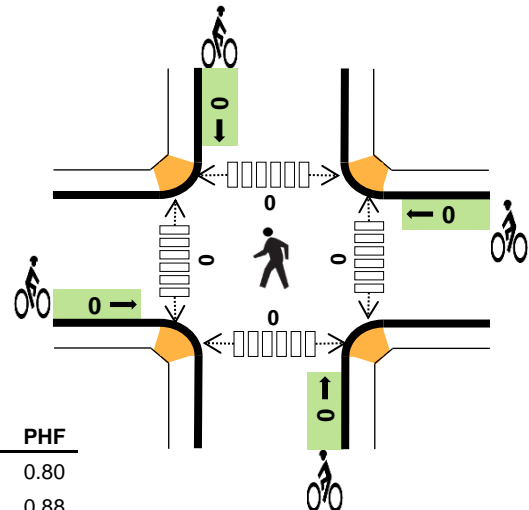
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	4	5	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	3	4	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0
Count Total	0	6	0	15	21	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	2	0	9	11	0	0	0	0	0	0	0	0	0	0

## Meadowbrook Parkway Newt Dr



Date: Tue, Jun 02, 2020  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 4:30 PM to 5:30 PM

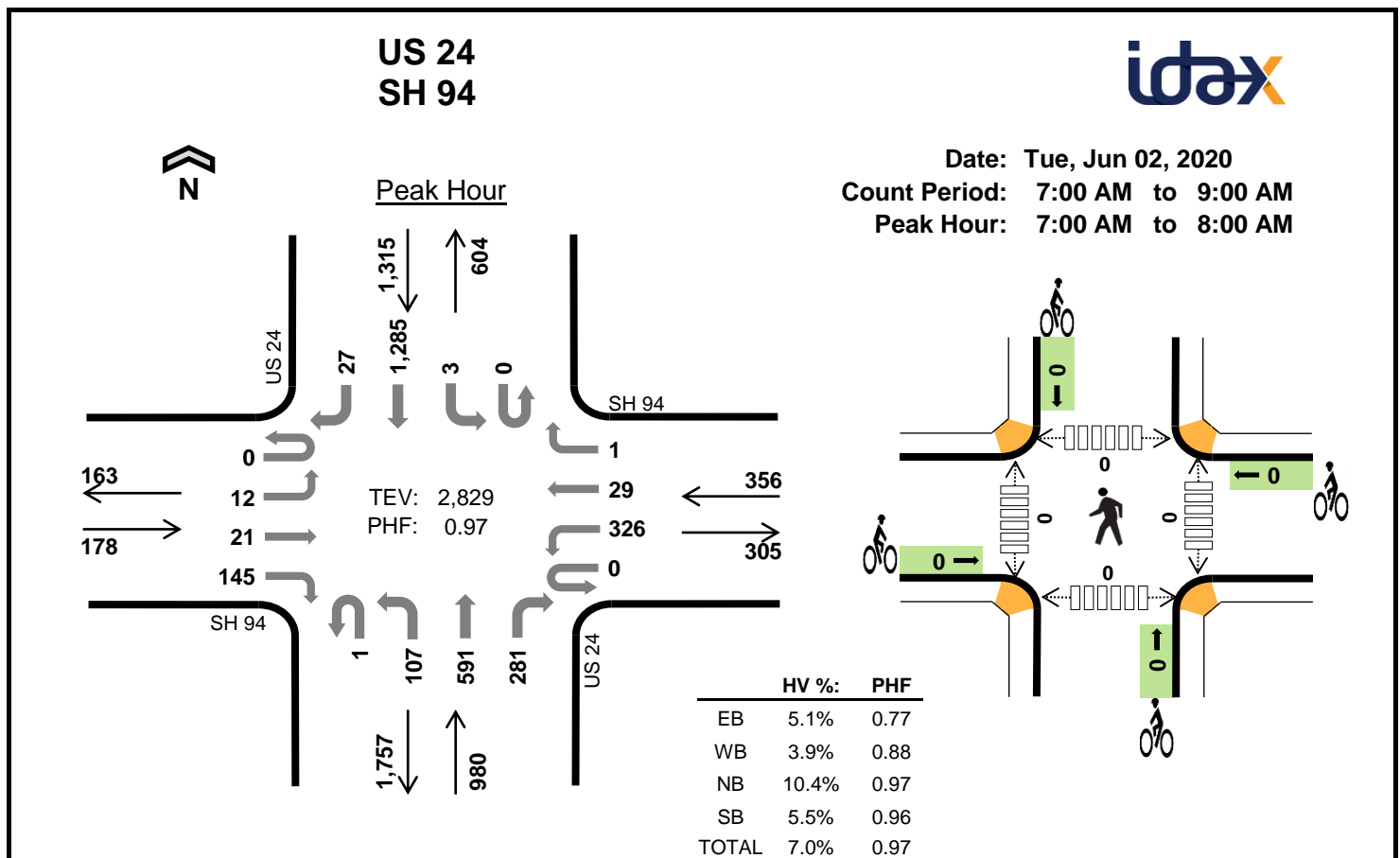


### Two-Hour Count Summaries

Interval Start	Newt Dr				Newt Dr				Meadowbrook Parkway				Meadowbrook Parkway				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	2	0	4	0	6	26	0	0	0	0	0	38	0	0	78	0
4:15 PM	0	2	3	0	4	0	6	15	0	0	0	0	0	44	0	1	75	0
4:30 PM	0	2	6	0	2	0	3	23	0	0	0	0	0	42	0	4	82	0
4:45 PM	0	1	8	0	2	0	7	21	0	0	0	0	0	41	0	0	80	315
5:00 PM	0	2	3	0	4	0	12	9	0	0	0	0	0	70	0	1	101	338
5:15 PM	0	3	7	0	2	0	4	17	0	0	0	0	0	42	0	2	77	340
5:30 PM	0	0	4	0	6	0	4	8	0	0	0	0	0	27	0	0	49	307
5:45 PM	0	1	4	0	2	0	6	7	0	0	0	0	0	29	0	1	50	277
Count Total	0	13	37	0	26	0	48	126	0	0	0	0	0	333	0	9	592	0
Peak Hour	0	8	24	0	10	0	26	70	0	0	0	0	0	195	0	7	340	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	4	0	1	5	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
5:15 PM	2	2	0	1	5	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
Count Total	2	10	0	5	17	0	0	0	0	0	0	0	0	0	0
Peak Hour	2	8	0	3	13	0	0	0	0	0	0	0	0	0	0

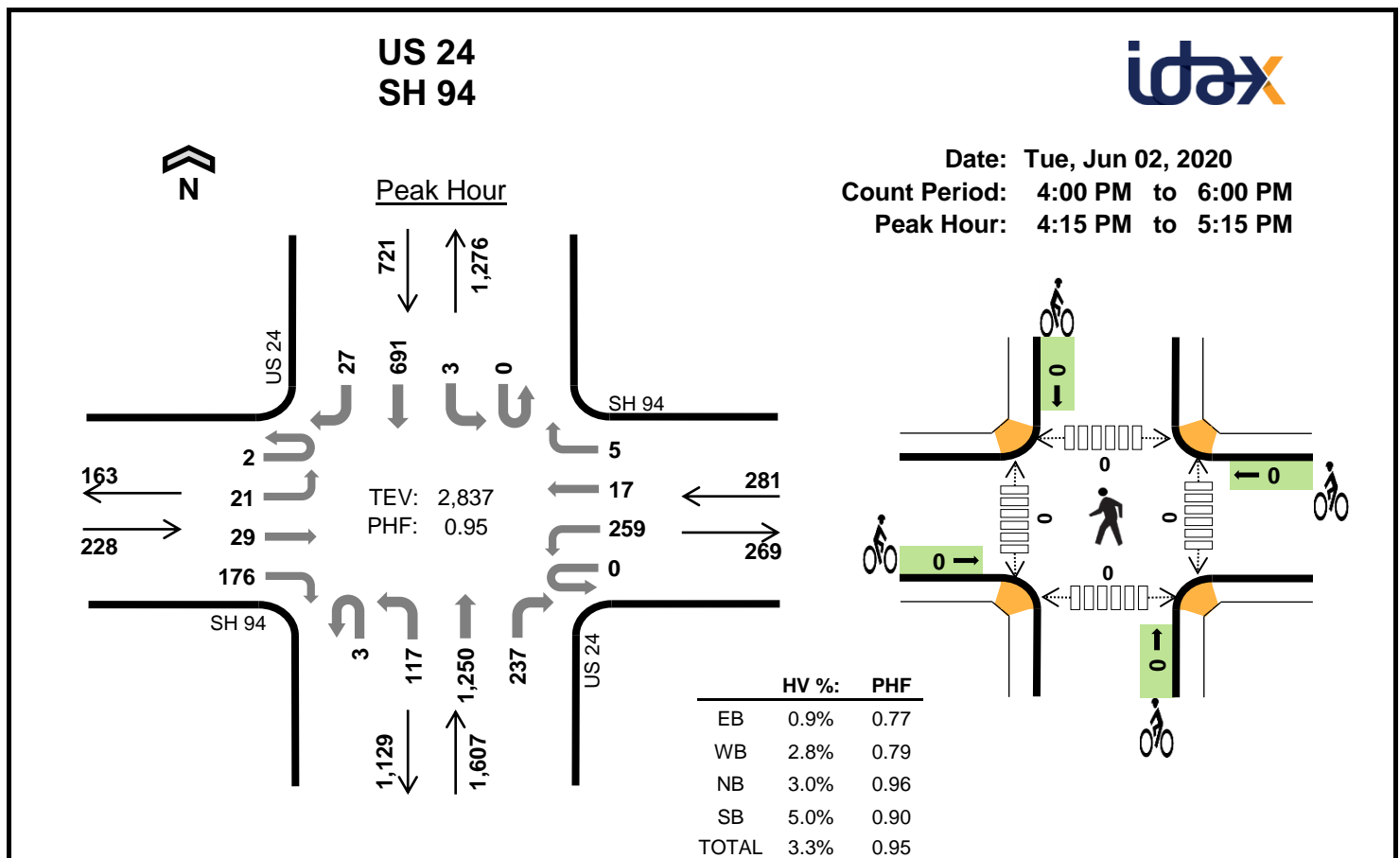


### Two-Hour Count Summaries

Interval Start	SH 94				SH 94				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	6	45	0	81	10	0	0	27	147	65	0	1	319	7	709	0
7:15 AM	0	6	7	21	0	90	10	1	0	25	145	79	0	0	336	8	728	0
7:30 AM	0	5	6	47	0	85	5	0	0	20	152	80	0	0	310	6	716	0
7:45 AM	0	0	2	32	0	70	4	0	1	35	147	57	0	2	320	6	676	2,829
8:00 AM	0	4	4	25	0	51	7	1	0	28	120	54	0	3	230	5	532	2,652
8:15 AM	0	4	4	34	0	51	6	0	1	17	107	64	0	1	207	10	506	2,430
8:30 AM	0	1	4	26	0	66	2	0	0	25	128	55	0	0	223	4	534	2,248
8:45 AM	0	3	7	29	0	48	6	1	1	23	131	44	0	1	197	9	500	2,072
Count Total	0	24	40	259	0	542	50	3	3	200	1,077	498	0	8	2,142	55	4,901	0
Peak Hour	0	12	21	145	0	326	29	1	1	107	591	281	0	3	1,285	27	2,829	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	1	19	20	44	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	5	27	16	48	0	0	0	0	0	0	0	0	0	0
7:30 AM	4	3	31	15	53	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	5	25	21	52	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	8	20	15	44	0	0	0	0	0	0	0	0	0	0
8:15 AM	3	2	24	9	38	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	7	27	13	47	0	0	0	0	0	0	0	0	0	0
8:45 AM	2	5	15	18	40	0	0	0	0	0	0	0	0	0	0
Count Total	15	36	188	127	366	0	0	0	0	0	0	0	0	0	0
Peak Hour	9	14	102	72	197	0	0	0	0	0	0	0	0	0	0



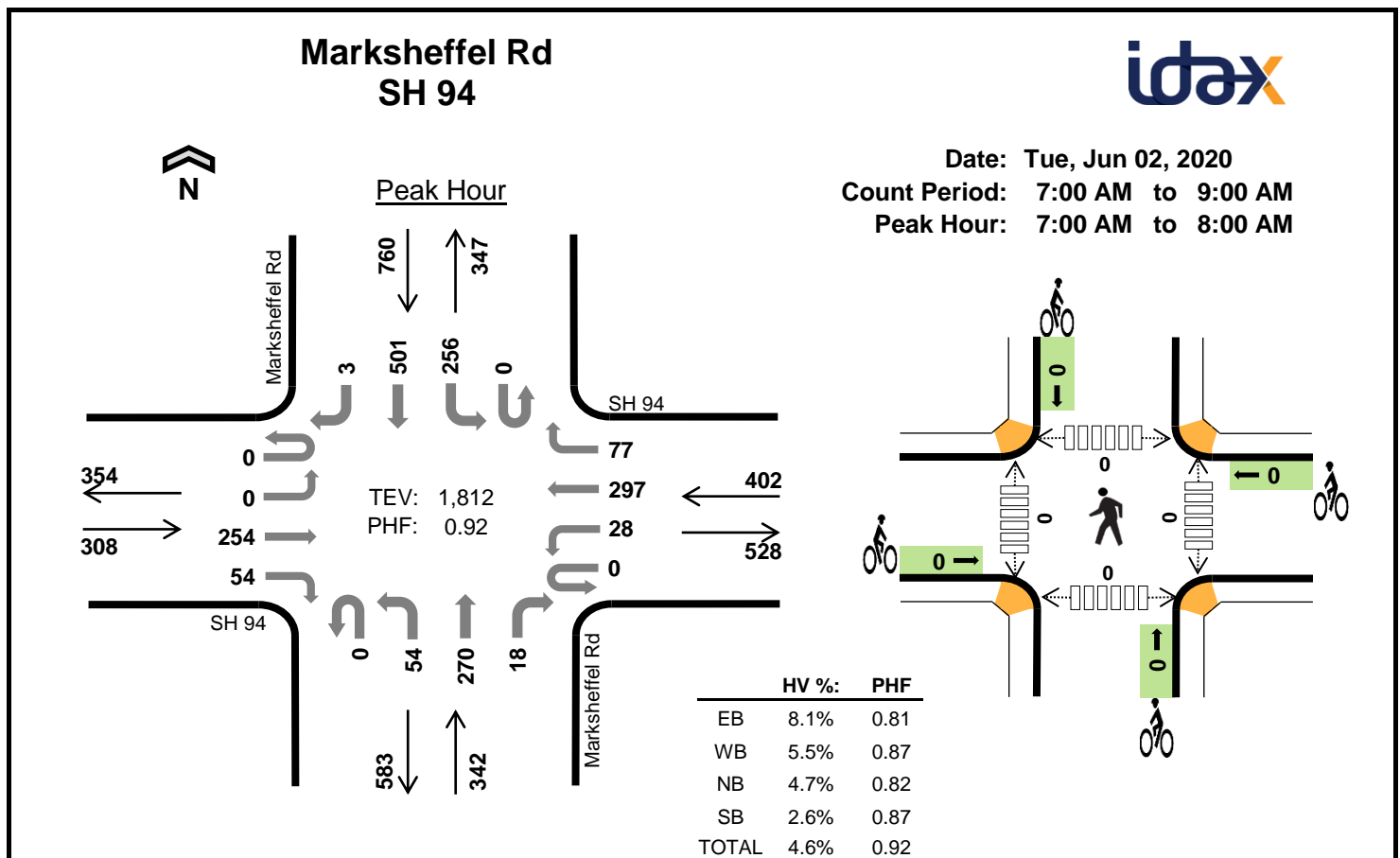
### Two-Hour Count Summaries

Interval Start	SH 94				SH 94				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	5	4	32	0	73	7	0	1	31	284	80	1	2	177	7	704	0
4:15 PM	0	5	4	45	0	51	2	2	1	30	327	62	0	3	153	7	692	0
4:30 PM	0	4	13	33	0	66	7	0	1	29	300	46	0	0	194	7	700	0
4:45 PM	0	9	1	40	0	83	5	1	0	31	307	53	0	0	158	7	695	2,791
5:00 PM	2	3	11	58	0	59	3	2	1	27	316	76	0	0	186	6	750	2,837
5:15 PM	0	8	7	36	0	49	8	0	0	19	299	80	0	0	170	8	684	2,829
5:30 PM	0	5	4	29	0	44	7	1	0	19	267	85	0	0	183	4	648	2,777
5:45 PM	0	3	8	24	0	38	4	1	0	12	252	62	0	0	142	10	556	2,638
Count Total	2	42	52	297	0	463	43	7	4	198	2,352	544	1	5	1,363	56	5,429	0
Peak Hour	2	21	29	176	0	259	17	5	3	117	1,250	237	0	3	691	27	2,837	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	4	16	12	32	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	3	11	12	26	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	1	20	12	34	0	0	0	0	0	0	0	0	0	0
4:45 PM	1	1	14	5	21	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	3	4	7	14	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	2	10	6	19	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	1	7	11	21	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	2	3	7	13	0	0	0	0	0	0	0	0	0	0
Count Total	6	17	85	72	180	0	0	0	0	0	0	0	0	0	0
Peak Hour	2	8	49	36	95	0	0	0	0	0	0	0	0	0	0



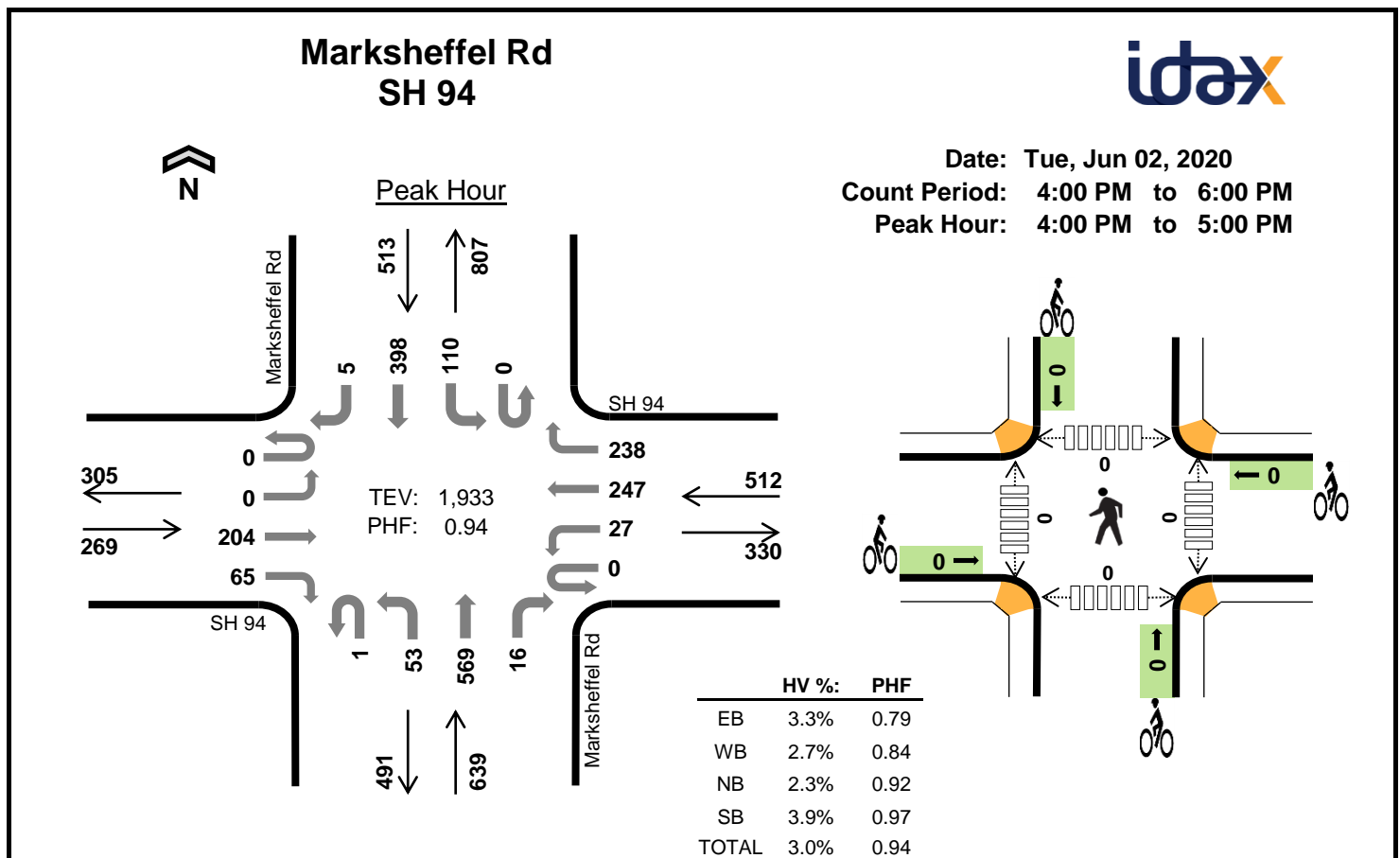


### Two-Hour Count Summaries

Interval Start	SH 94				SH 94				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	57	8	0	2	73	22	0	11	71	7	0	79	110	0	440	0
7:15 AM	0	0	79	16	0	7	87	21	0	10	51	3	0	74	143	1	492	0
7:30 AM	0	0	61	21	0	8	69	13	0	24	76	4	0	67	133	1	477	0
7:45 AM	0	0	57	9	0	11	68	21	0	9	72	4	0	36	115	1	403	1,812
8:00 AM	0	4	39	14	0	2	43	12	0	10	50	2	0	47	115	1	339	1,711
8:15 AM	0	0	61	11	0	2	49	21	0	8	59	2	0	32	89	0	334	1,553
8:30 AM	0	1	50	15	0	6	67	25	0	9	52	4	0	32	85	1	347	1,423
8:45 AM	0	0	36	14	0	4	44	17	0	14	49	1	0	21	85	2	287	1,307
Count Total	0	5	440	108	0	42	500	152	0	95	480	27	0	388	875	7	3,119	0
Peak Hour	0	0	254	54	0	28	297	77	0	54	270	18	0	256	501	3	1,812	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	2	5	5	16	0	0	0	0	0	0	0	0	0	0
7:15 AM	6	4	4	4	18	0	0	0	0	0	0	0	0	0	0
7:30 AM	9	6	4	8	27	0	0	0	0	0	0	0	0	0	0
7:45 AM	6	10	3	3	22	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	7	2	9	21	0	0	0	0	0	0	0	0	0	0
8:15 AM	10	5	2	4	21	0	0	0	0	0	0	0	0	0	0
8:30 AM	8	5	8	7	28	0	0	0	0	0	0	0	0	0	0
8:45 AM	8	6	1	5	20	0	0	0	0	0	0	0	0	0	0
Count Total	54	45	29	45	173	0	0	0	0	0	0	0	0	0	0
Peak Hour	25	22	16	20	83	0	0	0	0	0	0	0	0	0	0



### Two-Hour Count Summaries

Interval Start	SH 94				SH 94				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	58	27	0	7	63	49	0	14	140	2	0	24	94	1	479	0
4:15 PM	0	0	57	15	0	10	65	78	1	10	142	6	0	28	102	1	515	0
4:30 PM	0	0	42	13	0	6	47	62	0	12	159	2	0	25	105	1	474	0
4:45 PM	0	0	47	10	0	4	72	49	0	17	128	6	0	33	97	2	465	1,933
5:00 PM	1	1	72	14	0	5	52	48	0	8	107	2	0	20	84	2	416	1,870
5:15 PM	1	0	73	13	0	5	37	44	0	18	112	3	0	29	110	0	445	1,800
5:30 PM	0	0	69	19	0	1	40	31	0	12	75	3	0	28	115	0	393	1,719
5:45 PM	0	0	47	21	0	0	32	31	0	7	122	2	0	28	110	0	400	1,654
Count Total	2	1	465	132	0	38	408	392	1	98	985	26	0	215	817	7	3,587	0
Peak Hour	0	0	204	65	0	27	247	238	1	53	569	16	0	110	398	5	1,933	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	5	4	7	17	0	0	0	0	0	0	0	0	0	0
4:15 PM	2	3	4	4	13	0	0	0	0	0	0	0	0	0	0
4:30 PM	2	4	5	8	19	0	0	0	0	0	0	0	0	0	0
4:45 PM	4	2	2	1	9	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	2	2	4	9	0	0	0	0	0	0	0	0	0	0
5:15 PM	2	1	3	2	8	0	0	1	0	1	0	0	0	0	0
5:30 PM	3	0	2	1	6	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	1	3	4	9	0	0	0	0	0	0	0	0	0	0
Count Total	16	18	25	31	90	0	0	1	0	1	0	0	0	0	0
Peak Hour	9	14	15	20	58	0	0	0	0	0	0	0	0	0	0

# Traffic Data Resources

Location: Marksheffel @ Space Village      File Name : MARKSHEFFEL @ SPACE VILLAGE-THUR-WSP-3-20  
 Turning Movement Count      Site Code : 00000000  
 Weather: Clear      Start Date : 3/12/2020  
 Comments: Heavy truck traffic      Page No : 1

## Groups Printed- Unshifted

	MARKSHEFFEL From North				SPACE VILLAGE From East				MARKSHEFFEL From South				SPACE VILLAGE From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
06:00 AM	1	84	0	85	0	0	7	7	0	47	20	67	23	5	1	29	188
06:15 AM	4	140	0	144	0	2	2	4	2	68	33	103	17	9	1	27	278
06:30 AM	4	157	0	161	0	2	0	2	1	92	40	133	19	13	2	34	330
06:45 AM	13	164	0	177	0	6	8	14	2	109	54	165	26	9	4	39	395
Total	22	545	0	567	0	10	17	27	5	316	147	468	85	36	8	129	1191
07:00 AM	18	196	6	220	1	1	3	5	6	121	51	178	35	19	2	56	459
07:15 AM	37	201	0	238	1	4	3	8	1	110	62	173	35	8	2	45	464
07:30 AM	33	235	1	269	0	3	1	4	4	124	83	211	23	9	2	34	518
07:45 AM	31	227	1	259	0	3	1	4	1	117	77	195	21	6	1	28	486
Total	119	859	8	986	2	11	8	21	12	472	273	757	114	42	7	163	1927
*** BREAK ***																	
04:00 PM	7	147	0	154	0	4	4	8	3	210	40	253	55	8	3	66	481
04:15 PM	8	149	0	157	0	3	7	10	5	263	46	314	46	8	2	56	537
04:30 PM	5	122	1	128	0	2	10	12	6	228	56	290	52	10	1	63	493
04:45 PM	3	132	0	135	1	3	9	13	1	213	46	260	62	6	4	72	480
Total	23	550	1	574	1	12	30	43	15	914	188	1117	215	32	10	257	1991
05:00 PM	7	127	0	134	0	2	4	6	5	213	55	273	65	7	1	73	486
05:15 PM	4	155	2	161	0	1	2	3	1	226	48	275	58	10	4	72	511
05:30 PM	5	119	0	124	1	2	6	9	0	153	38	191	53	12	1	66	390
05:45 PM	2	111	0	113	0	3	1	4	0	152	31	183	46	6	2	54	354
Total	18	512	2	532	1	8	13	22	6	744	172	922	222	35	8	265	1741
Grand Total	182	2466	11	2659	4	41	68	113	38	2446	780	3264	636	145	33	814	6850
Apprch %	6.8	92.7	0.4		3.5	36.3	60.2		1.2	74.9	23.9		78.1	17.8	4.1		
Total %	2.7	36	0.2	38.8	0.1	0.6	1	1.6	0.6	35.7	11.4	47.6	9.3	2.1	0.5	11.9	

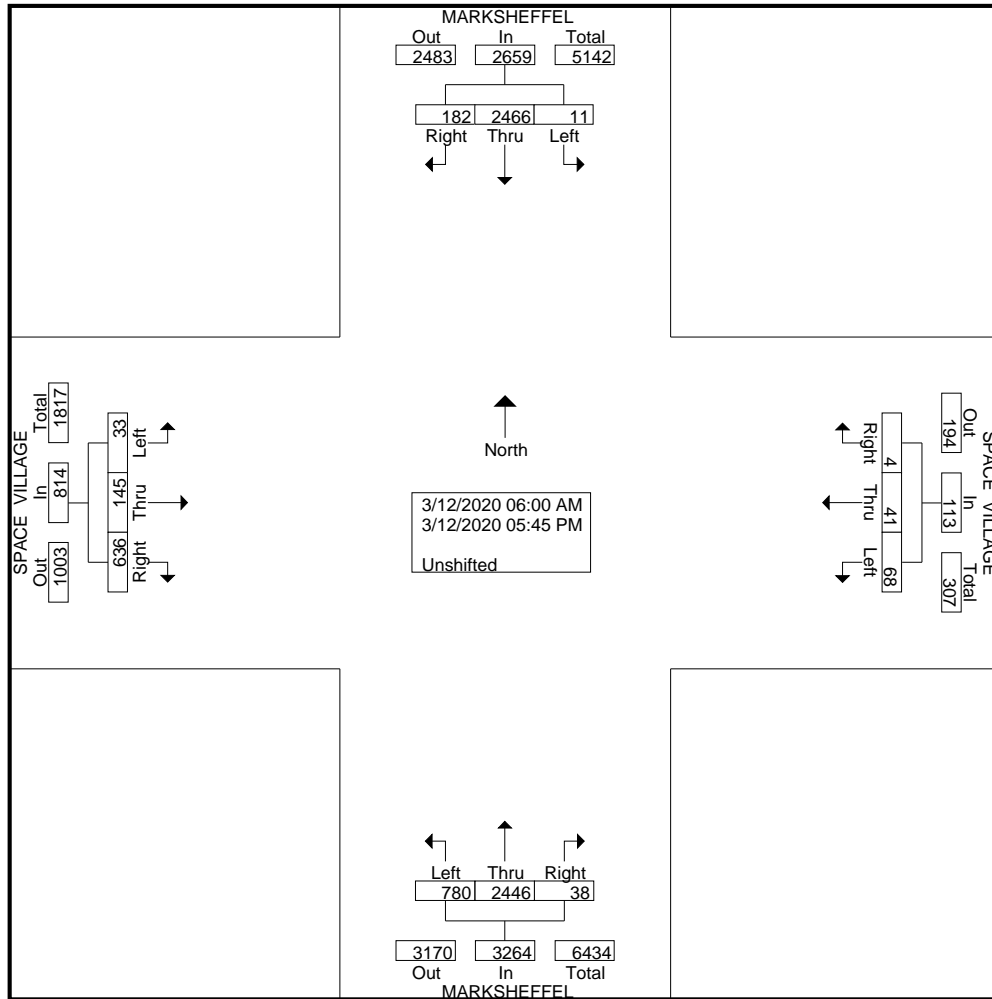
# Traffic Data Resources

File Name : MARKSHEFFEL @ SPACE VILLAGE-THUR-WSP-3-20

Site Code : 00000000

Start Date : 3/12/2020

Page No : 2



	MARKSHEFFEL From North				SPACE VILLAGE From East				MARKSHEFFEL From South				SPACE VILLAGE From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	8	149	0	157	0	3	7	10	5	263	46	314	46	8	2	56	537
04:30 PM	5	122	1	128	0	2	10	12	6	228	56	290	52	10	1	63	493
04:45 PM	3	132	0	135	1	3	9	13	1	213	46	260	62	6	4	72	480
05:00 PM	7	127	0	134	0	2	4	6	5	213	55	273	65	7	1	73	486
Total Volume	23	530	1	554	1	10	30	41	17	917	203	1137	225	31	8	264	1996
% App. Total	4.2	95.7	0.2		2.4	24.4	73.2		1.5	80.7	17.9		85.2	11.7	3		
PHF	.719	.889	.250	.882	.250	.833	.750	.788	.708	.872	.906	.905	.865	.775	.500	.904	.929

Description:	SH 94 E/O Marksheffel Rd, Colorado Springs
--------------	--

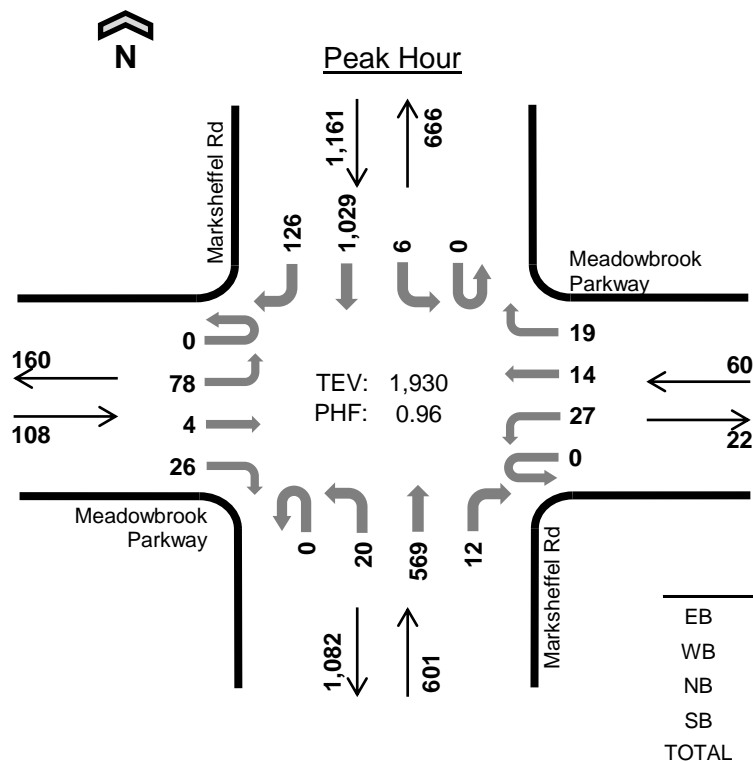
Marshoeffel and SH 94	Peak Hour Counts	528	95%	Marshoeffel and SH 94	Peak Hour Counts	330	118%
		402	89%			512	161%
	Percent Difference	92%			Percent Difference	144%	

Description: SH 24 NE/O SH 94, Colorado Springs

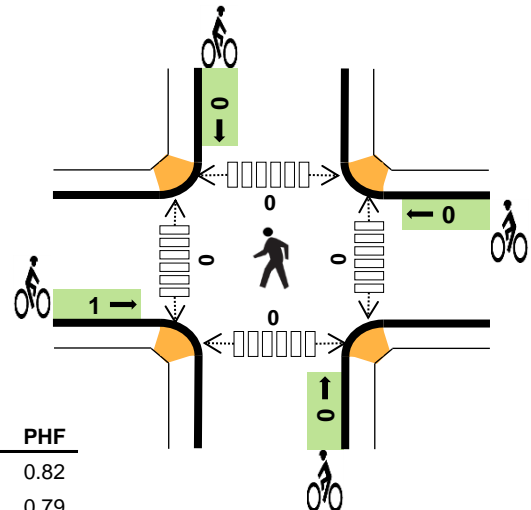
	US 24 and SH 94	Peak Hour Counts	604	100%		US 24 and SH 94	Peak Hour Counts	1276	117%
			1315	130%				721	96%
		Percent Difference	121%					110%	
	US 24 and Marksheffel	Peak Hour Counts	609	99%		US 24 and Marksheffel	Peak Hour Counts	1282	117%
			1344	128%				749	93%
		Percent Difference	119%					108%	



## Marksheffel Rd Meadowbrook Parkway



Date: Thu, Jun 04, 2020  
Count Period: 7:00 AM to 9:00 AM  
Peak Hour: 7:00 AM to 8:00 AM



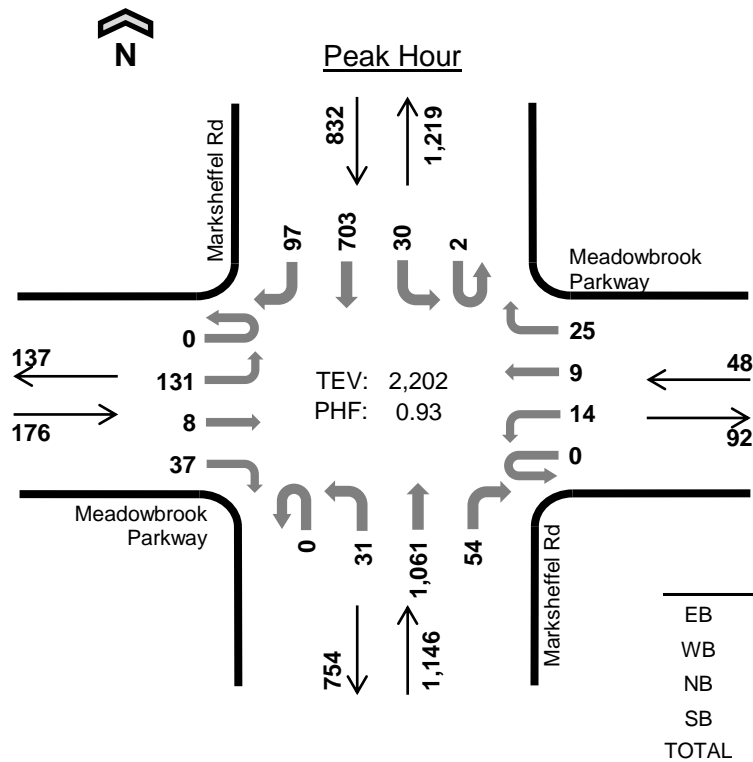
### Two-Hour Count Summaries

Interval Start	Meadowbrook Parkway				Meadowbrook Parkway				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	12	2	7	0	11	3	5	0	3	167	2	0	0	268	24	504	0
7:15 AM	0	24	1	5	0	5	3	2	0	4	144	4	0	0	256	26	474	0
7:30 AM	0	18	1	5	0	5	4	6	0	8	130	3	0	3	276	38	497	0
7:45 AM	0	24	0	9	0	6	4	6	0	5	128	3	0	3	229	38	455	1,930
8:00 AM	0	25	2	9	0	3	4	6	0	9	100	7	0	5	219	24	413	1,839
8:15 AM	0	21	1	3	0	4	2	8	0	2	98	3	1	3	159	25	330	1,695
8:30 AM	0	7	2	4	0	8	4	5	0	4	127	5	0	2	200	27	395	1,593
8:45 AM	0	24	1	4	0	11	2	6	0	4	103	4	0	2	158	30	349	1,487
Count Total	0	155	10	46	0	53	26	44	0	39	997	31	1	18	1,765	232	3,417	0
Peak Hour	0	78	4	26	0	27	14	19	0	20	569	12	0	6	1,029	126	1,930	0

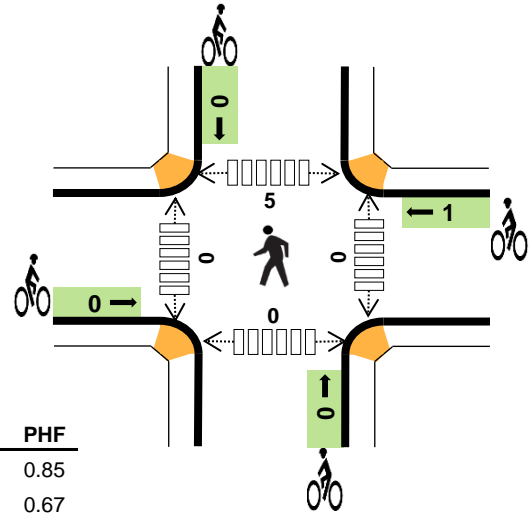
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	8	21	31	0	0	0	0	0	0	0	0	0	0
7:15 AM	3	0	9	14	26	0	0	0	0	0	0	0	0	0	0
7:30 AM	4	0	10	16	30	1	0	0	0	1	0	0	0	0	0
7:45 AM	2	0	13	15	30	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	0	12	10	25	0	0	0	0	0	0	0	0	0	0
8:15 AM	4	0	4	12	20	0	0	0	0	0	0	0	1	0	1
8:30 AM	2	0	6	7	15	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	9	12	22	0	0	0	0	0	0	0	0	0	0
Count Total	20	1	71	107	199	1	0	0	0	1	0	0	1	0	1
Peak Hour	11	0	40	66	117	1	0	0	0	1	0	0	0	0	0

## Marksheffel Rd Meadowbrook Parkway



Date: Thu, Jun 04, 2020  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 4:00 PM to 5:00 PM

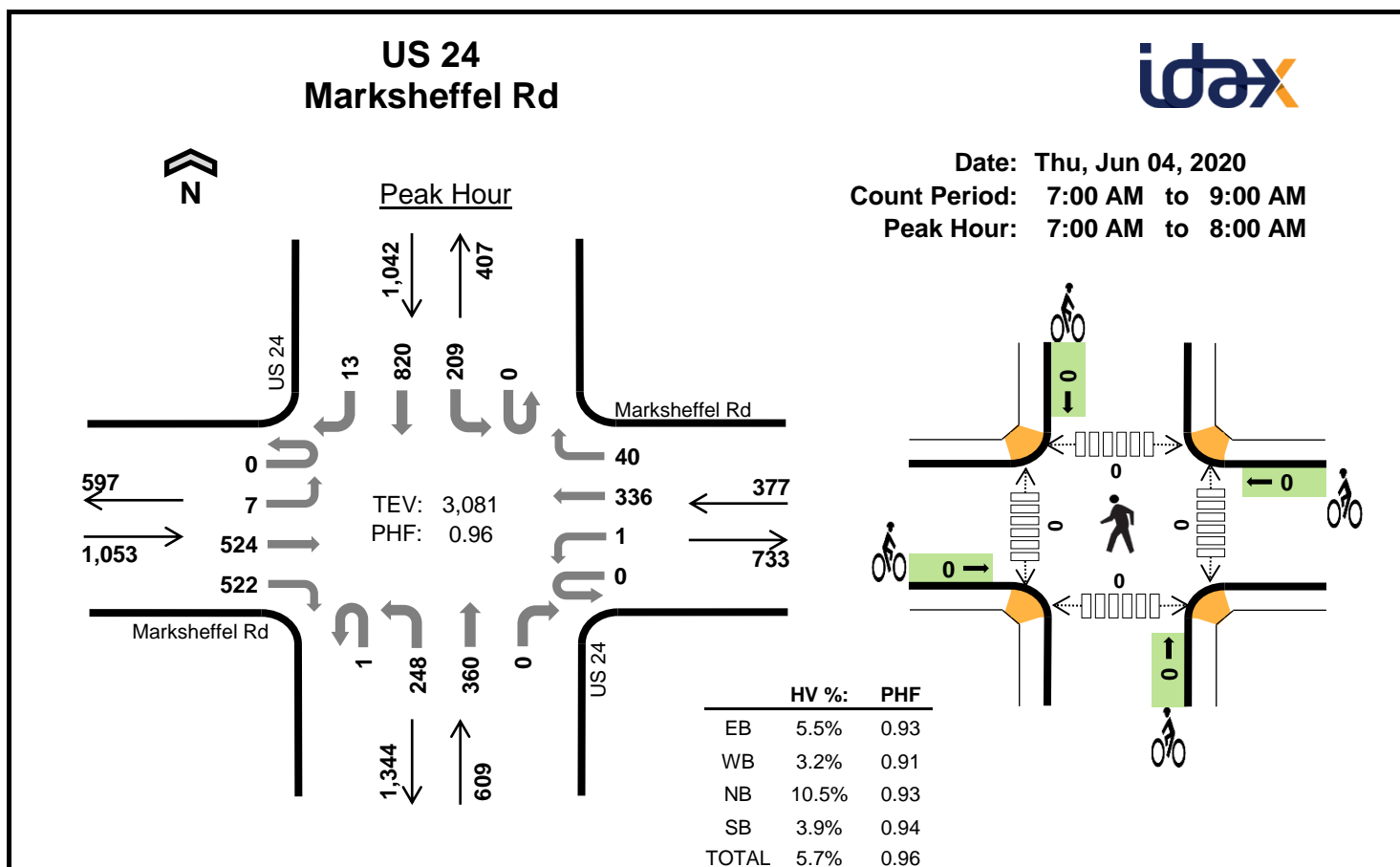


### Two-Hour Count Summaries

Interval Start	Meadowbrook Parkway				Meadowbrook Parkway				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	43	0	5	0	5	3	10	0	12	227	7	0	5	183	21	521	0
4:15 PM	0	29	3	9	0	5	2	6	0	8	294	16	1	6	164	25	568	0
4:30 PM	0	39	2	11	0	1	1	5	0	5	260	11	1	10	150	27	523	0
4:45 PM	0	20	3	12	0	3	3	4	0	6	280	20	0	9	206	24	590	2,202
5:00 PM	0	42	5	10	0	6	0	5	0	5	226	12	0	10	173	13	507	2,188
5:15 PM	0	29	3	10	0	4	0	9	0	3	260	14	0	7	193	23	555	2,175
5:30 PM	0	18	3	9	0	4	1	5	0	3	214	13	0	12	200	29	511	2,163
5:45 PM	0	24	0	4	0	3	0	8	1	4	194	10	0	7	123	12	390	1,963
Count Total	0	244	19	70	0	31	10	52	1	46	1,955	103	2	66	1,392	174	4,165	0
Peak Hour	0	131	8	37	0	14	9	25	0	31	1,061	54	2	30	703	97	2,202	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	5	12	17	0	0	0	0	0	0	0	0	0	0
4:15 PM	2	0	3	6	11	0	1	0	0	1	0	0	2	0	2
4:30 PM	0	0	4	7	11	0	0	0	0	0	0	0	3	0	3
4:45 PM	1	0	5	7	13	0	0	0	0	0	0	0	0	0	0
5:00 PM	2	0	2	6	10	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	5	6	11	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	0	2	8	12	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	5	7	0	0	0	0	0	0	0	0	0	0
Count Total	7	0	28	57	92	0	1	0	0	1	0	0	5	0	5
Peak Hour	3	0	17	32	52	0	1	0	0	1	0	0	5	0	5

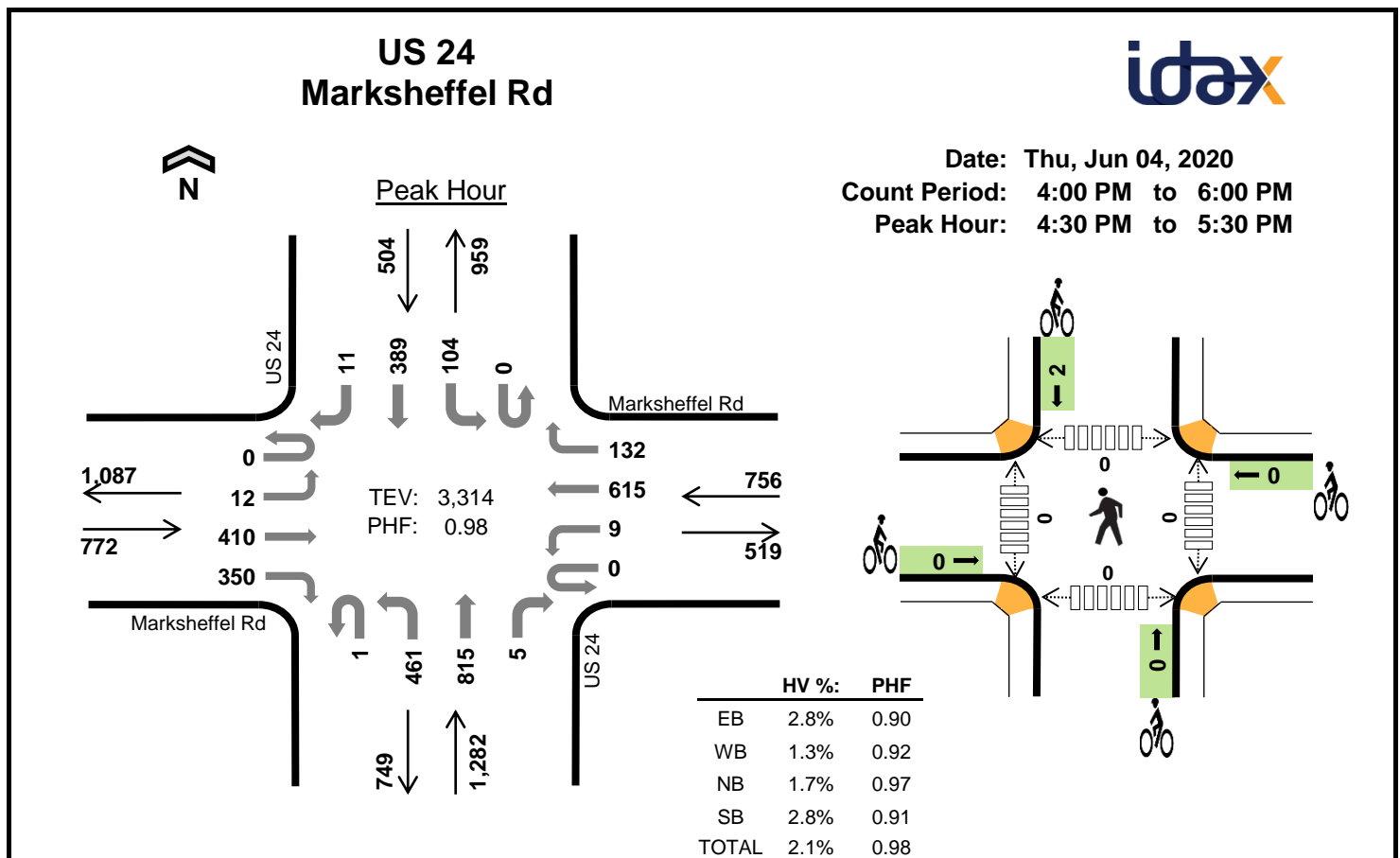


### Two-Hour Count Summaries

Interval Start	Marksheffel Rd				Marksheffel Rd				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	122	138	0	0	94	6	0	68	96	0	0	50	203	1	778	0
7:15 AM	0	0	155	127	0	0	96	8	1	59	96	0	0	43	213	3	801	0
7:30 AM	0	3	123	142	0	1	80	14	0	62	78	0	0	59	214	5	781	0
7:45 AM	0	4	124	115	0	0	66	12	0	59	90	0	0	57	190	4	721	3,081
8:00 AM	0	8	106	109	0	2	57	17	0	50	75	0	0	37	125	7	593	2,896
8:15 AM	0	1	87	90	0	0	48	16	0	50	73	1	0	42	138	1	547	2,642
8:30 AM	0	3	83	105	0	1	84	13	0	48	71	0	0	30	155	1	594	2,455
8:45 AM	0	0	92	85	0	2	58	8	0	52	91	0	0	39	162	5	594	2,328
Count Total	0	19	892	911	0	6	583	94	1	448	670	1	0	357	1,400	27	5,409	0
Peak Hour	0	7	524	522	0	1	336	40	1	248	360	0	0	209	820	13	3,081	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	18	3	10	8	39	0	0	0	0	0	0	0	0	0	0
7:15 AM	12	3	17	10	42	0	0	0	0	0	0	0	0	0	0
7:30 AM	14	4	21	13	52	0	0	0	0	0	0	0	0	0	0
7:45 AM	14	2	16	10	42	0	0	0	0	0	0	0	0	0	0
8:00 AM	9	3	18	11	41	0	0	0	0	0	0	0	0	0	0
8:15 AM	9	1	12	7	29	0	0	0	0	0	0	0	0	0	0
8:30 AM	9	2	10	9	30	0	0	0	0	0	0	0	0	0	0
8:45 AM	11	4	22	21	58	0	0	0	0	0	0	0	0	0	0
Count Total	96	22	126	89	333	0	0	0	0	0	0	0	0	0	0
Peak Hour	58	12	64	41	175	0	0	0	0	0	0	0	0	0	0



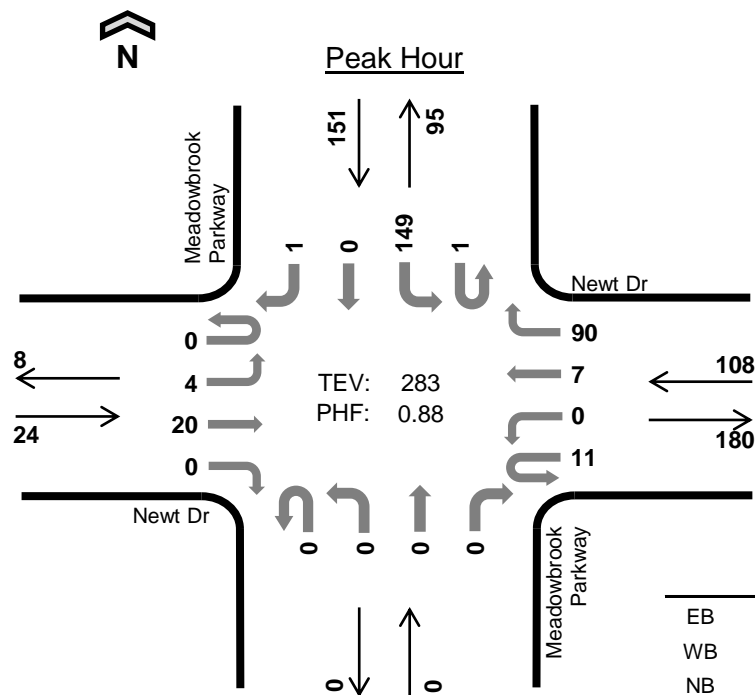
### Two-Hour Count Summaries

Interval Start	Marksheffel Rd				Marksheffel Rd				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	102	84	0	3	163	33	0	78	159	0	1	21	132	0	778	0
4:15 PM	0	7	82	73	0	1	172	39	2	131	166	1	0	32	121	4	831	0
4:30 PM	0	4	92	73	0	4	165	37	0	119	207	0	0	23	100	2	826	0
4:45 PM	0	5	117	92	0	1	162	34	0	128	185	4	0	17	90	5	840	3,275
5:00 PM	0	3	96	92	0	2	140	34	1	96	210	1	0	27	101	1	804	3,301
5:15 PM	0	0	105	93	0	2	148	27	0	118	213	0	0	37	98	3	844	3,314
5:30 PM	0	3	111	87	0	1	115	29	0	108	178	1	0	15	109	2	759	3,247
5:45 PM	0	3	78	62	0	6	110	20	0	96	122	0	0	24	91	1	613	3,020
Count Total	0	27	783	656	0	20	1,175	253	3	874	1,440	7	1	196	842	18	6,295	0
Peak Hour	0	12	410	350	0	9	615	132	1	461	815	5	0	104	389	11	3,314	0

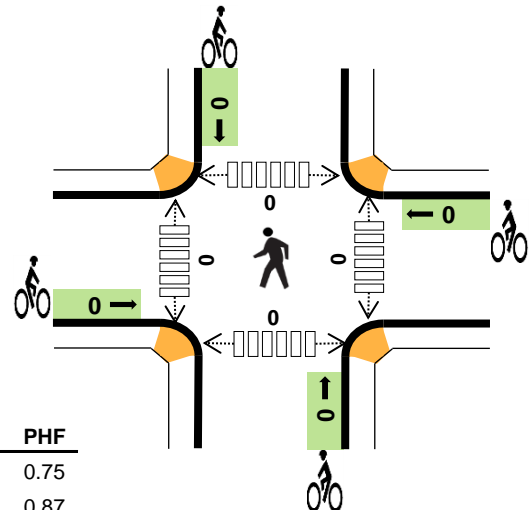
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	12	3	7	8	30	0	0	0	0	0	0	0	0	0	0
4:15 PM	6	2	10	5	23	0	0	0	0	0	0	0	0	0	0
4:30 PM	4	4	6	6	20	0	0	0	1	1	0	0	0	0	0
4:45 PM	6	2	6	1	15	0	0	0	0	0	0	0	0	0	0
5:00 PM	7	2	6	3	18	0	0	0	0	0	0	0	0	0	0
5:15 PM	5	2	4	4	15	0	0	0	1	1	0	0	0	0	0
5:30 PM	6	0	5	5	16	0	0	0	0	0	0	0	0	0	0
5:45 PM	2	2	3	2	9	0	0	0	1	1	0	0	0	0	0
Count Total	48	17	47	34	146	0	0	0	3	3	0	0	0	0	0
Peak Hour	22	10	22	14	68	0	0	0	2	2	0	0	0	0	0

## Meadowbrook Parkway Newt Dr



Date: Tue, Jun 02, 2020  
Count Period: 7:00 AM to 9:00 AM  
Peak Hour: 7:00 AM to 8:00 AM



	HV %:	PHF
EB	0.0%	0.75
WB	1.9%	0.87
NB	-	-
SB	6.0%	0.74
TOTAL	3.9%	0.88

### Two-Hour Count Summaries

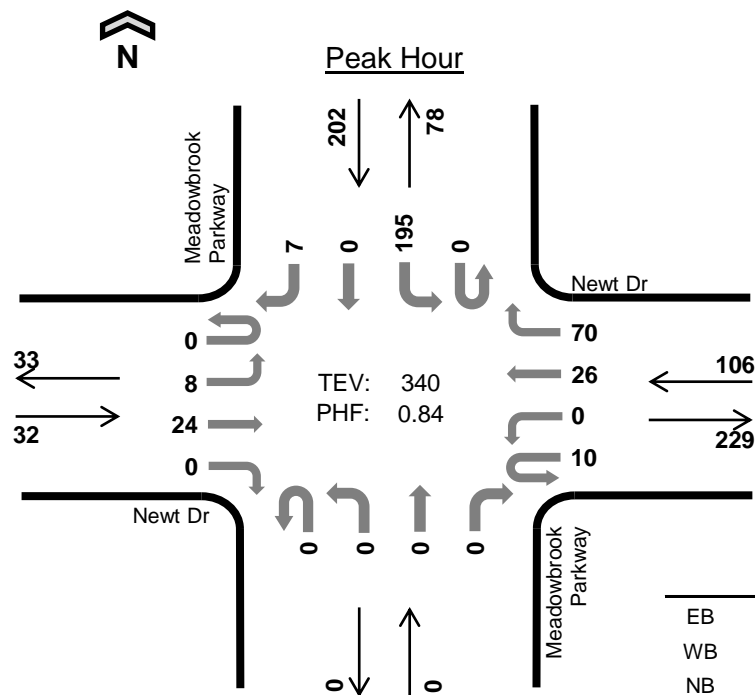
Interval Start	Newt Dr				Newt Dr				Meadowbrook Parkway				Meadowbrook Parkway				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	3	5	0	4	0	1	21	0	0	0	0	0	41	0	1	76	0
7:15 AM	0	0	5	0	4	0	0	22	0	0	0	0	1	31	0	0	63	0
7:30 AM	0	1	3	0	2	0	4	19	0	0	0	0	0	51	0	0	80	0
7:45 AM	0	0	7	0	1	0	2	28	0	0	0	0	0	26	0	0	64	283
8:00 AM	0	4	2	0	4	0	3	24	0	0	0	0	0	32	0	0	69	276
8:15 AM	0	0	4	0	0	0	3	11	0	0	0	0	0	34	0	0	52	265
8:30 AM	0	0	4	0	4	0	2	18	0	0	0	0	0	25	0	0	53	238
8:45 AM	0	1	5	0	4	0	2	17	0	0	0	0	0	30	0	0	59	233
Count Total	0	9	35	0	23	0	17	160	0	0	0	0	1	270	0	1	516	0
Peak Hour	0	4	20	0	11	0	7	90	0	0	0	0	1	149	0	1	283	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

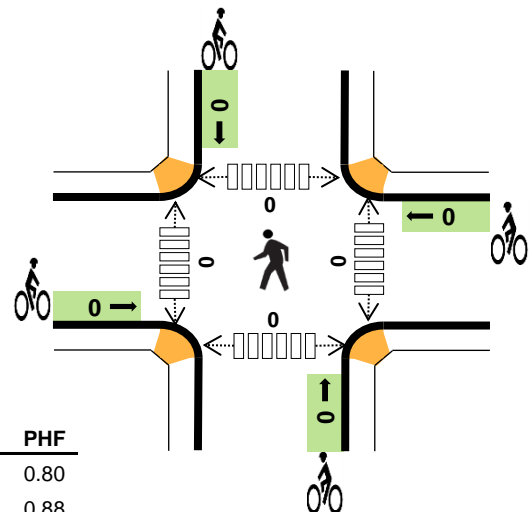
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	4	5	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	3	4	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0
Count Total	0	6	0	15	21	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	2	0	9	11	0	0	0	0	0	0	0	0	0	0



## Meadowbrook Parkway Newt Dr



Date: Tue, Jun 02, 2020  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 4:30 PM to 5:30 PM



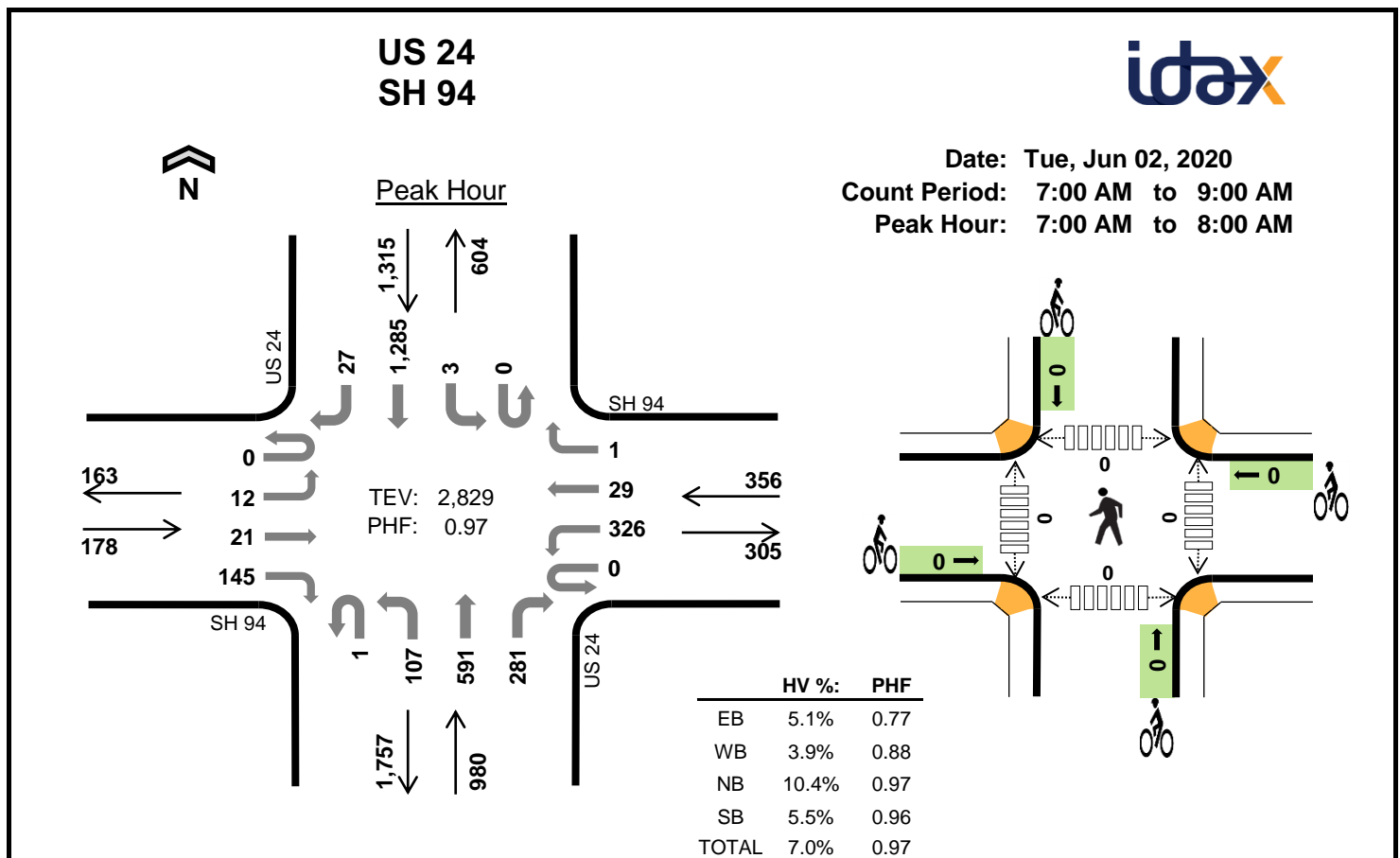
	HV %:	PHF
EB	6.3%	0.80
WB	7.5%	0.88
NB	-	-
SB	1.5%	0.71
TOTAL	3.8%	0.84

### Two-Hour Count Summaries

Interval Start	Newt Dr				Newt Dr				Meadowbrook Parkway				Meadowbrook Parkway				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	2	0	4	0	6	26	0	0	0	0	0	38	0	0	78	0
4:15 PM	0	2	3	0	4	0	6	15	0	0	0	0	0	44	0	1	75	0
4:30 PM	0	2	6	0	2	0	3	23	0	0	0	0	0	42	0	4	82	0
4:45 PM	0	1	8	0	2	0	7	21	0	0	0	0	0	41	0	0	80	315
5:00 PM	0	2	3	0	4	0	12	9	0	0	0	0	0	70	0	1	101	338
5:15 PM	0	3	7	0	2	0	4	17	0	0	0	0	0	42	0	2	77	340
5:30 PM	0	0	4	0	6	0	4	8	0	0	0	0	0	27	0	0	49	307
5:45 PM	0	1	4	0	2	0	6	7	0	0	0	0	0	29	0	1	50	277
Count Total	0	13	37	0	26	0	48	126	0	0	0	0	0	333	0	9	592	0
Peak Hour	0	8	24	0	10	0	26	70	0	0	0	0	0	195	0	7	340	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	4	0	1	5	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
5:15 PM	2	2	0	1	5	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
Count Total	2	10	0	5	17	0	0	0	0	0	0	0	0	0	0
Peak Hour	2	8	0	3	13	0	0	0	0	0	0	0	0	0	0

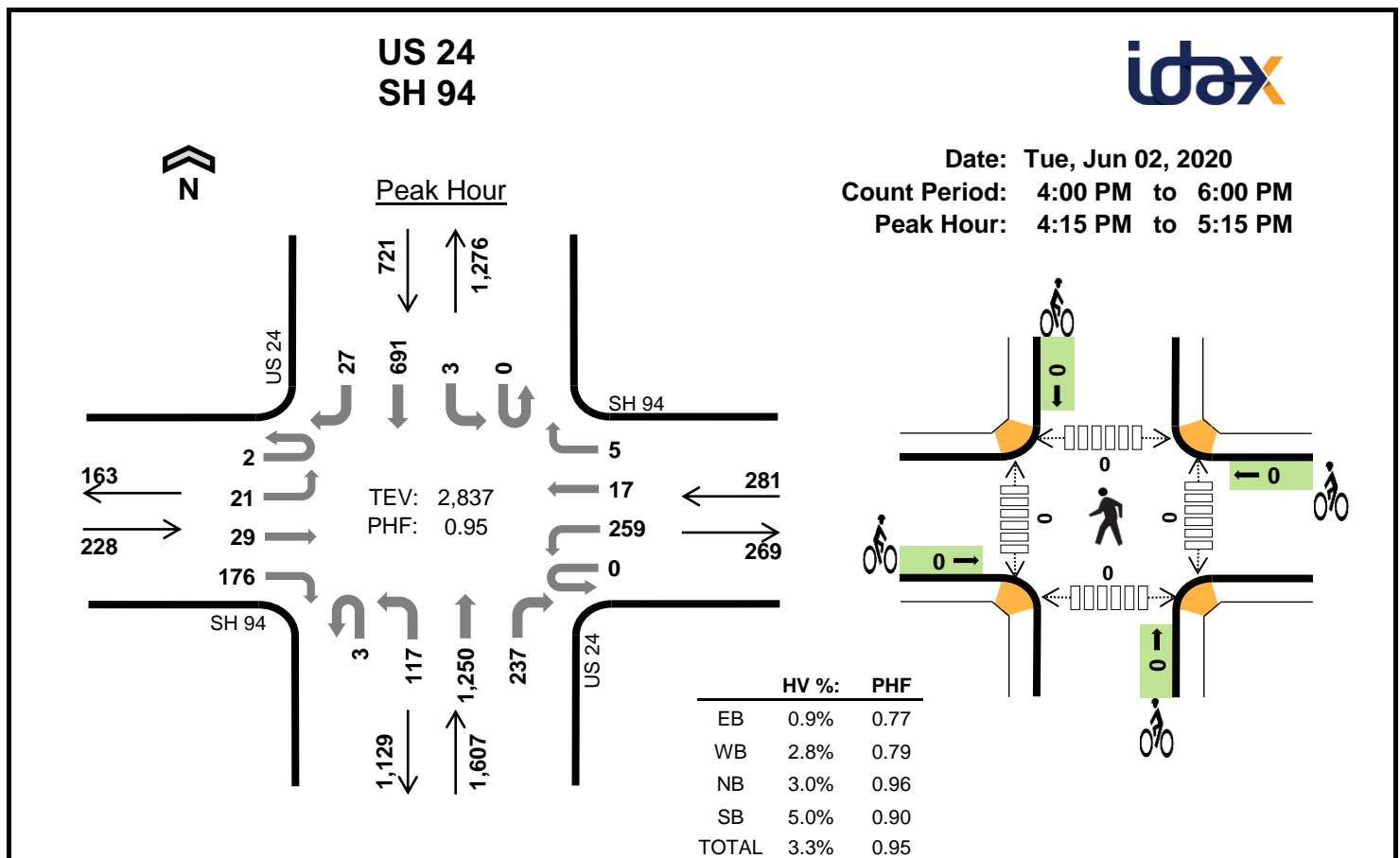


### Two-Hour Count Summaries

Interval Start	SH 94				SH 94				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	6	45	0	81	10	0	0	27	147	65	0	1	319	7	709	0
7:15 AM	0	6	7	21	0	90	10	1	0	25	145	79	0	0	336	8	728	0
7:30 AM	0	5	6	47	0	85	5	0	0	20	152	80	0	0	310	6	716	0
7:45 AM	0	0	2	32	0	70	4	0	1	35	147	57	0	2	320	6	676	2,829
8:00 AM	0	4	4	25	0	51	7	1	0	28	120	54	0	3	230	5	532	2,652
8:15 AM	0	4	4	34	0	51	6	0	1	17	107	64	0	1	207	10	506	2,430
8:30 AM	0	1	4	26	0	66	2	0	0	25	128	55	0	0	223	4	534	2,248
8:45 AM	0	3	7	29	0	48	6	1	1	23	131	44	0	1	197	9	500	2,072
Count Total	0	24	40	259	0	542	50	3	3	200	1,077	498	0	8	2,142	55	4,901	0
Peak Hour	0	12	21	145	0	326	29	1	1	107	591	281	0	3	1,285	27	2,829	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	1	19	20	44	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	5	27	16	48	0	0	0	0	0	0	0	0	0	0
7:30 AM	4	3	31	15	53	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	5	25	21	52	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	8	20	15	44	0	0	0	0	0	0	0	0	0	0
8:15 AM	3	2	24	9	38	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	7	27	13	47	0	0	0	0	0	0	0	0	0	0
8:45 AM	2	5	15	18	40	0	0	0	0	0	0	0	0	0	0
Count Total	15	36	188	127	366	0	0	0	0	0	0	0	0	0	0
Peak Hour	9	14	102	72	197	0	0	0	0	0	0	0	0	0	0

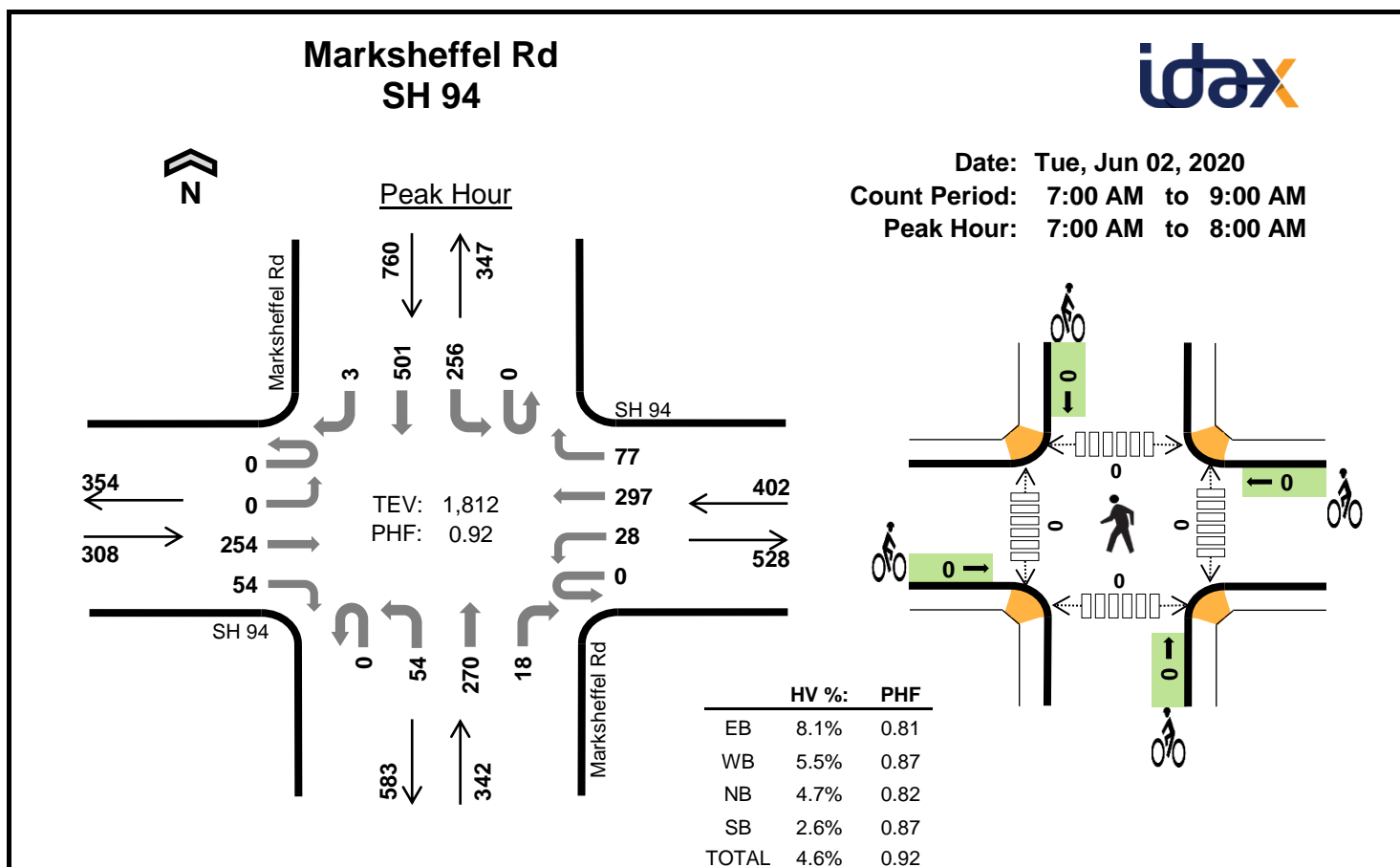


### Two-Hour Count Summaries

Interval Start	SH 94				SH 94				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	5	4	32	0	73	7	0	1	31	284	80	1	2	177	7	704	0
4:15 PM	0	5	4	45	0	51	2	2	1	30	327	62	0	3	153	7	692	0
4:30 PM	0	4	13	33	0	66	7	0	1	29	300	46	0	0	194	7	700	0
4:45 PM	0	9	1	40	0	83	5	1	0	31	307	53	0	0	158	7	695	2,791
5:00 PM	2	3	11	58	0	59	3	2	1	27	316	76	0	0	186	6	750	2,837
5:15 PM	0	8	7	36	0	49	8	0	0	19	299	80	0	0	170	8	684	2,829
5:30 PM	0	5	4	29	0	44	7	1	0	19	267	85	0	0	183	4	648	2,777
5:45 PM	0	3	8	24	0	38	4	1	0	12	252	62	0	0	142	10	556	2,638
Count Total	2	42	52	297	0	463	43	7	4	198	2,352	544	1	5	1,363	56	5,429	0
Peak Hour	2	21	29	176	0	259	17	5	3	117	1,250	237	0	3	691	27	2,837	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	4	16	12	32	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	3	11	12	26	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	1	20	12	34	0	0	0	0	0	0	0	0	0	0
4:45 PM	1	1	14	5	21	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	3	4	7	14	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	2	10	6	19	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	1	7	11	21	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	2	3	7	13	0	0	0	0	0	0	0	0	0	0
Count Total	6	17	85	72	180	0	0	0	0	0	0	0	0	0	0
Peak Hour	2	8	49	36	95	0	0	0	0	0	0	0	0	0	0

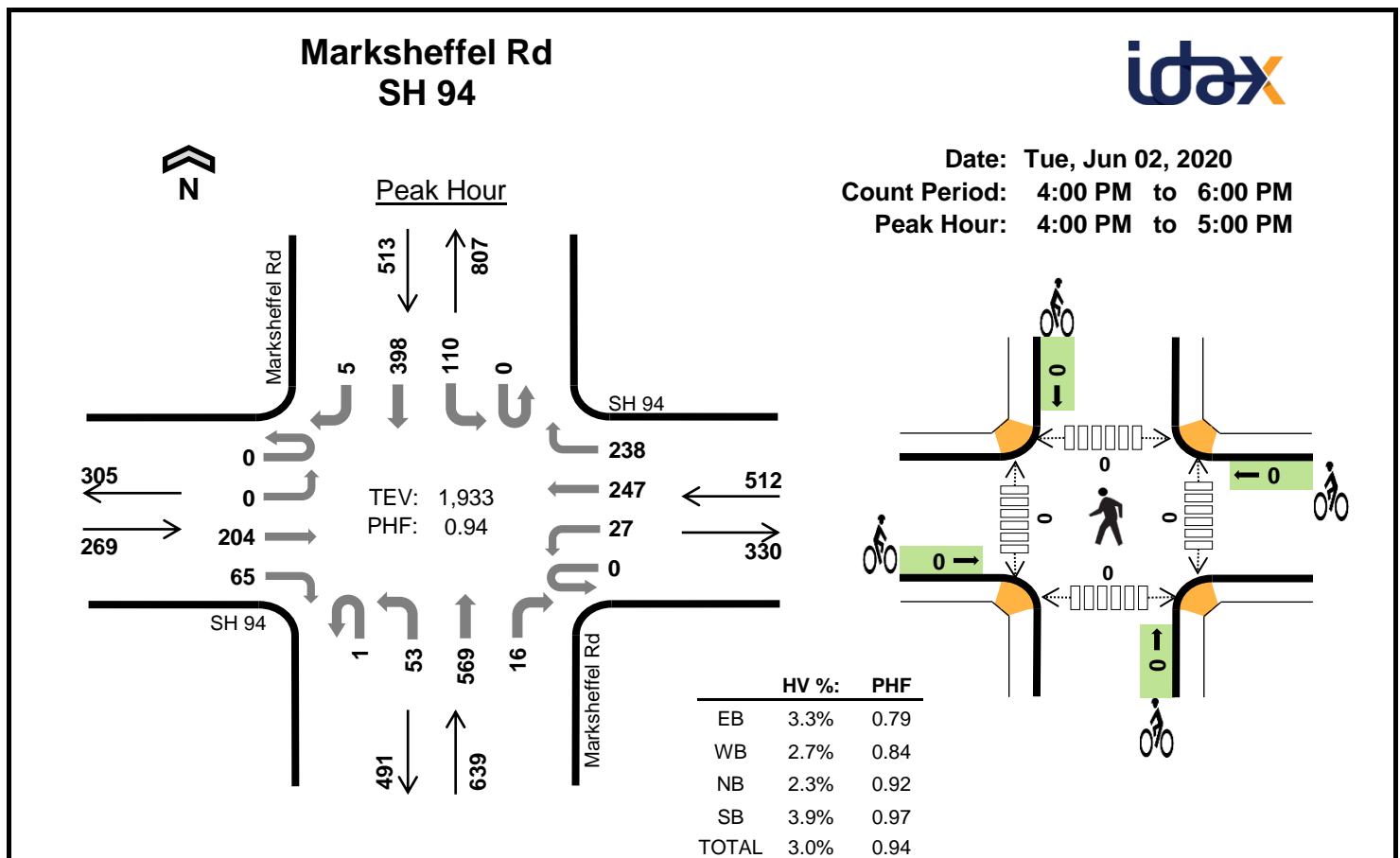


### Two-Hour Count Summaries

Interval Start	SH 94				SH 94				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	57	8	0	2	73	22	0	11	71	7	0	79	110	0	440	0
7:15 AM	0	0	79	16	0	7	87	21	0	10	51	3	0	74	143	1	492	0
7:30 AM	0	0	61	21	0	8	69	13	0	24	76	4	0	67	133	1	477	0
7:45 AM	0	0	57	9	0	11	68	21	0	9	72	4	0	36	115	1	403	1,812
8:00 AM	0	4	39	14	0	2	43	12	0	10	50	2	0	47	115	1	339	1,711
8:15 AM	0	0	61	11	0	2	49	21	0	8	59	2	0	32	89	0	334	1,553
8:30 AM	0	1	50	15	0	6	67	25	0	9	52	4	0	32	85	1	347	1,423
8:45 AM	0	0	36	14	0	4	44	17	0	14	49	1	0	21	85	2	287	1,307
Count Total	0	5	440	108	0	42	500	152	0	95	480	27	0	388	875	7	3,119	0
Peak Hour	0	0	254	54	0	28	297	77	0	54	270	18	0	256	501	3	1,812	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	2	5	5	16	0	0	0	0	0	0	0	0	0	0
7:15 AM	6	4	4	4	18	0	0	0	0	0	0	0	0	0	0
7:30 AM	9	6	4	8	27	0	0	0	0	0	0	0	0	0	0
7:45 AM	6	10	3	3	22	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	7	2	9	21	0	0	0	0	0	0	0	0	0	0
8:15 AM	10	5	2	4	21	0	0	0	0	0	0	0	0	0	0
8:30 AM	8	5	8	7	28	0	0	0	0	0	0	0	0	0	0
8:45 AM	8	6	1	5	20	0	0	0	0	0	0	0	0	0	0
Count Total	54	45	29	45	173	0	0	0	0	0	0	0	0	0	0
Peak Hour	25	22	16	20	83	0	0	0	0	0	0	0	0	0	0



### Two-Hour Count Summaries

Interval Start	SH 94				SH 94				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	58	27	0	7	63	49	0	14	140	2	0	24	94	1	479	0
4:15 PM	0	0	57	15	0	10	65	78	1	10	142	6	0	28	102	1	515	0
4:30 PM	0	0	42	13	0	6	47	62	0	12	159	2	0	25	105	1	474	0
4:45 PM	0	0	47	10	0	4	72	49	0	17	128	6	0	33	97	2	465	1,933
5:00 PM	1	1	72	14	0	5	52	48	0	8	107	2	0	20	84	2	416	1,870
5:15 PM	1	0	73	13	0	5	37	44	0	18	112	3	0	29	110	0	445	1,800
5:30 PM	0	0	69	19	0	1	40	31	0	12	75	3	0	28	115	0	393	1,719
5:45 PM	0	0	47	21	0	0	32	31	0	7	122	2	0	28	110	0	400	1,654
Count Total	2	1	465	132	0	38	408	392	1	98	985	26	0	215	817	7	3,587	0
Peak Hour	0	0	204	65	0	27	247	238	1	53	569	16	0	110	398	5	1,933	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	5	4	7	17	0	0	0	0	0	0	0	0	0	0
4:15 PM	2	3	4	4	13	0	0	0	0	0	0	0	0	0	0
4:30 PM	2	4	5	8	19	0	0	0	0	0	0	0	0	0	0
4:45 PM	4	2	2	1	9	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	2	2	4	9	0	0	0	0	0	0	0	0	0	0
5:15 PM	2	1	3	2	8	0	0	1	0	1	0	0	0	0	0
5:30 PM	3	0	2	1	6	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	1	3	4	9	0	0	0	0	0	0	0	0	0	0
Count Total	16	18	25	31	90	0	0	1	0	1	0	0	0	0	0
Peak Hour	9	14	15	20	58	0	0	0	0	0	0	0	0	0	0



# Traffic Data Resources

Location: Marksheffel @ Space Village      File Name : MARKSHEFFEL @ SPACE VILLAGE-THUR-WSP-3-20  
 Turning Movement Count      Site Code : 00000000  
 Weather: Clear      Start Date : 3/12/2020  
 Comments: Heavy truck traffic      Page No : 1

## Groups Printed- Unshifted

	MARKSHEFFEL From North				SPACE VILLAGE From East				MARKSHEFFEL From South				SPACE VILLAGE From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
06:00 AM	1	84	0	85	0	0	7	7	0	47	20	67	23	5	1	29	188
06:15 AM	4	140	0	144	0	2	2	4	2	68	33	103	17	9	1	27	278
06:30 AM	4	157	0	161	0	2	0	2	1	92	40	133	19	13	2	34	330
06:45 AM	13	164	0	177	0	6	8	14	2	109	54	165	26	9	4	39	395
Total	22	545	0	567	0	10	17	27	5	316	147	468	85	36	8	129	1191
07:00 AM	18	196	6	220	1	1	3	5	6	121	51	178	35	19	2	56	459
07:15 AM	37	201	0	238	1	4	3	8	1	110	62	173	35	8	2	45	464
07:30 AM	33	235	1	269	0	3	1	4	4	124	83	211	23	9	2	34	518
07:45 AM	31	227	1	259	0	3	1	4	1	117	77	195	21	6	1	28	486
Total	119	859	8	986	2	11	8	21	12	472	273	757	114	42	7	163	1927
*** BREAK ***																	
04:00 PM	7	147	0	154	0	4	4	8	3	210	40	253	55	8	3	66	481
04:15 PM	8	149	0	157	0	3	7	10	5	263	46	314	46	8	2	56	537
04:30 PM	5	122	1	128	0	2	10	12	6	228	56	290	52	10	1	63	493
04:45 PM	3	132	0	135	1	3	9	13	1	213	46	260	62	6	4	72	480
Total	23	550	1	574	1	12	30	43	15	914	188	1117	215	32	10	257	1991
05:00 PM	7	127	0	134	0	2	4	6	5	213	55	273	65	7	1	73	486
05:15 PM	4	155	2	161	0	1	2	3	1	226	48	275	58	10	4	72	511
05:30 PM	5	119	0	124	1	2	6	9	0	153	38	191	53	12	1	66	390
05:45 PM	2	111	0	113	0	3	1	4	0	152	31	183	46	6	2	54	354
Total	18	512	2	532	1	8	13	22	6	744	172	922	222	35	8	265	1741
Grand Total	182	2466	11	2659	4	41	68	113	38	2446	780	3264	636	145	33	814	6850
Apprch %	6.8	92.7	0.4		3.5	36.3	60.2		1.2	74.9	23.9		78.1	17.8	4.1		
Total %	2.7	36	0.2	38.8	0.1	0.6	1	1.6	0.6	35.7	11.4	47.6	9.3	2.1	0.5	11.9	

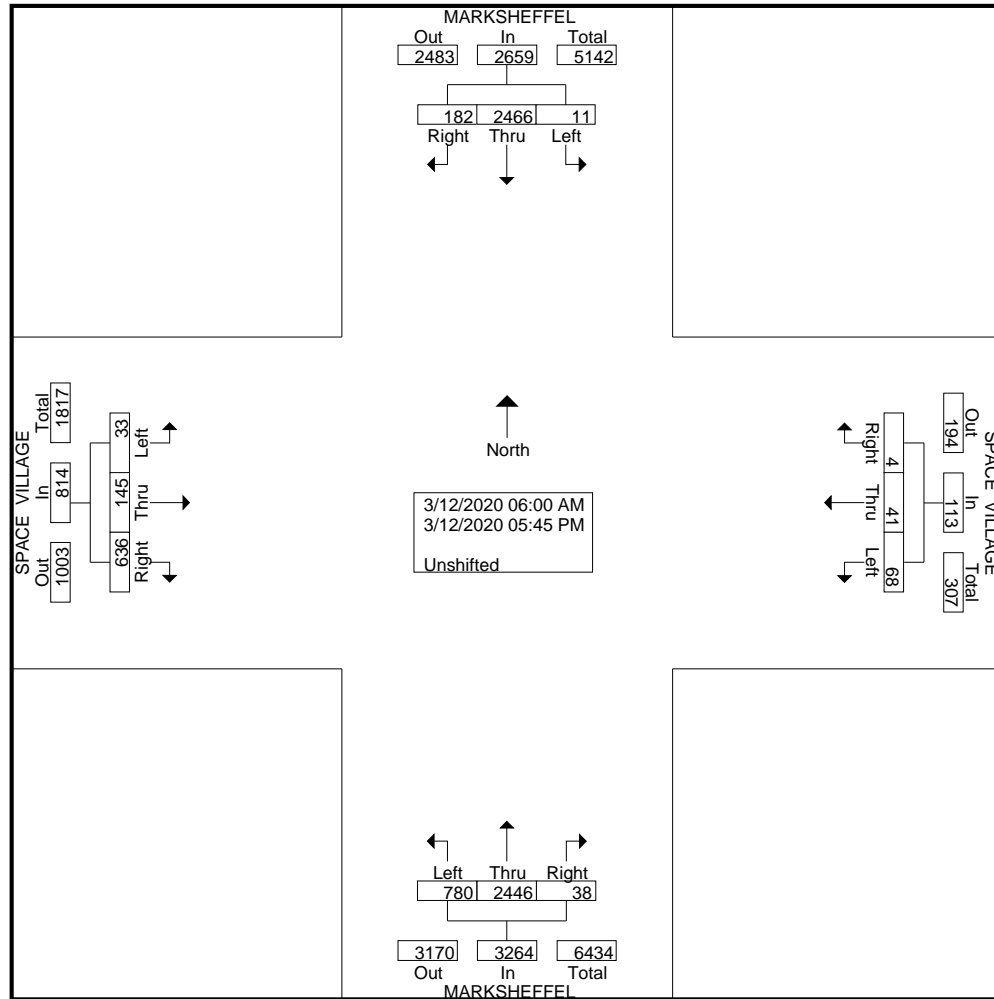
# Traffic Data Resources

File Name : MARKSHEFFEL @ SPACE VILLAGE-THUR-WSP-3-20

Site Code : 00000000

Start Date : 3/12/2020

Page No : 2



	MARKSHEFFEL From North				SPACE VILLAGE From East				MARKSHEFFEL From South				SPACE VILLAGE From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	8	149	0	157	0	3	7	10	5	263	46	314	46	8	2	56	537
04:30 PM	5	122	1	128	0	2	10	12	6	228	56	290	52	10	1	63	493
04:45 PM	3	132	0	135	1	3	9	13	1	213	46	260	62	6	4	72	480
05:00 PM	7	127	0	134	0	2	4	6	5	213	55	273	65	7	1	73	486
Total Volume	23	530	1	554	1	10	30	41	17	917	203	1137	225	31	8	264	1996
% App. Total	4.2	95.7	0.2		2.4	24.4	73.2		1.5	80.7	17.9		85.2	11.7	3		
PHF	.719	.889	.250	.882	.250	.833	.750	.788	.708	.872	.906	.905	.865	.775	.500	.904	.929

# APPENDIX B

CDOT Annual Traffic Data  
2040 PPACOG Traffic Model

Description:	SH 94 E/O Marksheffel Rd, Colorado Springs
--------------	--

Marsh Jeffel and SH 94Marshner and Shi 74Marshner and Shi 74

Description: SH 24 NE/O SH 94, Colorado Springs

LIC 04 - 100 - LIC 04US 24 and SH 94US 24 and SH 94

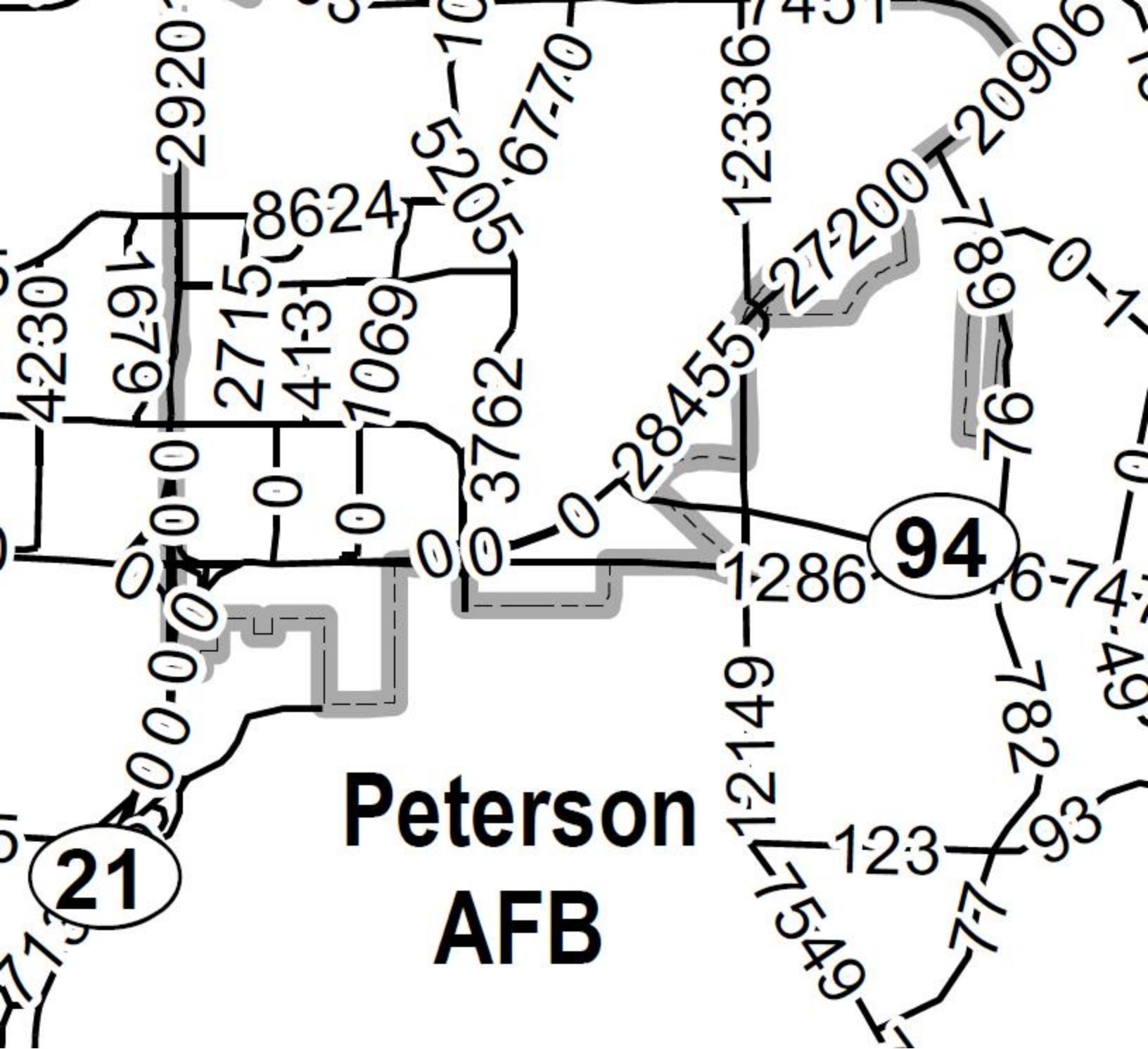
US 24 and Marksheffel	Peak Hour Counts	1282	117%
		749	93%
	Percent Difference	108%	

Reagan Ranch Traffic Projection

ROUTE	REFPT	ENDREFPT	LENGTH	YR20FACTOR	DHV	LOCATION
094A	0.548	1	0.47	1.33	13.5	ON SH 94 E/O MARKSHEFFEL RD COLORADO SPRINGS
094A	1	8.085	7.077	1.25	12.5	ON SH 94 E/O SPACE VILLAGE AVE CR 2804

Station ID	2018 AADT	2040 AADT	Growth Factor	Yearly Growth Rate
103943	10000	13630	1.33	1.30%
103944	11000	14025	1.25	1.02%
		Avg Growth Rate		1.16%





2040 PPACOG MODEL

# APPENDIX C

## Trip Generation Worksheets

Crossroads-Meadowbrook-Reagan Ranch Phase 1 Trip Generation Summary

Use	Quantity	Daily	Weekday Vehicle Trips					
			AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Crossroads North								
Public Park (ITE 411)	20 Acres	16	0	0	0	1	1	2
Tire Superstore (ITE 849)	7,000 SF	144	6	3	9	7	8	15
Home Improvement Superstore (ITE 862)	127,000 SF	3,904	113	86	199	145	151	296
Furniture Store (ITE 890)	114,000 SF	720	21	9	30	28	31	59
Sit Down Restaurant (ITE 932)	11,000 SF	1,234	60	49	109	66	41	107
Fast-Food Restaurant (ITE 934)	2,500 SF	1,178	51	49	100	43	39	82
Gas Station Super Convenience (ITE 960)	6,000 SF	5,026	249	250	499	208	208	416
Total Crossroads North Trips		12,222	500	446	946	498	479	977
Crossroads North Trips after Internal Capture		11,246	490	437	927	458	441	899
Meadowbrook Park								
Single Family Housing (ITE 210)	67 Units	720	13	39	52	43	26	69
Meadowbrook Park Total Trips		720	13	39	52	43	26	69
Crossroads Mix Use								
Mid-Rise Multifamily Housing (ITE 221)	300 Units	1,634	26	74	100	77	50	127
Shopping Center (ITE 820)	10,000 SF	1,256	97	60	157	48	51	99
Sit Down Restaurant (ITE 932)	4,000 SF	450	22	18	40	24	15	39
Fast Food Restaurant (ITE 934)	11,000 SF	5,182	225	217	442	187	172	359
Coffee Shop (ITE 937)	2,500 SF	2,050	113	109	222	55	55	110
Total Crossroads Mix Use Trips		10,572	483	478	961	391	343	734
Crossroads Mix Use Trips after Internal Capture		9,726	474	468	942	359	316	675
Reagan Ranch Northwest Area								
Industrial Park (ITE 130)	220,000 SF	742	71	17	88	18	70	88
Reagan Ranch Northwest Area Total Trips		742	71	17	88	18	70	88
Reagan Ranch Northeast Area								
Single Family Housing (ITE 210)	125 Units	1,276	22	72	94	79	47	126
Shopping Center (ITE 820)	30,000 SF	2,652	104	63	167	107	116	223
Total Reagan Ranch Northeast Area Trips		3,928	126	135	261	186	163	349
Reagan Ranch NE Area Trips after Internal Capture		3,614	124	132	256	171	150	321
Reagan Ranch Southeast Area								
Single Family Housing (ITE 210)	255 Units	2,460	45	141	186	156	94	250
Mid-Rise Multifamily Housing (ITE 221)	360 Units	1,962	31	89	120	93	59	152
Shopping Center (ITE 820)	70,000 SF	4,718	116	71	187	200	217	417
Total Reagan Ranch Southeast Area Trips		9,140	192	301	493	449	370	819
Reagan Ranch SE Area Trips after Internal Capture		8,410	188	295	483	413	340	753
Total Site Generated Trips		37,324	1,385	1,416	2,801	1,585	1,451	3,036
Total Site External Trips after Internal Capture		34,458	1,360	1,389	2,748	1,462	1,343	2,806

Crossroads-Meadowbrook-Reagan Ranch Full Buildout Trip Generation Summary

Use	Quantity	Daily	Weekday Vehicle Trips					
			AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Crossroads North								
Public Park (ITE 411)	20 Acres	16	0	0	0	1	1	2
Movie Theatre (ITE 444)	52,000 SF	4,062	5	6	11	302	19	321
Tire Superstore (ITE 849)	7,000 SF	144	6	3	9	7	8	15
Home Improvement Superstore (ITE 862)	127,000 SF	3,904	113	86	199	145	151	296
Furniture Store (ITE 890)	114,000 SF	720	21	9	30	28	31	59
Sit Down Restaurant (ITE 932)	11,000 SF	1,234	60	49	109	66	41	107
Fast-Food Restaurant (ITE 934)	5,000 SF	2,356	103	98	201	85	78	163
Gas Station Super Convenience (ITE 960)	6,000 SF	5,026	249	250	499	208	208	416
Total Crossroads North Trips		17,462	557	501	1,058	842	537	1,379
Crossroads North Trips after Internal Capture		16,066	546	491	1,037	775	494	1,269
Meadowbrook Park								
Single Family Housing (ITE 210)	67 Units	720	13	39	52	43	26	69
Meadowbrook Park Total Trips		720	13	39	52	43	26	69
Crossroads Mix Use								
Mid-Rise Multifamily Housing (ITE 221)	300 Units	1,634	26	74	100	77	50	127
Shopping Center (ITE 820)	10,000 SF	1,256	97	60	157	48	51	99
Pharmacy (ITE 881)	14,000 SF	1,528	29	25	54	72	72	144
Sit Down Restaurant (ITE 932)	8,000 SF	898	44	36	80	48	30	78
Fast Food Restaurant (ITE 934)	11,000 SF	5,182	225	217	442	187	172	359
Coffee Shop (ITE 937)	2,500 SF	2,050	113	109	222	55	55	110
Total Crossroads Mix Use Trips		12,548	534	521	1,055	487	430	917
Crossroads Mix Use Trips after Internal Capture		11,544	523	511	1,034	448	396	844
Reagan Ranch Northwest Area								
Industrial Park (ITE 130)	365,000 SF	1,232	118	28	146	31	115	146
Reagan Ranch Northwest Area Total Trips		1,232	118	28	146	31	115	146
Reagan Ranch Northeast Area								
Single Family Housing (ITE 210)	200 Units	1,968	37	110	147	125	73	198
Shopping Center (ITE 820)	175,000 SF	8,796	148	91	239	395	427	822
Total Reagan Ranch Northeast Area Trips		10,764	185	201	386	520	500	1,020
Reagan Ranch NE Area Trips after Internal Capture		9,904	181	197	378	478	460	938
Reagan Ranch Southeast Area								
Single Family Housing (ITE 210)	393 Units	3,662	71	213	284	238	140	378
Mid-Rise Multifamily Housing (ITE 221)	360 Units	1,962	31	89	120	93	59	152
Office (ITE 710)	100,000 SF	1,062	103	17	120	18	96	114
Shopping Center (ITE 820)	350,000 SF	14,092	203	124	327	659	714	1,373
Total Reagan Ranch Southeast Area Trips		20,778	408	443	851	1,008	1,009	2,017
Reagan Ranch SE Area Trips after Internal Capture		19,116	400	434	834	928	928	1,856
Total Site Generated Trips		63,504	1,815	1,733	3,548	2,931	2,617	5,548
Total Site External Trips after Internal Capture		58,582	1,781	1,700	3,481	2,703	2,419	5,121

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North - Phase 1)  
 Subject Trip Generation - Public Park  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. 1 of 1

## TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations  
 Land Use Code - Public Park (411)  
 Independent Variable - Acres (X)

Acres 20  
 $X = 20$   
 $T = \text{Average Vehicle Trip Ends}$

### Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 3)

Directional Distribution: 59% ent. 41% exit.  
 $(T) = 0.02 (X)$   
 $(T) = 0.02 * (20.0)$   
 $T = 0$  Average Vehicle Trip Ends  
 0 entering 0 exiting  
 0 + 0 = 0

### Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 4)

Directional Distribution: 55% ent. 45% exit.  
 $(T) = 0.11 (X)$   
 $(T) = 0.11 * (20.0)$   
 $T = 2$  Average Vehicle Trip Ends  
 1 entering 1 exiting  
 1 + 1 = 2

### Weekday (400 Series page 2)

Average Weekday  
 $T = 0.78 * (X)$   
 $T = 0.78 * 20$   
 Directional Distribution: 50% entering, 50% exiting  
 $T = 16$  Average Vehicle Trip Ends  
 8 entering 8 exiting  
 8 + 8 = 16



Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North Phase 1)  
 Subject Trip Generation for Tire Superstore  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Tire Superstore (849)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **7,000** Square Feet

X = 7.000

T = Average Vehicle Trip Ends

### Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 262)

		Directional Distribution:	65% ent.	35% exit.
T = 1.34 (X)		T = 9	Average Vehicle Trip Ends	
T = 1.34 *	7.000	6 entering	3	exiting
		6 + 3 =	9	

### Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 263)

		Directional Distribution:	47% ent.	53% exit.
T = 2.11 (X)		T = 15	Average Vehicle Trip Ends	
T = 2.11 *	7.000	7 entering	8	exiting
		7 + 8 =	15	

### Weekday (800 Series Page 261)

Average Weekday		Directional Distribution:	50% entering, 50% exiting
T = 20.37 (X)		T = 144	Average Vehicle Trip Ends
T = 20.37*	7.000	72 entering	72 exiting
		72 + 72 =	144

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North Phase 1)  
 Subject Trip Generation for Home Improvements Superstore  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Home Improvement Superstore (862)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **127,000** Square Feet

X = 127.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 437)**

		Directional Distribution:	57% ent.	43% exit.
T = 1.57 (X)		T =	199	Average Vehicle Trip Ends
T = 1.57 *	127.000	113	entering	86 exiting
		113	(*)	· 86 = 199

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 438)**

		Directional Distribution:	49% ent.	51% exit.
T = 2.33 (X)		T =	296	Average Vehicle Trip Ends
T = 2.33 *	127.000	145	entering	151 exiting
		145	+	151 = 296

### **Weekday (800 Series Page 436)**

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
T = 30.74 (X)		T =	3904 Average Vehicle Trip Ends	
T = 30.74*	127.000	1952	entering 1952 exiting	
		1952	+	1952 = 3904

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North Phase 1)  
 Subject Trip Generation for Furniture Store  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Furniture Store (890)

Independent Variable - 1000 Square Feet (X)

SF = **114,000**

X = 114.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 585)**

(T) = 0.26 (X)		Directional Distribution:	71% ent.	29% exit.
(T) = 0.26 *	(114.0)	T = 30	Average Vehicle Trip Ends	
		21 entering	9 exiting	
		21 + 9 = 30		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 586)**

(T) = 0.52 (X)		Directional Distribution:	47% ent.	53% exit.
(T) = 0.52 *	(114.0)	T = 59	Average Vehicle Trip Ends	
		28 entering	31 exiting	
		28 + 31 = 59		

### **Weekday (800 Series Page 584)**

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 6.30 (X)		T = 720	Average Vehicle Trip Ends	
(T) = 6.30 *	(114.0)	360 entering	360 exiting	
		360 + 360 = 720		

### **Saturday, Peak Hour of Generator (800 Series Page 590)**

Daily Weekday		Directional Distribution:	54% ent.	46% exit.
(T) = 1.10 (X)		T = 125	Average Vehicle Trip Ends	
(T) = 1.10 *	(114.0)	68 entering	57 exiting	
		68 + 57 = 125		

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North Phase 1)  
 Subject Trip Generation for High-Turnover (Sit-Down) Restaurant  
 Designed by TES Date June 24, 2020 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - High Turnover Sit-Down Restaurant (932)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **11,000** Square Feet

X = 11.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 97)**

Average Weekday	Directional Distribution:	55% ent.	45% exit.
T = 9.94 (X)	T = 109	Average Vehicle Trip Ends	
T = 9.94 * 11.000	60 entering	49	exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 98)**

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 9.77 (X)	T = 107	Average Vehicle Trip Ends	
T = 9.77 * 11.000	66 entering	41	exiting

### **Weekday (900 Series Page 96)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 112.18 (X)	T = 1234	Average Vehicle Trip Ends
T = 112.18 * 11.000	617 entering	617 exiting

### **P.M. Peak Hour of Generator (900 Series Page 100)**

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 17.41 (X)	T = 192	Average Vehicle Trip Ends	
T = 17.41 * 11.000	100 entering	92	exiting

### **Saturday Peak Hour of Generator (900 Series Page 105)**

Average Saturday	Directional Distribution:	51% ent.	49% exit.
T = 11.19 (X)	T = 124	Average Vehicle Trip Ends	
T = 11.19 * 11.000	63 entering	61	exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 207)**

AM Peak Hour = 57% Non-Pass By	PM Peak Hour = 57% Non-Pass By
IN Out Total	
AM Peak 34 28 62	
PM Peak 38 23 61	
Daily 352 352 704	PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 207)**

AM Peak Hour = 43% Pass By	PM Peak Hour = 43% Pass By
IN Out Total	
AM Peak 26 21 48	
PM Peak 28 18 46	
Daily 265 265 530	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North Phase 1)  
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **2,500** Square Feet

X = 2.500

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)**

Average Weekday	Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)	T = 100	Average Vehicle Trip Ends	
T = 40.19 * 2.500	51 entering	49	exiting
	51 + 49 =	100	

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)**

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)	T = 82	Average Vehicle Trip Ends	
T = 32.67 * 2.500	43 entering	39	exiting
	43 + 39 (*) =	82	

### **Weekday (900 Series page 157)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 470.95 (X)	T = 1178	Average Vehicle Trip Ends
T = 470.95 * 2.500	589 entering	589 exiting
	589 + 589 =	1178

### **Saturday Peak Hour of Generator (900 Series page 163)**

	Directional Distribution:	51% ent.	49% exit.
T = 54.86 (X)	T = 137	Average Vehicle Trip Ends	
T = 54.86 * 2.500	70 entering	67	exiting
	70 + 67 =	137	

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	26	25	51		
PM Peak	22	20	41		
Daily	295	295	590	PM Peak Hour Rate Applied to Daily	

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	25	24	49		
PM Peak	22	20	41		
Daily	294	294	588	PM Peak Hour Rate Applied to Daily	



Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North Phase 1)  
 Subject Trip Generation for Super Convenience Market/Gas Station  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Super Convenience Market/Gas Station (960)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **6,000** Square Feet

X = 6.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 404)**

		Directional Distribution:	50% ent.	50% exit.
T = 83.14 (X)		T = 499	Average Vehicle Trip Ends	
T = 83.14 *	6.000	249 entering	250 exiting	
		249 + 250 = 499		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 405)**

		Directional Distribution:	50% ent.	50% exit.
T = 69.28 (X)		T = 416	Average Vehicle Trip Ends	
T = 69.28 *	6.000	208 entering	208 exiting	
		208 + 208 = 416		

### **Weekday (800 Series page 335)**

Average Weekday		Directional Distribution:	50% entering, 50% exiting
T = 837.58 (X)		T = 5026	Average Vehicle Trip Ends
T = 837.58 *	6.000	2513 entering	2513 exiting
		2513 + 2513 = 5026	

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	* Utilized ITE 945 pass-by calculations
AM Peak 95 95 190	
PM Peak 92 92 183	
Daily 1106 1106 2212	PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 154 155 309	
PM Peak 116 116 233	
Daily 1407 1407 2814	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook-Reagan Ranch (Meadowbrook Park Phase 1)  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independent Variable - Dwelling Units (X)

$$X = 67$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 3)**

Average Weekday	Directional Distribution:	25% ent.	75% exit.
(T) = 0.71 (X) + 4.80	T = 52	Average Vehicle Trip Ends	
(T) = 0.71 * (67) + 4.80	13 entering	39 exiting	
	13 + 39 = 52		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 4)**

Average Weekday	Directional Distribution:	63% ent.	37% exit.
Ln(T) = 0.96 Ln(X) + 0.20	T = 69	Average Vehicle Trip Ends	
Ln(T) = 0.96 * Ln(67) + 0.20	43 entering	26 exiting	
	43 + 26 = 69		

### **Peak Hour of Generator, Saturday (200 Series Page 8)**

Average Saturday	Directional Distribution:	54% ent.	46% exit.
(T) = 0.84 (X) + 17.99	T = 74	Average Vehicle Trip Ends	
(T) = 0.84 * (67) + 17.99	40 entering	34 exiting	
	40 + 34 = 74		

### **Weekday (200 Series Page 2)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
Ln(T) = 0.92 Ln(X) + 2.71	T = 720	Average Vehicle Trip Ends
Ln(T) = 0.92 * Ln(67) + 2.71	360 entering	360 exiting
	360 + 360 = 720	

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use Phase 1)  
 Subject Trip Generation for Multifamily Housing (Mid-Rise)  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Multifamily Housing (Mid-Rise) (221)

Independent Variable - Dwelling Units (X)

$$X = 300$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 200 Page 74)**

$$\ln(T) = 0.98 \ln(X) - 0.98$$

$$\ln(T) = 0.98 * \ln(300.0) - 0.98$$

Directional Distribution: 26% ent. 74% exit.

T = 100 Average Vehicle Trip Ends

26 entering 74 exiting

$$26 + 74 = 100$$

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 200 Page 75)**

$$\ln(T) = 0.96 \ln(X) - 0.63$$

$$\ln(T) = 0.96 * \ln(300.0) - 0.63$$

Directional Distribution: 61% ent. 39% exit.

T = 127 Average Vehicle Trip Ends

77 entering 50 exiting

$$77 + 50 = 127$$

### **Weekday (Series 200 Page 73)**

$$(T) = 5.45(X) - 1.75$$

$$(T) = 5.45 * 300 - 1.75$$

Directional Distribution: 50% ent. 50% exit.

T = 1634 Average Vehicle Trip Ends

817 entering 817 exiting

$$817 + 817 = 1634$$

### **Peak Hour of Generator, Saturday (Series 200 Page 79)**

$$(T) = 0.42(X) + 6.73$$

$$(T) = 0.42 * 300 + 6.73$$

Directional Distribution: 49% ent. 51% exit.

T = 133 Average Vehicle Trip Ends

65 entering 68 exiting

$$65 + 68 = 133$$

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use Phase 1)  
 Subject Trip Generation for Shopping Center  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **10,000** Square Feet

X = 10.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 139)**

Directional Distribution: 62% ent. 38% exit.  
 T = 0.50 \* (X) + 151.78 T = 157 Average Vehicle Trip Ends  
 T = 0.50 \* 10 + 151.78 97 entering 60 exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 140)**

Directional Distribution: 48% ent. 52% exit.  
 Ln(T) = 0.74 Ln(X) + 2.89 T = 99 Average Vehicle Trip Ends  
 Ln(T) = 0.74 \* Ln(10) + 2.89 48 entering 51 exiting

### **Weekday (800 Series Page 138)**

Daily Weekday Directional Distribution: 50% entering, 50% exiting  
 Ln(T) = 0.68 Ln(X) + 5.57 T = 1256 Average Vehicle Trip Ends  
 Ln(T) = 0.68 \* Ln(10) + 5.57 628 entering 628 exiting

### **Saturday Peak Hour of Generator (Page 144)**

Average Saturday Directional Distribution: 52% ent. 48% exit.  
 Ln(T) = 0.79 Ln(X) + 2.79 T = 100 Average Vehicle Trip Ends  
 Ln(T) = 0.79 \* Ln(10) + 2.79 52 entering 48 exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 190)**

AM Peak Hour = 66% Non-Pass By	PM Peak Hour = 66% Non-Pass By
IN Out Total	
AM Peak 64 39 103	
PM Peak 32 34 65	
Daily 414 414 828	PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 190)**

AM Peak Hour = 34% Pass By	PM Peak Hour = 34% Pass By
IN Out Total	
AM Peak 33 20 54	
PM Peak 16 17 34	
Daily 214 214 428	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use Phase 1)  
 Subject Trip Generation for High-Turnover (Sit-Down) Restaurant  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - High Turnover Sit-Down Restaurant (932)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **4,000** Square Feet

X = 4.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 97)**

Average Weekday	Directional Distribution:	55% ent.	45% exit.
T = 9.94 (X)	T = 40	Average Vehicle Trip Ends	
T = 9.94 * 4.000	22 entering	18	exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 98)**

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 9.77 (X)	T = 39	Average Vehicle Trip Ends	
T = 9.77 * 4.000	24 entering	15	exiting

### **Weekday (900 Series Page 96)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 112.18 (X)	T = 450	Average Vehicle Trip Ends
T = 112.18 * 4.000	225 entering	225 exiting

### **P.M. Peak Hour of Generator (900 Series Page 100)**

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 17.41 (X)	T = 70	Average Vehicle Trip Ends	
T = 17.41 * 4.000	36 entering	34	exiting

### **Saturday Peak Hour of Generator (900 Series Page 105)**

Average Saturday	Directional Distribution:	51% ent.	49% exit.
T = 11.19 (X)	T = 46	Average Vehicle Trip Ends	
T = 11.19 * 4.000	23 entering	23	exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 207)**

AM Peak Hour =	57%	Non-Pass By	PM Peak Hour =	57%	Non-Pass By
	IN	Out	Total		
AM Peak	12	10	23		
PM Peak	14	8	22		
Daily	128	128	256		PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 207)**

AM Peak Hour =	43%	Pass By	PM Peak Hour =	43%	Pass By
	IN	Out	Total		
AM Peak	9	8	18		
PM Peak	10	6	17		
Daily	97	97	194		PM Peak Hour Rate Applied to Daily



Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use Phase 1)  
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **11,000** Square Feet

X = 11.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)**

Average Weekday	Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)	T = 442	Average Vehicle Trip Ends	
T = 40.19 * 11.000	225 entering	217	exiting
	225 + 217 =	442	

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)**

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)	T = 359	Average Vehicle Trip Ends	
T = 32.67 * 11.000	187 entering	172	exiting
	187 + 172 =	359	

### **Weekday (900 Series page 157)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 470.95 (X)	T = 5182	Average Vehicle Trip Ends
T = 470.95 * 11.000	2591 entering	2591 exiting
	2591 + 2591 =	5182

### **Saturday Peak Hour of Generator (900 Series page 163)**

T = 54.86 (X)	Directional Distribution:	51% ent.	49% exit.
T = 54.86 * 11.000	T = 603	Average Vehicle Trip Ends	
	308 entering	295	exiting
	308 (*) - 295 =	603	

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	115	111	225		
PM Peak	94	86	180		
Daily	1296	1296	2592	PM Peak Hour Rate Applied to Daily	

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	110	106	217		
PM Peak	94	86	180		
Daily	1295	1295	2590	PM Peak Hour Rate Applied to Daily	

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use Phase 1)  
 Subject Trip Generation for Coffee/Donut Shop with Drive Through  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Coffee/Donut Shop with Drive Through (937)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **2,500**

X = 2.5

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 900 Page 232)**

T = 88.99 (X)	Directional Distribution: 51% ent. 49% exit.
T = 88.99 * 2.5	T = 222 Average Vehicle Trip Ends
	113 entering 109 exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 900 Page 233)**

T = 43.38 (X)	Directional Distribution: 50% ent. 50% exit.
T = 43.38 * 2.5	T = 110 Average Vehicle Trip Ends
	55 entering 55 exiting

### **Weekday (Series 900 Page 231)**

Average Weekday	Directional Distribution: 50% entering, 50% exiting
(T) = 820.38 (X)	T = 2050 Average Vehicle Trip Ends
(T) = 820.38 * (2.5)	1025 entering 1025 exiting
	1025 + 1025 = 2050

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch NW Parcel Phase 1)  
Subject Trip Generation for Industrial Park  
Designed by JRP Date February 08, 2021 Job No. 096956015  
Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Industrial Park (130)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **220,000**

X = 220.0

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 22)**

		Directional Distribution:	81% ent.	19% exit.
T = 0.40 (X)		T = 88	Average Vehicle Trip Ends	
T = 0.40 *	220	71 entering	17	exiting
		71 + 17	= 88	

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 23)**

		Directional Distribution:	21% ent.	79% exit.
T = 0.40 (X)		T = 88	Average Vehicle Trip Ends	
T = 0.40 *	220	18 entering	70	exiting
		18 + 70	= 88	

### **Weekday (100 Series Page 21)**

		Directional Distribution:	50% entering, 50% exiting	
T = 3.37 (X)		T = 742	Average Vehicle Trip Ends	
T = 3.37 *	220	371 entering	371	exiting
		371 + 371	= 742	

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch NE Parcel Phase 1)  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independant Variable - Dwelling Units (X)

$$X = 125$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 3)**

Average Weekday	Directional Distribution:	25% ent.	75% exit.
(T) = 0.71 (X) + 4.80	T = 94	Average Vehicle Trip Ends	
(T) = 0.71 * (125) + 4.80	22 entering	71 exiting	
	22 + 72 = 94		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 4)**

Average Weekday	Directional Distribution:	63% ent.	37% exit.
Ln(T) = 0.96 Ln(X) + 0.20	T = 126	Average Vehicle Trip Ends	
Ln(T) = 0.96 * Ln(125) + 0.20	79 entering	47 exiting	
	79 + 47 = 126		

### **Peak Hour of Generator, Saturday (200 Series Page 8)**

Average Saturday	Directional Distribution:	54% ent.	46% exit.
(T) = 0.84 (X) + 17.99	T = 123	Average Vehicle Trip Ends	
(T) = 0.84 * (125) + 17.99	66 entering	57 exiting	
	66 + 57 = 123		

### **Weekday (200 Series Page 2)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
Ln(T) = 0.92 Ln(X) + 2.71	T = 1276	Average Vehicle Trip Ends
Ln(T) = 0.92 * Ln(125) + 2.71	638 entering	638 exiting
	638 + 638 = 1276	

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch NE Parcel Phase 1)  
 Subject Trip Generation for Shopping Center  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **30,000** Square Feet

X = 30.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 139)**

Directional Distribution: 62% ent. 38% exit.  
 $T = 0.50 * (X) + 151.78$   
 $T = 0.50 * 30 + 151.78$   
 $T = 167$  Average Vehicle Trip Ends  
 104 entering 63 exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 140)**

Directional Distribution: 48% ent. 52% exit.  
 $\ln(T) = 0.74 \ln(X) + 2.89$   
 $\ln(T) = 0.74 * \ln(30) + 2.89$   
 $T = 223$  Average Vehicle Trip Ends  
 107 entering 116 exiting

### **Weekday (800 Series Page 138)**

Daily Weekday  
 $\ln(T) = 0.68 \ln(X) + 5.57$   
 $\ln(T) = 0.68 * \ln(30) + 5.57$   
 $T = 2652$  Average Vehicle Trip Ends  
 1326 entering 1326 exiting

### **Saturday Peak Hour of Generator (Page 144)**

Average Saturday  
 $\ln(T) = 0.79 \ln(X) + 2.79$   
 $\ln(T) = 0.79 * \ln(30) + 2.79$   
 $T = 239$  Average Vehicle Trip Ends  
 124 entering 115 exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 190)**

AM Peak Hour =	66%	Non-Pass By	PM Peak Hour =	66%	Non-Pass By
	IN	Out		IN	Out
AM Peak	69	42		69	42
PM Peak	71	77		71	77
Daily	875	875		875	875
		1750			1750

PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 190)**

AM Peak Hour =	34%	Pass By	PM Peak Hour =	34%	Pass By
	IN	Out		IN	Out
AM Peak	35	21		35	21
PM Peak	36	39		36	39
Daily	451	451		451	451
		902			902

PM Peak Hour Rate Applied to Daily



Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch SE Parcel Phase 1)  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independent Variable - Dwelling Units (X)

$$X = 255$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 3)**

Average Weekday	Directional Distribution:	25% ent.	75% exit.
(T) = 0.71 (X) + 4.80	T = 186	Average Vehicle Trip Ends	
(T) = 0.71 * (255) + 4.80	45 entering	140	exiting
	45 + 141 = 186		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 4)**

Average Weekday	Directional Distribution:	63% ent.	37% exit.
Ln(T) = 0.96 Ln(X) + 0.20	T = 250	Average Vehicle Trip Ends	
Ln(T) = 0.96 * Ln(255) + 0.20	156 entering	93	exiting
	156 + 94 = 250		

### **Peak Hour of Generator, Saturday (200 Series Page 8)**

Average Saturday	Directional Distribution:	54% ent.	46% exit.
(T) = 0.84 (X) + 17.99	T = 232	Average Vehicle Trip Ends	
(T) = 0.84 * (255) + 17.99	125 entering	107	exiting
	125 + 107 = 232		

### **Weekday (200 Series Page 2)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
Ln(T) = 0.92 Ln(X) + 2.71	T = 2460	Average Vehicle Trip Ends
Ln(T) = 0.92 * Ln(255) + 2.71	1230 entering	1230 exiting
	1230 + 1230 = 2460	

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch SE Parcel Phase 1)  
 Subject Trip Generation for Multifamily Housing (Mid-Rise)  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Multifamily Housing (Mid-Rise) (221)

Independant Variable - Dwelling Units (X)

$$X = 360$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 200 Page 74)**

$\ln(T) = 0.98 \ln(X) - 0.98$ $\ln(T) = 0.98 * \ln(360.0) - 0.98$	Directional Distribution: 26% ent. 74% exit. T = 120 Average Vehicle Trip Ends 31 entering 89 exiting  31 + 89 = 120
---	--

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 200 Page 75)**

$\ln(T) = 0.96 \ln(X) - 0.63$ $\ln(T) = 0.96 * \ln(360.0) - 0.63$	Directional Distribution: 61% ent. 39% exit. T = 152 Average Vehicle Trip Ends 93 entering 59 exiting  93 + 59 = 152
---	--

### **Weekday (Series 200 Page 73)**

$(T) = 5.45*(X) - 1.75$ $(T) = 5.45 * 360 - 1.75$	Directional Distribution: 50% ent. 50% exit. T = 1962 Average Vehicle Trip Ends 981 entering 981 exiting  981 + 981 = 1962
---	--

### **Peak Hour of Generator, Saturday (Series 200 Page 79)**

$(T) = 0.42*(X) + 6.73$ $(T) = 0.42 * 360 + 6.73$	Directional Distribution: 49% ent. 51% exit. T = 158 Average Vehicle Trip Ends 77 entering 81 exiting  77 + 81 = 158
---	--

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch SE Parcel Phase 1)  
 Subject Trip Generation for Shopping Center  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **70,000** Square Feet

X = 70.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 139)**

Directional Distribution: 62% ent. 38% exit.  
 $T = 0.50 * (X) + 151.78$   
 $T = 0.50 * 70 + 151.78$   
 $T = 187$  Average Vehicle Trip Ends  
 116 entering 71 exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 140)**

Directional Distribution: 48% ent. 52% exit.  
 $\ln(T) = 0.74 \ln(X) + 2.89$   
 $\ln(T) = 0.74 * \ln(70) + 2.89$   
 $T = 417$  Average Vehicle Trip Ends  
 200 entering 217 exiting

### **Weekday (800 Series Page 138)**

Daily Weekday  
 $\ln(T) = 0.68 \ln(X) + 5.57$   
 $\ln(T) = 0.68 * \ln(70) + 5.57$   
 Directional Distribution: 50% entering, 50% exiting  
 $T = 4718$  Average Vehicle Trip Ends  
 2359 entering 2359 exiting

### **Saturday Peak Hour of Generator (Page 144)**

Average Saturday  
 $\ln(T) = 0.79 \ln(X) + 2.79$   
 $\ln(T) = 0.79 * \ln(70) + 2.79$   
 Directional Distribution: 52% ent. 48% exit.  
 $T = 467$  Average Vehicle Trip Ends  
 243 entering 224 exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 190)**

AM Peak Hour =	66%	Non-Pass By	PM Peak Hour =	66%	Non-Pass By
	IN	Out		IN	Out
AM Peak	76	47		76	47
PM Peak	132	143		132	143
Daily	1557	1557		1557	1557
		3114			3114

PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 190)**

AM Peak Hour =	34%	Pass By	PM Peak Hour =	34%	Pass By
	IN	Out		IN	Out
AM Peak	39	24		39	24
PM Peak	68	74		68	74
Daily	802	802		802	802
		1604			1604

PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North)  
 Subject Trip Generation - Public Park  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. 1 of 1

## TRIP GENERATION MANUAL TECHNIQUES

P

ITE Trip Generation Manual 10th Edition, Average Rate Equations  
 Land Use Code - Public Park (411)  
 Independent Variable - Acres (X)

Acres 20  
 $X = 20$   
 $T = \text{Average Vehicle Trip Ends}$

### Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 3)

Directional Distribution: 59% ent. 41% exit.  
 $(T) = 0.02 (X)$   
 $(T) = 0.02 * (20.0)$   
 $T = 0$  Average Vehicle Trip Ends  
 0 entering 0 exiting  
 0 + 0 = 0

### Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 4)

Directional Distribution: 55% ent. 45% exit.  
 $(T) = 0.11 (X)$   
 $(T) = 0.11 * (20.0)$   
 $T = 2$  Average Vehicle Trip Ends  
 1 entering 1 exiting  
 1 + 1 = 2

### Weekday (400 Series page 2)

Average Weekday  
 $T = 0.78 * (X)$   
 $T = 0.78 * 20$   
 Directional Distribution: 50% entering, 50% exiting  
 $T = 16$  Average Vehicle Trip Ends  
 8 entering 8 exiting  
 8 + 8 = 16

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North)  
 Subject Trip Generation for Movie Theater  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Movie Theater (444)

Independent Variable - Gross Floor Area

Gross Floor Area = **52,000** Square Feet

X = 52.0

T = Average Vehicle Trip Ends

### Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 111)

		Directional Distribution:	50% ent.	50% exit.
T = 0.22 (X)		T = 11	Average Vehicle Trip Ends	
T = 0.22 *	52	5 entering	6 exiting	
		5 (*) - 6 =	11	

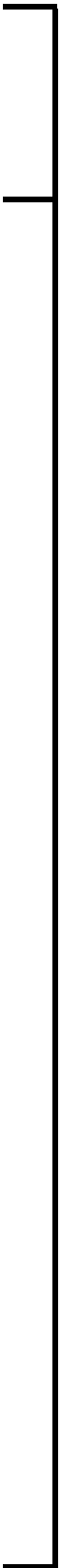
### Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 112)

		Directional Distribution:	94% ent.	6% exit.
T = 6.17 (X)		T = 321	Average Vehicle Trip Ends	
T = 6.17 *	52	302 entering	19 exiting	
		302 + 19 =	321	

### Weekday (400 Series Page 110)

Average Weekday		Directional Distribution:	50% entering, 50% exiting
T = 78.09 (X)		T = 4062	Average Vehicle Trip Ends
T = 78.09*	52	2031 entering	2031 exiting
		2031 + 2031 =	4062





Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North)  
 Subject Trip Generation for Tire Superstore  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Tire Superstore (849)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **7,000** Square Feet

X = 7.000

T = Average Vehicle Trip Ends

### Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 262)

		Directional Distribution:	65% ent.	35% exit.
T = 1.34 (X)		T = 9	Average Vehicle Trip Ends	
T = 1.34 *	7.000	6 entering	3	exiting
		6 + 3 =	9	

### Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 263)

		Directional Distribution:	47% ent.	53% exit.
T = 2.11 (X)		T = 15	Average Vehicle Trip Ends	
T = 2.11 *	7.000	7 entering	8	exiting
		7 + 8 =	15	

### Weekday (800 Series Page 261)

Average Weekday		Directional Distribution:	50% entering,	50% exiting
T = 20.37 (X)		T = 144	Average Vehicle Trip Ends	
T = 20.37*	7.000	72 entering	72	exiting
		72 + 72 =	144	

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North)  
 Subject Trip Generation for Home Improvements Superstore  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Home Improvement Superstore (862)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **127,000** Square Feet

X = 127.000

T = Average Vehicle Trip Ends

### Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 437)

		Directional Distribution:	57% ent.	43% exit.
T = 1.57 (X)		T =	199	Average Vehicle Trip Ends
T = 1.57 *	127.000	113	entering	86 exiting
		113	(*) · 86 =	199

### Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 438)

		Directional Distribution:	49% ent.	51% exit.
T = 2.33 (X)		T =	296	Average Vehicle Trip Ends
T = 2.33 *	127.000	145	entering	151 exiting
		145	+	151 = 296

### Weekday (800 Series Page 436)

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
T = 30.74 (X)		T =	3904 Average Vehicle Trip Ends	
T = 30.74* 127.000		1952	entering 1952 exiting	
		1952	+	1952 = 3904

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North)  
 Subject Trip Generation for Furniture Store  
 Designed by JRP Date ### February 08, 2021 Job No. 096956015  
 Checked by  Date  Sheet No.  of

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Furniture Store (890)

Independent Variable - 1000 Square Feet (X)

SF = **114,000**

X = 114.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 585)**

(T) = 0.26 (X)		Directional Distribution:	71% ent.	29% exit.
(T) = 0.26 *	(114.0)	T = 30	Average Vehicle Trip Ends	
		21 entering	9 exiting	
		21 + 9 = 30		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 586)**

(T) = 0.52 (X)		Directional Distribution:	47% ent.	53% exit.
(T) = 0.52 *	(114.0)	T = 59	Average Vehicle Trip Ends	
		28 entering	31 exiting	
		28 + 31 = 59		

### **Weekday (800 Series Page 584)**

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 6.30 (X)		T = 720	Average Vehicle Trip Ends	
(T) = 6.30 *	(114.0)	360 entering	360 exiting	
		360 + 360 = 720		

### **Saturday, Peak Hour of Generator (800 Series Page 590)**

Daily Weekday		Directional Distribution:	54% ent.	46% exit.
(T) = 1.10 (X)		T = 125	Average Vehicle Trip Ends	
(T) = 1.10 *	(114.0)	68 entering	57 exiting	
		68 + 57 = 125		

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North)  
 Subject Trip Generation for High-Turnover (Sit-Down) Restaurant  
 Designed by TES Date June 24, 2020 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - High Turnover Sit-Down Restaurant (932)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **11,000** Square Feet

X = 11.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 97)**

Average Weekday	Directional Distribution:	55% ent.	45% exit.
T = 9.94 (X)	T = 109	Average Vehicle Trip Ends	
T = 9.94 * 11.000	60 entering	49	exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 98)**

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 9.77 (X)	T = 107	Average Vehicle Trip Ends	
T = 9.77 * 11.000	66 entering	41	exiting

### **Weekday (900 Series Page 96)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 112.18 (X)	T = 1234	Average Vehicle Trip Ends
T = 112.18 * 11.000	617 entering	617 exiting

### **P.M. Peak Hour of Generator (900 Series Page 100)**

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 17.41 (X)	T = 192	Average Vehicle Trip Ends	
T = 17.41 * 11.000	100 entering	92	exiting

### **Saturday Peak Hour of Generator (900 Series Page 105)**

Average Saturday	Directional Distribution:	51% ent.	49% exit.
T = 11.19 (X)	T = 124	Average Vehicle Trip Ends	
T = 11.19 * 11.000	63 entering	61	exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 207)**

AM Peak Hour = 57% Non-Pass By	PM Peak Hour = 57% Non-Pass By
IN Out Total	
AM Peak 34 28 62	
PM Peak 38 23 61	
Daily 352 352 704	PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 207)**

AM Peak Hour = 43% Pass By	PM Peak Hour = 43% Pass By
IN Out Total	
AM Peak 26 21 48	
PM Peak 28 18 46	
Daily 265 265 530	PM Peak Hour Rate Applied to Daily



Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North)  
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **5,000** Square Feet

X = 5.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)**

Average Weekday  
 T = 40.19 (X)  
 T = 40.19 \* 5.000

Directional Distribution: 51% ent. 49% exit.  
 T = 201 Average Vehicle Trip Ends  
 103 entering 98 exiting  
 103 + 98 (\*) = 201

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)**

Average Weekday  
 T = 32.67 (X)  
 T = 32.67 \* 5.000

Directional Distribution: 52% ent. 48% exit.  
 T = 163 Average Vehicle Trip Ends  
 85 entering 78 exiting  
 85 + 78 = 163

### **Weekday (900 Series page 157)**

Average Weekday  
 T = 470.95 (X)  
 T = 470.95 \* 5.000

Directional Distribution: 50% entering, 50% exiting  
 T = 2356 Average Vehicle Trip Ends  
 1178 entering 1178 exiting  
 1178 + 1178 = 2356

### **Saturday Peak Hour of Generator (900 Series page 163)**

T = 54.86 (X)  
 T = 54.86 \* 5.000

Directional Distribution: 51% ent. 49% exit.  
 T = 274 Average Vehicle Trip Ends  
 140 entering 134 exiting  
 140 + 134 = 274

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	53	50	103		
PM Peak	43	39	82		
Daily	589	589	1178	PM Peak Hour Rate Applied to Daily	

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	50	48	98		
PM Peak	43	39	82		
Daily	589	589	1178	PM Peak Hour Rate Applied to Daily	

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads North)  
 Subject Trip Generation for Super Convenience Market/Gas Station  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Super Convenience Market/Gas Station (960)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **6,000** Square Feet

X = 6.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 404)**

		Directional Distribution:	50% ent.	50% exit.
T = 83.14 (X)		T = 499	Average Vehicle Trip Ends	
T = 83.14 *	6.000	249 entering	250 exiting	
		249 + 250 = 499		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 405)**

		Directional Distribution:	50% ent.	50% exit.
T = 69.28 (X)		T = 416	Average Vehicle Trip Ends	
T = 69.28 *	6.000	208 entering	208 exiting	
		208 + 208 = 416		

### **Weekday (800 Series page 335)**

Average Weekday		Directional Distribution:	50% entering, 50% exiting
T = 837.58 (X)		T = 5026	Average Vehicle Trip Ends
T = 837.58 *	6.000	2513 entering	2513 exiting
		2513 + 2513 = 5026	

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	* Utilized ITE 945 pass-by calculations
AM Peak 95 95 190	
PM Peak 92 92 183	
Daily 1106 1106 2212	PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 154 155 309	
PM Peak 116 116 233	
Daily 1407 1407 2814	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook-Reagan Ranch (Meadowbrook Park)  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independent Variable - Dwelling Units (X)

$$X = 67$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 3)**

Average Weekday	Directional Distribution:	25% ent.	75% exit.
(T) = 0.71 (X) + 4.80	T = 52	Average Vehicle Trip Ends	
(T) = 0.71 * (67) + 4.80	13 entering	39 exiting	
	13 + 39 = 52		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 4)**

Average Weekday	Directional Distribution:	63% ent.	37% exit.
Ln(T) = 0.96 Ln(X) + 0.20	T = 69	Average Vehicle Trip Ends	
Ln(T) = 0.96 * Ln(67) + 0.20	43 entering	26 exiting	
	43 + 26 = 69		

### **Peak Hour of Generator, Saturday (200 Series Page 8)**

Average Saturday	Directional Distribution:	54% ent.	46% exit.
(T) = 0.84 (X) + 17.99	T = 74	Average Vehicle Trip Ends	
(T) = 0.84 * (67) + 17.99	40 entering	34 exiting	
	40 + 34 = 74		

### **Weekday (200 Series Page 2)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
Ln(T) = 0.92 Ln(X) + 2.71	T = 720	Average Vehicle Trip Ends
Ln(T) = 0.92 * Ln(67) + 2.71	360 entering	360 exiting
	360 + 360 = 720	

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use)  
 Subject Trip Generation for Multifamily Housing (Mid-Rise)  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Multifamily Housing (Mid-Rise) (221)

Independant Variable - Dwelling Units (X)

$$X = 300$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 200 Page 74)**

$$\ln(T) = 0.98 \ln(X) - 0.98$$

$$\ln(T) = 0.98 * \ln(300.0) - 0.98$$

Directional Distribution: 26% ent. 74% exit.

T = 100 Average Vehicle Trip Ends

26 entering 74 exiting

$$26 + 74 = 100$$

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 200 Page 75)**

$$\ln(T) = 0.96 \ln(X) - 0.63$$

$$\ln(T) = 0.96 * \ln(300.0) - 0.63$$

Directional Distribution: 61% ent. 39% exit.

T = 127 Average Vehicle Trip Ends

77 entering 50 exiting

$$77 + 50 = 127$$

### **Weekday (Series 200 Page 73)**

$$(T) = 5.45*(X) - 1.75$$

$$(T) = 5.45 * 300 - 1.75$$

Directional Distribution: 50% ent. 50% exit.

T = 1634 Average Vehicle Trip Ends

817 entering 817 exiting

$$817 + 817 = 1634$$

### **Peak Hour of Generator, Saturday (Series 200 Page 79)**

$$(T) = 0.42*(X) + 6.73$$

$$(T) = 0.42 * 300 + 6.73$$

Directional Distribution: 49% ent. 51% exit.

T = 133 Average Vehicle Trip Ends

65 entering 68 exiting

$$65 + 68 = 133$$

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use)  
 Subject Trip Generation for Shopping Center  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **10,000** Square Feet

X = 10.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 139)**

Directional Distribution: 62% ent. 38% exit.  
 $T = 0.50 * (X) + 151.78$   
 $T = 0.50 * 10 + 151.78$   
 $T = 157$  Average Vehicle Trip Ends  
 97 entering 60 exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 140)**

Directional Distribution: 48% ent. 52% exit.  
 $\ln(T) = 0.74 \ln(X) + 2.89$   
 $\ln(T) = 0.74 * \ln(10) + 2.89$   
 $T = 99$  Average Vehicle Trip Ends  
 48 entering 51 exiting

### **Weekday (800 Series Page 138)**

Daily Weekday  
 $\ln(T) = 0.68 \ln(X) + 5.57$   
 $\ln(T) = 0.68 * \ln(10) + 5.57$   
 Directional Distribution: 50% entering, 50% exiting  
 $T = 1256$  Average Vehicle Trip Ends  
 628 entering 628 exiting

### **Saturday Peak Hour of Generator (Page 144)**

Average Saturday  
 $\ln(T) = 0.79 \ln(X) + 2.79$   
 $\ln(T) = 0.79 * \ln(10) + 2.79$   
 Directional Distribution: 52% ent. 48% exit.  
 $T = 100$  Average Vehicle Trip Ends  
 52 entering 48 exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 190)**

AM Peak Hour =	66%	Non-Pass By	PM Peak Hour =	66%	Non-Pass By
	IN	Out	Total		
AM Peak	64	39	103		
PM Peak	32	34	65		
Daily	414	414	828	PM Peak Hour Rate Applied to Daily	

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 190)**

AM Peak Hour =	34%	Pass By	PM Peak Hour =	34%	Pass By
	IN	Out	Total		
AM Peak	33	20	54		
PM Peak	16	17	34		
Daily	214	214	428	PM Peak Hour Rate Applied to Daily	



Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use)  
 Subject Trip Generation for Pharmacy/Drugstore with Drive-Through Window  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Pharmacy/Drugstore with Drive-Through Window (881)

Independant Variable - 1000 Sq. Feet Gross Floor Area (X)

SF= **14000**

X = 14.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page Series 800 Page 562)**

Average Weekday	Directional Distribution:	53% ent.	47% exit.
T = 3.84 (X)	T = 54	Average Vehicle Trip Ends	
(T) = 3.84* (14.0)	29 entering	25 exiting	
	29 + 25 = 54		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 800 page 563)**

Average Weekday	Directional Distribution:	50% ent.	50% exit.
T = 10.29 (X)	T = 144	Average Vehicle Trip Ends	
(T) = 10.29 * (14.0)	72 entering	72 exiting	
	72 + 72 = 144		

### **Weekday (Series 800 page 561)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 109.16 (X)	T = 1528	Average Vehicle Trip Ends
(T) = 109.16 * (14.0)	764 entering	764 exiting
	764 + 764 = 1528	

### **Saturday Peak Hour of Generator (page 1807)**

T = 8.20 (X)	Directional Distribution:	49% ent.	51% exit.
(T) = 8.20 * (14.0)	T = 115	Average Vehicle Trip Ends	
	56 entering	59 exiting	
	56 + 59 = 115		

### **Non-Pass-by Trip Volumes (page 63, ITE Trip Generation Handbook, December 2012)**

PM Average Pass By Percentage:	51%	Pass By
	IN	Out
AM Peak	15	13
PM Peak	37	37
Daily	390	390
Saturday	29	30
	Total	
	28	
	73	
	780	
	59	

PM Rate Applied to AM Peak  
 PM Rate Applied to Daily  
 PM Rate Applied to Saturday

### **Pass-by Trip Volumes (page 63, ITE Trip Generation Handbook, December 2012)**

PM Average Pass By Percentage:	49%	Pass By
	IN	Out
AM Peak	14	12
PM Peak	35	35
Daily	374	374
Saturday	27	29
	Total	
	26	
	71	
	750	
	56	

PM Rate Applied to AM Peak  
 PM Rate Applied to Daily  
 PM Rate Applied to Saturday

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use)  
 Subject Trip Generation for High-Turnover (Sit-Down) Restaurant  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - High Turnover Sit-Down Restaurant (932)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **8,000** Square Feet

X = 8.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 97)**

Average Weekday	Directional Distribution:	55% ent.	45% exit.
T = 9.94 (X)	T = 80	Average Vehicle Trip Ends	
T = 9.94 * 8.000	44 entering	36	exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 98)**

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 9.77 (X)	T = 78	Average Vehicle Trip Ends	
T = 9.77 * 8.000	48 entering	30	exiting

### **Weekday (900 Series Page 96)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 112.18 (X)	T = 898	Average Vehicle Trip Ends
T = 112.18 * 8.000	449 entering	449 exiting

### **P.M. Peak Hour of Generator (900 Series Page 100)**

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 17.41 (X)	T = 139	Average Vehicle Trip Ends	
T = 17.41 * 8.000	72 entering	67	exiting

### **Saturday Peak Hour of Generator (900 Series Page 105)**

Average Saturday	Directional Distribution:	51% ent.	49% exit.
T = 11.19 (X)	T = 90	Average Vehicle Trip Ends	
T = 11.19 * 8.000	46 entering	44	exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 207)**

AM Peak Hour =	57%	Non-Pass By	PM Peak Hour =	57%	Non-Pass By
	IN	Out	Total		
AM Peak	25	20	45		
PM Peak	28	17	45		
Daily	256	256	512		

PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 207)**

AM Peak Hour =	43%	Pass By	PM Peak Hour =	43%	Pass By
	IN	Out	Total		
AM Peak	19	15	35		
PM Peak	21	13	34		
Daily	193	193	386		

PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use)  
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **11,000** Square Feet Fast

X = 11.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)**

Average Weekday	Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)	T = 442	Average Vehicle Trip Ends	
T = 40.19 * 11.000	225 entering	217	exiting
	225 + 217 =	442	

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)**

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)	T = 359	Average Vehicle Trip Ends	
T = 32.67 * 11.000	187 entering	172	exiting
	187 + 172 =	359	

### **Weekday (900 Series page 157)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 470.95 (X)	T = 5182	Average Vehicle Trip Ends
T = 470.95 * 11.000	2591 entering	2591 exiting
	2591 + 2591 =	5182

### **Saturday Peak Hour of Generator (900 Series page 163)**

	Directional Distribution:	51% ent.	49% exit.
T = 54.86 (X)	T = 603	Average Vehicle Trip Ends	
T = 54.86 * 11.000	308 entering	295	exiting
	308 (*) - 295 =	603	

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	115	111	225		
PM Peak	94	86	180		
Daily	1296	1296	2592	PM Peak Hour Rate Applied to Daily	

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)**

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	110	106	217		
PM Peak	94	86	180		
Daily	1295	1295	2590	PM Peak Hour Rate Applied to Daily	

Project Crossroads-Meadowbrook-Reagan Ranch (Crossroads Mix Use)  
 Subject Trip Generation for Coffee/Donut Shop with Drive Through  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Coffee/Donut Shop with Drive Through (937)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **2,500**

X = 2.5

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 900 Page 232)**

T = 88.99 (X)	Directional Distribution: 51% ent. 49% exit.
T = 88.99 * 2.5	T = 222 Average Vehicle Trip Ends
	113 entering 109 exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 900 Page 233)**

T = 43.38 (X)	Directional Distribution: 50% ent. 50% exit.
T = 43.38 * 2.5	T = 110 Average Vehicle Trip Ends
	55 entering 55 exiting

### **Weekday (Series 900 Page 231)**

Average Weekday	Directional Distribution: 50% entering, 50% exiting
(T) = 820.38 (X)	T = 2050 Average Vehicle Trip Ends
(T) = 820.38 * (2.5)	1025 entering 1025 exiting
	1025 + 1025 = 2050

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch NW Parcel)  
Subject Trip Generation for Industrial Park  
Designed by JRP Date February 08, 2021 Job No. 096956015  
Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Industrial Park (130)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **365,000**

X = 365.0

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 22)**

T = 0.40 (X)		Directional Distribution:	81% ent.	19% exit.
T = 0.40 *	365	T =	146	Average Vehicle Trip Ends
		118 entering	28 exiting	
		118 + 28	=	146

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 23)**

T = 0.40 (X)		Directional Distribution:	21% ent.	79% exit.
T = 0.40 *	365	T =	146	Average Vehicle Trip Ends
		31 entering	115 exiting	
		31 + 115	=	146

### **Weekday (100 Series Page 21)**

T = 3.37 (X)		Directional Distribution:	50% entering, 50% exiting
T = 3.37 *	365	T =	1232
		616 entering	616 exiting
		616 + 616	= 1232



Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch NE Parcel)  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independent Variable - Dwelling Units (X)

$$X = 200$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 3)**

Average Weekday	Directional Distribution:	25% ent.	75% exit.
$(T) = 0.71 (X) + 4.80$	T = 147	Average Vehicle Trip Ends	
$(T) = 0.71 * (200) + 4.80$	37 entering	110	exiting
	37 + 110 = 147		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 4)**

Average Weekday	Directional Distribution:	63% ent.	37% exit.
$\ln(T) = 0.96 \ln(X) + 0.20$	T = 198	Average Vehicle Trip Ends	
$\ln(T) = 0.96 * \ln(200) + 0.20$	125 entering	73	exiting
	125 + 73 = 198		

### **Peak Hour of Generator, Saturday (200 Series Page 8)**

Average Saturday	Directional Distribution:	54% ent.	46% exit.
$(T) = 0.84 (X) + 17.99$	T = 186	Average Vehicle Trip Ends	
$(T) = 0.84 * (200) + 17.99$	100 entering	86	exiting
	100 + 86 = 186		

### **Weekday (200 Series Page 2)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
$\ln(T) = 0.92 \ln(X) + 2.71$	T = 1968	Average Vehicle Trip Ends
$\ln(T) = 0.92 * \ln(200) + 2.71$	984 entering	984 exiting
	984 + 984 = 1968	

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch NE Parcel)  
 Subject Trip Generation for Shopping Center  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **175,000** Square Feet

X = 175.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 139)**

Directional Distribution: 62% ent. 38% exit.  
 T = 0.50 \* (X) + 151.78  
 T = 0.50 \* 175 + 151.78  
 T = 239 Average Vehicle Trip Ends  
 148 entering 91 exiting

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 140)**

Directional Distribution: 48% ent. 52% exit.  
 Ln(T) = 0.74 Ln(X) + 2.89  
 Ln(T) = 0.74 \* Ln(175) + 2.89  
 T = 822 Average Vehicle Trip Ends  
 395 entering 427 exiting

### **Weekday (800 Series Page 138)**

Daily Weekday  
 Ln(T) = 0.68 Ln(X) + 5.57  
 Ln(T) = 0.68 \* Ln(175) + 5.57  
 Directional Distribution: 50% entering, 50% exiting  
 T = 8796 Average Vehicle Trip Ends  
 4398 entering 4398 exiting

### **Saturday Peak Hour of Generator (Page 144)**

Average Saturday  
 Ln(T) = 0.79 Ln(X) + 2.79  
 Ln(T) = 0.79 \* Ln(175) + 2.79  
 Directional Distribution: 52% ent. 48% exit.  
 T = 963 Average Vehicle Trip Ends  
 501 entering 462 exiting

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 190)**

AM Peak Hour =	66%	Non-Pass By	PM Peak Hour =	66%	Non-Pass By
	IN	Out		IN	Out
AM Peak	98	60		98	60
PM Peak	261	282		261	282
Daily	2903	2903		2903	2903
		5806			5806

PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 190)**

AM Peak Hour =	34%	Pass By	PM Peak Hour =	34%	Pass By
	IN	Out		IN	Out
AM Peak	50	31		50	31
PM Peak	134	145		134	145
Daily	1495	1495		1495	1495

PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch SE Parcel)  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independant Variable - Dwelling Units (X)

$$X = 393$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 3)**

Average Weekday	Directional Distribution:	25% ent.	75% exit.
$(T) = 0.71 (X) + 4.80$	T = 284	Average Vehicle Trip Ends	
$(T) = 0.71 * (393) + 4.80$	71 entering	213	exiting
	71 + 213 = 284		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 4)**

Average Weekday	Directional Distribution:	63% ent.	37% exit.
$\ln(T) = 0.96 \ln(X) + 0.20$	T = 378	Average Vehicle Trip Ends	
$\ln(T) = 0.96 * \ln(393) + 0.20$	238 entering	140	exiting
	238 + 140 = 378		

### **Peak Hour of Generator, Saturday (200 Series Page 8)**

Average Saturday	Directional Distribution:	54% ent.	46% exit.
$(T) = 0.84 (X) + 17.99$	T = 348	Average Vehicle Trip Ends	
$(T) = 0.84 * (393) + 17.99$	188 entering	160	exiting
	188 + 160 = 348		

### **Weekday (200 Series Page 2)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
$\ln(T) = 0.92 \ln(X) + 2.71$	T = 3662	Average Vehicle Trip Ends
$\ln(T) = 0.92 * \ln(393) + 2.71$	1831 entering	1831 exiting
	1831 + 1831 = 3662	

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch SE Parcel)  
 Subject Trip Generation for Multifamily Housing (Mid-Rise)  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Multifamily Housing (Mid-Rise) (221)

Independant Variable - Dwelling Units (X)

$$X = 360$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 200 Page 74)**

$\ln(T) = 0.98 \ln(X) - 0.98$ $\ln(T) = 0.98 * \ln(360.0) - 0.98$	Directional Distribution: 26% ent. 74% exit. T = 120 Average Vehicle Trip Ends 31 entering 89 exiting  31 + 89 = 120
---	--

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 200 Page 75)**

$\ln(T) = 0.96 \ln(X) - 0.63$ $\ln(T) = 0.96 * \ln(360.0) - 0.63$	Directional Distribution: 61% ent. 39% exit. T = 152 Average Vehicle Trip Ends 93 entering 59 exiting  93 + 59 = 152
---	--

### **Weekday (Series 200 Page 73)**

$(T) = 5.45*(X) - 1.75$ $(T) = 5.45 * 360 - 1.75$	Directional Distribution: 50% ent. 50% exit. T = 1962 Average Vehicle Trip Ends 981 entering 981 exiting  981 + 981 = 1962
---	--

### **Peak Hour of Generator, Saturday (Series 200 Page 79)**

$(T) = 0.42*(X) + 6.73$ $(T) = 0.42 * 360 + 6.73$	Directional Distribution: 49% ent. 51% exit. T = 158 Average Vehicle Trip Ends 77 entering 81 exiting  77 + 81 = 158
---	--

Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch SE Parcel)  
 Subject Trip Generation for Office Building (South Parcel)  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - General Office Building (710)

Independent Variable - 1000 Square Feet (X)

SF = **100,000**

X = 100.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 4)**

$T = 0.94 (X) + 26.49$ $T = 0.94 * (100.0) + 26.49$	Directional Distribution: 86% ent. 14% exit. T = 120 Average Vehicle Trip Ends 103 entering 17 exiting  103 + 17 = 120
--	--

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 5)**

$\ln(T) = 0.95 \ln(X) + 0.36$ $\ln(T) = 0.95 * \ln(100.0) + 0.36$	Directional Distribution: 16% ent. 84% exit. T = 114 Average Vehicle Trip Ends 18 entering 96 exiting  18 + 96 = 114
--	--

### **Weekday (700 Series Page 3)**

Average Weekday $\ln(T) = 0.97 \ln(X) + 2.50$ $\ln(T) = 0.97 * \ln(100.0) + 2.50$	Directional Distribution: 50% entering, 50% exiting T = 1062 Average Vehicle Trip Ends 531 entering 531 exiting  531 + 531 = 1062
---	---



Project Crossroads-Meadowbrook-Reagan Ranch (Reagan Ranch SE Parcel)  
 Subject Trip Generation for Shopping Center  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **350,000** Square Feet

X = 350.000

T = Average Vehicle Trip Ends

### Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 139)

Directional Distribution: 62% ent. 38% exit.  
 $T = 0.50 * (X) + 151.78$   
 $T = 0.50 * 350 + 151.78$   
 $T = 327$  Average Vehicle Trip Ends  
 203 entering 124 exiting

### Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 140)

Directional Distribution: 48% ent. 52% exit.  
 $\ln(T) = 0.74 \ln(X) + 2.89$   
 $\ln(T) = 0.74 * \ln(350) + 2.89$   
 $T = 1373$  Average Vehicle Trip Ends  
 659 entering 714 exiting

### Weekday (800 Series Page 138)

Daily Weekday  
 $\ln(T) = 0.68 \ln(X) + 5.57$   
 $\ln(T) = 0.68 * \ln(350) + 5.57$   
 $T = 14092$  Average Vehicle Trip Ends  
 7046 entering 7046 exiting

### Saturday Peak Hour of Generator (Page 144)

Average Saturday  
 $\ln(T) = 0.79 \ln(X) + 2.79$   
 $\ln(T) = 0.79 * \ln(350) + 2.79$   
 $T = 1665$  Average Vehicle Trip Ends  
 866 entering 799 exiting

### Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 190)

AM Peak Hour =	66%	Non-Pass By	PM Peak Hour =	66%	Non-Pass By
	IN	Out		IN	Out
AM Peak	134	82		134	82
PM Peak	435	471		435	471
Daily	4650	4650		4650	4650
		9300			9300

PM Peak Hour Rate Applied to Daily

### Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 190)

AM Peak Hour =	34%	Pass By	PM Peak Hour =	34%	Pass By
	IN	Out		IN	Out
AM Peak	69	42		69	42
PM Peak	224	243		224	243
Daily	2396	2396		2396	2396

PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook-Reagan Ranch (East of Reagan Ranch 2040 Background Parcel)  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by JRP Date February 08, 2021 Job No. 096956015  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independant Variable - Dwelling Units (X)

$$X = 1,123$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 3)**

Average Weekday	Directional Distribution:	25% ent.	75% exit.
(T) = 0.71 (X) + 4.80	T = 802	Average Vehicle Trip Ends	
(T) = 0.71 * (1123) + 4.80	201 entering	602	exiting
	201 + 601 = 802		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 4)**

Average Weekday	Directional Distribution:	63% ent.	37% exit.
Ln(T) = 0.96 Ln(X) + 0.20	T = 1036	Average Vehicle Trip Ends	
Ln(T) = 0.96 * Ln(1123) + 0.20	653 entering	383	exiting
	653 + 383 = 1036		

### **Peak Hour of Generator, Saturday (200 Series Page 8)**

Average Saturday	Directional Distribution:	54% ent.	46% exit.
(T) = 0.84 (X) + 17.99	T = 961	Average Vehicle Trip Ends	
(T) = 0.84 * (1123) + 17.99	519 entering	442	exiting
	519 + 442 = 961		

### **Weekday (200 Series Page 2)**

Average Weekday	Directional Distribution:	50% entering, 50% exiting
Ln(T) = 0.92 Ln(X) + 2.71	T = 9622	Average Vehicle Trip Ends
Ln(T) = 0.92 * Ln(1123) + 2.71	4811 entering	4811 exiting
	4811 + 4811 = 9622	

# APPENDIX D

























## Intersection Analysis Worksheets

# Timings

2020 Adjusted Existing AM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	5	35	36	19	26	27	768	16	8	1389	170
Future Volume (vph)	105	5	35	36	19	26	27	768	16	8	1389	170
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	11.0	41.5	41.5	11.0	41.5	41.5	67.5	67.5	67.5	67.5	67.5	67.5
Total Split (%)	9.2%	34.6%	34.6%	9.2%	34.6%	34.6%	56.3%	56.3%	56.3%	56.3%	56.3%	56.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	6.0	7.3	7.3	10.1	6.9	6.9	94.6	94.6	94.6	94.6	94.6	94.6
Actuated g/C Ratio	0.05	0.06	0.06	0.08	0.06	0.06	0.79	0.79	0.79	0.79	0.79	0.79
v/c Ratio	0.69	0.05	0.22	0.27	0.19	0.16	0.13	0.30	0.01	0.02	0.54	0.14
Control Delay	77.9	53.0	3.0	50.0	57.4	2.1	14.8	15.4	2.8	4.2	6.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	53.0	3.0	50.0	57.4	2.1	14.8	15.4	2.8	4.2	6.3	0.9
LOS	E	D	A	D	E	A	B	B	A	A	A	A
Approach Delay		59.1			36.5			15.2			5.7	
Approach LOS		E			D			B			A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 12.6













Intersection LOS: B

Intersection Capacity Utilization 60.9%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway
























					
Ø2 (R)			Ø3		Ø4
67.5 s			11 s		41.5 s
					
Ø6 (R)			Ø7		Ø8
67.5 s			11 s		41.5 s

# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2020 Adjusted Existing AM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	5	35	36	19	26	27	768	16	8	1389	170
Future Volume (veh/h)	105	5	35	36	19	26	27	768	16	8	1389	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	109	5	36	38	20	27	28	800	17	8	1447	177
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	157	97	82	169	77	65	239	2624	1170	512	2645	1180
Arrive On Green	0.05	0.06	0.06	0.03	0.04	0.04	0.77	0.77	0.77	0.77	0.77	0.77
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	298	3413	1522	648	3441	1535
Grp Volume(v), veh/h	109	5	36	38	20	27	28	800	17	8	1447	177
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	298	1706	1522	648	1721	1535
Q Serve(g_s), s	4.0	0.3	2.8	2.4	1.2	2.0	5.0	8.5	0.3	0.5	20.1	3.6
Cycle Q Clear(g_c), s	4.0	0.3	2.8	2.4	1.2	2.0	25.1	8.5	0.3	8.9	20.1	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	97	82	169	77	65	239	2624	1170	512	2645	1180
V/C Ratio(X)	0.69	0.05	0.44	0.22	0.26	0.42	0.12	0.30	0.01	0.02	0.55	0.15
Avail Cap(c_a), veh/h	162	533	452	198	561	476	239	2624	1170	512	2645	1180
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.72	0.72	0.72	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.2	53.7	54.9	52.9	55.8	56.1	10.5	4.2	3.2	5.5	5.5	3.6
Incr Delay (d2), s/veh	11.7	0.2	3.6	0.7	1.8	4.2	0.7	0.2	0.0	0.1	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.1	1.1	1.1	0.6	0.9	0.4	2.6	0.1	0.1	6.3	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.9	53.9	58.5	53.6	57.5	60.3	11.3	4.4	3.3	5.6	6.4	3.9
LnGrp LOS	E	D	E	D	E	E	B	A	A	A	A	A
Approach Vol, veh/h	150			85			845			1632		
Approach Delay, s/veh	65.2			56.6			4.6			6.1		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	98.8			9.1			12.2			98.8		
Change Period (Y+Rc), s	6.5			5.5			* 5.5			6.5		
Max Green Setting (Gmax), s	61.0			5.5			* 37			61.0		
Max Q Clear Time (g_c+I1), s	27.1			4.4			4.8			22.1		
Green Ext Time (p_c), s	7.6			0.0			0.1			17.0		
Intersection Summary												
HCM 6th Ctrl Delay			10.5									
HCM 6th LOS			B									
Notes												

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



























# Timings

2020 Adjusted Existing PM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	11	50	19	12	34	42	1432	73	41	949	131
Future Volume (vph)	177	11	50	19	12	34	42	1432	73	41	949	131
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	12.0	42.5	42.5	11.0	41.5	41.5	66.5	66.5	66.5	66.5	66.5	66.5
Total Split (%)	10.0%	35.4%	35.4%	9.2%	34.6%	34.6%	55.4%	55.4%	55.4%	55.4%	55.4%	55.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	7.0	12.3	12.3	10.8	6.4	6.4	91.8	91.8	91.8	91.8	91.8	91.8
Actuated g/C Ratio	0.06	0.10	0.10	0.09	0.05	0.05	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.95	0.06	0.23	0.14	0.13	0.23	0.12	0.57	0.06	0.24	0.38	0.12
Control Delay	108.3	51.1	6.9	45.5	56.5	3.3	8.0	14.0	3.6	8.9	5.6	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.3	51.1	6.9	45.5	56.5	3.3	8.0	14.0	3.6	8.9	5.6	0.9
LOS	F	D	A	D	E	A	A	B	A	A	A	A
Approach Delay		84.3			25.2			13.4			5.2	
Approach LOS		F			C			B			A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 63.0%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway



























					
Ø2 (R)			Ø3		Ø4
66.5 s			11 s		42.5 s
					
Ø6 (R)			Ø7		Ø8
66.5 s			12 s		41.5 s

# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2020 Adjusted Existing PM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	177	11	50	19	12	34	42	1432	73	41	949	131
Future Volume (veh/h)	177	11	50	19	12	34	42	1432	73	41	949	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	190	12	54	20	13	37	45	1540	78	44	1020	141
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	202	140	119	151	77	65	379	2696	1203	237	2654	1184
Arrive On Green	0.06	0.08	0.08	0.02	0.04	0.04	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	484	3554	1585	307	3497	1560
Grp Volume(v), veh/h	190	12	54	20	13	37	45	1540	78	44	1020	141
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	484	1777	1585	307	1749	1560
Q Serve(g_s), s	6.6	0.7	3.9	1.3	0.8	2.7	4.2	22.1	1.5	8.5	11.9	2.9
Cycle Q Clear(g_c), s	6.6	0.7	3.9	1.3	0.8	2.7	16.1	22.1	1.5	30.7	11.9	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	202	140	119	151	77	65	379	2696	1203	237	2654	1184
V/C Ratio(X)	0.94	0.09	0.45	0.13	0.17	0.57	0.12	0.57	0.06	0.19	0.38	0.12
Avail Cap(c_a), veh/h	202	584	495	197	561	476	379	2696	1203	237	2654	1184
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.39	0.39	0.39	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.3	51.7	53.1	53.4	55.5	56.5	7.7	6.2	3.7	12.7	4.9	3.8
Incr Delay (d2), s/veh	47.2	0.3	2.7	0.4	1.0	7.5	0.2	0.3	0.0	1.7	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.3	1.7	0.6	0.4	1.2	0.4	7.1	0.4	0.7	3.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	103.5	51.9	55.8	53.8	56.6	64.0	7.9	6.5	3.7	14.4	5.4	4.0
LnGrp LOS	F	D	E	D	E	E	A	A	A	B	A	A
Approach Vol, veh/h	256		70				1663			1205		
Approach Delay, s/veh	91.0		59.7				6.4			5.5		
Approach LOS	F		E				A			A		
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	97.6		7.9		14.5		97.6		12.0		10.4	
Change Period (Y+Rc), s	6.5		5.5		* 5.5		6.5		5.0		5.5	
Max Green Setting (Gmax), s	60.0		5.5		* 38		60.0		7.0		36.0	
Max Q Clear Time (g_c+I1), s	24.1		3.3		5.9		32.7		8.6		4.7	
Green Ext Time (p_c), s	18.0		0.0		0.2		10.4		0.0		0.1	
Intersection Summary												
HCM 6th Ctrl Delay	14.0											
HCM 6th LOS	B											
Notes												

























\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Timings

2026 Background AM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	10	40	40	25	30	30	825	20	10	1490	185
Future Volume (vph)	115	10	40	40	25	30	30	825	20	10	1490	185
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	11.0	41.5	41.5	11.0	41.5	41.5	67.5	67.5	67.5	67.5	67.5	67.5
Total Split (%)	9.2%	34.6%	34.6%	9.2%	34.6%	34.6%	56.3%	56.3%	56.3%	56.3%	56.3%	56.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	6.0	7.7	7.7	11.6	7.2	7.2	92.0	92.0	92.0	92.0	92.0	92.0
Actuated g/C Ratio	0.05	0.06	0.06	0.10	0.06	0.06	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.75	0.09	0.25	0.28	0.23	0.18	0.17	0.33	0.02	0.02	0.59	0.16
Control Delay	84.4	53.6	4.8	48.5	58.1	2.3	17.7	17.2	3.0	4.4	7.8	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.4	53.6	4.8	48.5	58.1	2.3	17.7	17.2	3.0	4.4	7.8	0.9
LOS	F	D	A	D	E	A	B	B	A	A	A	A
Approach Delay		63.2			36.5			16.8			7.0	
Approach LOS		E			D			B			A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 14.3













Intersection LOS: B

Intersection Capacity Utilization 63.7%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway
























					
Ø2 (R)			Ø3		Ø4
67.5 s			11 s		41.5 s
					
Ø6 (R)			Ø7		Ø8
67.5 s			11 s		41.5 s

# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2026 Background AM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	10	40	40	25	30	30	825	20	10	1490	185
Future Volume (veh/h)	115	10	40	40	25	30	30	825	20	10	1490	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	120	10	42	42	26	31	31	859	21	10	1552	193
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	162	98	83	172	77	66	213	2617	1167	480	2639	1177
Arrive On Green	0.05	0.06	0.06	0.03	0.04	0.04	0.77	0.77	0.77	0.77	0.77	0.77
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	265	3413	1522	611	3441	1535
Grp Volume(v), veh/h	120	10	42	42	26	31	31	859	21	10	1552	193
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	265	1706	1522	611	1721	1535
Q Serve(g_s), s	4.4	0.7	3.3	2.7	1.6	2.3	6.7	9.4	0.4	0.6	23.0	4.0
Cycle Q Clear(g_c), s	4.4	0.7	3.3	2.7	1.6	2.3	29.7	9.4	0.4	10.0	23.0	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	98	83	172	77	66	213	2617	1167	480	2639	1177
V/C Ratio(X)	0.74	0.10	0.51	0.24	0.34	0.47	0.15	0.33	0.02	0.02	0.59	0.16
Avail Cap(c_a), veh/h	162	533	452	198	561	476	213	2617	1167	480	2639	1177
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.72	0.72	0.72	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.2	53.8	55.0	52.8	55.9	56.2	12.2	4.4	3.3	5.9	5.9	3.7
Incr Delay (d2), s/veh	16.6	0.5	4.7	0.7	2.5	5.2	1.0	0.2	0.0	0.1	1.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.3	1.3	1.2	0.8	1.0	0.5	2.9	0.1	0.1	7.3	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.8	54.2	59.8	53.6	58.4	61.4	13.3	4.6	3.3	6.0	6.9	4.0
LnGrp LOS	E	D	E	D	E	E	B	A	A	A	A	A
Approach Vol, veh/h	172			99			911			1755		
Approach Delay, s/veh	68.6			57.3			4.9			6.6		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	98.5			9.3			12.2			98.5		
Change Period (Y+Rc), s	6.5			5.5			* 5.5			6.5		
Max Green Setting (Gmax), s	61.0			5.5			* 37			61.0		
Max Q Clear Time (g_c+I1), s	31.7			4.7			5.3			25.0		
Green Ext Time (p_c), s	8.2			0.0			0.1			18.3		
Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									
Notes												

























\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Timings

2026 Background PM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	15	55	25	15	40	50	1535	80	45	1020	145
Future Volume (vph)	190	15	55	25	15	40	50	1535	80	45	1020	145
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	13.0	43.5	43.5	11.0	41.5	41.5	65.5	65.5	65.5	65.5	65.5	65.5
Total Split (%)	10.8%	36.3%	36.3%	9.2%	34.6%	34.6%	54.6%	54.6%	54.6%	54.6%	54.6%	54.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	8.0	11.3	11.3	11.0	6.6	6.6	90.6	90.6	90.6	90.6	90.6	90.6
Actuated g/C Ratio	0.07	0.09	0.09	0.09	0.06	0.06	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.89	0.09	0.26	0.19	0.16	0.26	0.16	0.62	0.07	0.32	0.42	0.13
Control Delay	93.3	51.9	8.2	45.5	56.9	5.5	9.4	16.6	4.2	12.4	6.3	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.3	51.9	8.2	45.5	56.9	5.5	9.4	16.6	4.2	12.4	6.3	1.0
LOS	F	D	A	D	E	A	A	B	A	B	A	A
Approach Delay		72.9			27.6			15.8			5.9	
Approach LOS		E			C			B			A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 17.0









Intersection LOS: B

Intersection Capacity Utilization 66.2%

ICU Level of Service C

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway

			
Ø2 (R)		Ø3	Ø4
65.5 s		11 s	43.5 s
			
Ø6 (R)		Ø7	Ø8
65.5 s		13 s	41.5 s


























# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2026 Background PM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	15	55	25	15	40	50	1535	80	45	1020	145
Future Volume (veh/h)	190	15	55	25	15	40	50	1535	80	45	1020	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	204	16	59	27	16	43	54	1651	86	48	1097	156
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	230	154	131	163	83	71	340	2655	1184	204	2613	1165
Arrive On Green	0.07	0.08	0.08	0.02	0.04	0.04	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	443	3554	1585	274	3497	1560
Grp Volume(v), veh/h	204	16	59	27	16	43	54	1651	86	48	1097	156
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	443	1777	1585	274	1749	1560
Q Serve(g_s), s	7.0	1.0	4.3	1.7	1.0	3.2	6.1	26.3	1.7	12.0	13.9	3.4
Cycle Q Clear(g_c), s	7.0	1.0	4.3	1.7	1.0	3.2	20.0	26.3	1.7	38.4	13.9	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	230	154	131	163	83	71	340	2655	1184	204	2613	1165
V/C Ratio(X)	0.89	0.10	0.45	0.17	0.19	0.61	0.16	0.62	0.07	0.23	0.42	0.13
Avail Cap(c_a), veh/h	230	600	509	201	561	476	340	2655	1184	204	2613	1165
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	51.0	52.5	52.8	55.2	56.3	9.3	7.2	4.1	16.2	5.6	4.3
Incr Delay (d2), s/veh	31.0	0.3	2.4	0.5	1.1	8.2	0.3	0.4	0.0	2.7	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.5	1.8	0.8	0.5	1.4	0.6	8.7	0.5	0.9	4.6	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.5	51.3	54.9	53.2	56.3	64.5	9.6	7.5	4.1	18.9	6.1	4.5
LnGrp LOS	F	D	D	D	E	E	A	A	A	B	A	A
Approach Vol, veh/h	279		86				1791		1301			
Approach Delay, s/veh	77.8		59.4				7.4		6.4			
Approach LOS	E		E				A		A			
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	96.1		8.5		15.4		96.1		13.0		10.9	
Change Period (Y+Rc), s	6.5		5.5		* 5.5		6.5		5.0		5.5	
Max Green Setting (Gmax), s	59.0		5.5		* 39		59.0		8.0		36.0	
Max Q Clear Time (g_c+I1), s	28.3		3.7		6.3		40.4		9.0		5.2	
Green Ext Time (p_c), s	18.4		0.0		0.2		9.5		0.0		0.2	
Intersection Summary												
HCM 6th Ctrl Delay	14.0											
HCM 6th LOS	B											
Notes												

























\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Timings

2026 Total AM.syn

02/15/2021

## 1: Marksheffel Rd & Meadowbrook Parkway

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	10	40	40	25	30	30	1090	20	10	1755	335
Future Volume (vph)	270	10	40	40	25	30	30	1090	20	10	1755	335
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	13.0	43.5	43.5	11.0	41.5	41.5	65.5	65.5	65.5	65.5	65.5	65.5
Total Split (%)	10.8%	36.3%	36.3%	9.2%	34.6%	34.6%	54.6%	54.6%	54.6%	54.6%	54.6%	54.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	8.0	9.7	9.7	11.6	7.2	7.2	90.0	90.0	90.0	90.0	90.0	90.0
Actuated g/C Ratio	0.07	0.08	0.08	0.10	0.06	0.06	0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	1.33	0.07	0.22	0.28	0.23	0.18	0.28	0.45	0.02	0.03	0.72	0.29
Control Delay	218.3	51.2	3.9	46.9	58.1	2.3	24.1	16.8	1.9	5.2	10.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	218.3	51.2	3.9	46.9	58.1	2.3	24.1	16.8	1.9	5.2	10.9	1.4
LOS	F	D	A	D	E	A	C	B	A	A	B	A
Approach Delay		186.3			35.9			16.7			9.4	
Approach LOS		F			D			B			A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.33

Intersection Signal Delay: 27.8



















Intersection LOS: C

Intersection Capacity Utilization 72.5%

ICU Level of Service C

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway
























								
Ø2 (R)			Ø3			Ø4		
65.5 s			11 s			43.5 s		
								
Ø6 (R)			Ø7			Ø8		
65.5 s			13 s			41.5 s		

# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2026 Total AM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	10	40	40	25	30	30	1090	20	10	1755	335
Future Volume (veh/h)	270	10	40	40	25	30	30	1090	20	10	1755	335
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	281	10	42	42	26	31	31	1135	21	10	1828	349
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	216	127	108	172	77	66	141	2561	1142	355	2582	1152
Arrive On Green	0.07	0.07	0.07	0.03	0.04	0.04	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	174	3413	1522	471	3441	1535
Grp Volume(v), veh/h	281	10	42	42	26	31	31	1135	21	10	1828	349
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	174	1706	1522	471	1721	1535
Q Serve(g_s), s	8.0	0.6	3.2	2.7	1.6	2.3	13.9	14.9	0.4	1.0	34.0	8.8
Cycle Q Clear(g_c), s	8.0	0.6	3.2	2.7	1.6	2.3	47.8	14.9	0.4	15.9	34.0	8.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	216	127	108	172	77	66	141	2561	1142	355	2582	1152
V/C Ratio(X)	1.30	0.08	0.39	0.24	0.34	0.47	0.22	0.44	0.02	0.03	0.71	0.30
Avail Cap(c_a), veh/h	216	562	476	198	561	476	141	2561	1142	355	2582	1152
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.63	0.63	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.0	51.9	53.1	52.8	55.9	56.2	20.7	5.6	3.8	8.6	8.0	4.8
Incr Delay (d2), s/veh	165.5	0.3	2.3	0.7	2.5	5.2	2.2	0.4	0.0	0.1	1.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	0.3	1.3	1.2	0.8	1.0	0.6	4.7	0.1	0.1	11.2	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	221.5	52.2	55.4	53.6	58.4	61.4	23.0	6.0	3.8	8.7	9.7	5.5
LnGrp LOS	F	D	E	D	E	E	C	A	A	A	A	A
Approach Vol, veh/h	333			99			1187			2187		
Approach Delay, s/veh	195.5			57.3			6.4			9.0		
Approach LOS	F			E			A			A		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	96.5		9.3	14.2		96.5	13.0	10.5				
Change Period (Y+Rc), s	6.5		5.5	* 5.5		6.5	5.0	5.5				
Max Green Setting (Gmax), s	59.0		5.5	* 39		59.0	8.0	36.0				
Max Q Clear Time (g_c+I1), s	49.8		4.7	5.2		36.0	10.0	4.3				
Green Ext Time (p_c), s	5.8		0.0	0.2		17.2	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	25.7											
HCM 6th LOS	C											
Notes												

























\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Timings

2026 Total PM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	15	55	25	15	40	50	1835	80	45	1340	270
Future Volume (vph)	295	15	55	25	15	40	50	1835	80	45	1340	270
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	14.0	44.5	44.5	11.0	41.5	41.5	64.5	64.5	64.5	64.5	64.5	64.5
Total Split (%)	11.7%	37.1%	37.1%	9.2%	34.6%	34.6%	53.8%	53.8%	53.8%	53.8%	53.8%	53.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	9.0	12.3	12.3	11.0	6.6	6.6	89.6	89.6	89.6	89.6	89.6	89.6
Actuated g/C Ratio	0.08	0.10	0.10	0.09	0.06	0.06	0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	1.23	0.08	0.25	0.19	0.16	0.26	0.26	0.75	0.07	0.59	0.56	0.24
Control Delay	179.8	50.8	7.8	44.7	56.9	5.5	11.8	19.3	4.0	43.2	8.1	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	179.8	50.8	7.8	44.7	56.9	5.5	11.8	19.3	4.0	43.2	8.1	1.1
LOS	F	D	A	D	E	A	B	B	A	D	A	A
Approach Delay		148.6			27.4			18.5			7.9	
Approach LOS		F			C			B			A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.23

Intersection Signal Delay: 26.0

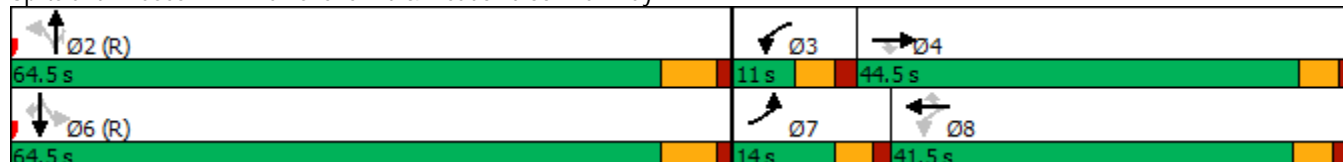
Intersection LOS: C

Intersection Capacity Utilization 77.5%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway






























# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2026 Total PM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	295	15	55	25	15	40	50	1835	80	45	1340	270
Future Volume (veh/h)	295	15	55	25	15	40	50	1835	80	45	1340	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	317	16	59	27	16	43	54	1973	86	48	1441	290
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	259	170	144	163	83	71	216	2625	1171	143	2584	1152
Arrive On Green	0.08	0.09	0.09	0.02	0.04	0.04	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	280	3554	1585	200	3497	1560
Grp Volume(v), veh/h	317	16	59	27	16	43	54	1973	86	48	1441	290
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	280	1777	1585	200	1749	1560
Q Serve(g_s), s	9.0	0.9	4.2	1.7	1.0	3.2	12.7	39.1	1.8	22.3	22.0	7.2
Cycle Q Clear(g_c), s	9.0	0.9	4.2	1.7	1.0	3.2	34.7	39.1	1.8	61.4	22.0	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	170	144	163	83	71	216	2625	1171	143	2584	1152
V/C Ratio(X)	1.22	0.09	0.41	0.17	0.19	0.61	0.25	0.75	0.07	0.34	0.56	0.25
Avail Cap(c_a), veh/h	259	616	522	201	561	476	216	2625	1171	143	2584	1152
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.17	0.17	0.17	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	50.0	51.5	52.8	55.2	56.3	14.7	9.2	4.3	27.2	7.0	5.0
Incr Delay (d2), s/veh	129.8	0.2	1.9	0.5	1.1	8.2	0.5	0.4	0.0	6.3	0.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	0.5	1.8	0.8	0.5	1.4	0.8	13.1	0.5	1.3	7.5	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	185.3	50.3	53.4	53.2	56.3	64.5	15.2	9.6	4.4	33.5	7.8	5.6
LnGrp LOS	F	D	D	D	E	E	B	A	A	C	A	A
Approach Vol, veh/h	392			86			2113			1779		
Approach Delay, s/veh	160.0			59.4			9.5			8.2		
Approach LOS	F			E			A			A		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	95.1		8.5	16.4		95.1	14.0	10.9				
Change Period (Y+Rc), s	6.5		5.5	* 5.5		6.5	5.0	5.5				
Max Green Setting (Gmax), s	58.0		5.5	* 40		58.0	9.0	36.0				
Max Q Clear Time (g_c+I1), s	41.1		3.7	6.2		63.4	11.0	5.2				
Green Ext Time (p_c), s	14.0		0.0	0.2		0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			23.4									
HCM 6th LOS			C									
Notes												



























# Timings

2040 Background AM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	10	45	50	25	35	35	1150	25	15	1810	215
Future Volume (vph)	135	10	45	50	25	35	35	1150	25	15	1810	215
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	13.0	43.5	43.5	11.0	41.5	41.5	65.5	65.5	65.5	65.5	65.5	65.5
Total Split (%)	10.8%	36.3%	36.3%	9.2%	34.6%	34.6%	54.6%	54.6%	54.6%	54.6%	54.6%	54.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	7.9	9.7	9.7	11.6	7.2	7.2	90.0	90.0	90.0	90.0	90.0	90.0
Actuated g/C Ratio	0.07	0.08	0.08	0.10	0.06	0.06	0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	0.67	0.07	0.24	0.34	0.23	0.21	0.36	0.47	0.02	0.06	0.74	0.19
Control Delay	70.8	51.2	5.7	49.1	58.1	2.7	28.5	16.2	2.3	5.5	11.5	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	51.2	5.7	49.1	58.1	2.7	28.5	16.2	2.3	5.5	11.5	1.4
LOS	E	D	A	D	E	A	C	B	A	A	B	A
Approach Delay		54.4			36.5			16.3			10.4	
Approach LOS		D			D			B			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 15.5













Intersection LOS: B

Intersection Capacity Utilization 72.5%

ICU Level of Service C

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway
























					
Ø2 (R)			Ø3	Ø4	
65.5 s			11 s	43.5 s	
					
Ø6 (R)			Ø7	Ø8	
65.5 s			13 s	41.5 s	

# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2040 Background AM.syn

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	10	45	50	25	35	35	1150	25	15	1810	215
Future Volume (veh/h)	135	10	45	50	25	35	35	1150	25	15	1810	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	141	10	47	52	26	36	36	1198	26	16	1885	224
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	192	105	89	181	78	66	146	2585	1153	336	2607	1163
Arrive On Green	0.06	0.06	0.06	0.04	0.04	0.04	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	186	3413	1522	441	3441	1535
Grp Volume(v), veh/h	141	10	47	52	26	36	36	1198	26	16	1885	224
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	186	1706	1522	441	1721	1535
Q Serve(g_s), s	5.1	0.6	3.7	3.3	1.6	2.7	15.5	15.7	0.5	1.7	35.2	5.0
Cycle Q Clear(g_c), s	5.1	0.6	3.7	3.3	1.6	2.7	50.7	15.7	0.5	17.4	35.2	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	192	105	89	181	78	66	146	2585	1153	336	2607	1163
V/C Ratio(X)	0.74	0.10	0.53	0.29	0.33	0.55	0.25	0.46	0.02	0.05	0.72	0.19
Avail Cap(c_a), veh/h	216	562	476	198	561	476	146	2585	1153	336	2607	1163
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.57	0.57	0.57	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	53.3	54.7	52.5	55.9	56.4	21.4	5.4	3.6	8.7	7.8	4.1
Incr Delay (d2), s/veh	10.9	0.4	4.8	0.9	2.5	6.9	2.3	0.3	0.0	0.3	1.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.3	1.5	1.5	0.8	1.2	0.8	4.9	0.1	0.2	11.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.4	53.7	59.5	53.4	58.4	63.3	23.7	5.8	3.6	9.0	9.6	4.5
LnGrp LOS	E	D	E	D	E	E	C	A	A	A	A	A
Approach Vol, veh/h	198			114			1260			2125		
Approach Delay, s/veh	64.1			57.7			6.2			9.0		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	97.4		9.9	12.7		97.4		12.1	10.5			
Change Period (Y+Rc), s	6.5		5.5	* 5.5		6.5		5.0	5.5			
Max Green Setting (Gmax), s	59.0		5.5	* 39		59.0		8.0	36.0			
Max Q Clear Time (g_c+I1), s	52.7		5.3	5.7		37.2		7.1	4.7			
Green Ext Time (p_c), s	4.4		0.0	0.2		16.5		0.0	0.2			
Intersection Summary												
HCM 6th Ctrl Delay	12.5											
HCM 6th LOS	B											
Notes												

# Timings

2040 Background PM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	15	65	25	20	45	55	1920	95	55	1395	165
Future Volume (vph)	225	15	65	25	20	45	55	1920	95	55	1395	165
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	14.0	44.5	44.5	11.0	41.5	41.5	64.5	64.5	64.5	64.5	64.5	64.5
Total Split (%)	11.7%	37.1%	37.1%	9.2%	34.6%	34.6%	53.8%	53.8%	53.8%	53.8%	53.8%	53.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	9.0	12.7	12.7	11.4	7.0	7.0	89.2	89.2	89.2	89.2	89.2	89.2
Actuated g/C Ratio	0.08	0.11	0.11	0.10	0.06	0.06	0.74	0.74	0.74	0.74	0.74	0.74
v/c Ratio	0.94	0.08	0.29	0.18	0.20	0.28	0.32	0.78	0.09	0.91	0.58	0.15
Control Delay	98.4	50.3	11.4	44.1	57.6	7.4	13.8	22.1	4.7	113.3	8.6	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.4	50.3	11.4	44.1	57.6	7.4	13.8	22.1	4.7	113.3	8.6	1.0
LOS	F	D	B	D	E	A	B	C	A	F	A	A
Approach Delay		77.5			29.0			21.1			11.4	
Approach LOS		E			C			C			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 21.6

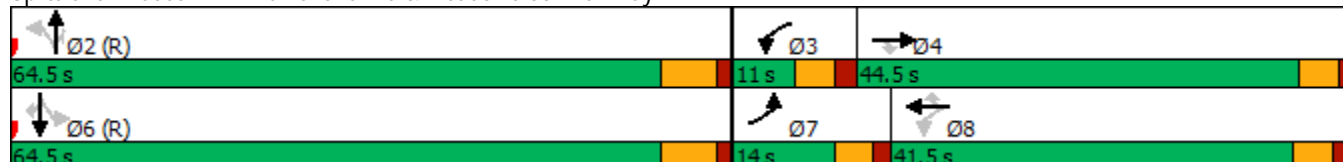
Intersection LOS: C

Intersection Capacity Utilization 77.8%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway





























# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2040 Background PM.syn

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	225	15	65	25	20	45	55	1920	95	55	1395	165
Future Volume (veh/h)	225	15	65	25	20	45	55	1920	95	55	1395	165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	242	16	70	27	22	48	59	2065	102	59	1500	177
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	259	176	149	167	90	76	218	2613	1165	126	2571	1147
Arrive On Green	0.08	0.09	0.09	0.02	0.05	0.05	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	295	3554	1585	180	3497	1560
Grp Volume(v), veh/h	242	16	70	27	22	48	59	2065	102	59	1500	177
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	295	1777	1585	180	1749	1560
Q Serve(g_s), s	8.4	0.9	5.0	1.7	1.4	3.6	13.9	44.1	2.2	37.1	23.9	4.1
Cycle Q Clear(g_c), s	8.4	0.9	5.0	1.7	1.4	3.6	37.8	44.1	2.2	81.1	23.9	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	176	149	167	90	76	218	2613	1165	126	2571	1147
V/C Ratio(X)	0.93	0.09	0.47	0.16	0.24	0.63	0.27	0.79	0.09	0.47	0.58	0.15
Avail Cap(c_a), veh/h	259	616	522	205	561	476	218	2613	1165	126	2571	1147
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	49.6	51.5	52.4	55.0	56.1	16.1	10.0	4.5	35.7	7.4	4.7
Incr Delay (d2), s/veh	38.4	0.2	2.3	0.4	1.4	8.2	0.3	0.2	0.0	11.9	1.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.5	2.1	0.8	0.7	1.6	0.9	14.7	0.6	2.0	8.1	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.6	49.9	53.8	52.8	56.4	64.3	16.4	10.3	4.5	47.6	8.3	5.0
LnGrp LOS	F	D	D	D	E	E	B	B	A	D	A	A
Approach Vol, veh/h	328		97			2226			1736			
Approach Delay, s/veh	82.9		59.3			10.2			9.3			
Approach LOS	F		E			B			A			
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	94.7		8.5	16.8		94.7	14.0	11.3				
Change Period (Y+Rc), s	6.5		5.5	* 5.5		6.5	5.0	5.5				
Max Green Setting (Gmax), s	58.0		5.5	* 40		58.0	9.0	36.0				
Max Q Clear Time (g_c+I1), s	46.1		3.7	7.0		83.1	10.4	5.6				
Green Ext Time (p_c), s	10.6		0.0	0.3		0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	16.4											
HCM 6th LOS	B											
Notes												

# Timings

2040 Total AM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	10	45	50	25	35	35	1495	25	15	2185	380
Future Volume (vph)	300	10	45	50	25	35	35	1495	25	15	2185	380
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	14.0	44.5	44.5	11.0	41.5	41.5	64.5	64.5	64.5	64.5	64.5	64.5
Total Split (%)	11.7%	37.1%	37.1%	9.2%	34.6%	34.6%	53.8%	53.8%	53.8%	53.8%	53.8%	53.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	9.0	10.7	10.7	11.6	7.2	7.2	89.0	89.0	89.0	89.0	89.0	89.0
Actuated g/C Ratio	0.08	0.09	0.09	0.10	0.06	0.06	0.74	0.74	0.74	0.74	0.74	0.74
v/c Ratio	1.32	0.06	0.23	0.34	0.23	0.21	0.60	0.62	0.02	0.10	0.90	0.33
Control Delay	211.4	50.0	5.2	48.3	58.1	2.7	62.7	29.0	3.5	6.9	19.7	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	211.4	50.0	5.2	48.3	58.1	2.7	62.7	29.0	3.5	6.9	19.7	2.4
LOS	F	D	A	D	E	A	E	C	A	A	B	A
Approach Delay	180.9				36.1			29.4			17.1	
Approach LOS	F				D			C			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.32

Intersection Signal Delay: 34.3

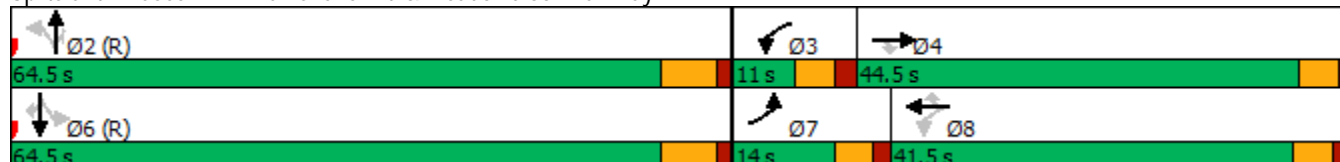
Intersection LOS: C

Intersection Capacity Utilization 85.2%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway




























# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2040 Total AM.syn

02/15/2021




























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	10	45	50	25	35	35	1495	25	15	2185	380
Future Volume (veh/h)	300	10	45	50	25	35	35	1495	25	15	2185	380
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	312	10	47	52	26	36	36	1557	26	16	2276	396
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	243	133	113	181	78	66	85	2532	1129	292	2553	1139
Arrive On Green	0.08	0.08	0.08	0.04	0.04	0.04	1.00	1.00	1.00	0.74	0.74	0.74
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	106	3413	1522	313	3441	1535
Grp Volume(v), veh/h	312	10	47	52	26	36	36	1557	26	16	2276	396
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	106	1706	1522	313	1721	1535
Q Serve(g_s), s	9.0	0.6	3.6	3.3	1.6	2.7	28.5	0.0	0.0	1.7	60.5	10.8
Cycle Q Clear(g_c), s	9.0	0.6	3.6	3.3	1.6	2.7	89.0	0.0	0.0	1.7	60.5	10.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	243	133	113	181	78	66	85	2532	1129	292	2553	1139
V/C Ratio(X)	1.29	0.08	0.42	0.29	0.33	0.55	0.42	0.62	0.02	0.05	0.89	0.35
Avail Cap(c_a), veh/h	243	577	489	198	561	476	85	2532	1129	292	2553	1139
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	51.5	52.9	52.5	55.9	56.4	34.5	0.0	0.0	4.2	11.8	5.4
Incr Delay (d2), s/veh	155.9	0.2	2.5	0.9	2.5	6.9	7.8	0.6	0.0	0.4	5.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	0.3	1.4	1.5	0.8	1.2	1.2	0.2	0.0	0.1	21.1	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	211.4	51.8	55.4	53.4	58.4	63.3	42.3	0.6	0.0	4.6	17.1	6.2
LnGrp LOS	F	D	E	D	E	E	D	A	A	A	B	A
Approach Vol, veh/h	369			114			1619			2688		
Approach Delay, s/veh	187.2			57.7			1.5			15.4		
Approach LOS	F			E			A			B		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	95.5		9.9	14.6		95.5	14.0	10.5				
Change Period (Y+Rc), s	6.5		5.5	* 5.5		6.5	5.0	5.5				
Max Green Setting (Gmax), s	58.0		5.5	* 40		58.0	9.0	36.0				
Max Q Clear Time (g_c+I1), s	91.0		5.3	5.6		62.5	11.0	4.7				
Green Ext Time (p_c), s	0.0		0.0	0.2		0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			24.9									
HCM 6th LOS			C									
Notes												

# Timings

2040 Total PM.syn

## 1: Marksheffel Rd & Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (vph)	355	15	65	25	20	45	55	2520	95	55	2060	315
Future Volume (vph)	355	15	65	25	20	45	55	2520	95	55	2060	315
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	41.5	41.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	14.0	44.5	44.5	11.0	41.5	41.5	64.5	64.5	64.5	64.5	64.5	64.5
Total Split (%)	11.7%	37.1%	37.1%	9.2%	34.6%	34.6%	53.8%	53.8%	53.8%	53.8%	53.8%	53.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	9.0	12.7	12.7	11.4	7.0	7.0	89.2	89.2	89.2	89.2	89.2	89.2
Actuated g/C Ratio	0.08	0.11	0.11	0.10	0.06	0.06	0.74	0.74	0.74	0.74	0.74	0.74
v/c Ratio	1.49	0.08	0.29	0.18	0.20	0.28	0.94	1.03	0.09	0.95	0.86	0.28
Control Delay	276.8	50.3	11.4	44.1	57.6	7.4	94.0	49.8	4.6	127.2	16.5	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	276.8	50.3	11.4	44.1	57.6	7.4	94.0	49.8	4.6	127.2	16.5	2.1
LOS	F	D	B	D	E	A	F	D	A	F	B	A
Approach Delay		229.4			29.0			49.1			17.2	
Approach LOS		F			C			D			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.49

Intersection Signal Delay: 48.9

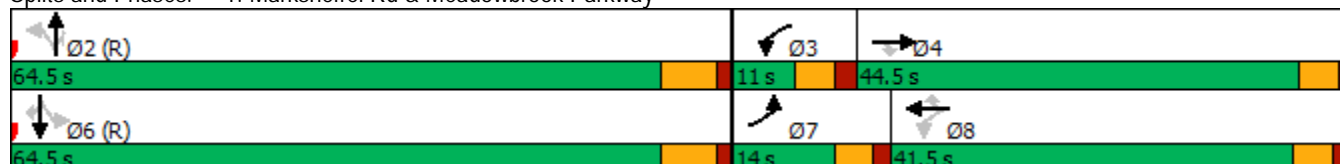
Intersection LOS: D

Intersection Capacity Utilization 98.1%

ICU Level of Service F

Analysis Period (min) 15

### Splits and Phases: 1: Marksheffel Rd & Meadowbrook Parkway


























# HCM 6th Signalized Intersection Summary

## 1: Marksheffel Rd & Meadowbrook Parkway

2040 Total PM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	355	15	65	25	20	45	55	2520	95	55	2060	315
Future Volume (veh/h)	355	15	65	25	20	45	55	2520	95	55	2060	315
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	382	16	70	27	22	48	59	2710	102	59	2215	339
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	259	176	149	167	90	76	95	2613	1165	129	2571	1147
Arrive On Green	0.08	0.09	0.09	0.02	0.05	0.05	1.00	1.00	1.00	0.74	0.74	0.74
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	124	3554	1585	94	3497	1560
Grp Volume(v), veh/h	382	16	70	27	22	48	59	2710	102	59	2215	339
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	124	1777	1585	94	1749	1560
Q Serve(g_s), s	9.0	0.9	5.0	1.7	1.4	3.6	33.3	0.0	0.0	52.9	54.9	8.8
Cycle Q Clear(g_c), s	9.0	0.9	5.0	1.7	1.4	3.6	88.2	0.0	0.0	52.9	54.9	8.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	176	149	167	90	76	95	2613	1165	129	2571	1147
V/C Ratio(X)	1.47	0.09	0.47	0.16	0.24	0.63	0.62	1.04	0.09	0.46	0.86	0.30
Avail Cap(c_a), veh/h	259	616	522	205	561	476	95	2613	1165	129	2571	1147
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.20	0.20	0.20	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	49.6	51.5	52.4	55.0	56.1	34.4	0.0	0.0	11.2	11.5	5.4
Incr Delay (d2), s/veh	233.0	0.2	2.3	0.4	1.4	8.2	6.1	20.0	0.0	11.1	4.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	0.5	2.1	0.8	0.7	1.6	1.9	7.3	0.0	1.3	19.4	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	288.5	49.9	53.8	52.8	56.4	64.3	40.5	20.0	0.0	22.4	15.6	6.0
LnGrp LOS	F	D	D	D	E	E	D	F	A	C	B	A
Approach Vol, veh/h	468			97			2871			2613		
Approach Delay, s/veh	245.2			59.3			19.7			14.5		
Approach LOS	F			E			B			B		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	94.7		8.5	16.8		94.7	14.0	11.3				
Change Period (Y+Rc), s	6.5		5.5	* 5.5		6.5	5.0	5.5				
Max Green Setting (Gmax), s	58.0		5.5	* 40		58.0	9.0	36.0				
Max Q Clear Time (g_c+I1), s	90.2		3.7	7.0		56.9	11.0	5.6				
Green Ext Time (p_c), s	0.0		0.0	0.3		1.1	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	35.5											
HCM 6th LOS	D											
Notes												























\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Timings

## 2: Marksheffel Rd & US-24

2020 Adjusted Existing AM.syn

02/15/2021

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	335	486	282	1107	18	1	454	54	9	707	705
Future Volume (vph)	335	486	282	1107	18	1	454	54	9	707	705
Turn Type	Prot	NA	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2	1	6		3	8		7	4	
Permitted Phases			6		Free			Free			Free
Detector Phase	5	2	1	6		3	8		7	4	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0	12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	21.0	48.5	25.0	52.5		11.5	36.0		10.5	35.0	
Total Split (%)	17.5%	40.4%	20.8%	43.8%		9.6%	30.0%		8.8%	29.2%	
Yellow Time (s)	5.0	5.0	5.0	5.0		5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5		6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max		None	None		None	None	
Act Effect Green (s)	17.7	56.4	66.7	52.7	120.0	5.1	27.6	120.0	6.2	28.8	120.0
Actuated g/C Ratio	0.15	0.47	0.56	0.44	1.00	0.04	0.23	1.00	0.05	0.24	1.00
v/c Ratio	0.75	0.33	0.52	0.76	0.01	0.01	0.59	0.04	0.10	0.90	0.48
Control Delay	51.7	38.2	14.5	33.2	0.0	71.0	50.2	0.0	51.4	53.2	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	38.2	14.5	33.2	0.0	71.0	50.2	0.0	51.4	53.2	1.6
LOS	D	D	B	C	A	E	D	A	D	D	A
Approach Delay		43.7		29.0			45.0			27.6	
Approach LOS		D		C			D			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 33.4

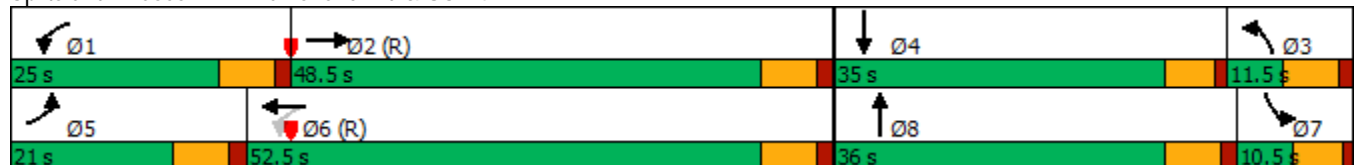
Intersection LOS: C

Intersection Capacity Utilization 75.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24


























# HCM 6th Signalized Intersection Summary

2020 Adjusted Existing AM.syn

## 2: Marksheffel Rd & US-24

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	486	0	282	1107	18	1	454	54	9	707	705
Future Volume (veh/h)	335	486	0	282	1107	18	1	454	54	9	707	705
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1737	1737	1737	1841	1841	1841	1856	1856	1856	1811	1811	1811
Adj Flow Rate, veh/h	349	506	0	294	1153	0	1	473	0	9	736	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	11	11	11	4	4	4	3	3	3	6	6	6
Cap, veh/h	388	1474		560	1529		2	586		102	799	
Arrive On Green	0.12	0.45	0.00	0.11	0.44	0.00	0.00	0.17	0.00	0.10	0.39	0.00
Sat Flow, veh/h	3209	3300	1472	1753	3497	1560	1767	3526	1572	1725	3441	1535
Grp Volume(v), veh/h	349	506	0	294	1153	0	1	473	0	9	736	0
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1753	1749	1560	1767	1763	1572	1725	1721	1535
Q Serve(g_s), s	12.9	12.0	0.0	10.9	33.2	0.0	0.1	15.5	0.0	0.6	24.4	0.0
Cycle Q Clear(g_c), s	12.9	12.0	0.0	10.9	33.2	0.0	0.1	15.5	0.0	0.6	24.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	388	1474		560	1529		2	586		102	799	
V/C Ratio(X)	0.90	0.34		0.53	0.75		0.41	0.81		0.09	0.92	
Avail Cap(c_a), veh/h	388	1474		635	1529		74	867		102	846	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.84	0.84	0.00
Uniform Delay (d), s/veh	52.0	21.7	0.0	15.4	28.4	0.0	59.9	48.2	0.0	51.1	35.7	0.0
Incr Delay (d2), s/veh	23.2	0.6	0.0	0.8	3.5	0.0	85.9	3.6	0.0	0.3	12.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	4.8	0.0	4.4	14.4	0.0	0.1	7.1	0.0	0.3	10.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.3	22.3	0.0	16.2	31.9	0.0	145.8	51.7	0.0	51.5	48.5	0.0
LnGrp LOS	E	C		B	C		F	D		D	D	
Approach Vol, veh/h	855		A	1447		A	474		A	745		A
Approach Delay, s/veh	43.9			28.7			51.9			48.6		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.9	60.1	6.7	33.4	21.0	59.0	13.6	26.5				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	18.5	42.0	5.0	29.5	14.5	46.0	5.0	* 30				
Max Q Clear Time (g_c+l1), s	12.9	14.0	2.1	26.4	14.9	35.2	2.6	17.5				
Green Ext Time (p_c), s	0.4	3.7	0.0	1.4	0.0	5.9	0.0	2.4				
Intersection Summary												
HCM 6th Ctrl Delay	39.7											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												



























# Timings

## 2: Marksheffel Rd & US-24

2020 Adjusted Existing PM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	622	1100	7	140	525	15	12	830	178	16	554	473
Future Volume (vph)	622	1100	7	140	525	15	12	830	178	16	554	473
Turn Type	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	33.0	53.5		15.0	35.5		11.5	41.0		10.5	40.0	
Total Split (%)	27.5%	44.6%		12.5%	29.6%		9.6%	34.2%		8.8%	33.3%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effect Green (s)	25.5	54.4	120.0	46.7	37.8	120.0	6.4	33.0	120.0	5.2	35.4	120.0
Actuated g/C Ratio	0.21	0.45	1.00	0.39	0.32	1.00	0.05	0.28	1.00	0.04	0.30	1.00
v/c Ratio	0.87	0.70	0.00	0.64	0.49	0.01	0.13	0.87	0.11	0.21	0.55	0.31
Control Delay	37.9	39.6	0.0	34.5	36.9	0.0	50.3	43.2	0.1	58.2	33.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	39.6	0.0	34.5	36.9	0.0	50.3	43.2	0.1	58.2	33.2	0.6
LOS	D	D	A	C	D	A	D	D	A	E	C	A
Approach Delay		38.8			35.6			35.7			18.8	
Approach LOS		D			D			D			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 33.0

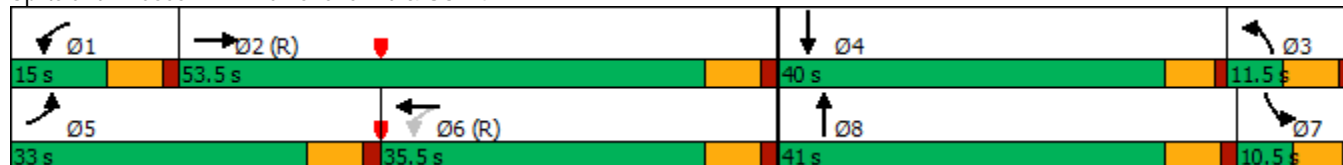
Intersection LOS: C

Intersection Capacity Utilization 77.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24



























# HCM 6th Signalized Intersection Summary

2020 Adjusted Existing PM.syn

## 2: Marksheffel Rd & US-24

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	622	1100	7	140	525	15	12	830	178	16	554	473
Future Volume (veh/h)	622	1100	7	140	525	15	12	830	178	16	554	473
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	635	1122	0	143	536	0	12	847	0	16	565	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	3	3	3
Cap, veh/h	701	1523		267	1046		181	948		30	672	
Arrive On Green	0.20	0.43	0.00	0.07	0.30	0.00	0.10	0.27	0.00	0.03	0.38	0.00
Sat Flow, veh/h	3456	3554	1585	1767	3526	1572	1781	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	635	1122	0	143	536	0	12	847	0	16	565	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1767	1763	1572	1781	1777	1585	1767	1763	1572
Q Serve(g_s), s	21.5	31.6	0.0	6.7	15.1	0.0	0.7	27.5	0.0	1.1	17.5	0.0
Cycle Q Clear(g_c), s	21.5	31.6	0.0	6.7	15.1	0.0	0.7	27.5	0.0	1.1	17.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	701	1523		267	1046		181	948		30	672	
V/C Ratio(X)	0.91	0.74		0.53	0.51		0.07	0.89		0.53	0.84	
Avail Cap(c_a), veh/h	763	1523		267	1046		181	1022		74	1014	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.94	0.94	0.00
Uniform Delay (d), s/veh	46.7	28.6	0.0	27.6	35.0	0.0	48.7	42.4	0.0	57.5	35.5	0.0
Incr Delay (d2), s/veh	13.8	3.2	0.0	2.1	1.8	0.0	0.2	9.7	0.0	12.6	3.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	13.9	0.0	3.0	6.8	0.0	0.3	13.3	0.0	0.6	6.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.5	31.8	0.0	29.7	36.8	0.0	48.9	52.1	0.0	70.0	39.4	0.0
LnGrp LOS	E	C		C	D		D	D		E	D	
Approach Vol, veh/h	1757		A	679		A	859		A	581		A
Approach Delay, s/veh	42.2			35.3			52.0			40.2		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	57.9	18.7	28.4	30.8	42.1	8.6	38.5				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	8.5	47.0	5.0	34.5	26.5	29.0	5.0	* 35				
Max Q Clear Time (g_c+I1), s	8.7	33.6	2.7	19.5	23.5	17.1	3.1	29.5				
Green Ext Time (p_c), s	0.0	6.7	0.0	3.3	0.8	2.8	0.0	2.5				

### Intersection Summary

HCM 6th Ctrl Delay 42.9

HCM 6th LOS D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.




























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

2026 Background AM.syn

## 2: Marksheffel Rd & US-24

02/15/2021

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 			 			 	
Traffic Volume (vph)	360	525	305	1190	20	5	490	60	10	760	760
Future Volume (vph)	360	525	305	1190	20	5	490	60	10	760	760
Turn Type	Prot	NA	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2	1	6		3	8		7	4	
Permitted Phases			6		Free			Free			Free
Detector Phase	5	2	1	6		3	8		7	4	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0	12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	21.0	47.5	26.0	52.5		11.5	36.0		10.5	35.0	
Total Split (%)	17.5%	39.6%	21.7%	43.8%		9.6%	30.0%		8.8%	29.2%	
Yellow Time (s)	5.0	5.0	5.0	5.0		5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5		6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max		None	None		None	None	
Act Effect Green (s)	19.5	54.8	65.2	50.2	120.0	5.1	28.6	120.0	5.8	29.4	120.0
Actuated g/C Ratio	0.16	0.46	0.54	0.42	1.00	0.04	0.24	1.00	0.05	0.24	1.00
v/c Ratio	0.73	0.37	0.59	0.85	0.01	0.07	0.61	0.04	0.12	0.95	0.52
Control Delay	48.5	38.9	16.2	39.0	0.0	68.0	48.9	0.1	52.2	57.6	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	38.9	16.2	39.0	0.0	68.0	48.9	0.1	52.2	57.6	2.0
LOS	D	D	B	D	A	E	D	A	D	E	A
Approach Delay		42.8		33.9			43.7			29.9	
Approach LOS		D		C			D			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 35.5

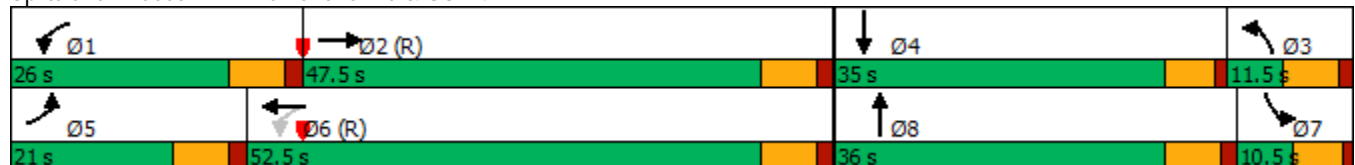
Intersection LOS: D

Intersection Capacity Utilization 79.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24



























# HCM 6th Signalized Intersection Summary

2026 Background AM.syn

## 2: Marksheffel Rd & US-24

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	525	0	305	1190	20	5	490	60	10	760	760
Future Volume (veh/h)	360	525	0	305	1190	20	5	490	60	10	760	760
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1737	1737	1737	1841	1841	1841	1856	1856	1856	1811	1811	1811
Adj Flow Rate, veh/h	375	547	0	318	1240	0	5	510	0	10	792	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	11	11	11	4	4	4	3	3	3	6	6	6
Cap, veh/h	388	1388		532	1475		11	623		110	835	
Arrive On Green	0.12	0.42	0.00	0.12	0.42	0.00	0.01	0.18	0.00	0.11	0.41	0.00
Sat Flow, veh/h	3209	3300	1472	1753	3497	1560	1767	3526	1572	1725	3441	1535
Grp Volume(v), veh/h	375	547	0	318	1240	0	5	510	0	10	792	0
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1753	1749	1560	1767	1763	1572	1725	1721	1535
Q Serve(g_s), s	14.0	13.8	0.0	12.2	38.1	0.0	0.3	16.7	0.0	0.6	26.7	0.0
Cycle Q Clear(g_c), s	14.0	13.8	0.0	12.2	38.1	0.0	0.3	16.7	0.0	0.6	26.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	388	1388		532	1475		11	623		110	835	
V/C Ratio(X)	0.97	0.39		0.60	0.84		0.44	0.82		0.09	0.95	
Avail Cap(c_a), veh/h	388	1388		603	1475		74	867		110	846	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.79	0.79	0.00
Uniform Delay (d), s/veh	52.5	24.2	0.0	16.6	31.1	0.0	59.4	47.5	0.0	50.4	34.9	0.0
Incr Delay (d2), s/veh	37.0	0.8	0.0	1.3	6.0	0.0	24.8	4.4	0.0	0.3	16.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	5.5	0.0	5.0	17.0	0.0	0.2	7.7	0.0	0.3	11.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	89.5	25.0	0.0	17.9	37.0	0.0	84.2	51.9	0.0	50.7	51.4	0.0
LnGrp LOS	F	C		B	D		F	D		D	D	
Approach Vol, veh/h	922		A	1558		A	515		A	802		A
Approach Delay, s/veh	51.2			33.1			52.2			51.4		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.1	57.0	7.3	34.6	21.0	57.1	14.2	27.7				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	19.5	41.0	5.0	29.5	14.5	46.0	5.0	* 30				
Max Q Clear Time (g_c+l1), s	14.2	15.8	2.3	28.7	16.0	40.1	2.6	18.7				
Green Ext Time (p_c), s	0.5	3.9	0.0	0.5	0.0	3.9	0.0	2.5				
Intersection Summary												
HCM 6th Ctrl Delay	44.0											
HCM 6th LOS	D											

# Timings

2026 Background PM.syn

## 2: Marksheffel Rd & US-24

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	670	1180	10	155	565	20	15	890	195	20	595	510
Future Volume (vph)	670	1180	10	155	565	20	15	890	195	20	595	510
Turn Type	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	33.0	53.5		15.0	35.5		11.5	41.0		10.5	40.0	
Total Split (%)	27.5%	44.6%		12.5%	29.6%		9.6%	34.2%		8.8%	33.3%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effect Green (s)	26.8	52.4	120.0	45.7	35.6	120.0	6.5	33.8	120.0	5.1	33.4	120.0
Actuated g/C Ratio	0.22	0.44	1.00	0.38	0.30	1.00	0.05	0.28	1.00	0.04	0.28	1.00
v/c Ratio	0.89	0.78	0.01	0.73	0.55	0.01	0.16	0.91	0.13	0.27	0.62	0.33
Control Delay	37.7	41.8	0.0	47.4	39.3	0.0	50.1	46.1	0.1	59.4	36.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	41.8	0.0	47.4	39.3	0.0	50.1	46.1	0.1	59.4	36.0	0.6
LOS	D	D	A	D	D	A	D	D	A	E	D	A
Approach Delay		40.1			40.0			38.0			20.4	
Approach LOS		D			D			D			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 35.0

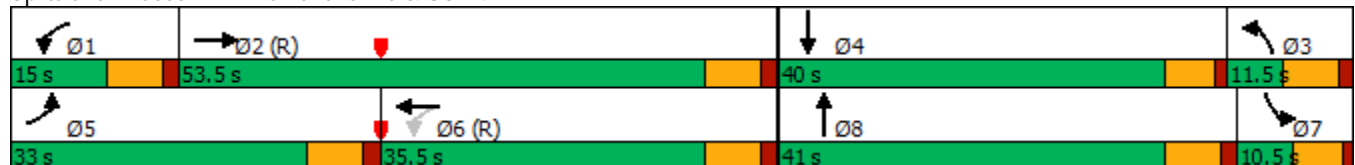
Intersection LOS: D

Intersection Capacity Utilization 82.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24





























# HCM 6th Signalized Intersection Summary

2026 Background PM.syn

## 2: Marksheffel Rd & US-24

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	670	1180	10	155	565	20	15	890	195	20	595	510
Future Volume (veh/h)	670	1180	10	155	565	20	15	890	195	20	595	510
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	684	1204	0	158	577	0	15	908	0	20	607	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	3	3	3
Cap, veh/h	739	1473		238	957		186	987		36	713	
Arrive On Green	0.21	0.41	0.00	0.07	0.27	0.00	0.10	0.28	0.00	0.04	0.40	0.00
Sat Flow, veh/h	3456	3554	1585	1767	3526	1572	1781	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	684	1204	0	158	577	0	15	908	0	20	607	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1767	1763	1572	1781	1777	1585	1767	1763	1572
Q Serve(g_s), s	23.3	36.0	0.0	7.8	17.1	0.0	0.9	29.7	0.0	1.3	18.8	0.0
Cycle Q Clear(g_c), s	23.3	36.0	0.0	7.8	17.1	0.0	0.9	29.7	0.0	1.3	18.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	739	1473		238	957		186	987		36	713	
V/C Ratio(X)	0.92	0.82		0.66	0.60		0.08	0.92		0.56	0.85	
Avail Cap(c_a), veh/h	763	1473		238	957		186	1022		74	1014	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.92	0.92	0.00
Uniform Delay (d), s/veh	46.2	31.1	0.0	30.8	38.1	0.0	48.6	42.0	0.0	57.0	34.1	0.0
Incr Delay (d2), s/veh	16.8	5.1	0.0	6.8	2.8	0.0	0.2	12.8	0.0	11.9	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	16.2	0.0	3.7	7.8	0.0	0.4	14.7	0.0	0.7	7.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.0	36.2	0.0	37.5	40.9	0.0	48.7	54.8	0.0	68.9	38.8	0.0
LnGrp LOS	E	D		D	D		D	D		E	D	
Approach Vol, veh/h	1888		A	735		A	923		A	627		A
Approach Delay, s/veh	45.9			40.2			54.7			39.7		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	56.2	19.0	29.8	32.2	39.1	8.9	39.8				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	8.5	47.0	5.0	34.5	26.5	29.0	5.0	* 35				
Max Q Clear Time (g_c+I1), s	9.8	38.0	2.9	20.8	25.3	19.1	3.3	31.7				
Green Ext Time (p_c), s	0.0	5.4	0.0	3.5	0.4	2.7	0.0	1.6				

### Intersection Summary

HCM 6th Ctrl Delay 45.9

HCM 6th LOS D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

## 2: Marksheffel Rd & US-24

2026 Total AM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	550	125	350	1215	20	5	755	105	10	1025	760
Future Volume (vph)	360	550	125	350	1215	20	5	755	105	10	1025	760
Turn Type	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	20.0	38.0		28.0	46.0		11.5	43.5		10.5	42.5	
Total Split (%)	16.7%	31.7%		23.3%	38.3%		9.6%	36.3%		8.8%	35.4%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effect Green (s)	20.6	42.2	120.0	61.0	41.5	120.0	5.0	36.3	120.0	5.5	37.1	120.0
Actuated g/C Ratio	0.17	0.35	1.00	0.51	0.35	1.00	0.04	0.30	1.00	0.05	0.31	1.00
v/c Ratio	0.69	0.50	0.09	0.75	1.06	0.01	0.07	0.74	0.07	0.13	1.01	0.52
Control Delay	40.9	46.8	0.1	25.9	80.6	0.0	56.8	40.6	0.1	49.2	60.5	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	46.8	0.1	25.9	80.6	0.0	56.8	40.6	0.1	49.2	60.5	0.9
LOS	D	D	A	C	F	A	E	D	A	D	E	A
Approach Delay		39.1			67.5			35.7			35.2	
Approach LOS		D			E			D			D	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 45.8

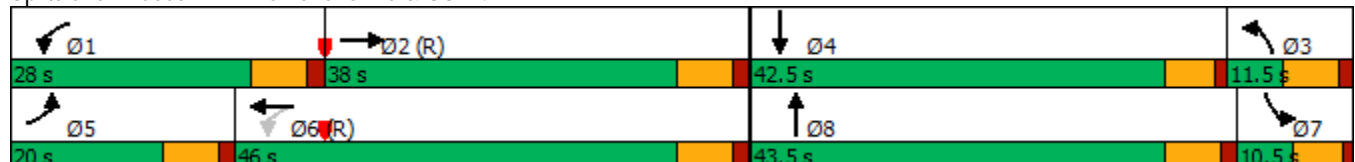
Intersection LOS: D

Intersection Capacity Utilization 87.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24



























# HCM 6th Signalized Intersection Summary

2026 Total AM.syn

02/15/2021

## 2: Marksheffel Rd & US-24

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	550	125	350	1215	20	5	755	105	10	1025	760
Future Volume (veh/h)	360	550	125	350	1215	20	5	755	105	10	1025	760
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1737	1737	1737	1841	1841	1841	1856	1856	1856	1811	1811	1811
Adj Flow Rate, veh/h	375	573	0	365	1266	0	5	786	0	10	1068	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	11	11	11	4	4	4	3	3	3	6	6	6
Cap, veh/h	361	1060		481	1275		11	917		80	1061	
Arrive On Green	0.11	0.32	0.00	0.16	0.36	0.00	0.01	0.26	0.00	0.09	0.62	0.00
Sat Flow, veh/h	3209	3300	1472	1753	3497	1560	1767	3526	1572	1725	3441	1535
Grp Volume(v), veh/h	375	573	0	365	1266	0	5	786	0	10	1068	0
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1753	1749	1560	1767	1763	1572	1725	1721	1535
Q Serve(g_s), s	13.5	17.1	0.0	16.3	43.3	0.0	0.3	25.5	0.0	0.6	37.0	0.0
Cycle Q Clear(g_c), s	13.5	17.1	0.0	16.3	43.3	0.0	0.3	25.5	0.0	0.6	37.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	361	1060		481	1275		11	917		80	1061	
V/C Ratio(X)	1.04	0.54		0.76	0.99		0.44	0.86		0.12	1.01	
Avail Cap(c_a), veh/h	361	1060		521	1275		74	1087		80	1061	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.66	0.66	0.00
Uniform Delay (d), s/veh	53.3	33.5	0.0	22.6	38.0	0.0	59.4	42.3	0.0	52.2	23.0	0.0
Incr Delay (d2), s/veh	57.7	2.0	0.0	5.9	23.7	0.0	24.8	6.1	0.0	0.5	24.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	7.1	0.0	7.4	22.3	0.0	0.2	11.8	0.0	0.3	13.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.0	35.5	0.0	28.6	61.6	0.0	84.2	48.4	0.0	52.6	47.1	0.0
LnGrp LOS	F	D		C	E		F	D		D	F	
Approach Vol, veh/h	948		A	1631		A	791		A	1078		A
Approach Delay, s/veh	65.3			54.2			48.6			47.1		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.2	45.0	7.3	42.5	20.0	50.2	12.1	37.7				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	21.5	31.5	5.0	37.0	13.5	39.5	5.0	* 37				
Max Q Clear Time (g_c+l1), s	18.3	19.1	2.3	39.0	15.5	45.3	2.6	27.5				
Green Ext Time (p_c), s	0.4	3.1	0.0	0.0	0.0	0.0	0.0	3.7				
Intersection Summary												
HCM 6th Ctrl Delay	53.9											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

# Timings

## 2: Marksheffel Rd & US-24

2026 Total PM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	670	1200	125	210	585	20	15	1190	245	20	915	510
Future Volume (vph)	670	1200	125	210	585	20	15	1190	245	20	915	510
Turn Type	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	35.0	49.0		14.0	28.0		11.5	46.5		10.5	45.5	
Total Split (%)	29.2%	40.8%		11.7%	23.3%		9.6%	38.8%		8.8%	37.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effect Green (s)	27.2	42.5	120.0	42.9	29.1	120.0	5.4	40.0	120.0	5.0	40.6	120.0
Actuated g/C Ratio	0.23	0.35	1.00	0.36	0.24	1.00	0.04	0.33	1.00	0.04	0.34	1.00
v/c Ratio	0.88	0.98	0.08	0.79	0.70	0.01	0.19	1.03	0.16	0.27	0.79	0.33
Control Delay	33.2	50.2	0.0	51.5	48.1	0.0	52.0	61.6	0.2	57.7	34.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	50.2	0.0	51.5	48.1	0.0	52.0	61.6	0.2	57.7	34.4	0.5
LOS	C	D	A	D	D	A	D	E	A	E	C	A
Approach Delay		41.3			47.8			51.1			22.8	
Approach LOS		D			D			D			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 40.0

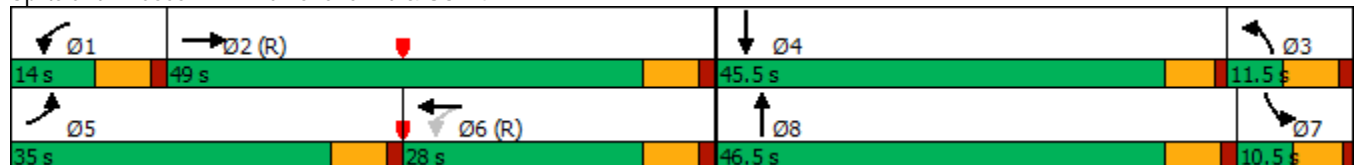
Intersection LOS: D

Intersection Capacity Utilization 94.0%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24



























# HCM 6th Signalized Intersection Summary

2026 Total PM.syn

02/15/2021

## 2: Marksheffel Rd & US-24

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	670	1200	125	210	585	20	15	1190	245	20	915	510
Future Volume (veh/h)	670	1200	125	210	585	20	15	1190	245	20	915	510
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	684	1224	0	214	597	0	15	1214	0	20	934	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	3	3	3
Cap, veh/h	752	1305		186	747		128	1185		36	1023	
Arrive On Green	0.22	0.37	0.00	0.06	0.21	0.00	0.07	0.33	0.00	0.04	0.58	0.00
Sat Flow, veh/h	3456	3554	1585	1767	3526	1572	1781	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	684	1224	0	214	597	0	15	1214	0	20	934	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1767	1763	1572	1781	1777	1585	1767	1763	1572
Q Serve(g_s), s	23.2	39.9	0.0	7.5	19.3	0.0	0.9	40.0	0.0	1.3	28.4	0.0
Cycle Q Clear(g_c), s	23.2	39.9	0.0	7.5	19.3	0.0	0.9	40.0	0.0	1.3	28.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	752	1305		186	747		128	1185		36	1023	
V/C Ratio(X)	0.91	0.94		1.15	0.80		0.12	1.02		0.56	0.91	
Avail Cap(c_a), veh/h	821	1305		186	747		128	1185		74	1175	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.83	0.83	0.00
Uniform Delay (d), s/veh	45.8	36.6	0.0	42.5	44.9	0.0	52.1	40.0	0.0	57.0	23.8	0.0
Incr Delay (d2), s/veh	13.3	13.9	0.0	112.0	8.7	0.0	0.4	32.6	0.0	10.8	8.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	19.5	0.0	7.8	9.3	0.0	0.4	22.5	0.0	0.7	9.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	50.6	0.0	154.5	53.6	0.0	52.5	72.6	0.0	67.8	32.3	0.0
LnGrp LOS	E	D		F	D		D	F		E	C	
Approach Vol, veh/h	1908		A	811		A	1229		A	954		A
Approach Delay, s/veh	53.6			80.2			72.4			33.1		
Approach LOS	D			F			E			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	50.6	15.1	40.3	32.6	31.9	8.9	46.5				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	7.5	42.5	5.0	40.0	28.5	21.5	5.0	* 40				
Max Q Clear Time (g_c+I1), s	9.5	41.9	2.9	30.4	25.2	21.3	3.3	42.0				
Green Ext Time (p_c), s	0.0	0.5	0.0	4.5	1.0	0.1	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	58.7											
HCM 6th LOS	E											
Notes												



























# Timings

2026 Total AM Improved.syn

## 2: Marksheffel Rd & US-24

02/17/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	550	125	350	1215	20	5	755	105	10	1025	760
Future Volume (vph)	360	550	125	350	1215	20	5	755	105	10	1025	760
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	20.0	35.0		30.0	45.0		12.0	44.5		10.5	43.0	
Total Split (%)	16.7%	29.2%		25.0%	37.5%		10.0%	37.1%		8.8%	35.8%	
Yellow Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.5		6.0	6.5		6.0	6.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effect Green (s)	20.0	43.9	120.0	18.2	42.0	120.0	5.8	36.8	120.0	5.7	37.5	120.0
Actuated g/C Ratio	0.17	0.37	1.00	0.15	0.35	1.00	0.05	0.31	1.00	0.05	0.31	1.00
v/c Ratio	0.71	0.48	0.09	0.72	1.04	0.01	0.06	0.73	0.07	0.12	1.00	0.52
Control Delay	42.6	45.9	0.1	56.4	75.7	0.0	43.0	29.1	0.1	48.7	57.6	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	45.9	0.1	56.4	75.7	0.0	43.0	29.1	0.1	48.7	57.6	0.9
LOS	D	D	A	E	E	A	D	C	A	D	E	A
Approach Delay		39.3			70.5			25.7			33.6	
Approach LOS		D			E			C			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 44.5

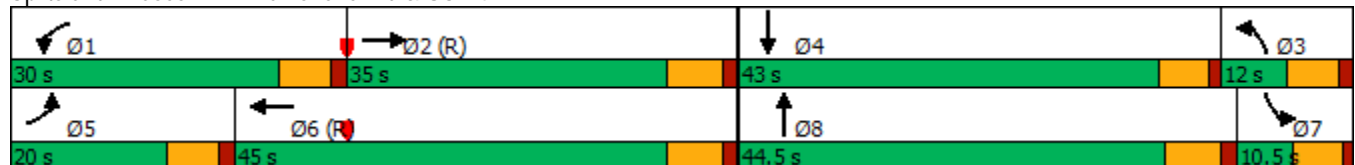
Intersection LOS: D

Intersection Capacity Utilization 87.2%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 2: Marksheffel Rd & US-24



























# HCM 6th Signalized Intersection Summary

2026 Total AM Improved.syn

## 2: Marksheffel Rd & US-24

02/17/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	550	125	350	1215	20	5	755	105	10	1025	760
Future Volume (veh/h)	360	550	125	350	1215	20	5	755	105	10	1025	760
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1737	1737	1737	1841	1841	1841	1856	1856	1856	1811	1811	1811
Adj Flow Rate, veh/h	375	573	0	365	1266	0	5	786	0	10	1068	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	11	11	11	4	4	4	3	3	3	6	6	6
Cap, veh/h	374	1162		439	1275		11	922		84	1075	
Arrive On Green	0.12	0.35	0.00	0.13	0.36	0.00	0.01	0.26	0.00	0.10	0.63	0.00
Sat Flow, veh/h	3209	3300	1472	3401	3497	1560	1767	3526	1572	1725	3441	1535
Grp Volume(v), veh/h	375	573	0	365	1266	0	5	786	0	10	1068	0
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1700	1749	1560	1767	1763	1572	1725	1721	1535
Q Serve(g_s), s	14.0	16.3	0.0	12.6	43.3	0.0	0.3	25.4	0.0	0.6	36.8	0.0
Cycle Q Clear(g_c), s	14.0	16.3	0.0	12.6	43.3	0.0	0.3	25.4	0.0	0.6	36.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	374	1162		439	1275		11	922		84	1075	
V/C Ratio(X)	1.00	0.49		0.83	0.99		0.44	0.85		0.12	0.99	
Avail Cap(c_a), veh/h	374	1162		680	1275		88	1116		84	1075	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.66	0.66	0.00
Uniform Delay (d), s/veh	53.0	30.5	0.0	51.0	38.0	0.0	59.4	42.1	0.0	51.8	22.4	0.0
Incr Delay (d2), s/veh	46.9	1.5	0.0	5.2	23.7	0.0	24.8	5.6	0.0	0.4	20.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	6.7	0.0	5.7	22.3	0.0	0.2	11.7	0.0	0.3	12.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.9	32.0	0.0	56.2	61.6	0.0	84.2	47.7	0.0	52.2	43.0	0.0
LnGrp LOS	F	C		E	E		F	D		D	D	
Approach Vol, veh/h	948		A	1631		A	791		A	1078		A
Approach Delay, s/veh	58.8			60.4			47.9			43.1		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.5	48.7	6.8	43.0	20.0	50.2	11.9	37.9				
Change Period (Y+Rc), s	6.0	6.5	6.0	5.5	6.0	6.5	6.0	* 6.5				
Max Green Setting (Gmax), s	24.0	28.5	6.0	37.5	14.0	38.5	5.0	* 38				
Max Q Clear Time (g_c+I1), s	14.6	18.3	2.3	38.8	16.0	45.3	2.6	27.4				
Green Ext Time (p_c), s	0.9	2.8	0.0	0.0	0.0	0.0	0.0	4.0				
Intersection Summary												
HCM 6th Ctrl Delay	53.7											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

# Timings

2026 Total PM Improved.syn

## 2: Marksheffel Rd & US-24

02/17/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	670	1200	125	210	585	20	15	1190	245	20	915	510
Future Volume (vph)	670	1200	125	210	585	20	15	1190	245	20	915	510
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	37.0	47.0		14.0	24.0		11.5	48.5		10.5	47.5	
Total Split (%)	30.8%	39.2%		11.7%	20.0%		9.6%	40.4%		8.8%	39.6%	
Yellow Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.5		6.0	6.5		6.0	6.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effect Green (s)	28.0	43.9	120.0	10.9	26.8	120.0	5.7	42.0	120.0	5.0	42.6	120.0
Actuated g/C Ratio	0.23	0.37	1.00	0.09	0.22	1.00	0.05	0.35	1.00	0.04	0.36	1.00
v/c Ratio	0.85	0.95	0.08	0.69	0.76	0.01	0.18	0.98	0.16	0.27	0.75	0.33
Control Delay	36.7	51.8	0.1	65.7	52.3	0.0	52.9	55.6	0.2	57.6	31.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	51.8	0.1	65.7	52.3	0.0	52.9	55.6	0.2	57.6	31.6	0.5
LOS	D	D	A	E	D	A	D	E	A	E	C	A
Approach Delay		43.5			54.5			46.2			21.0	
Approach LOS		D			D			D			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 40.0

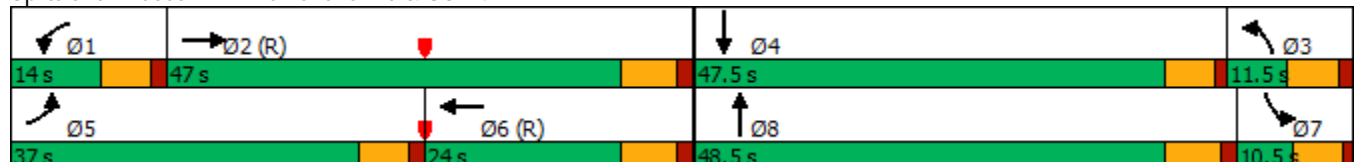
Intersection LOS: D

Intersection Capacity Utilization 87.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24



























# HCM 6th Signalized Intersection Summary

2026 Total PM Improved.syn

02/17/2021























## 2: Marksheffel Rd & US-24

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	670	1200	125	210	585	20	15	1190	245	20	915	510
Future Volume (veh/h)	670	1200	125	210	585	20	15	1190	245	20	915	510
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	684	1224	0	214	597	0	15	1214	0	20	934	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	3	3	3
Cap, veh/h	764	1261		229	706		153	1244		36	1033	
Arrive On Green	0.22	0.35	0.00	0.07	0.20	0.00	0.09	0.35	0.00	0.04	0.59	0.00
Sat Flow, veh/h	3456	3554	1585	3428	3526	1572	1781	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	684	1224	0	214	597	0	15	1214	0	20	934	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1714	1763	1572	1781	1777	1585	1767	1763	1572
Q Serve(g_s), s	23.1	40.7	0.0	7.5	19.6	0.0	0.9	40.5	0.0	1.3	28.0	0.0
Cycle Q Clear(g_c), s	23.1	40.7	0.0	7.5	19.6	0.0	0.9	40.5	0.0	1.3	28.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	764	1261		229	706		153	1244		36	1033	
V/C Ratio(X)	0.89	0.97		0.94	0.85		0.10	0.98		0.56	0.90	
Avail Cap(c_a), veh/h	893	1261		229	706		153	1244		74	1234	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.83	0.83	0.00
Uniform Delay (d), s/veh	45.4	38.1	0.0	55.7	46.2	0.0	50.6	38.5	0.0	57.0	23.4	0.0
Incr Delay (d2), s/veh	10.4	19.3	0.0	42.2	11.9	0.0	0.3	19.9	0.0	10.8	7.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	20.8	0.0	4.6	9.7	0.0	0.4	20.7	0.0	0.7	9.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	57.4	0.0	97.9	58.1	0.0	50.9	58.4	0.0	67.8	30.6	0.0
LnGrp LOS	E	E		F	E		D	E		E	C	
Approach Vol, veh/h	1908		A	811		A	1229		A	954		A
Approach Delay, s/veh	56.8			68.6			58.3			31.4		
Approach LOS	E			E			E			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	49.1	16.3	40.7	32.5	30.5	8.4	48.5				
Change Period (Y+Rc), s	6.0	6.5	6.0	5.5	6.0	6.5	6.0	* 6.5				
Max Green Setting (Gmax), s	8.0	40.5	5.5	42.0	31.0	17.5	5.0	* 42				
Max Q Clear Time (g_c+I1), s	9.5	42.7	2.9	30.0	25.1	21.6	3.3	42.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	5.2	1.5	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	54.2											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

# Timings 2: Marksheffel Rd & US-24

2040 Background AM.syn

02/15/2021

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	425	615	370	1395	25	5	755	100	15	955	890
Future Volume (vph)	425	615	370	1395	25	5	755	100	15	955	890
Turn Type	Prot	NA	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2	1	6		3	8		7	4	
Permitted Phases			6		Free			Free			Free
Detector Phase	5	2	1	6		3	8		7	4	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0	12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	20.0	38.0	28.0	46.0		11.5	43.5		10.5	42.5	
Total Split (%)	16.7%	31.7%	23.3%	38.3%		9.6%	36.3%		8.8%	35.4%	
Yellow Time (s)	5.0	5.0	5.0	5.0		5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5		6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max		None	None		None	None	
Act Effect Green (s)	20.4	38.1	60.7	39.5	120.0	5.0	36.3	120.0	5.6	39.3	120.0
Actuated g/C Ratio	0.17	0.32	0.51	0.33	1.00	0.04	0.30	1.00	0.05	0.33	1.00
v/c Ratio	0.83	0.62	0.85	1.27	0.02	0.07	0.74	0.07	0.20	0.89	0.61
Control Delay	54.1	58.0	37.8	164.5	0.0	57.2	39.7	0.1	50.2	38.4	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	58.0	37.8	164.5	0.0	57.2	39.7	0.1	50.2	38.4	2.7
LOS	D	E	D	F	A	E	D	A	D	D	A
Approach Delay		56.4		136.0			35.2			21.4	
Approach LOS		E		F			D			C	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.27

Intersection Signal Delay: 67.1

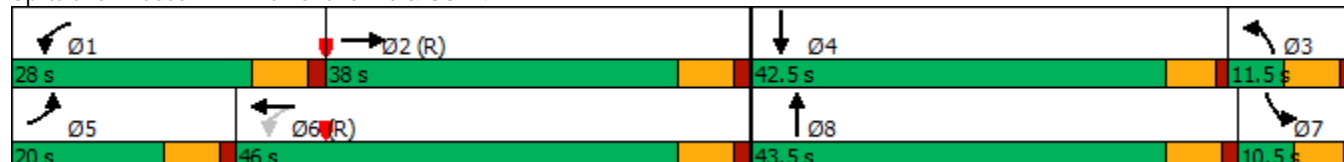
Intersection LOS: E

Intersection Capacity Utilization 92.5%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24





























# HCM 6th Signalized Intersection Summary

2040 Background AM.syn

## 2: Marksheffel Rd & US-24

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	425	615	0	370	1395	25	5	755	100	15	955	890
Future Volume (veh/h)	425	615	0	370	1395	25	5	755	100	15	955	890
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1737	1737	1737	1841	1841	1841	1856	1856	1856	1811	1811	1811
Adj Flow Rate, veh/h	443	641	0	385	1453	0	5	786	0	16	995	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	11	11	11	4	4	4	3	3	3	6	6	6
Cap, veh/h	361	1065		467	1299		11	917		68	1037	
Arrive On Green	0.11	0.32	0.00	0.16	0.37	0.00	0.01	0.26	0.00	0.08	0.60	0.00
Sat Flow, veh/h	3209	3300	1472	1753	3497	1560	1767	3526	1572	1725	3441	1535
Grp Volume(v), veh/h	443	641	0	385	1453	0	5	786	0	16	995	0
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1753	1749	1560	1767	1763	1572	1725	1721	1535
Q Serve(g_s), s	13.5	19.6	0.0	17.0	44.6	0.0	0.3	25.5	0.0	1.0	32.7	0.0
Cycle Q Clear(g_c), s	13.5	19.6	0.0	17.0	44.6	0.0	0.3	25.5	0.0	1.0	32.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	361	1065		467	1299		11	917		68	1037	
V/C Ratio(X)	1.23	0.60		0.83	1.12		0.44	0.86		0.24	0.96	
Avail Cap(c_a), veh/h	361	1065		498	1299		74	1087		72	1061	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	53.3	34.2	0.0	23.2	37.7	0.0	59.4	42.3	0.0	53.6	23.2	0.0
Incr Delay (d2), s/veh	124.3	2.5	0.0	10.4	64.1	0.0	24.8	6.1	0.0	1.1	13.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	8.2	0.0	8.2	30.2	0.0	0.2	11.8	0.0	0.5	10.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	177.5	36.7	0.0	33.6	101.8	0.0	84.2	48.4	0.0	54.7	36.7	0.0
LnGrp LOS	F	D		C	F		F	D		D	D	
Approach Vol, veh/h	1084		A	1838		A	791		A	1011		A
Approach Delay, s/veh	94.3			87.5			48.6			37.0		
Approach LOS	F			F			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.9	45.2	7.3	41.6	20.0	51.1	11.2	37.7				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	21.5	31.5	5.0	37.0	13.5	39.5	5.0	* 37				
Max Q Clear Time (g_c+l1), s	19.0	21.6	2.3	34.7	15.5	46.6	3.0	27.5				
Green Ext Time (p_c), s	0.3	3.1	0.0	1.4	0.0	0.0	0.0	3.7				

### Intersection Summary

HCM 6th Ctrl Delay 71.7

HCM 6th LOS E

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

2040 Background PM.syn

## 2: Marksheffel Rd & US-24

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	785	1390	10	210	665	20	20	1165	245	25	895	600
Future Volume (vph)	785	1390	10	210	665	20	20	1165	245	25	895	600
Turn Type	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		11.5	11.5		10.5	10.5	
Total Split (s)	34.0	51.1		15.0	32.1		11.5	43.4		10.5	42.4	
Total Split (%)	28.3%	42.6%		12.5%	26.8%		9.6%	36.2%		8.8%	35.3%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effect Green (s)	30.7	44.6	120.0	39.3	26.6	120.0	5.4	36.9	120.0	5.0	39.6	120.0
Actuated g/C Ratio	0.26	0.37	1.00	0.33	0.22	1.00	0.04	0.31	1.00	0.04	0.33	1.00
v/c Ratio	0.91	1.08	0.01	0.83	0.87	0.01	0.25	1.09	0.16	0.36	0.79	0.39
Control Delay	43.5	90.3	0.0	56.8	58.6	0.0	51.1	84.0	0.2	60.4	35.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.5	90.3	0.0	56.8	58.6	0.0	51.1	84.0	0.2	60.4	35.0	0.6
LOS	D	F	A	E	E	A	D	F	A	E	C	A
Approach Delay		73.1			56.9			69.2			21.9	
Approach LOS		E			E			E			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 56.8

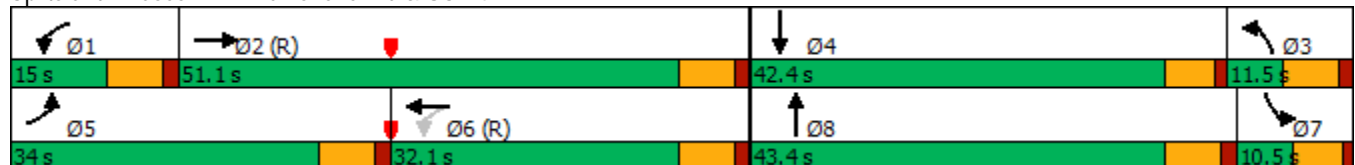
Intersection LOS: E

Intersection Capacity Utilization 98.5%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Marksheffel Rd & US-24



























# HCM 6th Signalized Intersection Summary

2040 Background PM.syn

02/15/2021

## 2: Marksheffel Rd & US-24

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	785	1390	10	210	665	20	20	1165	245	25	895	600
Future Volume (veh/h)	785	1390	10	210	665	20	20	1165	245	25	895	600
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	801	1418	0	214	679	0	20	1189	0	26	913	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	3	3	3
Cap, veh/h	792	1353		185	784		106	1093		43	988	
Arrive On Green	0.23	0.38	0.00	0.07	0.22	0.00	0.06	0.31	0.00	0.05	0.56	0.00
Sat Flow, veh/h	3456	3554	1585	1767	3526	1572	1781	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	801	1418	0	214	679	0	20	1189	0	26	913	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1767	1763	1572	1781	1777	1585	1767	1763	1572
Q Serve(g_s), s	27.5	45.7	0.0	8.5	22.3	0.0	1.3	36.9	0.0	1.7	28.3	0.0
Cycle Q Clear(g_c), s	27.5	45.7	0.0	8.5	22.3	0.0	1.3	36.9	0.0	1.7	28.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	792	1353		185	784		106	1093		43	988	
V/C Ratio(X)	1.01	1.05		1.16	0.87		0.19	1.09		0.61	0.92	
Avail Cap(c_a), veh/h	792	1353		185	784		106	1093		74	1084	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	46.3	37.1	0.0	39.1	44.9	0.0	53.6	41.6	0.0	56.5	25.2	0.0
Incr Delay (d2), s/veh	34.8	38.0	0.0	114.3	12.3	0.0	0.8	54.4	0.0	10.8	10.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.5	26.5	0.0	7.3	11.0	0.0	0.6	24.2	0.0	0.9	9.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.1	75.1	0.0	153.4	57.2	0.0	54.5	96.0	0.0	67.4	35.6	0.0
LnGrp LOS	F	F		F	E		D	F		E	D	
Approach Vol, veh/h	2219		A	893		A	1209		A	939		A
Approach Delay, s/veh	77.3			80.2			95.3			36.4		
Approach LOS	E			F			F			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	52.2	13.7	39.1	34.0	33.2	9.4	43.4				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	8.5	44.6	5.0	36.9	27.5	25.6	5.0	* 37				
Max Q Clear Time (g_c+l1), s	10.5	47.7	3.3	30.3	29.5	24.3	3.7	38.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	3.3	0.0	0.6	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			74.6									
HCM 6th LOS			E									
Notes												

# Timings

## 2: Marksheffel Rd & US-24

2040 Total AM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	425	645	140	435	1425	25	5	1100	160	15	1330	890
Future Volume (vph)	425	645	140	435	1425	25	5	1100	160	15	1330	890
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			Free			Free
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	11.5	11.5		10.5	10.5	
Total Split (s)	24.0	38.0	38.0	30.0	44.0	44.0	11.5	41.5		10.5	40.5	
Total Split (%)	20.0%	31.7%	31.7%	25.0%	36.7%	36.7%	9.6%	34.6%		8.8%	33.8%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	20.2	41.0	41.0	20.7	41.5	41.5	5.0	34.6	120.0	5.2	37.5	120.0
Actuated g/C Ratio	0.17	0.34	0.34	0.17	0.35	0.35	0.04	0.29	1.00	0.04	0.31	1.00
v/c Ratio	0.84	0.42	0.25	0.78	0.86	0.04	0.07	0.79	0.11	0.22	0.91	0.61
Control Delay	51.2	45.9	25.9	57.4	43.3	0.1	37.6	25.3	0.1	49.5	36.1	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	45.9	25.9	57.4	43.3	0.1	37.6	25.3	0.1	49.5	36.1	1.2
LOS	D	D	C	E	D	A	D	C	A	D	D	A
Approach Delay		45.5			45.9			22.2			22.3	
Approach LOS		D			D			C			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 33.3

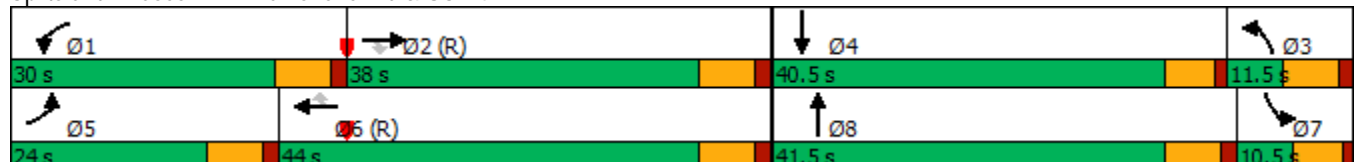
Intersection LOS: C

Intersection Capacity Utilization 80.8%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 2: Marksheffel Rd & US-24



























# HCM 6th Signalized Intersection Summary

2040 Total AM.syn

02/15/2021

## 2: Marksheffel Rd & US-24

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	425	645	140	435	1425	25	5	1100	160	15	1330	890
Future Volume (veh/h)	425	645	140	435	1425	25	5	1100	160	15	1330	890
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1737	1737	1737	1841	1841	1841	1856	1856	1856	1811	1811	1811
Adj Flow Rate, veh/h	443	672	0	453	1484	0	5	1146	0	16	1385	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	11	11	11	4	4	4	3	3	3	6	6	6
Cap, veh/h	468	1617		524	1755		11	1340		41	1435	
Arrive On Green	0.15	0.34	0.00	0.15	0.35	0.00	0.01	0.35	0.00	0.05	0.58	0.00
Sat Flow, veh/h	3209	4742	1472	3401	5025	1560	1767	5066	1572	1725	4944	1535
Grp Volume(v), veh/h	443	672	0	453	1484	0	5	1146	0	16	1385	0
Grp Sat Flow(s),veh/h/ln	1605	1581	1472	1700	1675	1560	1767	1689	1572	1725	1648	1535
Q Serve(g_s), s	16.4	13.1	0.0	15.6	32.7	0.0	0.3	25.2	0.0	1.1	32.1	0.0
Cycle Q Clear(g_c), s	16.4	13.1	0.0	15.6	32.7	0.0	0.3	25.2	0.0	1.1	32.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	468	1617		524	1755		11	1340		41	1435	
V/C Ratio(X)	0.95	0.42		0.86	0.85		0.44	0.86		0.39	0.97	
Avail Cap(c_a), veh/h	468	1617		666	1755		74	1477		72	1442	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	0.95	0.95	0.00	0.36	0.36	0.00
Uniform Delay (d), s/veh	50.8	30.4	0.0	49.5	36.1	0.0	59.3	36.8	0.0	56.3	24.6	0.0
Incr Delay (d2), s/veh	28.5	0.8	0.0	9.4	5.2	0.0	23.7	4.6	0.0	2.2	7.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	5.1	0.0	7.3	14.0	0.0	0.2	10.3	0.0	0.5	9.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.3	31.2	0.0	58.9	41.3	0.0	83.0	41.3	0.0	58.5	32.5	0.0
LnGrp LOS	E	C		E	D		F	D		E	C	
Approach Vol, veh/h	1115		A	1937		A	1151		A	1401		A
Approach Delay, s/veh	50.3			45.4			41.5			32.8		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.0	47.4	7.3	40.3	24.0	48.4	9.4	38.2				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	23.5	31.5	5.0	35.0	17.5	37.5	5.0	* 35				
Max Q Clear Time (g_c+l1), s	17.6	15.1	2.3	34.1	18.4	34.7	3.1	27.2				
Green Ext Time (p_c), s	0.9	4.3	0.0	0.7	0.0	2.2	0.0	4.6				

### Intersection Summary

HCM 6th Ctrl Delay 42.4

HCM 6th LOS D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

## 2: Marksheffel Rd & US-24

2040 Total PM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	785	1415	205	325	690	20	20	1765	345	25	1560	600
Future Volume (vph)	785	1415	205	325	690	20	20	1765	345	25	1560	600
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			Free			Free
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	11.5	11.5		10.5	10.5	
Total Split (s)	34.0	41.5	41.5	18.0	25.5	25.5	11.5	50.0		10.5	49.0	
Total Split (%)	28.3%	34.6%	34.6%	15.0%	21.3%	21.3%	9.6%	41.7%		8.8%	40.8%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	30.7	36.5	36.5	14.2	20.0	20.0	5.1	43.5	120.0	5.0	46.2	120.0
Actuated g/C Ratio	0.26	0.30	0.30	0.12	0.17	0.17	0.04	0.36	1.00	0.04	0.38	1.00
v/c Ratio	0.91	0.93	0.36	0.83	0.84	0.05	0.27	0.98	0.22	0.36	0.82	0.39
Control Delay	33.5	47.7	21.8	69.9	58.6	0.2	59.9	45.3	0.3	53.6	28.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	47.7	21.8	69.9	58.6	0.2	59.9	45.3	0.3	53.6	28.5	0.4
LOS	C	D	C	E	E	A	E	D	A	D	C	A
Approach Delay		40.8			61.1			38.2			21.1	
Approach LOS		D			E			D			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 37.3

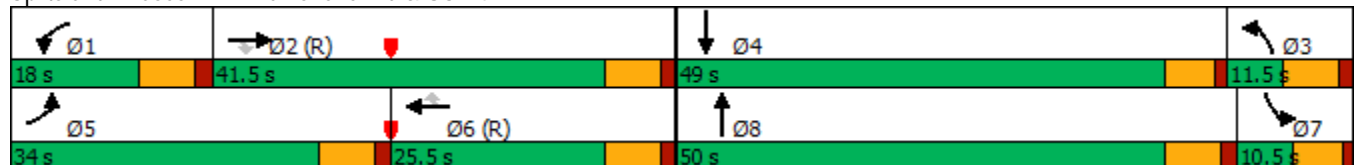
Intersection LOS: D

Intersection Capacity Utilization 87.0%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 2: Marksheffel Rd & US-24







































# HCM 6th Signalized Intersection Summary

## 2: Marksheffel Rd & US-24










2040 Total PM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  			  			  	
Traffic Volume (veh/h)	785	1415	205	325	690	20	20	1765	345	25	1560	600
Future Volume (veh/h)	785	1415	205	325	690	20	20	1765	345	25	1560	600
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	801	1444	0	332	704	0	20	1801	0	26	1592	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	3	3	3
Cap, veh/h	792	1536		329	849		96	1851		43	1729	
Arrive On Green	0.23	0.30	0.00	0.10	0.17	0.00	0.05	0.36	0.00	0.05	0.68	0.00
Sat Flow, veh/h	3456	5106	1585	3428	5066	1572	1781	5106	1585	1767	5066	1572
Grp Volume(v), veh/h	801	1444	0	332	704	0	20	1801	0	26	1592	0
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1714	1689	1572	1781	1702	1585	1767	1689	1572
Q Serve(g_s), s	27.5	33.1	0.0	11.5	16.1	0.0	1.3	41.7	0.0	1.7	32.2	0.0
Cycle Q Clear(g_c), s	27.5	33.1	0.0	11.5	16.1	0.0	1.3	41.7	0.0	1.7	32.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	792	1536		329	849		96	1851		43	1729	
V/C Ratio(X)	1.01	0.94		1.01	0.83		0.21	0.97		0.61	0.92	
Avail Cap(c_a), veh/h	792	1536		329	849		96	1851		74	1836	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	0.81	0.81	0.00	0.44	0.44	0.00
Uniform Delay (d), s/veh	46.3	40.9	0.0	54.2	48.3	0.0	54.3	37.7	0.0	56.5	17.7	0.0
Incr Delay (d2), s/veh	34.8	12.5	0.0	52.3	9.2	0.0	0.9	13.1	0.0	6.0	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.5	15.5	0.0	7.3	7.5	0.0	0.6	19.3	0.0	0.8	7.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.1	53.4	0.0	106.6	57.5	0.0	55.2	50.8	0.0	62.6	21.5	0.0
LnGrp LOS	F	D		F	E		E	D		E	C	
Approach Vol, veh/h	2245		A	1036		A	1821		A	1618		A
Approach Delay, s/veh	63.3			73.2			50.8			22.1		
Approach LOS	E			E			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	42.6	12.9	46.5	34.0	26.6	9.4	50.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	5.5	6.5	6.5	6.5	* 6.5				
Max Green Setting (Gmax), s	11.5	35.0	5.0	43.5	27.5	19.0	5.0	* 44				
Max Q Clear Time (g_c+l1), s	13.5	35.1	3.3	34.2	29.5	18.1	3.7	43.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	6.7	0.0	0.4	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			51.5									
HCM 6th LOS			D									
Notes												

HCM 6th TWSC  
3: Meadowbrook Pkwy & Newt Dr

2020 Adjusted Existing AM.syn  
02/15/2021

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	27	0	0	9	122	0	0	0	201	0	1
Future Vol, veh/h	5	27	0	0	9	122	0	0	0	201	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	6	6	6
Mvmt Flow	6	31	0	0	10	139	0	0	0	228	0	1










Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	532	457	1	472	457	0	1	0	0	0	0	0
Stage 1	457	457	-	0	0	-	-	-	-	-	-	-
Stage 2	75	0	-	472	457	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.254	-	-
Pot Cap-1 Maneuver	458	500	1084	502	500	-	1622	-	-	-	-	-
Stage 1	583	568	-	-	-	-	-	-	-	-	-	-
Stage 2	934	-	-	573	568	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	500	1084	479	500	-	1622	-	-	-	-	-
Mov Cap-2 Maneuver	291	525	-	503	528	-	-	-	-	-	-	-
Stage 1	583	568	-	-	-	-	-	-	-	-	-	-
Stage 2	934	-	-	542	568	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0			
HCM LOS	-	-	-	-

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1622	-	-	-	525	-	528	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.058	-	0.019	-	-	-	-
HCM Control Delay (s)	0	-	-	-	12.3	0	12	-	-	-	-
HCM Lane LOS	A	-	-	-	B	A	B	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	-	0.1	-	-	-	-

HCM 6th TWSC  
3: Meadowbrook Pkwy & Newt Dr










2020 Adjusted Existing PM.syn  
02/15/2021

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	32	0	0	35	95	0	0	0	263	0	9
Future Vol, veh/h	11	32	0	0	35	95	0	0	0	263	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	6	6	6	8	8	8	2	2	2	2	2	2
Mvmt Flow	13	38	0	0	42	113	0	0	0	313	0	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	710	632	6	651	637	0	11	0	0	0	0	0
Stage 1	632	632	-	0	0	-	-	-	-	-	-	-
Stage 2	78	0	-	651	637	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.18	6.58	6.28	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.572	4.072	3.372	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	343	392	1065	373	387	-	1608	-	-	-	-	-
Stage 1	462	468	-	-	-	-	-	-	-	-	-	-
Stage 2	921	-	-	447	462	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	392	1065	348	387	-	1608	-	-	-	-	-
Mov Cap-2 Maneuver	239	436	-	388	438	-	-	-	-	-	-	-
Stage 1	462	468	-	-	-	-	-	-	-	-	-	-
Stage 2	921	-	-	411	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0			
HCM LOS	-	-	-	-










Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1608	-	-	-	436	-	438	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.087	-	0.095	-	-	-	-
HCM Control Delay (s)	0	-	-	-	14	0	14.1	-	-	-	-
HCM Lane LOS	A	-	-	-	B	A	B	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	-	0.3	-	-	-	-

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	30	0	0	10	135	0	0	0	220	0	5
Future Vol, veh/h	10	30	0	0	10	135	0	0	0	220	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	6	6	6
Mvmt Flow	11	34	0	0	11	153	0	0	0	250	0	6

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	585	503	3	520	506	0	6	0	0	0	0	0
Stage 1	503	503	-	0	0	-	-	-	-	-	-	-
Stage 2	82	0	-	520	506	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.254	-	-
Pot Cap-1 Maneuver	422	471	1081	467	469	-	1615	-	-	-	-	-
Stage 1	551	541	-	-	-	-	-	-	-	-	-	-
Stage 2	926	-	-	539	540	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	471	1081	443	469	-	1615	-	-	-	-	-
Mov Cap-2 Maneuver	277	501	-	470	504	-	-	-	-	-	-	-
Stage 1	551	541	-	-	-	-	-	-	-	-	-	-
Stage 2	926	-	-	505	540	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0			
HCM LOS	-	-	-	-

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1615	-	-	-	501	-	504	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.068	-	0.023	-	-	-	-
HCM Control Delay (s)	0	-	-	-	12.7	0	12.3	-	-	-	-
HCM Lane LOS	A	-	-	-	B	A	B	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	-	0.1	-	-	-	-

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	35	0	0	40	105	0	0	0	285	0	10
Future Vol, veh/h	15	35	0	0	40	105	0	0	0	285	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	6	6	6	8	8	8	2	2	2	2	2	2
Mvmt Flow	18	42	0	0	48	125	0	0	0	339	0	12










Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	771	684	6	705	690	0	12	0	0	0	0	0
Stage 1	684	684	-	0	0	-	-	-	-	-	-	-
Stage 2	87	0	-	705	690	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.18	6.58	6.28	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.572	4.072	3.372	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	312	366	1065	343	361	-	1607	-	-	-	-	-
Stage 1	432	443	-	-	-	-	-	-	-	-	-	-
Stage 2	911	-	-	418	437	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	366	1065	317	361	-	1607	-	-	-	-	-
Mov Cap-2 Maneuver	224	413	-	360	417	-	-	-	-	-	-	-
Stage 1	432	443	-	-	-	-	-	-	-	-	-	-
Stage 2	911	-	-	379	437	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0			
HCM LOS	-	-	-	-

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1607	-	-	-	413	-	417	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.101	-	0.114	-	-	-	-
HCM Control Delay (s)	0	-	-	-	14.7	0	14.7	-	-	-	-
HCM Lane LOS	A	-	-	-	B	A	B	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	-	0.4	-	-	-	-

HCM 6th TWSC  
3: Meadowbrook Pkwy & Newt Dr

2026 Total AM.syn  
02/15/2021

Intersection												
Int Delay, s/veh	103.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	30	0	335	10	145	0	140	330	250	145	5
Future Vol, veh/h	10	30	0	335	10	145	0	140	330	250	145	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	6	6	6
Mvmt Flow	11	34	0	381	11	165	0	159	375	284	165	6










Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1171	1270	168	1100	1086	347	171	0	0	534	0	0
Stage 1	736	736	-	347	347	-	-	-	-	-	-	-
Stage 2	435	534	-	753	739	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.254	-	-
Pot Cap-1 Maneuver	170	168	876	~ 190	216	696	1406	-	-	1014	-	-
Stage 1	411	425	-	669	635	-	-	-	-	-	-	-
Stage 2	600	524	-	402	424	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	98	121	876	~ 128	156	696	1406	-	-	1014	-	-
Mov Cap-2 Maneuver	140	177	-	~ 212	246	-	-	-	-	-	-	-
Stage 1	411	306	-	669	635	-	-	-	-	-	-	-
Stage 2	450	524	-	~ 257	305	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.8	287.6	0	6.2
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1406	-	-	140	177	212	246	696	1014	-	-
HCM Lane V/C Ratio	-	-	-	0.081	0.193	1.796	0.046	0.237	0.28	-	-
HCM Control Delay (s)	0	-	-	33	30.1	\$ 415	20.3	11.8	9.9	-	-
HCM Lane LOS	A	-	-	D	D	F	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.7	26.5	0.1	0.9	1.2	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			



Intersection												
Int Delay, s/veh	98.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	35	0	255	40	135	0	95	225	305	110	10
Future Vol, veh/h	15	35	0	255	40	135	0	95	225	305	110	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	6	6	6	8	8	8	2	2	2	2	2	2
Mvmt Flow	18	42	0	304	48	161	0	113	268	363	131	12

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1215	1244	137	1131	1116	247	143	0	0	381	0	0
Stage 1	863	863	-	247	247	-	-	-	-	-	-	-
Stage 2	352	381	-	884	869	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.18	6.58	6.28	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.572	4.072	3.372	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	155	171	901	~ 176	202	777	1440	-	-	1177	-	-
Stage 1	344	366	-	744	691	-	-	-	-	-	-	-
Stage 2	657	606	-	332	361	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	78	118	901	~ 109	140	777	1440	-	-	1177	-	-
Mov Cap-2 Maneuver	106	167	-	~ 166	211	-	-	-	-	-	-	-
Stage 1	344	253	-	744	691	-	-	-	-	-	-	-
Stage 2	485	606	-	~ 192	250	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB				
HCM Control Delay, s	37.2		268.3		0			6.8				
HCM LOS	E		F									

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1440	-	-	106	167	166	211	777	1177	-	-
HCM Lane V/C Ratio	-	-	-	0.168	0.25	1.829	0.226	0.207	0.308	-	-
HCM Control Delay (s)	0	-	-	45.7	33.6	442.5	27	10.8	9.4	-	-
HCM Lane LOS	A	-	-	E	D	F	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.9	22.3	0.8	0.8	1.3	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

Intersection					
Intersection Delay, s/veh	9.2				
Intersection LOS	A				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	45	557		534	455
Demand Flow Rate, veh/h	46	568		544	482
Vehicles Circulating, veh/h	865	173		347	400
Vehicles Exiting, veh/h	17	718		564	341
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	7.4	5.6		11.3	11.3
Approach LOS	A	A		B	B
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.704	0.296	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	46	400	168	544	482
Cap Entry Lane, veh/h	571	1213	1213	969	918
Entry HV Adj Factor	0.985	0.979	0.982	0.981	0.944
Flow Entry, veh/h	45	392	165	534	455
Cap Entry, veh/h	563	1188	1192	950	866
V/C Ratio	0.081	0.330	0.138	0.562	0.525
Control Delay, s/veh	7.4	6.2	4.2	11.3	11.3
LOS	A	A	A	B	B
95th %tile Queue, veh	0	1	0	4	3

Intersection					
Intersection Delay, s/veh	8.6				
Intersection LOS	A				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	60	513		381	506
Demand Flow Rate, veh/h	64	554		388	516
Vehicles Circulating, veh/h	832	134		434	380
Vehicles Exiting, veh/h	64	688		462	308
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	7.8	5.4		9.5	11.4
Approach LOS	A	A		A	B
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.686	0.314	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	64	380	174	388	516
Cap Entry Lane, veh/h	591	1257	1257	886	937
Entry HV Adj Factor	0.945	0.927	0.925	0.981	0.981
Flow Entry, veh/h	60	352	161	381	506
Cap Entry, veh/h	558	1165	1163	870	919
V/C Ratio	0.108	0.302	0.138	0.438	0.551
Control Delay, s/veh	7.8	5.9	4.3	9.5	11.4
LOS	A	A	A	A	B
95th %tile Queue, veh	0	1	0	2	3

Intersection					
Intersection Delay, s/veh	4.3				
Intersection LOS	A				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	51	193		0	296
Demand Flow Rate, veh/h	52	197		0	313
Vehicles Circulating, veh/h	307	11		359	17
Vehicles Exiting, veh/h	23	348		0	191
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	4.1	3.6		0.0	4.8
Approach LOS	A	A		-	A
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.086	0.914	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	52	17	180	0	313
Cap Entry Lane, veh/h	1009	1406	1406	957	1356
Entry HV Adj Factor	0.985	0.980	0.978	1.000	0.946
Flow Entry, veh/h	51	17	176	0	296
Cap Entry, veh/h	993	1378	1375	957	1282
V/C Ratio	0.052	0.012	0.128	0.000	0.231
Control Delay, s/veh	4.1	2.7	3.6	3.8	4.8
LOS	A	A	A	A	A
95th %tile Queue, veh	0	0	0	0	1

Intersection					
Intersection Delay, s/veh	5.1				
Intersection LOS	A				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	72	197		0	417
Demand Flow Rate, veh/h	76	212		0	425
Vehicles Circulating, veh/h	407	19		483	58
Vehicles Exiting, veh/h	76	464		0	173
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	5.0	3.5		0.0	5.8
Approach LOS	A	A		-	A
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.274	0.726	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	76	58	154	0	425
Cap Entry Lane, veh/h	911	1396	1396	843	1301
Entry HV Adj Factor	0.944	0.926	0.929	1.000	0.981
Flow Entry, veh/h	72	54	143	0	417
Cap Entry, veh/h	860	1292	1296	843	1276
V/C Ratio	0.083	0.042	0.110	0.000	0.327
Control Delay, s/veh	5.0	3.1	3.7	4.3	5.8
LOS	A	A	A	A	A
95th %tile Queue, veh	0	0	0	0	1

Intersection					
Intersection Delay, s/veh	11.2				
Intersection LOS	B				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	51	625		585	512
Demand Flow Rate, veh/h	52	637		597	542
Vehicles Circulating, veh/h	964	191		395	445
Vehicles Exiting, veh/h	23	801		621	383
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	8.4	6.1		14.2	14.2
Approach LOS	A	A		B	B
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.699	0.301	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	52	445	192	597	542
Cap Entry Lane, veh/h	516	1194	1194	922	876
Entry HV Adj Factor	0.985	0.981	0.979	0.981	0.945
Flow Entry, veh/h	51	437	188	585	512
Cap Entry, veh/h	508	1171	1169	904	828
V/C Ratio	0.101	0.373	0.161	0.647	0.618
Control Delay, s/veh	8.4	6.8	4.5	14.2	14.2
LOS	A	A	A	B	B
95th %tile Queue, veh	0	2	1	5	4



























Intersection					
Intersection Delay, s/veh	12.3				
Intersection LOS	B				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	72	608		476	602
Demand Flow Rate, veh/h	76	656		486	613
Vehicles Circulating, veh/h	1000	165		507	463
Vehicles Exiting, veh/h	76	828		569	358
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	9.8	6.3		13.7	17.6
Approach LOS	A	A		B	C
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.706	0.294	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	76	463	193	486	613
Cap Entry Lane, veh/h	498	1222	1222	823	861
Entry HV Adj Factor	0.944	0.926	0.927	0.980	0.982
Flow Entry, veh/h	72	429	179	476	602
Cap Entry, veh/h	470	1132	1133	806	845
V/C Ratio	0.153	0.379	0.158	0.591	0.712
Control Delay, s/veh	9.8	7.0	4.6	13.7	17.6
LOS	A	A	A	B	C
95th %tile Queue, veh	1	2	1	4	6

# Timings

## 4: US-24 & Newt Dr/SH-94

2020 Adjusted Existing AM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	28	196	440	39	1	144	798	379	4	1735	36
Future Volume (vph)	16	28	196	440	39	1	144	798	379	4	1735	36
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		19.0	32.0		12.0	64.0		12.5	64.5	64.5
Total Split (%)	9.6%	20.4%		15.8%	26.7%		10.0%	53.3%		10.4%	53.8%	53.8%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.8	7.5	120.0	13.0	16.8	120.0	84.1	83.1	120.0	79.1	73.6	73.6
Actuated g/C Ratio	0.05	0.06	1.00	0.11	0.14	1.00	0.70	0.69	1.00	0.66	0.61	0.61
v/c Ratio	0.10	0.26	0.13	1.25	0.08	0.00	1.12	0.36	0.27	0.01	0.86	0.04
Control Delay	55.9	58.6	0.2	160.8	24.1	0.0	150.4	9.7	0.4	6.8	24.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	58.6	0.2	160.8	24.1	0.0	150.4	9.7	0.4	6.8	24.2	0.1
LOS	E	E	A	F	C	A	F	A	A	A	C	A
Approach Delay		10.7			149.5			22.3			23.7	
Approach LOS		B			F			C			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 38.2

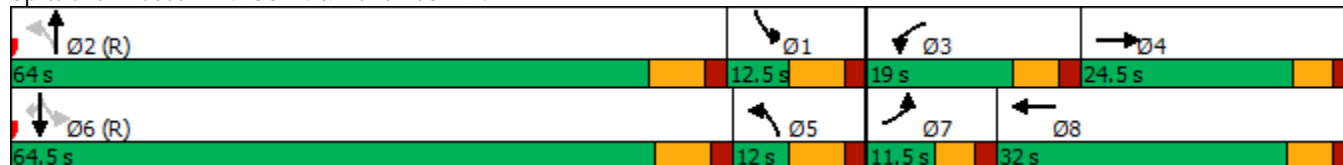
Intersection LOS: D

Intersection Capacity Utilization 91.8%

ICU Level of Service F

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2020 Adjusted Existing AM.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	28	196	440	39	1	144	798	379	4	1735	36
Future Volume (veh/h)	16	28	196	440	39	1	144	798	379	4	1735	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	16	29	0	454	40	0	148	823	0	4	1789	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	58	72		368	470		321	1581		532	1649	
Arrive On Green	0.02	0.04	0.00	0.11	0.13	0.00	0.16	0.47	0.00	0.16	0.48	0.00
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	1668	3328	1485	1725	3441	1535
Grp Volume(v), veh/h	16	29	0	454	40	0	148	823	0	4	1789	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1668	1664	1485	1725	1721	1535
Q Serve(g_s), s	0.6	1.9	0.0	13.0	1.2	0.0	5.1	20.7	0.0	0.0	57.5	0.0
Cycle Q Clear(g_c), s	0.6	1.9	0.0	13.0	1.2	0.0	5.1	20.7	0.0	0.0	57.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	58	72		368	470		321	1581		532	1649	
V/C Ratio(X)	0.28	0.41		1.23	0.09		0.46	0.52		0.01	1.09	
Avail Cap(c_a), veh/h	169	289		368	758		321	1581		532	1649	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.69	0.69	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.2	56.3	0.0	53.5	45.5	0.0	43.8	22.0	0.0	17.4	31.3	0.0
Incr Delay (d2), s/veh	2.5	3.6	0.0	120.1	0.1	0.0	1.0	1.2	0.0	0.0	49.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.9	0.0	11.7	0.5	0.0	4.0	8.2	0.0	0.1	34.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	59.9	0.0	173.6	45.5	0.0	44.8	23.2	0.0	17.4	80.4	0.0
LnGrp LOS	E	E		F	D		D	C		B	F	
Approach Vol, veh/h	45		A	494		A	971		A	1793		A
Approach Delay, s/veh	60.2			163.2			26.5			80.2		
Approach LOS	E			F			C			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.3	64.0	19.0	10.7	25.8	64.5	7.6	22.1				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	57.0	13.0	* 19	5.0	57.5	6.0	26.0				
Max Q Clear Time (g_c+I1), s	2.0	22.7	15.0	3.9	7.1	59.5	2.6	3.2				
Green Ext Time (p_c), s	0.0	6.9	0.0	0.1	0.0	0.0	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	76.6											
HCM 6th LOS	E											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

# Timings

## 4: US-24 & Newt Dr/SH-94

2020 Adjusted Existing PM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	39	238	350	23	7	158	1688	320	4	933	36
Future Volume (vph)	28	39	238	350	23	7	158	1688	320	4	933	36
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		18.0	31.0		19.0	65.0		12.5	58.5	58.5
Total Split (%)	9.6%	20.4%		15.0%	25.8%		15.8%	54.2%		10.4%	48.8%	48.8%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	6.1	8.1	120.0	16.8	21.1	120.0	78.7	76.3	120.0	70.1	64.6	64.6
Actuated g/C Ratio	0.05	0.07	1.00	0.14	0.18	1.00	0.66	0.64	1.00	0.58	0.54	0.54
v/c Ratio	0.17	0.33	0.16	0.77	0.04	0.00	0.50	0.80	0.21	0.03	0.53	0.04
Control Delay	56.7	59.5	0.2	82.0	35.7	0.0	21.3	21.1	0.3	5.8	18.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	59.5	0.2	82.0	35.7	0.0	21.3	21.1	0.3	5.8	18.5	0.2
LOS	E	E	A	F	D	A	C	C	A	A	B	A
Approach Delay		12.9			77.7			18.1			17.8	
Approach LOS		B			E			B			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 23.5

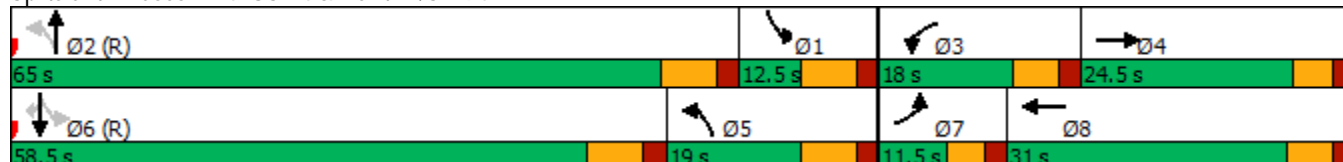
Intersection LOS: C

Intersection Capacity Utilization 84.1%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2020 Adjusted Existing PM.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	39	238	350	23	7	158	1688	320	4	933	36
Future Volume (veh/h)	28	39	238	350	23	7	158	1688	320	4	933	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	29	41	0	368	24	0	166	1777	0	4	982	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	89	75		343	417		547	1704		338	1489	
Arrive On Green	0.03	0.04	0.00	0.10	0.12	0.00	0.21	0.48	0.00	0.16	0.43	0.00
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	1767	3526	1572	1739	3469	1547
Grp Volume(v), veh/h	29	41	0	368	24	0	166	1777	0	4	982	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1767	1763	1572	1739	1735	1547
Q Serve(g_s), s	1.0	2.6	0.0	12.0	0.7	0.0	0.0	58.0	0.0	0.0	27.0	0.0
Cycle Q Clear(g_c), s	1.0	2.6	0.0	12.0	0.7	0.0	0.0	58.0	0.0	0.0	27.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	89	75		343	417		547	1704		338	1489	
V/C Ratio(X)	0.33	0.55		1.07	0.06		0.30	1.04		0.01	0.66	
Avail Cap(c_a), veh/h	173	296		343	734		547	1704		338	1489	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.71	0.71	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.4	56.6	0.0	54.0	47.0	0.0	29.5	31.0	0.0	42.3	27.3	0.0
Incr Delay (d2), s/veh	2.1	6.2	0.0	62.1	0.0	0.0	0.3	33.9	0.0	0.0	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.3	0.0	8.1	0.3	0.0	3.9	31.6	0.0	0.1	11.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	62.7	0.0	116.1	47.0	0.0	29.8	64.9	0.0	42.3	29.6	0.0
LnGrp LOS	E	E		F	D		C	F		D	C	
Approach Vol, veh/h		70	A		392	A		1943	A		986	A
Approach Delay, s/veh		61.4			111.8			61.9			29.6	
Approach LOS		E			F			E			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.2	65.0	18.0	10.8	32.7	58.5	8.6	20.2				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	58.0	12.0	* 19	12.0	51.5	6.0	25.0				
Max Q Clear Time (g_c+I1), s	2.0	60.0	14.0	4.6	2.0	29.0	3.0	2.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.1	0.3	7.5	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			58.3									
HCM 6th LOS			E									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

# Timings

## 4: US-24 & Newt Dr/SH-94

2026 Background AM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	35	215	475	45	5	155	860	410	5	1860	40
Future Volume (vph)	20	35	215	475	45	5	155	860	410	5	1860	40
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		20.0	33.0		12.0	63.0		12.5	63.5	63.5
Total Split (%)	9.6%	20.4%		16.7%	27.5%		10.0%	52.5%		10.4%	52.9%	52.9%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.8	7.9	120.0	14.0	18.1	120.0	82.8	81.8	120.0	77.8	72.3	72.3
Actuated g/C Ratio	0.05	0.07	1.00	0.12	0.15	1.00	0.69	0.68	1.00	0.65	0.60	0.60
v/c Ratio	0.13	0.31	0.14	1.25	0.09	0.00	1.21	0.40	0.29	0.01	0.94	0.04
Control Delay	56.5	59.3	0.2	161.4	23.4	0.0	181.5	10.7	0.5	7.6	31.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	59.3	0.2	161.4	23.4	0.0	181.5	10.7	0.5	7.6	31.4	0.1
LOS	E	E	A	F	C	A	F	B	A	A	C	A
Approach Delay		12.1			148.2			26.3			30.7	
Approach LOS		B			F			C			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 42.9

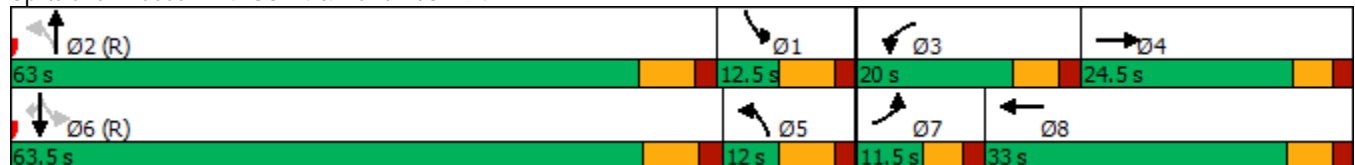
Intersection LOS: D

Intersection Capacity Utilization 96.9%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94





























# HCM 6th Signalized Intersection Summary

2026 Background AM.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

























													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	20	35	215	475	45	5	155	860	410	5	1860	40	
Future Volume (veh/h)	20	35	215	475	45	5	155	860	410	5	1860	40	
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No			No			No			
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811	
Adj Flow Rate, veh/h	21	36	0	490	46	0	160	887	0	5	1918	0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6	
Cap, veh/h	71	74		397	490		319	1553		501	1620		
Arrive On Green	0.02	0.04	0.00	0.12	0.14	0.00	0.16	0.47	0.00	0.16	0.47	0.00	
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	1668	3328	1485	1725	3441	1535	
Grp Volume(v), veh/h	21	36	0	490	46	0	160	887	0	5	1918	0	
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1668	1664	1485	1725	1721	1535	
Q Serve(g_s), s	0.7	2.3	0.0	14.0	1.4	0.0	6.0	23.3	0.0	0.0	56.5	0.0	
Cycle Q Clear(g_c), s	0.7	2.3	0.0	14.0	1.4	0.0	6.0	23.3	0.0	0.0	56.5	0.0	
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00	
Lane Grp Cap(c), veh/h	71	74		397	490		319	1553		501	1620		
V/C Ratio(X)	0.30	0.49		1.23	0.09		0.50	0.57		0.01	1.18		
Avail Cap(c_a), veh/h	169	289		397	787		319	1553		501	1620		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	0.68	0.68	0.00	1.00	1.00	0.00	1.00	1.00	0.00	
Uniform Delay (d), s/veh	57.9	56.4	0.0	53.0	44.9	0.0	44.2	23.3	0.0	19.5	31.7	0.0	
Incr Delay (d2), s/veh	2.3	4.9	0.0	120.0	0.1	0.0	1.2	1.5	0.0	0.0	89.3	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.3	1.2	0.0	12.6	0.6	0.0	4.4	9.3	0.0	0.1	42.7	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	60.2	61.3	0.0	173.0	45.0	0.0	45.4	24.8	0.0	19.5	121.1	0.0	
LnGrp LOS	E	E		F	D		D	C		B	F		
Approach Vol, veh/h	57		A	536			A	1047		A	1923		A
Approach Delay, s/veh	60.9			162.0				27.9			120.8		
Approach LOS	E			F				C			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8					
Phs Duration (G+Y+Rc), s	26.2	63.0	20.0	10.8	25.7	63.5	8.0	22.8					
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0					
Max Green Setting (Gmax), s	5.5	56.0	14.0	* 19	5.0	56.5	6.0	27.0					
Max Q Clear Time (g_c+I1), s	2.0	25.3	16.0	4.3	8.0	58.5	2.7	3.4					
Green Ext Time (p_c), s	0.0	7.4	0.0	0.1	0.0	0.0	0.0	0.2					
Intersection Summary													
HCM 6th Ctrl Delay	98.8												
HCM 6th LOS	F												
Notes													
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.													
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.													

# Timings

2026 Background PM.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	45	260	380	25	10	170	1810	345	5	1000	40
Future Volume (vph)	35	45	260	380	25	10	170	1810	345	5	1000	40
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		18.0	31.0		19.0	65.0		12.5	58.5	58.5
Total Split (%)	9.6%	20.4%		15.0%	25.8%		15.8%	54.2%		10.4%	48.8%	48.8%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	6.3	8.4	120.0	15.9	20.3	120.0	79.3	76.9	120.0	69.8	64.3	64.3
Actuated g/C Ratio	0.05	0.07	1.00	0.13	0.17	1.00	0.66	0.64	1.00	0.58	0.54	0.54
v/c Ratio	0.21	0.36	0.17	0.89	0.04	0.01	0.56	0.85	0.23	0.03	0.57	0.05
Control Delay	57.1	60.1	0.2	91.8	39.1	0.0	26.5	23.1	0.3	6.2	20.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	60.1	0.2	91.8	39.1	0.0	26.5	23.1	0.3	6.2	20.3	0.4
LOS	E	E	A	F	D	A	C	C	A	A	C	A
Approach Delay		14.0			86.4			19.9			19.5	
Approach LOS		B			F			B			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 26.0

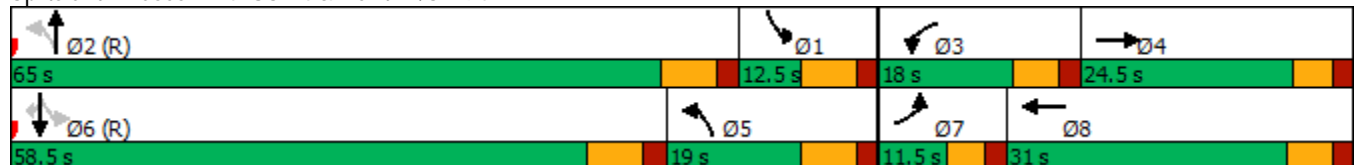
Intersection LOS: C

Intersection Capacity Utilization 88.4%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2026 Background PM.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	45	260	380	25	10	170	1810	345	5	1000	40
Future Volume (veh/h)	35	45	260	380	25	10	170	1810	345	5	1000	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	37	47	0	400	26	0	179	1905	0	5	1053	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	102	77		343	409		526	1704		336	1489	
Arrive On Green	0.03	0.04	0.00	0.10	0.12	0.00	0.21	0.48	0.00	0.16	0.43	0.00
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	1767	3526	1572	1739	3469	1547
Grp Volume(v), veh/h	37	47	0	400	26	0	179	1905	0	5	1053	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1767	1763	1572	1739	1735	1547
Q Serve(g_s), s	1.3	3.0	0.0	12.0	0.8	0.0	0.0	58.0	0.0	0.0	29.9	0.0
Cycle Q Clear(g_c), s	1.3	3.0	0.0	12.0	0.8	0.0	0.0	58.0	0.0	0.0	29.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	102	77		343	409		526	1704		336	1489	
V/C Ratio(X)	0.36	0.61		1.17	0.06		0.34	1.12		0.01	0.71	
Avail Cap(c_a), veh/h	173	296		343	734		526	1704		336	1489	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.68	0.68	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.1	56.6	0.0	54.0	47.2	0.0	32.1	31.0	0.0	42.5	28.1	0.0
Incr Delay (d2), s/veh	2.2	7.5	0.0	94.8	0.0	0.0	0.4	61.7	0.0	0.0	2.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.6	0.0	9.7	0.4	0.0	4.2	38.2	0.0	0.1	12.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.3	64.1	0.0	148.8	47.3	0.0	32.5	92.7	0.0	42.5	30.9	0.0
LnGrp LOS	E	E		F	D		C	F		D	C	
Approach Vol, veh/h		84	A		426	A		2084	A		1058	A
Approach Delay, s/veh		62.0			142.6			87.5			31.0	
Approach LOS		E			F			F			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.0	65.0	18.0	11.0	32.5	58.5	9.0	19.9				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	58.0	12.0	* 19	12.0	51.5	6.0	25.0				
Max Q Clear Time (g_c+I1), s	2.0	60.0	14.0	5.0	2.0	31.9	3.3	2.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.1	0.3	7.7	0.0	0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			77.0									
HCM 6th LOS			E									
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

# Timings

## 4: US-24 & Newt Dr/SH-94

2026 Total AM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	90	495	820	95	5	425	985	635	5	1860	65
Future Volume (vph)	45	90	495	820	95	5	425	985	635	5	1860	65
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		24.0	37.0		20.0	59.0		12.5	51.5	51.5
Total Split (%)	9.6%	20.4%		20.0%	30.8%		16.7%	49.2%		10.4%	42.9%	42.9%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.9	11.5	120.0	18.0	25.8	120.0	72.0	69.5	120.0	57.5	52.0	52.0
Actuated g/C Ratio	0.05	0.10	1.00	0.15	0.22	1.00	0.60	0.58	1.00	0.48	0.43	0.43
v/c Ratio	0.28	0.54	0.33	1.67	0.13	0.00	1.81	0.53	0.45	0.02	1.30	0.08
Control Delay	59.6	62.4	0.6	340.6	35.1	0.0	409.3	18.0	1.0	9.6	172.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.6	62.4	0.6	340.6	35.1	0.0	409.3	18.0	1.0	9.6	172.2	0.3
LOS	E	E	A	F	D	A	F	B	A	A	F	A
Approach Delay		13.6			307.2			94.0			166.0	
Approach LOS		B			F			F			F	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.81

Intersection Signal Delay: 145.5

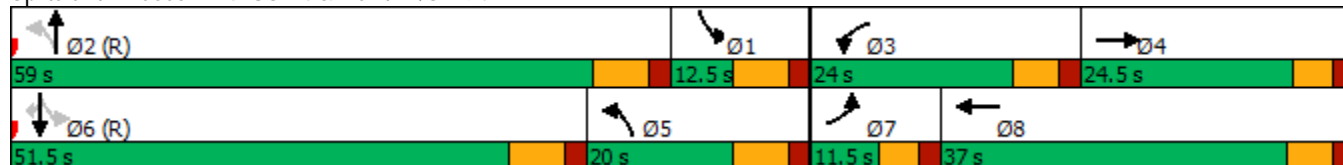
Intersection LOS: F

Intersection Capacity Utilization 121.7%

ICU Level of Service H

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2026 Total AM.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	90	495	820	95	5	425	985	635	5	1860	65
Future Volume (veh/h)	45	90	495	820	95	5	425	985	635	5	1860	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	46	93	0	845	98	0	438	1015	0	5	1918	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	110	126		510	666		383	1442		352	1276	
Arrive On Green	0.03	0.07	0.00	0.05	0.06	0.00	0.19	0.43	0.00	0.13	0.37	0.00
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	1668	3328	1485	1725	3441	1535
Grp Volume(v), veh/h	46	93	0	845	98	0	438	1015	0	5	1918	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1668	1664	1485	1725	1721	1535
Q Serve(g_s), s	1.6	6.0	0.0	18.0	3.2	0.0	23.2	29.8	0.0	0.0	44.5	0.0
Cycle Q Clear(g_c), s	1.6	6.0	0.0	18.0	3.2	0.0	23.2	29.8	0.0	0.0	44.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	110	126		510	666		383	1442		352	1276	
V/C Ratio(X)	0.42	0.74		1.66	0.15		1.14	0.70		0.01	1.50	
Avail Cap(c_a), veh/h	169	289		510	903		383	1442		352	1276	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.82	0.82	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.9	54.8	0.0	57.0	47.0	0.0	46.6	27.7	0.0	33.8	37.8	0.0
Incr Delay (d2), s/veh	2.5	8.2	0.0	302.5	0.1	0.0	91.0	2.9	0.0	0.0	230.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.0	0.0	29.7	1.4	0.0	21.0	12.3	0.0	0.1	59.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	63.1	0.0	359.5	47.1	0.0	137.6	30.6	0.0	33.8	268.3	0.0
LnGrp LOS	E	E		F	D		F	C		C	F	
Approach Vol, veh/h	139			A			1453			A		
Approach Delay, s/veh	61.9			327.1			62.9			267.7		
Approach LOS	E			F			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.7	59.0	24.0	14.3	30.2	51.5	9.4	28.8				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	52.0	18.0	* 19	13.0	44.5	6.0	31.0				
Max Q Clear Time (g_c+I1), s	2.0	31.8	20.0	8.0	25.2	46.5	3.6	5.2				
Green Ext Time (p_c), s	0.0	7.5	0.0	0.3	0.0	0.0	0.0	0.5				

### Intersection Summary

HCM 6th Ctrl Delay 207.1

HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

## 4: US-24 & Newt Dr/SH-94

2026 Total PM.syn

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	80	450	740	65	10	395	1925	625	5	1000	60
Future Volume (vph)	55	80	450	740	65	10	395	1925	625	5	1000	60
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		25.0	38.0		24.0	58.0		12.5	46.5	46.5
Total Split (%)	9.6%	20.4%		20.8%	31.7%		20.0%	48.3%		10.4%	38.8%	38.8%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.9	10.7	120.0	19.0	23.6	120.0	74.2	71.7	120.0	55.7	50.2	50.2
Actuated g/C Ratio	0.05	0.09	1.00	0.16	0.20	1.00	0.62	0.60	1.00	0.46	0.42	0.42
v/c Ratio	0.34	0.51	0.30	1.45	0.10	0.01	1.16	0.97	0.42	0.03	0.73	0.08
Control Delay	60.9	61.9	0.5	252.5	36.8	0.0	135.8	38.2	0.8	13.2	40.9	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	61.9	0.5	252.5	36.8	0.0	135.8	38.2	0.8	13.2	40.9	1.3
LOS	E	E	A	F	D	A	F	D	A	B	D	A
Approach Delay		14.5			232.2			43.4			38.6	
Approach LOS		B			F			D			D	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.45

Intersection Signal Delay: 67.8

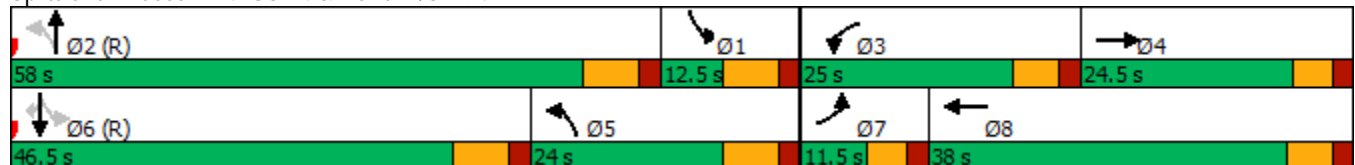
Intersection LOS: E

Intersection Capacity Utilization 101.8%

ICU Level of Service G

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94





























# HCM 6th Signalized Intersection Summary

2026 Total PM.syn

02/15/2021

## 4: US-24 & Newt Dr/SH-94

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	80	450	740	65	10	395	1925	625	5	1000	60
Future Volume (veh/h)	55	80	450	740	65	10	395	1925	625	5	1000	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	58	84	0	779	68	0	416	2026	0	5	1053	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	123	117		543	668		483	1498		299	1142	
Arrive On Green	0.04	0.06	0.00	0.16	0.19	0.00	0.23	0.43	0.00	0.14	0.33	0.00
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	1767	3526	1572	1739	3469	1547
Grp Volume(v), veh/h	58	84	0	779	68	0	416	2026	0	5	1053	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1767	1763	1572	1739	1735	1547
Q Serve(g_s), s	2.0	5.3	0.0	19.0	1.9	0.0	22.1	51.0	0.0	0.0	35.1	0.0
Cycle Q Clear(g_c), s	2.0	5.3	0.0	19.0	1.9	0.0	22.1	51.0	0.0	0.0	35.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	117		543	668		483	1498		299	1142	
V/C Ratio(X)	0.47	0.72		1.44	0.10		0.86	1.35		0.02	0.92	
Avail Cap(c_a), veh/h	173	296		543	940		483	1498		299	1142	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.73	0.73	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.8	55.2	0.0	50.5	40.2	0.0	41.8	34.5	0.0	44.7	38.8	0.0
Incr Delay (d2), s/veh	2.8	7.9	0.0	203.5	0.0	0.0	14.7	163.0	0.0	0.0	13.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.8	0.0	23.5	0.8	0.0	13.6	55.1	0.0	0.1	16.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	63.1	0.0	254.0	40.2	0.0	56.5	197.5	0.0	44.7	52.2	0.0
LnGrp LOS	E	E		F	D		E	F		D	D	
Approach Vol, veh/h	142		A	847		A	2442		A	1058		A
Approach Delay, s/veh	61.6			236.8			173.5			52.2		
Approach LOS	E			F			F			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.5	58.0	25.0	13.5	35.0	46.5	9.8	28.7				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	51.0	19.0	* 19	17.0	39.5	6.0	32.0				
Max Q Clear Time (g_c+I1), s	2.0	53.0	21.0	7.3	24.1	37.1	4.0	3.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.2	0.0	1.6	0.0	0.3				

### Intersection Summary

HCM 6th Ctrl Delay 153.3

HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

2026 Total AM Improved.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	90	495	820	95	5	425	985	635	5	1860	65
Future Volume (vph)	45	90	495	820	95	5	425	985	635	5	1860	65
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.5	23.5		11.0	24.0		12.0	25.0		12.0	25.0	25.0
Total Split (s)	12.0	24.5		27.5	40.0		14.0	55.0		13.0	54.0	54.0
Total Split (%)	10.0%	20.4%		22.9%	33.3%		11.7%	45.8%		10.8%	45.0%	45.0%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	6.3	11.5	120.0	21.5	28.9	120.0	7.0	65.9	120.0	60.1	54.5	54.5
Actuated g/C Ratio	0.05	0.10	1.00	0.18	0.24	1.00	0.06	0.55	1.00	0.50	0.45	0.45
v/c Ratio	0.26	0.54	0.33	0.96	0.22	0.00	2.37	0.39	0.45	0.02	0.86	0.08
Control Delay	58.5	62.4	0.6	58.1	29.8	0.0	656.5	17.2	1.0	9.4	32.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	62.4	0.6	58.1	29.8	0.0	656.5	17.2	1.0	9.4	32.3	0.8
LOS	E	E	A	E	C	A	F	B	A	A	C	A
Approach Delay		13.5			54.9			145.0			31.2	
Approach LOS		B			D			F			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 2.37

Intersection Signal Delay: 75.3

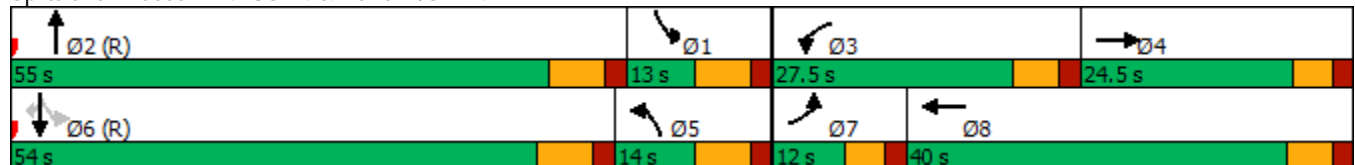
Intersection LOS: E

Intersection Capacity Utilization 87.0%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2026 Total AM Improved.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	90	495	820	95	5	425	985	635	5	1860	65
Future Volume (veh/h)	45	90	495	820	95	5	425	985	635	5	1860	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	46	93	0	845	98	0	438	1015	0	5	1918	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	110	126		886	404		465	1913		417	1936	
Arrive On Green	0.03	0.07	0.00	0.06	0.07	0.00	0.14	0.40	0.00	0.14	0.39	0.00
Sat Flow, veh/h	3374	1826	1547	4944	1841	1560	3237	4782	1485	1725	4944	1535
Grp Volume(v), veh/h	46	93	0	845	98	0	438	1015	0	5	1918	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1648	1841	1560	1618	1594	1485	1725	1648	1535
Q Serve(g_s), s	1.6	6.0	0.0	20.5	6.0	0.0	16.1	19.4	0.0	0.0	46.3	0.0
Cycle Q Clear(g_c), s	1.6	6.0	0.0	20.5	6.0	0.0	16.1	19.4	0.0	0.0	46.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	110	126		886	404		465	1913		417	1936	
V/C Ratio(X)	0.42	0.74		0.95	0.24		0.94	0.53		0.01	0.99	
Avail Cap(c_a), veh/h	183	289		886	522		465	1913		417	1936	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.86	0.86	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.9	54.8	0.0	56.0	46.2	0.0	50.9	27.4	0.0	24.4	36.3	0.0
Incr Delay (d2), s/veh	2.5	8.2	0.0	18.0	0.3	0.0	27.7	1.1	0.0	0.0	18.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.0	0.0	10.6	2.9	0.0	8.3	7.5	0.0	0.1	21.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	63.1	0.0	74.0	46.5	0.0	78.6	28.5	0.0	24.4	54.6	0.0
LnGrp LOS	E	E		E	D		E	C		C	D	
Approach Vol, veh/h	139			943			1453			1923		
Approach Delay, s/veh	61.9			71.1			43.6			54.5		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.2	55.0	27.5	14.3	24.2	54.0	9.4	32.3				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	6.0	48.0	21.5	* 19	7.0	47.0	6.5	34.0				
Max Q Clear Time (g_c+l1), s	2.0	21.4	22.5	8.0	18.1	48.3	3.6	8.0				
Green Ext Time (p_c), s	0.0	8.3	0.0	0.3	0.0	0.0	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	54.7											
HCM 6th LOS	D											

# Timings

2026 Total PM Improved.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	80	450	740	65	10	395	1925	625	5	1000	60
Future Volume (vph)	55	80	450	740	65	10	395	1925	625	5	1000	60
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		26.0	39.0		25.0	57.0		12.5	44.5	44.5
Total Split (%)	9.6%	20.4%		21.7%	32.5%		20.8%	47.5%		10.4%	37.1%	37.1%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.9	10.7	120.0	20.2	24.8	120.0	17.5	70.5	120.0	54.0	48.5	48.5
Actuated g/C Ratio	0.05	0.09	1.00	0.17	0.21	1.00	0.15	0.59	1.00	0.45	0.40	0.40
v/c Ratio	0.34	0.51	0.30	0.94	0.18	0.01	0.84	0.68	0.42	0.03	0.53	0.08
Control Delay	60.9	61.9	0.5	77.8	37.5	0.0	65.9	20.5	0.8	14.8	37.3	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	61.9	0.5	77.8	37.5	0.0	65.9	20.5	0.8	14.8	37.3	1.7
LOS	E	E	A	E	D	A	E	C	A	B	D	A
Approach Delay		14.5			73.6			22.4			35.2	
Approach LOS		B			E			C			D	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 31.8

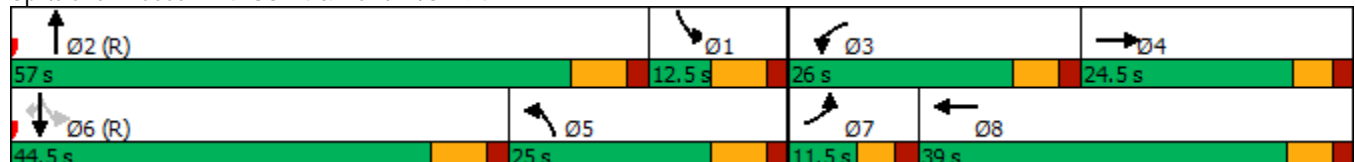
Intersection LOS: C

Intersection Capacity Utilization 78.8%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2026 Total PM Improved.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	80	450	740	65	10	395	1925	625	5	1000	60
Future Volume (veh/h)	55	80	450	740	65	10	395	1925	625	5	1000	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	58	84	0	779	68	0	416	2026	0	5	1053	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	123	117		831	367		828	2111		299	1558	
Arrive On Green	0.04	0.06	0.00	0.28	0.33	0.00	0.24	0.42	0.00	0.14	0.31	0.00
Sat Flow, veh/h	3456	1870	1585	4983	1856	1572	3428	5066	1572	1739	4985	1547
Grp Volume(v), veh/h	58	84	0	779	68	0	416	2026	0	5	1053	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1661	1856	1572	1714	1689	1572	1739	1662	1547
Q Serve(g_s), s	2.0	5.3	0.0	18.3	3.1	0.0	12.6	46.7	0.0	0.0	22.1	0.0
Cycle Q Clear(g_c), s	2.0	5.3	0.0	18.3	3.1	0.0	12.6	46.7	0.0	0.0	22.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	117		831	367		828	2111		299	1558	
V/C Ratio(X)	0.47	0.72		0.94	0.19		0.50	0.96		0.02	0.68	
Avail Cap(c_a), veh/h	173	296		831	510		828	2111		299	1558	
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.78	0.78	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.8	55.2	0.0	42.7	33.3	0.0	39.3	34.0	0.0	44.7	36.0	0.0
Incr Delay (d2), s/veh	2.8	7.9	0.0	15.0	0.2	0.0	0.5	12.2	0.0	0.0	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.8	0.0	7.9	1.4	0.0	5.4	21.0	0.0	0.1	9.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	63.1	0.0	57.7	33.5	0.0	39.8	46.2	0.0	44.7	38.3	0.0
LnGrp LOS	E	E		E	C		D	D		D	D	
Approach Vol, veh/h	142		A	847		A	2442		A	1058		A
Approach Delay, s/veh	61.6			55.7			45.1			38.4		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.5	57.0	26.0	13.5	36.0	44.5	9.8	29.7				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	50.0	20.0	* 19	18.0	37.5	6.0	33.0				
Max Q Clear Time (g_c+I1), s	2.0	48.7	20.3	7.3	14.6	24.1	4.0	5.1				
Green Ext Time (p_c), s	0.0	1.2	0.0	0.2	0.5	6.2	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay	46.0											
HCM 6th LOS	D											
Notes												

# Timings

2026 Total AM Improved\_4 WBL Flyover.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

											
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	45	90	495	95	5	425	985	635	5	1860	65
Future Volume (vph)	45	90	495	95	5	425	985	635	5	1860	65
Turn Type	Prot	NA	Free	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		8		5	2		1	6	
Permitted Phases			Free		Free			Free	6		6
Detector Phase	7	4		8		5	2		1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	35.5		24.0		25.0	72.0		12.5	59.5	59.5
Total Split (%)	9.6%	29.6%		20.0%		20.8%	60.0%		10.4%	49.6%	49.6%
Yellow Time (s)	3.5	3.5		4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead			Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes			Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.9	18.5	120.0	8.8	120.0	18.0	86.5	120.0	69.5	64.0	64.0
Actuated g/C Ratio	0.05	0.15	1.00	0.07	1.00	0.15	0.72	1.00	0.58	0.53	0.53
v/c Ratio	0.28	0.33	0.33	0.39	0.00	0.92	0.30	0.45	0.02	0.73	0.07
Control Delay	59.6	46.9	0.6	47.9	0.0	76.0	7.3	1.0	7.0	23.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.6	46.9	0.6	47.9	0.0	76.0	7.3	1.0	7.0	23.0	0.5
LOS	E	D	A	D	A	E	A	A	A	C	A
Approach Delay		11.4		45.6			19.6			22.2	
Approach LOS		B		D			B			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 20.1

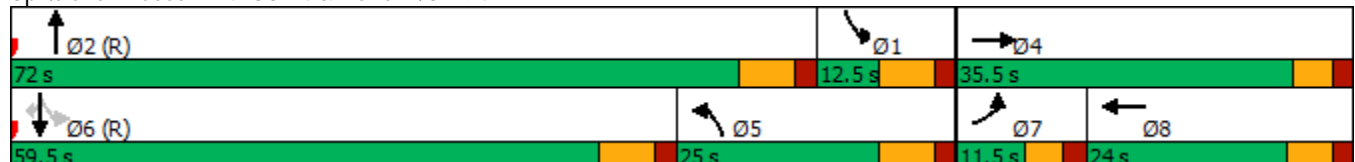
Intersection LOS: C

Intersection Capacity Utilization 72.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94




























# HCM 6th Signalized Intersection Summary

## 4: US-24 & Newt Dr/SH-94

2026 Total AM Improved\_4 WBL Flyover.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	90	495	0	95	5	425	985	635	5	1860	65
Future Volume (veh/h)	45	90	495	0	95	5	425	985	635	5	1860	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	0	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	46	93	0	0	98	0	438	1015	0	5	1918	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	0	4	4	10	10	10	6	6	6
Cap, veh/h	110	230		0	166		874	2590		515	2163	
Arrive On Green	0.03	0.13	0.00	0.00	0.02	0.00	0.27	0.54	0.00	0.17	0.44	0.00
Sat Flow, veh/h	3374	1826	1547	0	3589	1560	3237	4782	1485	1725	4944	1535
Grp Volume(v), veh/h	46	93	0	0	98	0	438	1015	0	5	1918	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	0	1749	1560	1618	1594	1485	1725	1648	1535
Q Serve(g_s), s	1.6	5.6	0.0	0.0	3.3	0.0	13.7	14.8	0.0	0.0	42.8	0.0
Cycle Q Clear(g_c), s	1.6	5.6	0.0	0.0	3.3	0.0	13.7	14.8	0.0	0.0	42.8	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	110	230		0	166		874	2590		515	2163	
V/C Ratio(X)	0.42	0.40		0.00	0.59		0.50	0.39		0.01	0.89	
Avail Cap(c_a), veh/h	169	456		0	525		874	2590		515	2163	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.82	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.9	48.3	0.0	0.0	57.9	0.0	37.0	16.0	0.0	16.4	31.0	0.0
Incr Delay (d2), s/veh	2.5	1.1	0.0	0.0	2.8	0.0	0.5	0.4	0.0	0.0	5.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.6	0.0	0.0	1.6	0.0	5.5	5.4	0.0	0.1	17.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	49.5	0.0	0.0	60.7	0.0	37.4	16.4	0.0	16.4	36.9	0.0
LnGrp LOS	E	D		A	E		D	B		B	D	
Approach Vol, veh/h		139	A		98	A		1453	A		1923	A
Approach Delay, s/veh		52.8			60.7			22.8			36.8	
Approach LOS		D			E			C			D	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.9	72.0		21.1	39.4	59.5	9.4	11.7				
Change Period (Y+Rc), s	7.0	7.0		* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	65.0		* 30	18.0	52.5	6.0	18.0				
Max Q Clear Time (g_c+I1), s	2.0	16.8		7.6	15.7	44.8	3.6	5.3				
Green Ext Time (p_c), s	0.0	9.4		0.4	0.4	6.5	0.0	0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			32.4									
HCM 6th LOS			C									
<b>Notes</b>												

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.


Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

2026 Total PM Improved\_4 WBL Flyover.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

											
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	55	80	450	65	10	395	1925	625	5	1000	60
Future Volume (vph)	55	80	450	65	10	395	1925	625	5	1000	60
Turn Type	Prot	NA	Free	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		8		5	2		1	6	
Permitted Phases			Free		Free			Free	6		6
Detector Phase	7	4		8		5	2		1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	12.0	36.0		24.0		31.0	71.0		13.0	53.0	53.0
Total Split (%)	10.0%	30.0%		20.0%		25.8%	59.2%		10.8%	44.2%	44.2%
Yellow Time (s)	3.5	3.5		4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead			Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes			Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	6.9	18.5	120.0	7.7	120.0	19.7	90.3	120.0	70.1	64.8	64.8
Actuated g/C Ratio	0.06	0.15	1.00	0.06	1.00	0.16	0.75	1.00	0.58	0.54	0.54
v/c Ratio	0.30	0.29	0.30	0.30	0.01	0.75	0.53	0.42	0.03	0.39	0.07
Control Delay	58.1	45.9	0.5	54.9	0.0	56.2	9.4	0.8	10.2	22.2	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	45.9	0.5	54.9	0.0	56.2	9.4	0.8	10.2	22.2	1.4
LOS	E	D	A	D	A	E	A	A	B	C	A
Approach Delay		12.1		47.3			13.9			21.0	
Approach LOS		B		D			B			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 15.8

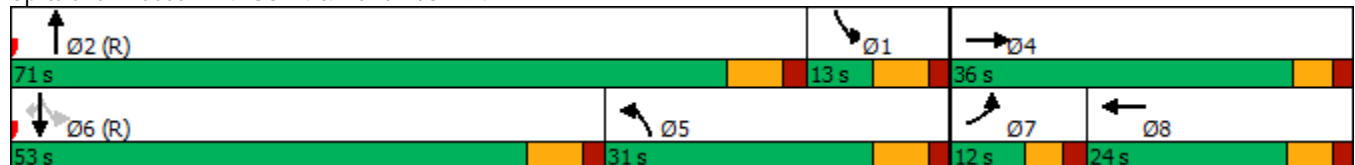
Intersection LOS: B

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94


























# HCM 6th Signalized Intersection Summary

## 4: US-24 & Newt Dr/SH-94

2026 Total PM Improved\_4 WBL Flyover.syn

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	80	450	0	65	10	395	1925	625	5	1000	60
Future Volume (veh/h)	55	80	450	0	65	10	395	1925	625	5	1000	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	58	84	0	0	68	0	416	2026	0	5	1053	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	0	3	3	3	3	3	5	5	5
Cap, veh/h	123	230		0	146		1121	2702		383	1911	
Arrive On Green	0.04	0.12	0.00	0.00	0.04	0.00	0.33	0.53	0.00	0.18	0.38	0.00
Sat Flow, veh/h	3456	1870	1585	0	3618	1572	3428	5066	1572	1739	4985	1547
Grp Volume(v), veh/h	58	84	0	0	68	0	416	2026	0	5	1053	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	0	1763	1572	1714	1689	1572	1739	1662	1547
Q Serve(g_s), s	2.0	4.9	0.0	0.0	2.3	0.0	11.2	37.3	0.0	0.0	19.8	0.0
Cycle Q Clear(g_c), s	2.0	4.9	0.0	0.0	2.3	0.0	11.2	37.3	0.0	0.0	19.8	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	230		0	146		1121	2702		383	1911	
V/C Ratio(X)	0.47	0.37		0.00	0.47		0.37	0.75		0.01	0.55	
Avail Cap(c_a), veh/h	187	475		0	529		1121	2702		383	1911	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.73	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.8	48.3	0.0	0.0	56.2	0.0	30.9	21.8	0.0	34.6	28.9	0.0
Incr Delay (d2), s/veh	2.8	1.0	0.0	0.0	1.7	0.0	0.2	2.0	0.0	0.0	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.4	0.0	0.0	1.0	0.0	4.7	14.7	0.0	0.1	8.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	49.3	0.0	0.0	57.9	0.0	31.1	23.7	0.0	34.7	30.1	0.0
LnGrp LOS	E	D		A	E		C	C		C	C	
Approach Vol, veh/h		142	A		68	A		2442	A		1058	A
Approach Delay, s/veh		53.5			57.9			25.0			30.1	
Approach LOS		D			E			C			C	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.3	71.0		20.7	46.3	53.0	9.8	11.0				
Change Period (Y+Rc), s	7.0	7.0		* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	6.0	64.0		* 31	24.0	46.0	6.5	18.0				
Max Q Clear Time (g_c+I1), s	2.0	39.3		6.9	13.2	21.8	4.0	4.3				
Green Ext Time (p_c), s	0.0	17.6		0.4	1.2	8.3	0.0	0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			28.1									
HCM 6th LOS			C									
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

# Timings

2040 Background AM.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	40	250	735	50	5	185	1010	540	10	2190	50
Future Volume (vph)	25	40	250	735	50	5	185	1010	540	10	2190	50
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		23.0	36.0		14.0	60.0		12.5	58.5	58.5
Total Split (%)	9.6%	20.4%		19.2%	30.0%		11.7%	50.0%		10.4%	48.8%	48.8%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.9	8.2	120.0	17.0	21.6	120.0	7.0	76.0	120.0	70.0	64.5	64.5
Actuated g/C Ratio	0.05	0.07	1.00	0.14	0.18	1.00	0.06	0.63	1.00	0.58	0.54	0.54
v/c Ratio	0.16	0.33	0.17	1.09	0.16	0.00	1.03	0.35	0.38	0.03	0.86	0.06
Control Delay	57.0	59.9	0.2	100.2	34.0	0.0	129.9	12.0	0.7	5.8	27.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	59.9	0.2	100.2	34.0	0.0	129.9	12.0	0.7	5.8	27.1	0.2
LOS	E	E	A	F	C	A	F	B	A	A	C	A
Approach Delay		12.3			95.4			21.1			26.4	
Approach LOS		B			F			C			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 34.4

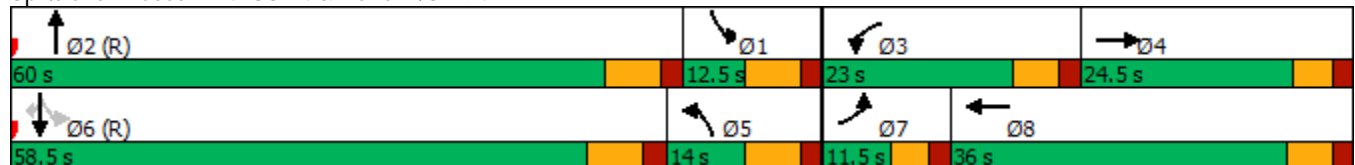
Intersection LOS: C

Intersection Capacity Utilization 84.9%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2040 Background AM.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	40	250	735	50	5	185	1010	540	10	2190	50
Future Volume (veh/h)	25	40	250	735	50	5	185	1010	540	10	2190	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	26	41	0	758	52	0	191	1041	0	10	2258	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	81	75		700	299		555	2112		478	2122	
Arrive On Green	0.02	0.04	0.00	0.05	0.05	0.00	0.17	0.44	0.00	0.16	0.43	0.00
Sat Flow, veh/h	3374	1826	1547	4944	1841	1560	3237	4782	1485	1725	4944	1535
Grp Volume(v), veh/h	26	41	0	758	52	0	191	1041	0	10	2258	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1648	1841	1560	1618	1594	1485	1725	1648	1535
Q Serve(g_s), s	0.9	2.6	0.0	17.0	3.2	0.0	6.2	18.6	0.0	0.0	51.5	0.0
Cycle Q Clear(g_c), s	0.9	2.6	0.0	17.0	3.2	0.0	6.2	18.6	0.0	0.0	51.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	75		700	299		555	2112		478	2122	
V/C Ratio(X)	0.32	0.55		1.08	0.17		0.34	0.49		0.02	1.06	
Avail Cap(c_a), veh/h	169	289		700	460		555	2112		478	2122	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.60	0.60	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.6	56.5	0.0	57.2	49.1	0.0	43.8	23.9	0.0	19.7	34.2	0.0
Incr Delay (d2), s/veh	2.2	6.2	0.0	51.6	0.2	0.0	0.4	0.8	0.0	0.0	39.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.3	0.0	10.9	1.5	0.0	2.5	7.1	0.0	0.2	27.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.8	62.6	0.0	108.8	49.2	0.0	44.1	24.7	0.0	19.7	73.5	0.0
LnGrp LOS	E	E		F	D		D	C		B	F	
Approach Vol, veh/h	67			A			810			A		
Approach Delay, s/veh	61.5			105.0			27.7			73.2		
Approach LOS	E			F			C			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.1	60.0	23.0	10.9	27.6	58.5	8.4	25.5				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	53.0	17.0	* 19	7.0	51.5	6.0	30.0				
Max Q Clear Time (g_c+I1), s	2.0	20.6	19.0	4.6	8.2	53.5	2.9	5.2				
Green Ext Time (p_c), s	0.0	9.1	0.0	0.1	0.0	0.0	0.0	0.2				

### Intersection Summary

HCM 6th Ctrl Delay 66.1

HCM 6th LOS E

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

2040 Background PM.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	50	300	560	30	10	200	2130	600	10	1180	50
Future Volume (vph)	40	50	300	560	30	10	200	2130	600	10	1180	50
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		21.0	34.0		19.0	62.0		12.5	55.5	55.5
Total Split (%)	9.6%	20.4%		17.5%	28.3%		15.8%	51.7%		10.4%	46.3%	46.3%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.9	8.8	120.0	15.6	20.8	120.0	11.3	76.8	120.0	66.5	61.0	61.0
Actuated g/C Ratio	0.05	0.07	1.00	0.13	0.17	1.00	0.09	0.64	1.00	0.55	0.51	0.51
v/c Ratio	0.25	0.39	0.20	0.92	0.10	0.01	0.66	0.70	0.40	0.07	0.49	0.06
Control Delay	58.6	60.5	0.3	84.1	43.9	0.0	62.8	17.1	0.8	9.6	25.8	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	60.5	0.3	84.1	43.9	0.0	62.8	17.1	0.8	9.6	25.8	0.9
LOS	E	E	A	F	D	A	E	B	A	A	C	A
Approach Delay		14.0			80.6			16.9			24.6	
Approach LOS		B			F			B			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 25.9

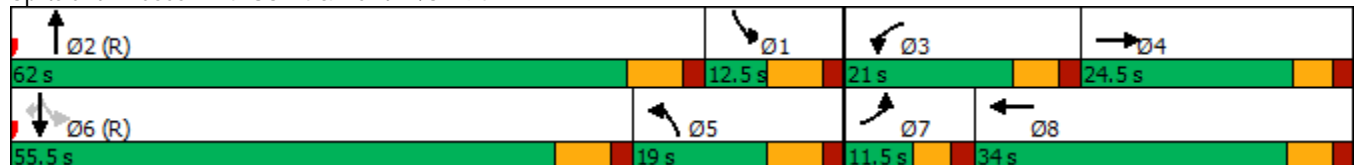
Intersection LOS: C

Intersection Capacity Utilization 79.3%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94





# HCM 6th Signalized Intersection Summary

2040 Background PM.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑	↗	↔↔↔	↑	↗	↔↔	↑↑↑	↗	↗	↑↑↑	↗
Traffic Volume (veh/h)	40	50	300	560	30	10	200	2130	600	10	1180	50
Future Volume (veh/h)	40	50	300	560	30	10	200	2130	600	10	1180	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	42	53	0	589	32	0	211	2242	0	11	1242	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	108	84		623	265		717	2322		330	2015	
Arrive On Green	0.03	0.04	0.00	0.13	0.14	0.00	0.21	0.46	0.00	0.16	0.40	0.00
Sat Flow, veh/h	3456	1870	1585	4983	1856	1572	3428	5066	1572	1739	4985	1547
Grp Volume(v), veh/h	42	53	0	589	32	0	211	2242	0	11	1242	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1661	1856	1572	1714	1689	1572	1739	1662	1547
Q Serve(g_s), s	1.4	3.3	0.0	14.1	1.8	0.0	6.2	51.6	0.0	0.0	23.7	0.0
Cycle Q Clear(g_c), s	1.4	3.3	0.0	14.1	1.8	0.0	6.2	51.6	0.0	0.0	23.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	108	84		623	265		717	2322		330	2015	
V/C Ratio(X)	0.39	0.63		0.95	0.12		0.29	0.97		0.03	0.62	
Avail Cap(c_a), veh/h	173	296		623	433		717	2322		330	2015	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.47	0.47	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.0	56.3	0.0	52.1	44.9	0.0	40.0	31.6	0.0	42.8	28.4	0.0
Incr Delay (d2), s/veh	2.2	7.5	0.0	13.8	0.1	0.0	0.2	12.2	0.0	0.0	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.8	0.0	6.6	0.8	0.0	2.7	22.9	0.0	0.3	9.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	63.8	0.0	65.9	45.0	0.0	40.2	43.8	0.0	42.9	29.8	0.0
LnGrp LOS	E	E		E	D		D	D		D	C	
Approach Vol, veh/h		95	A		621	A		2453	A		1253	A
Approach Delay, s/veh		61.8			64.8			43.5			29.9	
Approach LOS		E			E			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.6	62.0	21.0	11.4	32.1	55.5	9.3	23.1				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	55.0	15.0	* 19	12.0	48.5	6.0	28.0				
Max Q Clear Time (g_c+I1), s	2.0	53.6	16.1	5.3	8.2	25.7	3.4	3.8				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.1	0.2	9.8	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay 43.0

HCM 6th LOS D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

## 4: US-24 & Newt Dr/SH-94

2040 Total AM.syn

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	95	555	1155	105	5	480	1150	855	10	2190	80
Future Volume (vph)	55	95	555	1155	105	5	480	1150	855	10	2190	80
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		23.0	36.0		14.0	60.0		12.5	58.5	58.5
Total Split (%)	9.6%	20.4%		19.2%	30.0%		11.7%	50.0%		10.4%	48.8%	48.8%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.9	11.8	120.0	17.0	25.1	120.0	7.0	70.2	120.0	64.2	58.7	58.7
Actuated g/C Ratio	0.05	0.10	1.00	0.14	0.21	1.00	0.06	0.58	1.00	0.54	0.49	0.49
v/c Ratio	0.35	0.55	0.37	1.72	0.28	0.00	2.68	0.43	0.60	0.04	0.94	0.10
Control Delay	61.2	62.7	0.7	359.8	45.7	0.0	791.2	15.5	1.8	6.9	31.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.2	62.7	0.7	359.8	45.7	0.0	791.2	15.5	1.8	6.9	31.8	1.1
LOS	E	E	A	F	D	A	F	B	A	A	C	A
Approach Delay		13.8			332.4			160.7			30.6	
Approach LOS		B			F			F			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 2.68

Intersection Signal Delay: 133.5

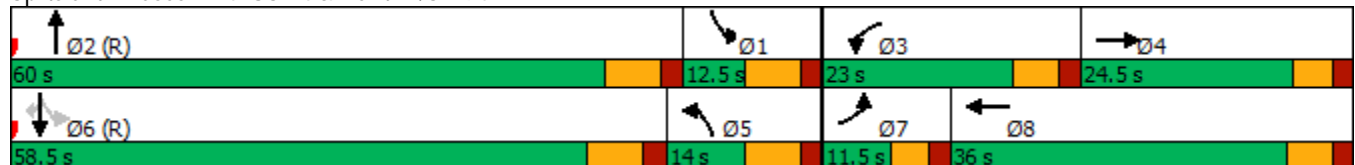
Intersection LOS: F

Intersection Capacity Utilization 101.3%

ICU Level of Service G

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2040 Total AM.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	95	555	1155	105	5	480	1150	855	10	2190	80
Future Volume (veh/h)	55	95	555	1155	105	5	480	1150	855	10	2190	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	57	98	0	1191	108	0	495	1186	0	10	2258	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	120	131		700	335		456	2112		394	2122	
Arrive On Green	0.04	0.07	0.00	0.14	0.18	0.00	0.14	0.44	0.00	0.13	0.43	0.00
Sat Flow, veh/h	3374	1826	1547	4944	1841	1560	3237	4782	1485	1725	4944	1535
Grp Volume(v), veh/h	57	98	0	1191	108	0	495	1186	0	10	2258	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1648	1841	1560	1618	1594	1485	1725	1648	1535
Q Serve(g_s), s	2.0	6.3	0.0	17.0	6.1	0.0	16.9	22.1	0.0	0.0	51.5	0.0
Cycle Q Clear(g_c), s	2.0	6.3	0.0	17.0	6.1	0.0	16.9	22.1	0.0	0.0	51.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	120	131		700	335		456	2112		394	2122	
V/C Ratio(X)	0.48	0.75		1.70	0.32		1.09	0.56		0.03	1.06	
Avail Cap(c_a), veh/h	169	289		700	460		456	2112		394	2122	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.84	0.84	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.8	54.6	0.0	51.5	42.6	0.0	51.5	24.9	0.0	24.1	34.2	0.0
Incr Delay (d2), s/veh	2.9	8.3	0.0	320.4	0.5	0.0	67.2	1.1	0.0	0.0	39.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.2	0.0	27.8	2.8	0.0	11.1	8.5	0.0	0.2	27.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.7	62.9	0.0	371.9	43.1	0.0	118.8	26.0	0.0	24.1	73.5	0.0
LnGrp LOS	E	E		F	D		F	C		C	F	
Approach Vol, veh/h	155			A			1299			A		
Approach Delay, s/veh	61.7						344.6			53.3		
Approach LOS	E						F			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.4	60.0	23.0	14.6	23.9	58.5	9.8	27.8				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	53.0	17.0	* 19	7.0	51.5	6.0	30.0				
Max Q Clear Time (g_c+I1), s	2.0	24.1	19.0	8.3	18.9	53.5	4.0	8.1				
Green Ext Time (p_c), s	0.0	10.3	0.0	0.3	0.0	0.0	0.0	0.5				

### Intersection Summary

HCM 6th Ctrl Delay	131.9
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

## 4: US-24 & Newt Dr/SH-94

2040 Total PM.syn

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	95	535	1160	80	10	470	2325	1165	10	1180	75
Future Volume (vph)	65	95	535	1160	80	10	470	2325	1165	10	1180	75
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	24.5		29.0	42.0		24.5	54.0		12.5	42.0	42.0
Total Split (%)	9.6%	20.4%		24.2%	35.0%		20.4%	45.0%		10.4%	35.0%	35.0%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	6.0	11.8	120.0	23.0	31.1	120.0	17.5	64.2	120.0	47.7	42.2	42.2
Actuated g/C Ratio	0.05	0.10	1.00	0.19	0.26	1.00	0.15	0.54	1.00	0.40	0.35	0.35
v/c Ratio	0.40	0.55	0.36	1.29	0.18	0.01	1.00	0.91	0.78	0.07	0.71	0.11
Control Delay	62.5	62.2	0.6	168.2	15.2	0.0	91.9	32.1	4.0	16.2	60.1	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	62.2	0.6	168.2	15.2	0.0	91.9	32.1	4.0	16.2	60.1	2.9
LOS	E	E	A	F	B	A	F	C	A	B	E	A
Approach Delay		14.8			157.0			30.9			56.3	
Approach LOS		B			F			C			E	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.29

Intersection Signal Delay: 55.8

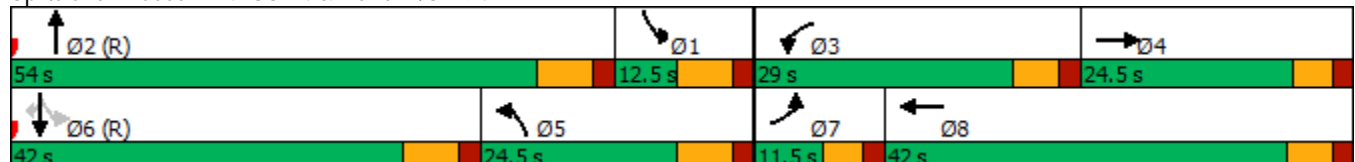
Intersection LOS: E

Intersection Capacity Utilization 94.5%

ICU Level of Service F

Analysis Period (min) 15

### Splits and Phases: 4: US-24 & Newt Dr/SH-94



























# HCM 6th Signalized Intersection Summary

2040 Total PM.syn

## 4: US-24 & Newt Dr/SH-94

02/18/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	95	535	1160	80	10	470	2325	1165	10	1180	75
Future Volume (veh/h)	65	95	535	1160	80	10	470	2325	1165	10	1180	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	68	100	0	1221	84	0	495	2447	0	11	1242	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	129	134		955	427		783	1984		283	1454	
Arrive On Green	0.04	0.07	0.00	0.19	0.23	0.00	0.23	0.39	0.00	0.13	0.29	0.00
Sat Flow, veh/h	3456	1870	1585	4983	1856	1572	3428	5066	1572	1739	4985	1547
Grp Volume(v), veh/h	68	100	0	1221	84	0	495	2447	0	11	1242	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1661	1856	1572	1714	1689	1572	1739	1662	1547
Q Serve(g_s), s	2.3	6.3	0.0	23.0	4.4	0.0	15.6	47.0	0.0	0.0	28.2	0.0
Cycle Q Clear(g_c), s	2.3	6.3	0.0	23.0	4.4	0.0	15.6	47.0	0.0	0.0	28.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	134		955	427		783	1984		283	1454	
V/C Ratio(X)	0.53	0.75		1.28	0.20		0.63	1.23		0.04	0.85	
Avail Cap(c_a), veh/h	173	296		955	557		783	1984		283	1454	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.71	0.71	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.7	54.7	0.0	48.5	37.3	0.0	41.7	36.5	0.0	45.6	40.1	0.0
Incr Delay (d2), s/veh	3.3	8.1	0.0	131.1	0.2	0.0	1.7	109.6	0.0	0.1	6.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.3	0.0	21.1	2.0	0.0	6.8	39.0	0.0	0.3	12.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.0	62.7	0.0	179.6	37.4	0.0	43.4	146.1	0.0	45.6	46.7	0.0
LnGrp LOS	E	E		F	D		D	F		D	D	
Approach Vol, veh/h		168	A		1305	A		2942	A		1253	A
Approach Delay, s/veh		61.6			170.5			128.8			46.7	
Approach LOS		E			F			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.4	54.0	29.0	14.6	34.4	42.0	10.0	33.6				
Change Period (Y+Rc), s	7.0	7.0	6.0	* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	47.0	23.0	* 19	17.5	35.0	6.0	36.0				
Max Q Clear Time (g_c+I1), s	2.0	49.0	25.0	8.3	17.6	30.2	4.3	6.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.3	0.0	3.2	0.0	0.4				

### Intersection Summary

HCM 6th Ctrl Delay 118.3

HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.






























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

2040 Total AM\_4 WBL Flyover.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

											
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 		 	  			  	
Traffic Volume (vph)	55	95	555	105	5	480	1150	855	10	2190	80
Future Volume (vph)	55	95	555	105	5	480	1150	855	10	2190	80
Turn Type	Prot	NA	Free	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		8		5	2		1	6	
Permitted Phases			Free		Free			Free	6		6
Detector Phase	7	4		8		5	2		1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	35.5		24.0		24.0	72.0		12.5	60.5	60.5
Total Split (%)	9.6%	29.6%		20.0%		20.0%	60.0%		10.4%	50.4%	50.4%
Yellow Time (s)	3.5	3.5		4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead			Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes			Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	5.9	18.8	120.0	9.1	120.0	17.0	86.2	120.0	70.2	64.7	64.7
Actuated g/C Ratio	0.05	0.16	1.00	0.08	1.00	0.14	0.72	1.00	0.58	0.54	0.54
v/c Ratio	0.35	0.35	0.37	0.41	0.00	1.10	0.35	0.60	0.04	0.86	0.09
Control Delay	61.2	46.8	0.7	56.0	0.0	120.0	7.8	1.8	6.1	24.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.2	46.8	0.7	56.0	0.0	120.0	7.8	1.8	6.1	24.5	0.5
LOS	E	D	A	E	A	F	A	A	A	C	A
Approach Delay		11.7		53.6			27.4			23.6	
Approach LOS		B		D			C			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 24.4

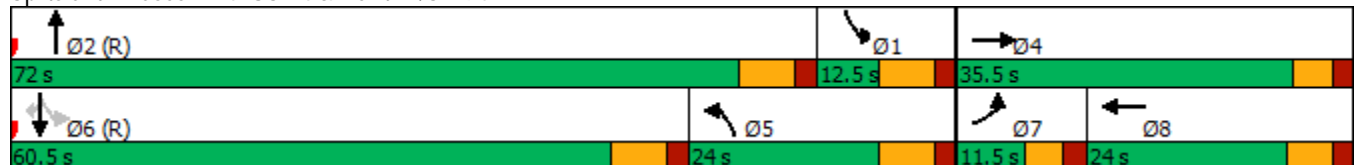
Intersection LOS: C

Intersection Capacity Utilization 80.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94




























# HCM 6th Signalized Intersection Summary

2040 Total AM\_4 WBL Flyover.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	95	555	0	105	5	480	1150	855	10	2190	80
Future Volume (veh/h)	55	95	555	0	105	5	480	1150	855	10	2190	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	0	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	57	98	0	0	108	0	495	1186	0	10	2258	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	0	4	4	10	10	10	6	6	6
Cap, veh/h	120	241		0	177		827	2590		470	2204	
Arrive On Green	0.04	0.13	0.00	0.00	0.02	0.00	0.26	0.54	0.00	0.16	0.45	0.00
Sat Flow, veh/h	3374	1826	1547	0	3589	1560	3237	4782	1485	1725	4944	1535
Grp Volume(v), veh/h	57	98	0	0	108	0	495	1186	0	10	2258	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	0	1749	1560	1618	1594	1485	1725	1648	1535
Q Serve(g_s), s	2.0	5.9	0.0	0.0	3.7	0.0	16.1	18.1	0.0	0.0	53.5	0.0
Cycle Q Clear(g_c), s	2.0	5.9	0.0	0.0	3.7	0.0	16.1	18.1	0.0	0.0	53.5	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	120	241		0	177		827	2590		470	2204	
V/C Ratio(X)	0.48	0.41		0.00	0.61		0.60	0.46		0.02	1.02	
Avail Cap(c_a), veh/h	169	456		0	525		827	2590		470	2204	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.17	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.8	47.8	0.0	0.0	57.8	0.0	39.2	16.8	0.0	18.3	33.3	0.0
Incr Delay (d2), s/veh	2.9	1.1	0.0	0.0	0.6	0.0	1.2	0.6	0.0	0.0	25.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.8	0.0	0.0	1.7	0.0	6.5	6.7	0.0	0.2	25.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.7	48.9	0.0	0.0	58.4	0.0	40.4	17.3	0.0	18.3	58.9	0.0
LnGrp LOS	E	D		A	E		D	B		B	F	
Approach Vol, veh/h	155		A	108		A	1681		A	2268		A
Approach Delay, s/veh	52.9			58.4			24.1			58.7		
Approach LOS	D			E			C			E		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.2	72.0		21.8	37.7	60.5	9.8	12.1				
Change Period (Y+Rc), s	7.0	7.0		* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	65.0		* 30	17.0	53.5	6.0	18.0				
Max Q Clear Time (g_c+I1), s	2.0	20.1		7.9	18.1	55.5	4.0	5.7				
Green Ext Time (p_c), s	0.0	11.6		0.4	0.0	0.0	0.0	0.4				

### Intersection Summary

HCM 6th Ctrl Delay 44.7

HCM 6th LOS D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.






























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# Timings

2040 Total PM\_4 WBL Flyover.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

											
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 		 	  			  	
Traffic Volume (vph)	65	95	535	80	10	470	2325	1165	10	1180	75
Future Volume (vph)	65	95	535	80	10	470	2325	1165	10	1180	75
Turn Type	Prot	NA	Free	NA	Free	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		8		5	2		1	6	
Permitted Phases			Free		Free			Free	6		6
Detector Phase	7	4		8		5	2		1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		24.0		12.0	25.0		12.5	25.5	25.5
Total Split (s)	11.5	35.5		24.0		32.0	72.0		12.5	52.5	52.5
Total Split (%)	9.6%	29.6%		20.0%		26.7%	60.0%		10.4%	43.8%	43.8%
Yellow Time (s)	3.5	3.5		4.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead			Lag		Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes			Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	6.6	18.7	120.0	8.4	120.0	22.0	86.3	120.0	65.3	59.8	59.8
Actuated g/C Ratio	0.06	0.16	1.00	0.07	1.00	0.18	0.72	1.00	0.54	0.50	0.50
v/c Ratio	0.36	0.34	0.36	0.34	0.01	0.80	0.68	0.78	0.08	0.50	0.09
Control Delay	60.5	47.1	0.6	57.7	0.0	56.7	11.9	4.0	11.9	27.5	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.5	47.1	0.6	57.7	0.0	56.7	11.9	4.0	11.9	27.5	1.6
LOS	E	D	A	E	A	E	B	A	B	C	A
Approach Delay		12.5		51.0			14.9			25.8	
Approach LOS		B		D			B			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 55.9 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 17.5

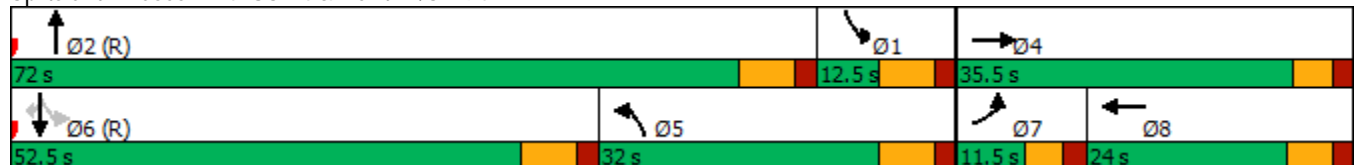
Intersection LOS: B

Intersection Capacity Utilization 73.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94

























# HCM 6th Signalized Intersection Summary

2040 Total PM\_4 WBL Flyover.syn

## 4: US-24 & Newt Dr/SH-94

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	95	535	0	80	10	470	2325	1165	10	1180	75
Future Volume (veh/h)	65	95	535	0	80	10	470	2325	1165	10	1180	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	68	100	0	0	84	0	495	2447	0	11	1242	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	0	3	3	3	3	3	5	5	5
Cap, veh/h	129	235		0	149		1127	2744		349	1890	
Arrive On Green	0.04	0.13	0.00	0.00	0.04	0.00	0.33	0.54	0.00	0.17	0.38	0.00
Sat Flow, veh/h	3456	1870	1585	0	3618	1572	3428	5066	1572	1739	4985	1547
Grp Volume(v), veh/h	68	100	0	0	84	0	495	2447	0	11	1242	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	0	1763	1572	1714	1689	1572	1739	1662	1547
Q Serve(g_s), s	2.3	5.9	0.0	0.0	2.8	0.0	13.6	51.4	0.0	0.0	24.7	0.0
Cycle Q Clear(g_c), s	2.3	5.9	0.0	0.0	2.8	0.0	13.6	51.4	0.0	0.0	24.7	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	235		0	149		1127	2744		349	1890	
V/C Ratio(X)	0.53	0.43		0.00	0.56		0.44	0.89		0.03	0.66	
Avail Cap(c_a), veh/h	173	468		0	529		1127	2744		349	1890	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.09	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.7	48.5	0.0	0.0	56.4	0.0	31.6	24.4	0.0	41.7	30.8	0.0
Incr Delay (d2), s/veh	3.3	1.2	0.0	0.0	0.3	0.0	0.3	4.9	0.0	0.0	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.9	0.0	0.0	1.3	0.0	5.7	20.8	0.0	0.3	10.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.0	49.7	0.0	0.0	56.7	0.0	31.9	29.3	0.0	41.8	32.6	0.0
LnGrp LOS	E	D		A	E		C	C		D	C	
Approach Vol, veh/h	168		A	84		A	2942		A	1253		A
Approach Delay, s/veh	53.9			56.7			29.7			32.7		
Approach LOS	D			E			C			C		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.9	72.0		21.1	46.4	52.5	10.0	11.1				
Change Period (Y+Rc), s	7.0	7.0		* 6	7.0	7.0	5.5	6.0				
Max Green Setting (Gmax), s	5.5	65.0		* 30	25.0	45.5	6.0	18.0				
Max Q Clear Time (g_c+I1), s	2.0	53.4		7.9	15.6	26.7	4.3	4.8				
Green Ext Time (p_c), s	0.0	10.5		0.4	1.3	8.9	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay	32.0											
HCM 6th LOS	C											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

# Timings

## 5: Marksheffel Rd & SH-94

2020 Adjusted Existing AM.syn

02/15/2021

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	254	54	28	297	77	54	270	18	256	501	3
Future Volume (vph)	254	54	28	297	77	54	270	18	256	501	3
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	51.0	51.0	51.0	51.0	51.0	16.0	33.0	33.0	36.0	53.0	53.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	13.3%	27.5%	27.5%	30.0%	44.2%	44.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	27.8	27.8	27.8	27.8	27.8	66.7	59.6	59.6	79.3	68.6	68.6
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23	0.56	0.50	0.50	0.66	0.57	0.57
v/c Ratio	0.68	0.13	0.20	0.78	0.18	0.12	0.17	0.02	0.39	0.27	0.00
Control Delay	46.8	0.6	37.5	55.9	0.8	10.2	19.2	0.1	5.1	5.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	0.6	37.5	55.9	0.8	10.2	19.2	0.1	5.1	5.9	0.0
LOS	D	A	D	E	A	B	B	A	A	A	A
Approach Delay	38.7			44.0			16.7			5.6	
Approach LOS	D			D			B			A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 21.9

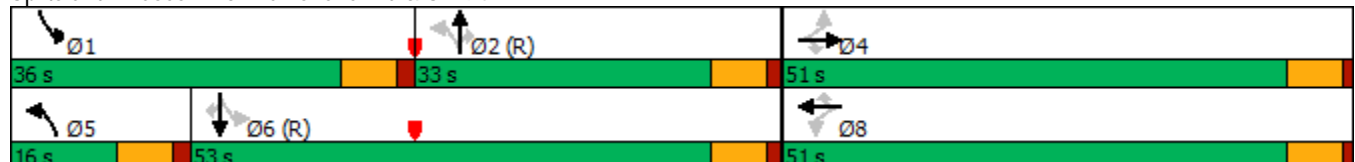
Intersection LOS: C

Intersection Capacity Utilization 60.7%

ICU Level of Service B

Analysis Period (min) 15














Splits and Phases: 5: Marksheffel Rd & SH-94



# HCM 6th Signalized Intersection Summary 5: Marksheffel Rd & SH-94

2020 Adjusted Existing AM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	254	54	28	297	77	54	270	18	256	501	3
Future Volume (veh/h)	0	254	54	28	297	77	54	270	18	256	501	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	0	276	-104	30	323	-25	59	293	20	278	545	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3
Cap, veh/h	60	367	311	147	373	316	564	1899	847	751	2115	943
Arrive On Green	0.00	0.41	0.00	0.21	0.21	0.00	0.04	0.55	0.55	0.09	0.60	0.60
Sat Flow, veh/h	1030	1781	1510	1174	1811	1535	1739	3469	1547	1767	3526	1572
Grp Volume(v), veh/h	0	276	-104	30	323	-25	59	293	20	278	545	3
Grp Sat Flow(s),veh/h/ln	1030	1781	1510	1174	1811	1535	1739	1735	1547	1767	1763	1572
Q Serve(g_s), s	0.0	15.8	0.0	2.9	20.7	0.0	1.8	5.0	0.7	7.8	8.8	0.1
Cycle Q Clear(g_c), s	0.0	15.8	0.0	18.8	20.7	0.0	1.8	5.0	0.7	7.8	8.8	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	367	311	147	373	316	564	1899	847	751	2115	943
V/C Ratio(X)	0.00	0.75	-0.33	0.20	0.87	-0.08	0.10	0.15	0.02	0.37	0.26	0.00
Avail Cap(c_a), veh/h	234	668	566	345	679	576	639	1899	847	1029	2115	943
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	32.7	0.0	52.8	46.0	0.0	10.8	13.4	12.5	8.9	11.4	9.6
Incr Delay (d2), s/veh	0.0	3.0	0.0	0.7	6.1	0.0	0.1	0.2	0.1	0.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.8	0.0	0.9	9.9	0.0	0.7	2.0	0.3	2.9	3.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	35.7	0.0	53.5	52.2	0.0	10.9	13.6	12.5	9.3	11.7	9.6
LnGrp LOS	A	D	A	D	D	A	B	B	B	A	B	A
Approach Vol, veh/h	172			328			372			826		
Approach Delay, s/veh	57.3			56.3			13.1			10.8		
Approach LOS	E			E			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.1	72.2		30.7	10.8	78.5		30.7				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	29.5	26.5		45.0	9.5	46.5		45.0				
Max Q Clear Time (g_c+I1), s	9.8	7.0		17.8	3.8	10.8		22.7				
Green Ext Time (p_c), s	0.8	1.8		1.7	0.0	4.1		2.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	24.8											
HCM 6th LOS	C											

# Timings

## 5: Marksheffel Rd & SH-94

2020 Adjusted Existing PM.syn

02/15/2021

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↖	↑	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	294	94	39	356	343	76	819	23	158	573	7
Future Volume (vph)	294	94	39	356	343	76	819	23	158	573	7
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	47.0	47.0	47.0	47.0	47.0	13.0	52.0	52.0	21.0	60.0	60.0
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	10.8%	43.3%	43.3%	17.5%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	32.1	32.1	32.1	32.1	32.1	65.4	58.4	58.4	73.1	64.3	64.3
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.54	0.49	0.49	0.61	0.54	0.54
v/c Ratio	0.63	0.19	0.24	0.77	0.64	0.17	0.51	0.03	0.46	0.33	0.01
Control Delay	41.4	0.9	35.3	50.7	20.7	11.8	24.1	0.0	13.2	21.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	0.9	35.3	50.7	20.7	11.8	24.1	0.0	13.2	21.4	0.4
LOS	D	A	D	D	C	B	C	A	B	C	A
Approach Delay	31.6			35.9			22.5			19.4	
Approach LOS	C			D			C			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 26.5

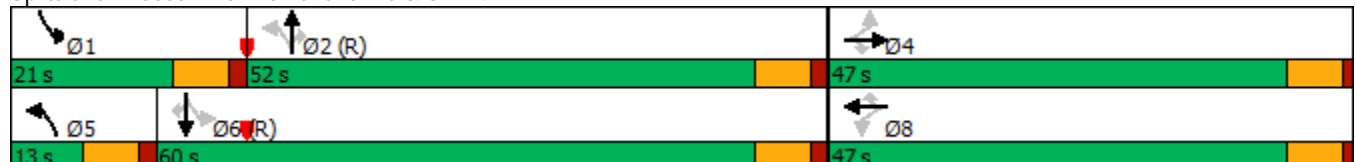
Intersection LOS: C

Intersection Capacity Utilization 75.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94





























HCM 6th Signalized Intersection Summary  
5: Marksheffel Rd & SH-94

2020 Adjusted Existing PM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	294	94	39	356	343	76	819	23	158	573	7
Future Volume (veh/h)	0	294	94	39	356	343	76	819	23	158	573	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	0	313	-60	41	379	259	81	871	24	168	610	7
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4
Cap, veh/h	60	442	374	177	442	374	510	1930	861	408	1975	881
Arrive On Green	0.00	0.48	0.00	0.24	0.24	0.24	0.04	0.54	0.54	0.06	0.56	0.56
Sat Flow, veh/h	784	1856	1572	1118	1856	1572	1781	3554	1585	1753	3497	1560
Grp Volume(v), veh/h	0	313	-60	41	379	259	81	871	24	168	610	7
Grp Sat Flow(s),veh/h/ln	784	1856	1572	1118	1856	1572	1781	1777	1585	1753	1749	1560
Q Serve(g_s), s	0.0	16.0	0.0	4.1	23.5	18.0	2.4	17.8	0.8	5.0	11.0	0.2
Cycle Q Clear(g_c), s	0.0	16.0	0.0	20.1	23.5	18.0	2.4	17.8	0.8	5.0	11.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	442	374	177	442	374	510	1930	861	408	1975	881
V/C Ratio(X)	0.00	0.71	-0.16	0.23	0.86	0.69	0.16	0.45	0.03	0.41	0.31	0.01
Avail Cap(c_a), veh/h	141	634	537	293	634	537	538	1930	861	513	1975	881
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	28.1	0.0	49.9	43.8	41.7	11.3	16.6	12.7	12.2	13.8	11.4
Incr Delay (d2), s/veh	0.0	2.1	0.0	0.7	8.1	2.3	0.1	0.8	0.1	0.7	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.8	0.0	1.2	11.7	7.2	1.0	7.3	0.3	2.0	4.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.2	0.0	50.6	51.8	44.0	11.5	17.4	12.8	12.9	14.2	11.4
LnGrp LOS	A	C	A	D	D	D	B	B	B	B	B	B
Approach Vol, veh/h	253			679			976			785		
Approach Delay, s/veh	37.4			48.8			16.8			13.9		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.8	71.7		34.6	11.2	74.3		34.6				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	14.5	45.5		41.0	6.5	53.5		41.0				
Max Q Clear Time (g_c+I1), s	7.0	19.8		18.0	4.4	13.0		25.5				
Green Ext Time (p_c), s	0.2	6.9		1.9	0.0	4.8		3.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	25.9											
HCM 6th LOS	C											

# Timings 5: Marksheffel Rd & SH-94

2026 Background AM.syn

02/15/2021

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↖	↑	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	275	60	35	320	85	60	290	20	275	540	5
Future Volume (vph)	275	60	35	320	85	60	290	20	275	540	5
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	51.0	51.0	51.0	51.0	51.0	16.0	33.0	33.0	36.0	53.0	53.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	13.3%	27.5%	27.5%	30.0%	44.2%	44.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	29.6	29.6	29.6	29.6	29.6	64.0	56.7	56.7	77.7	66.5	66.5
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.53	0.47	0.47	0.65	0.55	0.55
v/c Ratio	0.69	0.14	0.25	0.79	0.19	0.14	0.19	0.03	0.43	0.30	0.01
Control Delay	45.4	0.6	37.8	54.7	1.4	11.3	21.2	0.1	5.5	6.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	0.6	37.8	54.7	1.4	11.3	21.2	0.1	5.5	6.6	0.0
LOS	D	A	D	D	A	B	C	A	A	A	A
Approach Delay	37.4			43.1			18.5			6.2	
Approach LOS	D			D			B			A	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 22.1

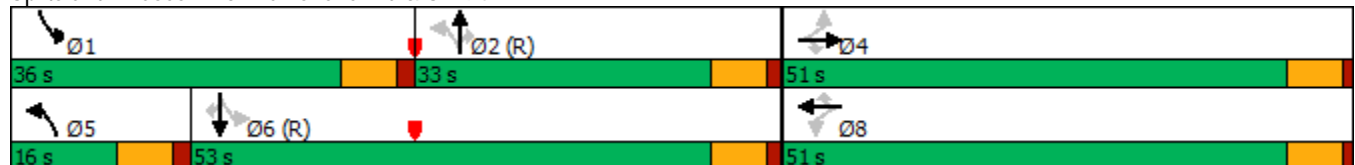
Intersection LOS: C

Intersection Capacity Utilization 65.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



























# HCM 6th Signalized Intersection Summary

2026 Background AM.syn

## 5: Marksheffel Rd & SH-94

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	275	60	35	320	85	60	290	20	275	540	5
Future Volume (veh/h)	0	275	60	35	320	85	60	290	20	275	540	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	0	299	-98	38	348	-17	65	315	22	299	587	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3
Cap, veh/h	60	393	333	151	399	338	528	1817	811	725	2060	919
Arrive On Green	0.00	0.44	0.00	0.22	0.22	0.00	0.04	0.52	0.52	0.10	0.58	0.58
Sat Flow, veh/h	999	1781	1510	1144	1811	1535	1739	3469	1547	1767	3526	1572
Grp Volume(v), veh/h	0	299	-98	38	348	-17	65	315	22	299	587	5
Grp Sat Flow(s),veh/h/ln	999	1781	1510	1144	1811	1535	1739	1735	1547	1767	1763	1572
Q Serve(g_s), s	0.0	17.0	0.0	3.8	22.3	0.0	2.0	5.7	0.8	8.8	10.0	0.2
Cycle Q Clear(g_c), s	0.0	17.0	0.0	20.7	22.3	0.0	2.0	5.7	0.8	8.8	10.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	393	333	151	399	338	528	1817	811	725	2060	919
V/C Ratio(X)	0.00	0.76	-0.29	0.25	0.87	-0.05	0.12	0.17	0.03	0.41	0.28	0.01
Avail Cap(c_a), veh/h	214	668	566	327	679	576	601	1817	811	987	2060	919
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	30.9	0.0	52.6	45.1	0.0	12.1	15.0	13.8	9.8	12.4	10.4
Incr Delay (d2), s/veh	0.0	3.0	0.0	0.9	6.5	0.0	0.1	0.2	0.1	0.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.1	0.0	1.1	10.7	0.0	0.8	2.3	0.3	3.4	4.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	33.9	0.0	53.5	51.6	0.0	12.2	15.2	13.9	10.2	12.8	10.4
LnGrp LOS	A	C	A	D	D	A	B	B	B	B	B	B
Approach Vol, veh/h	201				369				402			
Approach Delay, s/veh	50.4				54.2				14.6			
Approach LOS	D				D				B			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.2	69.4		32.5	10.9	76.6		32.5				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	29.5	26.5		45.0	9.5	46.5		45.0				
Max Q Clear Time (g_c+l1), s	10.8	7.7		19.0	4.0	12.0		24.3				
Green Ext Time (p_c), s	0.8	2.0		1.8	0.0	4.5		2.2				
Intersection Summary												
HCM 6th Ctrl Delay	25.0											
HCM 6th LOS	C											

Timings  
5: Marksheffel Rd & SH-94

2026 Background PM.syn

02/15/2021

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↙	↑	↗	↙	↑↑	↗	↙	↑↑	↗
Traffic Volume (vph)	320	105	45	385	370	85	880	25	170	615	10
Future Volume (vph)	320	105	45	385	370	85	880	25	170	615	10
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	47.0	47.0	47.0	47.0	47.0	13.0	52.0	52.0	21.0	60.0	60.0
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	10.8%	43.3%	43.3%	17.5%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	33.5	33.5	33.5	33.5	33.5	63.8	56.5	56.5	70.9	60.2	60.2
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.53	0.47	0.47	0.59	0.50	0.50
v/c Ratio	0.66	0.21	0.29	0.80	0.68	0.21	0.56	0.03	0.53	0.38	0.01
Control Delay	41.3	1.6	36.5	51.4	24.1	12.6	26.2	0.1	15.2	24.2	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	1.6	36.5	51.4	24.1	12.6	26.2	0.1	15.2	24.2	1.5
LOS	D	A	D	D	C	B	C	A	B	C	A
Approach Delay	31.4			37.9			24.4			22.0	
Approach LOS	C			D			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 28.4

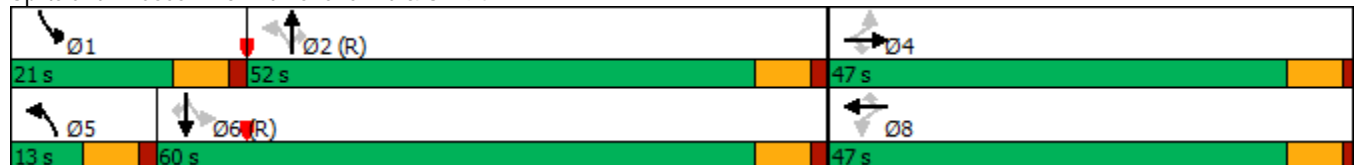
Intersection LOS: C

Intersection Capacity Utilization 79.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



























# HCM 6th Signalized Intersection Summary

2026 Background PM.syn

## 5: Marksheffel Rd & SH-94

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	320	105	45	385	370	85	880	25	170	615	10
Future Volume (veh/h)	0	320	105	45	385	370	85	880	25	170	615	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	0	340	-48	48	410	288	90	936	27	181	654	11
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4
Cap, veh/h	60	474	401	182	474	401	472	1849	825	376	1913	853
Arrive On Green	0.00	0.51	0.00	0.26	0.26	0.26	0.04	0.52	0.52	0.07	0.55	0.55
Sat Flow, veh/h	742	1856	1572	1079	1856	1572	1781	3554	1585	1753	3497	1560
Grp Volume(v), veh/h	0	340	-48	48	410	288	90	936	27	181	654	11
Grp Sat Flow(s),veh/h/ln	742	1856	1572	1079	1856	1572	1781	1777	1585	1753	1749	1560
Q Serve(g_s), s	0.0	17.0	0.0	5.0	25.4	20.0	2.8	20.6	1.0	5.7	12.5	0.4
Cycle Q Clear(g_c), s	0.0	17.0	0.0	21.9	25.4	20.0	2.8	20.6	1.0	5.7	12.5	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	474	401	182	474	401	472	1849	825	376	1913	853
V/C Ratio(X)	0.00	0.72	-0.12	0.26	0.87	0.72	0.19	0.51	0.03	0.48	0.34	0.01
Avail Cap(c_a), veh/h	124	634	537	276	634	537	498	1849	825	472	1913	853
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	26.0	0.0	49.3	42.7	40.7	12.7	18.8	14.1	14.0	15.2	12.4
Incr Delay (d2), s/veh	0.0	2.5	0.0	0.8	9.5	3.0	0.2	1.0	0.1	1.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.0	0.0	1.4	12.8	8.1	1.1	8.6	0.4	2.3	5.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.6	0.0	50.1	52.2	43.8	12.8	19.7	14.1	15.0	15.6	12.4
LnGrp LOS	A	C	A	D	D	D	B	B	B	B	B	B
Approach Vol, veh/h	292				746		1053				846	
Approach Delay, s/veh	33.3				48.8		19.0				15.5	
Approach LOS	C				D		B				B	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	14.5	68.9	36.6		11.3	72.1	36.6					
Change Period (Y+Rc), s	6.5	6.5	6.0		6.5	6.5	6.0					
Max Green Setting (Gmax), s	14.5	45.5	41.0		6.5	53.5	41.0					
Max Q Clear Time (g_c+l1), s	7.7	22.6	19.0		4.8	14.5	27.4					
Green Ext Time (p_c), s	0.3	7.2	2.0		0.0	5.2	3.3					
Intersection Summary												
HCM 6th Ctrl Delay	27.0											
HCM 6th LOS	C											

# Timings

2026 Total AM Improved.syn

## 5: Marksheffel Rd & SH-94

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	300	160	35	345	115	190	470	25	300	695	245
Future Volume (vph)	150	300	160	35	345	115	190	470	25	300	695	245
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		Free	6		Free
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.5	11.5		11.5	11.5	
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	16.0	33.0		36.0	53.0	
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	42.5%	13.3%	27.5%		30.0%	44.2%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.5	6.5		6.5	6.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effect Green (s)	35.5	35.5	35.5	35.5	35.5	35.5	58.5	48.1	120.0	69.8	55.2	120.0
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.49	0.40	1.00	0.58	0.46	1.00
v/c Ratio	1.07	0.63	0.31	0.20	0.71	0.22	0.54	0.37	0.02	0.60	0.47	0.17
Control Delay	127.2	36.3	3.3	30.5	44.2	3.3	22.8	24.9	0.0	22.6	23.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.2	36.3	3.3	30.5	44.2	3.3	22.8	24.9	0.0	22.6	23.3	0.2
LOS	F	D	A	C	D	A	C	C	A	C	C	A
Approach Delay		50.0			33.8			23.4			18.6	
Approach LOS		D			C			C			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 28.5

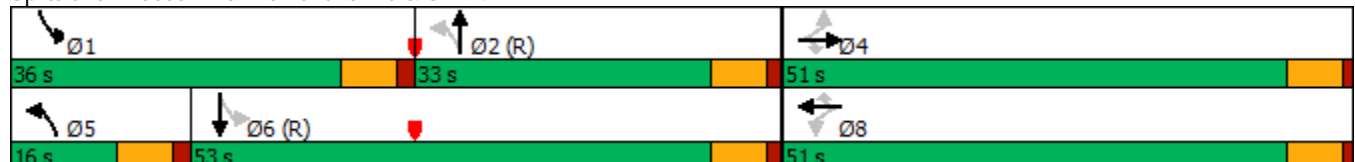
Intersection LOS: C

Intersection Capacity Utilization 77.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94





























# HCM 6th Signalized Intersection Summary

2026 Total AM Improved.syn

## 5: Marksheffel Rd & SH-94

02/18/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	300	160	35	345	115	190	470	25	300	695	245
Future Volume (veh/h)	150	300	160	35	345	115	190	470	25	300	695	245
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	163	326	11	38	375	16	207	511	0	326	755	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3
Cap, veh/h	239	636	539	313	647	548	352	1216		551	1429	
Arrive On Green	0.60	0.60	0.60	0.36	0.36	0.36	0.16	0.70	0.00	0.09	0.27	0.00
Sat Flow, veh/h	946	1781	1510	1010	1811	1535	1739	3469	1547	1767	3526	1572
Grp Volume(v), veh/h	163	326	11	38	375	16	207	511	0	326	755	0
Grp Sat Flow(s),veh/h/ln	946	1781	1510	1010	1811	1535	1739	1735	1547	1767	1763	1572
Q Serve(g_s), s	19.9	12.8	0.4	3.5	20.1	0.8	9.5	7.5	0.0	13.2	21.9	0.0
Cycle Q Clear(g_c), s	40.0	12.8	0.4	16.3	20.1	0.8	9.5	7.5	0.0	13.2	21.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	239	636	539	313	647	548	352	1216		551	1429	
V/C Ratio(X)	0.68	0.51	0.02	0.12	0.58	0.03	0.59	0.42		0.59	0.53	
Avail Cap(c_a), veh/h	256	668	566	331	679	576	352	1216		748	1429	
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	0.00	0.78	0.78	0.00
Uniform Delay (d), s/veh	33.3	18.1	15.6	35.0	31.3	25.1	21.9	12.8	0.0	19.8	33.9	0.0
Incr Delay (d2), s/veh	5.9	0.6	0.0	0.2	1.1	0.0	2.5	1.1	0.0	0.8	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	4.4	0.1	0.9	9.0	0.3	3.7	2.6	0.0	5.9	10.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	18.7	15.7	35.2	32.4	25.1	24.5	13.9	0.0	20.6	35.0	0.0
LnGrp LOS	D	B	B	D	C	C	C	B		C	D	
Approach Vol, veh/h	500			429			718			A		
Approach Delay, s/veh	25.3			32.4			16.9			30.7		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.6	48.5		48.9	16.0	55.1		48.9				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	29.5	26.5		45.0	9.5	46.5		45.0				
Max Q Clear Time (g_c+l1), s	15.2	9.5		42.0	11.5	23.9		22.1				
Green Ext Time (p_c), s	0.8	3.2		0.9	0.0	5.5		2.6				
Intersection Summary												
HCM 6th Ctrl Delay	26.3											
HCM 6th LOS	C											

# Timings

2026 Total PM Improved.syn

## 5: Marksheffel Rd & SH-94

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	340	265	45	405	395	225	1100	30	200	845	255
Future Volume (vph)	140	340	265	45	405	395	225	1100	30	200	845	255
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		Free	6		Free
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.5	11.5		11.5	11.5	
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	13.0	52.0		21.0	60.0	
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%	10.8%	43.3%		17.5%	50.0%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.5	6.5		6.5	6.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effect Green (s)	37.6	37.6	37.6	37.6	37.6	37.6	57.8	50.1	120.0	68.1	55.7	120.0
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.31	0.48	0.42	1.00	0.57	0.46	1.00
v/c Ratio	1.08	0.63	0.45	0.25	0.75	0.69	0.78	0.79	0.02	0.80	0.56	0.17
Control Delay	133.6	36.7	9.0	32.8	45.1	25.8	32.9	28.1	0.0	50.5	14.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.6	36.7	9.0	32.8	45.1	25.8	32.9	28.1	0.0	50.5	14.3	0.2
LOS	F	D	A	C	D	C	C	C	A	D	B	A
Approach Delay		45.0			35.4			28.3			17.1	
Approach LOS		D			D			C			B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 29.2

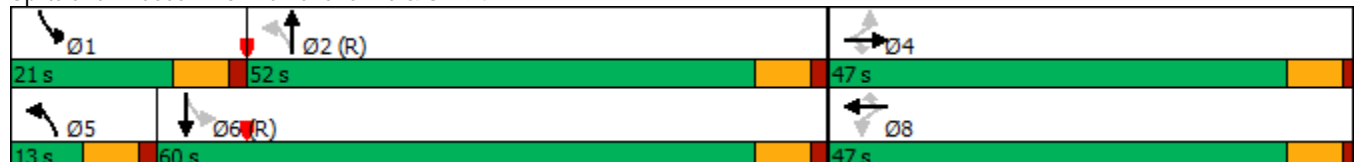
Intersection LOS: C

Intersection Capacity Utilization 91.4%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



























# HCM 6th Signalized Intersection Summary

2026 Total PM Improved.syn

## 5: Marksheffel Rd & SH-94

02/18/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	340	265	45	405	395	225	1100	30	200	845	255
Future Volume (veh/h)	140	340	265	45	405	395	225	1100	30	200	845	255
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	149	362	122	48	431	314	239	1170	0	213	899	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4
Cap, veh/h	161	634	537	239	634	537	284	1472		328	1559	
Arrive On Green	0.45	0.45	0.45	0.34	0.34	0.34	0.11	0.83	0.00	0.03	0.15	0.00
Sat Flow, veh/h	710	1856	1572	904	1856	1572	1781	3554	1585	1753	3497	1560
Grp Volume(v), veh/h	149	362	122	48	431	314	239	1170	0	213	899	0
Grp Sat Flow(s),veh/h/ln	710	1856	1572	904	1856	1572	1781	1777	1585	1753	1749	1560
Q Serve(g_s), s	17.1	17.2	5.7	5.4	23.9	19.7	6.5	19.9	0.0	8.1	28.7	0.0
Cycle Q Clear(g_c), s	41.0	17.2	5.7	22.6	23.9	19.7	6.5	19.9	0.0	8.1	28.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	161	634	537	239	634	537	284	1472		328	1559	
V/C Ratio(X)	0.92	0.57	0.23	0.20	0.68	0.58	0.84	0.79		0.65	0.58	
Avail Cap(c_a), veh/h	161	634	537	239	634	537	284	1472		389	1559	
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.00	0.87	0.87	0.00
Uniform Delay (d), s/veh	47.4	26.3	23.1	40.8	33.9	32.5	31.6	7.7	0.0	21.4	40.6	0.0
Incr Delay (d2), s/veh	46.4	1.1	0.2	0.4	2.9	1.6	19.7	4.5	0.0	2.5	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	7.2	2.1	1.2	11.2	7.7	5.6	4.1	0.0	3.8	13.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.9	27.4	23.3	41.2	36.8	34.1	51.3	12.3	0.0	24.0	42.0	0.0
LnGrp LOS	F	C	C	D	D	C	D	B		C	D	
Approach Vol, veh/h	633			793			1409			A	1112	A
Approach Delay, s/veh	42.2			36.0			18.9				38.5	
Approach LOS	D			D			B				D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.8	56.2		47.0	13.0	60.0		47.0				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	14.5	45.5		41.0	6.5	53.5		41.0				
Max Q Clear Time (g_c+l1), s	10.1	21.9		43.0	8.5	30.7		25.9				
Green Ext Time (p_c), s	0.2	9.5		0.0	0.0	6.8		3.7				
Intersection Summary												
HCM 6th Ctrl Delay	31.6											
HCM 6th LOS	C											

Timings  
5: Marksheffel Rd & SH-94

2040 Background AM.syn

02/15/2021

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↖	↑	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	320	130	40	375	100	250	555	25	325	705	5
Future Volume (vph)	320	130	40	375	100	250	555	25	325	705	5
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	51.0	51.0	51.0	51.0	51.0	16.0	33.0	33.0	36.0	53.0	53.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	13.3%	27.5%	27.5%	30.0%	44.2%	44.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	33.7	33.7	33.7	33.7	33.7	61.4	45.8	45.8	70.0	51.7	51.7
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.51	0.38	0.38	0.58	0.43	0.43
v/c Ratio	0.70	0.27	0.27	0.81	0.20	0.63	0.46	0.04	0.66	0.51	0.01
Control Delay	42.9	3.8	35.5	52.5	2.3	24.5	27.6	0.4	14.3	16.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	3.8	35.5	52.5	2.3	24.5	27.6	0.4	14.3	16.4	0.0
LOS	D	A	D	D	A	C	C	A	B	B	A
Approach Delay	31.6			41.4			25.9			15.7	
Approach LOS	C			D			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 25.9

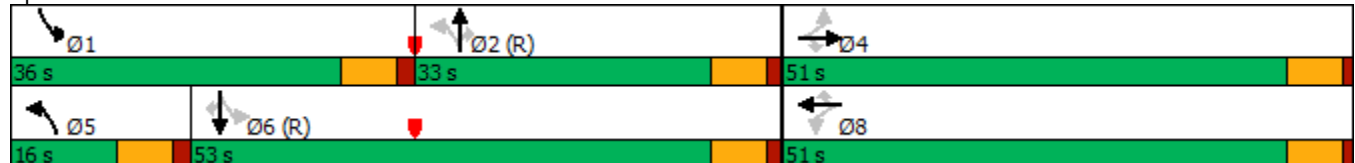
Intersection LOS: C

Intersection Capacity Utilization 78.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



























# HCM 6th Signalized Intersection Summary

2040 Background AM.syn

## 5: Marksheffel Rd & SH-94

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	320	130	40	375	100	250	555	25	325	705	5
Future Volume (veh/h)	0	320	130	40	375	100	250	555	25	325	705	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	0	348	-22	43	408	0	272	603	27	353	766	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3
Cap, veh/h	60	453	384	159	461	391	430	1611	719	629	1791	799
Arrive On Green	0.00	0.51	0.00	0.25	0.25	0.00	0.16	0.93	0.93	0.08	0.34	0.34
Sat Flow, veh/h	931	1781	1510	1020	1811	1535	1739	3469	1547	1767	3526	1572
Grp Volume(v), veh/h	0	348	-22	43	408	0	272	603	27	353	766	5
Grp Sat Flow(s),veh/h/ln	931	1781	1510	1020	1811	1535	1739	1735	1547	1767	1763	1572
Q Serve(g_s), s	0.0	18.9	0.0	4.8	26.0	0.0	9.5	2.3	0.2	11.8	20.1	0.3
Cycle Q Clear(g_c), s	0.0	18.9	0.0	23.7	26.0	0.0	9.5	2.3	0.2	11.8	20.1	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	453	384	159	461	391	430	1611	719	629	1791	799
V/C Ratio(X)	0.00	0.77	-0.06	0.27	0.89	0.00	0.63	0.37	0.04	0.56	0.43	0.01
Avail Cap(c_a), veh/h	172	668	566	282	679	576	430	1611	719	846	1791	799
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	0.00	0.94	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.91	0.91	0.91
Uniform Delay (d), s/veh	0.0	26.6	0.0	51.1	43.0	0.0	16.9	2.4	2.3	13.0	26.1	19.6
Incr Delay (d2), s/veh	0.0	3.0	0.0	0.9	9.5	0.0	3.0	0.7	0.1	0.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.4	0.0	1.3	12.8	0.0	3.9	0.8	0.1	5.1	9.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	29.6	0.0	52.0	52.6	0.0	19.9	3.0	2.4	13.7	26.8	19.6
LnGrp LOS	A	C	A	D	D	A	B	A	A	B	C	B
Approach Vol, veh/h	326			451			902			1124		
Approach Delay, s/veh	31.6			52.5			8.1			22.6		
Approach LOS	C			D			A			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.2	62.2		36.5	16.0	67.5		36.5				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	29.5	26.5		45.0	9.5	46.5		45.0				
Max Q Clear Time (g_c+l1), s	13.8	4.3		20.9	11.5	22.1		28.0				
Green Ext Time (p_c), s	1.0	4.3		2.1	0.0	5.8		2.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	23.8											
HCM 6th LOS	C											

# Timings 5: Marksheffel Rd & SH-94

2040 Background PM.syn

02/15/2021

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	375	315	50	450	435	215	1170	30	200	955	10
Future Volume (vph)	375	315	50	450	435	215	1170	30	200	955	10
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	47.0	47.0	47.0	47.0	47.0	13.0	52.0	52.0	21.0	60.0	60.0
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	10.8%	43.3%	43.3%	17.5%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	36.9	36.9	36.9	36.9	36.9	60.3	50.5	50.5	67.2	54.4	54.4
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.50	0.42	0.42	0.56	0.45	0.45
v/c Ratio	0.70	0.55	0.34	0.85	0.77	0.80	0.84	0.04	0.83	0.65	0.01
Control Delay	41.2	16.2	37.5	53.1	32.0	36.7	31.1	0.1	39.9	35.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	16.2	37.5	53.1	32.0	36.7	31.1	0.1	39.9	35.2	0.0
LOS	D	B	D	D	C	D	C	A	D	D	A
Approach Delay	29.8			42.4			31.3			35.7	
Approach LOS	C			D			C			D	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 34.8

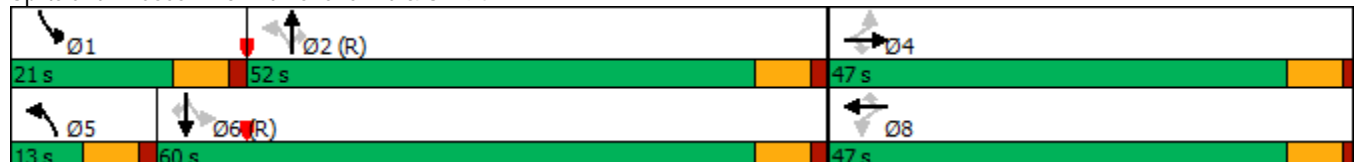
Intersection LOS: C

Intersection Capacity Utilization 92.1%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94

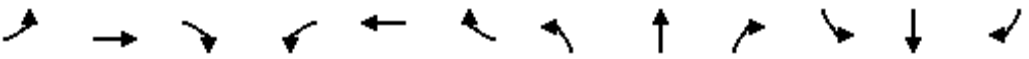
















# HCM 6th Signalized Intersection Summary 5: Marksheffel Rd & SH-94

2040 Background PM.syn

02/15/2021























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	375	315	50	450	435	215	1170	30	200	955	10
Future Volume (veh/h)	0	375	315	50	450	435	215	1170	30	200	955	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	0	399	175	53	479	357	229	1245	32	213	1016	11
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4
Cap, veh/h	60	540	458	171	540	458	282	1676	747	371	1736	774
Arrive On Green	0.00	0.58	0.58	0.29	0.29	0.29	0.11	0.94	0.94	0.03	0.16	0.16
Sat Flow, veh/h	652	1856	1572	832	1856	1572	1781	3554	1585	1753	3497	1560
Grp Volume(v), veh/h	0	399	175	53	479	357	229	1245	32	213	1016	11
Grp Sat Flow(s),veh/h/ln	652	1856	1572	832	1856	1572	1781	1777	1585	1753	1749	1560
Q Serve(g_s), s	0.0	18.9	7.2	7.1	29.6	25.0	6.5	8.0	0.1	7.2	32.2	0.7
Cycle Q Clear(g_c), s	0.0	18.9	7.2	26.0	29.6	25.0	6.5	8.0	0.1	7.2	32.2	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	540	458	171	540	458	282	1676	747	371	1736	774
V/C Ratio(X)	0.00	0.74	0.38	0.31	0.89	0.78	0.81	0.74	0.04	0.57	0.59	0.01
Avail Cap(c_a), veh/h	93	634	537	213	634	537	282	1676	747	445	1736	774
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.00	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh	0.0	21.7	19.3	48.1	40.6	39.0	27.3	2.0	1.8	15.1	38.7	25.6
Incr Delay (d2), s/veh	0.0	3.5	0.5	1.0	12.9	6.2	16.5	3.0	0.1	1.3	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.2	0.1	1.5	15.3	10.4	4.8	1.7	0.1	3.3	15.5	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	25.3	19.8	49.1	53.5	45.2	43.8	5.1	1.9	16.5	40.1	25.6
LnGrp LOS	A	C	B	D	D	D	D	A	A	B	D	C
Approach Vol, veh/h	574			889			1506			1240		
Approach Delay, s/veh	23.6			49.9			10.9			35.9		
Approach LOS	C			D			B			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.0	63.1		40.9	13.0	66.1		40.9				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	14.5	45.5		41.0	6.5	53.5		41.0				
Max Q Clear Time (g_c+I1), s	9.2	10.0		20.9	8.5	34.2		31.6				
Green Ext Time (p_c), s	0.3	12.3		3.0	0.0	7.4		3.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	28.2											
HCM 6th LOS	C											

# Timings

## 5: Marksheffel Rd & SH-94

2040 Total AM.syn

02/18/2021

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	165	350	310	40	405	135	430	810	355	975	275
Future Volume (vph)	165	350	310	40	405	135	430	810	355	975	275
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	pm+pt	NA	Free
Protected Phases		4			8		5	2	1	6	
Permitted Phases	4		4	8		8			6		Free
Detector Phase	4	4	4	8	8	8	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	29.0	36.0	36.0	43.0	43.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	24.2%	30.0%	30.0%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5
Lead/Lag							Lead	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	
Act Effect Green (s)	34.1	34.1	34.1	34.1	34.1	34.1	20.6	41.5	71.4	46.2	120.0
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.17	0.35	0.60	0.38	1.00
v/c Ratio	0.90	0.40	0.51	0.19	0.45	0.27	0.82	0.54	0.76	0.55	0.19
Control Delay	73.2	30.9	3.8	31.1	35.7	5.4	65.3	29.3	47.5	24.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	30.9	3.8	31.1	35.7	5.4	65.3	29.3	47.5	24.6	0.2
LOS	E	C	A	C	D	A	E	C	D	C	A
Approach Delay		29.2			28.3			41.5		25.5	
Approach LOS		C			C			D		C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 31.3

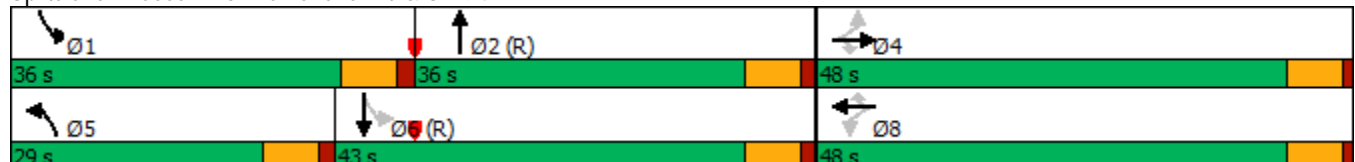
Intersection LOS: C

Intersection Capacity Utilization 77.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94

































# HCM 6th Signalized Intersection Summary

## 5: Marksheffel Rd & SH-94

2040 Total AM.syn

02/18/2021























																																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR																						
Lane Configurations		 			 		 	  			  																							
Traffic Volume (veh/h)	165	350	310	40	405	135	430	810	30	355	975	275																						
Future Volume (veh/h)	165	350	310	40	405	135	430	810	30	355	975	275																						
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0																						
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00																						
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																						
Work Zone On Approach	No			No			No			No																								
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856																						
Adj Flow Rate, veh/h	179	380	174	43	440	38	467	880	0	386	1060	0																						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92																						
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3																						
Cap, veh/h	257	1100	491	277	1119	499	524	1812		511	1830																							
Arrive On Green	0.54	0.54	0.54	0.33	0.33	0.33	0.31	0.73	0.00	0.05	0.12	0.00																						
Sat Flow, veh/h	873	3385	1510	827	3441	1535	3374	5149	0	1767	5066	1572																						
Grp Volume(v), veh/h	179	380	174	43	440	38	467	880	0	386	1060	0																						
Grp Sat Flow(s),veh/h/ln	873	1692	1510	827	1721	1535	1687	1662	0	1767	1689	1572																						
Q Serve(g_s), s	23.3	7.6	7.8	4.9	11.9	2.1	15.8	8.9	0.0	15.4	23.8	0.0																						
Cycle Q Clear(g_c), s	35.2	7.6	7.8	12.4	11.9	2.1	15.8	8.9	0.0	15.4	23.8	0.0																						
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00																						
Lane Grp Cap(c), veh/h	257	1100	491	277	1119	499	524	1812		511	1830																							
V/C Ratio(X)	0.70	0.35	0.35	0.16	0.39	0.08	0.89	0.49		0.75	0.58																							
Avail Cap(c_a), veh/h	279	1185	528	297	1204	537	633	1812		675	1830																							
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33																						
Upstream Filter(I)	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	0.00	0.81	0.81	0.00																						
Uniform Delay (d), s/veh	32.2	20.2	20.3	34.5	31.3	28.0	40.4	11.6	0.0	21.2	44.2	0.0																						
Incr Delay (d2), s/veh	5.2	0.1	0.3	0.3	0.2	0.1	13.1	0.9	0.0	2.8	1.1	0.0																						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
%ile BackOfQ(50%),veh/ln	4.7	2.8	2.6	1.0	5.0	0.8	6.5	2.7	0.0	7.5	11.0	0.0																						
Unsig. Movement Delay, s/veh																																		
LnGrp Delay(d),s/veh	37.4	20.4	20.6	34.7	31.6	28.1	53.5	12.6	0.0	24.0	45.3	0.0																						
LnGrp LOS	D	C	C	C	C	C	D	B		C	D																							
Approach Vol, veh/h	733				521		1347		A	1446		A																						
Approach Delay, s/veh	24.6				31.6		26.8			39.6																								
Approach LOS	C				C		C			D																								
Timer - Assigned Phs	1	2	4		5	6	8																											
Phs Duration (G+Y+Rc), s	24.9	50.1	45.0		25.1	49.9	45.0																											
Change Period (Y+Rc), s	6.5	6.5	6.0		6.5	6.5	6.0																											
Max Green Setting (Gmax), s	29.5	29.5	42.0		22.5	36.5	42.0																											
Max Q Clear Time (g_c+l1), s	17.4	10.9	37.2		17.8	25.8	14.4																											
Green Ext Time (p_c), s	1.0	6.1	1.8		0.8	5.4	3.5																											
Intersection Summary																																		
HCM 6th Ctrl Delay	31.6																																	
HCM 6th LOS	C																																	
Notes																																		
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.																																		

# Timings

## 5: Marksheffel Rd & SH-94

2040 Total PM.syn

02/18/2021

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	235	400	665	50	475	480	565	1735	230	1480	285
Future Volume (vph)	235	400	665	50	475	480	565	1735	230	1480	285
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA	pm+pt	NA	Free
Protected Phases	7	4	5	3	8	1	5	2	1	6	
Permitted Phases	4		4	8		8			6		Free
Detector Phase	7	4	5	3	8	1	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	11.0	11.5	9.5	11.0	11.5	11.5	11.5	11.5	11.5	
Total Split (s)	15.0	38.0	36.0	9.5	32.5	19.0	36.0	53.5	19.0	36.5	
Total Split (%)	12.5%	31.7%	30.0%	7.9%	27.1%	15.8%	30.0%	44.6%	15.8%	30.4%	
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	6.0	6.5	4.5	6.0	6.5	6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	
Act Effect Green (s)	39.0	29.9	63.0	29.0	22.5	44.4	27.0	47.6	52.3	36.4	120.0
Actuated g/C Ratio	0.32	0.25	0.52	0.24	0.19	0.37	0.22	0.40	0.44	0.30	1.00
v/c Ratio	1.02	0.49	0.81	0.21	0.77	0.74	0.78	0.94	0.84	1.04	0.20
Control Delay	89.7	43.2	23.0	29.3	54.3	28.6	45.7	57.6	58.2	84.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.7	43.2	23.0	29.3	54.3	28.6	45.7	57.6	58.2	84.7	0.2
LOS	F	D	C	C	D	C	D	E	E	F	A
Approach Delay		41.3			40.7			54.7		69.6	
Approach LOS		D			D			D		E	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 54.4

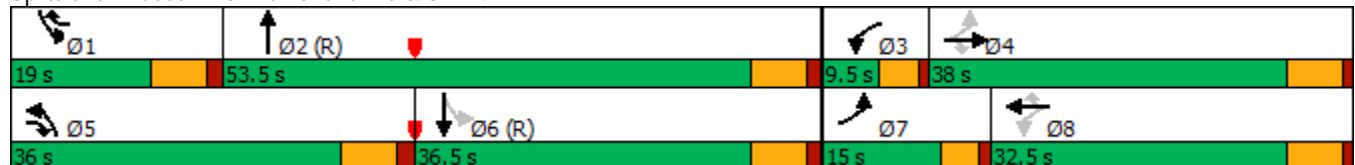
Intersection LOS: D

Intersection Capacity Utilization 93.1%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94


























# HCM 6th Signalized Intersection Summary

## 5: Marksheffel Rd & SH-94

2040 Total PM.syn







02/18/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	400	665	50	475	480	565	1735	50	230	1480	285
Future Volume (veh/h)	235	400	665	50	475	480	565	1735	50	230	1480	285
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	250	426	361	53	505	245	601	1846	0	245	1574	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4
Cap, veh/h	242	809	676	214	623	441	693	2226		263	1706	
Arrive On Green	0.15	0.38	0.38	0.03	0.18	0.18	0.07	0.14	0.00	0.10	0.34	0.00
Sat Flow, veh/h	1767	3526	1572	1767	3526	1572	3456	5274	0	1753	5025	1560
Grp Volume(v), veh/h	250	426	361	53	505	245	601	1846	0	245	1574	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1572	1728	1702	0	1753	1675	1560
Q Serve(g_s), s	10.5	11.2	20.4	2.9	16.5	15.9	20.7	42.2	0.0	11.0	36.1	0.0
Cycle Q Clear(g_c), s	10.5	11.2	20.4	2.9	16.5	15.9	20.7	42.2	0.0	11.0	36.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	242	809	676	214	623	441	693	2226		263	1706	
V/C Ratio(X)	1.03	0.53	0.53	0.25	0.81	0.55	0.87	0.83		0.93	0.92	
Avail Cap(c_a), veh/h	242	940	735	227	779	511	850	2226		263	1706	
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.57	0.57	0.57	1.00	1.00	1.00	1.00	1.00	0.00	0.78	0.78	0.00
Uniform Delay (d), s/veh	39.5	32.0	20.2	38.6	47.5	36.8	54.4	47.0	0.0	28.8	38.1	0.0
Incr Delay (d2), s/veh	52.3	0.3	0.4	0.6	5.3	1.1	8.1	3.7	0.0	31.5	8.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	4.3	6.1	1.3	7.7	6.3	10.4	20.0	0.0	6.9	15.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.8	32.3	20.6	39.2	52.7	37.9	62.5	50.8	0.0	60.4	46.1	0.0
LnGrp LOS	F	C	C	D	D	D	E	D		E	D	
Approach Vol, veh/h	1037			803			2447			A		
Approach Delay, s/veh	42.6			47.3			53.7			48.0		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	58.8	8.6	33.5	30.6	47.2	15.0	27.2				
Change Period (Y+Rc), s	6.5	6.5	4.5	6.0	6.5	6.5	4.5	6.0				
Max Green Setting (Gmax), s	12.5	47.0	5.0	32.0	29.5	30.0	10.5	26.5				
Max Q Clear Time (g_c+l1), s	13.0	44.2	4.9	22.4	22.7	38.1	12.5	18.5				
Green Ext Time (p_c), s	0.0	2.5	0.0	3.0	1.4	0.0	0.0	2.7				
Intersection Summary												
HCM 6th Ctrl Delay			49.3									
HCM 6th LOS			D									
Notes												

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘↗	
Traffic Vol, veh/h	713	0	28	543	0	84
Future Vol, veh/h	713	0	28	543	0	84
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	775	0	30	590	0	91
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	775	0	1425	775
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	650	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	*705	-	*74	*473
Stage 1	-	-	-	-	*446	-
Stage 2	-	-	-	-	*514	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*705	-	*71	*473
Mov Cap-2 Maneuver	-	-	-	-	*246	-
Stage 1	-	-	-	-	*446	-
Stage 2	-	-	-	-	*492	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		14.4	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	473	-	-	* 705	-	
HCM Lane V/C Ratio	0.193	-	-	0.043	-	
HCM Control Delay (s)	14.4	-	-	10.3	-	
HCM Lane LOS	B	-	-	B	-	
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon



Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↘↗	
Traffic Vol, veh/h	446	0	55	691	0	66
Future Vol, veh/h	446	0	55	691	0	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	485	0	60	751	0	72
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	485	0	1356	485
Stage 1	-	-	-	-	485	-
Stage 2	-	-	-	-	871	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	*1060	-	*119	*709
Stage 1	-	-	-	-	*669	-
Stage 2	-	-	-	-	*408	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*1060	-	*113	*709
Mov Cap-2 Maneuver	-	-	-	-	*270	-
Stage 1	-	-	-	-	*669	-
Stage 2	-	-	-	-	*385	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.6		10.6	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	709	-	-	* 1060	-	
HCM Lane V/C Ratio	0.101	-	-	0.056	-	
HCM Control Delay (s)	10.6	-	-	8.6	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	765	0	35	585	0	95
Future Vol, veh/h	765	0	35	585	0	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	832	0	38	636	0	103
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	832	0	1544	832
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	712	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	*627	-	*44	*421
Stage 1	-	-	-	-	*397	-
Stage 2	-	-	-	-	*481	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*627	-	*42	*421
Mov Cap-2 Maneuver	-	-	-	-	*212	-
Stage 1	-	-	-	-	*397	-
Stage 2	-	-	-	-	*452	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.6		16.3	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	421	-	-	* 627	-	
HCM Lane V/C Ratio	0.245	-	-	0.061	-	
HCM Control Delay (s)	16.3	-	-	11.1	-	
HCM Lane LOS	C	-	-	B	-	
HCM 95th %tile Q(veh)	1	-	-	0.2	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘↗	
Traffic Vol, veh/h	480	0	60	745	0	75
Future Vol, veh/h	480	0	60	745	0	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	522	0	65	810	0	82
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	522	0	1462	522
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	940	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	*1021	-	*92	*683
Stage 1	-	-	-	-	*645	-
Stage 2	-	-	-	-	*378	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*1021	-	*86	*683
Mov Cap-2 Maneuver	-	-	-	-	*244	-
Stage 1	-	-	-	-	*645	-
Stage 2	-	-	-	-	*354	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.7		11		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	683	-	-	* 1021	-	
HCM Lane V/C Ratio	0.119	-	-	0.064	-	
HCM Control Delay (s)	11	-	-	8.8	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon







Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	815	5	55	635	5	115
Future Vol, veh/h	815	5	55	635	5	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	886	5	60	690	5	125

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	891
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.15
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.245
Pot Cap-1 Maneuver	-	-	*589
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	1
Mov Cap-1 Maneuver	-	-	*589
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	19.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	377	-	-	* 589	-
HCM Lane V/C Ratio	0.346	-	-	0.101	-
HCM Control Delay (s)	19.5	-	-	11.8	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.5	-	-	0.3	-

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	525	5	95	790	5	100
Future Vol, veh/h	525	5	95	790	5	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	571	5	103	859	5	109
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	576	0	1636	571
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	1065	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	*943	-	*56	*631
Stage 1	-	-	-	-	*596	-
Stage 2	-	-	-	-	*330	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*943	-	*50	*631
Mov Cap-2 Maneuver	-	-	-	-	*200	-
Stage 1	-	-	-	-	*596	-
Stage 2	-	-	-	-	*294	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1		12.9	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	572	-	-	* 943	-	
HCM Lane V/C Ratio	0.2	-	-	0.11	-	
HCM Control Delay (s)	12.9	-	-	9.3	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.7	-	-	0.4	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↘	
Traffic Vol, veh/h	900	0	50	685	0	140
Future Vol, veh/h	900	0	50	685	0	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	978	0	54	745	0	152
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	978	0	1831	978
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	853	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	*473	-	*8	*318
Stage 1	-	-	-	-	*300	-
Stage 2	-	-	-	-	*413	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*473	-	*7	*318
Mov Cap-2 Maneuver	-	-	-	-	*154	-
Stage 1	-	-	-	-	*300	-
Stage 2	-	-	-	-	*366	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.9		26.3	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	318	-	-	* 473	-	
HCM Lane V/C Ratio	0.479	-	-	0.115	-	
HCM Control Delay (s)	26.3	-	-	13.6	-	
HCM Lane LOS	D	-	-	B	-	
HCM 95th %tile Q(veh)	2.5	-	-	0.4	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon



Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↘	
Traffic Vol, veh/h	565	0	105	875	0	105
Future Vol, veh/h	565	0	105	875	0	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	614	0	114	951	0	114
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	1793	614
Stage 1	-	-	-	-	614	-
Stage 2	-	-	-	-	1179	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	*904	-	*35	*605
Stage 1	-	-	-	-	*571	-
Stage 2	-	-	-	-	*291	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*904	-	*31	*605
Mov Cap-2 Maneuver	-	-	-	-	*172	-
Stage 1	-	-	-	-	*571	-
Stage 2	-	-	-	-	*254	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1		12.3	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	605	-	-	* 904	-	
HCM Lane V/C Ratio	0.189	-	-	0.126	-	
HCM Control Delay (s)	12.3	-	-	9.6	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.7	-	-	0.4	-	
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

Intersection						
Int Delay, s/veh	5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	960	5	85	740	5	170
Future Vol, veh/h	960	5	85	740	5	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	1043	5	92	804	5	185

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0 1048	0 2031 1043
Stage 1	-	-	- 1043 -
Stage 2	-	-	- 988 -
Critical Hdwy	-	- 4.15	- 6.45 6.25
Critical Hdwy Stg 1	-	-	- 5.45 -
Critical Hdwy Stg 2	-	-	- 5.45 -
Follow-up Hdwy	-	- 2.245	- 3.545 3.345
Pot Cap-1 Maneuver	-	- *396	- *~ 1 *266
Stage 1	-	-	- *251 -
Stage 2	-	-	- *356 -
Platoon blocked, %	-	- 1	- 1 1
Mov Cap-1 Maneuver	-	- *396	- *~ 1 *266
Mov Cap-2 Maneuver	-	-	- *166 -
Stage 1	-	-	- *251 -
Stage 2	-	-	- *273 -

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	48.6
HCM LOS	E		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	261	-	-	* 396	-
HCM Lane V/C Ratio	0.729	-	-	0.233	-
HCM Control Delay (s)	48.6	-	-	16.8	-
HCM Lane LOS	E	-	-	C	-
HCM 95th %tile Q(veh)	5.1	-	-	0.9	-

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↘	
Traffic Vol, veh/h	635	5	180	940	5	160
Future Vol, veh/h	635	5	180	940	5	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	690	5	196	1022	5	174
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	695	0	2104	690
Stage 1	-	-	-	-	690	-
Stage 2	-	-	-	-	1414	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	*827	-	*12	*553
Stage 1	-	-	-	-	*522	-
Stage 2	-	-	-	-	*223	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*827	-	*9	*553
Mov Cap-2 Maneuver	-	-	-	-	*120	-
Stage 1	-	-	-	-	*522	-
Stage 2	-	-	-	-	*170	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.7		16.2	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	498	-	-	* 827	-	
HCM Lane V/C Ratio	0.36	-	-	0.237	-	
HCM Control Delay (s)	16.2	-	-	10.7	-	
HCM Lane LOS	C	-	-	B	-	
HCM 95th %tile Q(veh)	1.6	-	-	0.9	-	
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

Intersection												
Int Delay, s/veh	8.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Vol, veh/h	7	42	114	8	11	2	273	472	12	8	859	119
Future Vol, veh/h	7	42	114	8	11	2	273	472	12	8	859	119
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	250	300	-	200	400	-	425	425	-	425
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	8	46	124	9	12	2	297	513	13	9	934	129

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1809	2072	467	1615	2188	257	1063	0	0	526	0	0
Stage 1	952	952	-	1107	1107	-	-	-	-	-	-	-
Stage 2	857	1120	-	508	1081	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	*86	*66	*730	*139	52	733	955	-	-	1016	-	-
Stage 1	*689	*604	-	*219	278	-	-	-	-	-	-	-
Stage 2	*312	*274	-	*689	505	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	*48	*~ 45	*730	-	35	733	955	-	-	1016	-	-
Mov Cap-2 Maneuver	*48	*~ 45	-	-	35	-	-	-	-	-	-	-
Stage 1	*475	*599	-	*151	192	-	-	-	-	-	-	-
Stage 2	*201	*189	-	*524	501	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	83.6		3.8	0.1
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	955	-	-	48	45	730	-	35	733	1016	-	-
HCM Lane V/C Ratio	0.311	-	-	0.159	1.014	0.17	-	0.342	0.003	0.009	-	-
HCM Control Delay (s)	10.5	-	-	93.6	279.4	10.9	-	154	9.9	8.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	F	A	A	-	-
HCM 95th %tile Q(veh)	1.3	-	-	0.5	4.2	0.6	-	1.1	0	0	-	-

Notes												
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon												

Intersection												
Int Delay, s/veh	12.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Vol, veh/h	8	31	225	30	10	1	203	917	17	1	530	23
Future Vol, veh/h	8	31	225	30	10	1	203	917	17	1	530	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	250	300	-	200	400	-	425	425	-	425
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	9	33	242	32	11	1	218	986	18	1	570	25

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1507	2012	285	1726	2019	493	595	0	0	1004	0	0
Stage 1	572	572	-	1422	1422	-	-	-	-	-	-	-
Stage 2	935	1440	-	304	597	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	*125	*66	*864	*78	*65	519	*1291	-	-	680	-	-
Stage 1	*815	*714	-	*142	*199	-	-	-	-	-	-	-
Stage 2	*284	*195	-	*815	*714	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	*92	*54	*864	*~ 25	*54	519	*1291	-	-	680	-	-
Mov Cap-2 Maneuver	*92	*54	-	*~ 25	*54	-	-	-	-	-	-	-
Stage 1	*677	*713	-	*118	*165	-	-	-	-	-	-	-
Stage 2	*220	*162	-	*559	*713	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.9	\$ 395.4	1.5	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	* 1291	-	-	92	54	864	25	54	519	680	-	-
HCM Lane V/C Ratio	0.169	-	-	0.094	0.617	0.28	1.29	0.199	0.002	0.002	-	-
HCM Control Delay (s)	8.4	-	-	48.1	146.6	10.8	510.8	87.5	12	10.3	-	-
HCM Lane LOS	A	-	-	E	F	B	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-	0.3	2.5	1.1	4	0.7	0	0	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Intersection												
Int Delay, s/veh	19.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Vol, veh/h	10	50	125	10	15	5	295	510	15	10	925	130
Future Vol, veh/h	10	50	125	10	15	5	295	510	15	10	925	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	250	300	-	200	400	-	425	425	-	425
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	11	54	136	11	16	5	321	554	16	11	1005	141

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1954	2239	503	1748	2364	277	1146	0	0	570	0	0
Stage 1	1027	1027	-	1196	1196	-	-	-	-	-	-	-
Stage 2	927	1212	-	552	1168	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	*63	*~ 47	*704	*108	36	711	904	-	-	978	-	-
Stage 1	*665	*583	-	*193	252	-	-	-	-	-	-	-
Stage 2	*283	*247	-	*665	473	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	*20	*~ 30	*704	-	23	711	904	-	-	978	-	-
Mov Cap-2 Maneuver	*20	*~ 30	-	-	23	-	-	-	-	-	-	-
Stage 1	*429	*576	-	*124	163	-	-	-	-	-	-	-
Stage 2	*163	*159	-	*480	468	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	205.7		4	0.1
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	904	-	-	20	30	704	-	23	711	978	-	-
HCM Lane V/C Ratio	0.355	-	-	0.543	1.812	0.193	-	0.709	0.008	0.011	-	-
HCM Control Delay (s)	11.2	-	-	\$ 315.9	\$ 669.8	11.3	-	\$ 328.9	10.1	8.7	-	-
HCM Lane LOS	B	-	-	F	F	B	-	F	B	A	-	-
HCM 95th %tile Q(veh)	1.6	-	-	1.5	6.3	0.7	-	2.1	0	0	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						



Intersection												
Int Delay, s/veh	65.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Vol, veh/h	10	35	245	35	15	5	220	985	20	5	570	25
Future Vol, veh/h	10	35	245	35	15	5	220	985	20	5	570	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	250	300	-	200	400	-	425	425	-	425
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	38	263	38	16	5	237	1059	22	5	613	27

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1635	2178	307	1869	2183	530	640	0	0	1081	0	0
Stage 1	623	623	-	1533	1533	-	-	-	-	-	-	-
Stage 2	1012	1555	-	336	650	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	*101	*50	*838	*60	*49	491	*1253	-	-	635	-	-
Stage 1	*791	*693	-	*121	*175	-	-	-	-	-	-	-
Stage 2	*254	*171	-	*791	*693	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	*58	*40	*838	*~ 6	*39	491	*1253	-	-	635	-	-
Mov Cap-2 Maneuver	*58	*40	-	*~ 6	*39	-	-	-	-	-	-	-
Stage 1	*641	*687	-	*98	*142	-	-	-	-	-	-	-
Stage 2	*181	*139	-	*508	*687	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.8	\$ 2302.9	1.5	0.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	* 1253	-	-	58	40	838	6	39	491	635	-	-
HCM Lane V/C Ratio	0.189	-	-	0.185	0.941	0.314	6.272	0.414	0.011	0.008	-	-
HCM Control Delay (s)	8.5	-	-	80.7	277.4	11.3	3552.2	151.3	12.4	10.7	-	-
HCM Lane LOS	A	-	-	F	F	B	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	0.6	3.6	1.4	6.2	1.4	0	0	-	-

Notes												
-: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↗	↱	↰	↗	↱
Traffic Vol, veh/h	40	80	135	45	75	40	325	770	30	70	1095	130
Future Vol, veh/h	40	80	135	45	75	40	325	770	30	70	1095	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	250	300	-	200	400	-	425	425	-	425
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	43	87	147	49	82	43	353	837	33	76	1190	141
Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	2508	2918	595	2334	3026	419	1331	0	0	870	0	0
Stage 1	1342	1342	-	1543	1543	-	-	-	-	-	-	-
Stage 2	1166	1576	-	791	1483	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	~ 15	~ 9	*627	*~ 26	~ 7	575	827	-	-	752	-	-
Stage 1	477	442	-	*117	170	-	-	-	-	-	-	-
Stage 2	201	164	-	*592	345	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 5	*627	-	~ 4	575	827	-	-	752	-	-
Mov Cap-2 Maneuver	-	~ 5	-	-	~ 4	-	-	-	-	-	-	-
Stage 1	273	397	-	*67	97	-	-	-	-	-	-	-
Stage 2	~ 17	94	-	*318	310	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB		SB		SB	
HCM Control Delay, s					3.6		0.6					
HCM LOS	-		-									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	827	-	-	-	5	627	-	4	575	752	-	-
HCM Lane V/C Ratio	0.427	-	-	-	17.391	0.234	-	20.38	0.076	0.101	-	-
HCM Control Delay (s)	12.6	-	-	-	\$ 8799	12.5	\$ 10487.6	11.8	10.3	-	-	-
HCM Lane LOS	B	-	-	-	F	B	-	F	B	B	-	-
HCM 95th %tile Q(veh)	2.2	-	-	-	12.8	0.9	-	12.2	0.2	0.3	-	-
Notes												
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon												

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↱	↱	↰	↱	↱
Traffic Vol, veh/h	55	90	270	80	80	30	245	1265	45	90	885	25
Future Vol, veh/h	55	90	270	80	80	30	245	1265	45	90	885	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	250	300	-	200	400	-	425	425	-	425
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	59	97	290	86	86	32	263	1360	48	97	952	27

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	2395	3080	476	2605	3059	680	979	0	0	1408	0	0
Stage 1	1146	1146	-	1886	1886	-	-	-	-	-	-	-
Stage 2	1249	1934	-	719	1173	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 20	~ 7	*708	*~ 11	~ 7	391	*1059	-	-	475	-	-
Stage 1	530	493	-	*~ 72	117	-	-	-	-	-	-	-
Stage 2	182	110	-	*668	473	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 4	*708	-	~ 4	391	*1059	-	-	475	-	-
Mov Cap-2 Maneuver	-	~ 4	-	-	~ 4	-	-	-	-	-	-	-
Stage 1	398	392	-	*~ 54	88	-	-	-	-	-	-	-
Stage 2	~ 3	~ 83	-	*236	376	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1.5	1.3
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	* 1059	-	-	-	4	708	-	4	391	475	-	-
HCM Lane V/C Ratio	0.249	-	-	-24.194	0.41	-21.505	0.083	0.204	-	-	-	-
HCM Control Delay (s)	9.5	-	-	\$ 12208.9	13.6	\$ 10995.6	15	14.5	-	-	-	-
HCM Lane LOS	A	-	-	F	B	-	F	C	B	-	-	-
HCM 95th %tile Q(veh)	1	-	-	- 14.2	2	- 12.8	0.3	0.8	-	-	-	-

























Notes												
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon												

# Timings

2026 Total AM Improved.syn

## 7: Marksheffel Rd & Space Village Ave






02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	80	135	45	75	40	325	770	30	70	1095	130
Future Volume (vph)	40	80	135	45	75	40	325	770	30	70	1095	130
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	35.0	85.8	85.8	10.2	61.0	61.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	29.2%	71.5%	71.5%	8.5%	50.8%	50.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	11.3	11.3	11.3	11.3	11.3	11.3	98.2	87.8	87.8	79.5	71.5	71.5
Actuated g/C Ratio	0.09	0.09	0.09	0.09	0.09	0.09	0.82	0.73	0.73	0.66	0.60	0.60
v/c Ratio	0.36	0.51	0.53	0.41	0.48	0.18	0.73	0.33	0.03	0.16	0.58	0.14
Control Delay	58.1	61.5	15.0	60.4	60.3	1.6	20.8	6.9	0.2	6.1	20.2	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	61.5	15.0	60.4	60.3	1.6	20.8	6.9	0.2	6.1	20.2	5.9
LOS	E	E	B	E	E	A	C	A	A	A	C	A
Approach Delay		36.3			45.8			10.7			18.0	
Approach LOS		D			D			B			B	

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 18.3
Intersection Capacity Utilization 71.2%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service C

### Splits and Phases: 7: Marksheffel Rd & Space Village Ave

























 Ø1	 Ø2 (R)	 Ø4
10.2 s	85.8 s	24 s
 Ø5	 Ø6 (R)	 Ø8
35 s	61 s	24 s

# HCM 6th Signalized Intersection Summary

2026 Total AM Improved.syn

## 7: Marksheffel Rd & Space Village Ave

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	80	135	45	75	40	325	770	30	70	1095	130
Future Volume (veh/h)	40	80	135	45	75	40	325	770	30	70	1095	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	43	87	147	49	82	43	353	837	33	76	1190	141
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	149	207	176	138	207	176	445	2465	1099	511	2303	1027
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.09	0.71	0.71	0.05	0.88	0.88
Sat Flow, veh/h	1236	1826	1547	1119	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	43	87	147	49	82	43	353	837	33	76	1190	141
Grp Sat Flow(s),veh/h/ln	1236	1826	1547	1119	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	4.0	5.3	11.2	5.1	5.0	3.0	7.2	11.0	0.8	1.6	8.9	1.5
Cycle Q Clear(g_c), s	9.0	5.3	11.2	10.4	5.0	3.0	7.2	11.0	0.8	1.6	8.9	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	149	207	176	138	207	176	445	2465	1099	511	2303	1027
V/C Ratio(X)	0.29	0.42	0.84	0.36	0.40	0.24	0.79	0.34	0.03	0.15	0.52	0.14
Avail Cap(c_a), veh/h	194	274	232	178	274	232	739	2465	1099	527	2303	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	49.5	52.1	54.4	49.4	48.5	8.2	6.6	5.1	5.6	2.9	2.5
Incr Delay (d2), s/veh	1.1	1.3	17.9	1.6	1.2	0.7	3.2	0.4	0.1	0.1	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.5	5.2	1.5	2.4	1.2	2.6	3.9	0.2	0.6	2.2	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.6	50.8	70.0	55.9	50.6	49.2	11.4	7.0	5.2	5.8	3.7	2.7
LnGrp LOS	D	D	E	E	D	D	B	A	A	A	A	A
Approach Vol, veh/h	277			174			1223			1407		
Approach Delay, s/veh	61.6			51.7			8.2			3.7		
Approach LOS	E			D			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	91.3		19.6	14.7	85.6		19.6				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		6.0				
Max Green Setting (Gmax), s	5.7	79.8		18.0	30.5	55.0		18.0				
Max Q Clear Time (g_c+I1), s	3.6	13.0		13.2	9.2	10.9		12.4				
Green Ext Time (p_c), s	0.0	7.6		0.5	1.1	12.9		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	13.4											
HCM 6th LOS	B											

# Timings

2026 Total PM Improved.syn

## 7: Marksheffel Rd & Space Village Ave

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	90	270	80	80	30	245	1265	45	90	885	25
Future Volume (vph)	55	90	270	80	80	30	245	1265	45	90	885	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	26.0	75.0	75.0	15.0	64.0	64.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	21.7%	62.5%	62.5%	12.5%	53.3%	53.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	13.4	13.4	13.4	13.4	13.4	13.4	91.9	81.5	81.5	85.0	77.9	77.9
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.11	0.11	0.77	0.68	0.68	0.71	0.65	0.65
v/c Ratio	0.41	0.47	0.69	0.61	0.42	0.11	0.56	0.57	0.04	0.33	0.42	0.03
Control Delay	56.5	56.3	15.9	67.5	54.5	0.7	8.6	12.0	0.6	12.7	24.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	56.3	15.9	67.5	54.5	0.7	8.6	12.0	0.6	12.7	24.4	0.2
LOS	E	E	B	E	D	A	A	B	A	B	C	A
Approach Delay		30.0			51.5			11.1			22.8	
Approach LOS		C			D			B			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 19.7

Intersection LOS: B

Intersection Capacity Utilization 66.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 7: Marksheffel Rd & Space Village Ave





























# HCM 6th Signalized Intersection Summary

2026 Total PM Improved.syn

## 7: Marksheffel Rd & Space Village Ave

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	90	270	80	80	30	245	1265	45	90	885	25
Future Volume (veh/h)	55	90	270	80	80	30	245	1265	45	90	885	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	59	97	193	86	86	32	263	1360	48	97	952	27
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	192	270	229	166	270	229	549	2342	1045	303	2225	992
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.07	0.66	0.66	0.08	1.00	1.00
Sat Flow, veh/h	1264	1856	1572	1081	1856	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	59	97	193	86	86	32	263	1360	48	97	952	27
Grp Sat Flow(s),veh/h/ln	1264	1856	1572	1081	1856	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	5.3	5.7	14.3	9.4	5.0	2.1	6.2	25.3	1.3	2.3	0.0	0.0
Cycle Q Clear(g_c), s	10.2	5.7	14.3	15.0	5.0	2.1	6.2	25.3	1.3	2.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	192	270	229	166	270	229	549	2342	1045	303	2225	992
V/C Ratio(X)	0.31	0.36	0.84	0.52	0.32	0.14	0.48	0.58	0.05	0.32	0.43	0.03
Avail Cap(c_a), veh/h	260	371	314	225	371	314	714	2342	1045	365	2225	992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	46.2	49.9	53.0	45.9	44.7	6.2	11.0	7.0	9.0	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.8	13.9	2.5	0.7	0.3	0.6	1.1	0.1	0.6	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.7	6.5	2.7	2.4	0.9	2.2	9.5	0.4	0.8	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.4	47.0	63.8	55.5	46.6	45.0	6.8	12.1	7.1	9.6	0.6	0.1
LnGrp LOS	D	D	E	E	D	D	A	B	A	A	A	A
Approach Vol, veh/h	349			204			1671			1076		
Approach Delay, s/veh	57.1			50.1			11.1			1.4		
Approach LOS	E			D			B			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.8	85.7		23.5	14.8	81.7		23.5				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	69.0		24.0	20.0	58.0		24.0				
Max Q Clear Time (g_c+I1), s	4.3	27.3		16.3	8.2	2.0		17.0				
Green Ext Time (p_c), s	0.1	14.9		0.8	0.6	9.0		0.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	15.2											
HCM 6th LOS	B											

# Timings

2040 Background AM.syn

## 7: Marksheffel Rd & Space Village Ave

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	65	155	20	45	15	375	975	35	15	1210	150
Future Volume (vph)	10	65	155	20	45	15	375	975	35	15	1210	150
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	36.0	86.5	86.5	9.5	60.0	60.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	30.0%	72.1%	72.1%	7.9%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	10.1	10.1	10.1	10.1	10.1	10.1	99.4	93.8	93.8	72.7	65.5	65.5
Actuated g/C Ratio	0.08	0.08	0.08	0.08	0.08	0.08	0.83	0.78	0.78	0.61	0.55	0.55
v/c Ratio	0.10	0.47	0.60	0.20	0.32	0.07	0.78	0.39	0.03	0.05	0.70	0.18
Control Delay	51.0	61.8	16.6	54.2	56.3	0.6	33.4	5.5	0.4	7.3	25.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	61.8	16.6	54.2	56.3	0.6	33.4	5.5	0.4	7.3	25.2	6.9
LOS	D	E	B	D	E	A	C	A	A	A	C	A
Approach Delay		30.9			45.5			12.9			23.0	
Approach LOS		C			D			B			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 19.6

Intersection LOS: B

Intersection Capacity Utilization 75.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 7: Marksheffel Rd & Space Village Ave



























# HCM 6th Signalized Intersection Summary

## 7: Marksheffel Rd & Space Village Ave

2040 Background AM.syn

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	65	155	20	45	15	375	975	35	15	1210	150
Future Volume (veh/h)	10	65	155	20	45	15	375	975	35	15	1210	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	11	71	168	22	49	16	408	1060	38	16	1315	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	192	229	194	160	229	194	442	2497	1114	375	1971	879
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.17	0.72	0.72	0.01	0.38	0.38
Sat Flow, veh/h	1305	1826	1547	1114	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	11	71	168	22	49	16	408	1060	38	16	1315	163
Grp Sat Flow(s),veh/h/ln	1305	1826	1547	1114	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	0.9	4.2	12.8	2.2	2.9	1.1	17.2	14.8	0.8	0.5	37.8	8.4
Cycle Q Clear(g_c), s	3.8	4.2	12.8	6.4	2.9	1.1	17.2	14.8	0.8	0.5	37.8	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	192	229	194	160	229	194	442	2497	1114	375	1971	879
V/C Ratio(X)	0.06	0.31	0.86	0.14	0.21	0.08	0.92	0.42	0.03	0.04	0.67	0.19
Avail Cap(c_a), veh/h	224	274	232	188	274	232	605	2497	1114	417	1971	879
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	47.7	51.5	50.7	47.1	46.4	31.4	6.8	4.8	10.5	27.7	18.7
Incr Delay (d2), s/veh	0.1	0.8	24.1	0.4	0.5	0.2	16.3	0.5	0.1	0.0	1.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.0	6.2	0.6	1.4	0.4	13.7	5.1	0.3	0.2	17.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	48.5	75.5	51.1	47.6	46.5	47.7	7.3	4.9	10.5	29.6	19.1
LnGrp LOS	D	D	E	D	D	D	D	A	A	B	C	B
Approach Vol, veh/h	250			87			1506			1494		
Approach Delay, s/veh	66.7			48.3			18.2			28.2		
Approach LOS	E			D			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	92.4		21.1	24.8	74.2		21.1				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		6.0				
Max Green Setting (Gmax), s	5.0	80.5		18.0	31.5	54.0		18.0				
Max Q Clear Time (g_c+I1), s	2.5	16.8		14.8	19.2	39.8		8.4				
Green Ext Time (p_c), s	0.0	10.7		0.3	1.1	8.6		0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	27.1											
HCM 6th LOS	C											

# Timings

2040 Background PM.syn

## 7: Marksheffel Rd & Space Village Ave

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	75	320	60	35	10	275	1400	35	15	1080	30
Future Volume (vph)	15	75	320	60	35	10	275	1400	35	15	1080	30
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	32.0	31.0	77.0	77.0	11.0	57.0	57.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%	26.7%	25.8%	64.2%	64.2%	9.2%	47.5%	47.5%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	12.7	12.7	12.7	12.7	12.7	12.7	95.3	90.5	90.5	77.7	71.9	71.9
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.11	0.11	0.79	0.75	0.75	0.65	0.60	0.60
v/c Ratio	0.11	0.42	0.77	0.47	0.20	0.04	0.65	0.57	0.03	0.06	0.55	0.03
Control Delay	46.7	54.9	19.3	60.0	48.5	0.3	14.6	9.3	0.1	10.9	39.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	54.9	19.3	60.0	48.5	0.3	14.6	9.3	0.1	10.9	39.4	0.9
LOS	D	D	B	E	D	A	B	A	A	B	D	A
Approach Delay		26.9			50.4			10.0			38.0	
Approach LOS		C			D			A			D	

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 22.7
Intersection Capacity Utilization 70.1%
Analysis Period (min) 15
Intersection LOS: C
ICU Level of Service C

### Splits and Phases: 7: Marksheffel Rd & Space Village Ave



























# HCM 6th Signalized Intersection Summary

## 7: Marksheffel Rd & Space Village Ave

2040 Background PM.syn

02/15/2021























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	75	320	60	35	10	275	1400	35	15	1080	30
Future Volume (veh/h)	15	75	320	60	35	10	275	1400	35	15	1080	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	16	81	247	65	38	11	296	1505	38	16	1161	32
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	273	326	276	204	326	276	426	2316	1033	224	2076	926
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.09	0.66	0.66	0.02	0.78	0.78
Sat Flow, veh/h	1345	1856	1572	1044	1856	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	16	81	247	65	38	11	296	1505	38	16	1161	32
Grp Sat Flow(s),veh/h/ln	1345	1856	1572	1044	1856	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	1.2	4.5	18.4	6.9	2.1	0.7	7.5	30.7	1.0	0.4	15.2	0.5
Cycle Q Clear(g_c), s	3.3	4.5	18.4	11.4	2.1	0.7	7.5	30.7	1.0	0.4	15.2	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	326	276	204	326	276	426	2316	1033	224	2076	926
V/C Ratio(X)	0.06	0.25	0.89	0.32	0.12	0.04	0.70	0.65	0.04	0.07	0.56	0.03
Avail Cap(c_a), veh/h	328	402	341	247	402	341	643	2316	1033	267	2076	926
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	42.6	48.4	47.5	41.6	41.0	10.3	12.3	7.2	11.5	7.0	5.4
Incr Delay (d2), s/veh	0.1	0.4	21.5	0.9	0.2	0.1	2.1	1.4	0.1	0.1	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.1	8.8	1.8	1.0	0.3	2.9	11.7	0.4	0.2	4.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	43.0	69.8	48.4	41.8	41.1	12.3	13.7	7.3	11.7	8.1	5.5
LnGrp LOS	D	D	E	D	D	D	B	B	A	B	A	A
Approach Vol, veh/h	344			114			1839			1209		
Approach Delay, s/veh	62.3			45.5			13.4			8.1		
Approach LOS	E			D			B			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	84.8		27.1	16.2	76.7		27.1				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	71.0		26.0	25.0	51.0		26.0				
Max Q Clear Time (g_c+I1), s	2.4	32.7		20.4	9.5	17.2		13.4				
Green Ext Time (p_c), s	0.0	16.8		0.7	0.8	11.0		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	17.4											
HCM 6th LOS	B											

# Timings

## 7: Marksheffel Rd & Space Village Ave

2040 Total AM.syn

02/15/2021

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Configurations											
Traffic Volume (vph)	50	115	180	75	135	70	425	1335	105	1520	
Future Volume (vph)	50	115	180	75	135	70	425	1335	105	1520	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		
Detector Phase	7	4	4	3	8	8	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	24.0	24.0	9.5	24.0	24.0	9.5	24.0	9.5	24.0	
Total Split (s)	9.8	24.0	24.0	9.8	24.0	24.0	34.4	71.4	14.8	51.8	
Total Split (%)	8.2%	20.0%	20.0%	8.2%	20.0%	20.0%	28.7%	59.5%	12.3%	43.2%	
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	3.5	4.5	3.5	4.5	
All-Red Time (s)	1.0	1.5	1.5	1.0	1.5	1.5	1.0	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	20.2	14.5	14.5	20.2	14.5	14.5	87.2	73.1	60.6	51.1	
Actuated g/C Ratio	0.17	0.12	0.12	0.17	0.12	0.12	0.73	0.61	0.50	0.43	
v/c Ratio	0.28	0.57	0.55	0.39	0.67	0.24	0.94	0.50	0.47	0.87	
Control Delay	41.2	59.8	12.5	44.8	65.5	1.8	55.7	25.2	21.0	53.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.2	59.8	12.5	44.8	65.5	1.8	55.7	25.2	21.0	53.1	
LOS	D	E	B	D	E	A	E	C	C	D	
Approach Delay		32.4			44.0			32.3		51.2	
Approach LOS		C			D			C		D	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 41.1

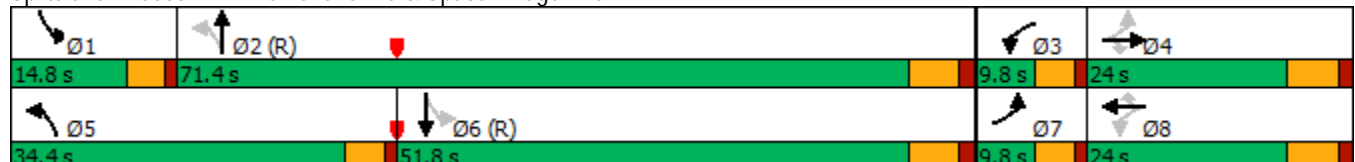
Intersection LOS: D

Intersection Capacity Utilization 85.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 7: Marksheffel Rd & Space Village Ave





























# HCM 6th Signalized Intersection Summary

2040 Total AM.syn

02/15/2021

## 7: Marksheffel Rd & Space Village Ave





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	115	180	75	135	70	425	1335	55	105	1520	150
Future Volume (veh/h)	50	115	180	75	135	70	425	1335	55	105	1520	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	54	125	98	82	147	38	462	1451	60	114	1652	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	148	168	143	166	181	153	480	3136	130	304	2144	211
Arrive On Green	0.04	0.09	0.09	0.04	0.10	0.10	0.45	1.00	1.00	0.02	0.15	0.15
Sat Flow, veh/h	1739	1826	1547	1739	1826	1547	1739	4909	203	1739	4613	454
Grp Volume(v), veh/h	54	125	98	82	147	38	462	982	529	114	1189	626
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1789	1739	1662	1744
Q Serve(g_s), s	3.3	8.0	7.4	5.1	9.5	2.7	24.3	0.0	0.0	4.0	41.2	41.3
Cycle Q Clear(g_c), s	3.3	8.0	7.4	5.1	9.5	2.7	24.3	0.0	0.0	4.0	41.2	41.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.26
Lane Grp Cap(c), veh/h	148	168	143	166	181	153	480	2123	1143	304	1545	811
V/C Ratio(X)	0.36	0.74	0.69	0.50	0.81	0.25	0.96	0.46	0.46	0.38	0.77	0.77
Avail Cap(c_a), veh/h	160	274	232	166	274	232	524	2123	1143	366	1545	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.3	53.1	52.8	47.3	53.0	49.9	22.7	0.0	0.0	15.6	44.6	44.7
Incr Delay (d2), s/veh	1.5	6.3	5.8	2.3	10.5	0.8	29.1	0.7	1.3	0.8	3.8	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.0	3.1	2.3	4.9	1.1	12.9	0.2	0.4	1.7	19.2	21.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	59.4	58.6	49.5	63.4	50.8	51.8	0.7	1.3	16.4	48.4	51.7
LnGrp LOS	D	E	E	D	E	D	D	A	A	B	D	D
Approach Vol, veh/h	277			267			1973			1929		
Approach Delay, s/veh	57.0			57.4			12.8			47.6		
Approach LOS	E			E			B			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	82.6	9.8	17.1	31.4	61.8	9.0	17.9				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	10.3	65.4	5.3	18.0	29.9	45.8	5.3	18.0				
Max Q Clear Time (g_c+I1), s	6.0	2.0	7.1	10.0	26.3	43.3	5.3	11.5				
Green Ext Time (p_c), s	0.1	16.8	0.0	0.6	0.6	2.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay	33.3											
HCM 6th LOS	C											

# Timings

## 7: Marksheffel Rd & Space Village Ave

2040 Total PM.syn

02/15/2021

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	130	195	370	180	225	50	330	2125	250	1735
Future Volume (vph)	130	195	370	180	225	50	330	2125	250	1735
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	24.0	9.5	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	10.0	24.0	24.0	12.4	26.4	26.4	27.0	62.6	21.0	56.6
Total Split (%)	8.3%	20.0%	20.0%	10.3%	22.0%	22.0%	22.5%	52.2%	17.5%	47.2%
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.5	1.5	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	24.0	17.0	17.0	28.8	19.4	19.4	78.4	57.3	66.8	51.6
Actuated g/C Ratio	0.20	0.14	0.14	0.24	0.16	0.16	0.65	0.48	0.56	0.43
v/c Ratio	0.78	0.81	0.93	0.92	0.81	0.15	0.96	0.99	0.95	0.88
Control Delay	68.1	73.0	48.8	83.5	69.9	0.9	51.9	63.5	55.0	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	73.0	48.8	83.5	69.9	0.9	51.9	63.5	55.0	28.9
LOS	E	E	D	F	E	A	D	E	D	C
Approach Delay		59.2			67.7			62.0		32.1
Approach LOS		E			E			E		C

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 51.6

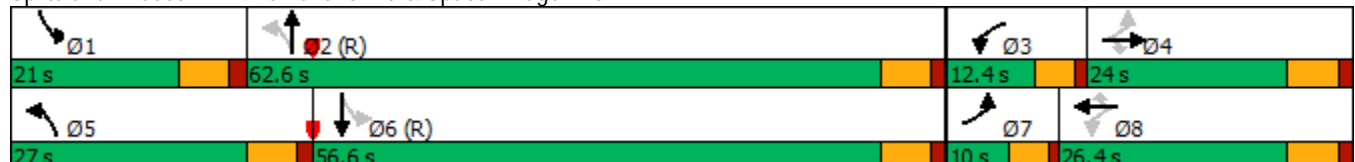
Intersection LOS: D

Intersection Capacity Utilization 95.8%

ICU Level of Service F

Analysis Period (min) 15

























Splits and Phases: 7: Marksheffel Rd & Space Village Ave



HCM 6th Signalized Intersection Summary  
7: Marksheffel Rd & Space Village Ave

2040 Total PM.syn

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	195	370	180	225	50	330	2125	85	250	1735	30
Future Volume (veh/h)	130	195	370	180	225	50	330	2125	85	250	1735	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	140	210	183	194	242	54	355	2285	91	269	1866	32
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	171	249	211	200	286	243	387	2443	97	290	2507	43
Arrive On Green	0.05	0.13	0.13	0.07	0.15	0.15	0.16	0.65	0.65	0.25	0.98	0.98
Sat Flow, veh/h	1767	1856	1572	1767	1856	1572	1767	4999	198	1767	5129	88
Grp Volume(v), veh/h	140	210	183	194	242	54	355	1540	836	269	1228	670
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1856	1572	1767	1689	1820	1767	1689	1840
Q Serve(g_s), s	5.5	13.3	13.7	7.9	15.2	3.6	12.2	48.7	49.6	12.8	3.6	3.6
Cycle Q Clear(g_c), s	5.5	13.3	13.7	7.9	15.2	3.6	12.2	48.7	49.6	12.8	3.6	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.05
Lane Grp Cap(c), veh/h	171	249	211	200	286	243	387	1650	889	290	1651	899
V/C Ratio(X)	0.82	0.84	0.87	0.97	0.84	0.22	0.92	0.93	0.94	0.93	0.74	0.74
Avail Cap(c_a), veh/h	171	278	236	200	315	267	478	1650	889	292	1651	899
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.7	50.7	50.9	47.8	49.3	44.4	16.1	19.3	19.4	30.2	0.7	0.7
Incr Delay (d2), s/veh	26.2	18.8	25.2	55.1	17.4	0.5	20.2	11.1	18.8	34.3	3.1	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	7.4	6.9	5.1	8.4	1.4	6.4	17.9	21.5	9.4	1.1	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.0	69.5	76.1	102.9	66.8	44.9	36.3	30.4	38.2	64.5	3.8	6.3
LnGrp LOS	E	E	E	F	E	D	D	C	D	E	A	A
Approach Vol, veh/h	533			490			2731			2167		
Approach Delay, s/veh	73.2			78.7			33.5			12.1		
Approach LOS	E			E			C			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.8	64.6	12.4	22.1	20.8	64.7	10.0	24.5				
Change Period (Y+Rc), s	6.0	6.0	4.5	6.0	6.0	6.0	4.5	6.0				
Max Green Setting (Gmax), s	15.0	56.6	7.9	18.0	21.0	50.6	5.5	20.4				
Max Q Clear Time (g_c+l1), s	14.8	51.6	9.9	15.7	14.2	5.6	7.5	17.2				
Green Ext Time (p_c), s	0.0	4.6	0.0	0.4	0.7	22.3	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	33.0											
HCM 6th LOS	C											

HCM 6th TWSC  
8: Meadowbrook Pkwy & Access

2026 Total AM.syn  
02/15/2021

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	5	0	10	30	0	15	5	385	10	5	430	5
Future Vol, veh/h	5	0	10	30	0	15	5	385	10	5	430	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	6	2	2	6	2
Mvmt Flow	5	0	11	33	0	16	5	418	11	5	467	5
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	922	919	470	919	916	424	472	0	0	429	0	0
Stage 1	480	480	-	434	434	-	-	-	-	-	-	-
Stage 2	442	439	-	485	482	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	251	271	594	252	272	630	1090	-	-	1130	-	-
Stage 1	567	554	-	600	581	-	-	-	-	-	-	-
Stage 2	594	578	-	563	553	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	243	269	594	246	270	630	1090	-	-	1130	-	-
Mov Cap-2 Maneuver	370	379	-	372	379	-	-	-	-	-	-	-
Stage 1	564	552	-	597	578	-	-	-	-	-	-	-
Stage 2	576	575	-	550	551	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	12.5		14.4			0.1			0.1			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1090	-	-	494	431	1130	-	-				
HCM Lane V/C Ratio	0.005	-	-	0.033	0.113	0.005	-	-				
HCM Control Delay (s)	8.3	-	-	12.5	14.4	8.2	-	-				
HCM Lane LOS	A	-	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0	-	-				

HCM 6th TWSC  
8: Meadowbrook Pkwy & Access

2026 Total PM.syn  
02/15/2021

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	5	0	10	20	0	10	10	330	30	15	550	5
Future Vol, veh/h	5	0	10	20	0	10	10	330	30	15	550	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	11	22	0	11	11	359	33	16	598	5
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1036	1047	601	1036	1033	376	603	0	0	392	0	0
Stage 1	633	633	-	398	398	-	-	-	-	-	-	-
Stage 2	403	414	-	638	635	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	210	228	500	210	232	670	975	-	-	1167	-	-
Stage 1	468	473	-	628	603	-	-	-	-	-	-	-
Stage 2	624	593	-	465	472	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	203	222	500	202	226	670	975	-	-	1167	-	-
Mov Cap-2 Maneuver	327	334	-	322	335	-	-	-	-	-	-	-
Stage 1	463	466	-	621	596	-	-	-	-	-	-	-
Stage 2	607	586	-	449	465	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	13.8		15.1			0.2			0.2			
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	975	-	-	425	389	1167	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.038	0.084	0.014	-	-				
HCM Control Delay (s)	8.7	-	-	13.8	15.1	8.1	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-				







HCM 6th TWSC  
8: Meadowbrook Pkwy & Access







2040 Total AM.syn  
02/15/2021

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↘		↙	↘	
Traffic Vol, veh/h	5	0	10	30	0	15	5	675	10	5	630	5
Future Vol, veh/h	5	0	10	30	0	15	5	675	10	5	630	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	6	2	2	6	2
Mvmt Flow	5	0	11	33	0	16	5	734	11	5	685	5
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1456	1453	688	1453	1450	740	690	0	0	745	0	0
Stage 1	698	698	-	750	750	-	-	-	-	-	-	-
Stage 2	758	755	-	703	700	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	108	130	446	108	131	417	905	-	-	863	-	-
Stage 1	431	442	-	403	419	-	-	-	-	-	-	-
Stage 2	399	417	-	428	441	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	103	128	446	104	129	417	905	-	-	863	-	-
Mov Cap-2 Maneuver	229	252	-	233	253	-	-	-	-	-	-	-
Stage 1	428	439	-	401	416	-	-	-	-	-	-	-
Stage 2	381	414	-	415	438	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	16.2		21			0.1			0.1			
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	905	-	-	339	273	863	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.048	0.179	0.006	-	-				
HCM Control Delay (s)	9	-	-	16.2	21	9.2	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.6	0	-	-				



Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	5	0	10	20	0	10	10	715	30	15	1035	5
Future Vol, veh/h	5	0	10	20	0	10	10	715	30	15	1035	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	11	22	0	11	11	777	33	16	1125	5
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1981	1992	1128	1981	1978	794	1130	0	0	810	0	0
Stage 1	1160	1160	-	816	816	-	-	-	-	-	-	-
Stage 2	821	832	-	1165	1162	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	46	61	249	46	62	388	618	-	-	816	-	-
Stage 1	238	270	-	371	391	-	-	-	-	-	-	-
Stage 2	369	384	-	237	269	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	43	59	249	43	60	388	618	-	-	816	-	-
Mov Cap-2 Maneuver	145	166	-	140	165	-	-	-	-	-	-	-
Stage 1	234	265	-	364	384	-	-	-	-	-	-	-
Stage 2	352	377	-	222	264	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	24.5		29.7			0.1			0.1			
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	618	-	-	201	178	816	-	-				
HCM Lane V/C Ratio	0.018	-	-	0.081	0.183	0.02	-	-				
HCM Control Delay (s)	10.9	-	-	24.5	29.7	9.5	-	-				
HCM Lane LOS	B	-	-	C	D	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.7	0.1	-	-				

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	90	90	50	775	1300	200
Future Vol, veh/h	90	90	50	775	1300	200
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	300	-	-	250
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	98	98	54	842	1413	217
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1942	707	1630	0	-	0
Stage 1	1413	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	*~ 80	378	394	-	-	-
Stage 1	*191	-	-	-	-	-
Stage 2	*720	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	*~ 69	378	394	-	-	-
Mov Cap-2 Maneuver	*139	-	-	-	-	-
Stage 1	*165	-	-	-	-	-
Stage 2	*720	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	47.3	0.9		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	394	-	139	378	-	-
HCM Lane V/C Ratio	0.138	-	0.704	0.259	-	-
HCM Control Delay (s)	15.6	-	76.7	17.8	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.5	-	4	1	-	-
Notes						
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						













Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	90	90	50	1365	1045	185
Future Vol, veh/h	90	90	50	1365	1045	185
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	300	-	-	250
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	98	98	54	1484	1136	201
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1986	568	1337	0	-	0
Stage 1	1136	-	-	-	-	-
Stage 2	850	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 53	466	512	-	-	-
Stage 1	268	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 47	466	512	-	-	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	240	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	38.5	0.5		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	512	-	154	466	-	-
HCM Lane V/C Ratio	0.106	-	0.635	0.21	-	-
HCM Control Delay (s)	12.9	-	62.1	14.8	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	3.5	0.8	-	-
Notes						
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

# Timings

2026 Total AM Improved.syn

## 9: Marksheffel Rd & CRN North Full Access

02/16/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	90	90	50	775	1300	200
Future Volume (vph)	90	90	50	775	1300	200
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	30.0	30.0	11.0	90.0	79.0	79.0
Total Split (%)	25.0%	25.0%	9.2%	75.0%	65.8%	65.8%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	12.0	12.0	97.5	97.5	88.0	88.0
Actuated g/C Ratio	0.10	0.10	0.81	0.81	0.73	0.73
v/c Ratio	0.55	0.40	0.18	0.30	0.56	0.18
Control Delay	62.7	14.2	6.6	5.7	25.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	14.2	6.6	5.7	25.0	8.9
LOS	E	B	A	A	C	A
Approach Delay	38.4			5.7	22.8	
Approach LOS	D			A	C	

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 18.3
Intersection Capacity Utilization 55.3%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service B













### Splits and Phases: 9: Marksheffel Rd & CRN North Full Access



HCM 6th Signalized Intersection Summary  
9: Marksheffel Rd & CRN North Full Access

2026 Total AM Improved.syn

02/16/2021













						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	90	50	775	1300	200
Future Volume (veh/h)	90	90	50	775	1300	200
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1826	1826	1870
Adj Flow Rate, veh/h	98	98	54	842	1413	217
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	5	5	2
Cap, veh/h	145	129	301	2884	2604	1190
Arrive On Green	0.08	0.08	0.07	1.00	0.75	0.75
Sat Flow, veh/h	1781	1585	1781	3561	3561	1585
Grp Volume(v), veh/h	98	98	54	842	1413	217
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1735	1735	1585
Q Serve(g_s), s	6.4	7.3	0.7	0.0	20.6	4.7
Cycle Q Clear(g_c), s	6.4	7.3	0.7	0.0	20.6	4.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	145	129	301	2884	2604	1190
V/C Ratio(X)	0.68	0.76	0.18	0.29	0.54	0.18
Avail Cap(c_a), veh/h	371	330	321	2884	2604	1190
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.96	0.96	1.00	1.00
Uniform Delay (d), s/veh	53.6	54.0	4.8	0.0	6.3	4.3
Incr Delay (d2), s/veh	5.5	8.9	0.3	0.2	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	6.6	0.2	0.1	6.8	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	59.1	62.9	5.1	0.2	7.1	4.7
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	196			896	1630	
Approach Delay, s/veh	61.0			0.5	6.8	
Approach LOS	E			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	105.3			14.7	9.7	95.6
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	84.5			25.0	5.5	73.5
Max Q Clear Time (g_c+I1), s	2.0			9.3	2.7	22.6
Green Ext Time (p_c), s	7.5			0.5	0.0	18.2
Intersection Summary						
HCM 6th Ctrl Delay			8.6			
HCM 6th LOS			A			

# Timings

2026 Total PM Improved.syn

## 9: Marksheffel Rd & CRN North Full Access

02/16/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	90	90	50	1365	1045	185
Future Volume (vph)	90	90	50	1365	1045	185
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	28.0	28.0	13.0	92.0	79.0	79.0
Total Split (%)	23.3%	23.3%	10.8%	76.7%	65.8%	65.8%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	12.0	12.0	97.5	97.5	88.0	88.0
Actuated g/C Ratio	0.10	0.10	0.81	0.81	0.73	0.73
v/c Ratio	0.56	0.40	0.14	0.52	0.44	0.17
Control Delay	62.9	14.2	3.0	4.0	15.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.9	14.2	3.0	4.0	15.9	6.7
LOS	E	B	A	A	B	A
Approach Delay	38.5			3.9	14.5	
Approach LOS	D			A	B	

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 10.8
Intersection Capacity Utilization 51.5%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service A

### Splits and Phases: 9: Marksheffel Rd & CRN North Full Access











# HCM 6th Signalized Intersection Summary 9: Marksheffel Rd & CRN North Full Access

2026 Total PM Improved.syn













02/16/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	90	50	1365	1045	185
Future Volume (veh/h)	90	90	50	1365	1045	185
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1870
Adj Flow Rate, veh/h	98	98	54	1484	1136	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	2
Cap, veh/h	144	128	381	2932	2648	1190
Arrive On Green	0.08	0.08	0.07	1.00	0.75	0.75
Sat Flow, veh/h	1781	1585	1781	3618	3618	1585
Grp Volume(v), veh/h	98	98	54	1484	1136	201
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1763	1763	1585
Q Serve(g_s), s	6.4	7.3	0.7	0.0	14.2	4.3
Cycle Q Clear(g_c), s	6.4	7.3	0.7	0.0	14.2	4.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	144	128	381	2932	2648	1190
V/C Ratio(X)	0.68	0.76	0.14	0.51	0.43	0.17
Avail Cap(c_a), veh/h	341	304	430	2932	2648	1190
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.85	0.85	1.00	1.00
Uniform Delay (d), s/veh	53.6	54.0	3.5	0.0	5.5	4.3
Incr Delay (d2), s/veh	5.5	9.0	0.1	0.5	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	6.6	0.2	0.2	4.7	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	59.1	63.1	3.7	0.5	6.0	4.6
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	196			1538	1337	
Approach Delay, s/veh	61.1			0.6	5.8	
Approach LOS	E			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	105.3			14.7	9.7	95.6
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	86.5			23.0	7.5	73.5
Max Q Clear Time (g_c+I1), s	2.0			9.3	2.7	16.2
Green Ext Time (p_c), s	19.6			0.5	0.0	12.9
Intersection Summary						
HCM 6th Ctrl Delay			6.7			
HCM 6th LOS			A			

# Timings 9: Marksheffel Rd & CRN North Full Access

2040 Total AM.syn  
02/16/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	100	100	55	1160	1675	220
Future Volume (vph)	100	100	55	1160	1675	220
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	28.0	28.0	14.0	92.0	78.0	78.0
Total Split (%)	23.3%	23.3%	11.7%	76.7%	65.0%	65.0%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	12.7	12.7	96.8	96.8	87.1	87.1
Actuated g/C Ratio	0.11	0.11	0.81	0.81	0.73	0.73
v/c Ratio	0.58	0.41	0.27	0.32	0.51	0.20
Control Delay	63.0	13.4	12.2	4.6	24.6	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	13.4	12.2	4.6	24.6	9.0
LOS	E	B	B	A	C	A
Approach Delay	38.2			5.0	22.8	
Approach LOS	D			A	C	

## Intersection Summary

Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
Natural Cycle: 65  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.58  
Intersection Signal Delay: 17.2  
Intersection LOS: B  
Intersection Capacity Utilization 55.4%  
ICU Level of Service B  
Analysis Period (min) 15

## Splits and Phases: 9: Marksheffel Rd & CRN North Full Access









HCM 6th Signalized Intersection Summary  
9: Marksheffel Rd & CRN North Full Access

2040 Total AM.syn

02/16/2021















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	100	55	1160	1675	220
Future Volume (veh/h)	100	100	55	1160	1675	220
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1826	1826	1870
Adj Flow Rate, veh/h	109	109	60	1261	1821	239
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	5	5	2
Cap, veh/h	157	140	275	4109	3701	1177
Arrive On Green	0.09	0.09	0.07	1.00	1.00	1.00
Sat Flow, veh/h	1781	1585	1781	5149	5149	1585
Grp Volume(v), veh/h	109	109	60	1261	1821	239
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1662	1662	1585
Q Serve(g_s), s	7.1	8.1	0.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.1	8.1	0.9	0.0	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	157	140	275	4109	3701	1177
V/C Ratio(X)	0.69	0.78	0.22	0.31	0.49	0.20
Avail Cap(c_a), veh/h	341	304	337	4109	3701	1177
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	0.96	0.96	0.45	0.45
Uniform Delay (d), s/veh	53.1	53.6	2.5	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.4	9.0	0.4	0.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	7.3	0.3	0.1	0.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	58.5	62.6	2.9	0.2	0.2	0.2
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	218			1321	2060	
Approach Delay, s/veh	60.6			0.3	0.2	
Approach LOS	E			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	104.4			15.6	9.8	94.6
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	86.5			23.0	8.5	72.5
Max Q Clear Time (g_c+l1), s	2.0			10.1	2.9	2.0
Green Ext Time (p_c), s	13.6			0.5	0.0	29.1
Intersection Summary						
HCM 6th Ctrl Delay			3.9			
HCM 6th LOS			A			

# Timings

2040 Total PM.syn

## 9: Marksheffel Rd & CRN North Full Access

02/16/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	100	100	80	2025	1760	310
Future Volume (vph)	100	100	80	2025	1760	310
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	24.0
Total Split (s)	34.0	34.0	15.0	86.0	71.0	71.0
Total Split (%)	28.3%	28.3%	12.5%	71.7%	59.2%	59.2%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	12.7	12.7	96.8	96.8	83.9	83.9
Actuated g/C Ratio	0.11	0.11	0.81	0.81	0.70	0.70
v/c Ratio	0.58	0.41	0.40	0.54	0.54	0.28
Control Delay	63.0	13.4	15.8	4.1	22.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	13.4	15.8	4.1	22.0	8.1
LOS	E	B	B	A	C	A
Approach Delay	38.2			4.5	19.9	
Approach LOS	D			A	B	

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 13.3
Intersection Capacity Utilization 57.3%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service B











### Splits and Phases: 9: Marksheffel Rd & CRN North Full Access



HCM 6th Signalized Intersection Summary  
9: Marksheffel Rd & CRN North Full Access







2040 Total PM.syn  
02/16/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				  	  	
Traffic Volume (veh/h)	100	100	80	2025	1760	310
Future Volume (veh/h)	100	100	80	2025	1760	310
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1870
Adj Flow Rate, veh/h	109	109	87	2201	1913	337
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	2
Cap, veh/h	158	141	254	4172	3741	1170
Arrive On Green	0.09	0.09	0.08	1.00	1.00	1.00
Sat Flow, veh/h	1781	1585	1781	5233	5233	1585
Grp Volume(v), veh/h	109	109	87	2201	1913	337
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1689	1689	1585
Q Serve(g_s), s	7.1	8.1	1.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.1	8.1	1.3	0.0	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	158	141	254	4172	3741	1170
V/C Ratio(X)	0.69	0.77	0.34	0.53	0.51	0.29
Avail Cap(c_a), veh/h	430	383	325	4172	3741	1170
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	0.83	0.83	0.54	0.54
Uniform Delay (d), s/veh	53.1	53.5	2.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.2	8.7	0.7	0.4	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	7.3	0.4	0.2	0.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	58.3	62.2	3.2	0.4	0.3	0.3
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	218			2288	2250	
Approach Delay, s/veh	60.3			0.5	0.3	
Approach LOS	E			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	104.3			15.7	10.2	94.1
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	80.5			29.0	9.5	65.5
Max Q Clear Time (g_c+l1), s	2.0			10.1	3.3	2.0
Green Ext Time (p_c), s	39.6			0.6	0.1	31.7
Intersection Summary						
HCM 6th Ctrl Delay			3.1			
HCM 6th LOS			A			

HCM 6th TWSC  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)







2026 Total AM.syn  
02/15/2021

Intersection						
Int Delay, s/veh	6.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	70	200	150	755	1290	100
Future Vol, veh/h	70	200	150	755	1290	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	300	-	-	250
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	76	217	163	821	1402	109
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2139	701	1511	0	-	0
Stage 1	1402	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	*~ 52	381	439	-	-	-
Stage 1	*193	-	-	-	-	-
Stage 2	*720	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	*~ 33	381	439	-	-	-
Mov Cap-2 Maneuver	*101	-	-	-	-	-
Stage 1	*121	-	-	-	-	-
Stage 2	*720	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	47.6	3		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	439	-	101	381	-	-
HCM Lane V/C Ratio	0.371	-	0.753	0.571	-	-
HCM Control Delay (s)	18	-	108.3	26.3	-	-
HCM Lane LOS	C	-	F	D	-	-
HCM 95th %tile Q(veh)	1.7	-	4	3.4	-	-
Notes						
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						



HCM 6th TWSC  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2026 Total PM.syn  
02/15/2021













Intersection							
Int Delay, s/veh	3.8						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	70	200	140	1345	1040	95	
Future Vol, veh/h	70	200	140	1345	1040	95	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	200	0	300	-	-	250	
Veh in Median Storage, #	1	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	3	3	2	
Mvmt Flow	76	217	152	1462	1130	103	
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	2165	565	1233	0	-	0	
Stage 1	1130	-	-	-	-	-	
Stage 2	1035	-	-	-	-	-	
Critical Hdwy	6.84	6.94	4.14	-	-	-	
Critical Hdwy Stg 1	5.84	-	-	-	-	-	
Critical Hdwy Stg 2	5.84	-	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.22	-	-	-	
Pot Cap-1 Maneuver	~ 40	468	561	-	-	-	
Stage 1	270	-	-	-	-	-	
Stage 2	303	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	~ 29	468	561	-	-	-	
Mov Cap-2 Maneuver	122	-	-	-	-	-	
Stage 1	197	-	-	-	-	-	
Stage 2	303	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s	33.4		1.3		0		
HCM LOS	D						
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	561		-	122	468	-	-
HCM Lane V/C Ratio	0.271		-	0.624	0.465	-	-
HCM Control Delay (s)	13.8		-	74.1	19.2	-	-
HCM Lane LOS	B		-	F	C	-	-
HCM 95th %tile Q(veh)	1.1		-	3.2	2.4	-	-
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon	

# Timings

2026 Total AM Improved.syn

## 10: Marksheffel Rd & Airl Lane (CRN South Full Access)

02/15/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	70	200	150	755	1290	100
Future Volume (vph)	70	200	150	755	1290	100
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.5	23.5	23.5	23.5
Total Split (s)	25.0	25.0	19.0	95.0	76.0	76.0
Total Split (%)	20.8%	20.8%	15.8%	79.2%	63.3%	63.3%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	10.5	10.5	99.0	99.0	85.1	85.1
Actuated g/C Ratio	0.09	0.09	0.82	0.82	0.71	0.71
v/c Ratio	0.49	0.65	0.51	0.29	0.58	0.09
Control Delay	62.2	17.1	16.0	2.7	4.7	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	17.1	16.0	2.7	4.7	0.7
LOS	E	B	B	A	A	A
Approach Delay	28.8			4.9	4.4	
Approach LOS	C			A	A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 7.1

Intersection LOS: A

Intersection Capacity Utilization 61.5%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 10: Marksheffel Rd & Airl Lane (CRN South Full Access)









HCM 6th Signalized Intersection Summary  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2026 Total AM Improved.syn

02/15/2021















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	200	150	755	1290	100
Future Volume (veh/h)	70	200	150	755	1290	100
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1826	1826	1870
Adj Flow Rate, veh/h	76	217	163	821	1402	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	5	5	2
Cap, veh/h	272	242	375	2636	2313	1057
Arrive On Green	0.15	0.15	0.09	1.00	1.00	1.00
Sat Flow, veh/h	1781	1585	1781	3561	3561	1585
Grp Volume(v), veh/h	76	217	163	821	1402	109
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1735	1735	1585
Q Serve(g_s), s	4.5	16.1	3.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.5	16.1	3.4	0.0	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	272	242	375	2636	2313	1057
V/C Ratio(X)	0.28	0.90	0.43	0.31	0.61	0.10
Avail Cap(c_a), veh/h	297	264	491	2636	2313	1057
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	0.86	0.86	0.76	0.76
Uniform Delay (d), s/veh	45.0	49.9	4.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.6	28.8	0.7	0.3	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	15.3	1.1	0.1	0.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.6	78.7	5.3	0.3	0.9	0.1
LnGrp LOS	D	E	A	A	A	A
Approach Vol, veh/h	293			984	1511	
Approach Delay, s/veh	70.1			1.1	0.9	
Approach LOS	E			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	96.7			23.3	11.2	85.5
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	89.5			20.0	13.5	70.5
Max Q Clear Time (g_c+l1), s	2.0			18.1	5.4	2.0
Green Ext Time (p_c), s	7.3			0.2	0.3	18.1
Intersection Summary						
HCM 6th Ctrl Delay			8.2			
HCM 6th LOS			A			

# Timings

2026 Total PM Improved.syn

## 10: Marksheffel Rd & Airl Lane (CRN South Full Access)

02/15/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	70	200	140	1345	1040	95
Future Volume (vph)	70	200	140	1345	1040	95
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.5	23.5	23.5	23.5
Total Split (s)	29.0	29.0	20.0	91.0	71.0	71.0
Total Split (%)	24.2%	24.2%	16.7%	75.8%	59.2%	59.2%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	10.5	10.5	99.0	99.0	85.9	85.9
Actuated g/C Ratio	0.09	0.09	0.82	0.82	0.72	0.72
v/c Ratio	0.49	0.65	0.38	0.51	0.45	0.09
Control Delay	62.2	15.9	6.9	10.6	5.7	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	15.9	6.9	10.6	5.7	1.5
LOS	E	B	A	B	A	A
Approach Delay	27.9			10.3	5.4	
Approach LOS	C			B	A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 10.0

Intersection LOS: A

Intersection Capacity Utilization 54.0%

ICU Level of Service A

Analysis Period (min) 15

### Splits and Phases: 10: Marksheffel Rd & Airl Lane (CRN South Full Access)









HCM 6th Signalized Intersection Summary  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2026 Total PM Improved.syn

02/15/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	200	140	1345	1040	95
Future Volume (veh/h)	70	200	140	1345	1040	95
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1870
Adj Flow Rate, veh/h	76	217	152	1462	1130	103
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	2
Cap, veh/h	276	245	440	2671	2355	1059
Arrive On Green	0.15	0.15	0.04	0.76	1.00	1.00
Sat Flow, veh/h	1781	1585	1781	3618	3618	1585
Grp Volume(v), veh/h	76	217	152	1462	1130	103
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1763	1763	1585
Q Serve(g_s), s	4.5	16.1	3.0	20.6	0.0	0.0
Cycle Q Clear(g_c), s	4.5	16.1	3.0	20.6	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	276	245	440	2671	2355	1059
V/C Ratio(X)	0.28	0.88	0.35	0.55	0.48	0.10
Avail Cap(c_a), veh/h	356	317	577	2671	2355	1059
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	0.51	0.51	0.86	0.86
Uniform Delay (d), s/veh	44.8	49.7	4.9	6.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	20.4	0.2	0.4	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	14.7	1.0	6.6	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.3	70.1	5.1	6.4	0.6	0.2
LnGrp LOS	D	E	A	A	A	A
Approach Vol, veh/h	293			1614	1233	
Approach Delay, s/veh	63.6			6.3	0.6	
Approach LOS	E			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	96.4			23.6	10.8	85.7
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	85.5			24.0	14.5	65.5
Max Q Clear Time (g_c+l1), s	22.6			18.1	5.0	2.0
Green Ext Time (p_c), s	18.3			0.5	0.3	12.2
Intersection Summary						
HCM 6th Ctrl Delay			9.4			
HCM 6th LOS			A			

# Timings

2040 Total AM.syn

## 10: Marksheffel Rd & Airl Lane (CRN South Full Access)

02/15/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	75	225	165	1145	1665	110
Future Volume (vph)	75	225	165	1145	1665	110
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.5	23.5	23.5	23.5
Total Split (s)	27.0	27.0	25.0	93.0	68.0	68.0
Total Split (%)	22.5%	22.5%	20.8%	77.5%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	10.9	10.9	98.6	98.6	81.1	81.1
Actuated g/C Ratio	0.09	0.09	0.82	0.82	0.68	0.68
v/c Ratio	0.51	0.67	0.61	0.31	0.54	0.11
Control Delay	62.4	15.7	22.1	7.6	3.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	15.7	22.1	7.6	3.1	0.5
LOS	E	B	C	A	A	A
Approach Delay	27.4			9.4	2.9	
Approach LOS	C			A	A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 7.6

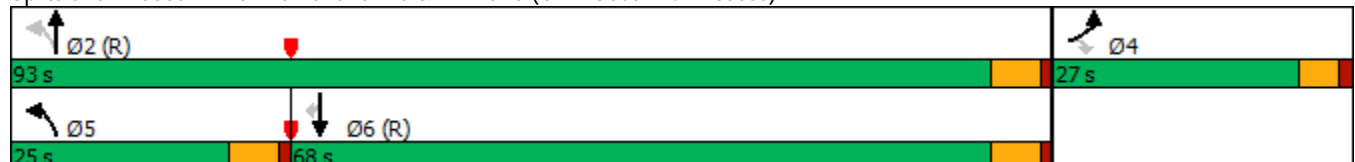
Intersection LOS: A

Intersection Capacity Utilization 58.8%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 10: Marksheffel Rd & Airl Lane (CRN South Full Access)





HCM 6th Signalized Intersection Summary  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2040 Total AM.syn

02/15/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↗↗↗	↗↗↗	↰
Traffic Volume (veh/h)	75	225	165	1145	1665	110
Future Volume (veh/h)	75	225	165	1145	1665	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1826	1826	1870
Adj Flow Rate, veh/h	82	245	179	1245	1810	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	5	5	2
Cap, veh/h	303	270	301	3700	3214	1022
Arrive On Green	0.17	0.17	0.05	0.74	1.00	1.00
Sat Flow, veh/h	1781	1585	1781	5149	5149	1585
Grp Volume(v), veh/h	82	245	179	1245	1810	120
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1662	1662	1585
Q Serve(g_s), s	4.8	18.2	3.8	10.3	0.0	0.0
Cycle Q Clear(g_c), s	4.8	18.2	3.8	10.3	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	303	270	301	3700	3214	1022
V/C Ratio(X)	0.27	0.91	0.59	0.34	0.56	0.12
Avail Cap(c_a), veh/h	327	291	498	3700	3214	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	0.81	0.81	0.80	0.80
Uniform Delay (d), s/veh	43.3	48.9	5.6	5.3	0.0	0.0
Incr Delay (d2), s/veh	0.5	29.2	1.5	0.2	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	17.1	1.4	3.2	0.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.8	78.1	7.1	5.5	0.6	0.2
LnGrp LOS	D	E	A	A	A	A
Approach Vol, veh/h	327			1424	1930	
Approach Delay, s/veh	69.5			5.7	0.6	
Approach LOS	E			A	A	
Timer - Assigned Phs	2		4		5	6
Phs Duration (G+Y+Rc), s	94.6		25.4		11.7	82.9
Change Period (Y+Rc), s	5.5		5.0		5.5	5.5
Max Green Setting (Gmax), s	87.5		22.0		19.5	62.5
Max Q Clear Time (g_c+l1), s	12.3		20.2		5.8	2.0
Green Ext Time (p_c), s	13.2		0.2		0.4	26.0
Intersection Summary						
HCM 6th Ctrl Delay			8.7			
HCM 6th LOS			A			

# Timings

2040 Total PM.syn

## 10: Marksheffel Rd & Airl Lane (CRN South Full Access)

02/15/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	75	225	235	2030	1705	155
Future Volume (vph)	75	225	235	2030	1705	155
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.5	23.5	23.5	23.5
Total Split (s)	23.0	23.0	30.0	97.0	67.0	67.0
Total Split (%)	19.2%	19.2%	25.0%	80.8%	55.8%	55.8%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	10.9	10.9	98.6	98.6	76.1	76.1
Actuated g/C Ratio	0.09	0.09	0.82	0.82	0.63	0.63
v/c Ratio	0.51	0.67	0.74	0.53	0.58	0.16
Control Delay	62.5	15.7	35.3	1.4	7.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	15.7	35.3	1.4	7.7	1.7
LOS	E	B	D	A	A	A
Approach Delay	27.4			4.9	7.2	
Approach LOS	C			A	A	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 7.4

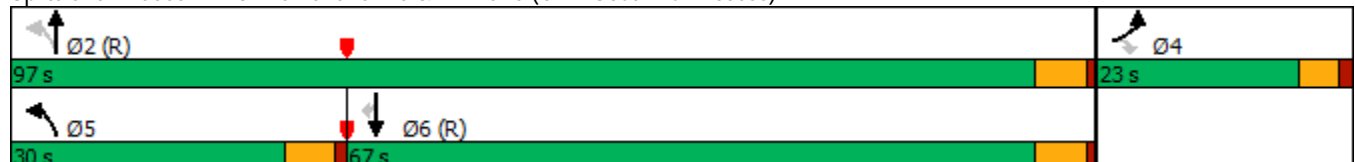
Intersection LOS: A

Intersection Capacity Utilization 63.5%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 10: Marksheffel Rd & Airl Lane (CRN South Full Access)



HCM 6th Signalized Intersection Summary  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2040 Total PM.syn

02/15/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	75	225	235	2030	1705	155
Future Volume (veh/h)	75	225	235	2030	1705	155
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1870
Adj Flow Rate, veh/h	82	245	255	2207	1853	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	2
Cap, veh/h	267	238	318	3863	3285	1028
Arrive On Green	0.15	0.15	0.09	1.00	1.00	1.00
Sat Flow, veh/h	1781	1585	1781	5233	5233	1585
Grp Volume(v), veh/h	82	245	255	2207	1853	168
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1689	1689	1585
Q Serve(g_s), s	4.9	18.0	5.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.9	18.0	5.5	0.0	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	267	238	318	3863	3285	1028
V/C Ratio(X)	0.31	1.03	0.80	0.57	0.56	0.16
Avail Cap(c_a), veh/h	267	238	560	3863	3285	1028
HCM Platoon Ratio	1.00	1.00	1.33	1.33	2.00	2.00
Upstream Filter(l)	1.00	1.00	0.21	0.21	0.77	0.77
Uniform Delay (d), s/veh	45.4	51.0	9.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.6	66.5	1.0	0.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	19.0	1.8	0.0	0.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.1	117.5	10.9	0.1	0.5	0.3
LnGrp LOS	D	F	B	A	A	A
Approach Vol, veh/h	327			2462	2021	
Approach Delay, s/veh	99.6			1.2	0.5	
Approach LOS	F			A	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		97.0		23.0	13.7	83.3
Change Period (Y+Rc), s		5.5		5.0	5.5	5.5
Max Green Setting (Gmax), s		91.5		18.0	24.5	61.5
Max Q Clear Time (g_c+l1), s		2.0		20.0	7.5	2.0
Green Ext Time (p_c), s		42.1		0.0	0.7	27.3
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			7.6			
HCM 6th LOS			A			

## Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	5	0	0	35	0	800	45	0	1285	35
Future Vol, veh/h	0	0	5	0	0	35	0	800	45	0	1285	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10	2	5	2	2	5	2
Mvmt Flow	0	0	5	0	0	38	0	870	49	0	1397	38

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	-	-	718	-	-	460	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.1	-	-	7.1	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.4	-	-	3.4	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	*541	0	0	527	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %			1					-	-		-	-
Mov Cap-1 Maneuver	-	-	*541	-	-	527	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	12.4	0	0
HCM LOS	B	B		





Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	-	-	541	527	-
HCM Lane V/C Ratio	-	-	0.01	0.072	-
HCM Control Delay (s)	-	-	11.7	12.4	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0	0.2	-

## Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

## Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	15	0	0	55	0	1300	40	0	980	10
Future Vol, veh/h	0	0	15	0	0	55	0	1300	40	0	980	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10	2	3	2	2	3	2
Mvmt Flow	0	0	16	0	0	60	0	1413	43	0	1065	11

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	-	-	538	-	-	728	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.1	-	-	7.1	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.4	-	-	3.4	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	*668	0	0	348	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %			1					-	-		-	-
Mov Cap-1 Maneuver	-	-	*668	-	-	348	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	17.5	0	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	-	-	668	348	-
HCM Lane V/C Ratio	-	-	0.024	0.172	-
HCM Control Delay (s)	-	-	10.5	17.5	-
HCM Lane LOS	-	-	B	C	-
HCM 95th %tile Q(veh)	-	-	0.1	0.6	-

## Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

## Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↑↑↑			↑↑↑	
Traffic Vol, veh/h	0	0	10	0	0	45	0	1390	60	0	1770	55
Future Vol, veh/h	0	0	10	0	0	45	0	1390	60	0	1770	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10	2	5	2	2	5	2
Mvmt Flow	0	0	11	0	0	49	0	1511	65	0	1924	60

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	992	-	-	788	-	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.3	-	-	7.3	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	4	-	-	4	-	-
Pot Cap-1 Maneuver	0	0	*482	0	0	*590	0	-
Stage 1	0	0	-	0	0	-	0	-
Stage 2	0	0	-	0	0	-	0	-
Platoon blocked, %			1			1	-	-
Mov Cap-1 Maneuver	-	-	*482	-	-	*590	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.6	11.7	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	-	-	482 590	-	-
HCM Lane V/C Ratio	-	-	0.023 0.083	-	-
HCM Control Delay (s)	-	-	12.6 11.7	-	-
HCM Lane LOS	-	-	B B	-	-
HCM 95th %tile Q(veh)	-	-	0.1 0.3	-	-





## Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon



## Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	25	0	0	205	0	2150	150	0	1985	15
Future Vol, veh/h	0	0	25	0	0	205	0	2150	150	0	1985	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10	2	3	2	2	3	2
Mvmt Flow	0	0	27	0	0	223	0	2337	163	0	2158	16

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	-	-	1087	-	-	1250	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.3	-	-	7.3	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	4	-	-	4	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	*439	0	0	*395	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %			1			1		-	-		-	-
Mov Cap-1 Maneuver	-	-	*439	-	-	*395	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	25.3	0	0
HCM LOS	B	D		






Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	-	-	439 395	-	-
HCM Lane V/C Ratio	-	-	0.062 0.564	-	-
HCM Control Delay (s)	-	-	13.7 25.3	-	-
HCM Lane LOS	-	-	B D	-	-
HCM 95th %tile Q(veh)	-	-	0.2 3.4	-	-

## Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection






Int Delay, s/veh 0.6






Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	235	505	20	10	10
Future Vol, veh/h	25	235	505	20	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	0
Veh in Median Storage, #	-	1	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	5	5	10	10	10
Mvmt Flow	27	255	549	22	11	11






Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	571	0	0 869 560
Stage 1	-	-	- 560 -
Stage 2	-	-	- 309 -
Critical Hdwy	4.2	-	- 6.5 6.3
Critical Hdwy Stg 1	-	-	- 5.5 -
Critical Hdwy Stg 2	-	-	- 5.5 -
Follow-up Hdwy	2.29	-	- 3.59 3.39
Pot Cap-1 Maneuver	963	-	- 312 513
Stage 1	-	-	- 556 -
Stage 2	-	-	- 727 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	963	-	- 303 513
Mov Cap-2 Maneuver	-	-	- 415 -
Stage 1	-	-	- 540 -
Stage 2	-	-	- 727 -

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	963	-	-	-	415	513
HCM Lane V/C Ratio	0.028	-	-	-	0.026	0.021
HCM Control Delay (s)	8.8	-	-	-	13.9	12.2
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.1

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	380	335	5	30	30
Future Vol, veh/h	5	380	335	5	30	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	0
Veh in Median Storage, #	-	1	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	3	3	10	10	10
Mvmt Flow	5	413	364	5	33	33
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	369	0	-	0	790	367
Stage 1	-	-	-	-	367	-
Stage 2	-	-	-	-	423	-
Critical Hdwy	4.2	-	-	-	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	2.29	-	-	-	3.59	3.39
Pot Cap-1 Maneuver	1147	-	-	-	348	661
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1147	-	-	-	347	661
Mov Cap-2 Maneuver	-	-	-	-	460	-
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	644	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		12		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1147	-	-	-	460	661
HCM Lane V/C Ratio	0.005	-	-	-	0.071	0.049
HCM Control Delay (s)	8.2	-	-	-	13.4	10.7
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.2

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	325	675	30	15	15
Future Vol, veh/h	35	325	675	30	15	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	0
Veh in Median Storage, #	-	1	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	5	5	10	10	10
Mvmt Flow	38	353	734	33	16	16
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	767	0	-	0	1180	751
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	429	-
Critical Hdwy	4.2	-	-	-	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	2.29	-	-	-	3.59	3.39
Pot Cap-1 Maneuver	*729	-	-	-	*157	*492
Stage 1	-	-	-	-	*465	-
Stage 2	-	-	-	-	*640	-
Platoon blocked, %	1	-	-	-	1	1
Mov Cap-1 Maneuver	*729	-	-	-	*149	*492
Mov Cap-2 Maneuver	-	-	-	-	*303	-
Stage 1	-	-	-	-	*441	-
Stage 2	-	-	-	-	*640	-
Approach	EB	WB		SB		
HCM Control Delay, s	1	0		15.1		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	* 729	-	-	-	303	492
HCM Lane V/C Ratio	0.052	-	-	-	0.054	0.033
HCM Control Delay (s)	10.2	-	-	-	17.6	12.6
HCM Lane LOS	B	-	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2	0.1
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	640	575	10	50	50
Future Vol, veh/h	10	640	575	10	50	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	0
Veh in Median Storage, #	-	1	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	3	3	10	10	10
Mvmt Flow	11	696	625	11	54	54

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	636	0	0 1349 631
Stage 1	-	-	- 631 -
Stage 2	-	-	- 718 -
Critical Hdwy	4.2	-	- 6.5 6.3
Critical Hdwy Stg 1	-	-	- 5.5 -
Critical Hdwy Stg 2	-	-	- 5.5 -
Follow-up Hdwy	2.29	-	- 3.59 3.39
Pot Cap-1 Maneuver	*880	-	- *106 *594
Stage 1	-	-	- *561 -
Stage 2	-	-	- *469 -
Platoon blocked, %	1	-	- 1 1
Mov Cap-1 Maneuver	*880	-	- *105 *594
Mov Cap-2 Maneuver	-	-	- *279 -
Stage 1	-	-	- *554 -
Stage 2	-	-	- *469 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	* 880	-	-	-	279	594
HCM Lane V/C Ratio	0.012	-	-	-	0.195	0.091
HCM Control Delay (s)	9.1	-	-	-	21	11.7
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7	0.3

Notes			
-: Volume exceeds capacity	\$. Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection				
Intersection Delay, s/veh	3.8			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	190	124	21	43
Demand Flow Rate, veh/h	197	130	21	44
Vehicles Circulating, veh/h	10	82	191	141
Vehicles Exiting, veh/h	175	130	16	71
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.9	3.8	3.3	3.4
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	197	130	21	44
Cap Entry Lane, veh/h	1366	1269	1136	1195
Entry HV Adj Factor	0.966	0.956	1.000	0.977
Flow Entry, veh/h	190	124	21	43
Cap Entry, veh/h	1319	1213	1136	1168
V/C Ratio	0.144	0.102	0.018	0.037
Control Delay, s/veh	3.9	3.8	3.3	3.4
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0



Intersection				
Intersection Delay, s/veh	4.0			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	245	124	27	65
Demand Flow Rate, veh/h	252	127	27	66
Vehicles Circulating, veh/h	10	83	229	144
Vehicles Exiting, veh/h	200	173	33	66
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.2	3.7	3.5	3.5
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	252	127	27	66
Cap Entry Lane, veh/h	1366	1268	1092	1191
Entry HV Adj Factor	0.973	0.973	1.000	0.985
Flow Entry, veh/h	245	124	27	65
Cap Entry, veh/h	1329	1234	1092	1173
V/C Ratio	0.185	0.100	0.025	0.055
Control Delay, s/veh	4.2	3.7	3.5	3.5
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0

Intersection				
Intersection Delay, s/veh	4.6			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	294	207	76	54
Demand Flow Rate, veh/h	306	216	77	55
Vehicles Circulating, veh/h	16	150	277	266
Vehicles Exiting, veh/h	305	204	45	100
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.7	4.8	4.2	3.9
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	306	216	77	55
Cap Entry Lane, veh/h	1358	1184	1040	1052
Entry HV Adj Factor	0.962	0.957	0.987	0.982
Flow Entry, veh/h	294	207	76	54
Cap Entry, veh/h	1306	1133	1027	1033
V/C Ratio	0.225	0.182	0.074	0.052
Control Delay, s/veh	4.7	4.8	4.2	3.9
LOS	A	A	A	A
95th %tile Queue, veh	1	1	0	0

Intersection				
Intersection Delay, s/veh	6.5			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	581	240	92	228
Demand Flow Rate, veh/h	596	246	94	232
Vehicles Circulating, veh/h	27	311	507	302
Vehicles Exiting, veh/h	507	290	116	255
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.1	6.1	5.6	5.8
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	596	246	94	232
Cap Entry Lane, veh/h	1342	1005	823	1014
Entry HV Adj Factor	0.975	0.976	0.979	0.983
Flow Entry, veh/h	581	240	92	228
Cap Entry, veh/h	1309	981	805	997
V/C Ratio	0.444	0.245	0.114	0.229
Control Delay, s/veh	7.1	6.1	5.6	5.8
LOS	A	A	A	A
95th %tile Queue, veh	2	1	0	1




Intersection				
Intersection Delay, s/veh	3.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	119	59	16	82
Demand Flow Rate, veh/h	124	61	16	83
Vehicles Circulating, veh/h	16	33	130	67
Vehicles Exiting, veh/h	134	113	10	27
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.5	3.2	3.1	3.3
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	124	61	16	83
Cap Entry Lane, veh/h	1358	1334	1209	1289
Entry HV Adj Factor	0.963	0.960	1.000	0.988
Flow Entry, veh/h	119	59	16	82
Cap Entry, veh/h	1307	1281	1209	1273
V/C Ratio	0.091	0.046	0.013	0.064
Control Delay, s/veh	3.5	3.2	3.1	3.3
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Intersection				
Intersection Delay, s/veh	3.5			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	164	92	16	48
Demand Flow Rate, veh/h	167	94	16	49
Vehicles Circulating, veh/h	10	83	161	94
Vehicles Exiting, veh/h	133	94	16	83
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.7	3.5	3.2	3.2
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	167	94	16	49
Cap Entry Lane, veh/h	1366	1268	1171	1254
Entry HV Adj Factor	0.979	0.976	1.000	0.980
Flow Entry, veh/h	164	92	16	48
Cap Entry, veh/h	1338	1237	1171	1228
V/C Ratio	0.122	0.074	0.014	0.039
Control Delay, s/veh	3.7	3.5	3.2	3.2
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

<b>Intersection</b>				
Intersection Delay, s/veh	3.8			
Intersection LOS	A			
<b>Approach</b>	<b>EB</b>	<b>WB</b>	<b>NB</b>	<b>SB</b>
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	190	87	43	125
Demand Flow Rate, veh/h	198	91	44	127
Vehicles Circulating, veh/h	27	67	198	114
Vehicles Exiting, veh/h	214	175	27	44
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.0	3.5	3.6	3.8
Approach LOS	A	A	A	A
<b>Lane</b>	<b>Left</b>	<b>Left</b>	<b>Left</b>	<b>Left</b>
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	198	91	44	127
Cap Entry Lane, veh/h	1342	1289	1128	1228
Entry HV Adj Factor	0.961	0.961	0.977	0.984
Flow Entry, veh/h	190	87	43	125
Cap Entry, veh/h	1289	1238	1102	1209
V/C Ratio	0.148	0.071	0.039	0.103
Control Delay, s/veh	4.0	3.5	3.6	3.8
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0






Intersection				
Intersection Delay, s/veh	4.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	277	190	49	59
Demand Flow Rate, veh/h	284	195	50	60
Vehicles Circulating, veh/h	27	139	250	213
Vehicles Exiting, veh/h	246	161	61	121
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.5	4.5	3.8	3.8
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	284	195	50	60
Cap Entry Lane, veh/h	1342	1197	1069	1110
Entry HV Adj Factor	0.975	0.977	0.980	0.983
Flow Entry, veh/h	277	190	49	59
Cap Entry, veh/h	1309	1169	1048	1092
V/C Ratio	0.212	0.163	0.047	0.054
Control Delay, s/veh	4.5	4.5	3.8	3.8
LOS	A	A	A	A
95th %tile Queue, veh	1	1	0	0

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	1100	5	0	1265
Future Vol, veh/h	0	20	1100	5	0	1265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	22	1196	5	0	1375
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	601	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	443	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	443	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.5	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)	-	443		-		
HCM Lane V/C Ratio	-	0.049		-		
HCM Control Delay (s)	-	13.5		-		
HCM Lane LOS	-	B		-		
HCM 95th %tile Q(veh)	-	0.2		-		

Intersection

Int Delay, s/veh 0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	1525	5	0	1225
Future Vol, veh/h	0	20	1525	5	0	1225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	22	1658	5	0	1332

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	832	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	312	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	312	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.4	0	0
HCM LOS	C		





Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	312	-
HCM Lane V/C Ratio	-	0.07	-
HCM Control Delay (s)	-	17.4	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.2	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗ ↘ ↘ ↘				↗ ↘ ↘ ↘
Traffic Vol, veh/h	0	70	1745	10	0	1765
Future Vol, veh/h	0	70	1745	10	0	1765
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	76	1897	11	0	1918
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	954	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*514	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-	-	-
Mov Cap-1 Maneuver	-	*514	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.2	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)	-	514		-		
HCM Lane V/C Ratio	-	0.148		-		
HCM Control Delay (s)	-	13.2		-		
HCM Lane LOS	-	B		-		
HCM 95th %tile Q(veh)	-	0.5		-		
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↑↑↑	↘		↑↑↑
Traffic Vol, veh/h	0	85	2455	20	0	2275
Future Vol, veh/h	0	85	2455	20	0	2275
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	92	2668	22	0	2473
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	1345	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*337	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-	-	-
Mov Cap-1 Maneuver	-	*337	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	19.7	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)		-	-	337	-	
HCM Lane V/C Ratio		-	-	0.274	-	
HCM Control Delay (s)		-	-	19.7	-	
HCM Lane LOS		-	-	C	-	
HCM 95th %tile Q(veh)		-	-	1.1	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection

Int Delay, s/veh 0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	1070	10	35	1235
Future Vol, veh/h	0	30	1070	10	35	1235
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	33	1163	11	38	1342

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	587	0 0 1174 0
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -
Critical Hdwy	-	6.94	- - 4.14 -
Critical Hdwy Stg 1	-	-	- - - -
Critical Hdwy Stg 2	-	-	- - - -
Follow-up Hdwy	-	3.32	- - 2.22 -
Pot Cap-1 Maneuver	0	453	- - 591 -
Stage 1	0	-	- - - -
Stage 2	0	-	- - - -
Platoon blocked, %		-	- - - -
Mov Cap-1 Maneuver	-	453	- - 591 -
Mov Cap-2 Maneuver	-	-	- - - -
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -





Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 453	591	-
HCM Lane V/C Ratio	-	- 0.072	0.064	-
HCM Control Delay (s)	-	- 13.6	11.5	-
HCM Lane LOS	-	- B	B	-
HCM 95th %tile Q(veh)	-	- 0.2	0.2	-



Intersection

Int Delay, s/veh 0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1495	10	70	1155
Future Vol, veh/h	0	35	1495	10	70	1155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	38	1625	11	76	1255

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	818	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	319	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	319	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.8	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	319	392
HCM Lane V/C Ratio	-	-	0.119	0.194
HCM Control Delay (s)	-	-	17.8	16.4
HCM Lane LOS	-	-	C	C
HCM 95th %tile Q(veh)	-	-	0.4	0.7

Intersection

Int Delay, s/veh 0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗ ↘ ↘ ↘			↗ ↘ ↘ ↘	
Traffic Vol, veh/h	0	105	1650	25	105	1660
Future Vol, veh/h	0	105	1650	25	105	1660
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	114	1793	27	114	1804

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	910	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.14	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.92	-
Pot Cap-1 Maneuver	0	*536	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	-
Mov Cap-1 Maneuver	-	*536	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-




Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	536	* 673
HCM Lane V/C Ratio	-	-	0.213	0.17
HCM Control Delay (s)	-	-	13.5	11.4
HCM Lane LOS	-	-	B	B
HCM 95th %tile Q(veh)	-	-	0.8	0.6

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	2.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↑↑↑↗		↘	↑↑↑↑
Traffic Vol, veh/h	0	135	2335	30	275	2010
Future Vol, veh/h	0	135	2335	30	275	2010
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	147	2538	33	299	2185
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	1286	0	0	2571	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	5.34	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	0	*359	-	-	*452	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %		1	-	-	1	-
Mov Cap-1 Maneuver	-	*359	-	-	*452	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	21.8	0		3.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	359	* 452	-	
HCM Lane V/C Ratio	-	-	0.409	0.661	-	
HCM Control Delay (s)	-	-	21.8	27.2	-	
HCM Lane LOS	-	-	C	D	-	
HCM 95th %tile Q(veh)	-	-	1.9	4.7	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	40	1035	10	0	1235
Future Vol, veh/h	0	40	1035	10	0	1235
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	43	1125	11	0	1342




Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	568	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	466	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	466	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	466
HCM Lane V/C Ratio	-	-	0.093
HCM Control Delay (s)	-	-	13.5
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.3

Intersection

Int Delay, s/veh 0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	45	1460	15	0	1155
Future Vol, veh/h	0	45	1460	15	0	1155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	49	1587	16	0	1255

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	802	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	327	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	327	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-





Approach	WB	NB	SB
HCM Control Delay, s	17.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	327
HCM Lane V/C Ratio	-	-	0.15
HCM Control Delay (s)	-	-	17.9
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.5

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↑↑↑	↘		↑↑↑
Traffic Vol, veh/h	0	140	1525	25	0	1660
Future Vol, veh/h	0	140	1525	25	0	1660
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	152	1658	27	0	1804
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	843	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*558	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*558	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)		-	-	558	-	
HCM Lane V/C Ratio		-	-	0.273	-	
HCM Control Delay (s)		-	-	13.9	-	
HCM Lane LOS		-	-	B	-	
HCM 95th %tile Q(veh)		-	-	1.1	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon







Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↑↑↑	↘		↑↑↑
Traffic Vol, veh/h	0	175	2200	50	0	2010
Future Vol, veh/h	0	175	2200	50	0	2010
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	190	2391	54	0	2185
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	1223	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*403	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*403	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	21.7	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)		-	-	403	-	
HCM Lane V/C Ratio		-	-	0.472	-	
HCM Control Delay (s)		-	-	21.7	-	
HCM Lane LOS		-	-	C	-	
HCM 95th %tile Q(veh)		-	-	2.5	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	30	1015	10	40	1200
Future Vol, veh/h	30	30	1015	10	40	1200
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	33	33	1103	11	43	1304
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1847	557	0	0	1114	0
Stage 1	1109	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	66	474	-	-	623	-
Stage 1	277	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	61	474	-	-	623	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	277	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	23.6	0		0.4		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	258	623	-	
HCM Lane V/C Ratio	-	-	0.253	0.07	-	
HCM Control Delay (s)	-	-	23.6	11.2	-	
HCM Lane LOS	-	-	C	B	-	
HCM 95th %tile Q(veh)	-	-	1	0.2	-	

Intersection

Int Delay, s/veh 1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	35	1440	15	80	1075
Future Vol, veh/h	35	35	1440	15	80	1075
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	38	38	1565	16	87	1168

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	2331	791	0
Stage 1	1573	-	-
Stage 2	758	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	~ 31	332	-
Stage 1	156	-	-
Stage 2	423	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	~ 24	332	-
Mov Cap-2 Maneuver	106	-	-
Stage 1	156	-	-
Stage 2	334	-	-

Approach	WB	NB	SB
HCM Control Delay, s	45.9	0	1.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	161	412
HCM Lane V/C Ratio	-	-	0.473	0.211
HCM Control Delay (s)	-	-	45.9	16.1
HCM Lane LOS	-	-	E	C
HCM 95th %tile Q(veh)	-	-	2.2	0.8

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# Timings

## 18: Marksheffel Rd & RR-SE Full Access #1

2040 Total AM.syn

02/15/2021

	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↙↘	↑↑↑	↙	↑↑↑
Traffic Volume (vph)	95	1450	120	1550
Future Volume (vph)	95	1450	120	1550
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	8	2	1	6
Permitted Phases			6	
Detector Phase	8	2	1	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5
Total Split (s)	32.0	67.0	21.0	88.0
Total Split (%)	26.7%	55.8%	17.5%	73.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max
Act Effect Green (s)	17.3	80.8	93.7	93.7
Actuated g/C Ratio	0.14	0.67	0.78	0.78
v/c Ratio	0.74	0.48	0.48	0.44
Control Delay	55.2	10.4	16.2	16.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	55.2	10.4	16.2	16.1
LOS	E	B	B	B
Approach Delay	55.2	10.4		16.1
Approach LOS	E	B		B

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 15.8

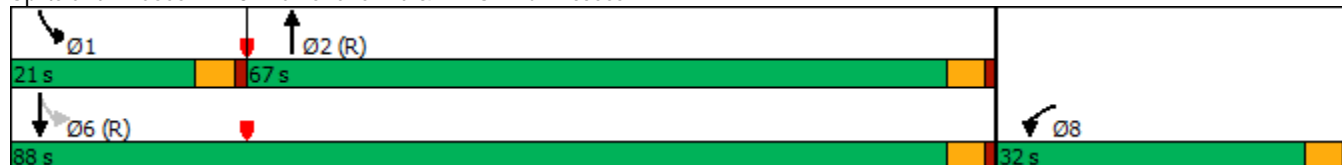
Intersection LOS: B

Intersection Capacity Utilization 57.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 18: Marksheffel Rd & RR-SE Full Access #1



HCM 6th Signalized Intersection Summary  
18: Marksheffel Rd & RR-SE Full Access #1

2040 Total AM.syn  
02/15/2021

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	↑↑↑		W	↑↑↑
Traffic Volume (veh/h)	95	95	1450	25	120	1550
Future Volume (veh/h)	95	95	1450	25	120	1550
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1826	1826	1870	1826
Adj Flow Rate, veh/h	103	103	1576	27	130	1685
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	5	5	2	5
Cap, veh/h	118	118	3560	61	357	3907
Arrive On Green	0.14	0.14	1.00	1.00	0.08	1.00
Sat Flow, veh/h	835	835	5211	86	1781	5149
Grp Volume(v), veh/h	207	0	1038	565	130	1685
Grp Sat Flow(s),veh/h/ln	1678	0	1662	1810	1781	1662
Q Serve(g_s), s	14.5	0.0	0.0	0.0	2.3	0.0
Cycle Q Clear(g_c), s	14.5	0.0	0.0	0.0	2.3	0.0
Prop In Lane	0.50	0.50		0.05	1.00	
Lane Grp Cap(c), veh/h	237	0	2344	1277	357	3907
V/C Ratio(X)	0.87	0.00	0.44	0.44	0.36	0.43
Avail Cap(c_a), veh/h	385	0	2344	1277	528	3907
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	0.0	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh	12.0	0.0	0.6	1.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	0.0	0.2	0.4	0.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	62.5	0.0	0.6	1.1	4.1	0.3
LnGrp LOS	E	A	A	A	A	A
Approach Vol, veh/h	207		1603			1815
Approach Delay, s/veh	62.5		0.8			0.6
Approach LOS	E		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.4	89.1			98.6	21.4
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	16.5	62.5			83.5	27.5
Max Q Clear Time (g_c+l1), s	4.3	2.0			2.0	16.5
Green Ext Time (p_c), s	0.2	18.4			23.2	0.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			4.2			
HCM 6th LOS			A			
<b>Notes</b>						
User approved volume balancing among the lanes for turning movement.						

# Timings

## 18: Marksheffel Rd & RR-SE Full Access #1

2040 Total PM.syn

02/15/2021

	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↙↘	↑↑↑	↙	↑↑↑
Traffic Volume (vph)	120	2130	305	1710
Future Volume (vph)	120	2130	305	1710
Turn Type	Prot	NA	Prot	NA
Protected Phases	8	2	1	6
Permitted Phases				
Detector Phase	8	2	1	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5
Total Split (s)	24.0	66.0	30.0	96.0
Total Split (%)	20.0%	55.0%	25.0%	80.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max
Act Effect Green (s)	18.6	63.3	24.6	92.4
Actuated g/C Ratio	0.16	0.53	0.20	0.77
v/c Ratio	0.89	0.89	0.91	0.48
Control Delay	73.5	32.5	50.5	14.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	73.5	32.5	50.5	14.1
LOS	E	C	D	B
Approach Delay	73.5	32.5		19.6
Approach LOS	E	C		B

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 28.9

Intersection LOS: C

Intersection Capacity Utilization 84.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 18: Marksheffel Rd & RR-SE Full Access #1









# HCM 6th Signalized Intersection Summary




## 18: Marksheffel Rd & RR-SE Full Access #1

2040 Total PM.syn

02/15/2021

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		↑↑↑		↘	↑↑↑
Traffic Volume (veh/h)	120	120	2130	50	305	1710
Future Volume (veh/h)	120	120	2130	50	305	1710
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1856	1856	1870	1856
Adj Flow Rate, veh/h	130	130	2315	54	332	1859
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	3	3	2	3
Cap, veh/h	136	136	2668	62	358	3863
Arrive On Green	0.16	0.16	1.00	1.00	0.20	0.76
Sat Flow, veh/h	836	836	5260	118	1781	5233
Grp Volume(v), veh/h	261	0	1533	836	332	1859
Grp Sat Flow(s),veh/h/ln	1678	0	1689	1834	1781	1689
Q Serve(g_s), s	18.5	0.0	0.0	0.0	22.0	16.5
Cycle Q Clear(g_c), s	18.5	0.0	0.0	0.0	22.0	16.5
Prop In Lane	0.50	0.50		0.06	1.00	
Lane Grp Cap(c), veh/h	273	0	1769	961	358	3863
V/C Ratio(X)	0.96	0.00	0.87	0.87	0.93	0.48
Avail Cap(c_a), veh/h	273	0	1769	961	379	3863
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.8	0.0	0.0	0.0	47.1	5.3
Incr Delay (d2), s/veh	42.7	0.0	6.0	10.6	27.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	0.0	1.5	2.8	12.4	5.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	92.6	0.0	6.0	10.6	74.8	5.8
LnGrp LOS	F	A	A	B	E	A
Approach Vol, veh/h	261		2369			2191
Approach Delay, s/veh	92.6		7.6			16.2
Approach LOS	F		A			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	28.6	67.4			96.0	24.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	25.5	61.5			91.5	19.5
Max Q Clear Time (g_c+l1), s	24.0	2.0			18.5	20.5
Green Ext Time (p_c), s	0.2	36.7			27.5	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			16.1			
HCM 6th LOS			B			
<b>Notes</b>						
User approved volume balancing among the lanes for turning movement.						

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	1005	10	0	1225
Future Vol, veh/h	0	20	1005	10	0	1225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	22	1092	11	0	1332
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	552	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	477	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	477	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)	-	477		-		
HCM Lane V/C Ratio	-	0.046		-		
HCM Control Delay (s)	-	12.9		-		
HCM Lane LOS	-	B		-		
HCM 95th %tile Q(veh)	-	0.1		-		

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	1430	15	0	1105
Future Vol, veh/h	0	20	1430	15	0	1105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	22	1554	16	0	1201
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	785	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	336	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	336	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.5	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)	-	- 336		-		
HCM Lane V/C Ratio	-	- 0.065		-		
HCM Control Delay (s)	-	- 16.5		-		
HCM Lane LOS	-	- C		-		
HCM 95th %tile Q(veh)	-	- 0.2		-		

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗ ↘ ↘ ↘				↗ ↘ ↘ ↘
Traffic Vol, veh/h	0	70	1405	25	0	1640
Future Vol, veh/h	0	70	1405	25	0	1640
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	76	1527	27	0	1783

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	777	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.14	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.92	-
Pot Cap-1 Maneuver	0	*580	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	-
Mov Cap-1 Maneuver	-	*580	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	580
HCM Lane V/C Ratio	-	-	0.131
HCM Control Delay (s)	-	-	12.1
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.5

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon





Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗ ↘ ↘ ↘	↗ ↘ ↘ ↘			↗ ↘ ↘ ↘
Traffic Vol, veh/h	0	85	2095	50	0	1825
Future Vol, veh/h	0	85	2095	50	0	1825
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	92	2277	54	0	1984

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	1166	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.14	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.92	-
Pot Cap-1 Maneuver	0	*425	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	-
Mov Cap-1 Maneuver	-	*425	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	425
HCM Lane V/C Ratio	-	-	0.217
HCM Control Delay (s)	-	-	15.8
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.8





Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	975	5	40	1190
Future Vol, veh/h	0	35	975	5	40	1190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	38	1060	5	43	1293
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	533	0	0	1065	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	491	-	-	650	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	491	-	-	650	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.9	0		0.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	491	650	-	
HCM Lane V/C Ratio	-	-	0.077	0.067	-	
HCM Control Delay (s)	-	-	12.9	10.9	-	
HCM Lane LOS	-	-	B	B	-	
HCM 95th %tile Q(veh)	-	-	0.3	0.2	-	



Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	45	1405	10	80	1025
Future Vol, veh/h	0	45	1405	10	80	1025
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	49	1527	11	87	1114

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	769	0 0 1538 0
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -
Critical Hdwy	-	6.94	- - 4.14 -
Critical Hdwy Stg 1	-	-	- - - -
Critical Hdwy Stg 2	-	-	- - - -
Follow-up Hdwy	-	3.32	- - 2.22 -
Pot Cap-1 Maneuver	0	344	- - 428 -
Stage 1	0	-	- - - -
Stage 2	0	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	-	344	- - 428 -
Mov Cap-2 Maneuver	-	-	- - - -
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	1.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 344	428	-
HCM Lane V/C Ratio	-	- 0.142	0.203	-
HCM Control Delay (s)	-	- 17.2	15.5	-
HCM Lane LOS	-	- C	C	-
HCM 95th %tile Q(veh)	-	- 0.5	0.8	-

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↑↑↑	↘	↗	↑↑↑
Traffic Vol, veh/h	0	130	1300	15	120	1530
Future Vol, veh/h	0	130	1300	15	120	1530
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	141	1413	16	130	1663
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	715	0	0	1429	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	5.34	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	0	*624	-	-	*784	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	1	-	-	1	-
Mov Cap-1 Maneuver	-	*624	-	-	*784	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.5	0		0.8		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	624	* 784	-	
HCM Lane V/C Ratio	-	-	0.226	0.166	-	
HCM Control Delay (s)	-	-	12.5	10.5	-	
HCM Lane LOS	-	-	B	B	-	
HCM 95th %tile Q(veh)	-	-	0.9	0.6	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection

Int Delay, s/veh 2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗ ↘ ↘ ↘			↗ ↘ ↘ ↘	
Traffic Vol, veh/h	0	165	1985	35	305	1525
Future Vol, veh/h	0	165	1985	35	305	1525
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	0	179	2158	38	332	1658

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	1098	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.14	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.92	-
Pot Cap-1 Maneuver	0	*447	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	-
Mov Cap-1 Maneuver	-	*447	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.3	0	3.4
HCM LOS	C		










Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	447	* 563
HCM Lane V/C Ratio	-	-	0.401	0.589
HCM Control Delay (s)	-	-	18.3	20.1
HCM Lane LOS	-	-	C	C
HCM 95th %tile Q(veh)	-	-	1.9	3.8

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

## Intersection

Int Delay, s/veh 401.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	540	10	125	10	25	45	160	395	5	30	490	680
Future Vol, veh/h	540	10	125	10	25	45	160	395	5	30	490	680
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	150	-	-	150	-	-	150	-	150
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	587	11	136	11	27	49	174	429	5	33	533	739

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1417	1381	533	1822	2118	432	1272	0	0	434	0	0
Stage 1	599	599	-	780	780	-	-	-	-	-	-	-
Stage 2	818	782	-	1042	1338	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 115	144	547	60	50	624	546	-	-	1126	-	-
Stage 1	~ 488	490	-	388	406	-	-	-	-	-	-	-
Stage 2	~ 370	405	-	277	222	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 34	95	547	32	33	624	546	-	-	1126	-	-
Mov Cap-2 Maneuver	~ 119	184	-	21	38	-	-	-	-	-	-	-
Stage 1	~ 332	476	-	264	276	-	-	-	-	-	-	-
Stage 2	~ 209	276	-	197	216	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1476.8	142.4	4.2	0.2
HCM LOS	F	F		










Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	546	-	-	119	477	21	96	1126	-	-
HCM Lane V/C Ratio	0.319	-	-	4.932	0.308	0.518	0.793	0.029	-	-
HCM Control Delay (s)	14.6	-	-	\$ 1842	15.9	295.3	120.5	8.3	-	-
HCM Lane LOS	B	-	-	F	C	F	F	A	-	-
HCM 95th %tile Q(veh)	1.4	-	-	62	1.3	1.5	4.2	0.1	-	-

## Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

## Intersection

Int Delay, s/veh 1063.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	805	25	185	10	30	55	130	560	5	70	400	565
Future Vol, veh/h	805	25	185	10	30	55	130	560	5	70	400	565
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	150	-	-	150	-	-	150	-	150
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	3	2
Mvmt Flow	875	27	201	11	33	60	141	609	5	76	435	614

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1527	1483	435	1902	2095	612	1049	0	0	614	0	0
Stage 1	587	587	-	894	894	-	-	-	-	-	-	-
Stage 2	940	896	-	1008	1201	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 96	125	621	52	52	493	663	-	-	965	-	-
Stage 1	~ 496	497	-	336	360	-	-	-	-	-	-	-
Stage 2	~ 316	359	-	290	258	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 46	91	621	24	38	493	663	-	-	965	-	-
Mov Cap-2 Maneuver	~ 96	164	-	26	78	-	-	-	-	-	-	-
Stage 1	~ 390	458	-	264	283	-	-	-	-	-	-	-
Stage 2	~ 193	283	-	170	238	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2966.9	66.5	2.2	0.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	663	-	-	96	466	26	171	965	-	-
HCM Lane V/C Ratio	0.213	-	-	9.115	0.49	0.418	0.54	0.079	-	-
HCM Control Delay (s)	11.9	-	-	\$ 3735.7	19.9	220.4	48.4	9.1	-	-
HCM Lane LOS	B	-	-	F	C	F	E	A	-	-
HCM 95th %tile Q(veh)	0.8	-	-	100.6	2.6	1.3	2.8	0.3	-	-

## Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# Timings

2026 Total AM Improved.syn

## 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

02/15/2021



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	←←	→	←	→	←	→	←	→	←
Traffic Volume (vph)	540	10	10	25	160	395	30	490	680
Future Volume (vph)	540	10	10	25	160	395	30	490	680
Turn Type	Prot	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases	7	4		8	5	2		6	
Permitted Phases			8		2		6		6
Detector Phase	7	4	8	8	5	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	23.5	23.5	10.5	23.5	23.5	23.5	23.5
Total Split (s)	33.0	56.5	23.5	23.5	13.0	63.5	50.5	50.5	50.5
Total Split (%)	27.5%	47.1%	19.6%	19.6%	10.8%	52.9%	42.1%	42.1%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	24.7	35.9	7.9	7.9	73.6	73.1	57.3	57.3	57.3
Actuated g/C Ratio	0.21	0.30	0.07	0.07	0.61	0.61	0.48	0.48	0.48
v/c Ratio	0.83	0.26	0.14	0.49	0.34	0.21	0.07	0.32	0.65
Control Delay	56.4	6.4	54.8	33.7	13.6	12.1	22.4	22.2	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	6.4	54.8	33.7	13.6	12.1	22.4	22.2	4.9
LOS	E	A	D	C	B	B	C	C	A
Approach Delay		46.4		36.4		12.5		12.4	
Approach LOS		D		D		B		B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 22.3

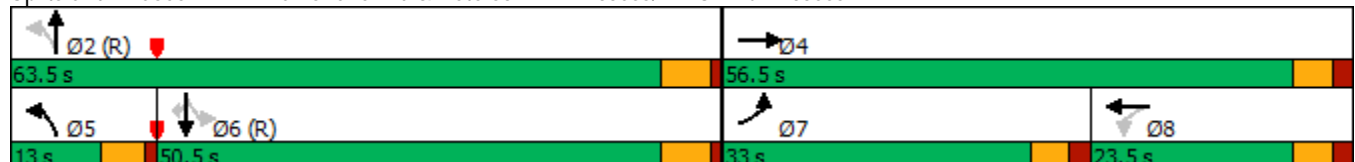
Intersection LOS: C

Intersection Capacity Utilization 68.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2


























# HCM 6th Signalized Intersection Summary

2026 Total AM Improved.syn

## 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

02/15/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	540	10	125	10	25	45	160	395	5	30	490	680
Future Volume (veh/h)	540	10	125	10	25	45	160	395	5	30	490	680
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1826	1870	1826	1870
Adj Flow Rate, veh/h	587	11	136	11	27	49	174	429	5	33	533	739
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	5	2	5	2
Cap, veh/h	663	36	446	138	38	68	350	2133	25	541	1748	799
Arrive On Green	0.19	0.30	0.30	0.06	0.06	0.06	0.06	0.61	0.61	0.50	0.50	0.50
Sat Flow, veh/h	3456	120	1483	1241	595	1080	1781	3512	41	954	3469	1585
Grp Volume(v), veh/h	587	0	147	11	0	76	174	212	222	33	533	739
Grp Sat Flow(s),veh/h/ln	1728	0	1603	1241	0	1676	1781	1735	1819	954	1735	1585
Q Serve(g_s), s	19.8	0.0	8.5	1.0	0.0	5.3	5.4	6.6	6.6	2.1	10.8	52.0
Cycle Q Clear(g_c), s	19.8	0.0	8.5	1.0	0.0	5.3	5.4	6.6	6.6	2.1	10.8	52.0
Prop In Lane	1.00		0.93	1.00		0.64	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	663	0	482	138	0	106	350	1054	1105	541	1748	799
V/C Ratio(X)	0.88	0.00	0.30	0.08	0.00	0.72	0.50	0.20	0.20	0.06	0.30	0.93
Avail Cap(c_a), veh/h	792	0	681	246	0	251	359	1054	1105	541	1748	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.2	0.0	32.3	53.1	0.0	55.2	12.7	10.5	10.5	15.3	17.5	27.7
Incr Delay (d2), s/veh	10.3	0.0	0.4	0.2	0.0	8.8	1.1	0.4	0.4	0.2	0.5	18.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	0.0	3.4	0.3	0.0	2.5	2.2	2.6	2.7	0.5	4.4	22.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.5	0.0	32.6	53.4	0.0	63.9	13.8	11.0	10.9	15.5	17.9	45.8
LnGrp LOS	E	A	C	D	A	E	B	B	B	B	B	D
Approach Vol, veh/h	734			87			608			1305		
Approach Delay, s/veh	52.5			62.6			11.8			33.7		
Approach LOS	D			E			B			C		
Timer - Assigned Phs	2			4		5	6	7	8			
Phs Duration (G+Y+Rc), s	78.4			41.6		12.4	66.0	28.5	13.1			
Change Period (Y+Rc), s	5.5			5.5		5.0	5.5	5.5	5.5			
Max Green Setting (Gmax), s	58.0			51.0		8.0	45.0	27.5	18.0			
Max Q Clear Time (g_c+I1), s	8.6			10.5		7.4	54.0	21.8	7.3			
Green Ext Time (p_c), s	2.8			1.0		0.0	0.0	1.2	0.2			
Intersection Summary												
HCM 6th Ctrl Delay	34.8											
HCM 6th LOS	C											

# Timings

2026 Total PM Improved.syn

## 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

02/15/2021



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	←←	→	←	→	←	→	←	→	←
Traffic Volume (vph)	805	25	10	30	130	560	70	400	565
Future Volume (vph)	805	25	10	30	130	560	70	400	565
Turn Type	Prot	NA	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		8	5	2	1	6	
Permitted Phases			8		2		6		6
Detector Phase	7	4	8	8	5	2	1	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	23.5	23.5	10.5	23.5	10.5	23.5	23.5
Total Split (s)	43.0	66.5	23.5	23.5	11.0	41.7	11.8	42.5	42.5
Total Split (%)	35.8%	55.4%	19.6%	19.6%	9.2%	34.8%	9.8%	35.4%	35.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	34.7	48.6	8.4	8.4	58.0	48.9	53.6	45.3	45.3
Actuated g/C Ratio	0.29	0.40	0.07	0.07	0.48	0.41	0.45	0.38	0.38
v/c Ratio	0.88	0.29	0.14	0.54	0.31	0.43	0.21	0.33	0.63
Control Delay	51.7	4.9	54.3	33.9	19.3	29.1	19.0	29.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	4.9	54.3	33.9	19.3	29.1	19.0	29.0	5.7
LOS	D	A	D	C	B	C	B	C	A
Approach Delay		42.0		36.1		27.3		15.6	
Approach LOS		D		D		C		B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 28.6

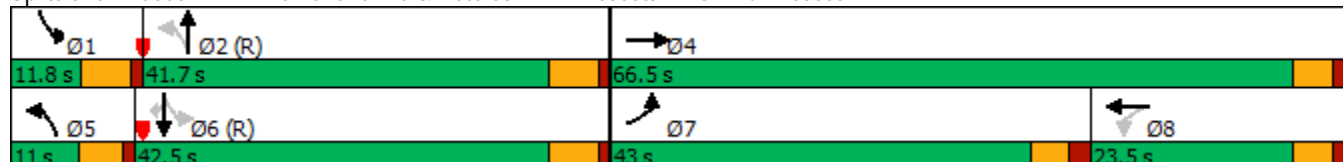
Intersection LOS: C

Intersection Capacity Utilization 63.2%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2
























# HCM 6th Signalized Intersection Summary

2026 Total PM Improved.syn

## 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

02/15/2021

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	805	25	185	10	30	55	130	560	5	70	400	565
Future Volume (veh/h)	805	25	185	10	30	55	130	560	5	70	400	565
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1856	1870	1856	1870
Adj Flow Rate, veh/h	875	27	201	11	33	60	141	609	5	76	435	614
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	3	2	3	2
Cap, veh/h	961	76	565	145	44	79	331	1529	13	378	1478	665
Arrive On Green	0.28	0.40	0.40	0.07	0.07	0.07	0.05	0.43	0.43	0.04	0.42	0.42
Sat Flow, veh/h	3456	191	1423	1153	595	1081	1781	3584	29	1781	3526	1585
Grp Volume(v), veh/h	875	0	228	11	0	93	141	300	314	76	435	614
Grp Sat Flow(s),veh/h/ln	1728	0	1614	1153	0	1676	1781	1763	1850	1781	1763	1585
Q Serve(g_s), s	29.4	0.0	11.9	1.1	0.0	6.5	5.5	14.1	14.1	2.9	9.8	44.1
Cycle Q Clear(g_c), s	29.4	0.0	11.9	1.1	0.0	6.5	5.5	14.1	14.1	2.9	9.8	44.1
Prop In Lane	1.00		0.88	1.00		0.65	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	961	0	641	145	0	123	331	752	790	378	1478	665
V/C Ratio(X)	0.91	0.00	0.36	0.08	0.00	0.76	0.43	0.40	0.40	0.20	0.29	0.92
Avail Cap(c_a), veh/h	1080	0	821	233	0	251	331	752	790	404	1478	665
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	0.0	25.4	52.0	0.0	54.5	18.9	23.7	23.8	19.2	23.1	33.0
Incr Delay (d2), s/veh	10.6	0.0	0.3	0.2	0.0	9.0	0.9	1.6	1.5	0.3	0.5	20.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.8	0.0	4.6	0.3	0.0	3.1	2.3	6.2	6.5	1.2	4.2	20.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	0.0	25.7	52.2	0.0	63.5	19.8	25.3	25.3	19.5	23.6	53.6
LnGrp LOS	D	A	C	D	A	E	B	C	C	B	C	D
Approach Vol, veh/h		1103			104			755			1125	
Approach Delay, s/veh		47.0			62.3			24.3			39.7	
Approach LOS		D			E			C			D	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	56.7		53.2	11.0	55.8	38.9	14.3				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.0	5.5	5.5	5.5				
Max Green Setting (Gmax), s	6.3	36.2		61.0	6.0	37.0	37.5	18.0				
Max Q Clear Time (g_c+I1), s	4.9	16.1		13.9	7.5	46.1	31.4	8.5				
Green Ext Time (p_c), s	0.0	3.7		1.6	0.0	0.0	2.0	0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				39.3								
HCM 6th LOS				D								

# Timings

2040 Total AM.syn

## 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

02/15/2021

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	 				 		 		 	
Traffic Volume (vph)	680	30	35	85	155	190	475	100	585	850
Future Volume (vph)	680	30	35	85	155	190	475	100	585	850
Turn Type	Prot	NA	Perm	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases	7	4		8		5	2		6	
Permitted Phases			8		8	2		6		6
Detector Phase	7	4	8	8	8	5	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	23.5	23.5	23.5	10.5	23.5	23.5	23.5	23.5
Total Split (s)	34.0	57.5	23.5	23.5	23.5	11.0	62.5	51.5	51.5	51.5
Total Split (%)	28.3%	47.9%	19.6%	19.6%	19.6%	9.2%	52.1%	42.9%	42.9%	42.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag	Lag	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	27.9	44.8	11.4	11.4	11.4	64.7	64.2	49.0	49.0	49.0
Actuated g/C Ratio	0.23	0.37	0.10	0.10	0.10	0.54	0.54	0.41	0.41	0.41
v/c Ratio	0.93	0.27	0.34	0.52	0.56	0.52	0.29	0.32	0.45	0.83
Control Delay	63.4	6.6	57.5	61.4	14.5	21.3	16.4	13.9	12.7	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	6.6	57.5	61.4	14.5	21.3	16.4	13.9	12.7	20.5
LOS	E	A	E	E	B	C	B	B	B	C
Approach Delay		51.7		34.5			17.8		17.1	
Approach LOS		D		C			B		B	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 27.5

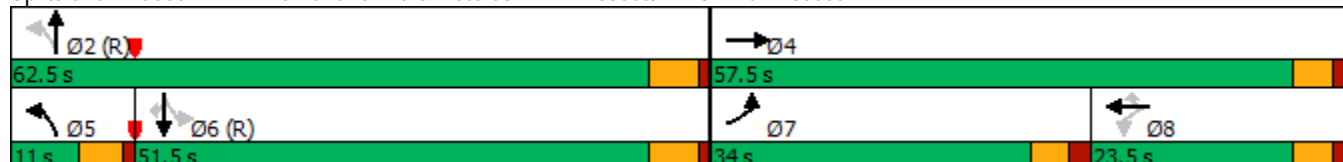
Intersection LOS: C

Intersection Capacity Utilization 81.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

























# HCM 6th Signalized Intersection Summary

2040 Total AM.syn

## 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

02/15/2021
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	680	30	145	35	85	155	190	475	10	100	585	850
Future Volume (veh/h)	680	30	145	35	85	155	190	475	10	100	585	850
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1826	1870	1826	1870
Adj Flow Rate, veh/h	739	33	158	38	92	86	207	516	11	109	636	598
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	5	2	5	2
Cap, veh/h	795	99	472	149	139	118	318	1937	41	468	1617	739
Arrive On Green	0.23	0.35	0.35	0.07	0.07	0.07	0.05	0.56	0.56	0.62	0.62	0.62
Sat Flow, veh/h	3456	281	1347	1192	1870	1585	1781	3473	74	876	3469	1585
Grp Volume(v), veh/h	739	0	191	38	92	86	207	258	269	109	636	598
Grp Sat Flow(s),veh/h/ln	1728	0	1628	1192	1870	1585	1781	1735	1813	876	1735	1585
Q Serve(g_s), s	25.1	0.0	10.4	3.7	5.7	6.4	6.0	9.3	9.3	6.8	11.1	34.5
Cycle Q Clear(g_c), s	25.1	0.0	10.4	3.7	5.7	6.4	6.0	9.3	9.3	6.8	11.1	34.5
Prop In Lane	1.00		0.83	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	795	0	571	149	139	118	318	968	1011	468	1617	739
V/C Ratio(X)	0.93	0.00	0.33	0.26	0.66	0.73	0.65	0.27	0.27	0.23	0.39	0.81
Avail Cap(c_a), veh/h	821	0	705	239	281	238	318	968	1011	468	1617	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	28.7	53.1	54.0	54.3	18.6	13.8	13.8	13.5	14.3	18.7
Incr Delay (d2), s/veh	16.5	0.0	0.3	0.9	5.2	8.2	4.7	0.7	0.6	1.2	0.7	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5	0.0	4.1	1.1	2.9	2.8	3.4	3.8	3.9	1.4	4.0	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.7	0.0	29.0	54.0	59.3	62.6	23.2	14.5	14.4	14.6	15.0	28.1
LnGrp LOS	E	A	C	D	E	E	C	B	B	B	B	C
Approach Vol, veh/h		930			216			734			1343	
Approach Delay, s/veh		55.0			59.6			16.9			20.8	
Approach LOS		E			E			B			C	
Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		72.4		47.6	11.0	61.4	33.1	14.4				
Change Period (Y+Rc), s		5.5		5.5	5.0	5.5	5.5	5.5				
Max Green Setting (Gmax), s		57.0		52.0	6.0	46.0	28.5	18.0				
Max Q Clear Time (g_c+I1), s		11.3		12.4	8.0	36.5	27.1	8.4				
Green Ext Time (p_c), s		3.6		1.3	0.0	5.0	0.5	0.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			32.4									
HCM 6th LOS			C									

# Timings

## 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

2040 Total PM.syn

02/15/2021

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	 						 		 	
Traffic Volume (vph)	1095	85	45	110	200	150	730	255	500	780
Future Volume (vph)	1095	85	45	110	200	150	730	255	500	780
Turn Type	Prot	NA	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		8		5	2	1	6	
Permitted Phases			8		8	2		6		6
Detector Phase	7	4	8	8	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	23.5	23.5	23.5	10.5	23.5	10.5	23.5	23.5
Total Split (s)	47.5	71.0	23.5	23.5	23.5	10.6	30.0	19.0	38.4	38.4
Total Split (%)	39.6%	59.2%	19.6%	19.6%	19.6%	8.8%	25.0%	15.8%	32.0%	32.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	42.0	60.7	13.2	13.2	13.2	33.7	24.5	48.3	34.6	34.6
Actuated g/C Ratio	0.35	0.51	0.11	0.11	0.11	0.28	0.20	0.40	0.29	0.29
v/c Ratio	0.99	0.36	0.43	0.59	0.67	0.55	1.14	0.84	0.54	0.81
Control Delay	63.0	8.7	60.0	61.6	24.0	36.1	122.9	69.4	41.9	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	8.7	60.0	61.6	24.0	36.1	122.9	69.4	41.9	22.4
LOS	E	A	E	E	C	D	F	E	D	C
Approach Delay		51.2		40.2			108.5		36.6	
Approach LOS		D		D			F		D	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 57.2

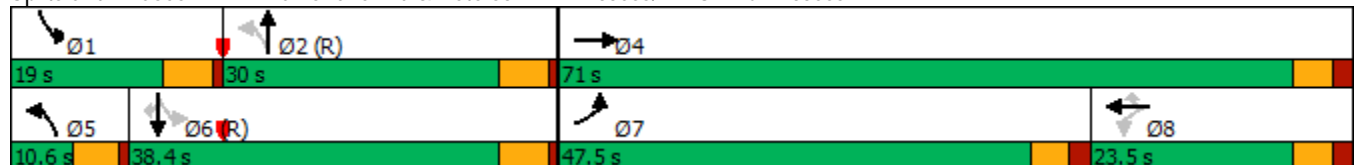
Intersection LOS: E

Intersection Capacity Utilization 86.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2



































# HCM 6th Signalized Intersection Summary

2040 Total PM.syn

## 21: Marksheffel Rd & Peterson AFB Access/RR-SE Full Access #2

02/15/2021









												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1095	85	220	45	110	200	150	730	20	255	500	780
Future Volume (veh/h)	1095	85	220	45	110	200	150	730	20	255	500	780
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1856	1856	1870	1856	1870
Adj Flow Rate, veh/h	1190	92	239	49	120	108	163	793	22	277	543	413
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	3	2	3	2
Cap, veh/h	1209	223	580	154	167	142	255	928	26	294	1180	531
Arrive On Green	0.35	0.49	0.49	0.09	0.09	0.09	0.05	0.26	0.26	0.04	0.11	0.11
Sat Flow, veh/h	3456	460	1195	1049	1870	1585	1781	3504	97	1781	3526	1585
Grp Volume(v), veh/h	1190	0	331	49	120	108	163	399	416	277	543	413
Grp Sat Flow(s),veh/h/ln	1728	0	1655	1049	1870	1585	1781	1763	1838	1781	1763	1585
Q Serve(g_s), s	41.0	0.0	15.4	5.4	7.5	8.0	5.6	25.8	25.8	12.9	17.3	30.4
Cycle Q Clear(g_c), s	41.0	0.0	15.4	5.4	7.5	8.0	5.6	25.8	25.8	12.9	17.3	30.4
Prop In Lane	1.00		0.72	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	1209	0	803	154	167	142	255	467	487	294	1180	531
V/C Ratio(X)	0.98	0.00	0.41	0.32	0.72	0.76	0.64	0.85	0.85	0.94	0.46	0.78
Avail Cap(c_a), veh/h	1209	0	903	217	281	238	255	467	487	294	1180	531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	0.0	19.9	52.2	53.2	53.4	35.4	41.9	41.9	33.0	43.2	49.0
Incr Delay (d2), s/veh	22.0	0.0	0.3	1.2	5.7	8.2	5.3	17.8	17.2	37.5	1.3	10.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.7	0.0	6.0	1.5	3.8	3.5	2.0	13.5	14.0	9.2	8.4	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	0.0	20.2	53.4	58.8	61.6	40.7	59.7	59.1	70.5	44.5	59.8
LnGrp LOS	E	A	C	D	E	E	D	E	E	E	D	E
Approach Vol, veh/h		1521			277			978			1233	
Approach Delay, s/veh		51.8			58.9			56.3			55.5	
Approach LOS		D			E			E			E	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	37.3		63.7	10.6	45.7	47.5	16.2				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.0	5.5	5.5	5.5				
Max Green Setting (Gmax), s	13.5	24.5		65.5	5.6	32.9	42.0	18.0				
Max Q Clear Time (g_c+l1), s	14.9	27.8		17.4	7.6	32.4	43.0	10.0				
Green Ext Time (p_c), s	0.0	0.0		2.5	0.0	0.3	0.0	0.7				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			54.5									
HCM 6th LOS			D									









Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	45	2	150	50	50	2	2	90	45	2	2
Future Vol, veh/h	2	45	2	150	50	50	2	2	90	45	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	49	2	163	54	54	2	2	98	49	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	108	0	0	51	0	0	463	488	50	511	462	81
Stage 1	-	-	-	-	-	-	54	54	-	407	407	-
Stage 2	-	-	-	-	-	-	409	434	-	104	55	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1483	-	-	1555	-	-	509	480	1018	473	497	979
Stage 1	-	-	-	-	-	-	958	850	-	621	597	-
Stage 2	-	-	-	-	-	-	619	581	-	902	849	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1483	-	-	1555	-	-	465	429	1018	392	444	979
Mov Cap-2 Maneuver	-	-	-	-	-	-	490	459	-	468	465	-
Stage 1	-	-	-	-	-	-	957	849	-	620	534	-
Stage 2	-	-	-	-	-	-	551	520	-	812	848	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	4.6	9.1	13.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	490	992	1483	-	-	1555	-	-	468	631
HCM Lane V/C Ratio	0.004	0.101	0.001	-	-	0.105	-	-	0.105	0.007
HCM Control Delay (s)	12.4	9	7.4	-	-	7.6	-	-	13.6	10.7
HCM Lane LOS	B	A	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0	0.3	0	-	-	0.4	-	-	0.3	0

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	45	2	140	50	50	2	2	90	45	2	2
Future Vol, veh/h	2	45	2	140	50	50	2	2	90	45	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	49	2	152	54	54	2	2	98	49	2	2
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	108	0	0	51	0	0	441	466	50	489	440	81
Stage 1	-	-	-	-	-	-	54	54	-	385	385	-
Stage 2	-	-	-	-	-	-	387	412	-	104	55	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1483	-	-	1555	-	-	527	494	1018	489	511	979
Stage 1	-	-	-	-	-	-	958	850	-	638	611	-
Stage 2	-	-	-	-	-	-	637	594	-	902	849	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1483	-	-	1555	-	-	484	445	1018	407	460	979
Mov Cap-2 Maneuver	-	-	-	-	-	-	508	473	-	481	480	-
Stage 1	-	-	-	-	-	-	957	849	-	637	551	-
Stage 2	-	-	-	-	-	-	571	536	-	812	848	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			4.4			9.1			13.1		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1 NBLn2		EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
Capacity (veh/h)	508	993	1483	-	-	1555	-	-	481	644		
HCM Lane V/C Ratio	0.004	0.101	0.001	-	-	0.098	-	-	0.102	0.007		
HCM Control Delay (s)	12.1	9	7.4	-	-	7.6	-	-	13.3	10.6		
HCM Lane LOS	B	A	A	-	-	A	-	-	B	B		
HCM 95th %tile Q(veh)	0	0.3	0	-	-	0.3	-	-	0.3	0		

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	50	2	165	55	55	2	2	100	50	2	2
Future Vol, veh/h	2	50	2	165	55	55	2	2	100	50	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	54	2	179	60	60	2	2	109	54	2	2









Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	120	0	0	56	0	0	509	537	55	563	508	90
Stage 1	-	-	-	-	-	-	59	59	-	448	448	-
Stage 2	-	-	-	-	-	-	450	478	-	115	60	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1468	-	-	1549	-	-	475	450	1012	437	468	968
Stage 1	-	-	-	-	-	-	953	846	-	590	573	-
Stage 2	-	-	-	-	-	-	589	556	-	890	845	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1468	-	-	1549	-	-	430	397	1012	354	413	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	460	433	-	435	439	-
Stage 1	-	-	-	-	-	-	952	845	-	589	507	-
Stage 2	-	-	-	-	-	-	518	492	-	791	844	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	4.6	9.2	14.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	460	986	1468	-	-	1549	-	-	435	604
HCM Lane V/C Ratio	0.005	0.112	0.001	-	-	0.116	-	-	0.125	0.007
HCM Control Delay (s)	12.9	9.1	7.5	-	-	7.6	-	-	14.5	11
HCM Lane LOS	B	A	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0	0.4	0	-	-	0.4	-	-	0.4	0

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	50	2	235	80	80	2	2	100	50	2	2
Future Vol, veh/h	2	50	2	235	80	80	2	2	100	50	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	54	2	255	87	87	2	2	109	54	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	174	0	0	56	0	0	702	743	55	756	701	131
Stage 1	-	-	-	-	-	-	59	59	-	641	641	-
Stage 2	-	-	-	-	-	-	643	684	-	115	60	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1403	-	-	1549	-	-	353	343	1012	325	363	919
Stage 1	-	-	-	-	-	-	953	846	-	463	469	-
Stage 2	-	-	-	-	-	-	462	449	-	890	845	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1403	-	-	1549	-	-	306	286	1012	252	303	919
Mov Cap-2 Maneuver	-	-	-	-	-	-	341	330	-	341	339	-
Stage 1	-	-	-	-	-	-	952	845	-	463	392	-
Stage 2	-	-	-	-	-	-	383	375	-	791	844	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			4.6			9.3			17.1		
HCM LOS							A			C		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	341	973	1403	-	-	1549	-	-	341	495
HCM Lane V/C Ratio	0.006	0.114	0.002	-	-	0.165	-	-	0.159	0.009
HCM Control Delay (s)	15.6	9.2	7.6	-	-	7.8	-	-	17.5	12.3
HCM Lane LOS	C	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0.4	0	-	-	0.6	-	-	0.6	0







Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	25	5	45	2	5	25	25	50	2	25	70	50
Future Vol, veh/h	25	5	45	2	5	25	25	50	2	25	70	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	5	49	2	5	27	27	54	2	27	76	54

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	282	267	103	293	293	55	130	0	0	56	0	0
Stage 1	157	157	-	109	109	-	-	-	-	-	-	-
Stage 2	125	110	-	184	184	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	670	639	952	659	618	1012	1455	-	-	1549	-	-
Stage 1	845	768	-	896	805	-	-	-	-	-	-	-
Stage 2	879	804	-	818	747	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	630	616	952	604	596	1012	1455	-	-	1549	-	-
Mov Cap-2 Maneuver	661	627	-	630	608	-	-	-	-	-	-	-
Stage 1	829	755	-	879	790	-	-	-	-	-	-	-
Stage 2	834	789	-	757	734	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10		9.2		2.4		1.3	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1455	-	-	806	886	1549	-
HCM Lane V/C Ratio	0.019	-	-	0.101	0.039	0.018	-
HCM Control Delay (s)	7.5	-	-	10	9.2	7.4	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0.1	-



Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	5	45	2	5	25	25	45	2	25	70	50
Future Vol, veh/h	25	5	45	2	5	25	25	45	2	25	70	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	5	49	2	5	27	27	49	2	27	76	54
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	277	262	103	288	288	50	130	0	0	51	0	0
Stage 1	157	157	-	104	104	-	-	-	-	-	-	-
Stage 2	120	105	-	184	184	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	675	643	952	664	622	1018	1455	-	-	1555	-	-
Stage 1	845	768	-	902	809	-	-	-	-	-	-	-
Stage 2	884	808	-	818	747	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	635	620	952	609	600	1018	1455	-	-	1555	-	-
Mov Cap-2 Maneuver	664	630	-	633	611	-	-	-	-	-	-	-
Stage 1	829	755	-	885	794	-	-	-	-	-	-	-
Stage 2	839	793	-	757	734	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	10		9.2			2.6			1.3			
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1455	-	-	808	891	1555	-	-				
HCM Lane V/C Ratio	0.019	-	-	0.101	0.039	0.017	-	-				
HCM Control Delay (s)	7.5	-	-	10	9.2	7.4	-	-				
HCM Lane LOS	A	-	-	B	A	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0.1	-	-				






Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	25	5	50	2	5	25	30	55	2	30	80	55
Future Vol, veh/h	25	5	50	2	5	25	30	55	2	30	80	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	5	54	2	5	27	33	60	2	33	87	60






Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	326	311	117	340	340	61	147	0	0	62	0	0
Stage 1	183	183	-	127	127	-	-	-	-	-	-	-
Stage 2	143	128	-	213	213	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	627	604	935	614	582	1004	1435	-	-	1541	-	-
Stage 1	819	748	-	877	791	-	-	-	-	-	-	-
Stage 2	860	790	-	789	726	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	586	577	935	555	556	1004	1435	-	-	1541	-	-
Mov Cap-2 Maneuver	628	599	-	591	579	-	-	-	-	-	-	-
Stage 1	800	732	-	857	773	-	-	-	-	-	-	-
Stage 2	812	772	-	722	711	-	-	-	-	-	-	-






Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.1		9.3		2.6		1.3	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1435	-	-	787	867	1541	-
HCM Lane V/C Ratio	0.023	-	-	0.11	0.04	0.021	-
HCM Control Delay (s)	7.6	-	-	10.1	9.3	7.4	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0.1	-






Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	25	5	50	2	10	25	40	65	2	40	90	80
Future Vol, veh/h	25	5	50	2	10	25	40	65	2	40	90	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	5	54	2	11	27	43	71	2	43	98	87
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	405	387	142	415	429	72	185	0	0	73	0	0
Stage 1	228	228	-	158	158	-	-	-	-	-	-	-
Stage 2	177	159	-	257	271	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	556	547	906	548	518	990	1390	-	-	1527	-	-
Stage 1	775	715	-	844	767	-	-	-	-	-	-	-
Stage 2	825	766	-	748	685	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	509	515	906	489	488	990	1390	-	-	1527	-	-
Mov Cap-2 Maneuver	568	553	-	539	526	-	-	-	-	-	-	-
Stage 1	751	695	-	818	743	-	-	-	-	-	-	-
Stage 2	766	742	-	678	666	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.5		9.9		2.9		1.4					
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1390	-	-	739	771	1527	-	-				
HCM Lane V/C Ratio	0.031	-	-	0.118	0.052	0.028	-	-				
HCM Control Delay (s)	7.7	-	-	10.5	9.9	7.4	-	-				
HCM Lane LOS	A	-	-	B	A	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.2	0.1	-	-				

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	45	50	100	110	2
Future Vol, veh/h	2	45	50	100	110	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	49	54	109	120	2
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	163	0	-	0	162	109
Stage 1	-	-	-	-	109	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1416	-	-	-	829	945
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1416	-	-	-	828	945
Mov Cap-2 Maneuver	-	-	-	-	805	-
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	970	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		10.3		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1416	-	-	-	805	945
HCM Lane V/C Ratio	0.002	-	-	-	0.149	0.002
HCM Control Delay (s)	7.5	-	-	-	10.3	8.8
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	45	50	95	110	2
Future Vol, veh/h	2	45	50	95	110	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	49	54	103	120	2
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	157	0	-	0	159	106
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1423	-	-	-	832	948
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1423	-	-	-	831	948
Mov Cap-2 Maneuver	-	-	-	-	807	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	970	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		10.2		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1423	-	-	-	807	948
HCM Lane V/C Ratio	0.002	-	-	-	0.148	0.002
HCM Control Delay (s)	7.5	-	-	-	10.2	8.8
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0





Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	50	55	110	125	2
Future Vol, veh/h	2	50	55	110	125	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	54	60	120	136	2
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	180	0	-	0	178	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1396	-	-	-	812	931
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	965	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1396	-	-	-	811	931
Mov Cap-2 Maneuver	-	-	-	-	793	-
Stage 1	-	-	-	-	904	-
Stage 2	-	-	-	-	965	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		10.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1396	-	-	-	793	931
HCM Lane V/C Ratio	0.002	-	-	-	0.171	0.002
HCM Control Delay (s)	7.6	-	-	-	10.5	8.9
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.6	0



Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	50	80	155	125	2
Future Vol, veh/h	2	50	80	155	125	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	54	87	168	136	2
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	255	0	-	0	229	171
Stage 1	-	-	-	-	171	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1310	-	-	-	759	873
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	965	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1310	-	-	-	757	873
Mov Cap-2 Maneuver	-	-	-	-	753	-
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	965	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		10.8		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1310	-	-	-	753	873
HCM Lane V/C Ratio	0.002	-	-	-	0.18	0.002
HCM Control Delay (s)	7.8	-	-	-	10.8	9.1
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.7	0

**Intersection**

Int Delay, s/veh 2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	155	150	100	110	5
Future Vol, veh/h	5	155	150	100	110	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	168	163	109	120	5





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	272	0	0 396 218
Stage 1	-	-	- 218 -
Stage 2	-	-	- 178 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1291	-	- 609 822
Stage 1	-	-	- 818 -
Stage 2	-	-	- 853 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1291	-	- 607 822
Mov Cap-2 Maneuver	-	-	- 657 -
Stage 1	-	-	- 815 -
Stage 2	-	-	- 853 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1291	-	-	-	663
HCM Lane V/C Ratio	0.004	-	-	-	0.189
HCM Control Delay (s)	7.8	-	-	-	11.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7

**Intersection**

Int Delay, s/veh 2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	155	140	95	110	5
Future Vol, veh/h	5	155	140	95	110	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	168	152	103	120	5





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	255	0	0 382 204
Stage 1	-	-	- 204 -
Stage 2	-	-	- 178 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1310	-	- 620 837
Stage 1	-	-	- 830 -
Stage 2	-	-	- 853 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1310	-	- 618 837
Mov Cap-2 Maneuver	-	-	- 665 -
Stage 1	-	-	- 827 -
Stage 2	-	-	- 853 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1310	-	-	-	671
HCM Lane V/C Ratio	0.004	-	-	-	0.186
HCM Control Delay (s)	7.8	-	-	-	11.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7

**Intersection**





Int Delay, s/veh 2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	175	165	110	125	5
Future Vol, veh/h	5	175	165	110	125	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	190	179	120	136	5

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	299	0	0 439 239
Stage 1	-	-	- 239 -
Stage 2	-	-	- 200 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1262	-	- 575 800
Stage 1	-	-	- 801 -
Stage 2	-	-	- 834 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1262	-	- 573 800
Mov Cap-2 Maneuver	-	-	- 633 -
Stage 1	-	-	- 798 -
Stage 2	-	-	- 834 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1262	-	-	-	638
HCM Lane V/C Ratio	0.004	-	-	-	0.221
HCM Control Delay (s)	7.9	-	-	-	12.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	175	235	155	125	5
Future Vol, veh/h	5	175	235	155	125	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	190	255	168	136	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	423	0	-	0	539	339
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	200	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1136	-	-	-	503	703
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	834	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1136	-	-	-	501	703
Mov Cap-2 Maneuver	-	-	-	-	578	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	834	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		13.2		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1136	-	-	-	582	
HCM Lane V/C Ratio	0.005	-	-	-	0.243	
HCM Control Delay (s)	8.2	-	-	-	13.2	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.9	

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↗↖	↗↖	↗
Traffic Vol, veh/h	0	90	50	860	1300	200
Future Vol, veh/h	0	90	50	860	1300	200
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	300	-	-	250
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	0	98	54	935	1413	217

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	707	1630
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	2.22
Pot Cap-1 Maneuver	0	378	394
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	378	394
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	394	-	378	-	-
HCM Lane V/C Ratio	0.138	-	0.259	-	-
HCM Control Delay (s)	15.6	-	17.8	-	-
HCM Lane LOS	C	-	C	-	-
HCM 95th %tile Q(veh)	0.5	-	1	-	-



Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↑↑	↑↑	↗
Traffic Vol, veh/h	0	90	50	1450	1045	185
Future Vol, veh/h	0	90	50	1450	1045	185
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	300	-	-	250
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	0	98	54	1576	1136	201

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	568	1337
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	2.22
Pot Cap-1 Maneuver	0	466	512
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	466	512
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.8	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	512	-	466	-	-
HCM Lane V/C Ratio	0.106	-	0.21	-	-
HCM Control Delay (s)	12.9	-	14.8	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.8	-	-

HCM 6th TWSC  
9: Marksheffel Rd & CRN North Full Access

2040 Total AM.syn  
02/16/2021

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↑↑↑	↑↑↑	↗
Traffic Vol, veh/h	0	100	55	1260	1675	220
Future Vol, veh/h	0	100	55	1260	1675	220
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	300	-	-	250
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	0	109	60	1370	1821	239
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	911	2060	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	5.34	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	0	*514	556	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	-	*514	556	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.9	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	556	-	514	-	-	
HCM Lane V/C Ratio	0.108	-	0.211	-	-	
HCM Control Delay (s)	12.3	-	13.9	-	-	
HCM Lane LOS	B	-	B	-	-	
HCM 95th %tile Q(veh)	0.4	-	0.8	-	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon













Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↑↑↑	↑↑↑	↗
Traffic Vol, veh/h	0	100	80	2125	1760	310
Future Vol, veh/h	0	100	80	2125	1760	310
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	300	-	-	250
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	0	109	87	2310	1913	337
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	957	2250	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	5.34	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	0	*492	449	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	-	*492	449	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.4	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	449	-	492	-	-	
HCM Lane V/C Ratio	0.194	-	0.221	-	-	
HCM Control Delay (s)	14.9	-	14.4	-	-	
HCM Lane LOS	B	-	B	-	-	
HCM 95th %tile Q(veh)	0.7	-	0.8	-	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# Timings

2026 Total AM Improved.syn

## 10: Marksheffel Rd & Airl Lane (CRN South Full Access)

02/16/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	155	200	150	755	1290	100
Future Volume (vph)	155	200	150	755	1290	100
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.5	23.5	23.5	23.5
Total Split (s)	27.0	27.0	19.0	93.0	74.0	74.0
Total Split (%)	22.5%	22.5%	15.8%	77.5%	61.7%	61.7%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	16.5	16.5	93.0	93.0	78.4	78.4
Actuated g/C Ratio	0.14	0.14	0.78	0.78	0.65	0.65
v/c Ratio	0.69	0.54	0.55	0.31	0.62	0.10
Control Delay	63.6	11.5	20.8	4.5	19.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	11.5	20.8	4.5	19.1	3.8
LOS	E	B	C	A	B	A
Approach Delay	34.2			7.2	18.0	
Approach LOS	C			A	B	

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 16.5
Intersection Capacity Utilization 65.9%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service C













### Splits and Phases: 10: Marksheffel Rd & Airl Lane (CRN South Full Access)



HCM 6th Signalized Intersection Summary  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2026 Total AM Improved.syn

02/16/2021













						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	155	200	150	755	1290	100
Future Volume (veh/h)	155	200	150	755	1290	100
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1826	1826	1870
Adj Flow Rate, veh/h	168	217	163	821	1402	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	5	5	2
Cap, veh/h	276	245	296	2628	2305	1053
Arrive On Green	0.15	0.15	0.09	1.00	0.66	0.66
Sat Flow, veh/h	1781	1585	1781	3561	3561	1585
Grp Volume(v), veh/h	168	217	163	821	1402	109
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1735	1735	1585
Q Serve(g_s), s	10.6	16.1	3.5	0.0	27.3	3.0
Cycle Q Clear(g_c), s	10.6	16.1	3.5	0.0	27.3	3.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	276	245	296	2628	2305	1053
V/C Ratio(X)	0.61	0.88	0.55	0.31	0.61	0.10
Avail Cap(c_a), veh/h	327	291	412	2628	2305	1053
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.86	0.86	1.00	1.00
Uniform Delay (d), s/veh	47.3	49.7	10.8	0.0	11.3	7.3
Incr Delay (d2), s/veh	2.4	23.3	1.4	0.3	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	14.9	1.6	0.1	10.1	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.7	72.9	12.2	0.3	12.5	7.5
LnGrp LOS	D	E	B	A	B	A
Approach Vol, veh/h	385			984	1511	
Approach Delay, s/veh	62.8			2.2	12.2	
Approach LOS	E			A	B	
Timer - Assigned Phs	2		4		5	6
Phs Duration (G+Y+Rc), s	96.4		23.6		11.2	85.2
Change Period (Y+Rc), s	5.5		5.0		5.5	5.5
Max Green Setting (Gmax), s	87.5		22.0		13.5	68.5
Max Q Clear Time (g_c+l1), s	2.0		18.1		5.5	29.3
Green Ext Time (p_c), s	7.3		0.5		0.3	15.7
Intersection Summary						
HCM 6th Ctrl Delay			15.6			
HCM 6th LOS			B			

# Timings

2026 Total PM Improved.syn

## 10: Marksheffel Rd & Airl Lane (CRN South Full Access)

02/16/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	155	200	140	1345	1040	95
Future Volume (vph)	155	200	140	1345	1040	95
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.5	23.5	23.5	23.5
Total Split (s)	29.0	29.0	21.0	91.0	70.0	70.0
Total Split (%)	24.2%	24.2%	17.5%	75.8%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	16.6	16.6	92.9	92.9	79.2	79.2
Actuated g/C Ratio	0.14	0.14	0.77	0.77	0.66	0.66
v/c Ratio	0.69	0.53	0.41	0.54	0.49	0.10
Control Delay	63.1	10.7	10.8	15.3	19.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	10.7	10.8	15.3	19.5	5.7
LOS	E	B	B	B	B	A
Approach Delay	33.6			14.9	18.4	
Approach LOS	C			B	B	

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 18.4
Intersection Capacity Utilization 58.4%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service B

### Splits and Phases: 10: Marksheffel Rd & Airl Lane (CRN South Full Access)





HCM 6th Signalized Intersection Summary  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2026 Total PM Improved.syn

02/16/2021















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↕	↕	↰
Traffic Volume (veh/h)	155	200	140	1345	1040	95
Future Volume (veh/h)	155	200	140	1345	1040	95
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1870
Adj Flow Rate, veh/h	168	217	152	1462	1130	103
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	2
Cap, veh/h	278	247	369	2667	2350	1056
Arrive On Green	0.16	0.16	0.04	0.76	0.67	0.67
Sat Flow, veh/h	1781	1585	1781	3618	3618	1585
Grp Volume(v), veh/h	168	217	152	1462	1130	103
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1763	1763	1585
Q Serve(g_s), s	10.5	16.1	3.1	20.7	18.9	2.8
Cycle Q Clear(g_c), s	10.5	16.1	3.1	20.7	18.9	2.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	278	247	369	2667	2350	1056
V/C Ratio(X)	0.60	0.88	0.41	0.55	0.48	0.10
Avail Cap(c_a), veh/h	356	317	520	2667	2350	1056
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.51	0.51	1.00	1.00
Uniform Delay (d), s/veh	47.2	49.5	7.6	6.1	9.8	7.1
Incr Delay (d2), s/veh	2.1	19.4	0.4	0.4	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	14.7	1.1	6.7	7.1	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.3	68.9	8.0	6.5	10.5	7.3
LnGrp LOS	D	E	A	A	B	A
Approach Vol, veh/h	385			1614	1233	
Approach Delay, s/veh	60.3			6.6	10.3	
Approach LOS	E			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	96.3			23.7	10.8	85.5
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	85.5			24.0	15.5	64.5
Max Q Clear Time (g_c+l1), s	22.7			18.1	5.1	20.9
Green Ext Time (p_c), s	18.3			0.7	0.3	11.6
Intersection Summary						
HCM 6th Ctrl Delay			14.4			
HCM 6th LOS			B			

Timings  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2040 Total AM.syn

02/16/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	175	225	165	1145	1665	110
Future Volume (vph)	175	225	165	1145	1665	110
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.5	23.5	23.5	23.5
Total Split (s)	28.0	28.0	24.0	92.0	68.0	68.0
Total Split (%)	23.3%	23.3%	20.0%	76.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	17.8	17.8	91.7	91.7	73.9	73.9
Actuated g/C Ratio	0.15	0.15	0.76	0.76	0.62	0.62
v/c Ratio	0.73	0.55	0.65	0.33	0.60	0.12
Control Delay	64.3	10.3	29.0	10.9	14.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	10.3	29.0	10.9	14.4	4.1
LOS	E	B	C	B	B	A
Approach Delay	33.9			13.2	13.7	
Approach LOS	C			B	B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 15.8

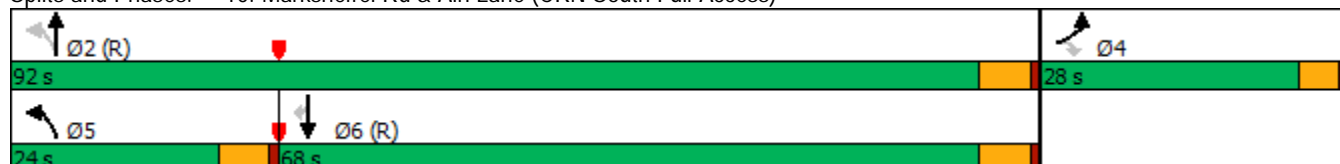
Intersection LOS: B

Intersection Capacity Utilization 64.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 10: Marksheffel Rd & Airl Lane (CRN South Full Access)









HCM 6th Signalized Intersection Summary  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2040 Total AM.syn













02/16/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	175	225	165	1145	1665	110
Future Volume (veh/h)	175	225	165	1145	1665	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1826	1826	1870
Adj Flow Rate, veh/h	190	245	179	1245	1810	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	5	5	2
Cap, veh/h	306	272	225	3692	3208	1020
Arrive On Green	0.17	0.17	0.03	0.50	0.21	0.21
Sat Flow, veh/h	1781	1585	1781	5149	5149	1585
Grp Volume(v), veh/h	190	245	179	1245	1810	120
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1662	1662	1585
Q Serve(g_s), s	11.9	18.2	3.8	18.1	39.0	7.3
Cycle Q Clear(g_c), s	11.9	18.2	3.8	18.1	39.0	7.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	306	272	225	3692	3208	1020
V/C Ratio(X)	0.62	0.90	0.80	0.34	0.56	0.12
Avail Cap(c_a), veh/h	341	304	408	3692	3208	1020
HCM Platoon Ratio	1.00	1.00	0.67	0.67	0.33	0.33
Upstream Filter(l)	1.00	1.00	0.81	0.81	1.00	1.00
Uniform Delay (d), s/veh	46.1	48.7	24.4	12.4	32.2	19.7
Incr Delay (d2), s/veh	2.9	26.1	5.2	0.2	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	16.9	3.8	7.5	17.6	2.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	48.9	74.8	29.6	12.6	32.9	20.0
LnGrp LOS	D	E	C	B	C	B
Approach Vol, veh/h	435			1424	1930	
Approach Delay, s/veh	63.5			14.7	32.1	
Approach LOS	E			B	C	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	94.4			25.6	11.7	82.7
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	86.5			23.0	18.5	62.5
Max Q Clear Time (g_c+l1), s	20.1			20.2	5.8	41.0
Green Ext Time (p_c), s	13.1			0.4	0.4	14.7
Intersection Summary						
HCM 6th Ctrl Delay			29.2			
HCM 6th LOS			C			

Timings  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2040 Total PM.syn  
02/16/2021

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	175	225	235	2030	1705	155
Future Volume (vph)	175	225	235	2030	1705	155
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.5	23.5	23.5	23.5
Total Split (s)	26.0	26.0	29.3	94.0	64.7	64.7
Total Split (%)	21.7%	21.7%	24.4%	78.3%	53.9%	53.9%
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	17.4	17.4	92.1	92.1	69.7	69.7
Actuated g/C Ratio	0.14	0.14	0.77	0.77	0.58	0.58
v/c Ratio	0.74	0.56	0.78	0.57	0.63	0.17
Control Delay	66.4	10.6	46.2	3.2	23.7	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	10.6	46.2	3.2	23.7	8.1
LOS	E	B	D	A	C	A
Approach Delay	35.0			7.7	22.4	
Approach LOS	D			A	C	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 16.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.0%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 10: Marksheffel Rd & Airl Lane (CRN South Full Access)









HCM 6th Signalized Intersection Summary  
10: Marksheffel Rd & Airl Lane (CRN South Full Access)

2040 Total PM.syn

02/16/2021



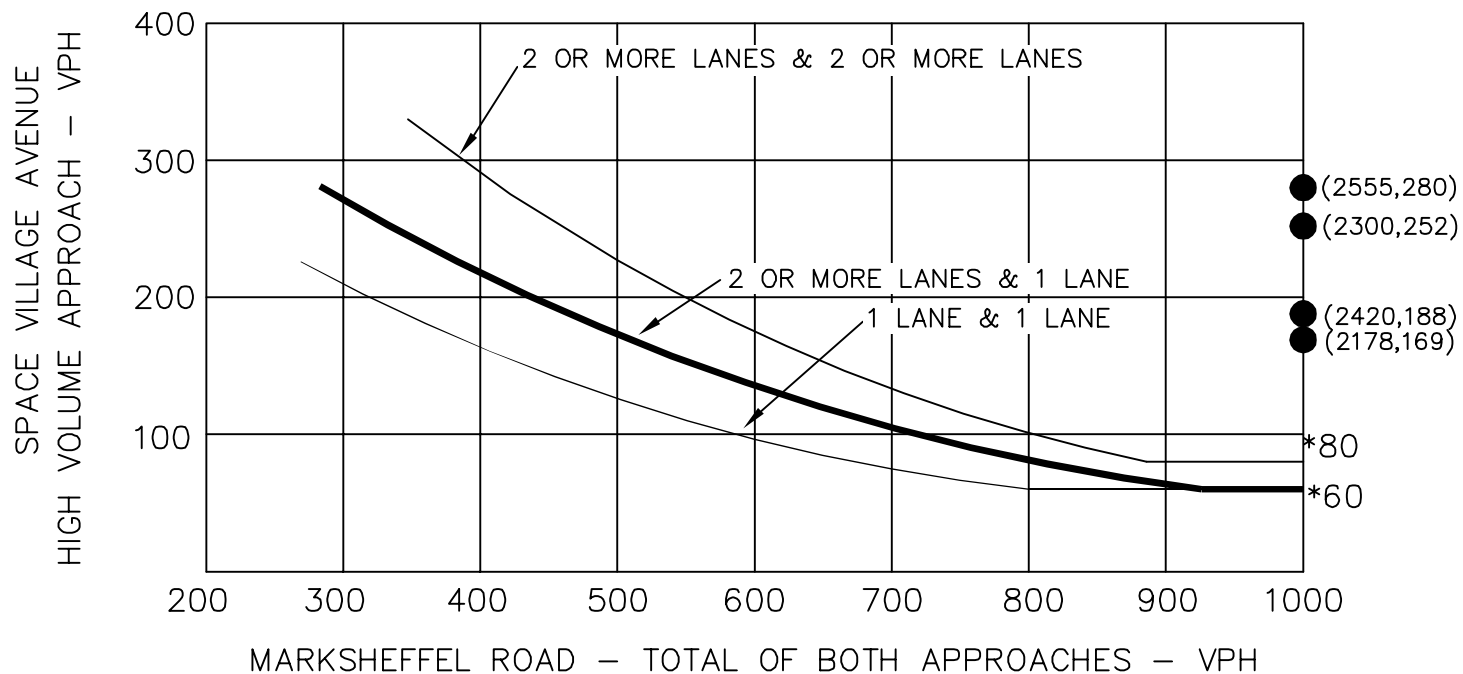
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	175	225	235	2030	1705	155
Future Volume (veh/h)	175	225	235	2030	1705	155
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1870
Adj Flow Rate, veh/h	190	245	255	2207	1853	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	2
Cap, veh/h	302	269	288	3763	3043	952
Arrive On Green	0.17	0.17	0.10	0.74	0.20	0.20
Sat Flow, veh/h	1781	1585	1781	5233	5233	1585
Grp Volume(v), veh/h	190	245	255	2207	1853	168
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1689	1689	1585
Q Serve(g_s), s	11.9	18.2	9.0	23.8	40.0	10.6
Cycle Q Clear(g_c), s	11.9	18.2	9.0	23.8	40.0	10.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	302	269	288	3763	3043	952
V/C Ratio(X)	0.63	0.91	0.89	0.59	0.61	0.18
Avail Cap(c_a), veh/h	312	277	470	3763	3043	952
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(l)	1.00	1.00	0.29	0.29	1.00	1.00
Uniform Delay (d), s/veh	46.3	48.9	31.8	7.0	35.3	23.4
Incr Delay (d2), s/veh	3.8	31.4	3.7	0.2	0.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	17.3	7.8	7.5	18.4	4.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.1	80.3	35.5	7.2	36.2	23.9
LnGrp LOS	D	F	D	A	D	C
Approach Vol, veh/h	435			2462	2021	
Approach Delay, s/veh	67.1			10.2	35.2	
Approach LOS	E			B	D	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	94.6			25.4	17.1	77.6
Change Period (Y+Rc), s	5.5			5.0	5.5	5.5
Max Green Setting (Gmax), s	88.5			21.0	23.8	59.2
Max Q Clear Time (g_c+l1), s	25.8			20.2	11.0	42.0
Green Ext Time (p_c), s	35.7			0.1	0.6	12.7
Intersection Summary						
HCM 6th Ctrl Delay			25.5			
HCM 6th LOS			C			

# APPENDIX E

Signal Warrant Analysis

Signal Clearance Intervals

**WARRANT 2 - FOUR HOUR VEHICULAR VOLUME (70% FACTOR)**  
 (COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



SPACE VILLAGE AVENUE AND  
 MARKSHEFFEL ROAD  
 SIGNAL WARRANT ANALYSIS  
 FOUR HOUR VOLUME WARRANT

\* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

● 2026 TOTAL TRAFFIC DATA POINT WITH PROJECT

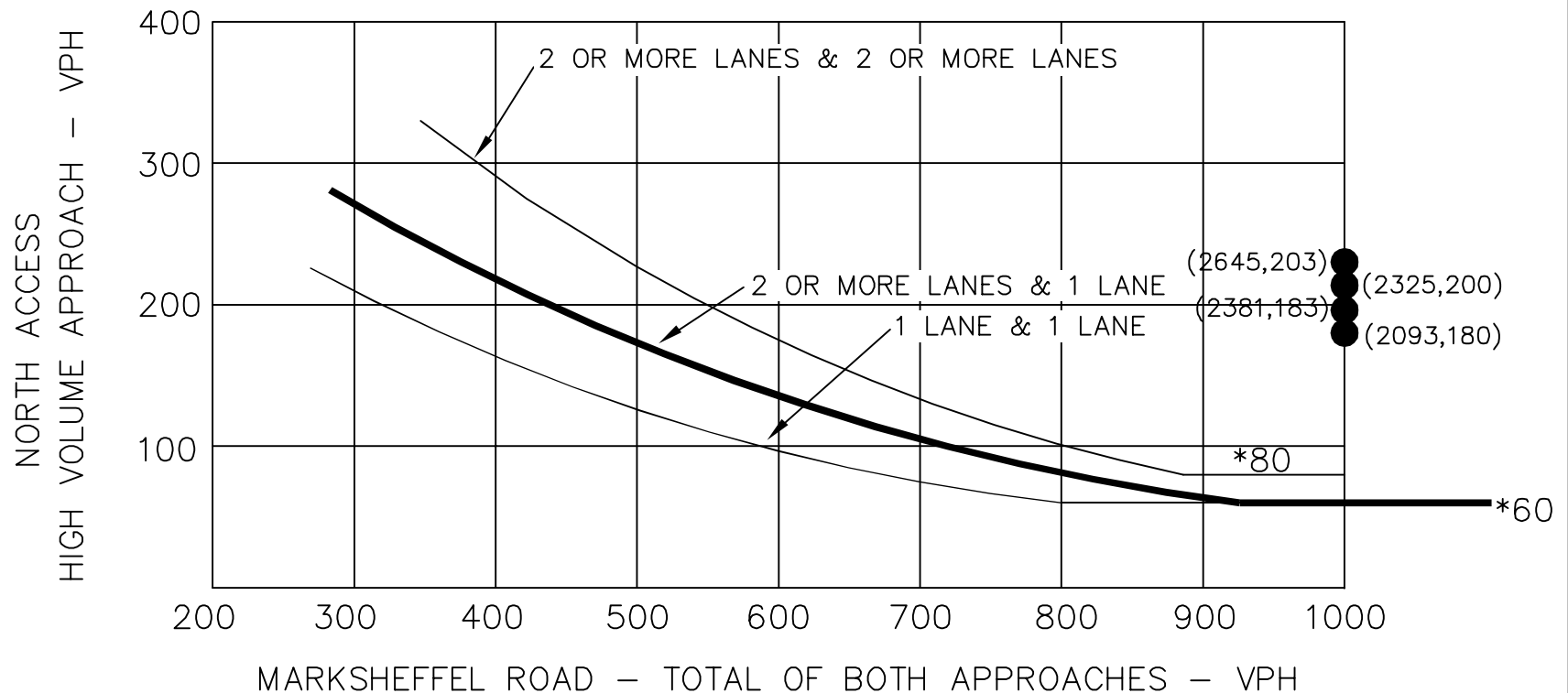
Source: Manual of Uniform Traffic Control Devices 2009

**Kimley»Horn**



## WARRANT 2 - FOUR HOUR VEHICULAR VOLUME (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



MARKSHEFFEL ROAD  
NORTH ACCESS  
SIGNAL WARRANT ANALYSIS  
FOUR HOUR VOLUME WARRANT

\* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

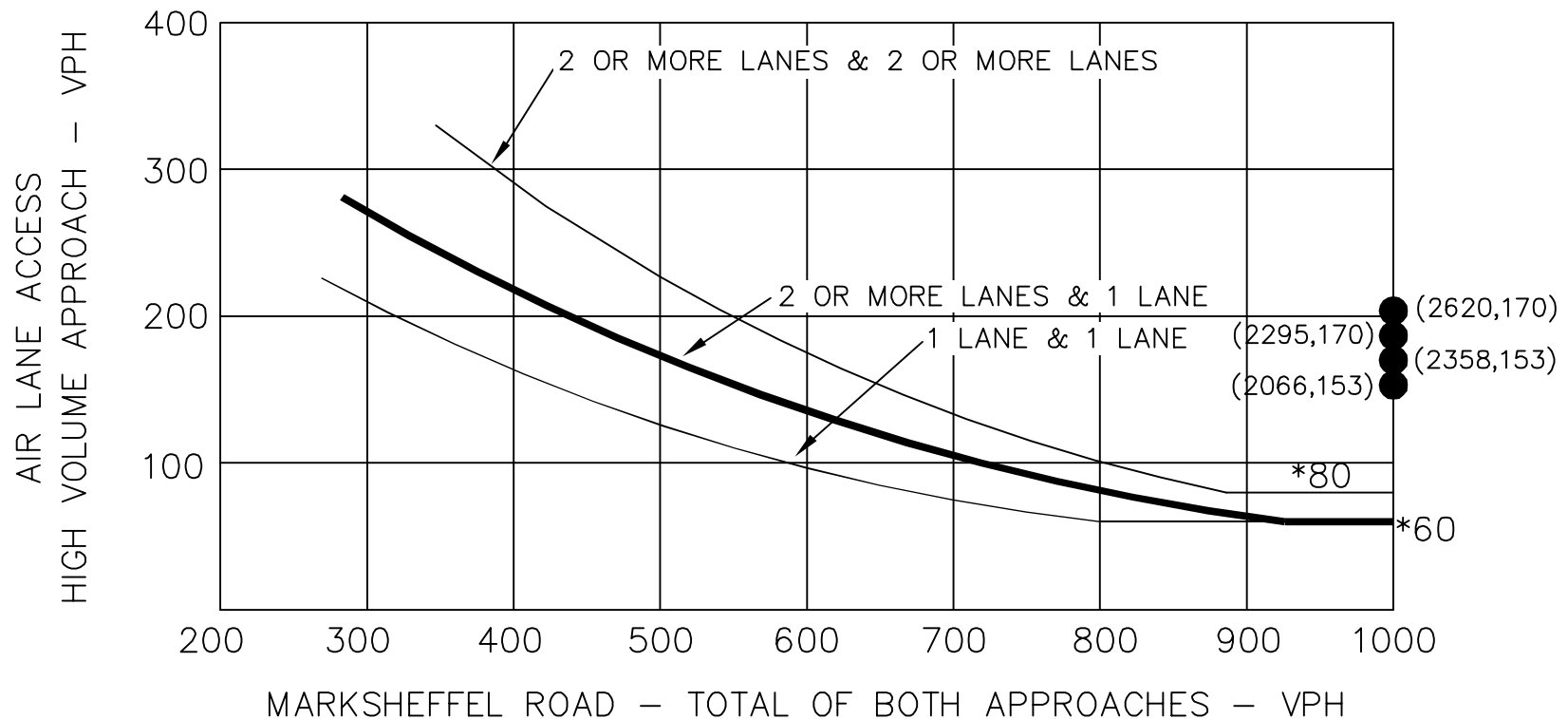
● 2026 TOTAL TRAFFIC DATA POINT WITH PROJECT

Source: Manual of Uniform Traffic Control Devices 2009

**Kimley»Horn**

## WARRANT 2 - FOUR HOUR VEHICULAR VOLUME (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



MARKSHEFFEL ROAD  
AND AIR LANE ACCESS  
SIGNAL WARRANT ANALYSIS  
FOUR HOUR VOLUME WARRANT

\* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

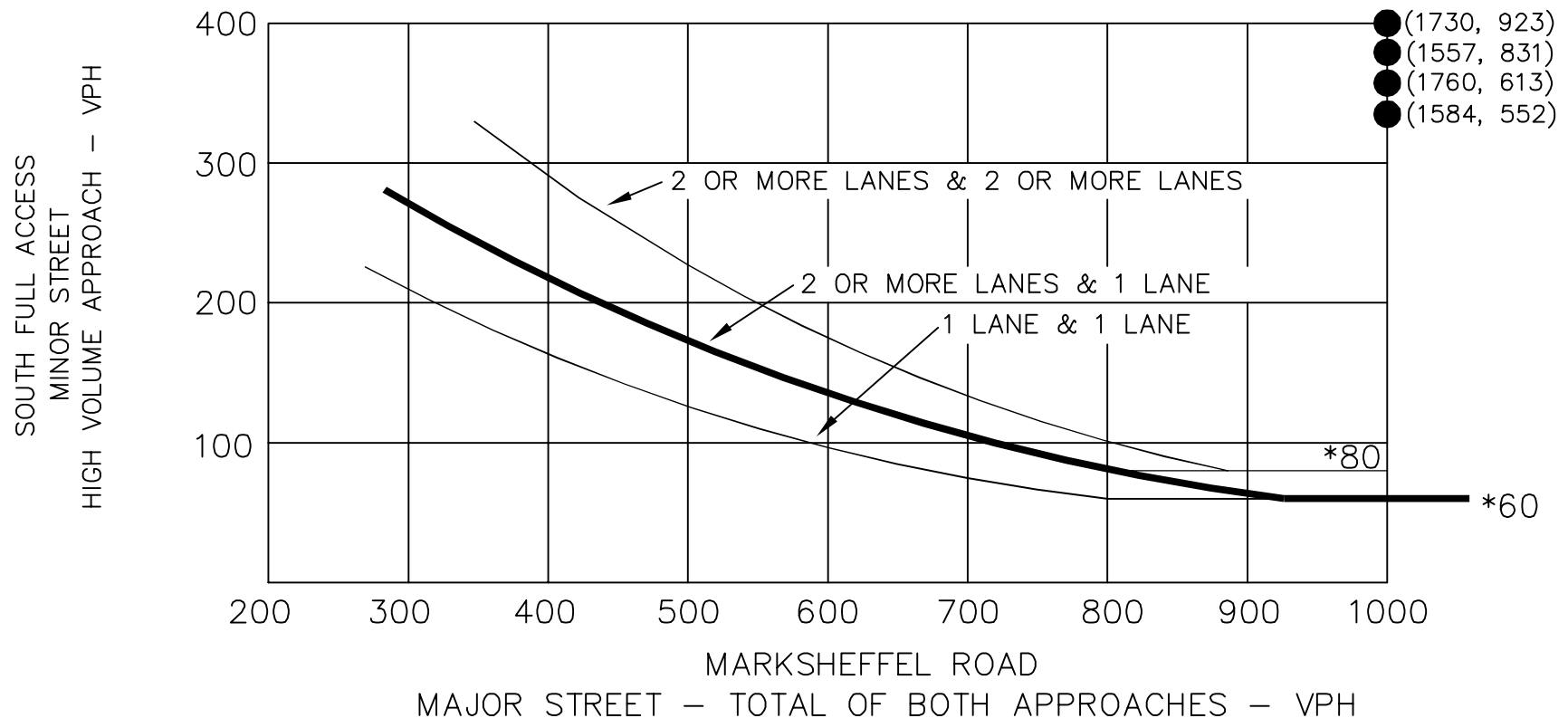
● 2026 TOTAL TRAFFIC DATA POINT WITH PROJECT

Source: Manual of Uniform Traffic Control Devices 2009

**Kimley»Horn**

## WARRANT 2 - FOUR HOUR VEHICULAR VOLUME (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



\* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

MARKSHEFFEL RD SOUTH FULL ACCESS

CROSSROADS–MEADOWBROOK

FOUR HOUR VOLUME WARRANT

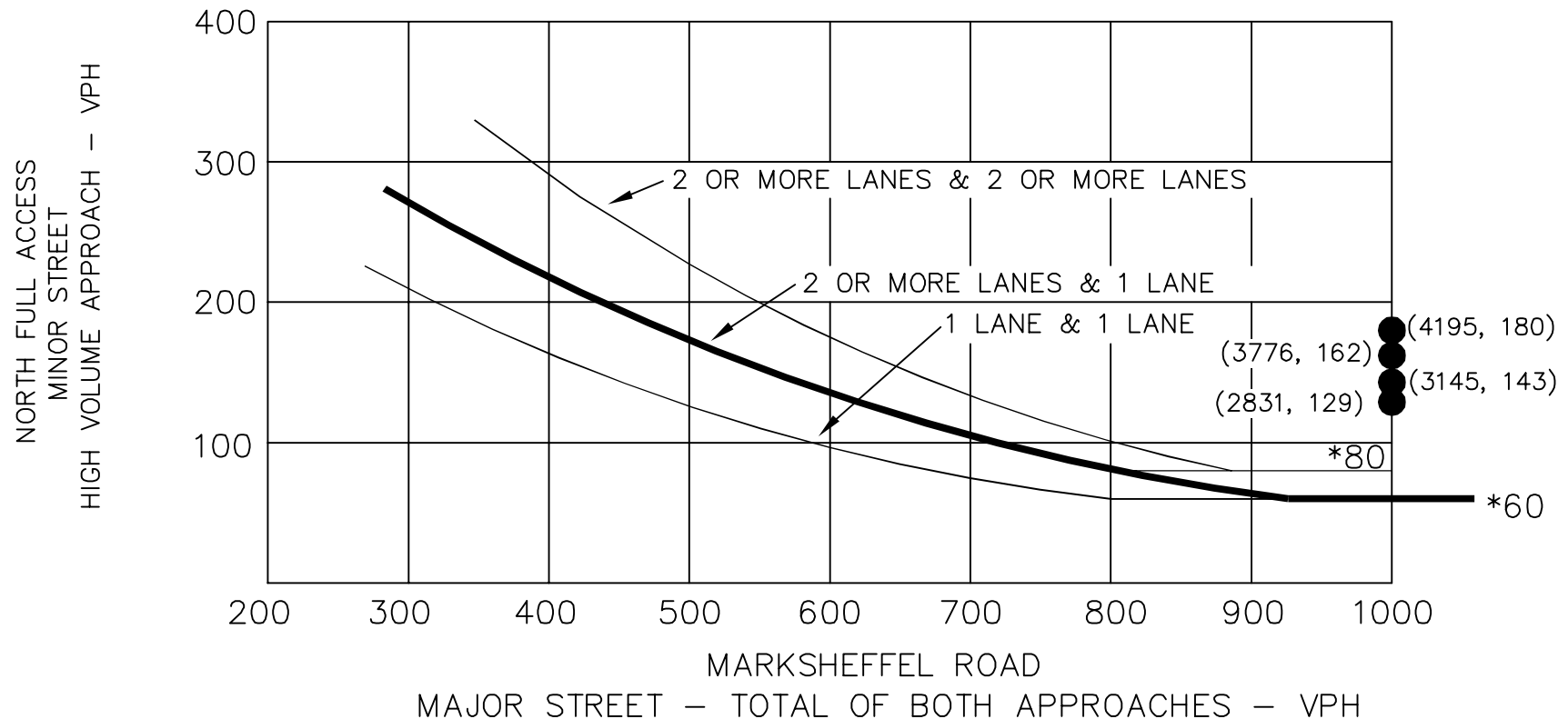
● 2026 Peak Hour Traffic Volume Projections

Source: Manual of Uniform Traffic Control Devices 2009

**Kimley»Horn**

## WARRANT 2 - FOUR HOUR VEHICULAR VOLUME (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



\* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

MARKSHEFFEL RD NORTH FULL ACCESS

CROSSROADS–MEADOWBROOK

FOUR HOUR VOLUME WARRANT

● 2040 Peak Hour Traffic Volume Projections

Source: Manual of Uniform Traffic Control Devices 2009

**Kimley»Horn**

Crossroads-Meadowbrook-Reagan Ranch Signal Clearance Calculations

Signal Clearance Intervals				
Approach	Intersection	Yellow Time	All Red Time	Total
EB	Meadowbrook Pkwy and Marksheffel Rd (#1)	3.573	1.458	5.030
WB		2.838	2.503	5.341
NB		5.043	1.484	6.527
SB		5.043	1.484	6.527
EB	US-24 and Marksheffel Rd (#2)	4.675	1.265	5.940
WB		5.043	1.707	6.749
NB		5.778	1.528	7.305
SB		5.778	1.706	7.483
EB	SH-94 and US-24 (#4)	2.838	3.020	5.858
WB		3.940	2.245	6.185
NB		5.043	1.868	6.910
SB		5.778	2.009	7.787
EB	SH-94 and Marksheffel Rd (#5)	5.043	1.237	6.279
WB		5.043	1.237	6.279
NB		5.043	1.459	6.502
SB		4.675	1.578	6.253

Input Parameters	
Speed Limit (mph)	Intersection Width (feet)
35	55
25	72
55	100
55	100
50	73
55	118
65	126
65	143
25	91
40	112
55	131
65	172
55	80
55	80
55	98
50	96

# APPENDIX F

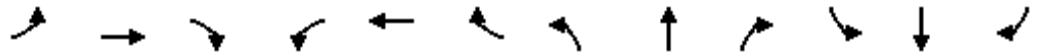
## Queueing Analysis Worksheets

## Queues

2026 Total AM Improved.syn

02/15/2021

## 1: Marksheffel Rd &amp; Meadowbrook Parkway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	281	10	42	42	26	31	31	1135	21	10	1828	349
v/c Ratio	1.33	0.07	0.22	0.28	0.23	0.18	0.28	0.45	0.02	0.03	0.72	0.29
Control Delay	218.3	51.2	3.9	46.9	58.1	2.3	23.8	16.8	1.8	5.2	10.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	218.3	51.2	3.9	46.9	58.1	2.3	23.8	16.8	1.8	5.2	10.9	1.4
Queue Length 50th (ft)	~145	7	0	28	20	0	17	359	0	2	376	5
Queue Length 95th (ft)	#235	25	6	60	49	0	m23	441	m0	7	498	31
Internal Link Dist (ft)		823			893			1023			636	
Turn Bay Length (ft)	200		150	250		200	425			350		350
Base Capacity (vph)	212	554	526	152	558	532	110	2529	1149	302	2553	1223
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.33	0.02	0.08	0.28	0.05	0.06	0.28	0.45	0.02	0.03	0.72	0.29

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.















## Queues

2026 Total PM Improved.syn

## 1: Marksheffel Rd &amp; Meadowbrook Parkway

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	317	16	59	27	16	43	54	1973	86	48	1441	290
v/c Ratio	1.23	0.08	0.25	0.19	0.16	0.26	0.26	0.75	0.07	0.59	0.56	0.24
Control Delay	179.8	50.8	7.8	44.7	56.9	5.5	11.8	19.3	4.0	43.2	8.1	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	179.8	50.8	7.8	44.7	56.9	5.5	11.8	19.3	4.0	43.2	8.1	1.1
Queue Length 50th (ft)	~156	12	0	18	12	0	21	587	9	16	238	0
Queue Length 95th (ft)	#249	34	24	44	35	7	m16	m605	m11	#96	308	23
Internal Link Dist (ft)		823			893			1023			636	
Turn Bay Length (ft)	200		150	250		200	425			350		350
Base Capacity (vph)	257	613	576	145	558	532	206	2641	1200	82	2591	1232
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.03	0.10	0.19	0.03	0.08	0.26	0.75	0.07	0.59	0.56	0.24

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total AM.syn

02/15/2021

## 1: Marksheffel Rd &amp; Meadowbrook Parkway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	313	10	47	52	26	36	36	1557	26	16	2276	396
v/c Ratio	1.32	0.06	0.23	0.34	0.23	0.21	0.60	0.62	0.02	0.10	0.90	0.33
Control Delay	211.4	50.0	5.2	48.3	58.1	2.7	62.7	29.0	3.5	6.9	19.7	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	211.4	50.0	5.2	48.3	58.1	2.7	62.7	29.0	3.5	6.9	19.7	2.4
Queue Length 50th (ft)	~160	7	0	35	20	0	24	557	1	3	680	22
Queue Length 95th (ft)	#254	24	11	70	49	0	m33	630	m1	12	#965	55
Internal Link Dist (ft)		823			893			1023			636	
Turn Bay Length (ft)	200		150	250		200	425			350		350
Base Capacity (vph)	238	568	538	152	558	532	60	2501	1137	167	2525	1204
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.02	0.09	0.34	0.05	0.07	0.60	0.62	0.02	0.10	0.90	0.33

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total PM.syn

02/15/2021

## 1: Marksheffel Rd &amp; Meadowbrook Parkway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	382	16	70	27	22	48	59	2710	102	59	2215	339
v/c Ratio	1.49	0.08	0.29	0.18	0.20	0.28	0.94	1.03	0.09	0.95	0.86	0.28
Control Delay	276.8	50.3	11.4	44.1	57.6	7.4	94.0	49.8	4.6	127.2	16.5	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	276.8	50.3	11.4	44.1	57.6	7.4	94.0	49.8	4.6	127.2	16.5	2.1
Queue Length 50th (ft)	~210	12	0	18	17	0	36	~957	12	37	600	17
Queue Length 95th (ft)	#310	34	36	44	44	13	m#57	m#1287	m15	#92	796	47
Internal Link Dist (ft)		823			893			1023			636	
Turn Bay Length (ft)	200		150	250		200	425			350		350
Base Capacity (vph)	257	613	576	149	558	532	63	2631	1195	62	2580	1219
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.49	0.03	0.12	0.18	0.04	0.09	0.94	1.03	0.09	0.95	0.86	0.28

## Intersection Summary













- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total AM Improved.syn

## 2: Marksheffel Rd &amp; US-24

02/17/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	375	573	130	365	1266	21	5	786	109	10	1068	792
v/c Ratio	0.71	0.48	0.09	0.72	1.04	0.01	0.06	0.73	0.07	0.12	1.00	0.52
Control Delay	42.6	45.9	0.1	56.4	75.7	0.0	43.0	29.1	0.1	48.7	57.6	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	45.9	0.1	56.4	75.7	0.0	43.0	29.1	0.1	48.7	57.6	0.9
Queue Length 50th (ft)	141	239	0	140	~550	0	4	278	0	8	~438	0
Queue Length 95th (ft)	#260	311	0	184	#738	0	m13	124	0	m11	#585	0
Internal Link Dist (ft)		1511			2597			1201			1023	
Turn Bay Length (ft)	1000		575	1000		700	300		375	375		
Base Capacity (vph)	526	1189	1455	673	1216	1553	87	1109	1568	80	1065	1524
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.48	0.09	0.54	1.04	0.01	0.06	0.71	0.07	0.13	1.00	0.52

## Intersection Summary













- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total PM Improved.syn

## 2: Marksheffel Rd &amp; US-24

02/17/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	684	1224	128	214	597	20	15	1214	250	20	934	520
v/c Ratio	0.85	0.95	0.08	0.69	0.76	0.01	0.18	0.98	0.16	0.27	0.75	0.33
Control Delay	36.7	51.8	0.1	65.7	52.3	0.0	52.9	55.6	0.2	57.6	31.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	51.8	0.1	65.7	52.3	0.0	52.9	55.6	0.2	57.6	31.6	0.5
Queue Length 50th (ft)	261	536	0	81	220	0	10	375	0	16	333	0
Queue Length 95th (ft)	355	#690	m0	#164	#406	0	m21	#627	0	m29	418	0
Internal Link Dist (ft)		1511			2597			1201			1023	
Turn Bay Length (ft)	1000		575	1000		700	300		375	375		
Base Capacity (vph)	886	1293	1583	309	782	1568	84	1238	1583	73	1243	1568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.95	0.08	0.69	0.76	0.01	0.18	0.98	0.16	0.27	0.75	0.33

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.













m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total AM.syn

## 2: Marksheffel Rd &amp; US-24

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	443	672	146	453	1484	26	5	1146	167	16	1385	927
v/c Ratio	0.84	0.42	0.25	0.78	0.86	0.04	0.07	0.79	0.11	0.22	0.91	0.61
Control Delay	51.2	45.9	25.9	57.4	43.3	0.1	37.6	25.3	0.1	49.5	36.1	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	45.9	25.9	57.4	43.3	0.1	37.6	25.3	0.1	49.5	36.1	1.2
Queue Length 50th (ft)	167	189	39	173	389	0	4	319	0	12	352	0
Queue Length 95th (ft)	#284	248	126	227	#512	0	m12	111	0	m14	m#482	m0
Internal Link Dist (ft)	1511			2597			1917			1023		
Turn Bay Length (ft)	1000		575	1000		700	300		375	375		
Base Capacity (vph)	530	1597	589	659	1726	629	73	1468	1568	74	1529	1524
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.42	0.25	0.69	0.86	0.04	0.07	0.78	0.11	0.22	0.91	0.61

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	801	1444	209	332	704	20	20	1801	352	26	1592	612
v/c Ratio	0.91	0.93	0.36	0.83	0.84	0.05	0.27	0.98	0.22	0.36	0.82	0.39
Control Delay	33.5	47.7	21.8	69.9	58.6	0.2	59.9	45.3	0.3	53.6	28.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	47.7	21.8	69.9	58.6	0.2	59.9	45.3	0.3	53.6	28.5	0.4
Queue Length 50th (ft)	~339	440	104	~140	197	0	16	523	0	20	259	0
Queue Length 95th (ft)	m#423	m#519	m139	#235	#265	0	m29	#599	0	m24	447	m0
Internal Link Dist (ft)		1511			2597			1917			1023	
Turn Bay Length (ft)	1000		575	1000		700	300		375	375		
Base Capacity (vph)	876	1546	579	402	841	428	75	1843	1583	73	1938	1568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.93	0.36	0.83	0.84	0.05	0.27	0.98	0.22	0.36	0.82	0.39

## Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.















## Queues

2026 Total AM Improved.syn

## 4: US-24 &amp; Newt Dr/SH-94

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	93	510	845	98	5	438	1015	655	5	1918	67
v/c Ratio	0.26	0.54	0.33	0.96	0.12	0.00	2.37	0.39	0.45	0.02	0.86	0.08
Control Delay	58.5	62.4	0.6	60.1	29.2	0.0	656.5	17.2	1.0	12.4	36.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	62.4	0.6	60.1	29.2	0.0	656.5	17.2	1.0	12.4	36.4	1.1
Queue Length 50th (ft)	18	70	0	207	29	0	-286	149	0	1	366	0
Queue Length 95th (ft)	38	121	0	#314	48	m0	#391	249	0	m2	m387	m2
Internal Link Dist (ft)		543			2360			1172			881	
Turn Bay Length (ft)	375			475		475	900		600	800		800
Base Capacity (vph)	180	286	1538	876	984	1553	185	2589	1468	264	2222	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.33	0.33	0.96	0.10	0.00	2.37	0.39	0.45	0.02	0.86	0.08

## Intersection Summary













- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total PM Improved.syn

## 4: US-24 &amp; Newt Dr/SH-94

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	58	84	474	779	68	11	416	2026	658	5	1053	63
v/c Ratio	0.34	0.51	0.30	0.94	0.09	0.01	0.84	0.68	0.42	0.03	0.53	0.08
Control Delay	60.9	61.9	0.5	75.6	34.4	0.0	65.9	20.5	0.8	14.2	39.4	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	61.9	0.5	75.6	34.4	0.0	65.9	20.5	0.8	14.2	39.4	1.4
Queue Length 50th (ft)	22	63	0	209	18	0	162	372	0	1	191	0
Queue Length 95th (ft)	45	112	0	#290	m30	m0	#236	589	0	m3	329	m7
Internal Link Dist (ft)		543			2360			1172			881	
Turn Bay Length (ft)	375			475		475	900		600	800		800
Base Capacity (vph)	171	294	1583	831	963	1568	510	2958	1568	149	1998	776
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.29	0.30	0.94	0.07	0.01	0.82	0.68	0.42	0.03	0.53	0.08

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	98	572	1191	108	5	495	1186	881	10	2258	82
v/c Ratio	0.35	0.55	0.37	1.72	0.15	0.00	2.68	0.43	0.60	0.04	0.94	0.10
Control Delay	61.2	62.7	0.7	360.2	44.2	0.0	791.2	15.5	1.8	6.9	31.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.2	62.7	0.7	360.2	44.2	0.0	791.2	15.5	1.8	6.9	31.8	1.1
Queue Length 50th (ft)	22	74	0	~493	42	0	~334	166	0	2	346	1
Queue Length 95th (ft)	45	126	0	#587	m64	m0	#442	279	0	m2	#741	m4
Internal Link Dist (ft)		543			2360			1172			881	
Turn Bay Length (ft)	375			475		475	900		600	800		800
Base Capacity (vph)	166	286	1538	693	867	1553	185	2758	1468	234	2393	845
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.34	0.37	1.72	0.12	0.00	2.68	0.43	0.60	0.04	0.94	0.10

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total PM.syn

## 4: US-24 &amp; Newt Dr/SH-94

02/15/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	100	563	1221	84	11	495	2447	1226	11	1242	79
v/c Ratio	0.40	0.55	0.36	1.29	0.09	0.01	1.00	0.91	0.78	0.07	0.71	0.11
Control Delay	62.5	62.2	0.6	180.0	20.0	0.0	91.9	32.1	4.0	16.2	60.1	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	62.2	0.6	180.0	20.0	0.0	91.9	32.1	4.0	16.2	60.1	2.9
Queue Length 50th (ft)	26	75	0	~440	21	0	200	572	0	4	360	3
Queue Length 95th (ft)	51	128	0	m#517	m23	m0	#313	#920	0	m7	409	m13
Internal Link Dist (ft)		543			2360			1172			881	
Turn Bay Length (ft)	375			475		475	900		600	800		800
Base Capacity (vph)	171	294	1583	947	1051	1568	495	2695	1568	150	1739	709
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.34	0.36	1.29	0.08	0.01	1.00	0.91	0.78	0.07	0.71	0.11

## Intersection Summary













- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total AM Improved.syn

## 5: Marksheffel Rd &amp; SH-94

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	326	174	38	375	125	207	511	27	326	755	266
v/c Ratio	1.07	0.63	0.31	0.20	0.71	0.22	0.54	0.37	0.02	0.60	0.47	0.17
Control Delay	127.2	36.3	3.3	30.5	44.2	3.3	22.8	24.9	0.0	22.6	23.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.2	36.3	3.3	30.5	44.2	3.3	22.8	24.9	0.0	22.6	23.3	0.2
Queue Length 50th (ft)	~136	182	0	22	253	0	41	151	0	103	162	0
Queue Length 95th (ft)	#250	237	29	47	327	26	#127	246	0	210	275	0
Internal Link Dist (ft)	2360			2852			463			968		
Turn Bay Length (ft)	300		250	225		250	375		400	400		400
Base Capacity (vph)	192	659	669	243	672	665	390	1378	1538	663	1611	1568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.49	0.26	0.16	0.56	0.19	0.53	0.37	0.02	0.49	0.47	0.17

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.













Queue shown is maximum after two cycles.

## Queues

2026 Total PM Improved.syn

## 5: Marksheffel Rd &amp; SH-94

02/18/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	362	282	48	431	420	239	1170	32	213	899	271
v/c Ratio	1.08	0.63	0.45	0.25	0.75	0.69	0.78	0.79	0.02	0.80	0.56	0.17
Control Delay	133.6	36.7	9.0	32.8	45.1	25.8	32.9	28.1	0.0	50.5	14.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.6	36.7	9.0	32.8	45.1	25.8	32.9	28.1	0.0	50.5	14.3	0.2
Queue Length 50th (ft)	116	237	28	26	285	158	51	442	0	101	191	0
Queue Length 95th (ft)	#256	339	90	60	404	275	#157	538	m0	#207	210	0
Internal Link Dist (ft)	2360			2852			463			968		
Turn Bay Length (ft)	300		250	225		250	375		400	400		400
Base Capacity (vph)	151	630	666	208	630	652	306	1477	1583	283	1611	1553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.57	0.42	0.23	0.68	0.64	0.78	0.79	0.02	0.75	0.56	0.17

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.












m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total AM.syn

## 5: Marksheffel Rd &amp; SH-94

02/18/2021

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	179	380	337	43	440	147	467	913	386	1060	299
v/c Ratio	0.90	0.40	0.51	0.19	0.45	0.27	0.82	0.54	0.76	0.55	0.19
Control Delay	73.2	30.9	3.8	31.1	35.7	5.4	65.3	29.3	47.5	24.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	30.9	3.8	31.1	35.7	5.4	65.3	29.3	47.5	24.6	0.2
Queue Length 50th (ft)	112	107	0	24	142	0	139	258	206	131	0
Queue Length 95th (ft)	#239	137	38	52	178	42	188	319	314	226	0
Internal Link Dist (ft)	2360			2852			463			968	
Turn Bay Length (ft)	300		250	225		250	375		400		400
Base Capacity (vph)	245	1170	742	284	1192	630	625	1700	562	1939	1568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.32	0.45	0.15	0.37	0.23	0.75	0.54	0.69	0.55	0.19

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



## Queues

2040 Total PM.syn

## 5: Marksheffel Rd &amp; SH-94

02/18/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	426	707	53	505	511	601	1899	245	1574	303
v/c Ratio	1.02	0.49	0.81	0.21	0.77	0.74	0.78	0.94	0.84	1.04	0.20
Control Delay	89.7	43.2	23.0	29.3	54.3	28.6	45.7	57.6	58.2	84.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.7	43.2	23.0	29.3	54.3	28.6	45.7	57.6	58.2	84.7	0.2
Queue Length 50th (ft)	~157	154	327	28	195	229	249	489	166	~499	0
Queue Length 95th (ft)	m#227	m197	439	56	248	371	m260	m500	#338	#643	0
Internal Link Dist (ft)		2360			2852			463		968	
Turn Bay Length (ft)	300		250	225		250	375		400		400
Base Capacity (vph)	246	935	904	256	774	689	849	2010	292	1514	1553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.46	0.78	0.21	0.65	0.74	0.71	0.94	0.84	1.04	0.20

## Intersection Summary













- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total AM Improved.syn

## 7: Marksheffel Rd &amp; Space Village Ave

02/15/2021













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	43	87	147	49	82	43	353	837	33	76	1190	141
v/c Ratio	0.36	0.51	0.53	0.41	0.48	0.18	0.73	0.33	0.03	0.16	0.58	0.14
Control Delay	58.1	61.5	15.0	60.4	60.3	1.6	20.8	6.9	0.2	6.1	20.2	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	61.5	15.0	60.4	60.3	1.6	20.8	6.9	0.2	6.1	20.2	5.9
Queue Length 50th (ft)	32	65	0	36	61	0	90	113	0	10	240	8
Queue Length 95th (ft)	67	114	60	75	110	0	199	173	2	33	381	41
Internal Link Dist (ft)	805				708				537			
Turn Bay Length (ft)	225		250	300		200	400		425	425		425
Base Capacity (vph)	191	271	355	190	271	323	602	2514	1143	464	2049	973
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.32	0.41	0.26	0.30	0.13	0.59	0.33	0.03	0.16	0.58	0.14
Intersection Summary												

## Queues

2026 Total PM Improved.syn

## 7: Marksheffel Rd &amp; Space Village Ave

02/15/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	59	97	290	86	86	32	263	1360	48	97	952	27
v/c Ratio	0.41	0.47	0.69	0.61	0.42	0.11	0.56	0.57	0.04	0.33	0.42	0.03
Control Delay	56.5	56.3	15.9	67.5	54.5	0.7	8.6	12.0	0.6	12.7	24.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	56.3	15.9	67.5	54.5	0.7	8.6	12.0	0.6	12.7	24.4	0.2
Queue Length 50th (ft)	43	72	10	65	63	0	42	262	0	44	302	0
Queue Length 95th (ft)	83	121	93	114	110	0	82	394	5	75	396	m0
Internal Link Dist (ft)		805			708			537			546	
Turn Bay Length (ft)	225		250	300		200	400		425	425		425
Base Capacity (vph)	258	369	534	255	369	422	578	2380	1091	321	2276	1066
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.26	0.54	0.34	0.23	0.08	0.46	0.57	0.04	0.30	0.42	0.03

## Intersection Summary

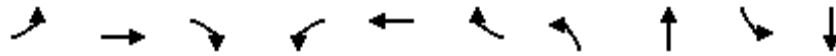
m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total AM.syn

## 7: Marksheffel Rd &amp; Space Village Ave

02/15/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	125	196	82	147	76	462	1511	114	1815
v/c Ratio	0.28	0.57	0.55	0.39	0.67	0.24	0.94	0.50	0.47	0.87
Control Delay	41.2	59.8	12.5	44.8	65.5	1.8	55.7	25.2	21.0	53.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	59.8	12.5	44.8	65.5	1.8	55.7	25.2	21.0	53.1
Queue Length 50th (ft)	34	92	0	52	110	0	313	296	54	534
Queue Length 95th (ft)	68	153	67	95	176	0	#523	474	104	#626
Internal Link Dist (ft)		805			708			537		546
Turn Bay Length (ft)	225		250	300		200	400		425	
Base Capacity (vph)	190	271	397	208	271	358	507	2995	274	2085
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.46	0.49	0.39	0.54	0.21	0.91	0.50	0.42	0.87

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

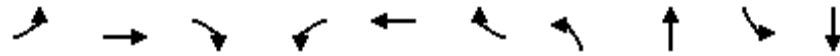
Queue shown is maximum after two cycles.

## Queues

2040 Total PM.syn

## 7: Marksheffel Rd &amp; Space Village Ave

02/15/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	140	210	398	194	242	54	355	2376	269	1898
v/c Ratio	0.78	0.81	0.93	0.92	0.81	0.15	0.96	0.99	0.95	0.88
Control Delay	68.1	73.0	48.8	83.5	69.9	0.9	51.9	63.5	55.0	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	73.0	48.8	83.5	69.9	0.9	51.9	63.5	55.0	28.9
Queue Length 50th (ft)	87	158	126	124	181	0	224	~723	176	300
Queue Length 95th (ft)	#178	#272	#314	#204	#302	0	m#308	#819	m175	m296
Internal Link Dist (ft)		805			708			537		546
Turn Bay Length (ft)	225		250	300		200	400		425	
Base Capacity (vph)	179	276	440	212	313	368	369	2395	284	2158
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.76	0.90	0.92	0.77	0.15	0.96	0.99	0.95	0.88

## Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## 9: Marksheffel Rd &amp; CRN North Full Access

02/16/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	98	98	54	842	1413	217
v/c Ratio	0.55	0.40	0.18	0.30	0.56	0.18
Control Delay	62.7	14.2	6.6	5.7	25.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	14.2	6.6	5.7	25.0	8.9
Queue Length 50th (ft)	74	0	5	44	493	65
Queue Length 95th (ft)	125	50	35	205	m523	m83
Internal Link Dist (ft)	495			910	636	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	368	407	293	2793	2520	1218
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.24	0.18	0.30	0.56	0.18

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## 9: Marksheffel Rd &amp; CRN North Full Access

02/16/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	98	98	54	1484	1136	201
v/c Ratio	0.56	0.40	0.14	0.52	0.44	0.17
Control Delay	62.9	14.2	3.0	4.0	15.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.9	14.2	3.0	4.0	15.9	6.7
Queue Length 50th (ft)	74	0	7	130	281	25
Queue Length 95th (ft)	126	50	m13	130	372	m67
Internal Link Dist (ft)	495			910	636	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	339	382	398	2849	2570	1214
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.26	0.14	0.52	0.44	0.17

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



## 9: Marksheffel Rd &amp; CRN North Full Access

02/16/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	109	109	60	1261	1821	239
v/c Ratio	0.58	0.41	0.27	0.32	0.51	0.20
Control Delay	63.0	13.4	12.2	4.6	24.6	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	13.4	12.2	4.6	24.6	9.0
Queue Length 50th (ft)	82	0	18	158	491	70
Queue Length 95th (ft)	137	52	28	87	521	m96
Internal Link Dist (ft)	495			910	1917	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	339	391	248	3984	3587	1215
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.28	0.24	0.32	0.51	0.20

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## 9: Marksheffel Rd &amp; CRN North Full Access

02/16/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	109	109	87	2201	1913	337
v/c Ratio	0.58	0.41	0.40	0.54	0.54	0.28
Control Delay	63.0	13.4	15.8	4.1	22.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	13.4	15.8	4.1	22.0	8.1
Queue Length 50th (ft)	82	0	16	107	426	57
Queue Length 95th (ft)	137	52	57	147	495	m120
Internal Link Dist (ft)	495			910	1917	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	427	465	247	4062	3522	1208
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.23	0.35	0.54	0.54	0.28

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total AM Improved.syn

## 10: Marksheffel Rd &amp; Airl Lane (CRN South Full Access)

02/15/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	76	217	163	821	1402	109
v/c Ratio	0.49	0.65	0.51	0.29	0.58	0.09
Control Delay	62.2	17.1	16.0	2.7	4.7	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	17.1	16.0	2.7	4.7	0.7
Queue Length 50th (ft)	57	4	27	35	105	0
Queue Length 95th (ft)	105	78	m106	112	184	3
Internal Link Dist (ft)	358			968	910	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	295	440	385	2835	2436	1153
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.49	0.42	0.29	0.58	0.09

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total PM Improved.syn

## 10: Marksheffel Rd &amp; Airl Lane (CRN South Full Access)

02/15/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	76	217	152	1462	1130	103
v/c Ratio	0.49	0.65	0.38	0.51	0.45	0.09
Control Delay	62.2	15.9	6.9	10.6	5.7	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	15.9	6.9	10.6	5.7	1.5
Queue Length 50th (ft)	57	0	42	360	135	3
Queue Length 95th (ft)	105	73	m62	m475	157	6
Internal Link Dist (ft)	358			968	910	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	354	490	482	2891	2510	1162
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.44	0.32	0.51	0.45	0.09

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total AM.syn

02/15/2021

## 10: Marksheffel Rd &amp; Airl Lane (CRN South Full Access)



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	82	245	179	1245	1810	120
v/c Ratio	0.51	0.67	0.61	0.31	0.54	0.11
Control Delay	62.4	15.7	22.1	7.6	3.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	15.7	22.1	7.6	3.1	0.5
Queue Length 50th (ft)	62	0	86	112	26	0
Queue Length 95th (ft)	111	77	m149	267	134	2
Internal Link Dist (ft)	358			968	910	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	324	490	393	4059	3336	1108
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.50	0.46	0.31	0.54	0.11

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total PM.syn

02/15/2021

## 10: Marksheffel Rd &amp; Airl Lane (CRN South Full Access)



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	82	245	255	2207	1853	168
v/c Ratio	0.51	0.67	0.74	0.53	0.58	0.16
Control Delay	62.5	15.7	35.3	1.4	7.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	15.7	35.3	1.4	7.7	1.7
Queue Length 50th (ft)	62	0	137	53	143	5
Queue Length 95th (ft)	111	77	m152	m71	183	9
Internal Link Dist (ft)	358			968	910	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	265	445	449	4138	3192	1064
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.55	0.57	0.53	0.58	0.16

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total AM.syn

02/15/2021

## 18: Marksheffel Rd &amp; RR-SE Full Access #1



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	206	1603	130	1685
v/c Ratio	0.74	0.48	0.48	0.44
Control Delay	55.2	10.4	16.2	16.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	55.2	10.4	16.2	16.1
Queue Length 50th (ft)	126	302	61	393
Queue Length 95th (ft)	197	360	m99	450
Internal Link Dist (ft)	297	530		470
Turn Bay Length (ft)			150	
Base Capacity (vph)	418	3320	378	3855
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.48	0.34	0.44

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



## Queues

2040 Total PM.syn

02/15/2021

## 18: Marksheffel Rd &amp; RR-SE Full Access #1



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	260	2369	332	1859
v/c Ratio	0.89	0.89	0.91	0.48
Control Delay	73.5	32.5	50.5	14.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	73.5	32.5	50.5	14.1
Queue Length 50th (ft)	172	486	266	396
Queue Length 95th (ft)	#319	m479	m#304	448
Internal Link Dist (ft)	297	530		470
Turn Bay Length (ft)			150	
Base Capacity (vph)	305	2649	376	3877
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.89	0.88	0.48

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total AM Improved.syn

## 21: Marksheffel Rd &amp; Peterson AFB Access/RR-SE Full Access #2

02/15/2021



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	587	147	11	76	174	434	33	533	739
v/c Ratio	0.83	0.26	0.14	0.49	0.34	0.21	0.07	0.32	0.65
Control Delay	56.4	6.4	54.8	33.7	13.6	12.1	22.4	22.2	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	6.4	54.8	33.7	13.6	12.1	22.4	22.2	4.9
Queue Length 50th (ft)	224	6	8	20	58	78	14	136	0
Queue Length 95th (ft)	284	48	27	68	106	121	40	208	90
Internal Link Dist (ft)		273		317		401		520	
Turn Bay Length (ft)	175		150		150		150		150
Base Capacity (vph)	786	759	185	293	521	2090	444	1642	1142
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.19	0.06	0.26	0.33	0.21	0.07	0.32	0.65
Intersection Summary									

## Queues

2026 Total PM Improved.syn

## 21: Marksheffel Rd &amp; Peterson AFB Access/RR-SE Full Access #2

02/15/2021



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	875	228	11	93	141	614	76	435	614
v/c Ratio	0.88	0.29	0.14	0.54	0.31	0.43	0.21	0.33	0.63
Control Delay	51.7	4.9	54.3	33.9	19.3	29.1	19.0	29.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	4.9	54.3	33.9	19.3	29.1	19.0	29.0	5.7
Queue Length 50th (ft)	326	12	8	25	58	185	30	127	0
Queue Length 95th (ft)	402	56	27	77	107	271	64	187	93
Internal Link Dist (ft)		273		317		401		520	
Turn Bay Length (ft)	175		150		150		150		150
Base Capacity (vph)	1072	920	172	303	459	1426	367	1323	979
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.25	0.06	0.31	0.31	0.43	0.21	0.33	0.63
Intersection Summary									

## Queues

2040 Total AM.syn

## 21: Marksheffel Rd &amp; Peterson AFB Access/RR-SE Full Access #2

02/15/2021



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	739	191	38	92	168	207	527	109	636	924
v/c Ratio	0.93	0.27	0.34	0.52	0.56	0.52	0.29	0.32	0.45	0.83
Control Delay	63.4	6.6	57.5	61.4	14.5	21.3	16.4	13.9	12.7	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	6.6	57.5	61.4	14.5	21.3	16.4	13.9	12.7	20.5
Queue Length 50th (ft)	288	16	28	69	0	81	113	24	73	228
Queue Length 95th (ft)	#397	60	62	119	64	139	165	61	137	321
Internal Link Dist (ft)		273		317			401		520	
Turn Bay Length (ft)	175		150			150		150		
Base Capacity (vph)	815	796	178	279	380	396	1835	346	1403	1113
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.24	0.21	0.33	0.44	0.52	0.29	0.32	0.45	0.83

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

2040 Total PM.syn

## 21: Marksheffel Rd &amp; Peterson AFB Access/RR-SE Full Access #2

02/15/2021



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1190	331	49	120	217	163	815	277	543	848
v/c Ratio	0.99	0.36	0.43	0.59	0.67	0.55	1.14	0.84	0.54	0.81
Control Delay	63.0	8.7	60.0	61.6	24.0	36.1	122.9	69.4	41.9	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	8.7	60.0	61.6	24.0	36.1	122.9	69.4	41.9	22.4
Queue Length 50th (ft)	469	65	36	90	36	81	~388	192	161	293
Queue Length 95th (ft)	#623	116	75	147	114	142	#518	m#360	m214	m369
Internal Link Dist (ft)		273		317			401		520	
Turn Bay Length (ft)	175		150			150		150		
Base Capacity (vph)	1201	985	156	279	380	299	714	331	1009	1044
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.34	0.31	0.43	0.57	0.55	1.14	0.84	0.54	0.81

## Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total AM Improved.syn

## 10: Marksheffel Rd &amp; Airl Lane (CRN South Full Access)

02/16/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	168	217	163	821	1402	109
v/c Ratio	0.69	0.54	0.55	0.31	0.62	0.10
Control Delay	63.6	11.5	20.8	4.5	19.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	11.5	20.8	4.5	19.1	3.8
Queue Length 50th (ft)	126	3	41	52	534	12
Queue Length 95th (ft)	192	70	m120	157	m560	m33
Internal Link Dist (ft)	358			968	910	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	324	464	354	2664	2246	1071
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.47	0.46	0.31	0.62	0.10

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2026 Total PM Improved.syn

## 10: Marksheffel Rd &amp; Airl Lane (CRN South Full Access)

02/16/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	168	217	152	1462	1130	103
v/c Ratio	0.69	0.53	0.41	0.54	0.49	0.10
Control Delay	63.1	10.7	10.8	15.3	19.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	10.7	10.8	15.3	19.5	5.7
Queue Length 50th (ft)	126	0	59	442	403	23
Queue Length 95th (ft)	191	66	m89	m561	521	m41
Internal Link Dist (ft)	358			968	910	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	354	490	459	2712	2312	1079
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.44	0.33	0.54	0.49	0.10

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



## 10: Marksheffel Rd &amp; Airl Lane (CRN South Full Access)



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	190	245	179	1245	1810	120
v/c Ratio	0.73	0.55	0.65	0.33	0.60	0.12
Control Delay	64.3	10.3	29.0	10.9	14.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	10.3	29.0	10.9	14.4	4.1
Queue Length 50th (ft)	142	0	92	122	420	15
Queue Length 95th (ft)	213	70	m164	288	508	m42
Internal Link Dist (ft)	358			968	910	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	339	501	359	3776	3041	1020
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.49	0.50	0.33	0.60	0.12

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2040 Total PM.syn

02/16/2021

## 10: Marksheffel Rd &amp; Airl Lane (CRN South Full Access)



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	190	245	255	2207	1853	168
v/c Ratio	0.74	0.56	0.78	0.57	0.63	0.17
Control Delay	66.4	10.6	46.2	3.2	23.7	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	10.6	46.2	3.2	23.7	8.1
Queue Length 50th (ft)	142	0	153	115	427	39
Queue Length 95th (ft)	218	71	m171	m115	564	m79
Internal Link Dist (ft)	358			968	910	
Turn Bay Length (ft)	200		300			250
Base Capacity (vph)	309	479	421	3866	2923	986
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.51	0.61	0.57	0.63	0.17

## Intersection Summary

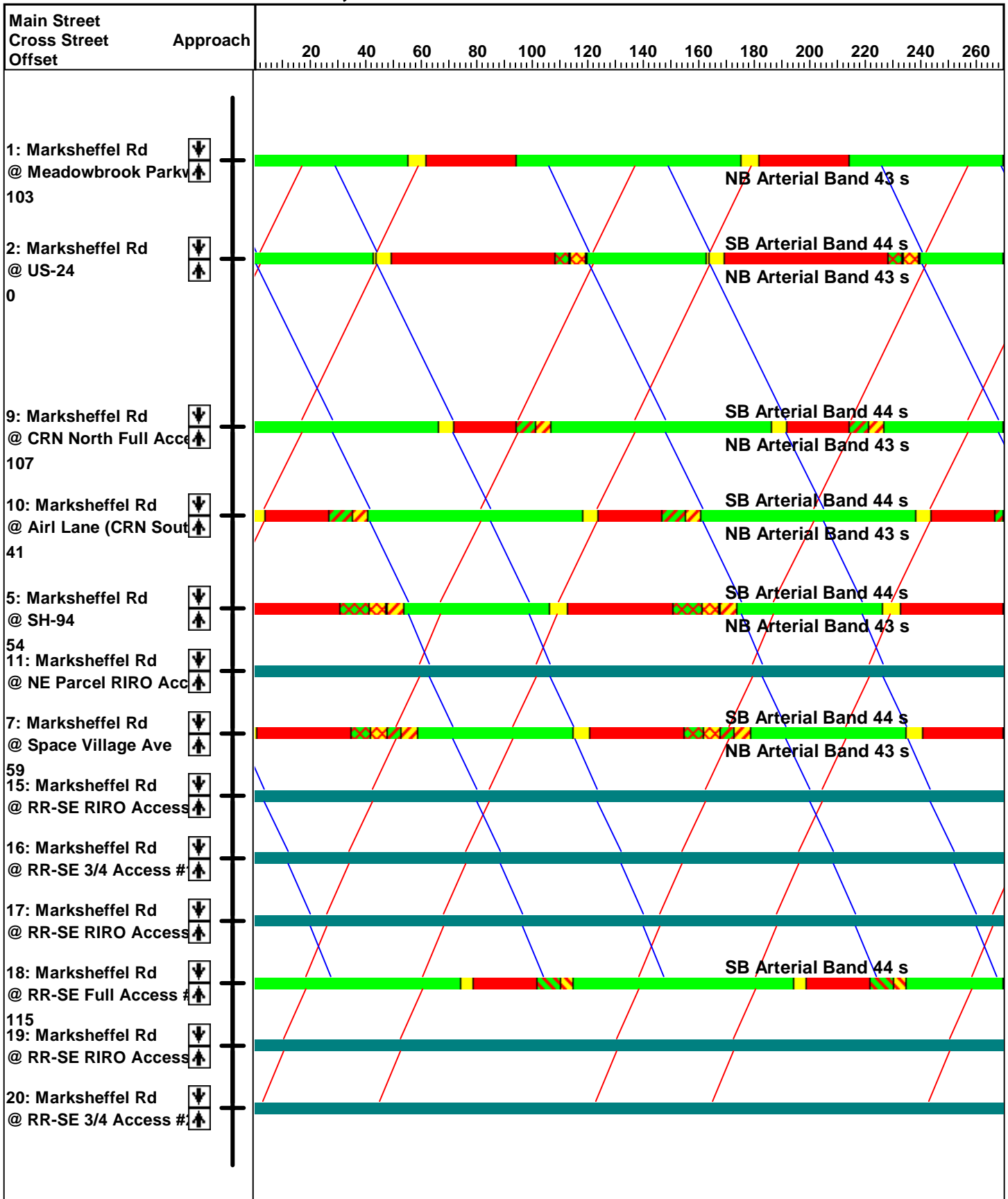
m Volume for 95th percentile queue is metered by upstream signal.

# APPENDIX G

## Time-Space Diagrams

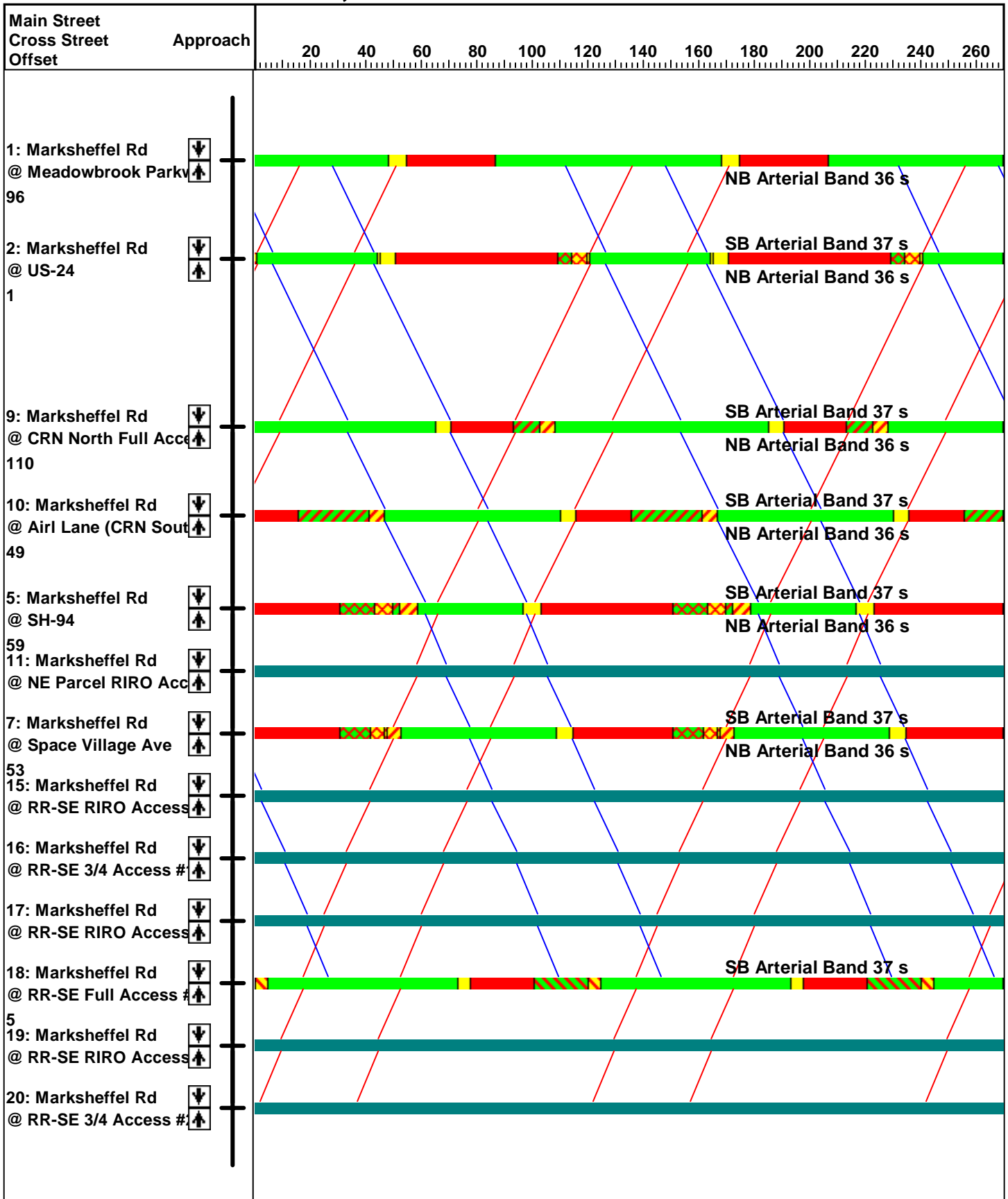
# Time-Space Diagram 2040 Total AM\_Signal\_Int 9 Signal.syn

## Arterial Bandwidths, 90th Percentile Green Times

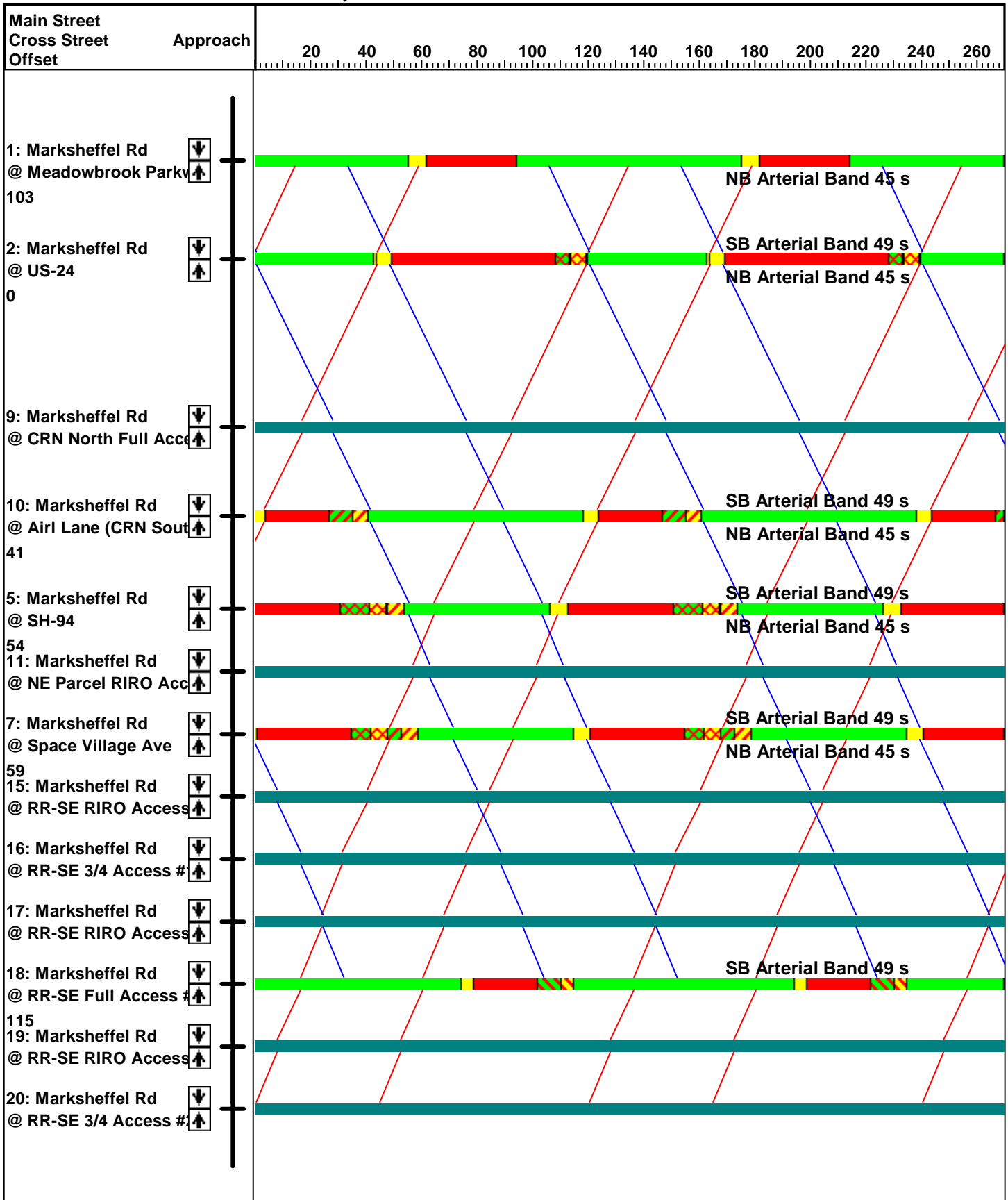


# Time-Space Diagram 2040 Total PM\_Signal\_Int 9 Signal.syn

## Arterial Bandwidths, 90th Percentile Green Times

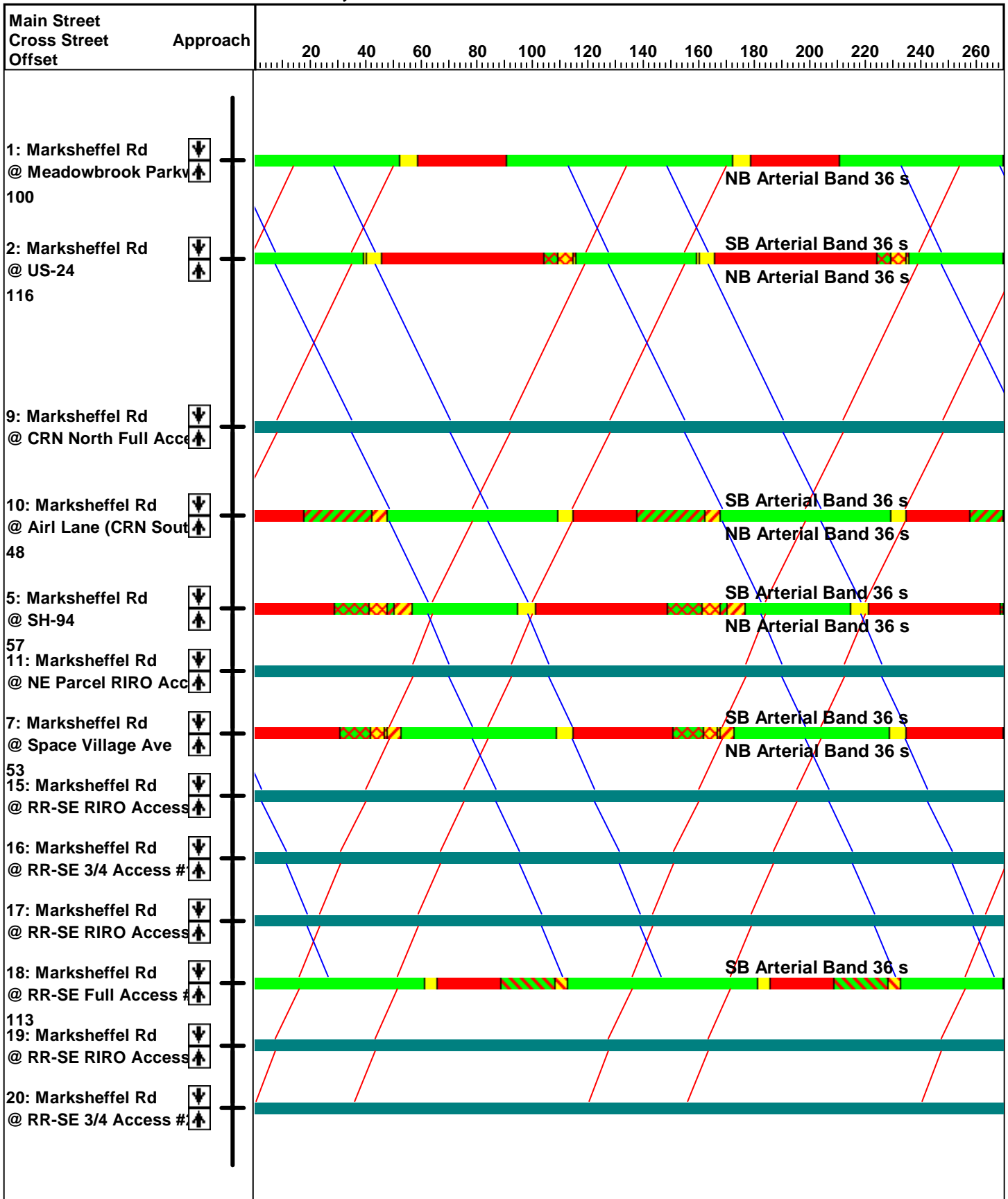


**Time-Space Diagram 2040 Total AM\_Signal\_Int 9 TWSC.syn**  
**Arterial Bandwidths, 90th Percentile Green Times**



# Time-Space Diagram 2040 Total PM\_Signal\_Int 9 TWSC.syn

## Arterial Bandwidths, 90th Percentile Green Times





# APPENDIX H

## Conceptual Site Plans





REV #	REVISIONS	DATE
1		
2		
3		
4		
5		
6		

DESIGNED	STB	09.06.19
DRAWN	STB	09.06.19
CHECKED	JH	09.06.19
PROJECT NUMBER:	363204	
SCALE:	AS NOTED	



**Clubhouse / Leasing**  
• Pool/Primary Amenity

**Primary Entry**  
• Gated Entry

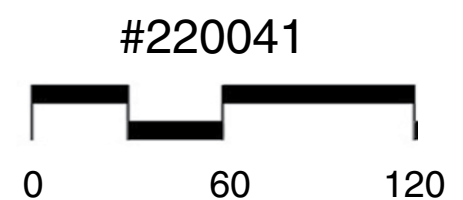
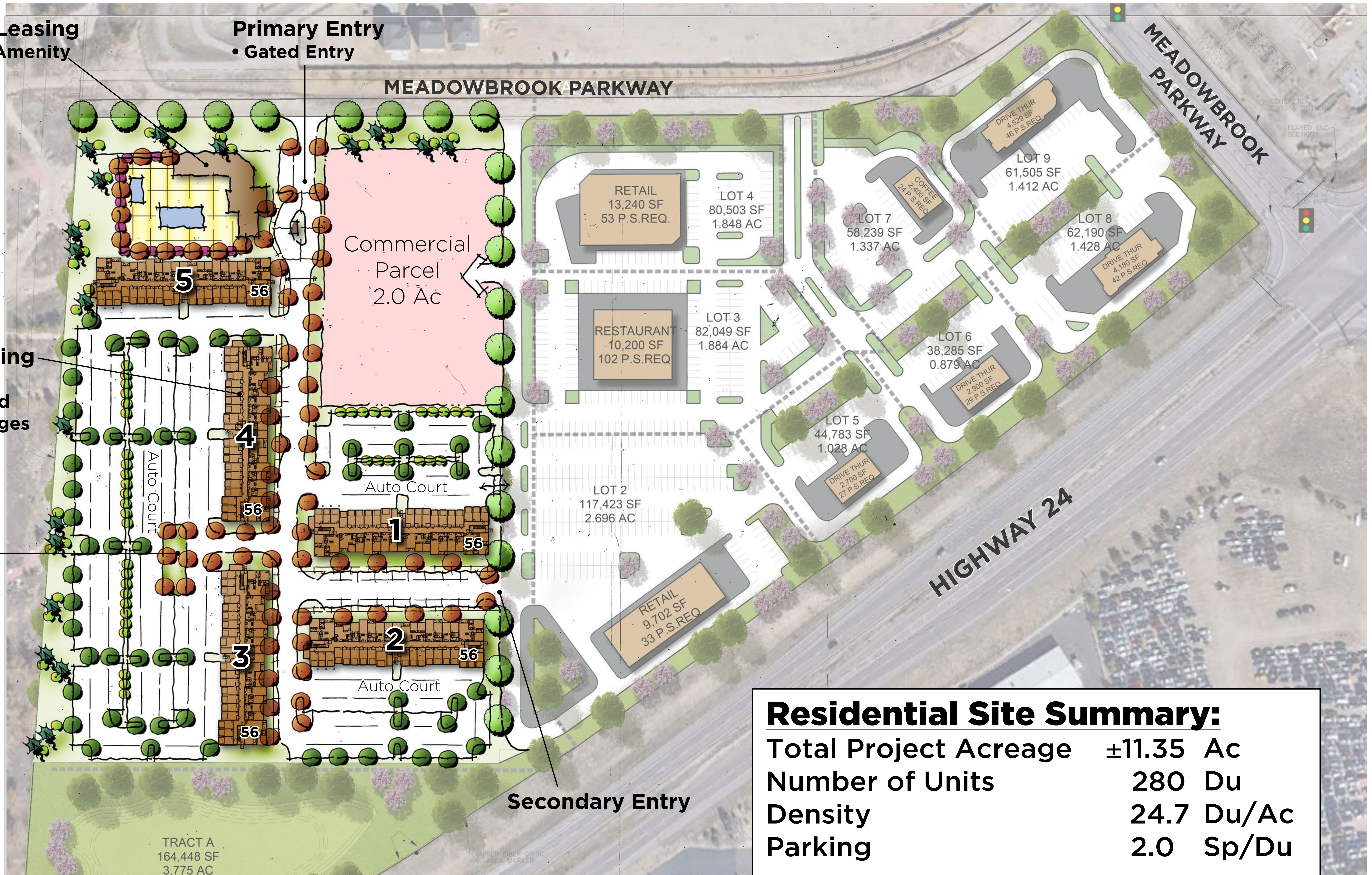
**56-Plex Building**  
• 4 Stories  
• Elevator Served  
• Attached Garages

**Dog Run**

Concept Plan 2 - 4 Stories

# CROSSROADS APARTMENTS

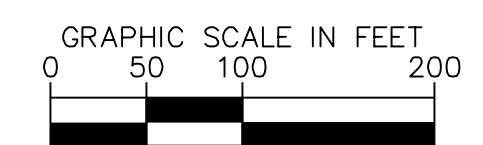
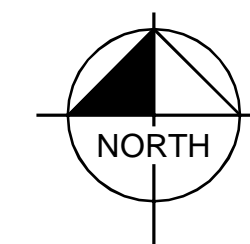
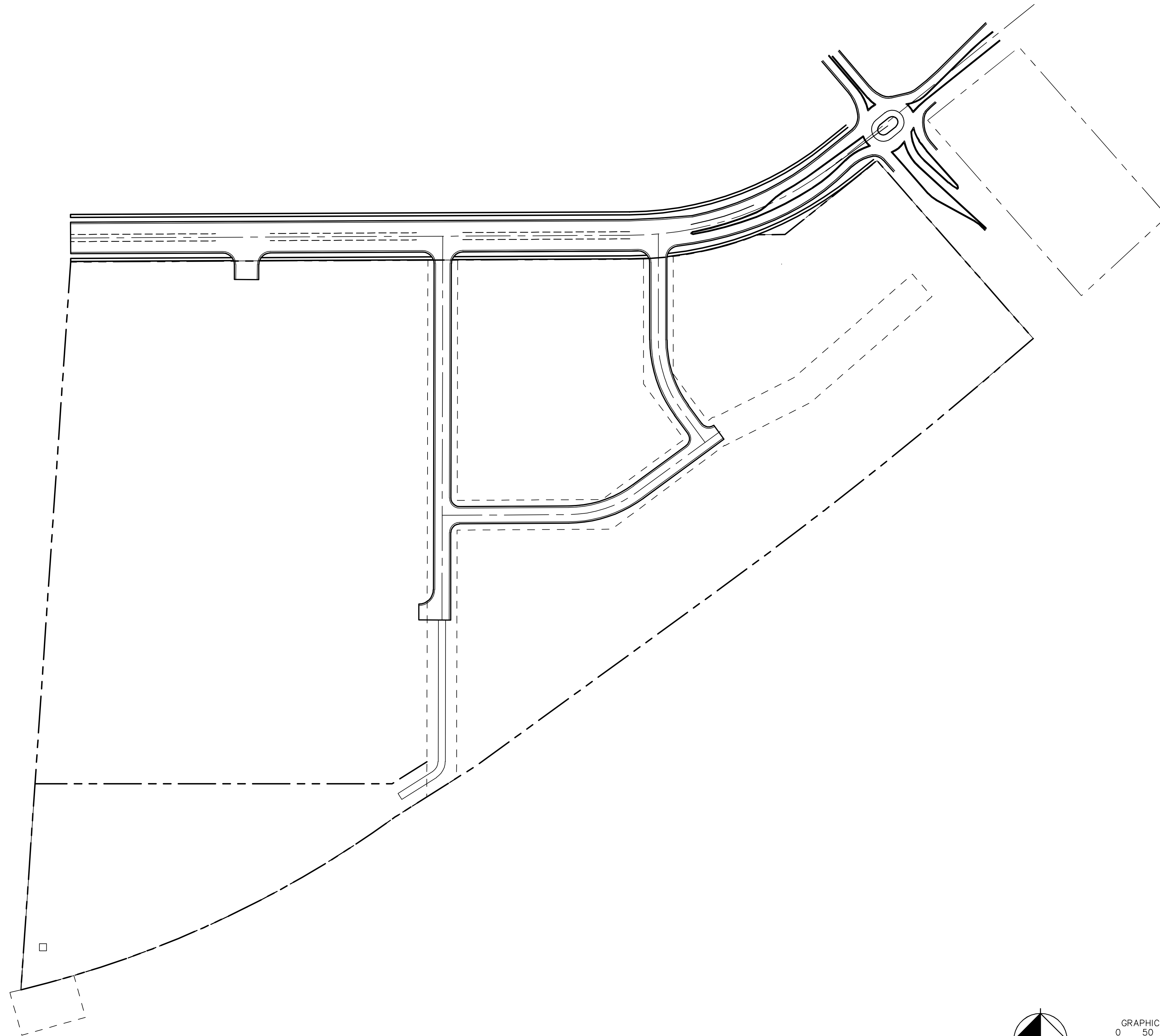
COLORADO SPRINGS, CO

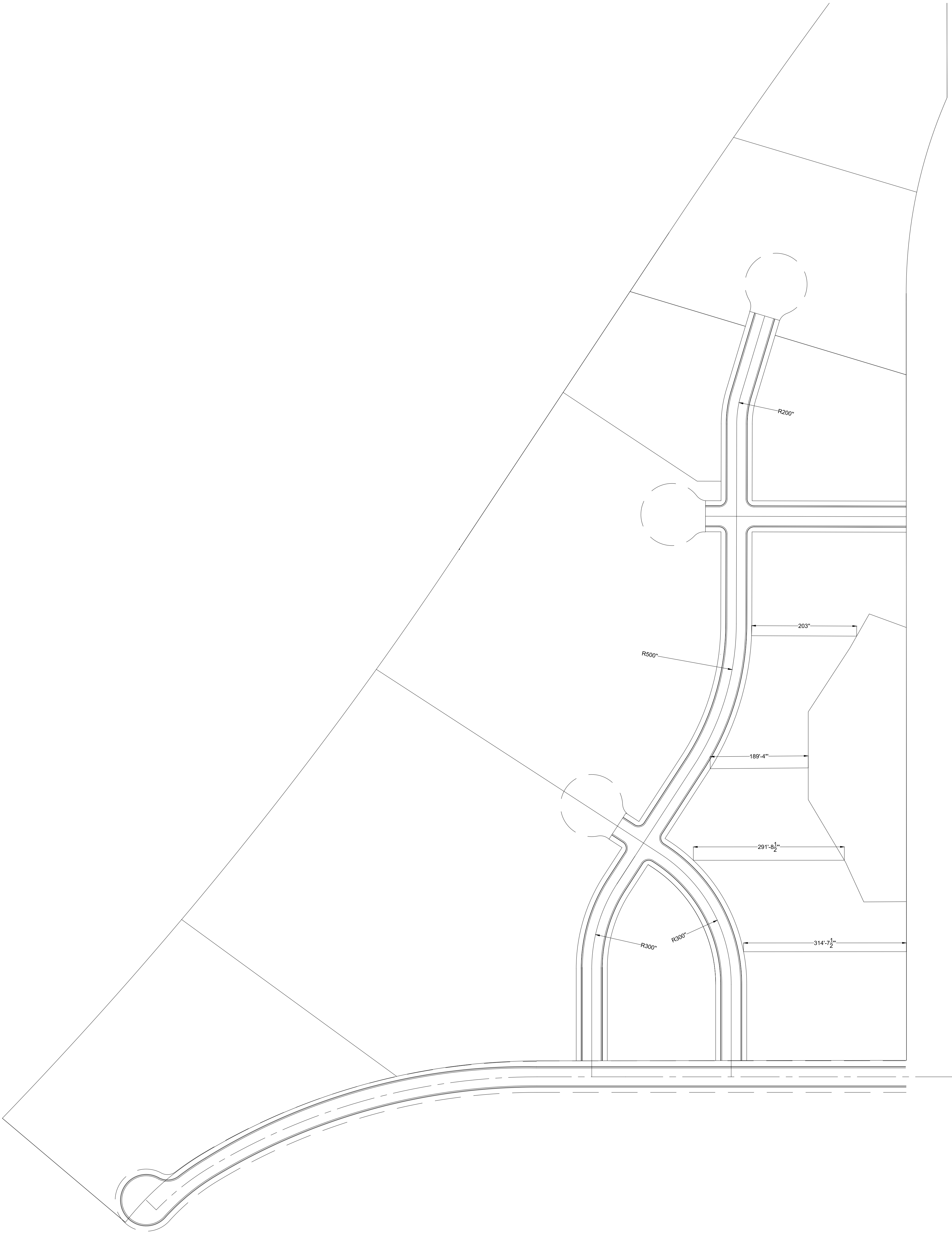
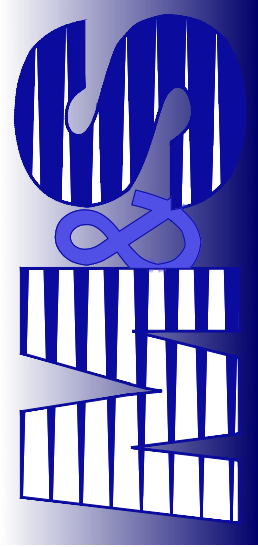


4.22.2020

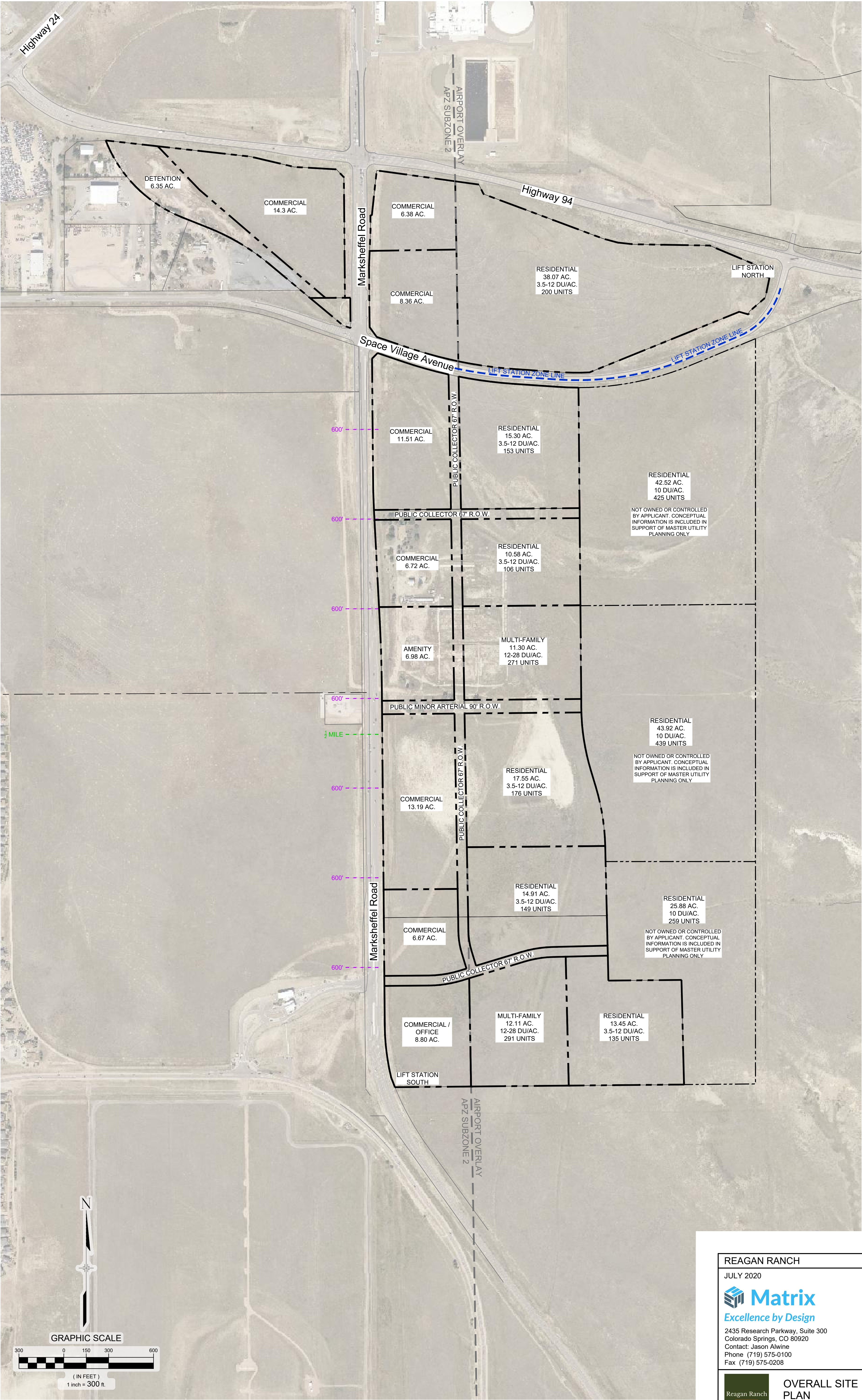












REAGAN RANCH

JULY 2020



2435 Research Parkway, Suite 300  
Colorado Springs, CO 80920  
Contact: Jason Alwine  
Phone (719) 575-0100  
Fax (719) 575-0208

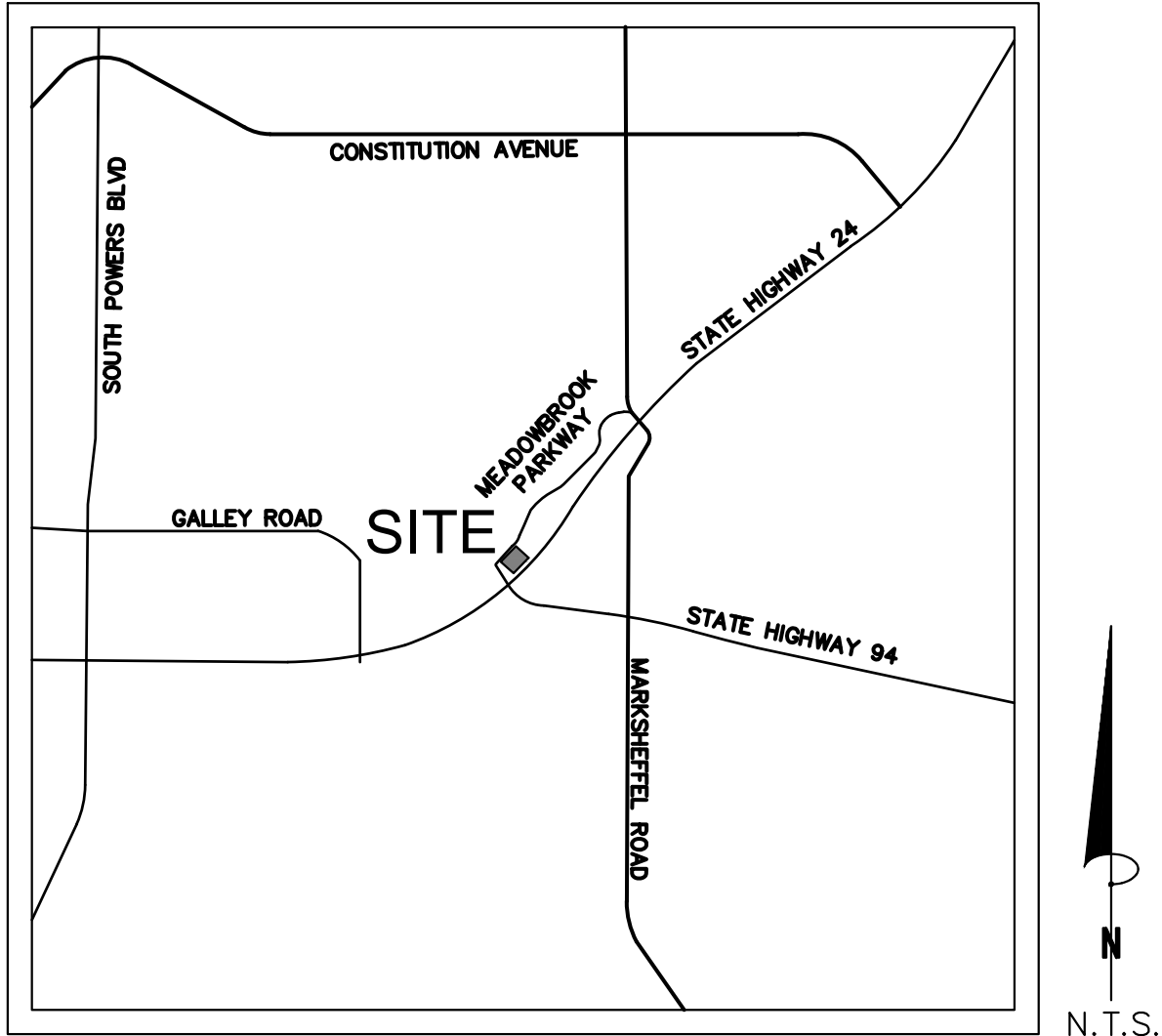


OVERALL SITE PLAN



K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009UT\_CV.dwg Green, Shelby 3/18/2021 10:57 AM

MEADOWBROOK PARK  
UTILITY AND MAIN SERVICE PLANS  
TRACT A 24/94 BUSINESS PARK FILING NO.1  
EL PASO COUNTY, STATE OF COLORADO



VICINITY MAP  
N.T.S

LAND AREA:

351,529 SQ. FT. OR 8.07 ACRES MORE OR LESS

BASIS OF BEARING:

MEASURED BETWEEN THE NW CORNER OF TRACT 1, 94/24 BUSINESS PARK FILING NO. 1, MONUMENTED WITH A NO. 4 REBAR WITH 1" RED PLASTIC CAP MARKED PLS 37928,AND THE SOUTHWEST CORNER OF LOT 1, MONUMENTED WITH A FOUND NO. 5 REBAR WITH BLUE PLASTIC CAP MARKED WITH PLS 32820

BENCHMARK/ PROJECT CONTROL:

NORTHWEST CORNER OF TRACT A AND IS MONUMENTED AS A NO. 4 REBAR WITH RED PLASTIC CAP FLUSH WITH THE GROUND EL.6321.70

LEGAL DESCRIPTION

TRACT A, 94/24 BUSINESS PARK FILING NO. 1, EL PASO COUNTY, STATE OF COLORADO

SOIL TYPE:

THE SOIL ON SITE IS CLASSIFIED WITH THE USCS AS NATIVE SILTY TO CLAYEY SAND (SM-SC)

FLOOD ZONE DESIGNATION

FEDERAL EMERGENCY MANAGEMENT AGENCY, FLOOD INSURANCE RATE MAP, MAP NUMBERS 08041C0970G & 08041C1160G EFFECTIVE DATE DECEMBER 7, 2018 INDICATES THIS PARCEL OF LAND IS LOCATED IN ZONE X (OUT OF THE 500 YEAR FLOODPLAIN)

Engineering Review  
05/15/2021 7:26:21 PM  
dsdrice  
JeffRice@elpasoco.com  
(719) 520-7877  
EPC Planning & Community  
Development Department

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
C3.0	COVER SHEET
C3.1	GENERAL NOTES
C3.2	GENERAL NOTES
C3.3	UTILITY SERVICE PLAN
C3.4	UTILITY SERVICE PLAN
C3.5	UTILITY SERVICE PLAN
C3.6	WATER PLAN
C3.7	WATER PLAN
C3.8	WATER PLAN
C3.9	HYDRANT & MAIN LOWERING PLAN & PROF.
C3.10	HYDRANT PLAN & PROFILE
C3.11	HYDRANT PLAN & PROFILE
C3.12	SAN. SEWER PLAN & PROFILE-LINE A
C3.13	SAN. SEWER PLAN & PROFILE-LINE A
C3.14	SAN. SEWER PLAN & PROFILE-LINE A
C3.15	SAN. SEWER PLAN & PROFILE-LINE B
C3.16	SAN. SEWER PLAN & PROFILE-LINE C
C3.17	SAN. SEWER PLAN & PROFILE-LINE D
C3.18	UTILITY DETAILS

CONTACTS:

OWNER:  
MEADOWBROOK PARK, LLC  
90 S. NEVADA AVENUE  
COLORADO SPRINGS,CO 80903  
TEL: (719) 475-7621  
CONTACT:DANNY MIENTKA

ENGINEER:  
KIMLEY-HORN AND ASSOCIATES, INC.  
2 NEVADA NORTH AVE., SUITE 300  
COLORADO SPRINGS, CO 80903  
TEL: (719) 453-0182  
CONTACT: JOHN HEIBERGER, P.E.

SURVEYOR:  
CLARK LAND SURVEYING, INC.  
177 S. TIFFANY DRIVE, UNIT 1  
PUEBLO WEST, CO 81007  
TEL: (719) 582-1270  
CONTACT: STEWART L. MAPES JR., PLS

EL PASO COUNTY:  
EL PASO COUNTY  
DEVELOPMENT SERVICES DEPARTMENT  
2880 INTERNATIONAL CIRCLE, SUITE 110  
COLORADO SPRINGS, CO 80910  
PHONE: (719) 520-3600

CHEROKEE METROPOLITAN DISTRICT:  
6250 PALMER PARK BLVD  
COLORADO SPRINGS, CO 80915  
PHONE: (719) 597-5080

COLORADO SPRINGS UTILITIES:  
1521 HANCOCK EXPRESSWAY  
MAIL CODE 1812  
COLORADO SPRINGS, CO 80903  
PHONE: (719) 668-8769

OWNER'S SIGNATURE BLOCK

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH ALL OF THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

NAME \_\_\_\_\_ DATE \_\_\_\_\_

ENGINEER'S SIGNATURE BLOCK

THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH THE APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THE DETAILED PLANS AND SPECIFICATIONS

JOHN HEIBERGER, PE – KIMLEY-HORN AND ASSOCIATES, INC. \_\_\_\_\_ DATE \_\_\_\_\_

EL PASO COUNTY REVIEW STATEMENT

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSION, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/ OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR A CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF THE CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR'S DISCRETION.

JENNIFER IRVINE, COUNTY ENGINEER/ ECM ADMINISTRATOR

DATE \_\_\_\_\_

Kimley»Horn

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
COVER SHEET

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
Kimley»Horn  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET

C3.0



K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009UT\_CV.dwg Green, Shelby 3/18/2021 10:57 AM

PRIVATE ENGINEER'S NOTICE TO CONTRACTORS:

- THE FOLLOWING NOTES ARE PROVIDED TO GIVE DIRECTIONS TO THE CONTRACTOR BY THE ENGINEER OF THE PLANS.
1. THE CHEROKEE METRO DISTRICT ENGINEER'S SIGNATURE ON THESE PLANS DOES NOT CONSTITUTE APPROVAL OF ANY OF THESE NOTES AND THE CITY WILL NOT BE HELD RESPONSIBLE FOR THEIR ENFORCEMENT.
  2. APPROVAL OF THESE PLANS BY CHEROKEE METRO DISTRICT DOES NOT AUTHORIZE ANY WORK TO BE PERFORMED UNTIL A PERMIT HAS BEEN ISSUED.
  3. THE APPROVAL OF THIS PLAN OR ISSUANCE OF A PERMIT BY CHEROKEE METRO DISTRICT DOES NOT AUTHORIZE THE SUBDIVIDER AND OWNER TO VIOLATE ANY FEDERAL, STATE OR COUNTY LAWS, ORDINANCES, REGULATIONS, OR POLICIES.
  4. NEITHER THE OWNER, NOR THE ENGINEER OF WORK WILL ENFORCE SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL DESIGN, CONSTRUCT, AND MAINTAIN ALL SAFETY DEVICES, INCLUDING SHORING, AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS, AND REGULATIONS.
  5. CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOBSITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING: SAFETY OF ALL PERSONS AND PROPERTY, AND THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPT LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
  6. THE CONTRACTOR SHALL BE RESPONSIBLE TO INSURE THAT ALL SLOPES, STREETS, UTILITIES, AND STORM SEWERS ARE BUILT IN ACCORDANCE WITH THESE PLANS. IF THERE IS ANY QUESTION REGARDING THESE PLANS OR FIELD STAKES, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY CALLING THE ENGINEER OF RECORD AT 719-453-0180. THE CONTRACTOR SHALL ALSO TAKE THE NECESSARY STEPS TO PROTECT THE PROJECT AND ADJACENT PROPERTY FROM ANY EROSION AND SILTATION THAT RESULT FROM HIS OPERATIONS BY APPROPRIATE MEANS (SAND BAGS, HAY BALES, TEMPORARY DESILTING BASINS, DIKES, SHORING, ETC.) UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY WHATEVER OWNER, AGENCY, OR ASSOCIATION IS TO BE ULTIMATELY RESPONSIBLE FOR MAINTENANCE.
  7. EXCEPT AS NOTED HEREON ALL UTILITY SERVICES WITHIN THIS DEVELOPMENT ARE UNDERGROUND INSTALLATIONS. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO STARTING WORK NEAR THEIR FACILITIES, AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES. FOR UTILITY MARK-OUT SERVICE, CALL 811.
  8. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED FROM A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO OTHER EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. NO REPRESENTATION IS MADE AS TO THE ACCURACY OR COMPLETENESS OF SAID UTILITY INFORMATION. THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHERS NOT OF RECORD OR NOT SHOWN ON THESE PLANS. ALL DAMAGES THERETO CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE APPROPRIATE SPECIFICATIONS AND STANDARDS AT THE EXPENSE OF THE CONTRACTOR.
  9. LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS SHALL BE CONFIRMED BY FIELD MEASUREMENTS PRIOR TO CONSTRUCTION OF NEW WORK.
  10. CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE EXISTING UNDERGROUND FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF REVISIONS ARE NECESSARY BECAUSE OF ACTUAL LOCATION OF EXISTING FACILITIES.
  11. FOR ALL UTILITY TRENCHES, SOILS REPORTS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD BY A QUALIFIED SOILS ENGINEER WHICH CERTIFY THAT TRENCH BACKFILL WAS COMPACTED AS DIRECTED BY THE SOILS ENGINEER IN ACCORDANCE WITH THE ON-SITE EARTHWORK SPECIFICATIONS.
  12. ANY WORK DONE WITHOUT INSPECTION OR MATERIALS TESTING IS SUBJECT TO REMOVAL OR CORRECTION.
  13. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ANY DAMAGE TO THE EXISTING IMPROVEMENTS AND REPLACEMENT TO THE SATISFACTION OF THE FIELD ENGINEER.
  14. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL JOIN CONDITIONS FOR GRADING, DRAINAGE AND UNDERGROUND FACILITIES, INCLUDING LOCATION AND ELEVATION OF EXISTING UNDERGROUND FACILITIES AT CROSSINGS WITH PROPOSED UNDERGROUND FACILITIES. IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLANS THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND SHALL NOT BEGIN CONSTRUCTION UNTIL THE CHANGED CONDITIONS HAVE BEEN EVALUATED.
  15. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE PLANS, THE SOILS AND/OR GEOLOGY REPORTS, AND THE SITE CONDITIONS PRIOR TO COMMENCING WORK.
  16. SHOULD CONFLICTING INFORMATION BE FOUND ON THE PLANS OR IN THE FIELD, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AT KIMLEY-HORN BEFORE PROCEEDING WITH THE WORK IN QUESTION.
  17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEY MONUMENTS AND/OR VERTICAL CONTROL BENCHMARKS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION. CONTRACTOR'S LAND SURVEYOR MUST FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK. IF DESTROYED, CONTRACTOR'S LAND SURVEYOR SHALL REPLACE SUCH MONUMENTS WITH APPROPRIATE MONUMENTS. A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILED AS REQUIRED BY THE PROFESSIONAL LAND SURVEYORS ACT. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE COLORADO SPRINGS (EL PASO COUNTY) FIELD SURVEY SECTION MUST BE NOTIFIED, IN WRITING, AT LEAST 3 DAYS PRIOR TO THE CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION.
  18. DEVIATIONS FROM THESE PLANS SIGNED PLANS WILL NOT BE ALLOWED UNLESS THE COUNTY ENGINEER APPROVES A CONSTRUCTION CHANGE OR THE COUNTY/AGENCY INSPECTOR REQUIRES THE CHANGE.
  19. AS-BUILT DRAWINGS MUST BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER PRIOR TO ACCEPTANCE OF THIS PROJECT.
  20. THE AREA WHICH IS DEFINED AS A NON GRADING AREA AND WHICH IS NOT TO BE DISTURBED SHALL BE STAKED PRIOR TO START OF THE WORK. THE PERMIT APPLICANT AND ALL OF THEIR REPRESENTATIVES OR CONTRACTORS SHALL COMPLY WITH THE REQUIREMENTS FOR PROTECTION OF THIS AREA AS REQUIRED BY ANY APPLICABLE AGENCY. ISSUANCE OF THE CITY'S GRADING PERMIT SHALL NOT RELIEVE THE APPLICANT OR ANY OF THEIR REPRESENTATIVES OR CONTRACTORS FROM COMPLYING WITH ANY STATE OR FEDERAL REQUIREMENTS BY AGENCIES INCLUDING BUT NOT LIMITED TO COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT OR COLORADO DIVISION OF WILDLIFE. COMPLIANCE MAY INCLUDE OBTAINING PERMITS, OTHER AUTHORIZATIONS, OR COMPLIANCE WITH MANDATES BY ANY APPLICABLE STATE OR FEDERAL AGENCY.
  21. NOTES AND DETAILS DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE GIVEN, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK.
  22. IF AT ANY TIME DURING THE GRADING OPERATION, ANY UNFAVORABLE GEOLOGICAL CONDITIONS ARE ENCOUNTERED, GRADING IN THAT AREA SHALL STOP UNTIL APPROVED CORRECTIVE MEASURES ARE OBTAINED.
  23. STRAIGHT GRADE SHALL BE MAINTAINED BETWEEN CONTOUR LINES AND SPOT ELEVATIONS UNLESS OTHERWISE SHOWN ON THE PLANS. THE CONTRACTOR SHALL TAKE ADDITIONAL CARE TO ENSURE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE WHILE MEETING MINIMUM AND MAXIMUM PAVEMENT SLOPES AS DEFINED IN THE CRITERIA.
  24. ALL DEBRIS AND FOREIGN MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT APPROVED DISPOSAL SITES. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS FOR THE TRANSPORTATION OF MATERIAL TO AND FROM THE SITE.
  25. DIMENSIONS TO PIPELINES ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
  26. CONSTRUCTION STAKING FOR IMPROVEMENTS SHOWN IN THESE PLANS SHALL BE PERFORMED BY CONTRACTOR'S LICENSED LAND SURVEYOR.
  27. ALL DIMENSIONS ARE IN FEET OR DECIMALS THEREOF.
  28. SPOT GRADES ARE TO FLOWLINE OR FINISH PAVEMENT GRADE UNLESS OTHERWISE NOTED.
  29. CONTRACTOR TO BE AWARE OF ALL OVERHEAD LINES AT ALL TIMES, SO AS NOT TO DISTURB THEM.
  30. WATER SHALL BE PROVIDED ONSITE AND USED TO CONTROL DUST DURING DEMOLITION AND CONSTRUCTION OPERATIONS.
  31. STORM DRAINAGE SYSTEMS SHOWN ON THESE PLANS HAVE BEEN DESIGNED FOR THE FINAL SITE CONDITION AT COMPLETION OF THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ADEQUATE DRAINAGE OF THE SITE, DURING INTERIM CONDITIONS OF CONSTRUCTION.
  32. RETAINING WALLS LOCATED CLOSER TO THE PROPERTY LINE THAN THE HEIGHT OF THE WALL SHALL BE BACKFILLED NOT LATER THAN 10 DAYS AFTER CONSTRUCTION OF THE WALL AND NECESSARY STRUCTURAL SUPPORTING MEMBERS UNLESS RECOMMENDED OTHERWISE BY RESPONSIBLE ENGINEER.
  33. THE CONTRACTOR IS RESPONSIBLE FOR APPLYING FOR AND OBTAINING A STATE STORMWATER DISCHARGE PERMIT FROM COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) AT MINIMUM 10 BUSINESS DAYS PRIOR TO THE START OF GRADING ACTIVITIES ONSITE. 10 BUSINESS DAYS IS THE MINIMUM TIME REQUIRED BY THE STATE TO PROCESS THE APPLICATION. IT IS HIGHLY RECOMMENDED THAT THE CONTRACTOR APPLY FOR THE PERMIT AT LEAST 20 BUSINESS DAYS PRIOR TO THE START OF GRADING ACTIVITIES.

WATER PLAN NOTES

**\*THE CONTRACTOR SHALL NOTIFY 'CHEROKEE METRO DISTRICT' OFFICE (719-597-5081) A MINIMUM OF 48 HOURS**

PRIOR TO THE START OF CONSTRUCTION.

GENERAL:

1. ALL CONSTRUCTION METHODS AND MATERIALS SHALL MEET CHEROKEE METRO DISTRICT *WATER LINE EXTENSION AND SERVICE STANDARDS (WATER LESS)*.
2. THE CONTRACTOR SHALL OBTAIN LOCATES PRIOR TO ANY EXCAVATION.
3. CHEROKEE METRO DISTRICT DOES NOT GUARANTEE THE ACCURACY OF LOCATIONS OF EXISTING PIPELINES, HYDRANTS, VALVES AND SERVICE LINES. IF FIELD CONDITIONS ARE FOUND TO BE DIFFERENT THAN SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE INSPECTOR AND THE ENGINEER OF RECORD IMMEDIATELY.
4. NO TREES OR STRUCTURES ARE PERMITTED WITHIN FIFTEEN FEET (15') OF A WATER MAIN.
5. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO ANY UTILITY FACILITIES AS A RESULT OF HIS ACTIONS. THE CONTRACTOR SHALL MAKE ALL THE REQUIRED REPAIRS IMMEDIATELY TO THE SATISFACTION OF COLORADO SPRINGS UTILITIES.
6. ALL FIELD STAKING SHALL COMPLY WITH THE *WATER LESS*.
7. THE CONTRACTOR SHALL MAKE THEIR BEST EFFORT TO ENSURE THAT WATER SERVICE TO ADJACENT PROPERTIES IS MAINTAINED DURING CONSTRUCTION.
8. CORROSION PROTECTION MEASURES SHALL COMPLY WITH THE *WATER LESS*.
9. NO SERVICE TAPS WILL BE ALLOWED UNTIL THE MAIN IS EXTENDED TO THE NEXT MAIN-LINE VALVE.
10. NO SERVICE TAPS SHALL BE MADE UNTIL AUTHORIZATION HAS BEEN GRANTED BY THE CHEROKEE METRO DISTRICT INSPECTOR.
11. ALL BENDS SHALL BE FIELD STAKED PRIOR TO CONSTRUCTION AND THE STATIONING ON THE FIELD STAKES SHALL MATCH THE STATIONING ON THE PLANS.
12. FIELD MODIFICATIONS TO A FIRE SERVICE LINE OR FIRE HYDRANT DESIGN OR LOCATION MAY NEED TO BE APPROVED BY THE DESIGN ENGINEER, COLORADO SPRINGS FIRE DEPARTMENT AND CHEROKEE METRO DISTRICT, AS REQUIRED BY THE INSPECTOR.
13. REUSE OR SALVAGE OF ANY MATERIAL IS LEFT TO THE DISCRETION OF THE CHEROKEE METRO DISTRICT INSPECTOR.
14. ALL TRENCH BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE CHEROKEE METRO DISTRICT *STANDARD SPECIFICATIONS MANUAL*.

WASTEWATER PLAN NOTES

**\*THE CONTRACTOR SHALL NOTIFY 'CHEROKEE METRO DISTRICT' OFFICE (719-597-5081) A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.**

GENERAL:

1. ALL CONSTRUCTION METHODS AND MATERIALS SHALL MEET CHEROKEE METRO DISTRICT *WASTEWATER LINE EXTENSION AND SERVICE STANDARDS (WASTEWATER STANDARDS)*.
2. THE CONTRACTOR SHALL OBTAIN LOCATES PRIOR TO ANY EXCAVATION.
3. CHEROKEE METRO DISTRICT DOES NOT GUARANTEE THE ACCURACY OF LOCATIONS OF EXISTING PIPELINES, MANHOLES AND SERVICE LINES. IF FIELD CONDITIONS ARE FOUND TO BE DIFFERENT THAN SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE INSPECTOR AND THE ENGINEER OF RECORD IMMEDIATELY.
4. NO TREES OR STRUCTURES ARE PERMITTED WITHIN FIFTEEN FEET (15') OF A WASTEWATER MAIN.
5. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO ANY UTILITY FACILITIES AS A RESULT OF HIS ACTIONS. THE CONTRACTOR SHALL MAKE ALL THE REQUIRED REPAIRS IMMEDIATELY TO THE SATISFACTION OF CHEROKEE METRO DISTRICT.
6. ALL FIELD STAKING SHALL COMPLY WITH THE WASTEWATER STANDARDS.
7. THE CONTRACTOR SHALL ENSURE THAT WASTEWATER SERVICE TO ADJACENT PROPERTIES IS MAINTAINED DURING CONSTRUCTION.
8. ALL MANHOLES LOCATED WITHIN THE PROJECT LIMITS SHALL BE ADJUSTED TO FINISH GRADE. IF MANHOLES ARE IN POOR CONDITION OR IF THE DISTANCE BETWEEN THE RING/COVER AND CONE OF THE MANHOLE EXCEEDS THE WASTEWATER STANDARDS, THE CONTRACTOR MAY BE REQUIRED TO REPLACE PART OR ALL OF THE EXISTING MANHOLES.
9. REUSE OR SALVAGE OF ANY MATERIAL IS LEFT TO THE DISCRETION OF THE CHEROKEE METRO DISTRICT INSPECTOR.
10. ALL TRENCH BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE CHEROKEE METRO DISTRICT *STANDARD SPECIFICATIONS MANUAL*.

UTILITY SERVICE PLAN NOTES

**\*THE CONTRACTOR SHALL NOTIFY 'CHEROKEE METRO DISTRICT' OFFICE (719-597-5081) A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.**

GENERAL:

1. ALL CONSTRUCTION METHODS AND MATERIALS SHALL MEET CHEROKEE METRO DISTRICT *WASTEWATER AND WATER LINE EXTENSION AND SERVICE STANDARDS (WATER/WASTEWATER LESS)*.
2. CHEROKEE METRO DISTRICT DOES NOT GUARANTEE THE ACCURACY OF LOCATIONS OF EXISTING PIPELINES, MANHOLES, HYDRANTS, VALVES AND SERVICE LINES. IF FIELD CONDITIONS ARE FOUND TO BE DIFFERENT THAN SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE INSPECTOR AND THE DESIGN ENGINEER IMMEDIATELY.
3. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO ANY UTILITY FACILITIES AS A RESULT OF HIS ACTIONS. THE CONTRACTOR SHALL MAKE ALL THE REQUIRED REPAIRS IMMEDIATELY TO THE SATISFACTION OF CHEROKEE METRO DISTRICT.
4. ALL FIELD STAKING SHALL COMPLY WITH THE *WATER/WASTEWATER LESS*.
5. CORROSION PROTECTION MEASURES SHALL COMPLY WITH THE *WATER/WASTEWATER LESS*.
6. FINAL LOCATION OF ALL WASTEWATER AND WATER SERVICES SHALL BE APPROVED IN THE FIELD BY THE CHEROKEE METRO DISTRICT INSPECTOR.
7. ALL TRENCH BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH SECTION 206 CHEROKEE METRO DISTRICT *SPECIFICATIONS MANUAL AND SECTION 5.18 OF THE WATER LESS*.

10. CMD DOES NOT HAVE SPECIFIC WATER AND SEWER LINE MARKER DECALS. THE CONTRACTOR SHOULD USE GENERIC BLUE WATER MARKERS FOR WATER LINES AND GENERIC GREEN SEWER MARKERS FOR SEWER LINES.

WASTEWATER:

1. SERVICE STUBS SHALL BE INSTALLED A MINIMUM OF SEVEN FEET (7') INTO THE PROPERTY, UNLESS OTHERWISE SHOWN, AND THE END OF THE STUB SHALL BE MARKED WITH A 2"x4"x12' STEEL OR WOODEN POST.
2. SERVICES SHALL BE CONNECTED A MINIMUM OF FIVE FEET (5') FROM THE OUTSIDE EDGE OF ANY MANHOLE ON THE MAIN LINE AND SHALL MAINTAIN TWO FEET (2') OF SEPARATION BETWEEN TAPS CENTER TO CENTER.
3. ALL CLEANOUTS SHALL BE THE SAME SIZE AS THE SERVICE LINE.
4. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT WHEN ANY SEPTIC TANK IS TO BE ABANDONED AND PAY ALL FEES NECESSARY TO OBTAIN A PERMIT.
5. A CMD INSPECTOR MUST BE PRESENT FOR THE COLLECTION OF BACTERIOLOGICAL SAMPLES WHENEVER THIS IS REQUIRED.
6. MANHOLE ADJUSTMENTS DUE TO PAVING ARE THE RESPONSIBILITY OF THE PAVER UNLESS CHEROKEE HAS ISSUED A FINAL LETTER OF ACCEPTANCE AND THE MANHOLE IS IN A PUBLIC RIGHT OF WAY.

WATER:

1. SERVICE STUBS SHALL BE INSTALLED WITH THE CURB STOP AT OR NEAR PROPERTY LINE AND SHALL NOT BE INSTALLED WITHIN DRIVEWAYS OR SIDEWALKS (SEE DETAIL DRAWING B2-3).
2. SERVICE TAPS SHALL BE MADE A MINIMUM OF THREE FEET (3') FROM THE BELL OR APPURTENANCE ON THE WATER MAIN. TAPS SHALL BE A MINIMUM OF THREE FEET (3') APART ON THE SAME SIDE OF THE WATER MAIN AND A MINIMUM OF ONE-AND-A-HALF FEET (1.5') WHEN TAPS ARE MADE ON OPPOSITE SIDES OF THE WATER MAIN.
3. ALL SERVICES FOR COMMERCIAL USE AND SOME RESIDENTIAL USES REQUIRE INSTALLATION OF A BACKFLOW PREVENTION ASSEMBLY IMMEDIATELY AFTER THE METER. THE BACKFLOW PREVENTION ASSEMBLY SHALL BE APPROVED BY THE FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH OF THE UNIVERSITY OF SOUTHERN CALIFORNIA (USC-FCCCHR) AND INSTALLED IN ACCORDANCE WITH THIS LISTING. PLEASE REFERENCE THE WATER LINE EXTENSION STANDARDS FOR ADDITIONAL REQUIREMENTS.
4. CONNECTIONS TO CMD WATER MAINS WILL BE COMPLETED BY THE CONTRACTOR UNDER THE SUPERVISION OF CHEROKEE METRO DISTRICT PERSONNEL. ALL VALVES SHALL OPEN LEFT.
5. ANY ABANDONED SERVICES MUST BE PHYSICALLY DISCONNECTED AT THE MAIN. ANY NECESSARY REPAIRS TO THE MAIN AND/OR SHUT DOWN OF THE TAPPING VALVE SHALL BE AS DIRECTED BY COLORADO SPRINGS UTILITIES.
6. ALL WATER SERVICE LINES SHOULD ENTER THE BUILDING WITHIN 3 FEET OF AN EXTERIOR WALL. EXPOSED WATER PLUMBING SHALL BE MINIMIZED INSIDE THE BUILDING PRIOR TO THE WATER METER AND/OR APPROVED BACKFLOW PREVENTION ASSEMBLY OR METHOD.
7. ALL HDPE WATER SERVICE LINES MUST EXTEND A MINIMUM OF 6 INCHES ABOVE THE FLOOR AND BE 90 DEGREES FROM THE FLOOR PLAN TO ALLOW FOR BRACING AND TRANSITION TO THE METER LOOP ASSEMBLY.
8. MINIMUM DEPTH OF BURY SHALL BE 5 FEET AND MAXIMUM DEPTH OF BURY SHALL BE 6 FEET UNLESS OTHERWISE APPROVED BY THE DISTRICT
9. POTABLE FIRE HYDRANT BODIES SHALL BE PAINTED WITH RUSTOLEUM 7792402 GLOSS WHITE. POTABLE FIRE HYDRANT CAPS AND BONNETS SHALL BE PAINTED WITH RUSTOLEUM 7524402 SAFETY BLUE. IF OIL-BASED PAINTS ARE UNAVAILABLE, A REASONABLE SUBSTITUTE MAY BE USED WITH CMD APPROVAL.
10. CONTRACTOR SHALL DISPOSE OF CHLORINATED WATER AS PER COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) REGULATIONS

WATER PROJECT SPECIFIC NOTES

	APPLICABLE	NOT-APPLICABLE	
1.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ANY EXISTING STUBS AND APPURTENANCES THAT WILL NOT BE USED SHALL BE REMOVED AND REPLACED WITH AN ACCEPTABLE SECTION OF MAIN AT THE EXPENSE OF THE CONTRACTOR.
2.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	A CONNECTION TO AN EXISTING STUB IS PROPOSED. CHEROKEE METRO DISTRICT DOES NOT GUARANTEE THE ACCURACY OF THE DEPTHS OR LOCATIONS OF EXISTING STUBS SHOWN ON ANY "AS-BUILT" DRAWINGS.
3.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	A WATER STUB-OUT(S) IS/ARE PROPOSED.CHEROKEE METRO DISTRICT DOES NOT GUARANTEE THAT THE DESIGN OR INSTALLATION OF THE PROPOSED WATER STUB-OUT WILL MEET FUTURE DEVELOPMENT NEEDS.
4.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	A WATER QUALITY PLAN HAS BEEN APPROVED FOR THIS PROJECT

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
GENERAL NOTES

Kimley»Horn

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
Kimley»Horn  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009  
SHEET  
C3.1

NO. REVISION BY DATE APPR.



## WASTEWATER PROJECT SPECIFIC NOTES

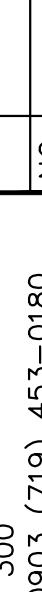
APPLICABLE	NON-APPLICABLE	
1.	<input checked="" type="checkbox"/>	CORROSION PROTECTION IS REQUIRED FOR ALL DUCTILE IRON PIPE. ALL PROTECTION SHALL COMPLY WITH THE WASTEWATER STANDARDS.
2.	<input checked="" type="checkbox"/>	<p><input type="checkbox"/> THIS PROJECT IS CONNECTING TO AN EXISTING MANHOLE. A MANHOLE ASSESSMENT HAS BEEN COMPLETED FOR THIS PROJECT. THE FOLLOWING CHECKED ITEMS ARE REQUIRED:            THE CONTRACTOR SHALL PROVIDE A BYPASS PUMPING PLAN FOR APPROVAL BY CHEROKEE METRO DISTRICTS AND COMPLY WITH ALL THE REQUIREMENTS THEREIN.            REPAIR THE EXISTING MANHOLE (REFER TO PLAN AND PROFILE FOR REQUIREMENTS).            REPLACE THE EXISTING MANHOLE (REFER TO PLAN AND PROFILE FOR REQUIREMENTS).</p>
3.	<input type="checkbox"/>	<p><input checked="" type="checkbox"/> MANHOLES ARE BEING ABANDONED, THE CONTRACTOR SHALL:</p> <ul style="list-style-type: none"> <li>• PLUG THE "IN" AND "OUT" INVERTS WITH A WATERTIGHT MECHANICAL PLUG AND GROUT WITH APPROVED MATERIAL.</li> <li>• REMOVE AND DISPOSE OF THE CONE SECTION.</li> <li>• REMOVE THE RING AND COVER AND RETURN THEM TO CHEROKEE METRO DISTRICT.</li> <li>• FILL THE MANHOLE WITH APPROVED MATERIAL.</li> </ul>
4.	<input type="checkbox"/>	<p><input checked="" type="checkbox"/> WASTEWATER MAINS EXISTS UNDERNEATH A PROPOSED STRUCTURE, CONTRACTOR SHALL:            REMOVE IT            GROUT IT FULL</p>
5.	<input type="checkbox"/>	<p><input checked="" type="checkbox"/> WASTEWATER MAIN TO BE ABANDONED EXISTS WITHIN RIGHT-OF-WAY, THE CONTRACTOR SHALL:            REMOVE IT            GROUT IT FULL</p>
6.	<input type="checkbox"/>	<p><input checked="" type="checkbox"/> PIPELINES LESS THAN 1.04% GRADE ARE PROPOSED. THE CONTRACTOR SHALL COMPLY WITH THE ADDITIONAL REQUIREMENTS AS SPECIFIED WITHIN THE WASTEWATER STANDARDS.</p>
7.	<input type="checkbox"/>	<p><input checked="" type="checkbox"/> THIS PROJECT IS UTILIZING EXISTING STUBS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE STUB, CONNECTION, TRANSITION AND SUBSEQUENT EXTENSION MEETS ALL CURRENT WASTEWATER STANDARDS.</p>
8.	<input checked="" type="checkbox"/>	<p><input type="checkbox"/> CHEROKEE METRO DISTRICT DOES NOT GUARANTEE THE ACCURACY OF THE DEPTHS OR LOCATIONS OF EXISTING STUBS SHOWN ON ANY "AS CONSTRUCTED" DRAWINGS. FURTHER, THE EXISTING STUB WILL BE INCLUDED IN THE TWO-YEAR WARRANTY PERIOD FOR THIS PROJECT.</p>
9.	<input type="checkbox"/>	<p><input checked="" type="checkbox"/> A WASTEWATER STUB OR STUBS ARE PROPOSED. CHEROKEE METRO DISTRICT DOES NOT GUARANTEE DEVELOPMENT NEEDS. FURTHER, THE STUB WILL NOT BE INCLUDED IN THE TWO-YEAR WARRANTY PERIOD FOR THIS PROJECT.</p>

DESIGNED BY: KK		NO.	REVISION	RY	DATE	APPR
DRAWN BY: KK						
CHECKED BY: JH						
DATE: 10/09/2020						

**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO

**UTILITY AND WATER SERVICE PLANS**

**GENERAL NOTES**



2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

**PRELIMINARY**

FOR REVIEW ONLY  
NOT FOR CONSTRUCTION

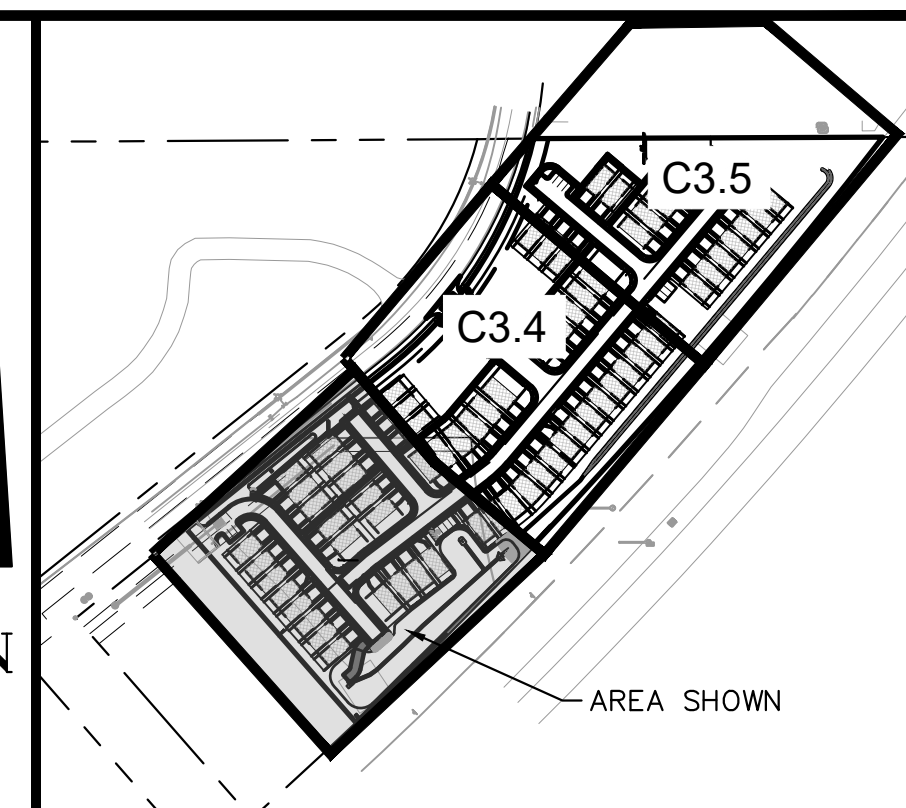
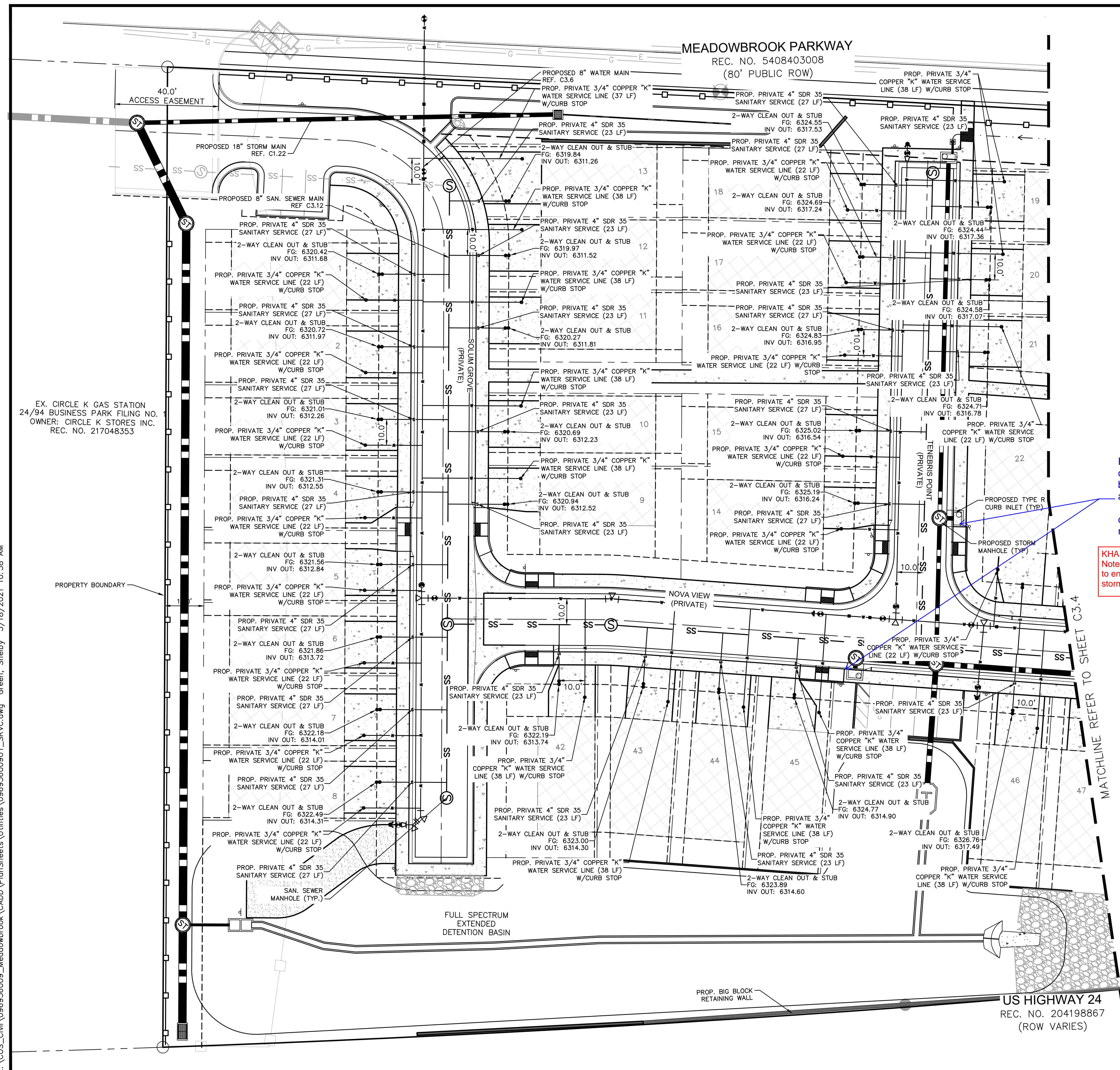
**Kimley-Horn & Associates, Inc.**

PROJECT NO. 096956009

SHEET










**C3.2**





KEY MAP  
NOT TO SCALE

## LEGEND

- |   |  |
|---|--|
|  | PROPERTY LINE                          |
|  | EXISTING WATER LINE & VALVE            |
|  | PROPOSED WATER LINE & VALVE            |
|  | PROPOSED FIRE HYDRANT                  |
|  | EXISTING SANITARY SEWER LINE & MANHOLE |
|  | PROPOSED SANITARY SEWER LINE & MANHOLE |
|  | PROPOSED STORM SEWER LINE & MANHOLE    |
|  | PROPOSED STORM SEWER STRUCTURES        |
|  | LOT LINE                               |

NOTES:

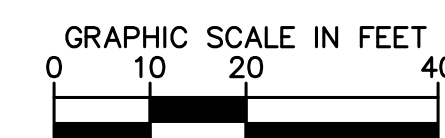
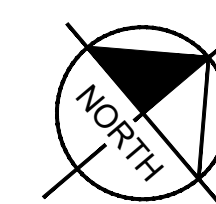
1. ALL WATER LINES TO BE BEDDED PER COLORADO SPRINGS UTILITIES SPECIFICATIONS.
2. ALL CONDITIONS SHOWN TO BE "EXISTING" OR "ASSUMED" SHALL BE VERIFIED IN THE FIELD BY THE GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION INCLUDING BUT NOT LIMITED TO POTHOLING OF EXISTING UTILITY ELEVATIONS AT CROSSINGS AND TIE-IN LOCATIONS. ANY DISCREPANCIES SHALL BE NOTED AND SUBMITTED TO THE OWNER AND THE ENGINEER FOR REVIEW. CHANGES TO THE ORIGINAL DESIGN OF THIS PROJECT DUE TO EXISTING SITE CONDITIONS MUST BE APPROVED BY BOTH THE ENGINEER AND OWNER PRIOR TO ANY CONSTRUCTION BEGINS.
3. THE HORIZONTAL DIMENSIONAL BETWEEN PROPOSED UTILITY LINES MAY VARY SLIGHTLY BASED ON INSTALLED VALVES, ADAPTER, AND PUMPS.
4. ALL APPURTENANCES ON HYDRANT LATERALS SHALL BE INSTALLED WITH MJ RESTRAINTS PER CSU STANDARDS.

CAUTION NOTE (SERVICE LINES):

CONTRACTOR SHALL MAINTAIN 1' OF VERTICAL SEPARATION AT ALL DRY UTILITY CROSSINGS. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITY CROSSINGS TO VERIFY DEPTH AND COORDINATE WITH ENGINEER OF RECORD.

WATER SERVICE LINE NOTES:

1. CURB STOPS SHALL BE INSTALLED 7 FEET FROM THE PROPERTY LINE IN ACCORDANCE WITH CSU STD. DETAIL B2-3.
2. ALL WATER SERVICE LINES SHALL BE STUBBED AND TERMINATE AT THE CURB STOP
3. METER LOCATIONS ARE NOT SHOWN ON THIS PLAN. METERS TO BE INSTALLED IN A METER PIT OR INSIDE THE SINGLE FAMILY STRUCTURE IN ACCORDANCE WITH CSU STD. DETAIL B2-2.



- Ensure that inlets won't conflict with ped ramps, both within sidewalks and at inlet gutter depressions.
- Ensure that pedestrian crossings will meet ADA requirements.

**KHA RESPONSE:**  
Note was added on plan for Contractor to ensure ADA landing is on top of storm structure.

47 MATCHLINE REFER TO SHEET C3.4

MEADOWBROOK PARKWAY  
REC. NO. 5408403008  
(80' PUBLIC ROW)

EX. CIRCLE K GAS STATION  
24/94 BUSINESS PARK FILING NO.  
OWNER: CIRCLE K STORES INC.  
REC. NO. 217048353

**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO  
**UTILITY AND WATER SERVICE PLANS**  
**UTILITY SERVICE PLAN**

**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 451-1100

DESIGNED BY: KJ  
DRAWN BY: KJ  
CHECKED BY: JH  
DATE: 10/09/2020

**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO  
096956009

SHEET

### C3.3

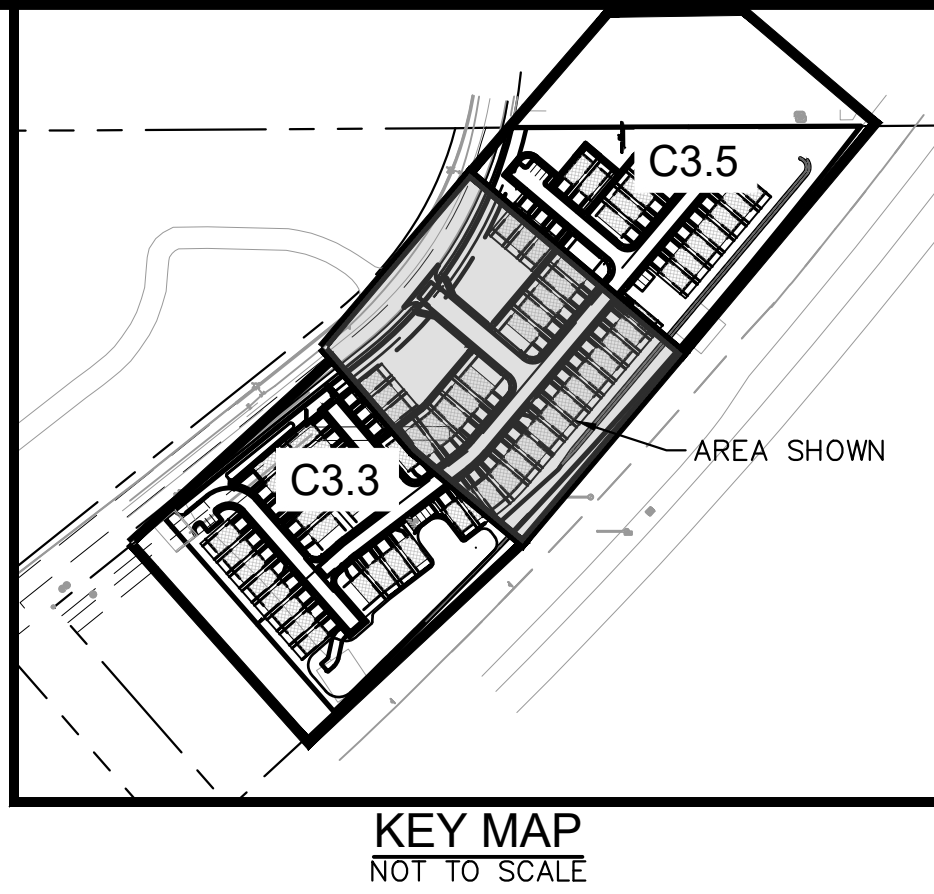
NO	REVISION	BY	DATE	APP
----	----------	----	------	-----



K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009UT\_SRV.C.dwg Green, Shelby 3/18/2021 10:59 AM

MATCHLINE REFER TO SHEET C3.3

MATCHLINE REFER TO SHEET C3.5



### LEGEND

- PROPERTY LINE
- EXISTING WATER LINE & VALVE
- PROPOSED WATER LINE & VALVE
- PROPOSED FIRE HYDRANT
- EXISTING SANITARY SEWER LINE & MANHOLE
- PROPOSED SANITARY SEWER LINE & MANHOLE
- PROPOSED STORM SEWER LINE & MANHOLE
- PROPOSED STORM SEWER STRUCTURES
- LOT LINE

### NOTES:

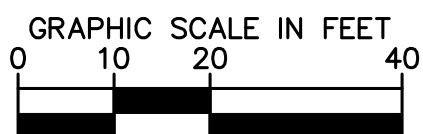
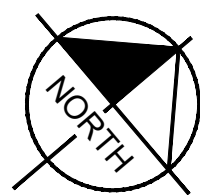
- ALL WATER LINES TO BE BEDDED PER COLORADO SPRINGS UTILITIES SPECIFICATIONS.
- ALL CONDITIONS SHOWN TO BE "EXISTING" OR "ASSUMED" SHALL BE VERIFIED IN THE FIELD BY THE GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION INCLUDING BUT NOT LIMITED TO POTHOLING OF EXISTING UTILITY ELEVATIONS AT CROSSINGS AND TIE-IN LOCATIONS. ANY DISCREPANCIES SHALL BE NOTED AND SUBMITTED TO THE OWNER AND THE ENGINEER FOR REVIEW. CHANGES TO THE ORIGINAL DESIGN OF THIS PROJECT DUE TO EXISTING SITE CONDITIONS MUST BE APPROVED BY BOTH THE ENGINEER AND OWNER PRIOR TO MAKING ANY CHANGES.
- THE HORIZONTAL DIMENSIONS BETWEEN PROPOSED UTILITY LINES MAY VARY SLIGHTLY BASED ON INSTALLED VALVES, ADAPTER, AND PUMPS.
- ALL APPURTENANCES ON HYDRANT LATERALS SHALL BE INSTALLED WITH MJ RESTRAINTS PER CSU STANDARDS.

### CAUTION NOTE (SERVICE LINES):

CONTRACTOR SHALL MAINTAIN 1' OF VERTICAL SEPARATION AT ALL DRY UTILITY CROSSINGS. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITY CROSSINGS TO VERIFY DEPTH AND COORDINATE WITH ENGINEER OF RECORD.

### WATER SERVICE LINE NOTES:

- CURB STOPS SHALL BE INSTALLED 7 FEET FROM THE PROPERTY LINE IN ACCORDANCE WITH CSU STD. DETAIL B2-3.
- ALL WATER SERVICE LINES SHALL BE STUBBED AND TERMINATE AT THE CURB STOP
- METER LOCATIONS ARE NOT SHOWN ON THIS PLAN. METERS TO BE INSTALLED IN A METER PIT OR INSIDE THE SINGLE FAMILY STRUCTURE IN ACCORDANCE WITH CSU STD. DETAIL B2-2.



## MEADOWBROOK PARK EL PASO COUNTY, COLORADO UTILITY AND WATER SERVICE PLANS UTILITY SERVICE PLAN

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION

PROJECT NO.  
096956009

SHEET

C3.4

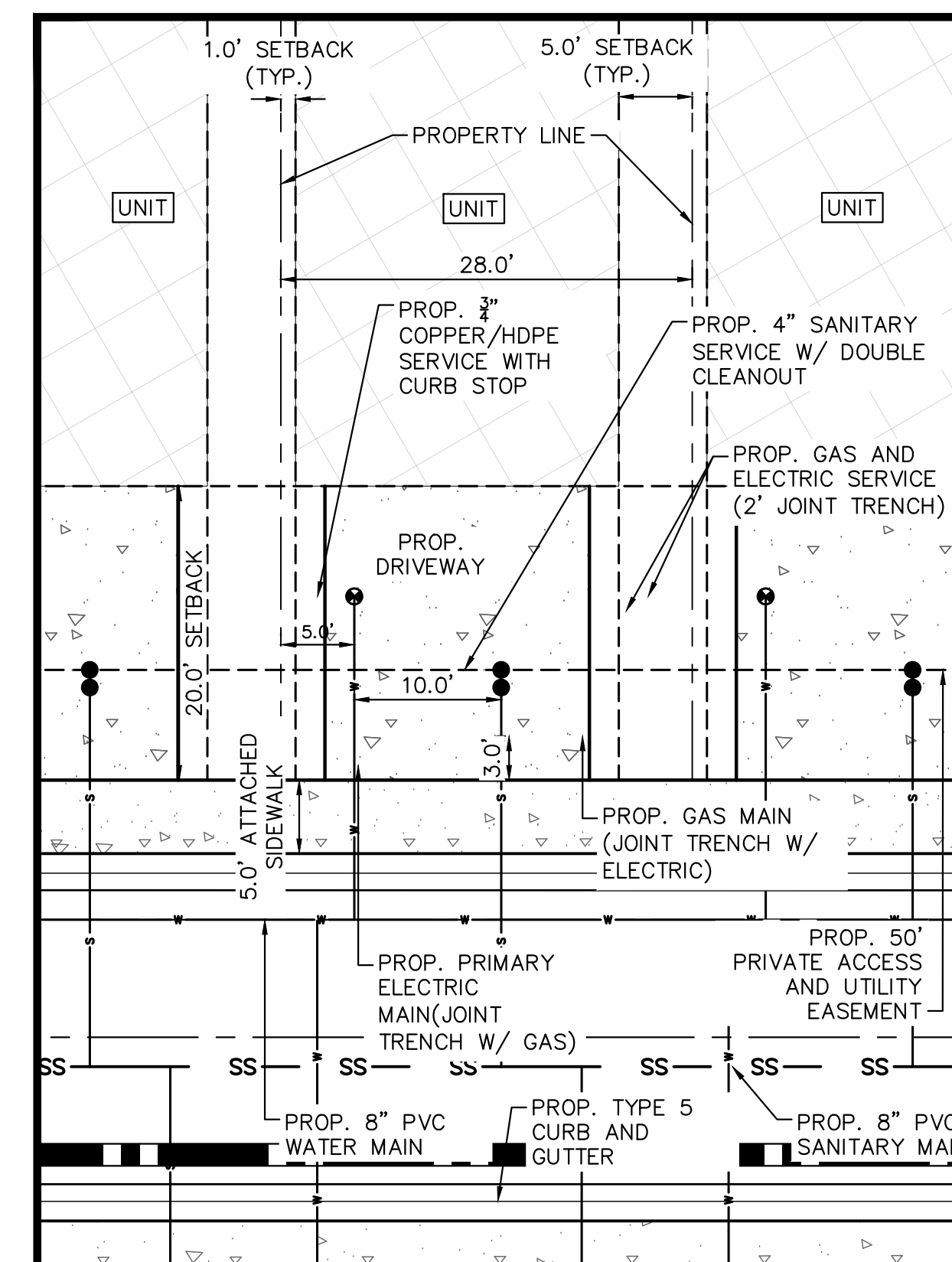
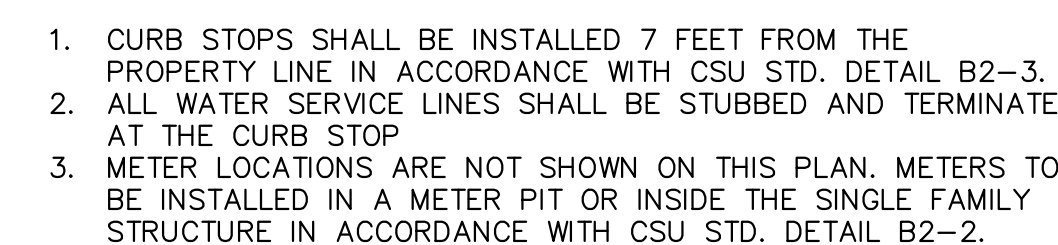
**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

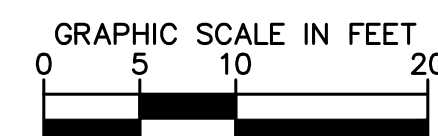
DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

NO. REVISION BY DATE APPR.





### TYPICAL UTILITY SERVICE CONNECTIONS DETAIL

[illegible]

# Kimley»Horn

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO  
**UTILITY AND WATER SERVICE PLANS**  
**UTILITY SERVICE PLAN**

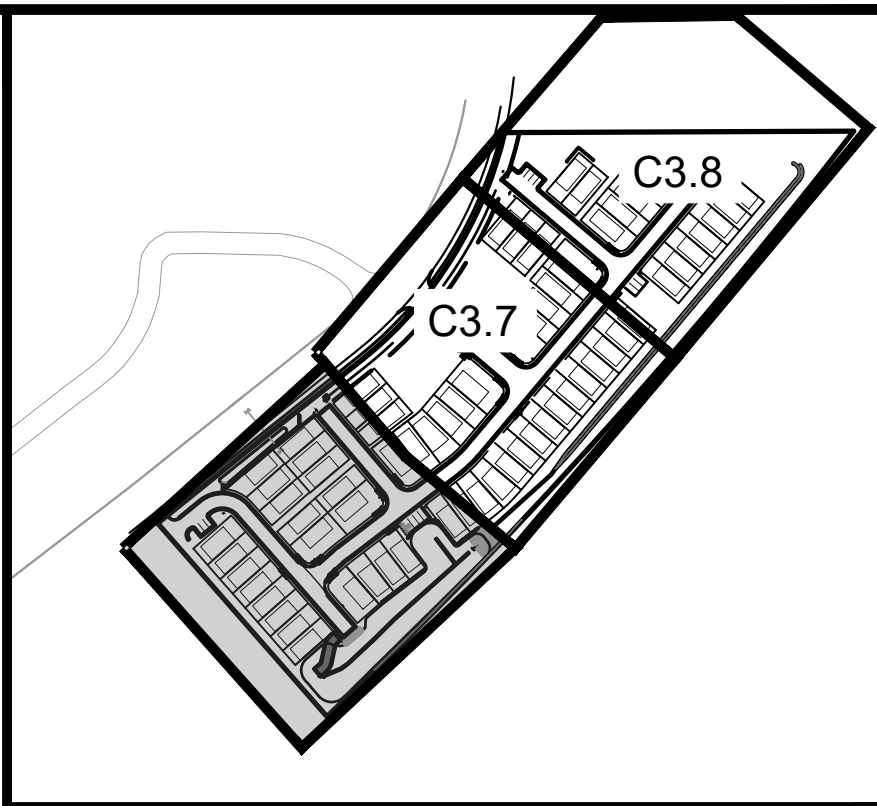
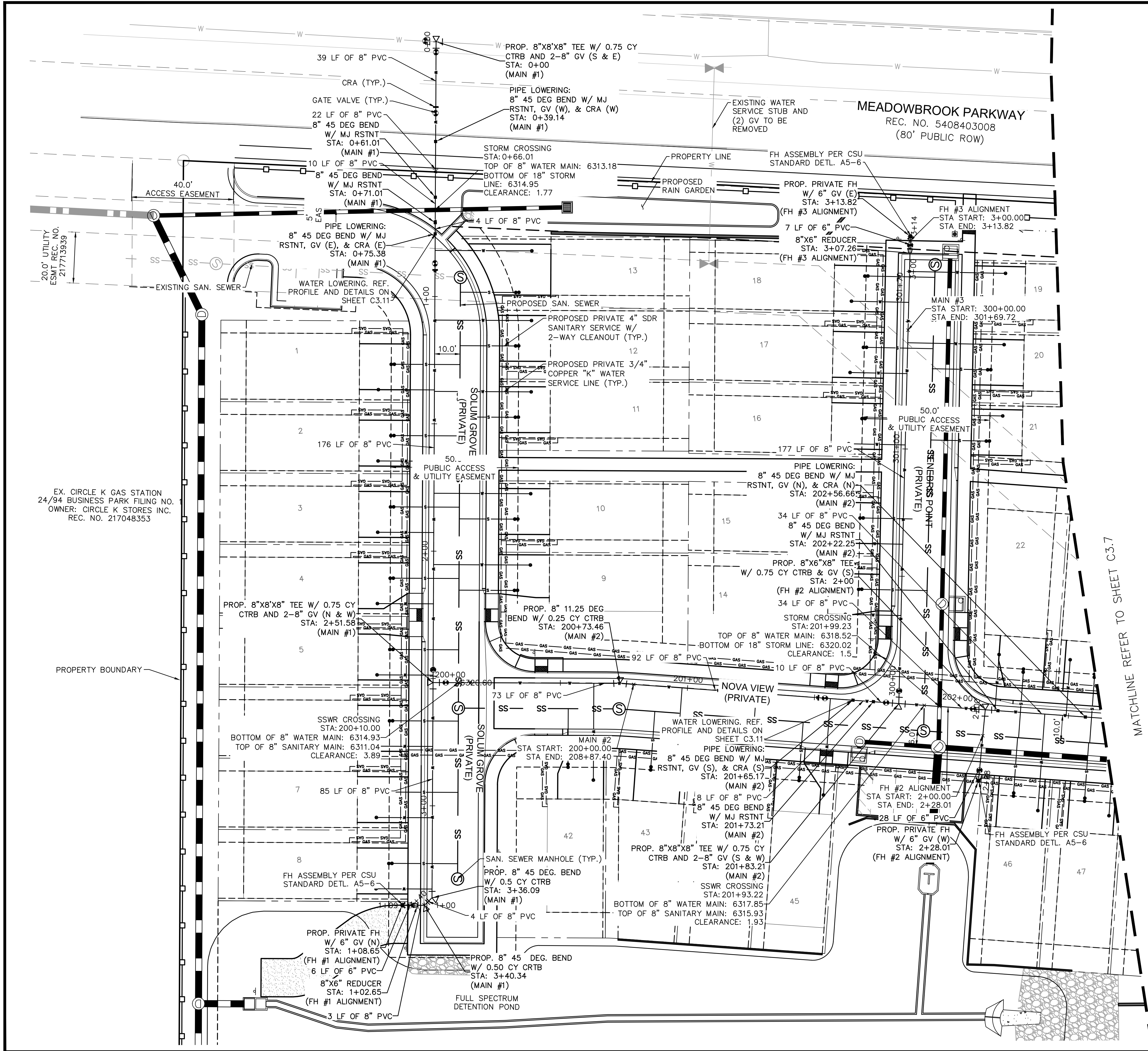
**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET  
C3.5



K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009UT\_WT.dwg Green, Shelby 3/18/2021 11:04 AM



KEY MAP  
NOT TO SCALE

### LEGEND

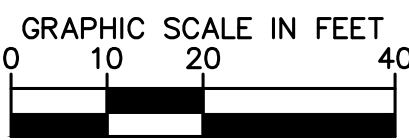
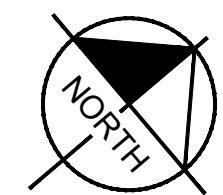
- PROPERTY LINE
- EXISTING WATER LINE & VALVE
- PROPOSED WATER LINE & VALVE
- LOT LINE
- PROPOSED FIRE HYDRANT
- EXISTING SANITARY SEWER LINE & MANHOLE
- PROPOSED SANITARY SEWER LINE & MANHOLE
- PROPOSED STORM SEWER LINE & MANHOLE
- PROPOSED STORM SEWER STRUCTURES

### NOTES:

- ALL WATER LINES TO BE BEDDED PER COLORADO SPRINGS UTILITIES SPECIFICATIONS.
- ALL CONDITIONS SHOWN TO BE "EXISTING" OR "ASSUMED" SHALL BE VERIFIED IN THE FIELD BY THE GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION INCLUDING BUT NOT LIMITED TO POTHOLES OF EXISTING UTILITY ELEVATIONS AT CROSSINGS AND TIE-IN LOCATIONS. ANY DISCREPANCIES SHALL BE NOTED AND SUBMITTED TO THE OWNER AND THE ENGINEER FOR REVIEW. CHANGES TO THE ORIGINAL DESIGN OF THIS PROJECT DUE TO EXISTING SITE CONDITIONS MUST BE APPROVED BY BOTH THE ENGINEER AND OWNER PRIOR TO MAKING ANY CHANGES.
- THE HORIZONTAL DIMENSIONS BETWEEN PROPOSED UTILITY LINES MAY VARY SLIGHTLY BASED ON INSTALLED VALVES, ADAPTER, AND PUMPS.
- ALL APPURTENANCES ON HYDRANT LATERALS SHALL BE INSTALLED WITH MJ RESTRAINTS PER CSU STANDARDS.

### CAUTION NOTE (SERVICE LINES):

CONTRACTOR SHALL MAINTAIN 1' OF VERTICAL SEPARATION AT ALL DRY UTILITY CROSSINGS. CONTRACTOR SHALL POT HOLE ALL EXISTING UTILITY CROSSINGS TO VERIFY DEPTH AND COORDINATE WITH ENGINEER OF RECORD.



**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
WATER PLAN

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET

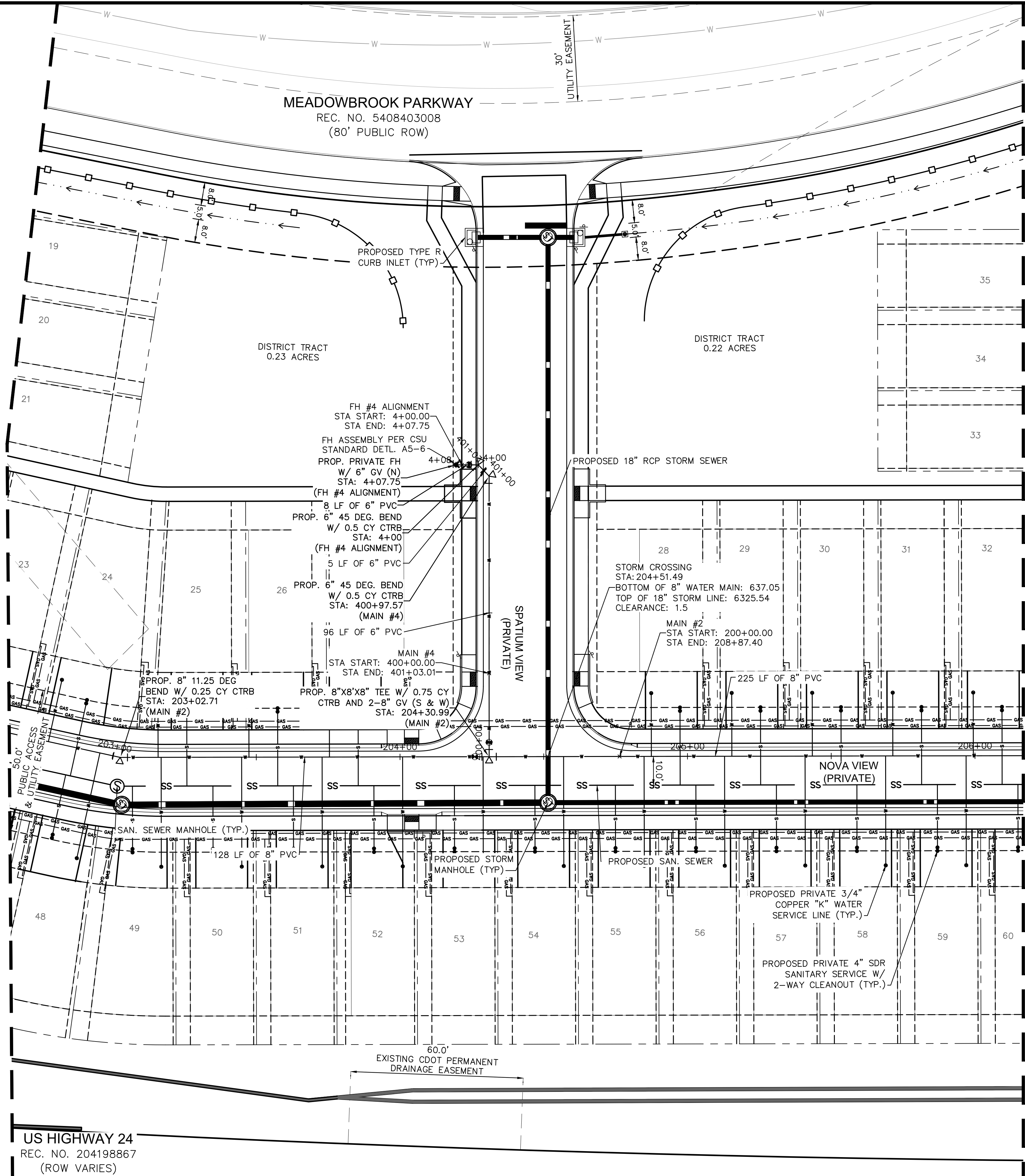
C3.6

NO. REVISION BY DATE APPR.

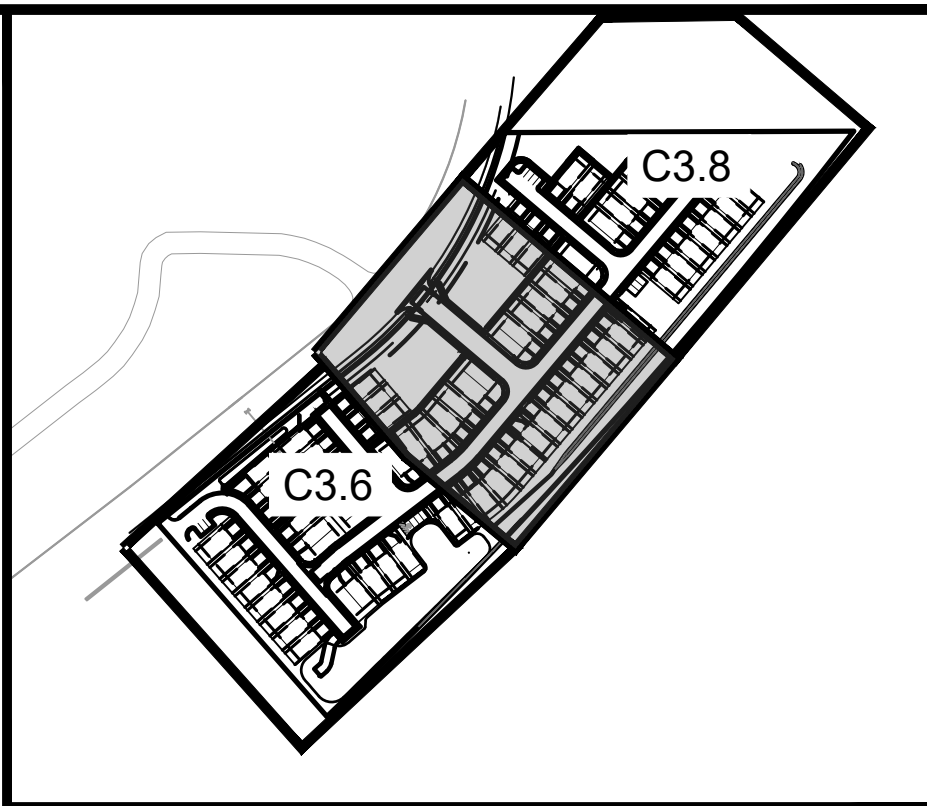


K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009UT\_WT.dwg Green, Shelby 3/18/2021 11:04 AM

MATCHLINE REFER TO SHEET C3.6



MATCHLINE REFER TO SHEET C3.8



KEY MAP  
NOT TO SCALE

LEGEND

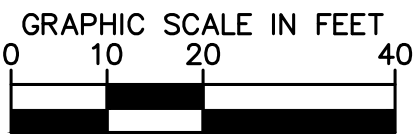
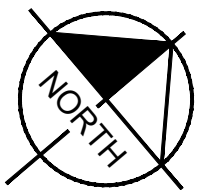
- PROPERTY LINE
- EXISTING WATER LINE & VALVE
- PROPOSED WATER LINE & VALVE
- PROPOSED FIRE HYDRANT
- EXISTING SANITARY SEWER LINE & MANHOLE
- PROPOSED SANITARY SEWER LINE & MANHOLE
- PROPOSED STORM SEWER LINE & MANHOLE
- PROPOSED STORM SEWER STRUCTURES

NOTES:

- ALL WATER LINES TO BE BEDDED PER COLORADO SPRINGS UTILITIES SPECIFICATIONS.
- ALL CONDITIONS SHOWN TO BE "EXISTING" OR "ASSUMED" SHALL BE VERIFIED IN THE FIELD BY THE GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION INCLUDING BUT NOT LIMITED TO POTHOLING OF EXISTING UTILITY ELEVATIONS AT CROSSINGS AND TIE-IN LOCATIONS. ANY DISCREPANCIES SHALL BE NOTED AND SUBMITTED TO THE OWNER AND THE ENGINEER FOR REVIEW. CHANGES TO THE ORIGINAL DESIGN OF THIS PROJECT DUE TO EXISTING SITE CONDITIONS MUST BE APPROVED BY BOTH THE ENGINEER AND OWNER PRIOR TO MAKING ANY CHANGES.
- THE HORIZONTAL DIMENSIONS BETWEEN PROPOSED UTILITY LINES MAY VARY SLIGHTLY BASED ON INSTALLED VALVES, ADAPTER, AND PUMPS.
- ALL APPURTENANCES ON HYDRANT LATERALS SHALL BE INSTALLED WITH MJ RESTRAINTS PER CSU STANDARDS.

CAUTION NOTE (SERVICE LINES):

CONTRACTOR SHALL MAINTAIN 1' OF VERTICAL SEPARATION AT ALL DRY UTILITY CROSSINGS. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITY CROSSINGS TO VERIFY DEPTH AND COORDINATE WITH ENGINEER OF RECORD.



**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
WATER PLAN

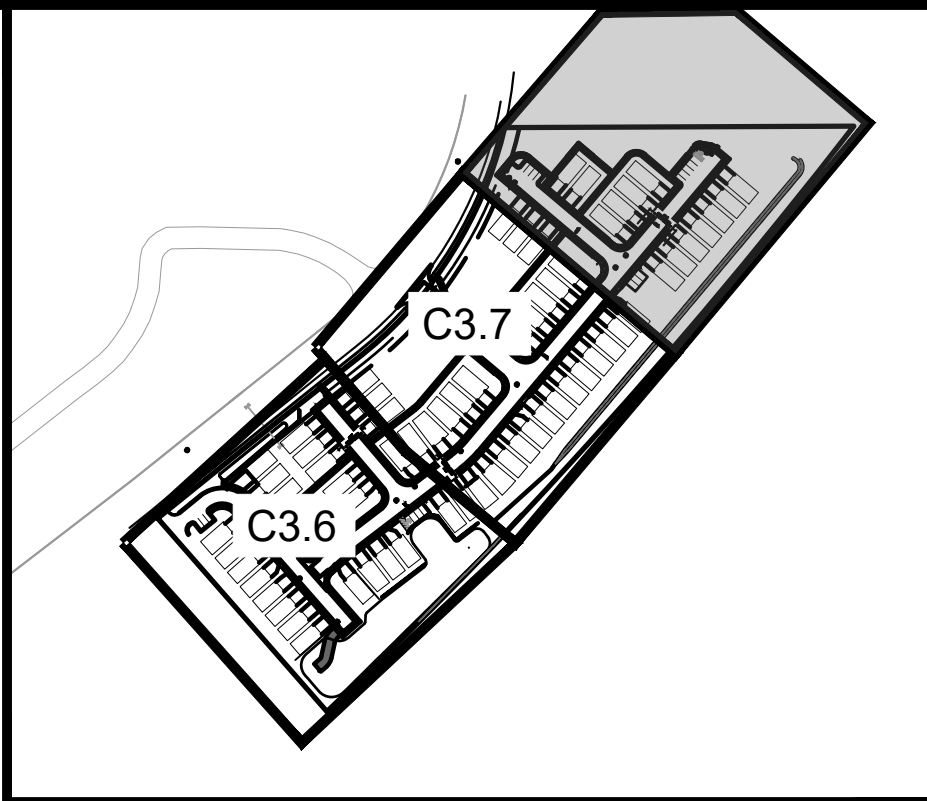
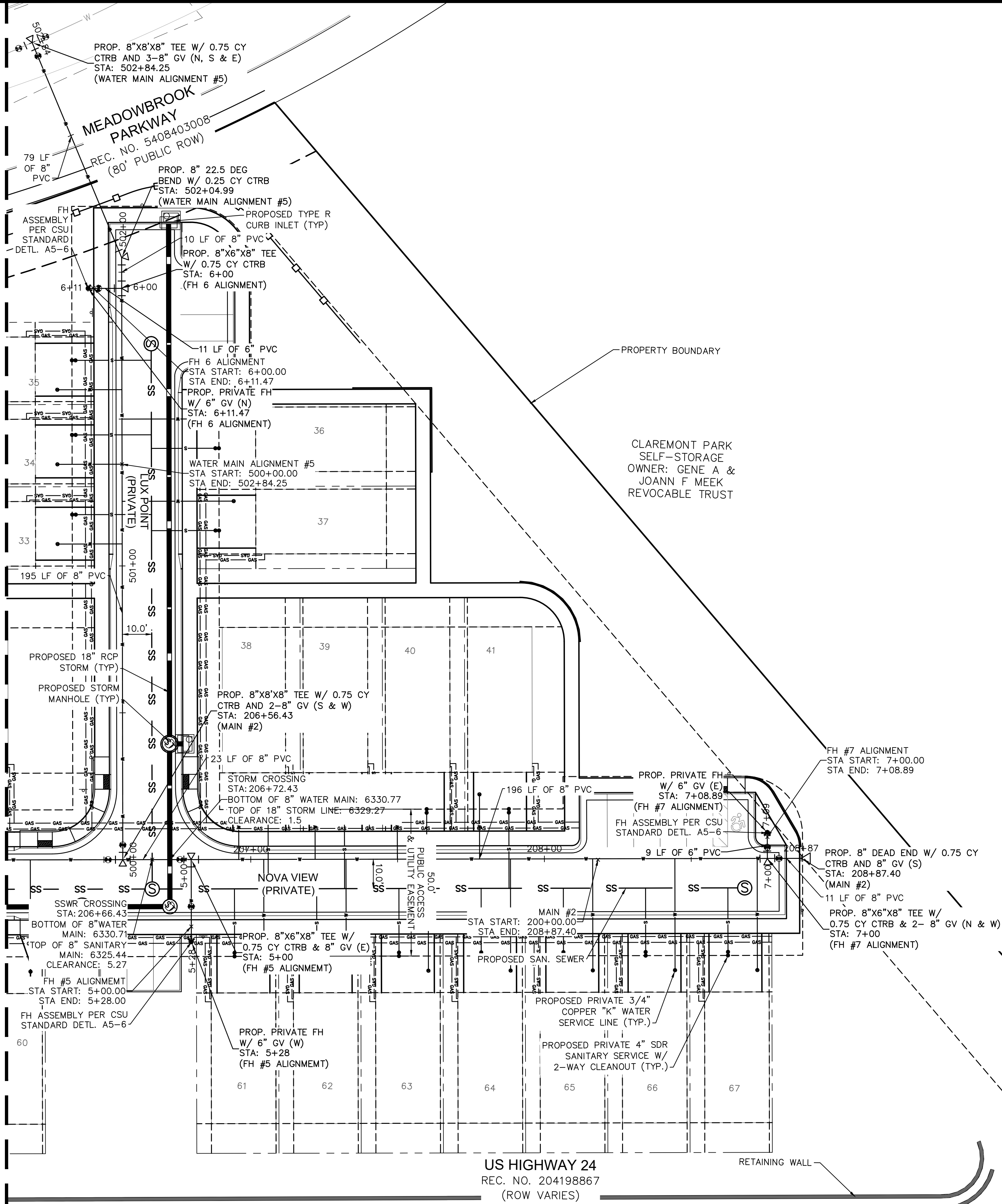
PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009  
SHEET  
C3.7



K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009UT\_WT.dwg Green, Shelby 3/18/2021 11:04 AM

MATCHLINE REFER TO SHEET C3.7



KEY MAP  
NOT TO SCALE

#### LEGEND

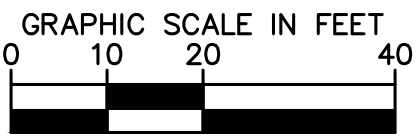
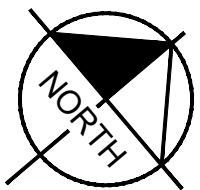
- PROPERTY LINE
- EXISTING WATER LINE & VALVE
- PROPOSED WATER LINE & VALVE
- PROPOSED FIRE HYDRANT
- SS --- EXISTING SANITARY SEWER LINE & MANHOLE
- S --- PROPOSED SANITARY SEWER LINE & MANHOLE
- --- PROPOSED STORM SEWER LINE & MANHOLE
- PROPOSED STORM SEWER STRUCTURES

#### NOTES:

1. ALL WATER LINES TO BE BEDDED PER COLORADO SPRINGS UTILITIES SPECIFICATIONS.
2. ALL CONDITIONS SHOWN TO BE "EXISTING" OR "ASSUMED" SHALL BE VERIFIED IN THE FIELD BY THE GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION INCLUDING BUT NOT LIMITED TO POTHOLING OF EXISTING UTILITY ELEVATIONS AT CROSSINGS AND TIE-IN LOCATIONS. ANY DISCREPANCIES SHALL BE NOTED AND SUBMITTED TO THE OWNER AND THE ENGINEER FOR REVIEW. CHANGES TO THE ORIGINAL DESIGN OF THIS PROJECT DUE TO EXISTING SITE CONDITIONS MUST BE APPROVED BY BOTH THE ENGINEER AND OWNER PRIOR TO MAKING ANY CHANGES.
3. THE HORIZONTAL DIMENSIONS BETWEEN PROPOSED UTILITY LINES MAY VARY SLIGHTLY BASED ON INSTALLED VALVES, ADAPTER, AND PUMPS.
4. ALL APPURTENANCES ON HYDRANT LATERALS SHALL BE INSTALLED WITH MJ RESTRAINTS PER CSU STANDARDS.

#### CAUTION NOTE (SERVICE LINES):

CONTRACTOR SHALL MAINTAIN 1' OF VERTICAL SEPARATION AT ALL DRY UTILITY CROSSINGS. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITY CROSSINGS TO VERIFY DEPTH AND COORDINATE WITH ENGINEER OF RECORD.



**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
WATER PLAN

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

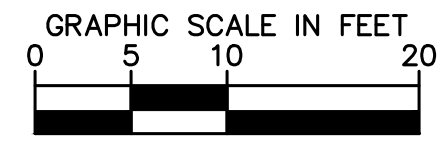
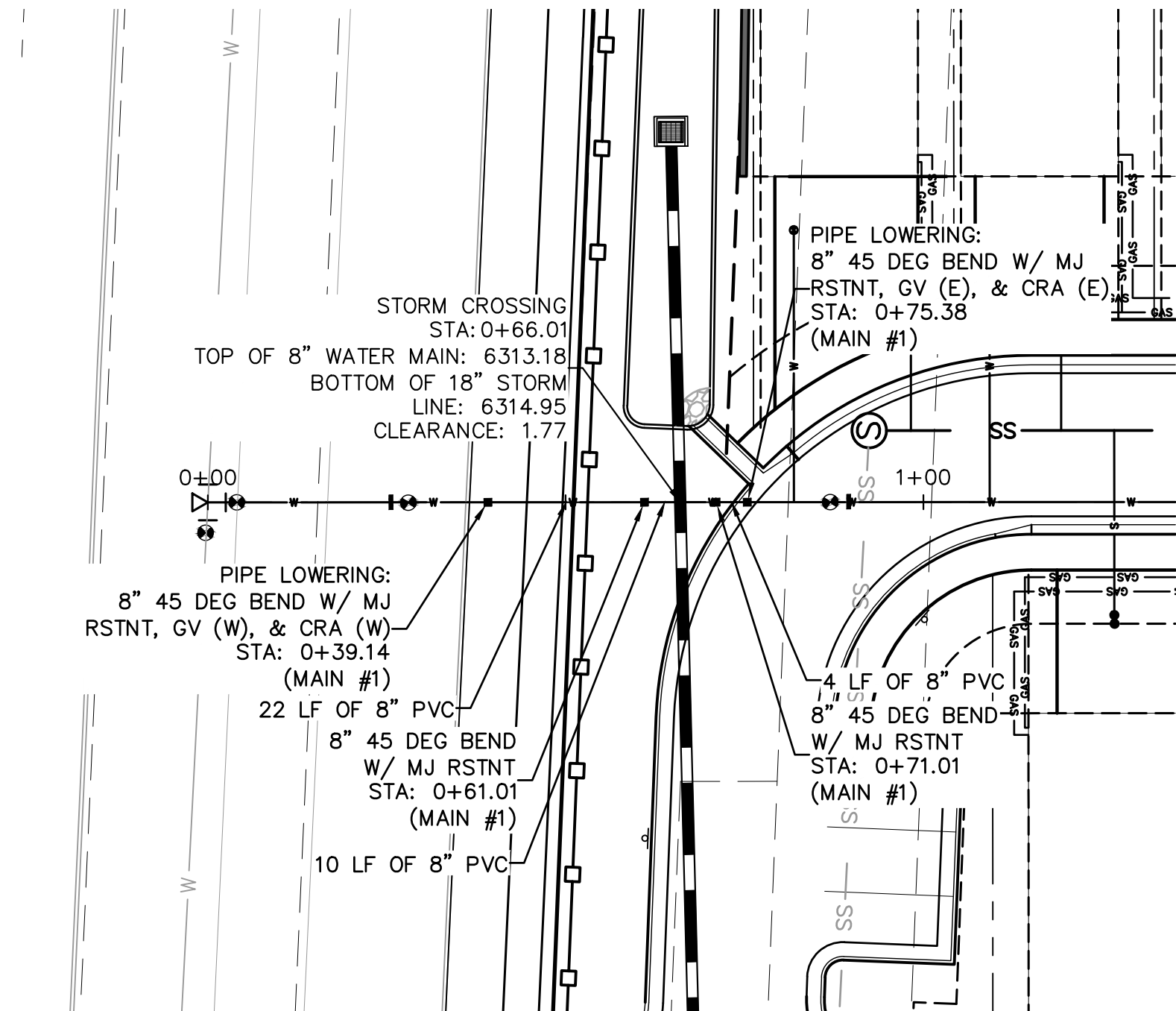
SHEET

C3.8

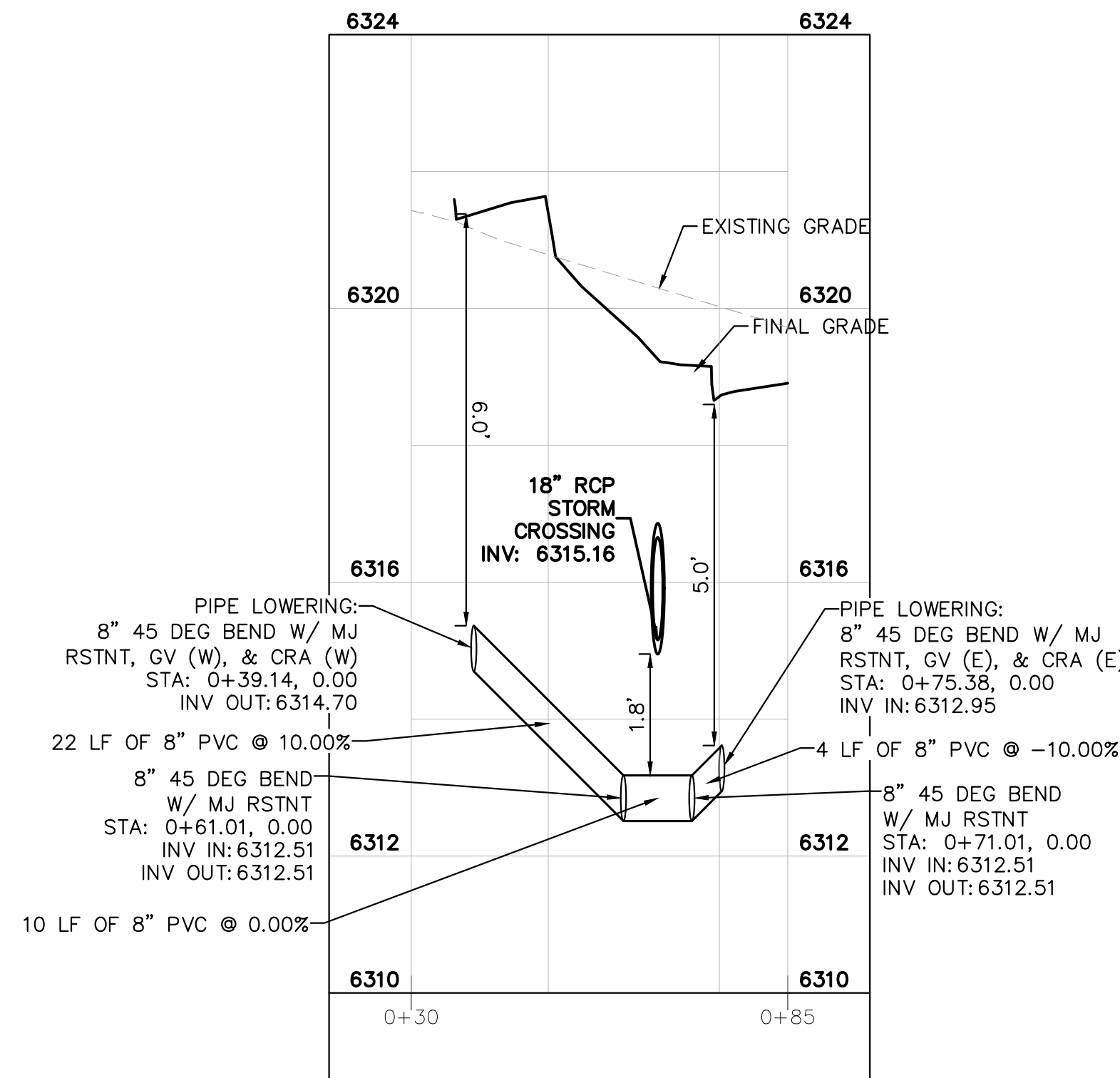
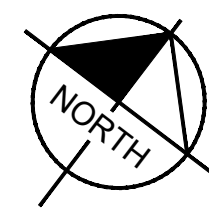
NO. REVISION BY DATE APPR.



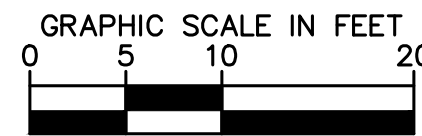
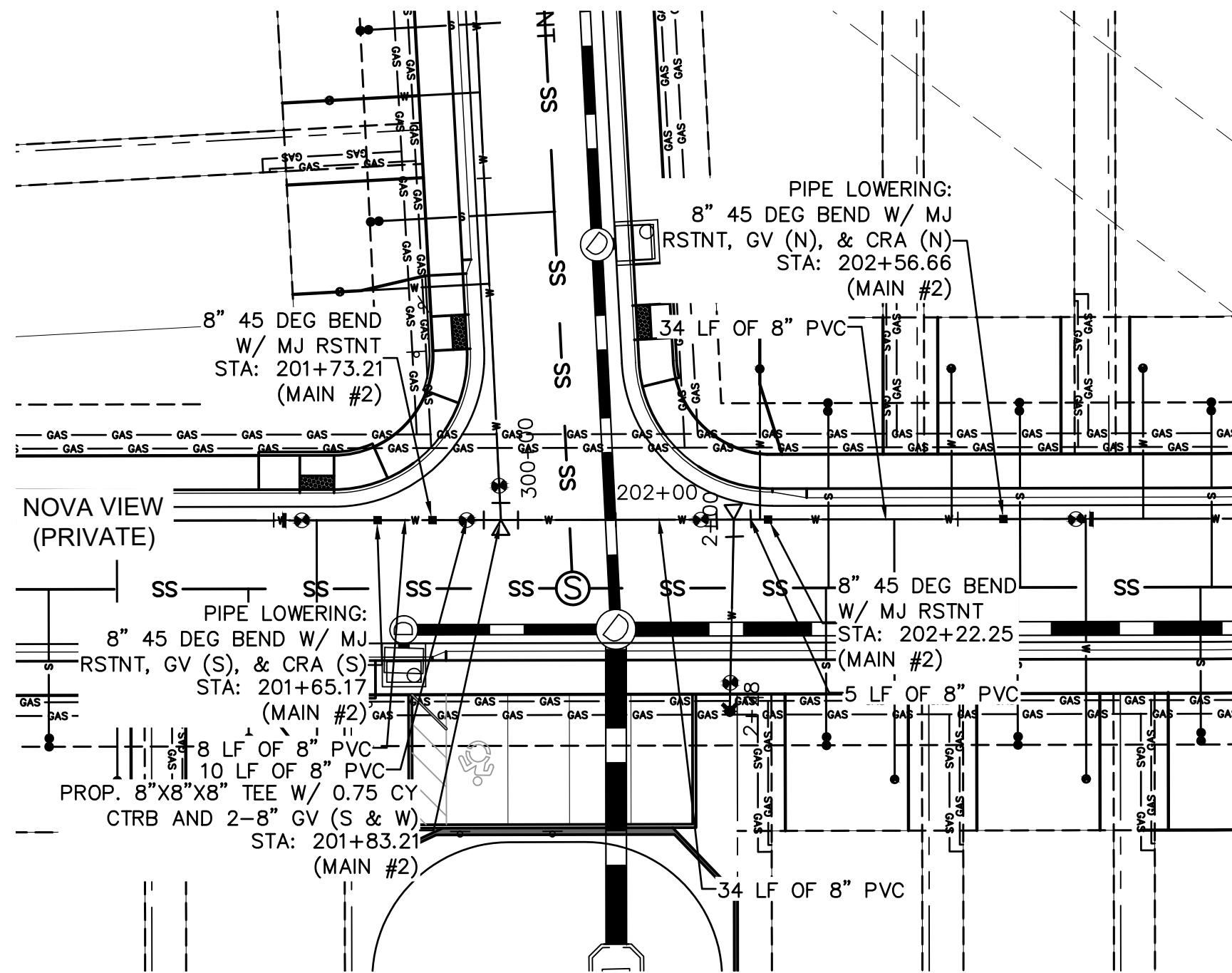
K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009\_UT\_WI.dwg Green, Shelby 3/18/2021 11:04 AM



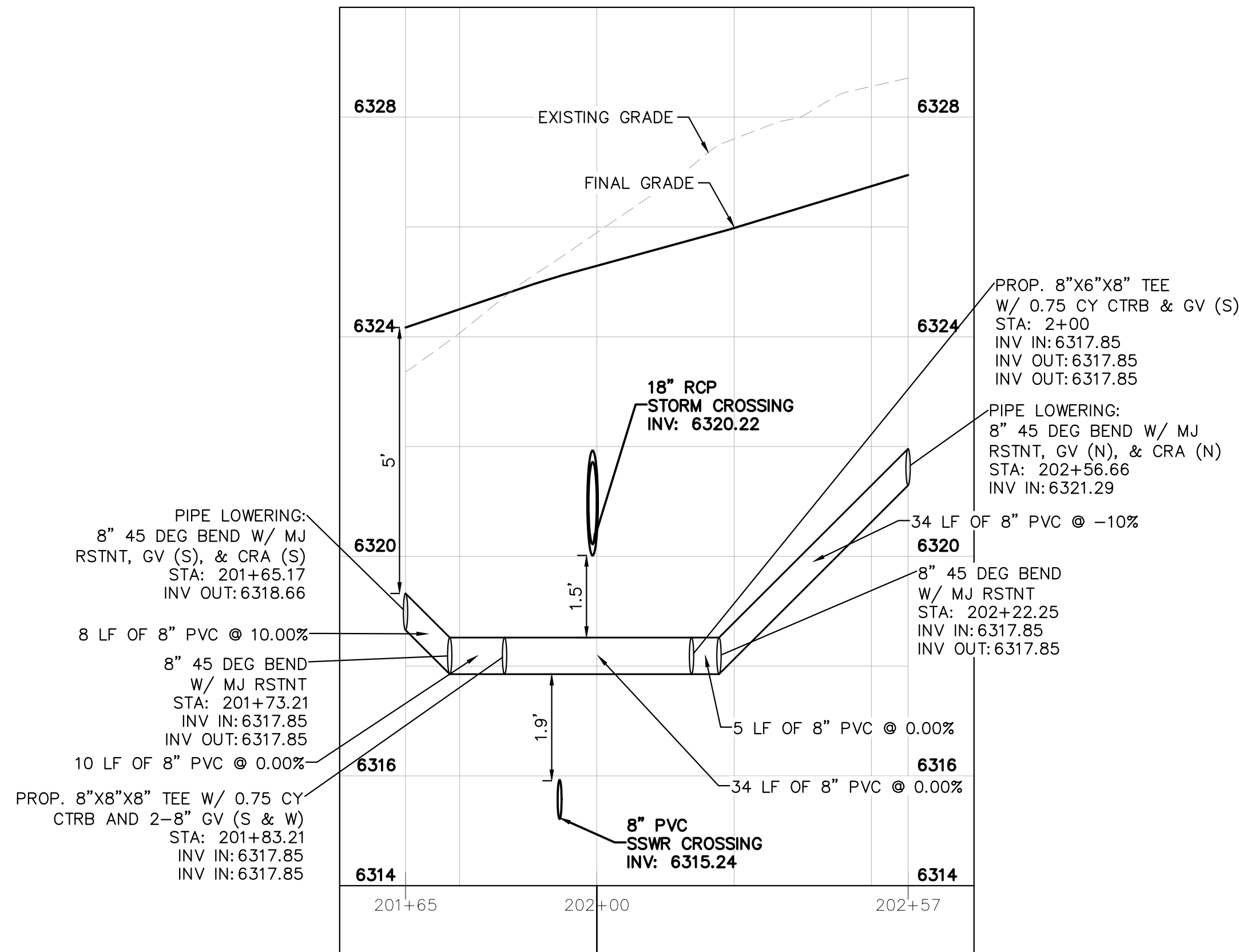
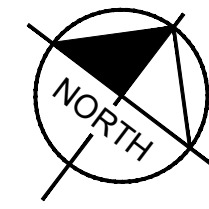
**WATER MAIN #1 PIPE  
LOWERING PLAN  
VIEW**



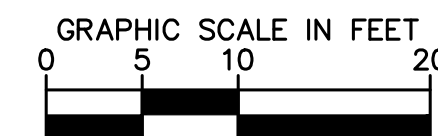
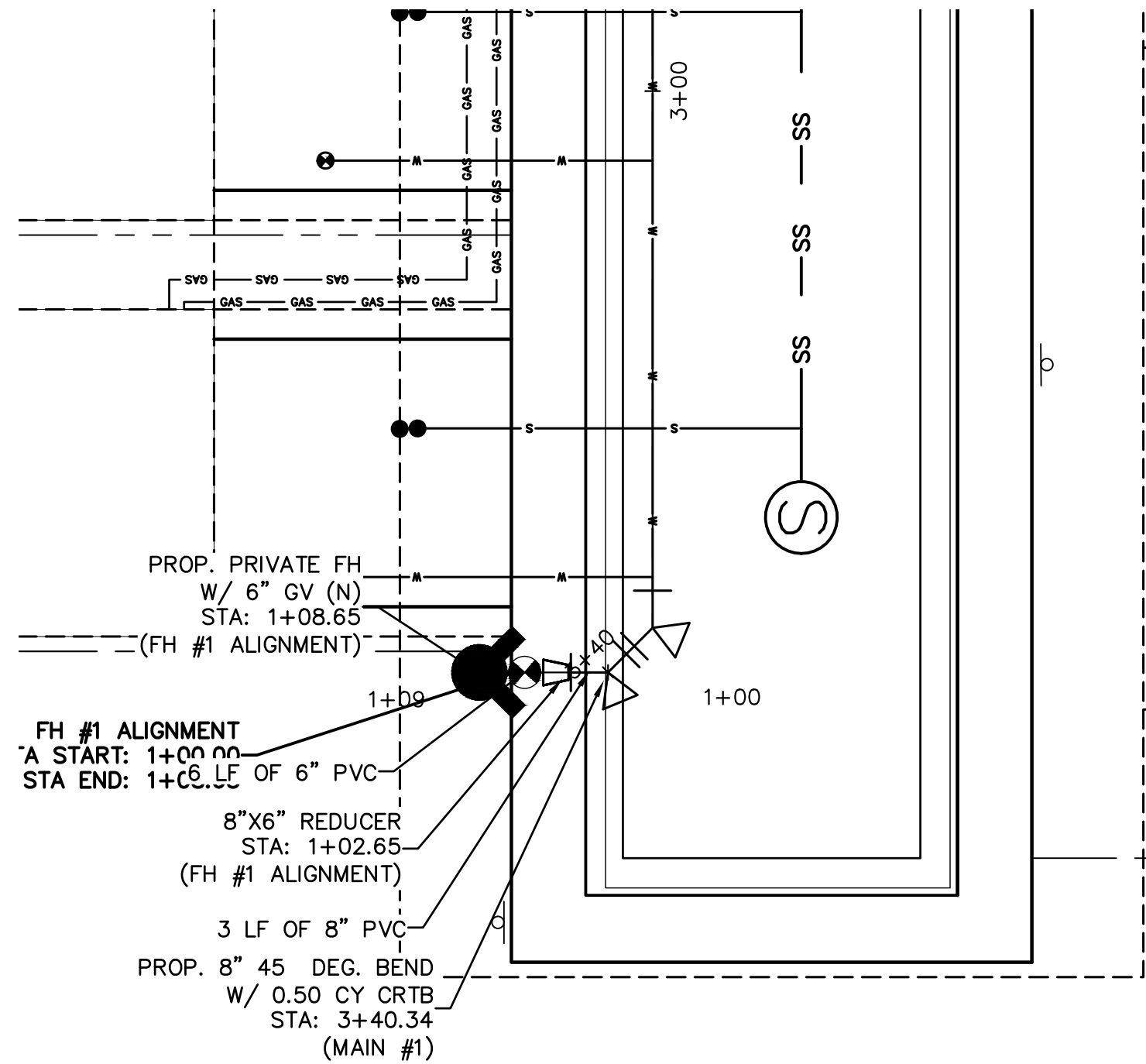
**WATER MAIN #1  
PIPE LOWERING  
PROFILE VIEW**



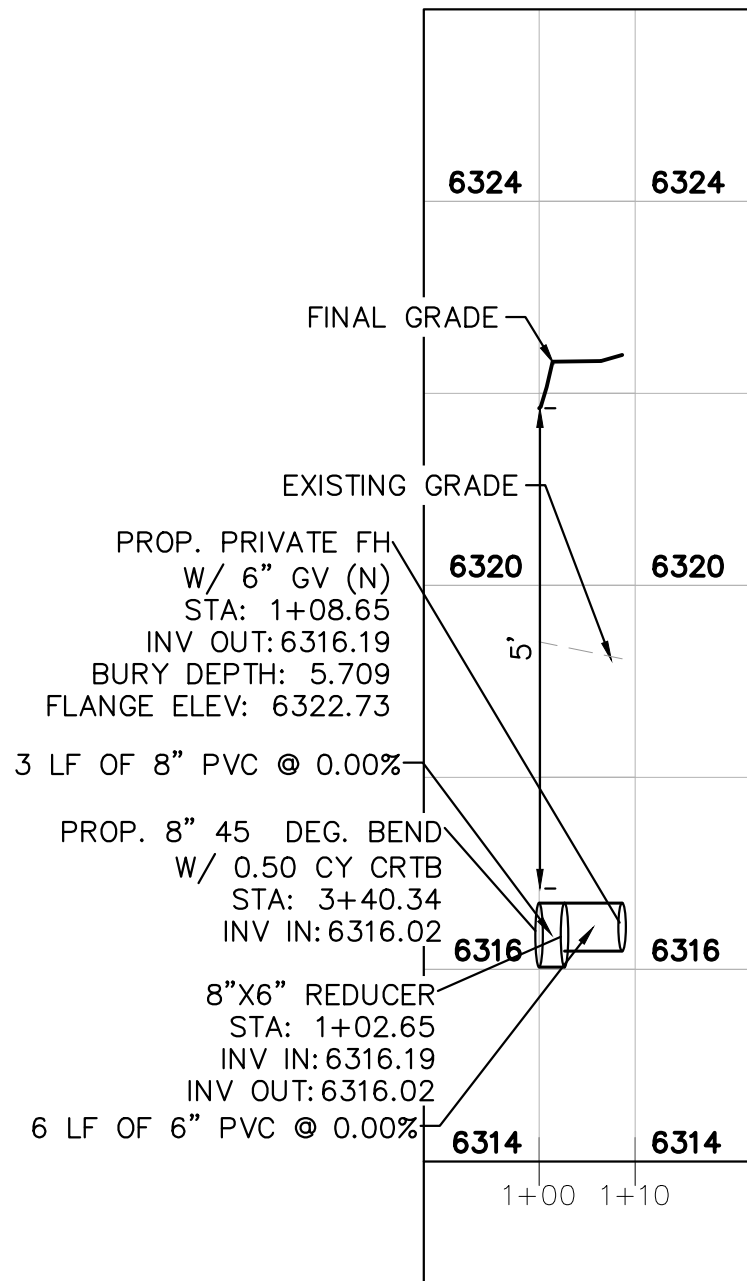
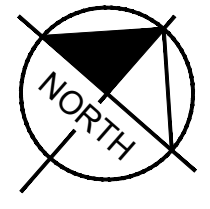
**WATER MAIN #2 PIPE  
LOWERING PLAN  
VIEW**



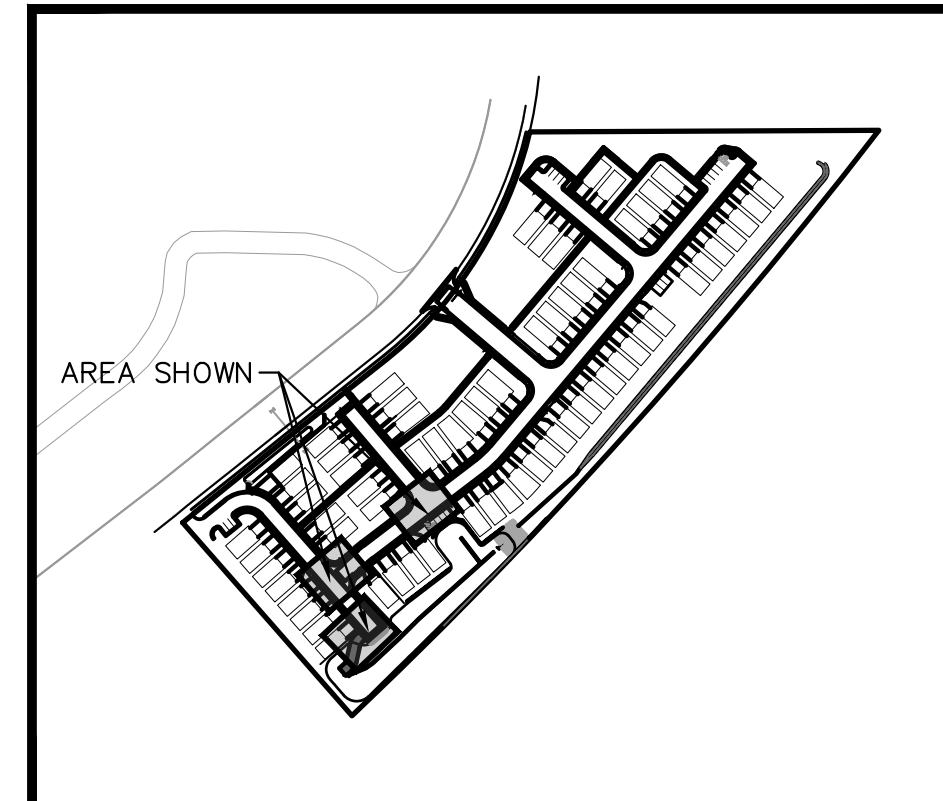
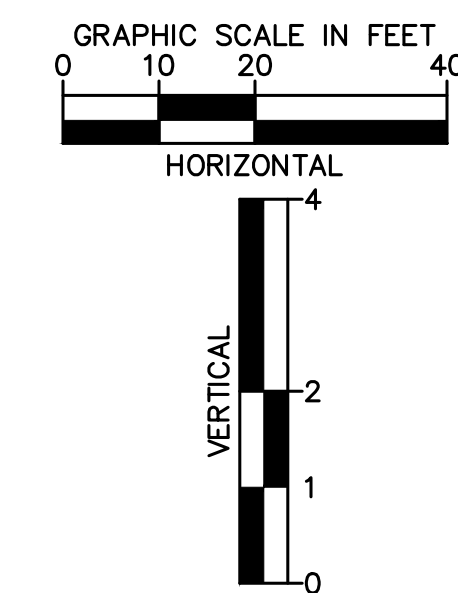
**WATER MAIN #2  
PIPE LOWERING  
PROFILE VIEW**



**FIRE HYDRANT LINE  
#1 PLAN VIEW**



**FIRE HYDRANT LINE  
#1 PROFILE VIEW**



**KEY MAP  
NOT TO SCALE**

**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
**WATER PLAN**

**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

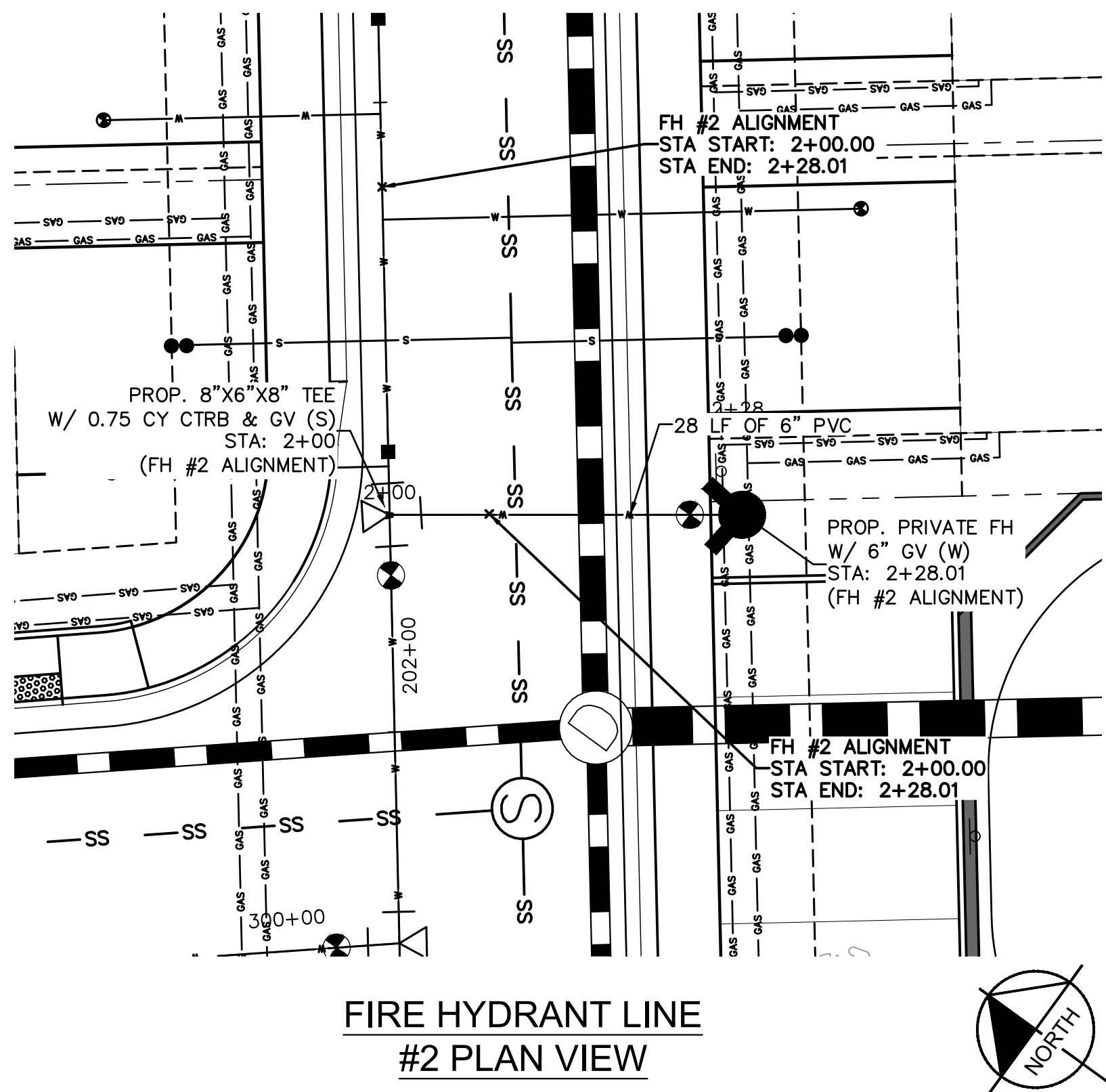
PROJECT NO.  
096956009

SHEET  
**C3.8**

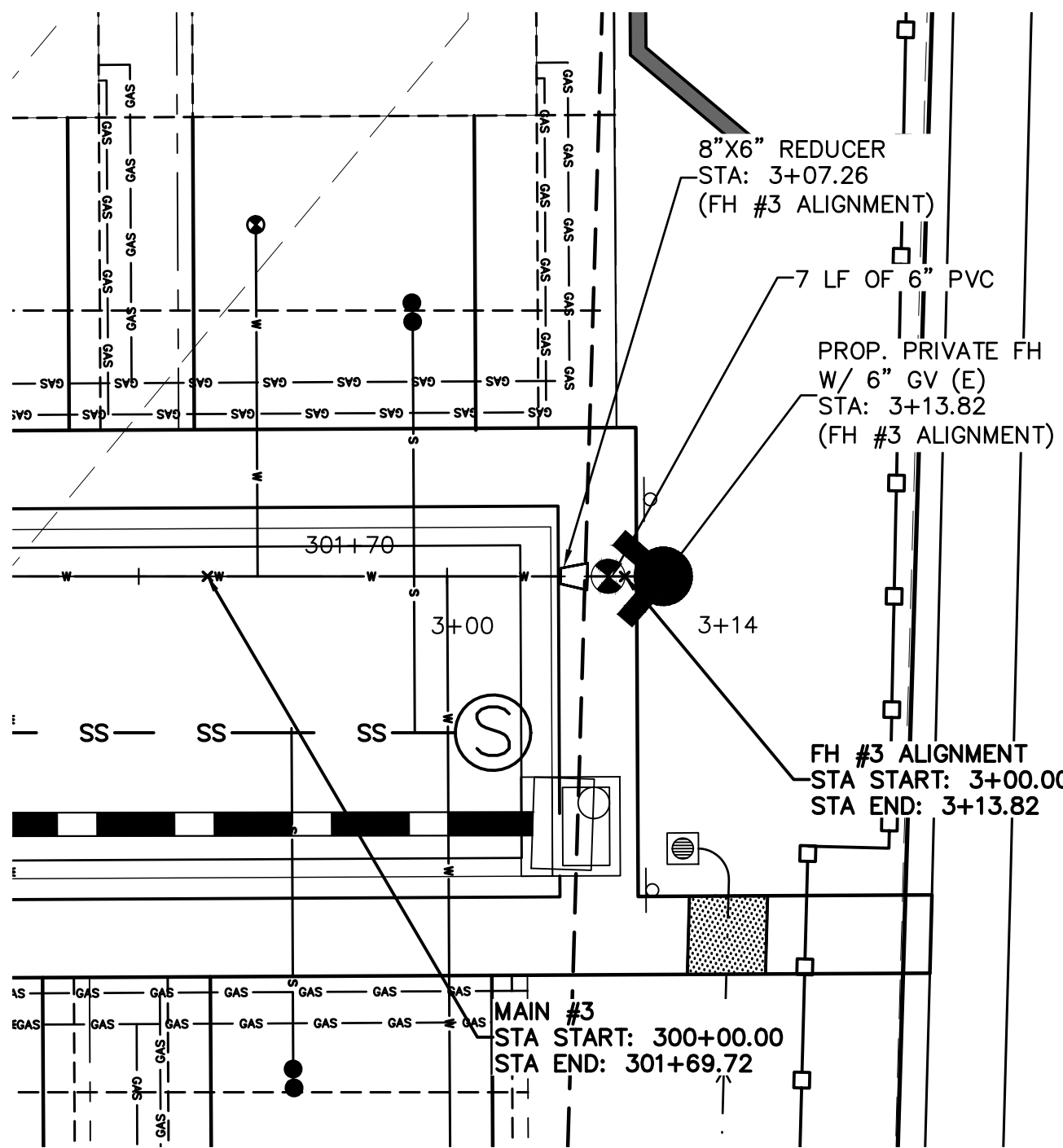
NO. REVISION BY DATE APPR.



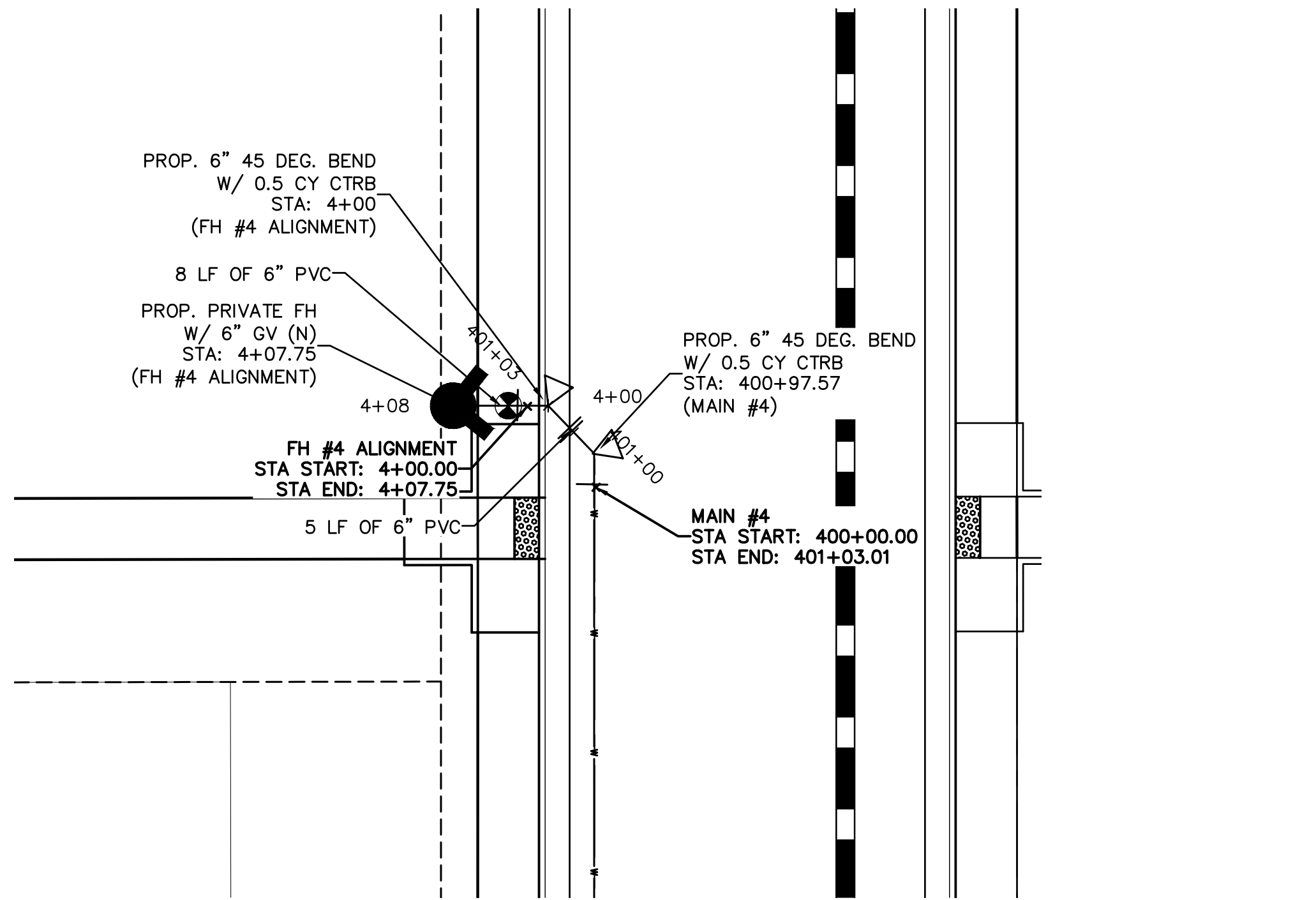
K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009UT\_WT.dwg Green, Shelby 3/18/2021 11:04 AM



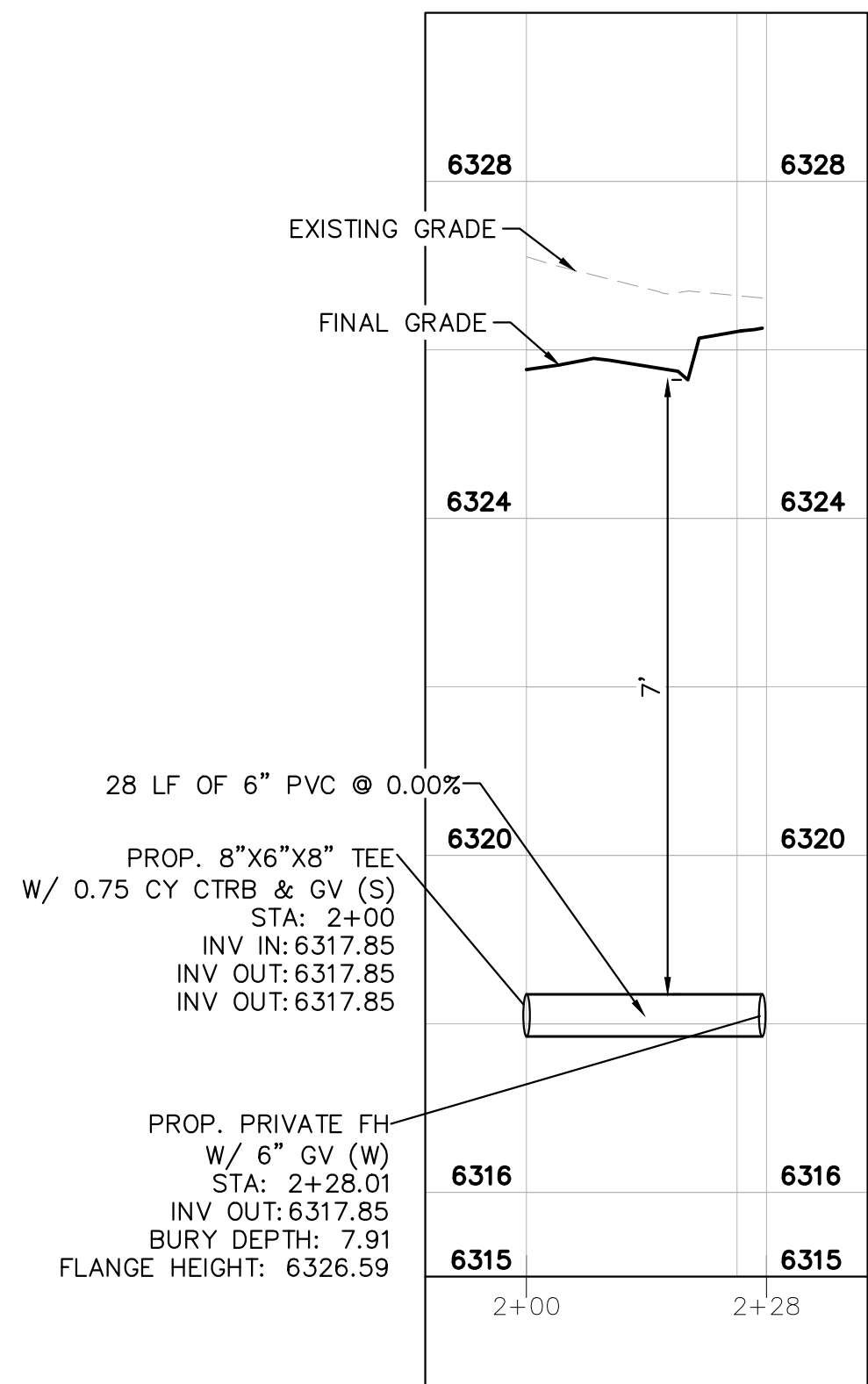
FIRE HYDRANT LINE  
#2 PLAN VIEW



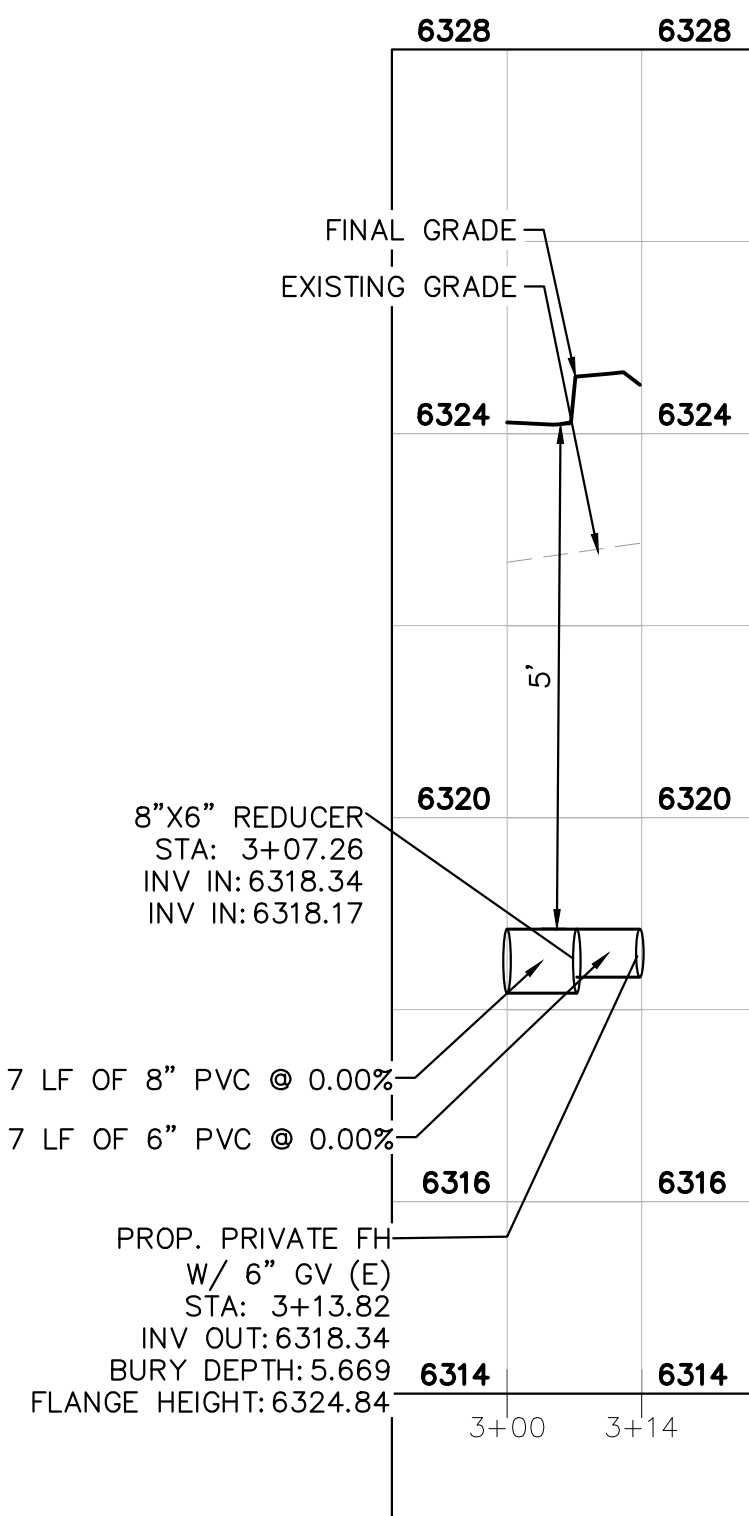
FIRE HYDRANT LINE  
#3 PLAN VIEW



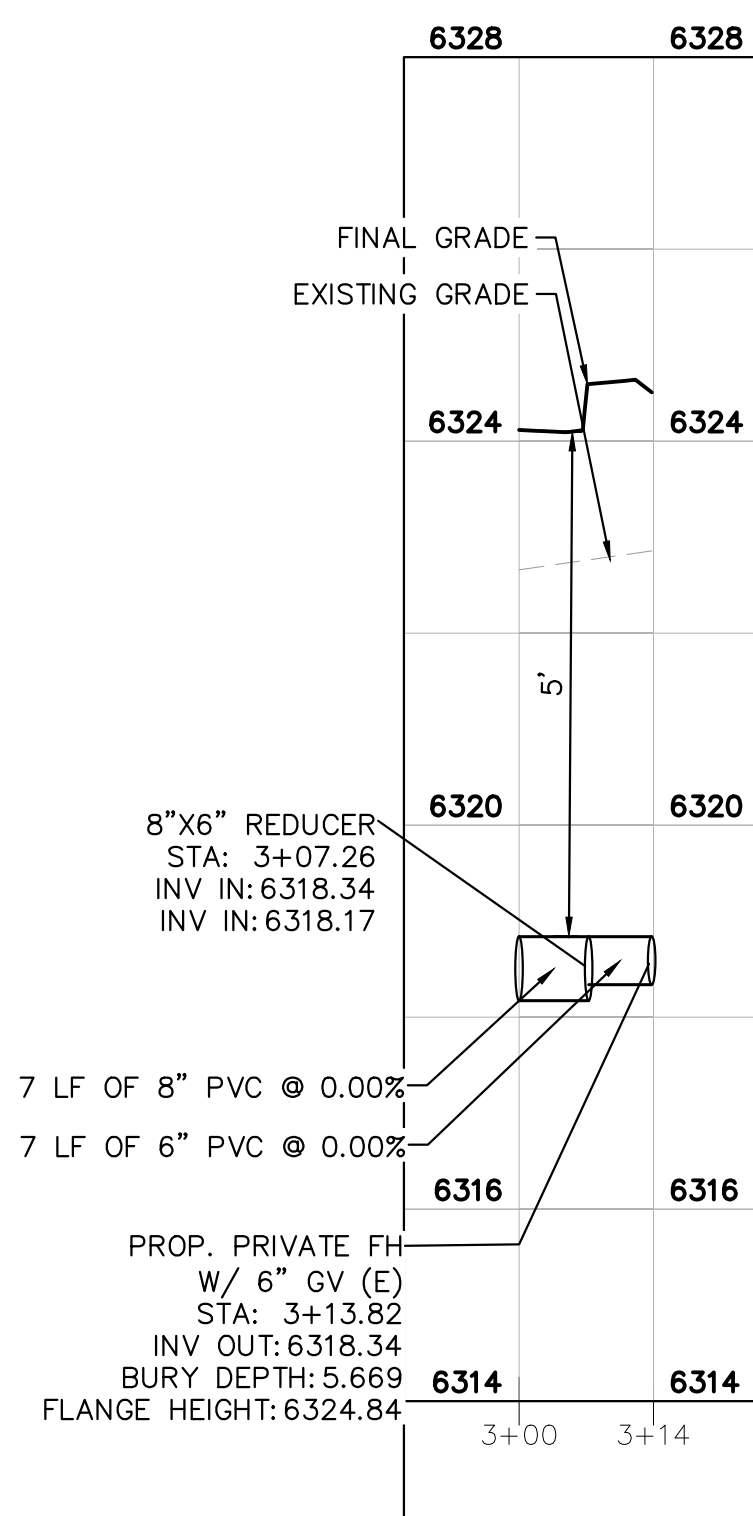
FIRE HYDRANT LINE  
#4 PLAN VIEW



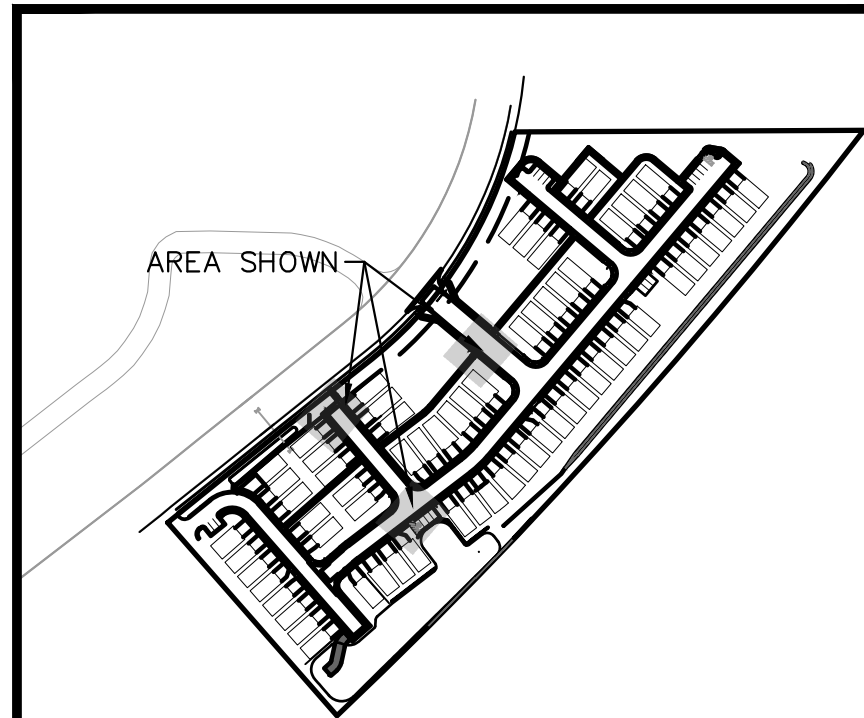
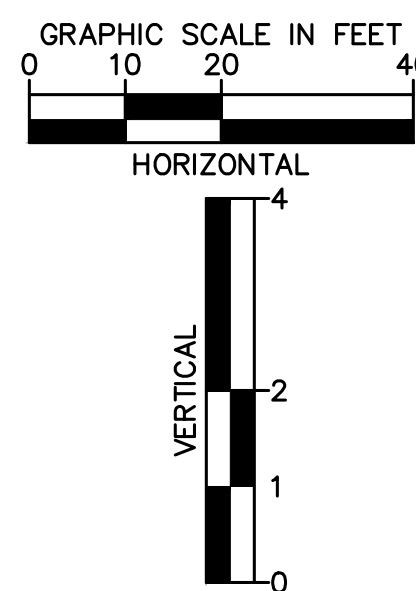
FIRE HYDRANT LINE  
#2 PROFILE VIEW



FIRE HYDRANT LINE  
#3 PROFILE VIEW



FIRE HYDRANT LINE  
#4 PROFILE VIEW



KEY MAP  
NOT TO SCALE

DESIGNED BY: KK		BY		DATE		APPR	
DRAWN BY: KK							
CHECKED BY: JH							
DATE: 10/09/2020							

**Kimley»Horn**  
2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
WATER PLAN

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

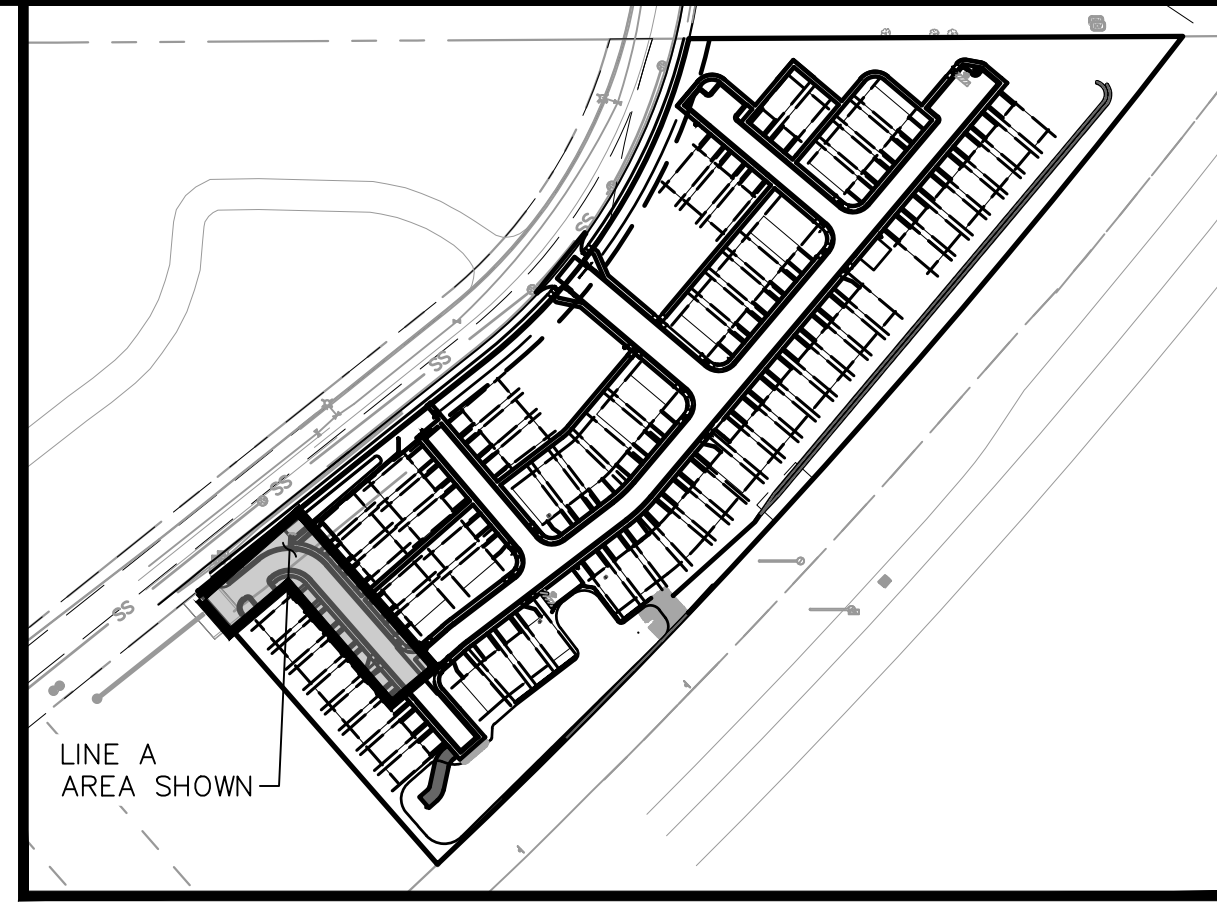
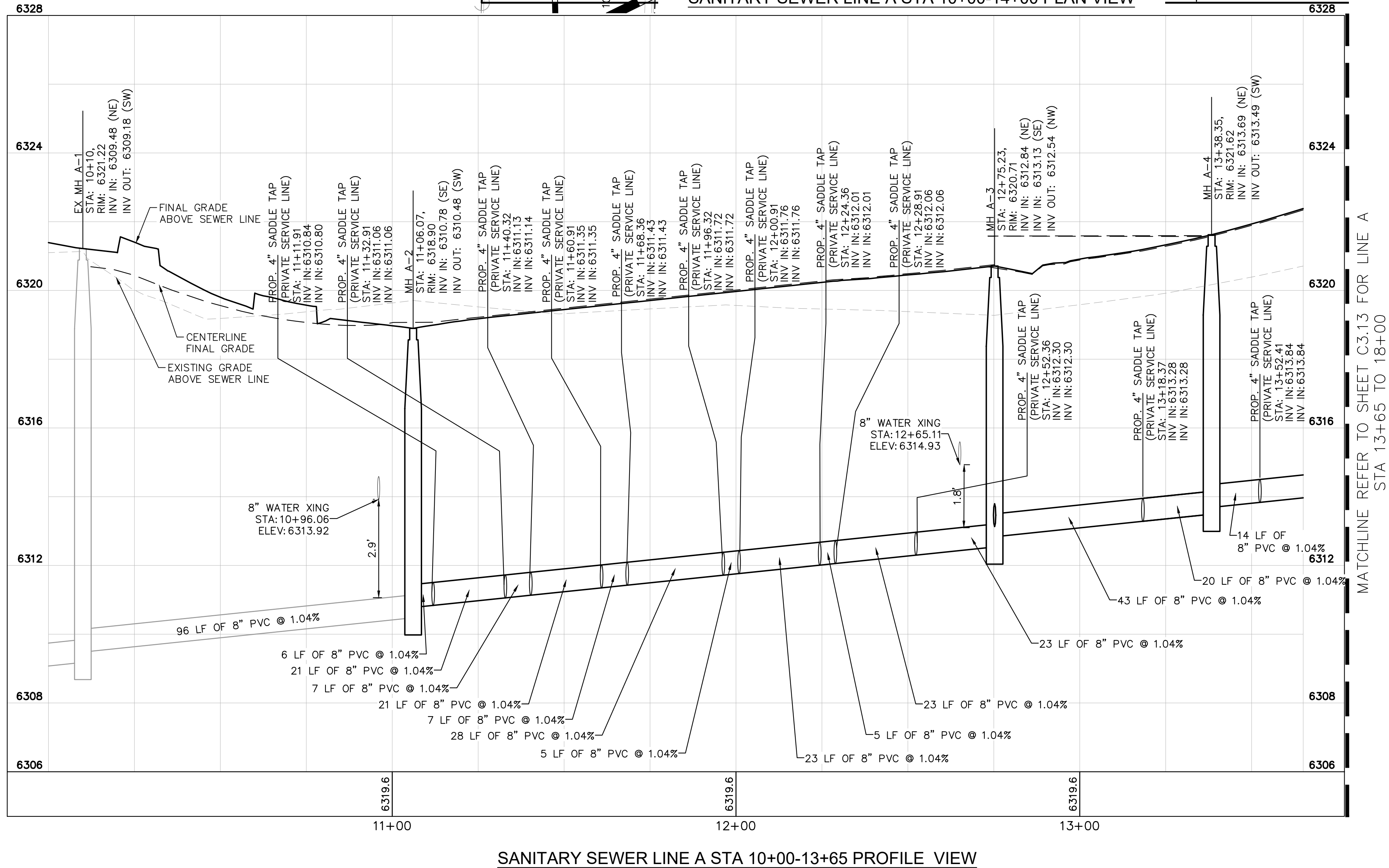
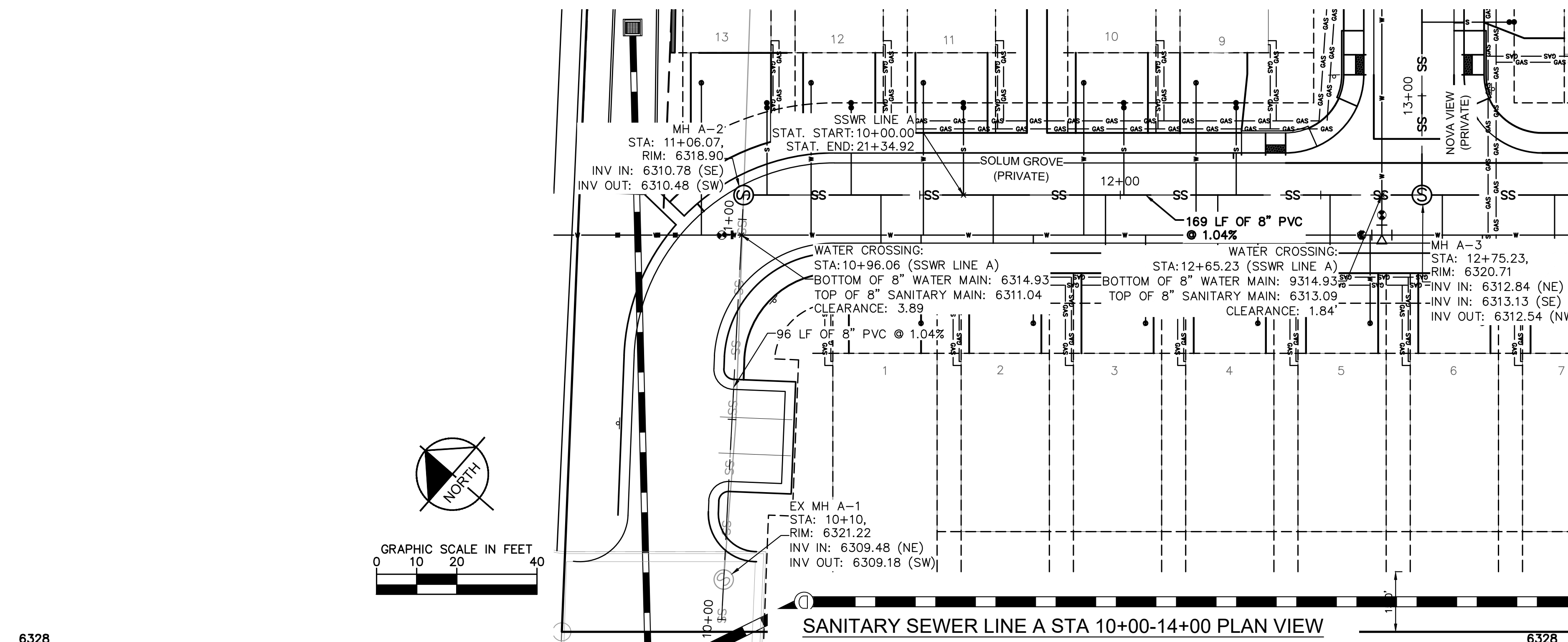
PROJECT NO.  
096956009

SHEET  
**C3.8**






















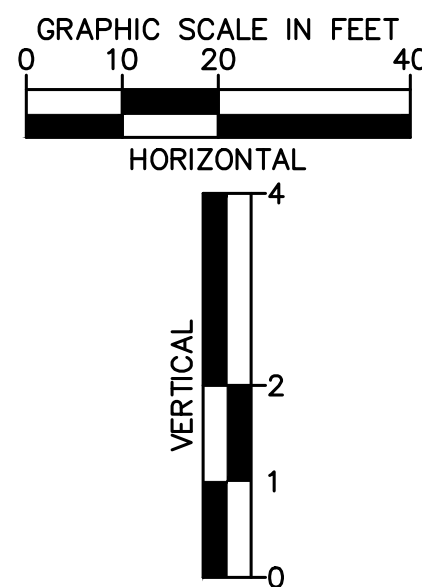
KEYMAP  
SCALE: 1"=200'

SANITARY SEWER NOTES

1. MANHOLE RIM ELEVATIONS PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL INSTALL MANHOLES IN ACCORDANCE WITH APPLICABLE DETAILS BASED UPON FINAL FINISH GRADING AT MANHOLE LOCATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTMENTS TO ACCOMMODATE DEVIATIONS IN SITE GRADING AT NO COST TO THE OWNER.
2. ALL SANITARY SEWER MANHOLES AND MAINS ARE PUBLIC UNLESS OTHERWISE NOTED.
3. ALL SERVICE LATERALS SHALL BE A MINIMUM OF 4" PVC AND PRIVATE UNLESS OTHERWISE NOTED ON PLANS.
4. CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING SANITARY SEWER AT ALL CONNECTION POINTS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
5. CONTRACTOR TO MODIFY EXISTING MANHOLE RIM ELEVATIONS TO MATCH PROPOSED FINISH GRADE AS NECESSARY.

## LEGEND

- |   |                           |
|---|---------------------------|
|  | PROPERTY LINE             |
|  | EXISTING EASEMENT LINE    |
|  | PROPOSED EASEMENT LINE    |
|  | EXISTING SANITARY SEWER   |
|  | PROPOSED SANITARY SEWER   |
|  | LOT LINE                  |
|  | SANITARY SEWER MANHOLE    |
|  | EXISTING SANITARY MANHOLE |
|  | PROPOSED STORM MANHOLE    |
|  | PROPOSED STORM SEWER      |
|  | PROPOSED WATER LINE       |
|  | PROPOSED FIRE HYDRANT     |
|  | PROPOSED STORM INLET      |



**Kimley»»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 451-1100

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
**SAN. SEWER PLAN & PROFILE-LINE A**

**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

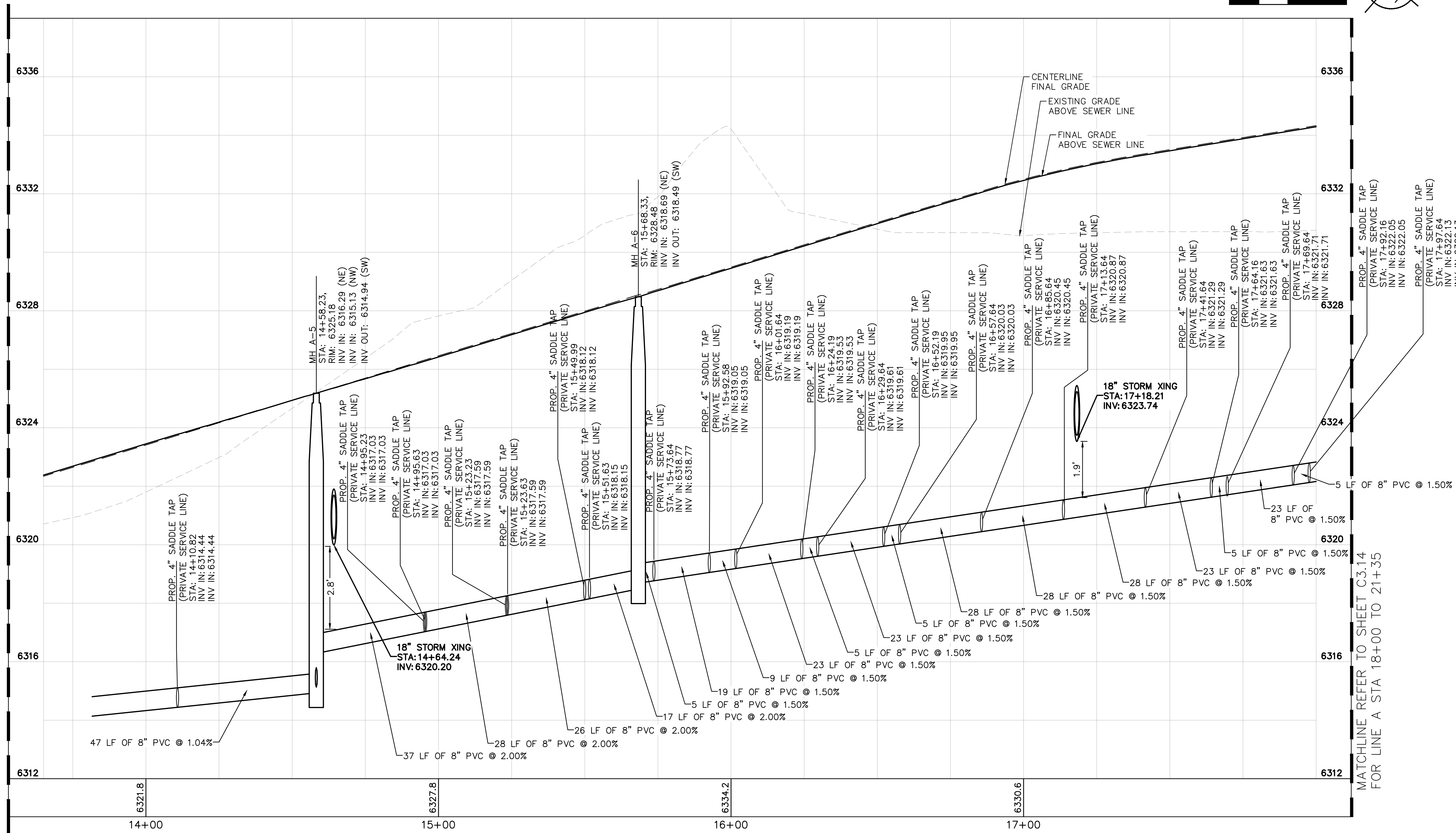
PROJECT NO.  
096956009

SHEET

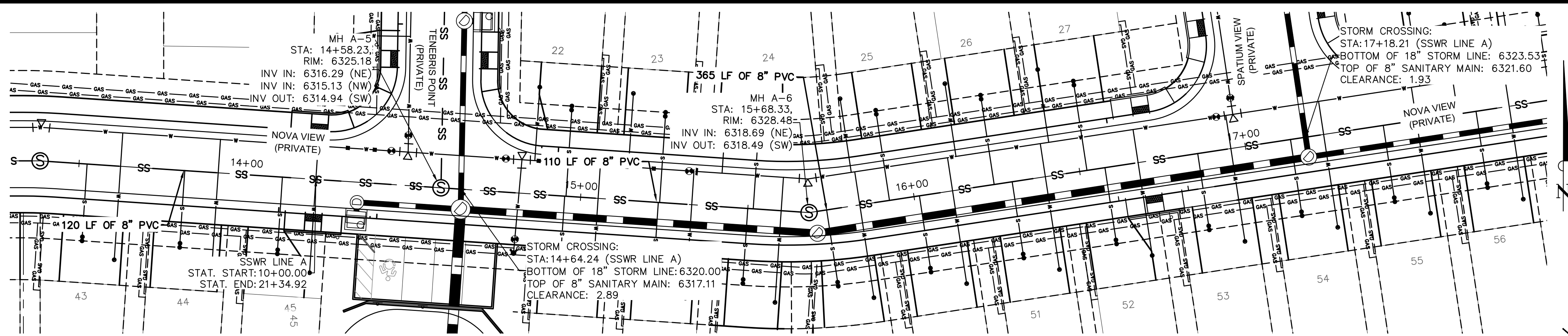
C3.12



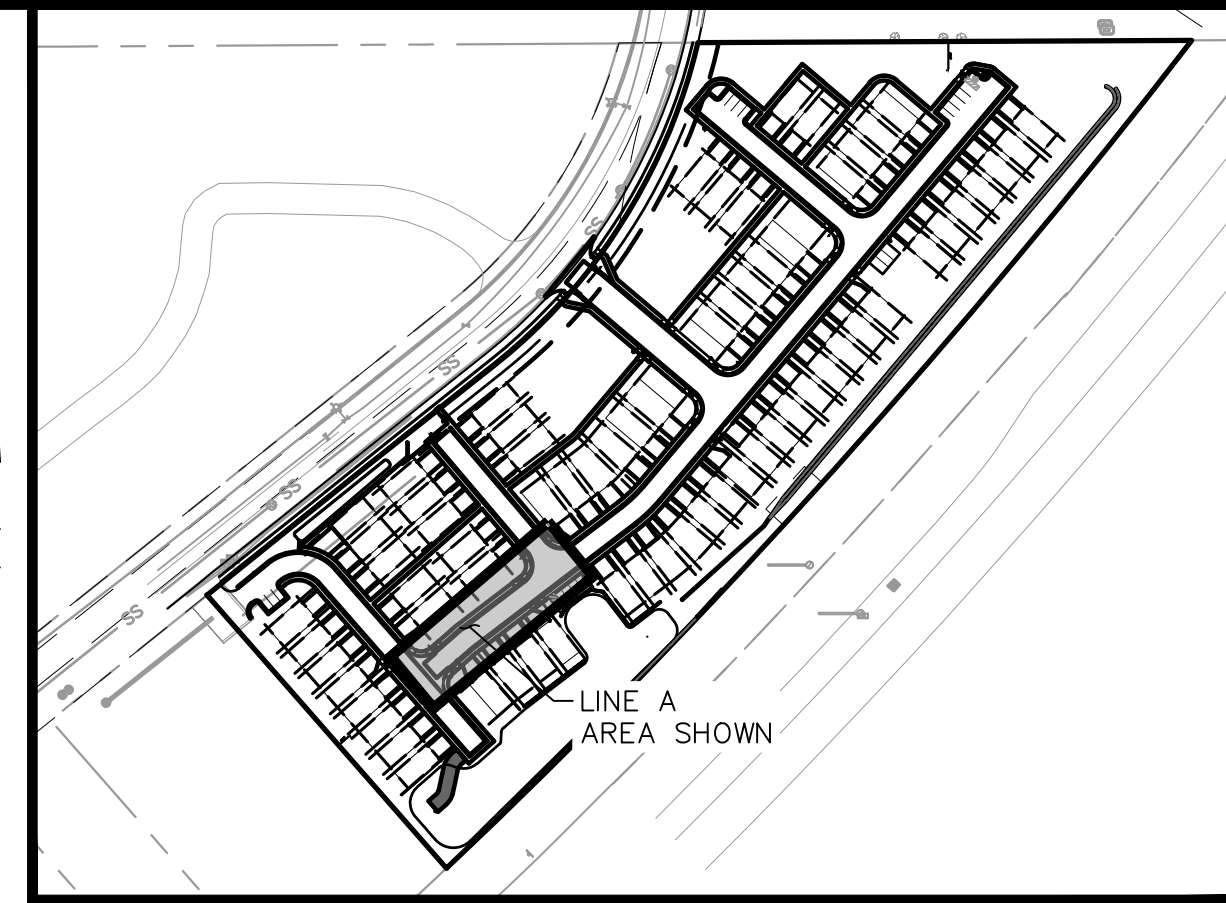
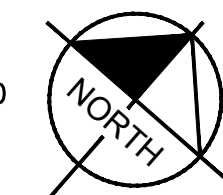
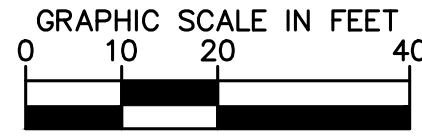
MATCHLINE REFER TO SHEET C3.12 FOR LINE A STA 10+00-13+65



SANITARY SEWER LINE A STA 13+65-18+00 PROFILE VIEW



SANITARY SEWER LINE A STA 14+00-18+00 PLAN VIEW



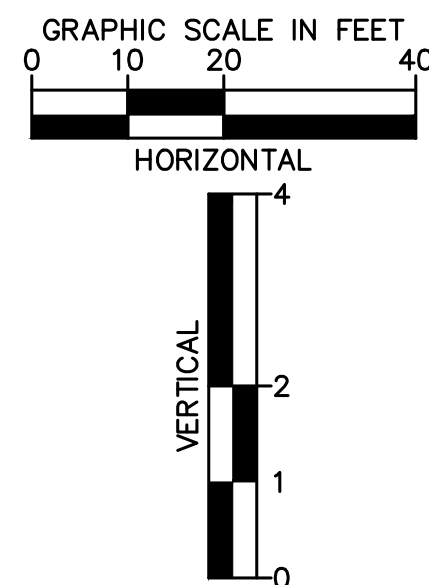
KEYMAP  
SCALE: 1"=200'

SANITARY SEWER NOTES

1. MANHOLE RIM ELEVATIONS PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL INSTALL MANHOLES IN ACCORDANCE WITH APPLICABLE DETAILS BASED UPON FINAL FINISH GRADING AT MANHOLE LOCATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTMENTS TO ACCOMMODATE DEVIATIONS IN SITE GRADING AT NO COST TO THE OWNER.
2. ALL SANITARY SEWER MANHOLES AND MAINS ARE PUBLIC UNLESS OTHERWISE NOTED.
3. ALL SERVICE LATERALS SHALL BE A MINIMUM OF 4" PVC AND PRIVATE UNLESS OTHERWISE NOTED ON PLANS.
4. CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING SANITARY SEWER AT ALL CONNECTION POINTS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
5. CONTRACTOR TO MODIFY EXISTING MANHOLE RIM ELEVATIONS TO MATCH PROPOSED FINISH GRADE AS NECESSARY.

LEGEND:

- PROPERTY LINE
- - - EXISTING EASEMENT LINE
- - - PROPOSED EASEMENT LINE
- SS — EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- LOT LINE
- (S) SANITARY SEWER MANHOLE
- EXISTING SANITARY MANHOLE
- (ST) PROPOSED STORM MANHOLE
- ▬ PROPOSED STORM SEWER
- PROPOSED WATER LINE
- ⦿ PROPOSED FIRE HYDRANT
- PROPOSED STORM INLET



MEADOWBROOK PARK  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
SAN. SEWER PLAN & PROFILE-LINE A

PRELIMINARY  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
Kimley»Horn  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET

C3.13

Kimley»Horn

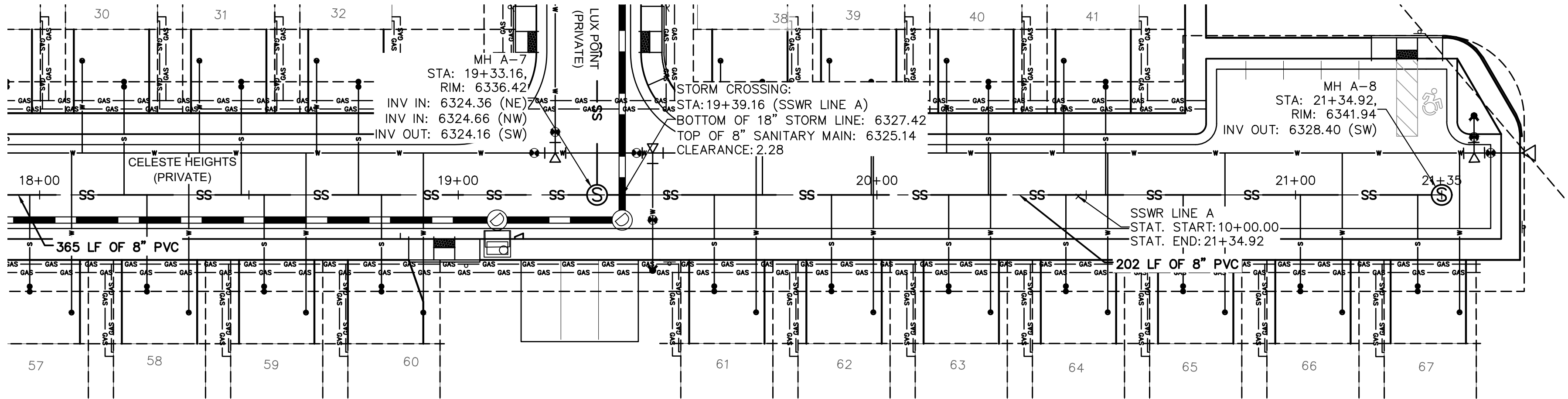
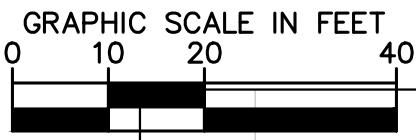
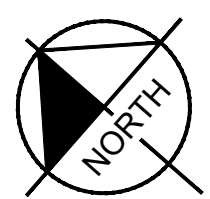
2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

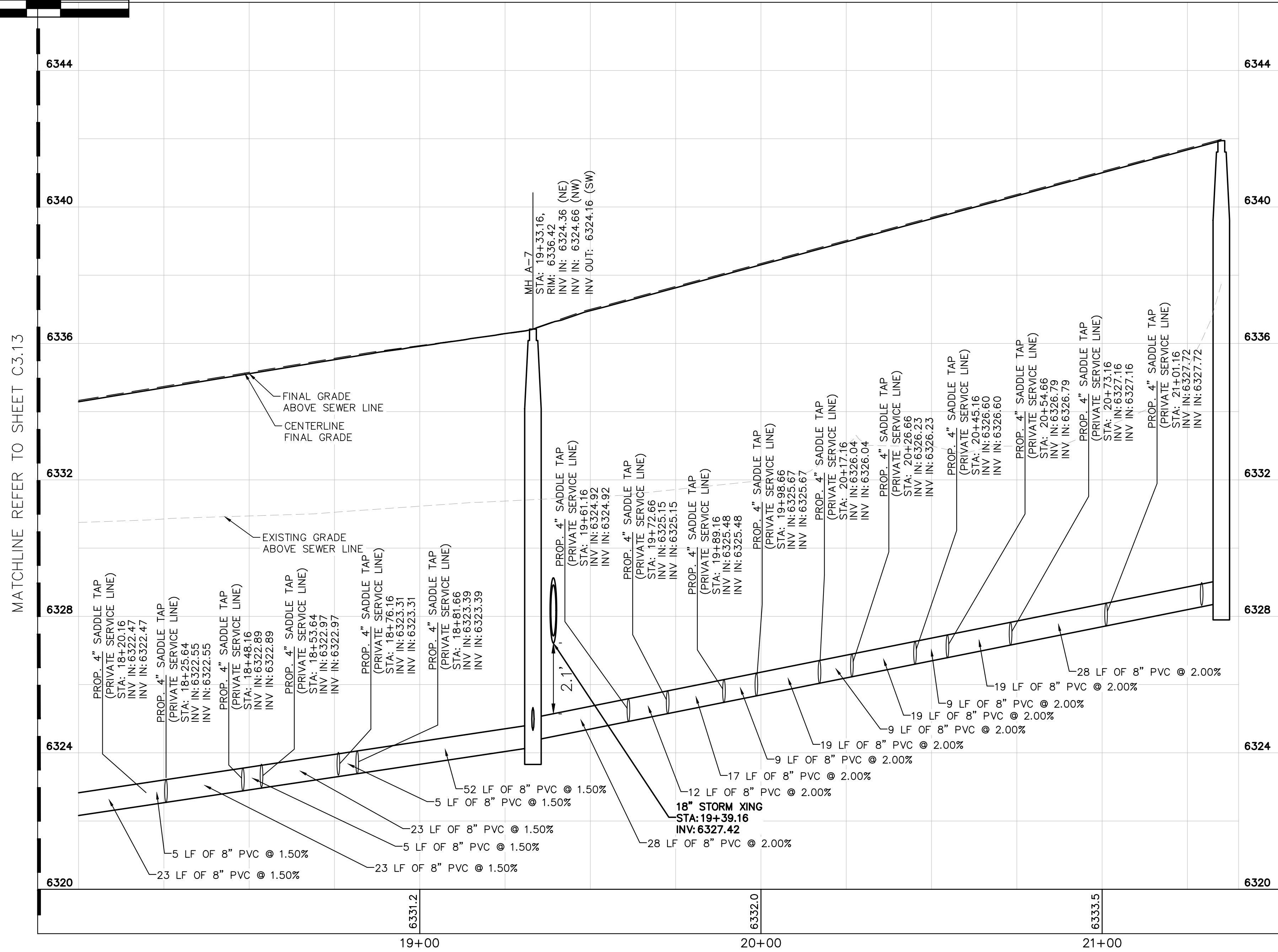
NO. REVISION BY DATE APPR



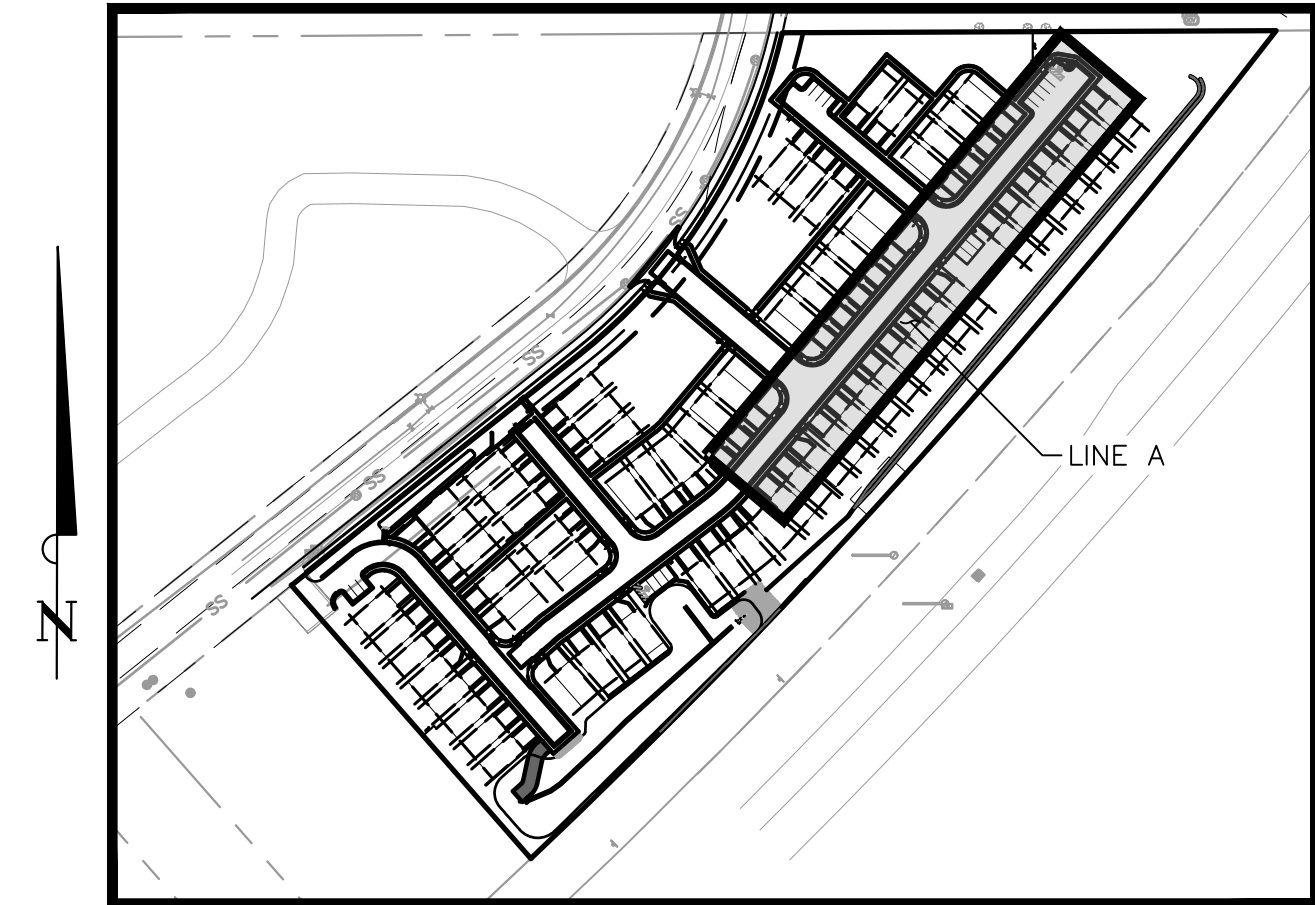
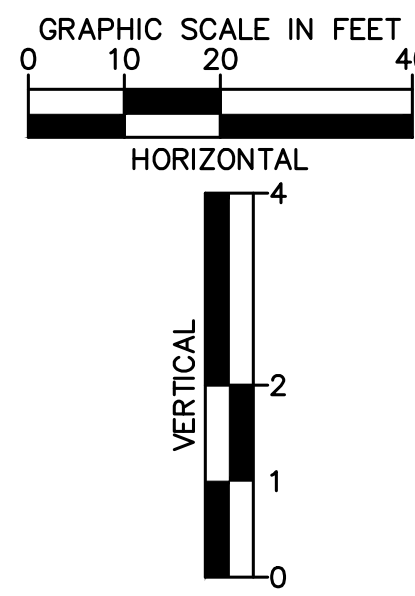
K:\COS\_Civil\096956009\_Meadowbrook\CADD\PlanSheets\Utilities\096956009UT\_SSPP.dwg Green, Shelby 3/18/2021 11:09 AM



SANITARY SEWER LINE A STA 18+00-21+40 PLAN VIEW



SANITARY SEWER LINE A STA 18+00-21+35 PROFILE VIEW



KEYMAP  
SCALE: 1"=200'

**SANITARY SEWER NOTES**

1. MANHOLE RIM ELEVATIONS PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL INSTALL MANHOLES IN ACCORDANCE WITH APPLICABLE DETAILS BASED UPON FINAL FINISH GRADING AT MANHOLE LOCATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTMENTS TO ACCOMMODATE DEVIATIONS IN SITE GRADING AT NO COST TO THE OWNER.
2. ALL SANITARY SEWER MANHOLES AND MAINS ARE PUBLIC UNLESS OTHERWISE NOTED.
3. ALL SERVICE LATERALS SHALL BE A MINIMUM OF 4" PVC AND PRIVATE UNLESS OTHERWISE NOTED ON PLANS.
4. CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING SANITARY SEWER AT ALL CONNECTION POINTS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
5. CONTRACTOR TO MODIFY EXISTING MANHOLE RIM ELEVATIONS TO MATCH PROPOSED FINISH GRADE AS NECESSARY.

**LEGEND:**

- PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- SS EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- LOT LINE
- SANITARY SEWER MANHOLE
- EXISTING SANITARY MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED STORM INLET

**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
**SAN. SEWER PLAN & PROFILE-LINE A**

**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET

**C3.14**

**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

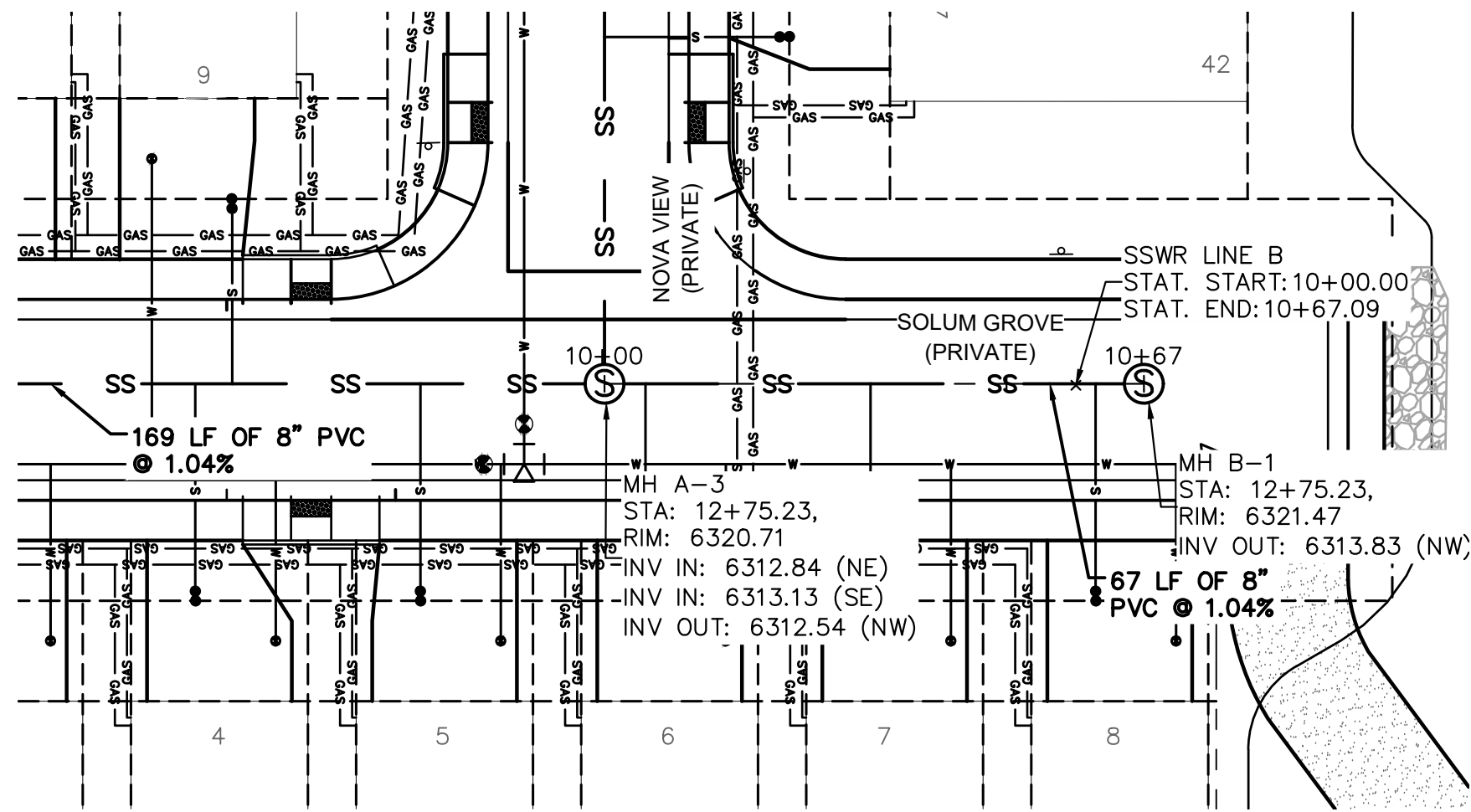
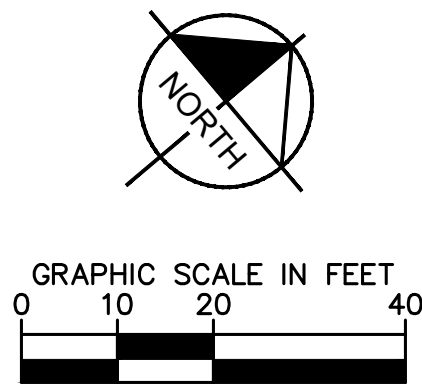
REVISION

BY

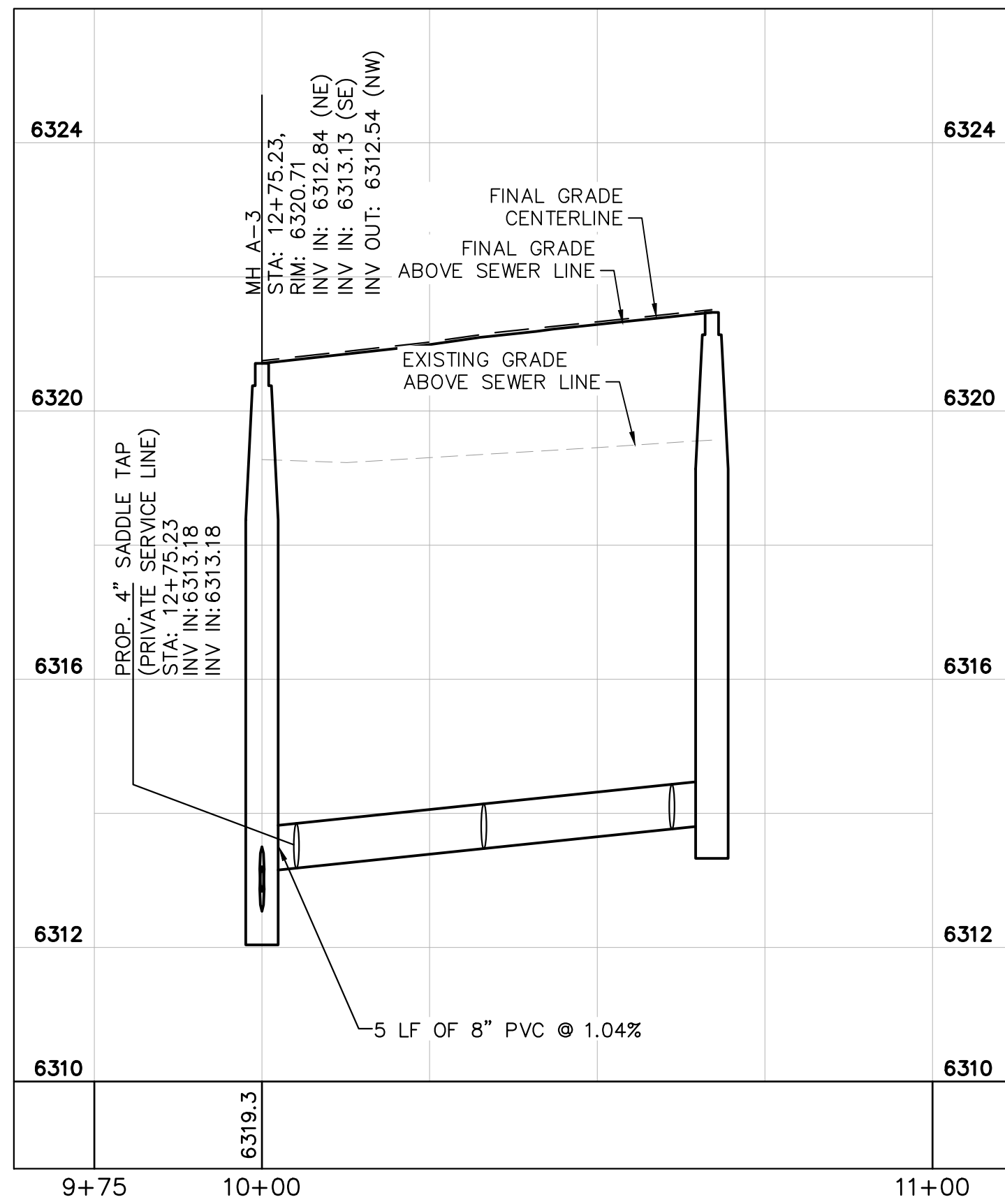
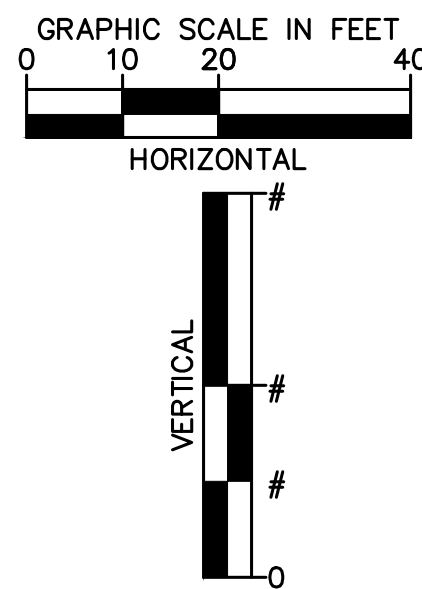
DATE

APPR





## SANITARY SEWER LINE B PLAN VIEW



### SANITARY SEWER LINE B PROFILE VIEW
















KEYMAP  
SCALE: 1"=200'

SANITARY SEWER NOTES

1. MANHOLE RIM ELEVATIONS PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL INSTALL MANHOLES IN ACCORDANCE WITH APPLICABLE DETAILS BASED UPON FINAL FINISH GRADING AT MANHOLE LOCATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTMENTS TO ACCOMMODATE DEVIATIONS IN SITE GRADING AT NO COST TO THE OWNER.
2. ALL SANITARY SEWER MANHOLES AND MAINS ARE PUBLIC UNLESS OTHERWISE NOTED.
3. ALL SERVICE LATERALS SHALL BE A MINIMUM OF 4" PVC AND PRIVATE UNLESS OTHERWISE NOTED ON PLANS.
4. CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING SANITARY SEWER AT ALL CONNECTION POINTS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
5. CONTRACTOR TO MODIFY EXISTING MANHOLE RIM ELEVATIONS TO MATCH PROPOSED FINISH GRADE AS NECESSARY.

PLAN VIEW LEGEND:

-  PROPERTY LINE  
 EXISTING EASEMENT LINE  
 PROPOSED EASEMENT LINE  
 EXISTING SANITARY SEWER  
 PROPOSED SANITARY SEWER  
 LOT LINE  
 SANITARY SEWER MANHOLE  
 EXISTING SANITARY MANHOLE  
 PROPOSED STORM MANHOLE  
 PROPOSED STORM SEWER  
 PROPOSED WATER LINE  
 PROPOSED FIRE HYDRANT  
 PROPOSED STORM INLET

**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
**SAN. SEWER PLAN & PROFILE-LINE B**

**Kimley»»Horn**

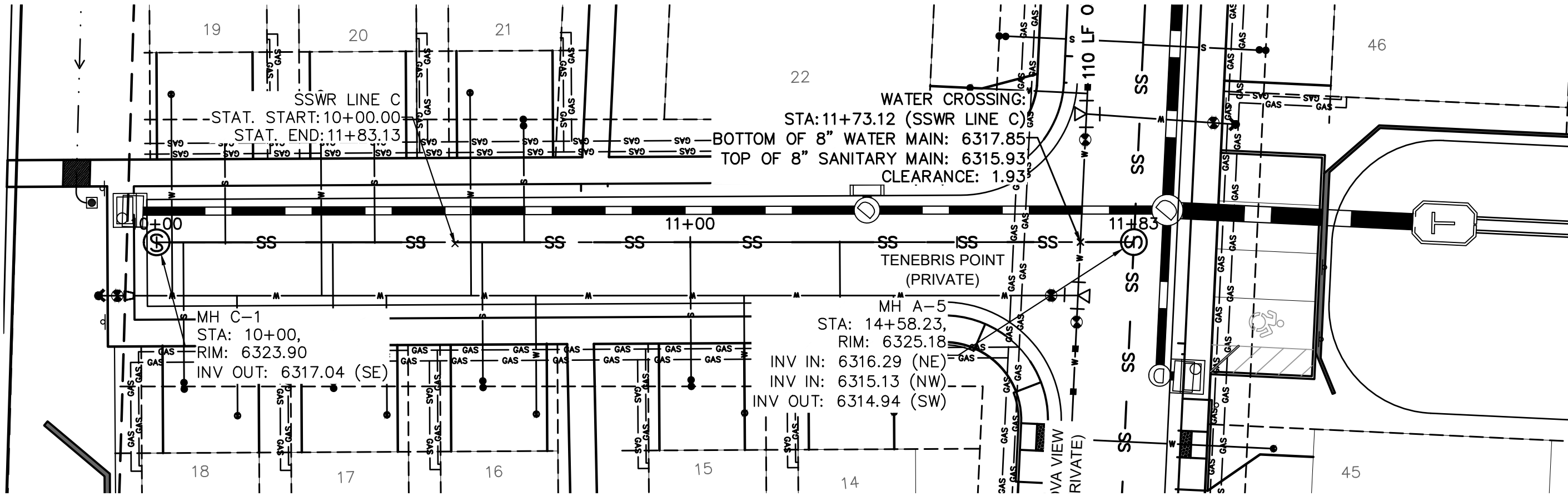
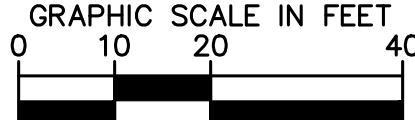
2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET  
C3.15



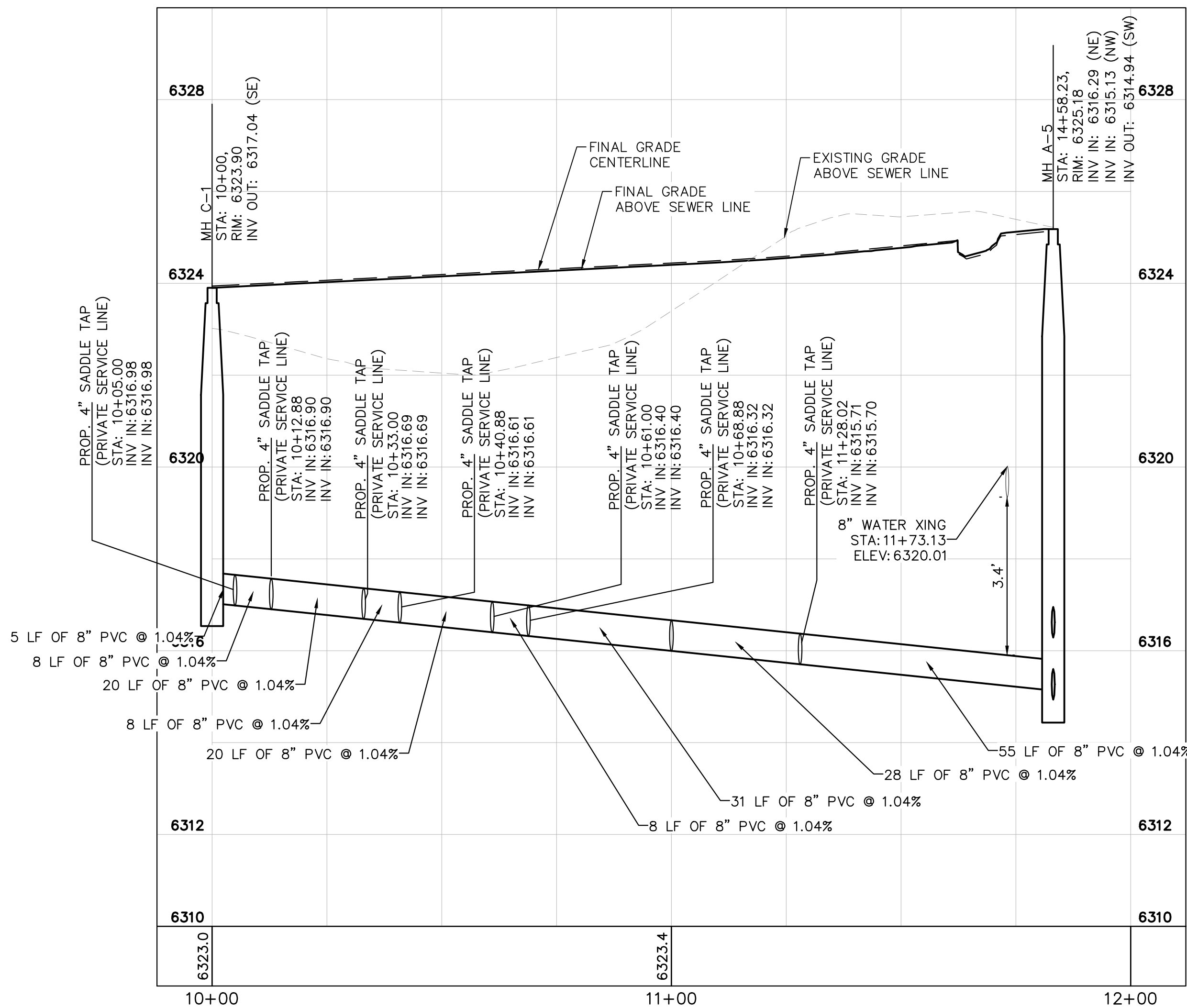
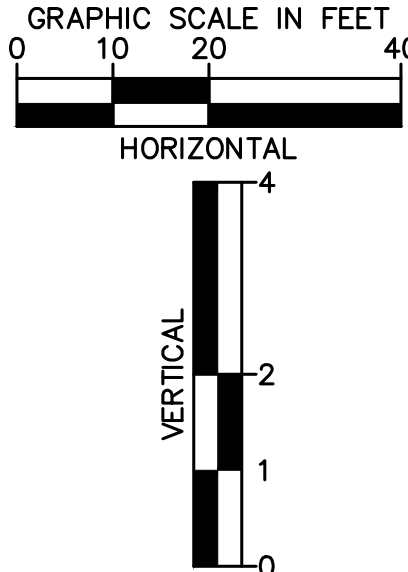
SANITARY SEWER LINE C PLAN VIEW



KEYMAP  
SCALE: 1"=200'














## SANITARY SEWER NOTES

1. MANHOLE RIM ELEVATIONS PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL INSTALL MANHOLES IN ACCORDANCE WITH APPLICABLE DETAILS BASED UPON FINAL FINISH GRADING AT MANHOLE LOCATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTMENTS TO ACCOMMODATE DEVIATIONS IN SITE GRADING AT NO COST TO THE OWNER.
2. ALL SANITARY SEWER MANHOLES AND MAINS ARE PUBLIC UNLESS OTHERWISE NOTED.
3. ALL SERVICE LATERALS SHALL BE A MINIMUM OF 4" PVC AND PRIVATE UNLESS OTHERWISE NOTED ON PLANS.
4. CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING SANITARY SEWER AT ALL CONNECTION POINTS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
5. CONTRACTOR TO MODIFY EXISTING MANHOLE RIM ELEVATIONS TO MATCH PROPOSED FINISH GRADE AS NECESSARY.



SANITARY SEWER LINE C PROFILE VIEW

## LEGEND

- |   |                           |
|---|---------------------------|
|  | PROPERTY LINE             |
|  | EXISTING EASEMENT LINE    |
|  | PROPOSED EASEMENT LINE    |
|  | EXISTING SANITARY SEWER   |
|  | PROPOSED SANITARY SEWER   |
|  | LOT LINE                  |
|  | SANITARY SEWER MANHOLE    |
|  | EXISTING SANITARY MANHOLE |
|  | PROPOSED STORM MANHOLE    |
|  | PROPOSED STORM SEWER      |
|  | PROPOSED WATER LINE       |
|  | PROPOSED FIRE HYDRANT     |
|  | PROPOSED STORM INLET      |

**Kimley»Horn**

2020 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue Suite 300  
Colorado Springs, Colorado 80903 (719) 451-1100

DESIGNED BY: KK  
DRAWN BY: KK  
CHECKED BY: JH  
DATE: 10/09/2020

**MEADOWBROOK PARK**  
EL PASO COUNTY, COLORADO  
UTILITY AND WATER SERVICE PLANS  
**SAN. SEWER PLAN & PROFILE-LINE C**

**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR  
CONSTRUCTION  
**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096956009

SHEET  
C3.16







