MCDONALD'S
LOT 2 OF VILLAGE AT LORSON RANCH FILING 1
UTILITY CONSTRUCTION PLANS

LAND AREA:

55,024 SQ. FT. OR 1.263 ACRES MORE OR LESS

BASIS OF BEARING:

BEARINGS ARE BASED ON THE NORTH LINE OF TRACT D, CARRIAGE MEADOWS NORTH FILING NO. 1, BEARING N 89°48'24" E, A DISTANCE OF 699.24 FEET, AS MONUMENTED AT BOTH ENDS BY A FOUND 1-1/4" YELLOW PLASTIC CAP STAMPED "FWS PLS 38226".

BENCHMARK:

BASIS OF ELEVATIONS: ELEVATIONS ARE BASED UPON A FOUND 2" ALUMINUM CAP STAMPED "FARNSWORTH GROUP INC. PLS 38053" ON THE WEST LINE OF TRACT B (ELEVATION = 5724.52)

LEGAL DESCRIPTION

VILLAGE AT LORSON RANCH FILING NO.1, LOT 2

GENERAL NOTES:

1. THE PARTIES RESPONSIBLE FOR THIS PLAN HAVE FAMILIARIZED THEMSELVES WITH ALL CURRENT ACCESSIBILITY CRITERIA AND SPECIFICATIONS AND THE PROPOSED PLAN REFLECTS ALL SITE ELEMENTS REQUIRED BY THE APPLICABLE ADA DESIGN STANDARDS AND GUIDELINES AS PUBLISHED BY THE UNITED STATES DEPARTMENT OF JUSTICE.
2. THE OWNER IS AWARE THAT THE ACCESS PERMITS (AP211569, AP211570) ARE SUBJECT TO CONDITIONS OF APPROVAL.

VICINITY MAP

NOT TO SCALE

NORTH

UTILITY CONSTRUCTION PLANS	
SHEET NUMBER	SHEET TITLE
3.0	COVER
3.1	NOTES
3.2	UTILITY PLAN
3.3	DETAILS

CONTACTS:

DEVELOPER:
MCDONALD'S USA, LLC
110 N. CARPENTER STREET
CHICAGO, IL 60607
TEL: (206) 348-4374
CONTACT: ROBERT YAGUSESKY
EMAIL: ROBERT.YAGUSESKY@US.MCD.COM

ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
2 NORTH NEVADA AVE., SUITE 900
COLORADO SPRINGS, CO 80903
TEL: (719) 453-0180
CONTACT: JESSICA MCCALLUM, P.E.
EMAIL: JESSICA.MCCALLUM@KIMLEY-HORN.COM

LANDSCAPE ARCHITECT:
KIMLEY-HORN AND ASSOCIATES, INC.
2 NEVADA NORTH AVE., SUITE 900
COLORADO SPRINGS, CO 80903
TEL: (719) 453-0180
CONTACT: JEREMY POWELL, P.L.A.
EMAIL: JEREMY.POWELL@KIMLEY-HORN.COM

ARCHITECT:
CORESTATES GROUP
135 WATER STREET, SUITE 201
NAPERVILLE, IL 60540
TEL: (224) 585-4591
CONTACT: JOY VRCHOTA
EMAIL: JOY.VRCHOTA@CORE-STATES.COM

SURVEYOR:
KIMLEY-HORN AND ASSOCIATES, INC.
6200 S. SYRACUSE WAY, SUITE 300
GREENWOOD VILLAGE, CO 80111
TEL: (303) 228-2300
CONTACT: DARREN WOLTERSTORFF, P.L.S.
EMAIL: DARREN.WOLTERSTORFF@KIMLEY-HORN.COM

OWNER:
CRADLAN, LLC
212 N. WAHSATCH AVE, SUITE 301
COLORADO SPRINGS, CO 80903

DISTRICT APPROVAL (WATER)

WIDEFIELD WATER AND SANITATION DISTRICT RECOGNIZES THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN AND HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

WIDEFIELD WATER AND SANITATION DISTRICT
WATER DESIGN APPROVAL

DATE: _____ BY:_____

PROJECT NO:_____

IN CASE OF ERRORS OR OMISSIONS WITH THE WATER DESIGN AS SHOWN ON THIS DOCUMENT THE STANDARDS AS DEFINED IN THE "RULES AND REGULATIONS FOR INSTALLATION OF WATER MAINS AND SERVICES" SHALL RULE.

APPROVALS EXPIRES 180 DAYS FROM DESIGN APPROVAL

DISTRICT APPROVAL (WASTEWATER)

WIDEFIELD WATER AND SANITATION DISTRICT RECOGNIZES THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN AND HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

WIDEFIELD WATER AND SANITATION DISTRICT
WATER DESIGN APPROVAL

DATE: _____ BY:_____

PROJECT NO:_____

IN CASE OF ERRORS OR OMISSIONS WITH THE WATER DESIGN AS SHOWN ON THIS DOCUMENT THE STANDARDS AS DEFINED IN THE "RULES AND REGULATIONS FOR INSTALLATION OF WASTEWATER MAINS AND SERVICES" SHALL RULE.

APPROVALS EXPIRES 180 DAYS FROM DESIGN APPROVAL

Know what's **below.** **Call** before you dig.

BY	DESCRIPTION	DATE	REV

Kimley»Horn

PREPARED BY:

PREPARED FOR: McDonald's USA, LLC

DRAWN BY	ALS
STD ISSUE DATE	7/30/2024
REVIEWED BY	JJM
DATE ISSUED	7/30/2024

TITLE: **UTILITY PLANS**

DESCRIPTION: COVER

SITE ID: 510128

SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

3.0

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 APPROVAL OF THIS PLAN OR ISSUANCE OF A PERMIT BY WIDEFIELD WATER AND SANITATION DISTRICT DOES NOT AUTHORIZE THE SUBDIVIDER AND OWNER TO VIOLATE ANY FEDERAL, STATE OR COUNTY LAWS, ORDINANCES, REGULATIONS, OR POLICIES.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS SHALL BE CONFIRMED BY FIELD MEASUREMENTS PRIOR TO CONSTRUCTION OF NEW WORK.
8. 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.
9. 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.
10. ANY WORK DONE WITHOUT INSPECTION OR MATERIALS TESTING IS SUBJECT TO REMOVAL OR CORRECTION.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ANY DAMAGE TO THE EXISTING IMPROVEMENTS AND REPLACEMENT TO THE SATISFACTION OF THE FIELD ENGINEER.
12. 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.
13. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE PLANS, THE SOILS AND/OR GEOLOGY REPORTS, AND THE SITE CONDITIONS PRIOR TO COMMENCING WORK.
14. 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.
15. 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.
16. DEVIATIONS FROM THESE SIGNED PLANS WILL NOT BE ALLOWED UNLESS THE COUNTY OR DISTRICT ENGINEER APPROVES A CONSTRUCTION CHANGE OR THE COUNTY/AGENCY INSPECTOR REQUIRES THE CHANGE.
17. AS-BUILT DRAWINGS MUST BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER PRIOR TO ACCEPTANCE OF THIS PROJECT.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. DIMENSIONS TO PIPELINES ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
24. CONSTRUCTION STAKING FOR IMPROVEMENTS SHOWN IN THESE PLANS SHALL BE PERFORMED BY CONTRACTOR'S LICENSED LAND SURVEYOR.
25. ALL DIMENSIONS ARE IN FEET OR DECIMALS THEREOF.
26. SPOT GRADES ARE TO FLOWLINE OR FINISH PAVEMENT GRADE UNLESS OTHERWISE NOTED.
27. CONTRACTOR TO BE AWARE OF ALL OVERHEAD LINES AT ALL TIMES, SO AS NOT TO DISTURB THEM.
28. WATER SHALL BE PROVIDED ONSITE AND USED TO CONTROL DUST DURING DEMOLITION AND CONSTRUCTION OPERATIONS.
29. 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.
30. 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.
31. 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.

WIDEFIELD WATER AND SANITATION DISTRICT GENERAL NOTES:

1. ALL UTILITY CONSTRUCTION TO BE CONDUCTED IN CONFORMANCE WITH THE CURRENT WIDEFIELD WATER AND SANITATION DISTRICT SPECIFICATIONS. COMPACTION REQUIREMENTS SHALL BE 95% STANDARD PROCTOR AS DETERMINED BY ASTM D698, UNLESS OTHERWISE APPROVED BY THE WIDEFIELD WATER AND SANITATION DISTRICT OR A HIGHER STANDARD IS IMPOSED BY ANOTHER AGENCY HAVING RIGHT-OF-WAY JURISDICTION.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE WIDEFIELD WATER AND SANITATION DISTRICT. THE WIDEFIELD WATER AND SANITATION DISTRICT RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
3. THE DEVELOPER OR HIS ENGINEER HAS LOCATED ALL FIRE HYDRANTS AND FUTURE SERVICE STUBS. ANY REQUIRED REALIGNMENT, EITHER HORIZONTAL OR VERTICAL, SHALL BE AT THE EXPENSE OF THE DEVELOPER.
4. ALL DUCTILE IRON PIPE, TO INCLUDE FITTINGS, VALVES AND FIRE HYDRANTS WILL BE WRAPPED WITH POLYETHYLENE TUBING, AND ELECTRICALLY ISOLATED.
5. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE DOUBLE BONDED. SPECIFICATIONS FOR CATHODIC PROTECTION ON BOTH DIP MAINS AND PVC MAINS IS SPECIFIED IN THE STANDARDS AND SPECIFICATIONS.
6. PVC MAIN LINES SHALL BE INSTALLED WITH COATED NO. 12 TRACER WIRE.
7. THE CONTRACTOR IS REQUIRED TO NOTIFY THE WIDEFIELD WATER AND SANITATION DISTRICT (390-7111) A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY AFFECTED UTILITY COMPANIES 48 HOURS PRIOR TO CONSTRUCTION ADJACENT TO THE KNOWN UTILITY LINES.
8. THE LOCATION OF ALL UTILITIES AS SHOWN ON THESE DRAWINGS ARE APPROXIMATE ONLY. THE LOCATION OF ALL UTILITIES SHALL BE VERIFIED PRIOR TO CONSTRUCTION BY THE CONTRACTOR.
9. THE CONTRACTOR SHALL FIELD EXCAVATE AND VERIFY THE VERTICAL AND HORIZONTAL LOCATION OF ALL TIE-INS. CONTRACTOR SHALL NOTIFY THE WIDEFIELD WATER AND SANITATION DISTRICT AND THE ENGINEER OF THE FIELD VERIFIED INFORMATION PRIOR TO CONSTRUCTION.
10. ALL BENDS SHALL BE FIELD STAKED PRIOR TO CONSTRUCTION.
11. ANY WATER UTILITY MATERIAL REMOVED AND NOT REUSED SHALL BE RETURNED TO THE WIDEFIELD WATER AND SANITATION DISTRICT IF THE DISTRICT SO REQUESTS.
12. THE CONTRACTOR SHALL AT HIS EXPENSE SUPPORT AND PROTECT ALL UTILITY MAINS SO THAT THEY WILL FUNCTION CONTINUOUSLY DURING CONSTRUCTION. SHOULD A UTILITY MAIN FAIL AS A RESULT OF THE CONTRACTOR'S OPERATION, IT WILL BE REPLACED IMMEDIATELY BY EITHER THE CONTRACTOR OR THE WIDEFIELD WATER AND SANITATION DISTRICT AT FULL COST OF LABOR AND MATERIALS TO THE CONTRACTOR.
13. ANY PUMPING OR BYPASS OPERATIONS MUST BE REVIEWED AND APPROVED PRIOR TO EXECUTION BY BOTH THE WIDEFIELD WATER AND SANITATION DISTRICT AND THE ENGINEER.
14. CONTRACTOR MUST REPLACE OR REPAIR ANY DAMAGE TO ALL SURFACE IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO FENCES, CURB AND GUTTER AND/OR ASPHALT THAT MAY BE CAUSED DURING CONSTRUCTION.
15. ALL WATER LINES 6"AND LARGER, AND ALL SEWER LINES 8"AND LARGER, SHALL HAVE AS "AS-BUILT"PLANS PREPARED AND APPROVED PRIOR TO FINAL ACCEPTANCE BY THE WIDEFIELD WATER AND SANITATION DISTRICT.
16. PRIOR TO CONSTRUCTION, A PRE-CONSTRUCTION CONFERENCE IS REQUIRED A MINIMUM OF 72 HOURS IN ADVANCE OF COMMENCEMENT OF WORK. TO SET THE PRE-CONSTRUCTION CONFERENCE, CONTRACT BRANDON BERNARD-WATER DIVISION MANAGER AND/OR JASON DREESSEN, WASTEWATER DIVISION MANAGER AT (719) 955-0548 OF THE WIDEFIELD WATER AND SANITATION DISTRICT FOR A TIME. NO PRE-CONSTRUCTION CONFERENCE TIMES WILL BE SET UNTIL 4 SETS OF SIGNED DRAWINGS ARE RECEIVED BY THE WIDEFIELD W&S DISTRICT.

811 Know what's **below.** **Call** before you dig.

REV	DATE	DESCRIPTION	BY

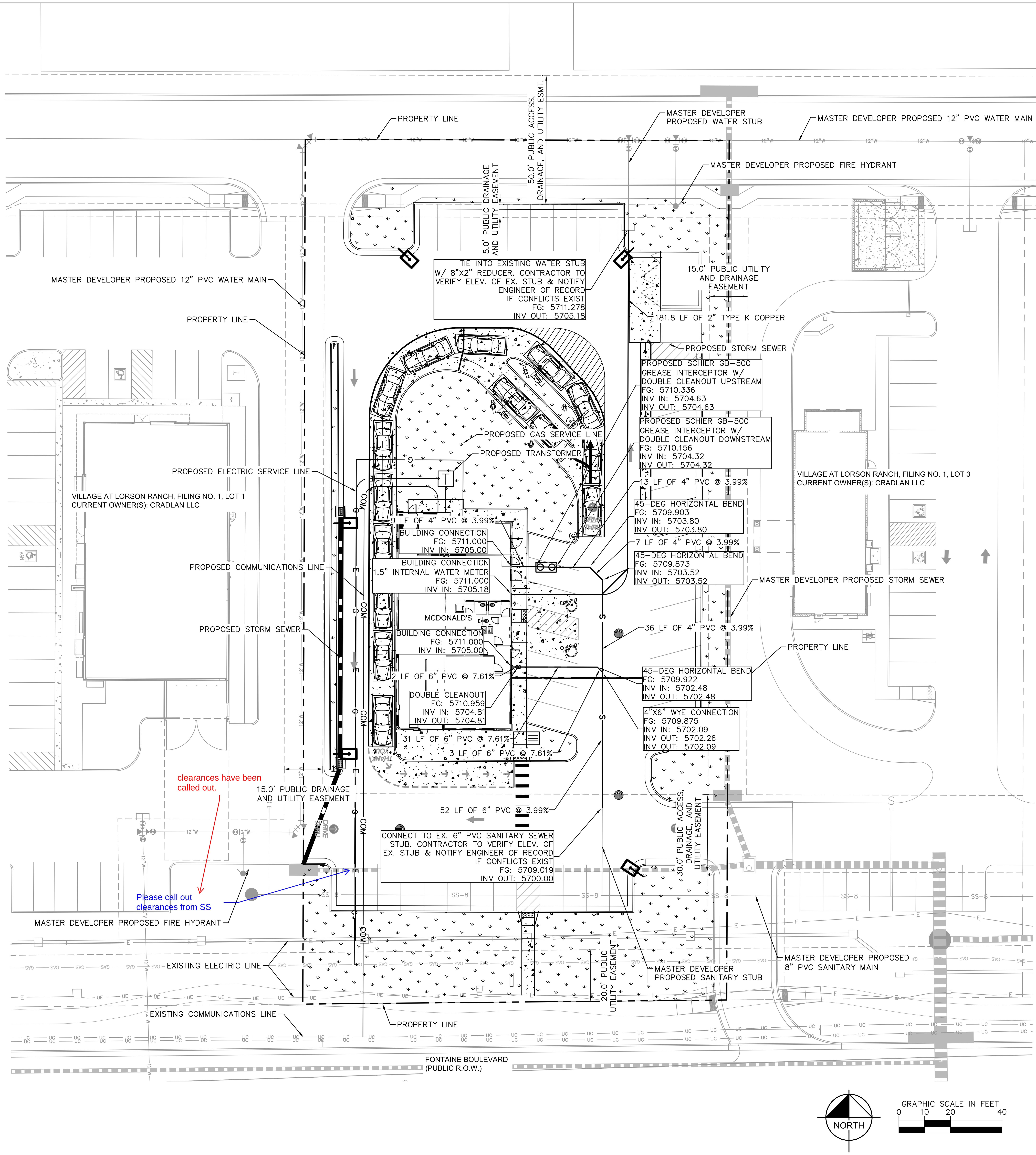
PREPARED BY:
Kimley»Horn

PREPARED FOR:
© McDonald's USA, LLC

DRAWN BY	ALS
STD ISSUE DATE	7/30/2024
REVIEWED BY	JJM
DATE ISSUED	7/30/2024

TITLE: **UTILITY PLANS**
DESCRIPTION: NOTES
SITE ID: 51028
SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

3.1



LEGEND

	PROPERTY LINE
	EASEMENT
SS-8	MASTER DEVELOPER 8" SANITARY SEWER
12"W	MASTER DEVELOPER 12" WATER MAIN
	MASTER DEVELOPER STORM SEWER
E / UE	EXISTING ELECTRIC LINE
UC	EXISTING COMMUNICATION LINE
G	PROPOSED GAS LINE
E	PROPOSED ELECTRIC LINE
COM	PROPOSED COMMUNICATION LINE
	PROPOSED GREASE INTERCEPTOR
T	PROPOSED TRANSFORMER
	PROPOSED STORM SEWER
S	PROPOSED SANITARY SEWER LINE
W	PROPOSED WATER SERVICE LINE

NOTES

1. ALL CONDITIONS SHOWN TO BE "EXISTING" OR "MASTER DEVELOPER PROPOSED" 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 OF RECORD 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.
2. ALL WATER SERVICE LINES SHALL MAINTAIN A BURY DEPTH OF 5'-6'.

CAUTIONARY NOTE

1. CONTRACTOR SHALL MAINTAIN 1.5' OF VERTICAL SEPARATION AT ALL WET UTILITY CROSSING AND 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.

811 Know what's below. Call before you dig.

REV	DATE	DESCRIPTION	BY

Kimley»Horn

PREPARED BY:

PREPARED FOR:

McDonald's USA, LLC

DRAWN BY: ALS
STD ISSUE DATE: 7/30/2024
REVIEWED BY: JJM
DATE ISSUED: 7/30/2024

TITLE: UTILITY PLANS
DESCRIPTION: UTILITY PLAN
SITE ID: 51028
SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

3.2

FIXTURE INFORMATION:

NAME	TYPE	FLOW RATE	OTHER	QTY.
3-COMP. SINK	3-COMPARTMENT SINK	GPM (1-MINUTE DRAIN TIME): 46.636 GPM (2-MINUTE DRAIN TIME): 21.818	DFU: 6 CAPACITY: 58.182 GAL.	1
FLOOR SINK/DRAIN	FLOOR SINK	GPM (1-MINUTE DRAIN TIME): 5 GPM (2-MINUTE DRAIN TIME): 2.5	DFU: 2 CAPACITY: 0 GAL.	11
MOP SINK – MS-1	MOP BASIN	GPM (1-MINUTE DRAIN TIME): 22.442 GPM (2-MINUTE DRAIN TIME): 11.221	DFU: 3 CAPACITY: 29.922 GAL.	2
VEGETABLE PREP SINK	PREP SINK ONE BOWL	GPM (1-MINUTE DRAIN TIME): 4.675 GPM (2-MINUTE DRAIN TIME): 2.338	DFU: 2 CAPACITY: 6.234 GAL.	1
WAREWASHER (ECOLAB QSR TSC)	DOOR TYPE	GPM (1-MINUTE DRAIN TIME): 60 GPM (2-MINUTE DRAIN TIME): 30	DFU: 2 CAPACITY: 60 GAL.	1
TOTALS:		GPM (1-MINUTE DRAIN TIME): 208.19 GPM (2-MINUTE DRAIN TIME): 104.1	DFU: 38 CAPACITY: 184.26 GAL.	

SIZING DETAILS:

PROJECT INFORMATION
CONSTRUCTIONS TYPE: NEW CONSTRUCTION
ADDITIONAL NOTES: McDONALD'S 4584 BUILDING – PROTOTYPICAL

LOCATION: OUTDOORS
BURIED: YES
HIGH WATER AREA: NO

FLOW RATE CALCULATION:
FLOW RATE TO INTERCEPTOR = (LESSER OF FLOW RATE BY PIPE SIZE AND FLOW RATE BY FIXTURES)
SIZE OF PIPE CONNECTED TO THE GREASE INTERCEPTOR: 4 IN.
DRAINAGE PERIOD: 2 MINUTES
FLOW RATE BY PIPE SIZE: 75 GPM
FLOW RATE BY FIXTURES, 2-MINUTE DRAINAGE PERIOD: 104.097 GPM
FLOW RATE BY FIXTURES, 1-MINUTE DRAINAGE PERIOD: 208.195 GPM
FLOW RATE USED TO SELECT GREASE INTERCEPTOR: 75 GPM
FIXTURE DFU: 38

GREASE OUTPUT:
MENU TYPE: FAST FOOD – FULL PREP
FRYER IN KITCHEN: YES
FOOD WASTE DISPOSER: YES
NUMBER OF SEATS: 43 SEATS
GREASE PRODUCTION VALUE: 0.035 LBS. PER SERVING (6.02 LBS. PER DAY)

30-DAY GREASE PRODUCTION 180.6 LBS.
60-DAY GREASE PRODUCTION: 361.2 LBS.
90-DAY GREASE PRODUCTION: 541.8 LBS.

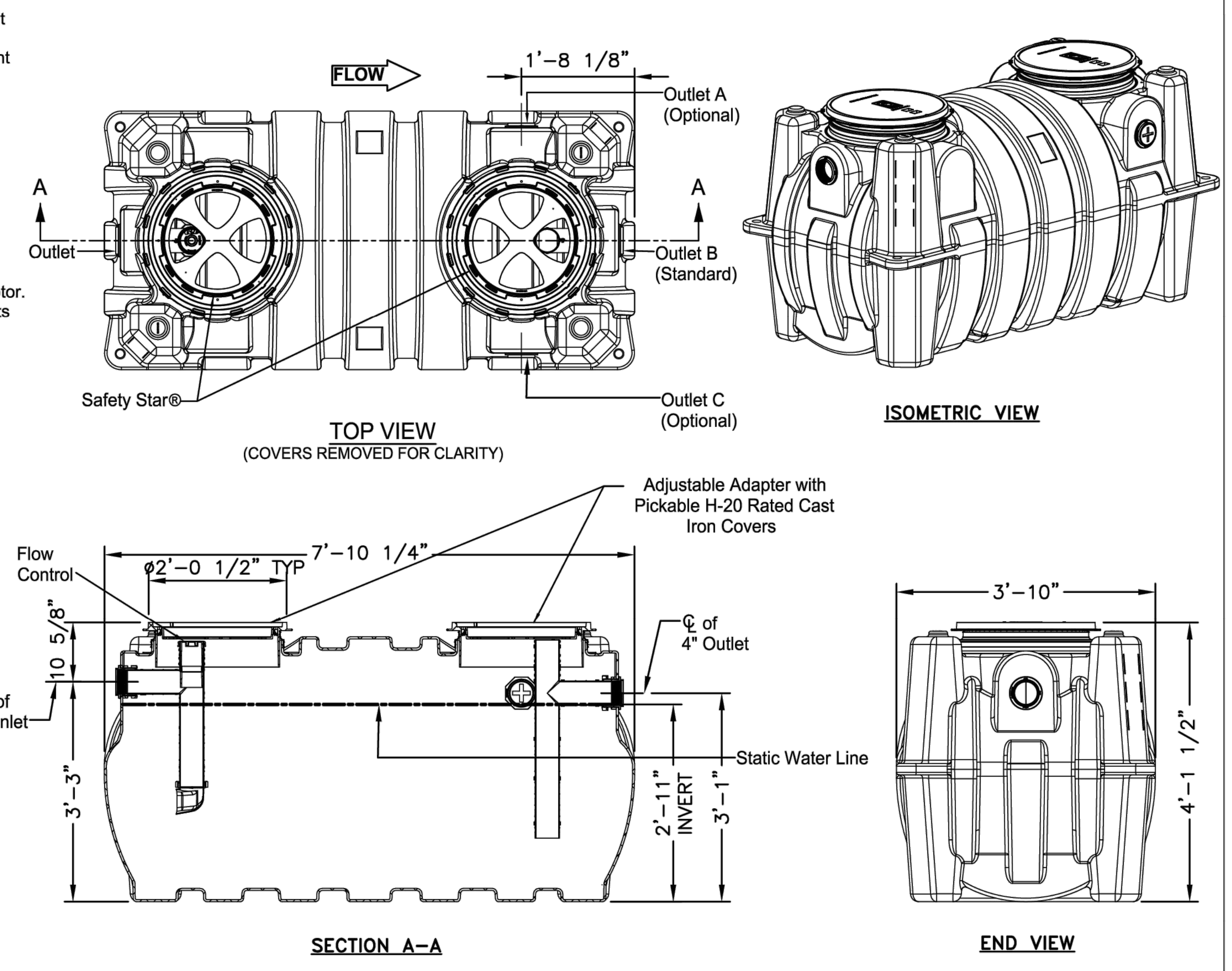
CALCULATION:
GREASE OUTPUT=(NUMBER OF SEATS)x4(AVERAGE TURNS PER SEAT PER 24 HOURS)x(GREASE PRODUCTION VALUE)x(DAYS BETWEEN PUMP-OUT).

DETAIL 1 / P3.0
GREASE INTERCEPTOR
SCALE: NONE

SPECIFICATIONS
Notes:
1. 4" FPT inlet/outlet with 4" plain end adapters, single inlet and triple outlet.
2. Unit weight - w/ cast iron covers: 528 lbs. (For wet weight add 4,254 lbs.)
3. Maximum operating temperature: 150º F continuous
4. Capacities - Liquid: 510 gal.
   Grease: 3,048 lbs. (417 gal.) @100 GPM
   Solids: 128 gal.
5. Built-in flow control. For series installations, only install flow control on the first unit in the series if necessary.
6. For gravity drainage applications only.
7. Do not use for pressure applications.
8. Cover placement allows full access to tank for proper maintenance.
9. A Vent shall be installed downstream of grease interceptor.
10. Engineered inlet and outlet diffusers with inspection ports are removable to inspect / clean piping.
11. Integral air relief / Anti-siphon / Sampling access.
12. Adjustable cover adapters provide up to 4" of additional height.
13. Designed for below-grade, above-grade, indoor or outdoor installations.
14. Safety Star®, access restrictor built into each cover adapter, prevents accidental entry to tanks (450 lb rating).

ENGINEER SPECIFICATION GUIDE
Schier Great Basin™ grease interceptor model # GB-500 shall be lifetime guaranteed and made in USA of seamless, rotationally-molded polyethylene with minimum 7/16" uniform wall thickness. Flow control cartridge shall be PVC. Interceptor shall be furnished for above or below-grade installation with adjustable cover adapter, Safety Star® access restrictor built into each cover adapter, and three outlet options. Interceptor shall be certified to ASME A112.14.3 (Type C) and CSA B481.1. Interceptor flow rate shall be 100 GPM. Interceptor grease capacity shall be 3,048 lbs. Cover shall provide water/gas-tight seal and have minimum 16,000 lbs. load capacity.

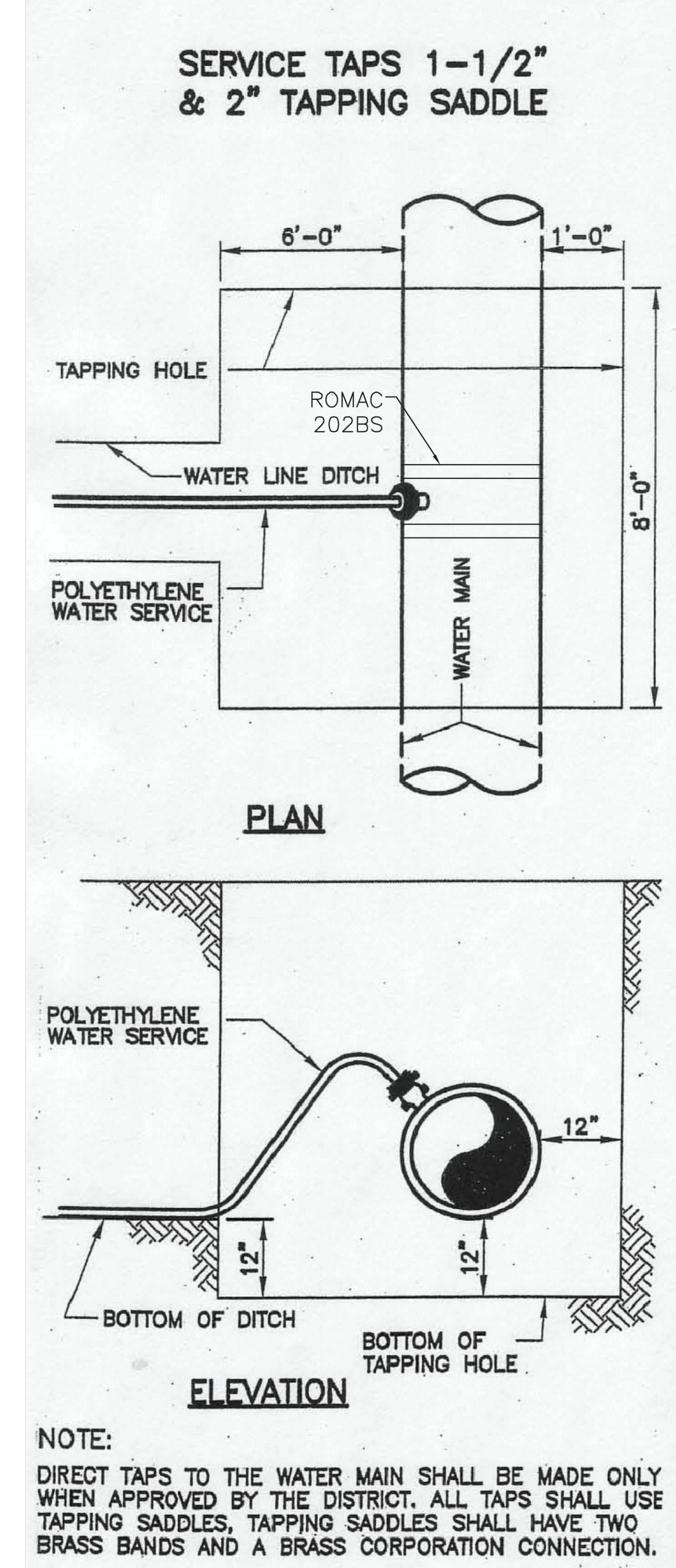
CERTIFIED PERFORMANCE
Great Basin™ hydromechanical grease interceptors are third party performance-tested and listed by IAPMO to ASME #A112.14.3 and CSA B481.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code and the International Plumbing Code.



SPECIFICATION SHEET

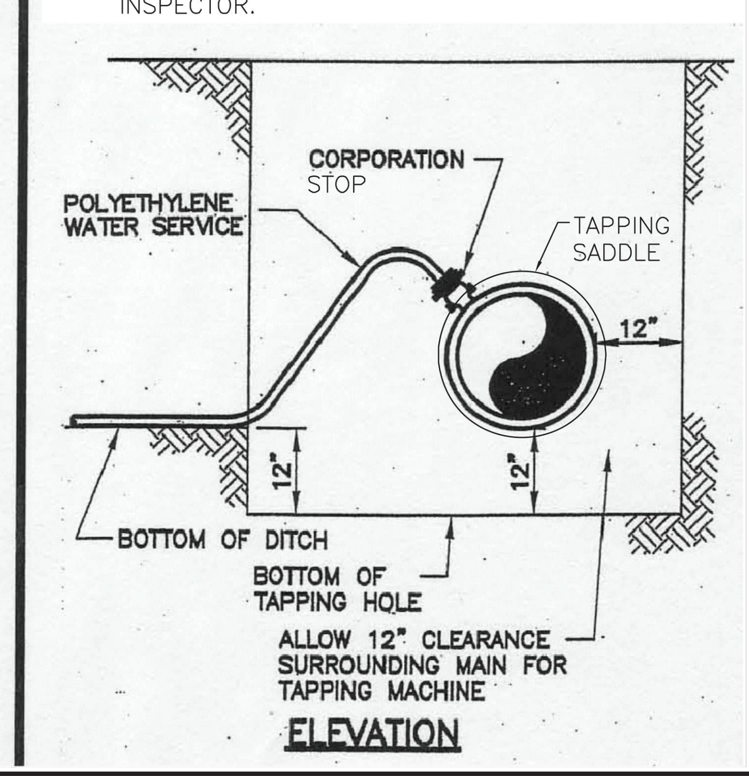
MODEL NUMBER:	PART NUMBER: 4075-001-01
GB-500	DESCRIPTION: GB-500 GREASE INTERCEPTOR 100 GPM, 4" INLET/OUTLET, H-20 RATED CAST IRON COVERS
PROPRIETARY AND CONFIDENTIAL	DWG BY: C. BUSENITZ · DATE: 4/14/2022 · REV: - · ECO: -

SCHIER
6455 Woodland Dr
Shawnee, KS 66218
Tel: 913-951-3300
Fax: 913-951-3399
schierproducts.com



NOTE:
DIRECT TAPS TO THE WATER MAIN SHALL BE MADE ONLY WHEN APPROVED BY THE DISTRICT. ALL TAPS SHALL USE TAPPING SADDLES. TAPPING SADDLES SHALL HAVE TWO BRASS BANDS AND A BRASS CORPORATION CONNECTION.

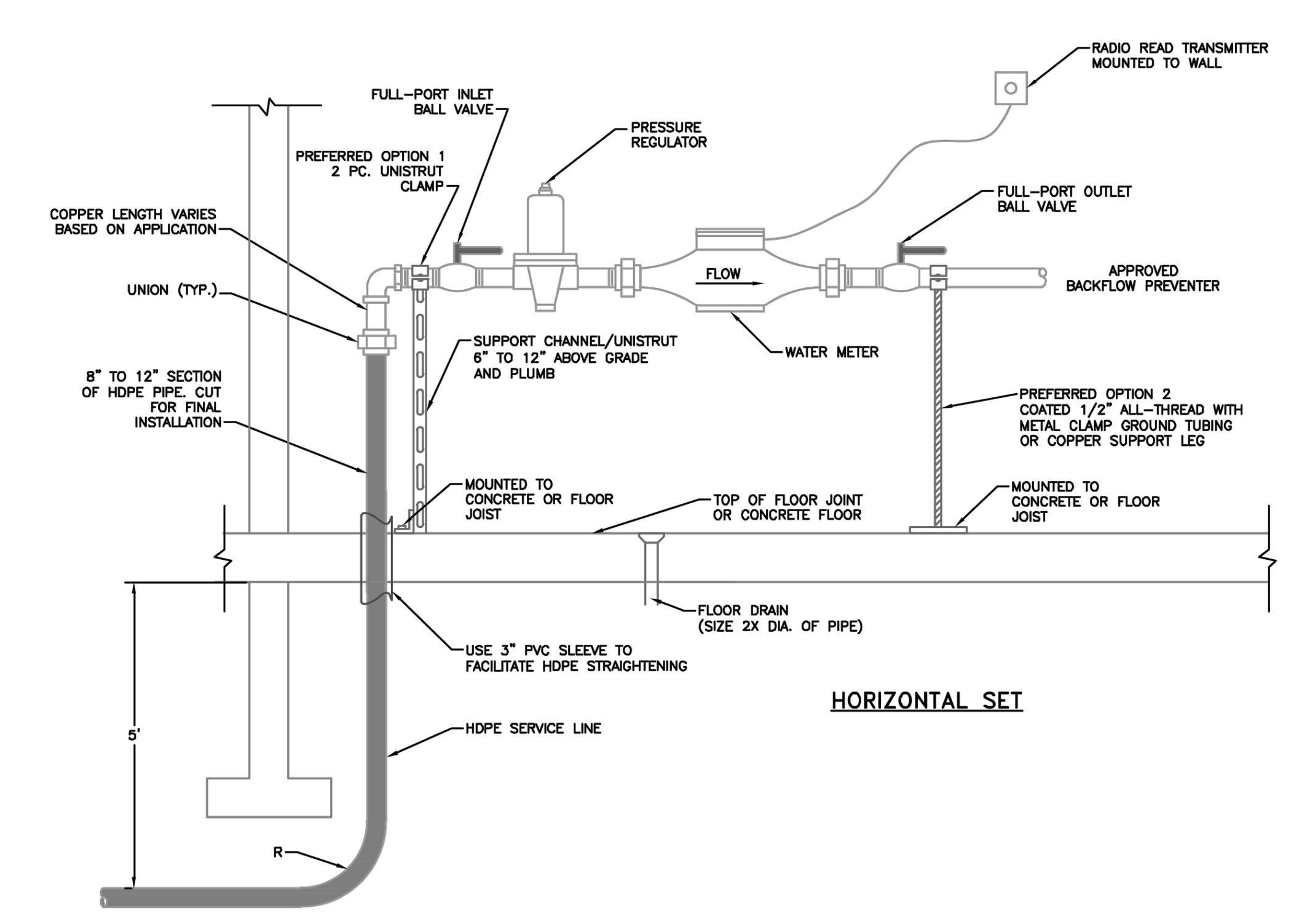
NOTES:
1. USE ROMAC 202BS TAP SADDLE OR EQUIVALENT.
2. ALL TAPS WILL BE MADE ABOVE CENTERLINE OF PIPE AND UPWARD AT A 45° ANGLE.
3. TAPS 1¼" OR LARGER MAY HAVE LOCATION AND ANGLE ADJUSTED AT THE DISCRETION OF THE INSPECTOR.



TAPPING DETAIL – 3/4" THROUGH 2"

Drawn: GGM	Revised:
Date: SEPT 2014	Revised:
Scale: N.T.S.	Revised:
Revised:	Revised:
Revised:	Revised:
Revised:	Revised:

Widefield Water and Sanitation District
W-32



NOTES:
1. IN THE INTEREST OF SPACE CONSERVATION IT IS PERMISSIBLE TO INSTALL PIPING VERTICALLY DOWNSTREAM OF THE METER INCLUDING THE CHECK VALVE. THE PRESSURE REGULATOR ON THE INLET SIDE OF THE METER MAY BE INSTALLED IN A HORIZONTAL OR VERTICAL POSITION.
2. A SECOND PRESSURE REGULATOR MAY BE INSTALLED ON THE DEMAND SIDE OF THE METER DOWNSTREAM FROM A BRANCH SUPPLYING AN IRRIGATION SYSTEM IF REQUIRED. THE IRRIGATION SYSTEM BRANCH MUST BE DOWNSTREAM OF THE METER, CHECK VALVE AND BALL VALVE.
3. ONLY MINIMAL SEPARATION IS ALLOWED BETWEEN FITTINGS UPSTREAM OF THE METER TO ALLOW PROPER INSTALLATION OF THE REQUIRED FITTINGS AS DEPICTED IN THESE DRAWINGS AND SPECIFICATIONS. IN NO CASE SHALL SEPARATION BE GREATER THAN NECESSARY WHICH COULD ALLOW A BRANCH, TEE, OR OTHER FITTING UPSTREAM OF THE METER THAN WHAT IS DEPICTED AND SPECIFIED HEREIN.
4. AN APPROVED TRANSITION FITTING FROM HDPE TO COPPER INSIDE THE STRUCTURE CAN BE USED ONCE THE HDPE SERVICE LINE ENTERS THE STRUCTURE.
5. THE METER PIPE MUST BE SECURED BEFORE AND AFTER THE INLET AND OUTLET VALVES TO A SOLID UPRIGHT SUCH AS THE UNISTRUT OR 1/2" ALL-THREAD (OR MOUNTED BI-LATERALLY) AND ANCHORED TO THE FLOOR AND CLAMPED TO THE HORIZONTAL PIPING.
6. BANDING OR GROUND STRAPS MUST BE INSTALLED AROUND METER LOOP ON COPPER LINES (COPPER TO COPPER).
7. THE LOCATION OF THE HDPE PENETRATION SHALL BE A MINIMUM OF 12" FROM ANY WALL OR FOUNDATION. A 30" CLEAR SPACE SHALL BE PROVIDED IN FRONT OF METER FOR ACCESS AND MAINTENANCE.
8. THE HDPE SERVICE LINE SHALL BE CONTINUOUS FROM THE CURB STOP THROUGH THE FLOOR WITH NO JOINTS.
9. THE DIAGRAM SHOWS A THREADED METER CONNECTION. A 2-BOLT ECCENTRIC FLANGE METER CAN ALSO BE ORDERED. A THREADED UNION MUST BE INSTALLED AT LEAST ON ONE SIDE OF THE METER AT EITHER THE DOWNSTREAM BALL VALVE OR UPSTREAM REGULATOR IF A FLANGE METER IS USED.

METER SIZE	METER LENGTH*	MIN. R
1-1/2" METER	12-5/8"	30"
2" METER	15-1/4"	48"

* CHECK METER LENGTH BEFORE INSTALLATION

1-1/2" & 2" INDOOR METER INSTALLATION

Drawn: GGM	Revised:
Date: JULY 2011	Revised:
Scale: N.T.S.	Revised:
Revised:	Revised:
Revised:	Revised:
Revised:	Revised:

Widefield Water and Sanitation District
W-40

811 Know what's below. Call before you dig.

REV	DATE	DESCRIPTION	BY

Kimley»Horn

PREPARED BY:

PREPARED FOR:
McDonald's USA, LLC ©

DRAWN BY: ALS
STD ISSUE DATE: 7/30/2024
REVIEWED BY: JJM
DATE ISSUED: 7/30/2024

TITLE: UTILITY PLANS
DESCRIPTION: DETAILS
SITE ID: 51028
SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

3.3

MCDONALD'S AT FONTAINE AND MARKSHEFFEL
GRADING AND EROSION CONTROL
VILLAGE AT LORSON RANCH FILING NO.1 LOT 2

$S\frac{1}{2}$ OF SECTION 15, TOWNSHIP 15S, RANGE 65 WEST OF THE 6TH P.M.,
COUNTY OF EL PASO, STATE OF COLORADO

OWNER'S SIGNATURE BLOCK

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN.

NAME ____________ DATE ____________

ENGINEER'S SIGNATURE BLOCK

THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.

JESSICA MCCALLUM, PE ____________ DATE
KIMLEY-HORN AND ASSOCIATES, INC.

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 RESPONIBILITY 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.

JOSHUA PALMER, P.E. COUNTY ENGINEER/ ECM ADMINISTRATOR ____________ DATE

VICINITY MAP

NOT TO SCALE

NORTH

GRADING AND EROSION CONTROL PLAN	
SHEET NUMBER	SHEET TITLE
C2.1	COVER
C2.2	NOTES
C2.3	INITIAL EC
C2.4	FINAL EC
C2.5	CUT FILL PLAN
C2.6	EROSION CONTROL DETAILS
C2.7	EROSION CONTROL DETAILS
C2.8	EROSION CONTROL DETAILS
C2.9	EROSION CONTROL DETAILS
C2.10	EROSION CONTROL DETAILS

LAND AREA:

55,101 SQ. FT. OR 1.265 ACRES MORE OR LESS

BASIS OF BEARING:

BEARINGS ARE BASED ON THE NORTH LINE OF TRACT D, CARRIAGE MEADOWS NORTH FILING NO. 1, BEARING N89°48'24" E, A DISTANCE OF 699.24 FEET, AS MONUMENTED AT BOTH ENDS BY A FOUND YELLOW PLASTIC CAP STAMPED "FWS PLS 38226".

BENCHMARK:

ELEVATIONS ARE BASED UPON A FOUND 2" ALUMINUM CAP STAMPED "FARNSWORTH GROUP INC. PLS 38053" ON THE WEST LINE OF TRACT B AS SHOWN AS HEREON (ELEVATION = 5724.52)

LEGAL DESCRIPTION

VILLAGE AT LORSON RANCH FILING NO.1, LOT 2

GENERAL NOTES:

1. THE PARTIES RESPONSIBLE FOR THIS PLAN HAVE FAMILIARIZED THEMSELVES WITH ALL CURRENT ACCESSIBILITY CRITERIA AND SPECIFICATIONS AND THE PROPOSED PLAN REFLECTS ALL SITE ELEMENTS REQUIRED BY THE APPLICABLE ADA DESIGN STANDARDS AND GUIDELINES AS PUBLISHED BY THE UNITED STATES DEPARTMENT OF JUSTICE.
2. THE OWNER IS AWARE THAT THE ACCESS PERMITS (AP211569, AP211570) ARE SUBJECT TO CONDITIONS OF APPROVAL.

FEMA CLASSIFICATION

THE FLOOD INSURANCE RATE MAP (FIRM) PANEL NO. 08041C0957G EFFECTIVE DATE DECEMBER 7, 2018, HAS BEEN EXAMINED AS IT RELATES TO THE PROPERTY BEING PLATTED. THE PROPERTY LIES WITHIN ZONE X, AREA OF MINIMAL FLOOD HAZARD.

LIMITS OF CONSTRUCTION

ONSITE DISTURBANCE: = ±1.11 ACRES

OFFSITE DISTURBANCE: = ±0.00 ACRES

TOTAL: = ±1.11 ACRES

CONTACTS:

DEVELOPER:
MCDONALD'S USA, LLC
110 N. CARPENTER STREET
CHICAGO, IL 60607
TEL: (206) 348-4374
CONTACT: ROBERT YAGUSESKY
EMAIL: ROBERT.YAGUSESKY@US.MCD.COM

ARCHITECT:
CORE STATES GROUP
135 WATER STREET, SUITE 201
NAPERVILLE, IL 60540
TEL: (224) 585-4591
CONTACT: JOY VRCHOTA
EMAIL: JVRCHOTA@CORE-STATES.COM

ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
2 NORTH NEVADA AVE., SUITE 900
COLORADO SPRINGS, CO 80903
TEL: (719) 284-7275
CONTACT: JESSICA MCCALLUM, P.E.
EMAIL: JESSICA.MCCALLUM@KIMLEY-HORN.COM

SURVEYOR:
KIMLEY-HORN AND ASSOCIATES, INC.
6200 S. SYRACUSE WAY, SUITE 300
GREENWOOD VILLAGE, CO 80111
TEL: (303) 228-2300
CONTACT: DARREN WOLTERSTORFF, P.L.S.
EMAIL: DARREN.WOLTERSTORFF@KIMLEY-HORN.COM

LANDSCAPE ARCHITECT:
KIMLEY-HORN AND ASSOCIATES, INC.
2 NEVADA NORTH AVE., SUITE 300
COLORADO SPRINGS, CO 80903
TEL: (719) 453-0180
CONTACT: JEREMY POWELL, P.L.A.
EMAIL: JEREMY.POWELL@KIMLEY-HORN.COM

OWNER:
CRADLAN COMMERCIAL, LLLP
212 N. WAHSATCH AVE, SUITE 301
COLORADO SPRINGS, CO 80903
TEL: (719)-635-3200
CONTACT: JEFF MARK
EMAIL: JMARK@LANDHUISCO.COM

ADDED
Add text:
EDARP File #: PPR2427

Know what's below. Call before you dig.

REV	DATE	DESCRIPTION	BY

Kimley»Horn

PREPARED BY:

PREPARED FOR: ©
McDonald's USA, LLC

DRAWN BY: ALS
STD ISSUE DATE: 7/30/2024
REVIEWED BY: JJM
DATE ISSUED: 7/30/2024

TITLE: CONSTRUCTION DRAWINGS
DESCRIPTION: COVER
SITE ID: 51028
SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

C2.1

ENGINEERING CONSTRUCTION NOTES

1. ALL EXISTING UTILITIES SHOWN ARE LOCATED ACCORDING TO THE INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME THE DRAWINGS WERE PREPARED AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER. GUARANTEE IS NOT MADE THAT ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN OR THAT THE LOCATION OF THOSE SHOWN ARE ENTIRELY ACCURATE. THE LOCATIONS SHOWN ARE FOR BIDDING PURPOSES ONLY. FINDING THE ACTUAL LOCATION OF ANY EXISTING UTILITIES IS THE CONTRACTORS RESPONSIBILITY AND SHALL BE DONE BEFORE HE COMMENCES ANY WORK IN THE VICINITY. FURTHERMORE, THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES DUE TO THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, NOR FOR TEMPORARY BRACING AND SHORING OF SAME. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.

2. 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.

3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE 48 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.

4. CONTRACTOR SHALL CONTACT UTILITY NOTIFICATION CENTER FOR THE LOCATION OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION (1–800–922–1987).

5. CONSTRUCTION SHALL COMPLY WITH ALL GOVERNING CODES AND BE CONSTRUCTED TO SAME.

6. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL REQUIRED CONSTRUCTION PERMITS AND BONDS PRIOR TO CONSTRUCTION.

7. THE CONTRACTOR SHALL RESTORE ALL DISTURBED VEGETATION IN KIND, UNLESS SHOWN OTHERWISE.

8. ALL PAVING, CONSTRUCTION, MATERIALS, AND WORKMANSHIP WITHIN THE PUBLIC RIGHT–OF–WAY OR EASEMENT SHALL CONFORM TO THE CITY OF COLORADO SPRINGS'S SPECIFICATIONS AND STANDARDS. (LATEST EDITION)

9. CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGGERS, AND ALL OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH MUTCD CONSTRUCTION AREA TRAFFIC CONTROL.

ENGINEERING DEMOLITION NOTES

1. ALL DEMOLITION SHALL BE CARRIED OUT IN A SAFE MANNER AND IN STRICT ACCORDANCE WITH OSHA REGULATIONS.

2. ALL CONDITIONS SHOWN TO BE "EXISTING" SHALL BE VERIFIED IN THE FIELD BY THE GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION. 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 OWNER AND THE ENGINEER PRIOR TO MAKING ANY CHANGES.

3. THE CONTRACTOR SHALL FIELD VERIFY THE EXTENT OF DEMOLITION.

4. WHEN UTILITIES ARE REMOVED, CAP AND SEAL A MINIMUM OF 8" BELOW FINISH GRADE.

ENGINEERING SITE NOTES

1. CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF ALL PROPERTY CORNERS.

2. CONTRACTOR SHALL MATCH PROPOSED CURB AND GUTTER, CONCRETE, AND PAVEMENT TO EXISTING GRADE AT ALL TIE IN LOCATIONS.

3. CONTRACTOR SHALL REMOVE PAVEMENT AND CONCRETE IN ACCORDANCE WITH SPECIFICATIONS OF EL PASO COUNTY AND/OR THE COLORADO STATE DEPARTMENT OF TRANSPORTATION.

4. THE EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH GEOTECHNICAL RECOMMENDATIONS AND ARCHITECTURAL BUILDING PLANS AND SPECIFICATIONS.

5. CONTRACTOR SHALL REFER TO BUILDING PLANS AND SPECIFICATIONS FOR ACTUAL LOCATION OF ALL UTILITY ENTRANCES, TO INCLUDE, SANITARY SEWER LATERALS, DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRICAL, AND TELEPHONE SERVICE. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND ASSURE PROPER DEPTHS ARE ACHIEVED, AS WELL AS, COORDINATE WITH ANY UTILITY COMPANIES FOR APPROVED LOCATIONS AND SCHEDULING OF TIE–INS/CONNECTIONS TO THEIR FACILITIES.

6. CONTRACTOR IS RESPONSIBLE FOR REPAIRING THE DAMAGE DONE TO ANY EXISTING ITEM DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO, OR BETTER THAN, EXISTING CONDITIONS. CONTRACTOR IS RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGE AND NOTIFY CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION START.

7. CONTRACTOR TO REMOVE OR RELOCATE, WHEN APPLICABLE, ALL EXISTING BUILDINGS, FOUNDATIONS, BASEMENTS, CONNECTING IMPROVEMENTS, DRAIN PIPES, SANITARY SEWER PIPES, POWER POLES, AND GUY WIRES, WATER METERS AND WATER LINES, WELLS, SIDEWALKS, SIGN POLES, UNDERGROUND GAS, SEPTIC TANKS, AND ASPHALT, SHOWN AND NOT SHOWN, WITHIN CONSTRUCTION LIMITS AND WHERE NEEDED, TO ALLOW FOR NEW CONSTRUCTION AS SHOWN.

ENGINEERING PAVING NOTES

1. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.

2. ALL CONCRETE SIDEWALKS SHALL HAVE CONTROL JOINTS CUT ON 5' CENTERS AND EXPANSION JOINTS PLACED ON 20' CENTERS. CONCRETE PAVEMENT JOINTS SHALL BE SPACED AT 12' CENTERS MAXIMUM.

3. ALL AREAS INDICATED AS PAVEMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TYPICAL PAVEMENT SECTIONS.

4. WHERE NEW PAVEMENT MEETS THE EXISTING PAVEMENT, THE CONTRACTOR SHALL SAW CUT THE EXISTING PAVEMENT A MINIMUM 2" DEEP FOR A SMOOTH AND STRAIGHT JOINT AND MATCH THE EXISTING PAVEMENT ELEVATION WITH THE PROPOSED PAVEMENT UNLESS OTHERWISE INDICATED.

ENGINEERING GRADING NOTES

1. CONTOURS ON SIDEWALKS AND PRIVATE/PUBLIC ROADWAYS ARE TO FINISH GRADE.

2. FOR GROUND TREATMENT OF ALL DISTURBED AREAS WITHIN THE PROJECT SITE, REFER TO LANDSCAPE PLANS.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF DUST AND DIRT RISING AND SCATTERING IN THE AIR DURING CONSTRUCTION AND SHALL PROVIDE WATER SPRINKLING OR OTHER SUITABLE METHODS OF CONTROL. THE CONTRACTOR SHALL COMPLY WITH ALL GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION.

4. THE CONTRACTOR SHALL GRADE THE SITE TO THE ELEVATIONS INDICATED AND SHALL RE–GRADE WASHOUTS WHERE THEY OCCUR AFTER EVERY RAINFALL UNTIL A GRASS STAND OR OTHER FINAL LANDSCAPE PLANTING IS WELL ESTABLISHED.

ENGINEERING DRAINAGE AND STORM WATER NOTES

1. ON–SITE STORM SEWER SYSTEM HAS BEEN PROVIDED TO MAINTAIN THE EXISTING DRAINAGE PATTERNS.

2. ALL ON–SITE STORM SEWER IS PRIVATE, UNLESS OTHERWISE NOTED.

3. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED AND REPAIRED AS NEEDED. EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.

4. THE CONTRACTOR SHALL DE–SILT ALL DRAINAGE STRUCTURES AS REQUIRED DURING AND AT THE END OF CONSTRUCTION TO PROVIDE POSITIVE DRAINAGE FLOWS.

5. IF DEWATERING IS REQUIRED, THE CONTRACTOR SHALL OBTAIN ANY APPLICABLE REQUIRED PERMITS. THE CONTRACTOR IS TO COORDINATE WITH THE OWNER PRIOR TO EXCAVATION.

ENGINEERING GENERAL NOTES FOR CONTRACTOR

THE FOLLOWING NOTES ARE PROVIDED TO GIVE DIRECTIONS TO THE CONTRACTOR BY THE ENGINEER OF THE PLANS.

1. THE CITY OR COUNTY 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 THE CITY/COUNTY 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 EL PASO COUNTY 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 LIABILITYARISING 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 WORK 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, 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. A LAND SURVEYOR MUST FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK. IF DESTROYED, A 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 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 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 TO THE ENGINEER OF RECORD 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/COUNTY'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 A 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.

STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS

1. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON–SITE WATERS, INCLUDING WETLANDS.
2. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS 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, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED IN WRITING.
3. A SEPARATE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. MANAGEMENT OF THE SWMP DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR. THE SWMP SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS IN THE FIELD.
4. ONCE THE ESQCP IS APPROVED AND A "NOTICE TO PROCEED" HAS BEEN ISSUES, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED GEC. A PRE–CONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY STAFF.
5. CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ACTIVITIES THAT COULD CONTRIBUTE POLLUTANTS TO STORMWATER. CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES AND DISTURBED LAND AREAS SHALL BE INSTALLED IMMEDIATELY UPON COMPLETION OF THE DISTURBANCE.
6. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE MAINTAINED AND REMAIN IN EFFECTIVE OPERATING CONDITION UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND FINAL STABILIZATION IS ESTABLISHED. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL ASSESS THE ADEQUACY OF CONTROL MEASURES AT THE SITE AND IDENTIFY IF CHANGES TO THOSE CONTROL MEASURES ARE NEEDED TO ENSURE THE CONTINUED EFFECTIVE PERFORMANCE OF THE CONTROL MEASURES. ALL CHANGES TO TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES MUST BE INCORPORATED INTO THE STORMWATER MANAGEMENT PLAN.
7. TEMPORARY STABILIZATION SHALL BE IMPLEMENTED ON DISTURBED AREAS AND STOCKPILES WHERE GROUND DISTURBING CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED OR TEMPORARILY CEASED FOR LONGER THAN 14 DAYS.
8. FINAL STABILIZATION MUST BE IMPLEMENTED AT ALL APPLICABLE CONSTRUCTION SITES. FINAL STABILIZATION IS ACHIEVED WHEN ALL GROUND DISTURBING ACTIVITIES ARE COMPLETE AND ALL DISTURBED AREAS EITHER HAVE A UNIFORM VEGETATIVE COVER WITH INDIVIDUAL PLAN DENSITY OF 70% OF PRE–DISTURBED LEVELS ESTABLISHED OR EQUIVALENT PERMANENT ALTERNATIVE STABILIZATION METHOD IS IMPLEMENTED. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED UPON FINAL STABILIZATION AND BEFORE PERMIT CLOSURE.
9. ALL PERMANENT STORMWATER MANAGEMENT FACILITIES SHALL BE INSTALLED AS DESIGNED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE DESIGN OR FUNCTION OF PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BE THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
10. EARTH DISTURBANCES SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY MINIMIZE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME. PRE–EXISTING VEGETATION SHALL BE PROTECTED AND MAINTAINED WITHIN 50 HORIZONTAL FEET OF A WATERS OF THE STATE UNLESS SHOWN TO BE INFEASIBLE AND SPECIFICALLY REQUESTED AND APPROVED.
11. COMPACTION OF SOIL MUST BE PREVENTED IN AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES OR WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED. IF COMPACTION PREVENTION IS NOT FEASIBLE DUE TO SITE CONSTRAINTS, ALL AREAS DESIGNATED FOR INFILTRATION AND VEGETATION CONTROL MEASURES MUST BE LOOSENED PRIOR TO INSTALLATION OF THE CONTROL MEASURE(S).
12. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE A STABILIZED CONVEYANCE DESIGNED TO MINIMIZE EROSION AND THE DISCHARGE OF SEDIMENT OFF SITE.
13. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE SWMP. NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO ENTER STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUTS SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY, CREEK, OR STREAM.
14. DURING DEWATERING OPERATIONS OF UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON SITE, BUT SHALL NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF UNLESS AN APPROVED STATE DEWATERING PERMIT IS IN PLACE.
15. EROSION CONTROL BLANKETING OR OTHER PROTECTIVE COVERING SHALL BE USED ON SLOPES STEEPER THAN 3:1.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
17. WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. CONTROL MEASURES MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
18. TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF–SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFF–SITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
19. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, SOIL AND SAND THAT MAY ACCUMULATE IN ROADS, STORM DRAINS, AND OTHER DRAINAGE CONVEYANCE SYSTEMS AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
20. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON–SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
21. NO CHEMICAL(S) HAVING THE POTENTIAL TO BE RELEASED IN STORMWATER ARE TO BE STORED OR USED ONSITE UNLESS PERMISSION FOR THE USE OF SUCH CHEMICAL(S) IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING APPROVAL FOR THE USE OF SUCH CHEMICAL(S), SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
22. BULK STORAGE OF ALLOWED PETROLEUM PRODUCTS OR OTHER ALLOWED LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL REQUIRE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS ONSITE AND TO PREVENT ANY SPILLED MATERIALS FROM ENTERING STATE WATERS, ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR OTHER FACILITIES.
23. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE CURB AND GUTTER OR DITCH EXCEPT WITH APPROVED SEDIMENT CONTROL MEASURES.
24. OWNER/DEVELOPER AND THEIR AGENTS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS OF THE LAND DEVELOPMENT CODE, DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (1041, NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND OTHER LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, LOCAL OR COUNTY AGENCIES, THE MOST RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE ONLY AT APPROVED CONSTRUCTION ACCESS POINTS.
26. PRIOR TO CONSTRUCTION THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
27. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND SHALL BE UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
28. THE GEOTECHNICAL EVALUATION FOR THIS SITE HAS BEEN PREPARED BY CTL THOMPSON, INC AND SHALL BE CONSIDERED A PART OF THESE PLANS.
29. AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB ONE (1) ACRE OF MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION, THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
WATER QUALITY CONTROL DIVISION
WQCD – PERMITS
4300 CHERRY CREEK DRIVE SOUTH
DENVER, CO 80246–1530
ATTN: PERMITS UNIT
https://cdphe.colorado.gov/cor400000–stormwater–discharge

811. Know what's **below.**
Call before you dig.

REV	DATE	DESCRIPTION	BY

Kimley»Horn

PREPARED BY:

PREPARED FOR:
© **McDonald's USA, LLC**

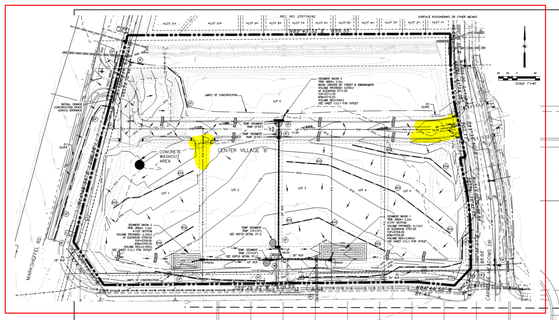
DRAWN BY: ALS
STD ISSUE DATE: 7/30/2024
REVIEWED BY: JJM
DATE ISSUED: 7/30/2024

TITLE
CONSTRUCTION DRAWINGS

DESCRIPTION
NOTES

SITE ID: 51028
SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

C2.2



VILLAGE AT LORSON RANCH,
FILING NO. 1, LOT 6
CURRENT OWNER(S): CRADLAN LLC

PRIVATE DRIVE PER PLAT

PROPERTY LINE

PROPERTY LINE

5.0' PUBLIC DRAINAGE AND UTILITY EASEMENT

Please move the VTC to the north side of the site, where construction traffic is expected to exit the site. See screenshot above, showing yellow highlights at the location for your pad onto "Center Villiage Heights" a private road

plans updated so VTC is moved to north side of site

PROPERTY LINE

PROPOSED PORTABLE TOILET

15.0' PUBLIC UTILITY AND DRAINAGE EASEMENT

JOB TRAILER TO BE LOCATED BY CONTRACTOR AND LOCATION UPDATED ON FIELD COPY OF THE EROSION CONTROL PLANS

VILLAGE AT LORSON RANCH,
FILING NO. 1, LOT 3
CURRENT OWNER(S): CRADLAN LLC

PARCEL CONTAINS
55,024 SQUARE FEET
1.263 ACRES

VILLAGE AT LORSON RANCH,
FILING NO. 1, LOT 1
CURRENT OWNER(S): CRADLAN LLC

15.0' PUBLIC DRAINAGE AND UTILITY EASEMENT

30.0' PUBLIC ACCESS, DRAINAGE, AND UTILITY EASEMENT

PROPERTY LINE

20.0' PUBLIC UTILITY EASEMENT

FONTAINE BOULEVARD (PUBLIC R.O.W.)

LOD linetype doesnt match from plans to Legend.

legend updated to match LOD linetype from plans

LEGEND

- PROPERTY LINE
- 6550 EXISTING MAJOR CONTOUR
- 6551 EXISTING MINOR CONTOUR
- LOD LIMITS OF CONSTRUCTION/DISTURBANCE
- CF CONSTRUCTION FENCE
- SF SILT FENCE
- PROPOSED EASEMENTS
- EXISTING EASEMENTS
- PROPOSED SETBACKS
- SS—8 EXISTING SANITARY SEWER
- 12"W EXISTING WATER LINE
- EXISTING STORM SEWER PIPE
- SSA STABILIZED STAGING AREA
- CWA CONCRETE WASHOUT
- VTC VEHICLE TRACKING CONTROL
- SP SOIL STOCKPILE
- IP INLET PROTECTION
- E EXISTING ELECTRIC LINE
- UC EXISTING UNDERGROUND COMMUNICATION LINE

NOTES

1. THE INTENT OF THIS PLAN IS TO IDENTIFY THE EROSION CONTROL PRACTICES RECOMMENDED. THE CONTRACTOR SHALL REFERENCE ADDITIONAL CONSTRUCTION PLANS FOR DEMOLITION OF EXISTING AND CONSTRUCTION OF PROPOSED IMPROVEMENTS.
2. ADJACENT STREETS AND SIDEWALK SHALL BE KEPT CLEAN AND FREE OF SEDIMENT AND/OR DEBRIS AT ALL TIMES. CONTRACTOR SHALL PERFORM STREET SWEEPING AT ALL TIMES DURING ACTIVE TRACKING AND AT A MINIMUM ON A DAILY BASIS AT THE END OF EACH CONSTRUCTION DAY.
3. TEMPORARY STABILIZATION (TS) SHALL BE IMPLEMENTED WITHIN THE DISTURBED PORTIONS OF THE PROJECT SITE NO LATER THAN 14 DAYS FOLLOWING THE CEASE OF CONSTRUCTION ACTIVITIES WITHIN THE DISTURBED AREAS.
4. PERMANENT STABILIZATION (PS) MAY BE USED WITHIN AREAS OF TEMPORARY STABILIZATION (TS) AT THE CONTRACTOR'S DISCRETION. STABILIZATION SHALL BE APPLIED IN ACCORDANCE WITH APPLICABLE TEMPORARY STABILIZATION SEQUENCING REQUIREMENTS.
5. CONTRACTOR SHALL UTILIZE ROLLED EROSION CONTROL PRODUCTS ON ALL SLOPES 3H:1V OR GREATER TO ACHIEVE REQUIRED STABILIZATION.
6. CONTRACTOR SHALL MAINTAIN ACCEPTABLE EROSION CONTROL PRACTICES WITHIN THE ANTICIPATED LIMITS OF CONSTRUCTION IDENTIFIED HEREIN. BEST MANAGEMENT PRACTICES AND STABILIZATION SHALL BE COMPLETED AS IDENTIFIED HEREIN IN ACCORDANCE WITHIN OWNER REQUIREMENTS.
7. ALL WORK IN THE FONTAINE BOULEVARD ROW REQUIRES A ROW PERMIT FROM COLORADO SPRINGS. CONTRACTOR IS RESPONSIBLE FOR APPLYING FOR AND OBTAINING ALL NECESSARY ROW PERMITS.
8. CONTRACTOR SHALL REFER TO THE APPROVED GEOTECHNICAL REPORT FOR OVEREXCAVATION REQUIREMENTS AND ADDITIONAL INFORMATION.
9. SILT FENCE TO BE INSTALLED PRIOR TO COMMENCEMENT OF ONSITE GRADING AND CONSTRUCTION ACTIVITIES.
10. DEMOLITION, REMOVAL AND SOIL TREATMENT SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER RECOMMENDATIONS AS NOTED IN THE APPROVED PROJECT GEOTECHNICAL REPORT.
11. CONTRACTOR TO NOTE PROXIMITY OF EXISTING IMPROVEMENTS ADJACENT TO THE SITE AND PROVIDE NECESSARY MEASURES TO PROTECT ALL FACILITIES AND STRUCTURES IN PLACE.
12. CONTRACTOR SHALL MAINTAIN STABILIZED STAGING AREA (SSA), VEHICLE TRACKING CONTROL (VTC), AND CONCRETE WASHOUT AREA (CWA) AT THE CONSTRUCTION ENTRANCE AT ALL TIMES. CONTRACTOR SHALL UPDATE THE EROSION CONTROL PLAN IN THE FIELD TO INDICATE THE LOCATION OF THE SSA, VTC, AND CWA BMPS AS EXCAVATION SEQUENCING DICTATES.
13. CONTRACTOR MAY SUBSTITUTE SEDIMENT CONTROL LOGS (SCL) FOR SILT FENCE (SF) AS PERIMETER CONTROL, DEPENDING UPON SITE CONDITIONS. SCL, AND SF MAY BE INTERCHANGED DEPENDING ON SITE CONDITIONS.
14. CONTRACTOR SHALL OBTAIN R.O.W. PERMITS FOR ANY R.O.W. CLOSURES.
15. SEE FINAL LANDSCAPING PLAN IN THE SITE DEVELOPMENT PLAN FOR FINAL STABILIZATION MEASURES.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

Know what's below. Call before you dig.

BY	DESCRIPTION	DATE	REV

Kimley»Horn

PREPARED BY:

PREPARED FOR:
McDonald's USA, LLC

DRAWN BY	REVIEWED BY	DATE ISSUED
ALS	JJM	7/30/2024
STD ISSUE DATE		
7/30/2024		

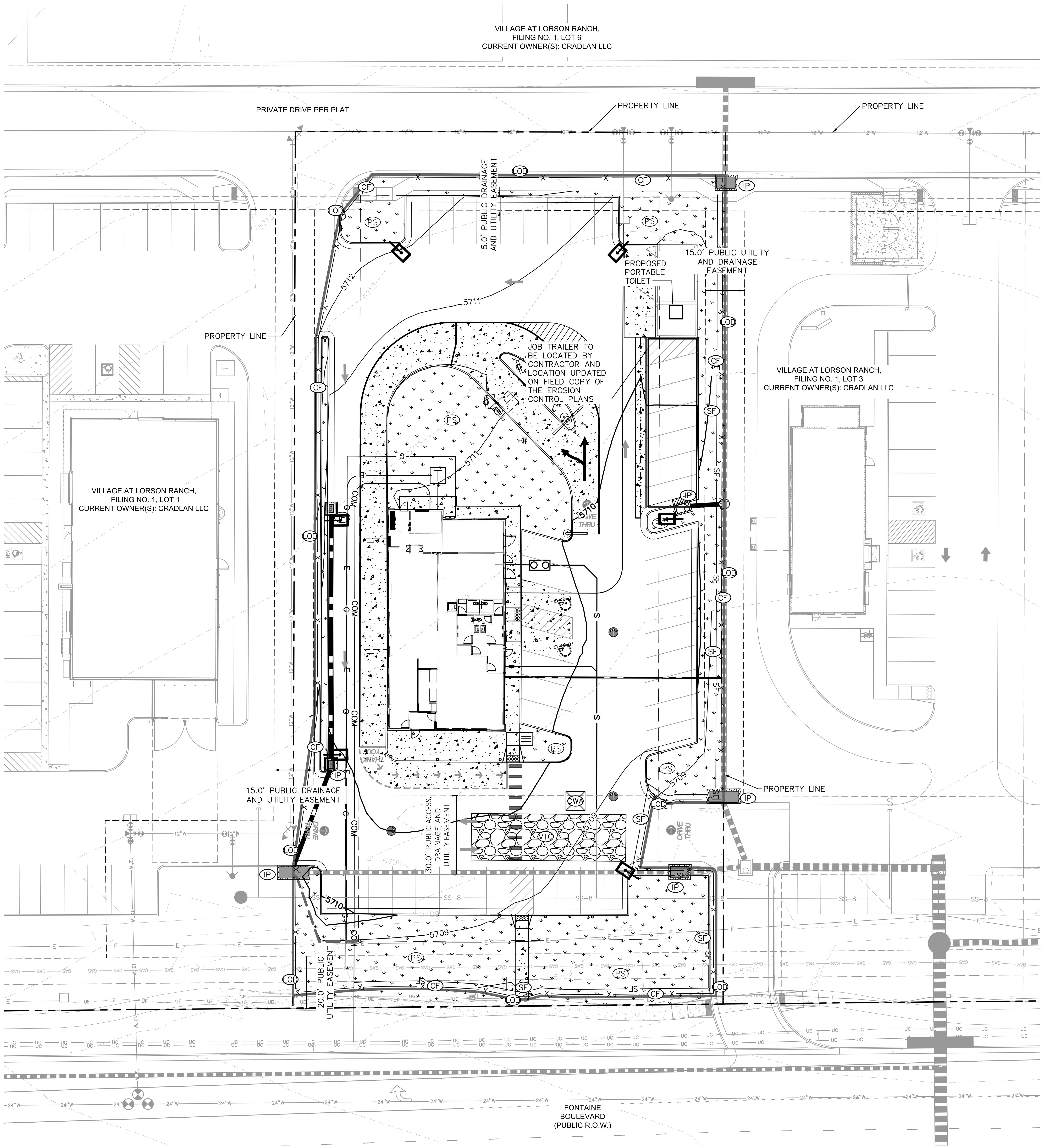
TITLE: CONSTRUCTION DRAWINGS

DESCRIPTION: INITIAL EC

SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

SITE ID: 51028

C2.3



LEGEND

- PROPERTY LINE
- EXISTING MAJOR CONTOUR (6550)
- EXISTING MINOR CONTOUR (6551)
- PROPOSED MAJOR CONTOUR (6550)
- PROPOSED MINOR CONTOUR (6551)
- LOD — LIMITS OF CONSTRUCTION/DISTURBANCE
- CF — CONSTRUCTION FENCE
- SF — SILT FENCE
- EASEMENT
- EXISTING SANITARY SEWER (SS-8)
- EXISTING WATER LINE (12"W)
- EXISTING STORM SEWER PIPE
- PROPOSED GAS LINE (G)
- SSA — STABILIZED STAGING AREA
- CWA — CONCRETE WASHOUT
- VTC — VEHICLE TRACKING CONTROL
- SP — SOIL STOCKPILE
- IP — INLET PROTECTION
- FINAL STABILIZATION. (REFERENCE FINAL LANDSCAPING PLANS)

NOTES

1. THE INTENT OF THIS PLAN IS TO IDENTIFY THE EROSION CONTROL PRACTICES RECOMMENDED. THE CONTRACTOR SHALL REFERENCE ADDITIONAL CONSTRUCTION PLANS FOR DEMOLITION OF EXISTING AND CONSTRUCTION OF PROPOSED IMPROVEMENTS.
2. ADJACENT STREETS AND SIDEWALK SHALL BE KEPT CLEAN AND FREE OF SEDIMENT AND/OR DEBRIS AT ALL TIMES. CONTRACTOR SHALL PERFORM STREET SWEEPING AT ALL TIMES DURING ACTIVE TRACKING AND AT A MINIMUM ON A DAILY BASIS AT THE END OF EACH CONSTRUCTION DAY.
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11. CONTRACTOR TO NOTE PROXIMITY OF EXISTING IMPROVEMENTS ADJACENT TO THE SITE AND PROVIDE NECESSARY MEASURES TO PROTECT ALL FACILITIES AND STRUCTURES IN PLACE.
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NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

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REV	DATE	DESCRIPTION	BY

Kimley»Horn

PREPARED BY:

PREPARED FOR:

McDonald's USA, LLC ©

DRAWN BY	STD ISSUE DATE	REVIEWED BY	DATE ISSUED
ALS	7/30/2024	JJM	7/30/2024

TITLE
CONSTRUCTION DRAWINGS

DESCRIPTION
FINAL EC

SITE ID 51028

SITE ADDRESS
NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

C2.4

VILLAGE AT LORSON RANCH,
FILING NO. 1, LOT 6
CURRENT OWNER(S): CRADLAN LLC

PROPERTY LINE

5.0' PUBLIC DRAINAGE AND UTILITY EASEMENT

15.0' PUBLIC UTILITY AND DRAINAGE EASEMENT

PROPERTY LINE

PROPERTY LINE

VILLAGE AT LORSON RANCH, FILING NO. 1, LOT 1
CURRENT OWNER(S): CRADLAN LLC

VILLAGE AT LORSON RANCH, FILING NO. 1, LOT 3
CURRENT OWNER(S): CRADLAN LLC

15.0' PUBLIC DRAINAGE AND UTILITY EASEMENT

30.0' PUBLIC ACCESS, DRAINAGE, AND UTILITY EASEMENT

20.0' PUBLIC UTILITY EASEMENT

PROPERTY LINE

FONTAINE BOULEVARD
(PUBLIC R.O.W.)

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- EXISTING STORM LINE
- SS—8 EXISTING SEWER
- E — E EXISTING ELECTRIC LINE
- UC — UC EXISTING COMMUNICATION LINE
- 12"W — 12"W EXISTING WATER LINE

CUT FILL SUMMARY

PROPOSED CUT = 128 CY

PROPOSED FILL = 698 CY

NET = 570 CY

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

811 Know what's **below.** **Call** before you dig.

BY	DESCRIPTION	DATE	REV

Kimley»Horn

PREPARED BY:

PREPARED FOR:
McDonald's USA, LLC

DRAWN BY: ALS
STD ISSUE DATE: 7/30/2024
REVIEWED BY: JJM
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TITLE: CONSTRUCTION DRAWINGS

DESCRIPTION: CUT FILL PLAN

SITE ADDRESS:
NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

SITE ID: 51028

C2.5

Description

Photograph CWA-1. Example of concrete washout area. Note gravel tracking pad for access and sign.

Concrete waste management involves designating and properly managing a specific area of the construction site as a concrete washout area. A concrete washout area can be created using one of several approaches designed to receive wash water from washing of tools and concrete mixer chutes, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. Three basic approaches are available: excavation of a pit in the ground, use of an above ground storage area, or use of prefabricated haul-away concrete washout containers. Surface discharges of concrete washout water from construction sites are prohibited.

Appropriate Uses

Concrete washout areas must be designated on all sites that will generate concrete wash water or liquid concrete waste from onsite concrete mixing or concrete delivery.

Because pH is a pollutant of concern for washout activities, when unlined pits are used for concrete washout, the soil must have adequate buffering capacity to result in protection of state groundwater standards; otherwise, a liner/containment must be used. The following management practices are recommended to prevent an impact from unlined pits to groundwater:

- The use of the washout site should be temporary (less than 1 year), and
- The washout site should be not be located in an area where shallow groundwater may be present, such as near natural drainages, springs, or wetlands.

Design and Installation

Concrete washout activities must be conducted in a manner that does not contribute pollutants to surface waters or stormwater runoff. Concrete washout areas may be lined or unlined excavated pits in the ground, commercially manufactured prefabricated washout containers, or aboveground holding areas constructed of berms, sandbags or straw bales with a plastic liner.

Although unlined washout areas may be used, lined pits may be required to protect groundwater under certain conditions.

Concrete Washout Area	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes

Do not locate an unlined washout area within 400 feet of any natural drainage pathway or waterbody or within 1,000 feet of any wells or drinking water sources. Even for lined concrete washouts, it is advisable to locate the facility away from waterbodies and drainage paths. If site constraints make these

setbacks infeasible or if highly permeable soils exist in the area, then the pit must be installed with an impermeable liner (16 mil minimum thickness) or surface storage alternatives using prefabricated concrete washout devices or a lined aboveground storage area should be used.

Design details with notes are provided in Detail CWA-1 for pits and CWA-2 for aboveground storage areas. Pre-fabricated concrete washout container information can be obtained from vendors.

Maintenance and Removal

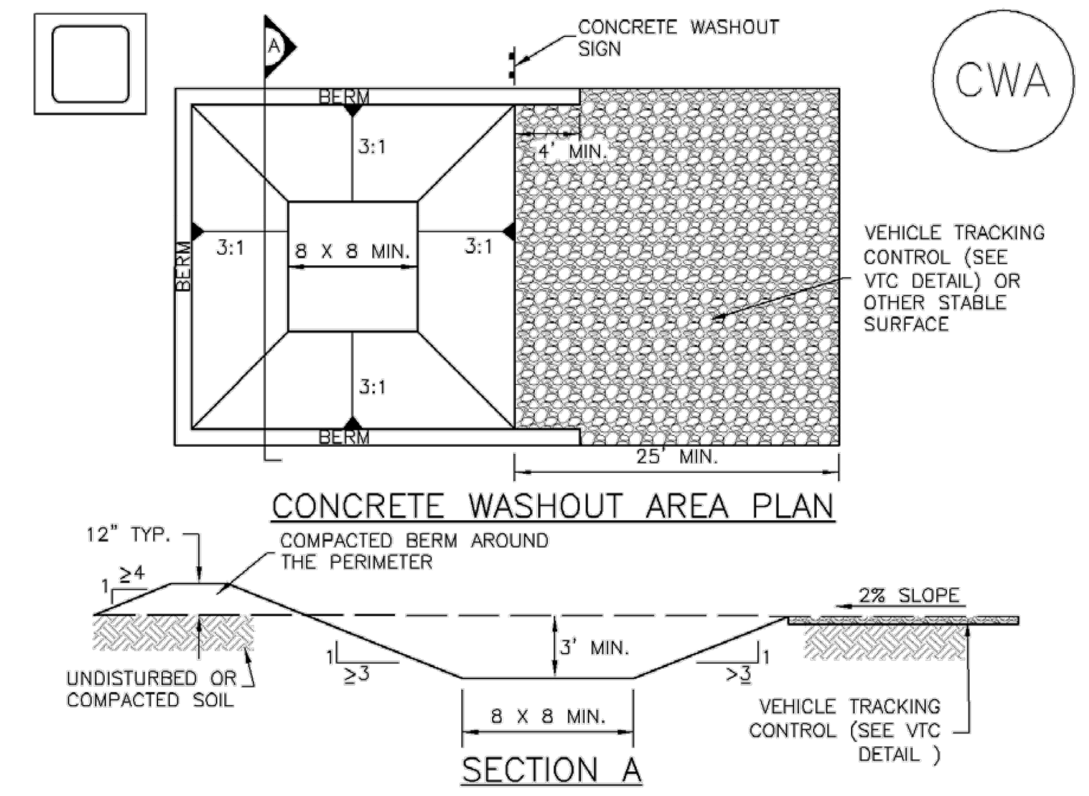
A key consideration for concrete washout areas is to ensure that adequate signage is in place identifying the location of the washout area. Part of inspecting and maintaining washout areas is ensuring that adequate signage is provided and in good repair and that the washout area is being used, as opposed to washout in non-designated areas of the site.

Remove concrete waste in the washout area, as needed to maintain BMP function (typically when filled to about two-thirds of its capacity). Collect concrete waste and deliver offsite to a designated disposal location.

Upon termination of use of the washout site, accumulated solid waste, including concrete waste and any contaminated soils, must be removed from the site to prevent on-site disposal of solid waste. If the wash water is allowed to evaporate and the concrete hardens, it may be recycled.

Photograph CWA-2. Prefabricated concrete washout. Photo courtesy of CDOT.

Photograph CWA-3. Earthen concrete washout. Photo courtesy of CDOT.



CWA-1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -CWA INSTALLATION LOCATION.

2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.

3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.

4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.

5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.

6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.

7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.

8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.

5. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.

6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.

7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD).

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Description

Photograph SF-1. Silt fence creates a sediment barrier, forcing sheet flow runoff to evaporate or infiltrate.

A silt fence is a woven geotextile fabric attached to wooden posts and trenched into the ground. It is designed as a sediment barrier to intercept sheet flow runoff from disturbed areas.

Appropriate Uses

A silt fence can be used where runoff is conveyed from a disturbed area as sheet flow. Silt fence is not designed to receive concentrated flow or to be used as a filter fabric. Typical uses include:

- Down slope of a disturbed area to accept sheet flow.
- Along the perimeter of a receiving water such as a stream, pond or wetland.
- At the perimeter of a construction site.

Design and Installation

Silt fence should be installed along the contour of slopes so that it intercepts sheet flow. The maximum recommended tributary drainage area per 100 lineal feet of silt fence, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to silt fence installed along the contour. Silt fence installed for other uses, such as perimeter control, should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the silt fence.

See Detail SF-1 for proper silt fence installation, which involves proper trenching, staking, securing the fabric to the stakes, and backfilling the silt fence. Properly installed silt fence should not be easily pulled out by hand and there should be no gaps between the ground and the fabric.

Silt fence must meet the minimum allowable strength requirements, depth of installation requirement, and other specifications in the design details. Improper installation of silt fence is a common reason for silt fence failure; however, when properly installed and used for the appropriate purposes, it can be highly effective.

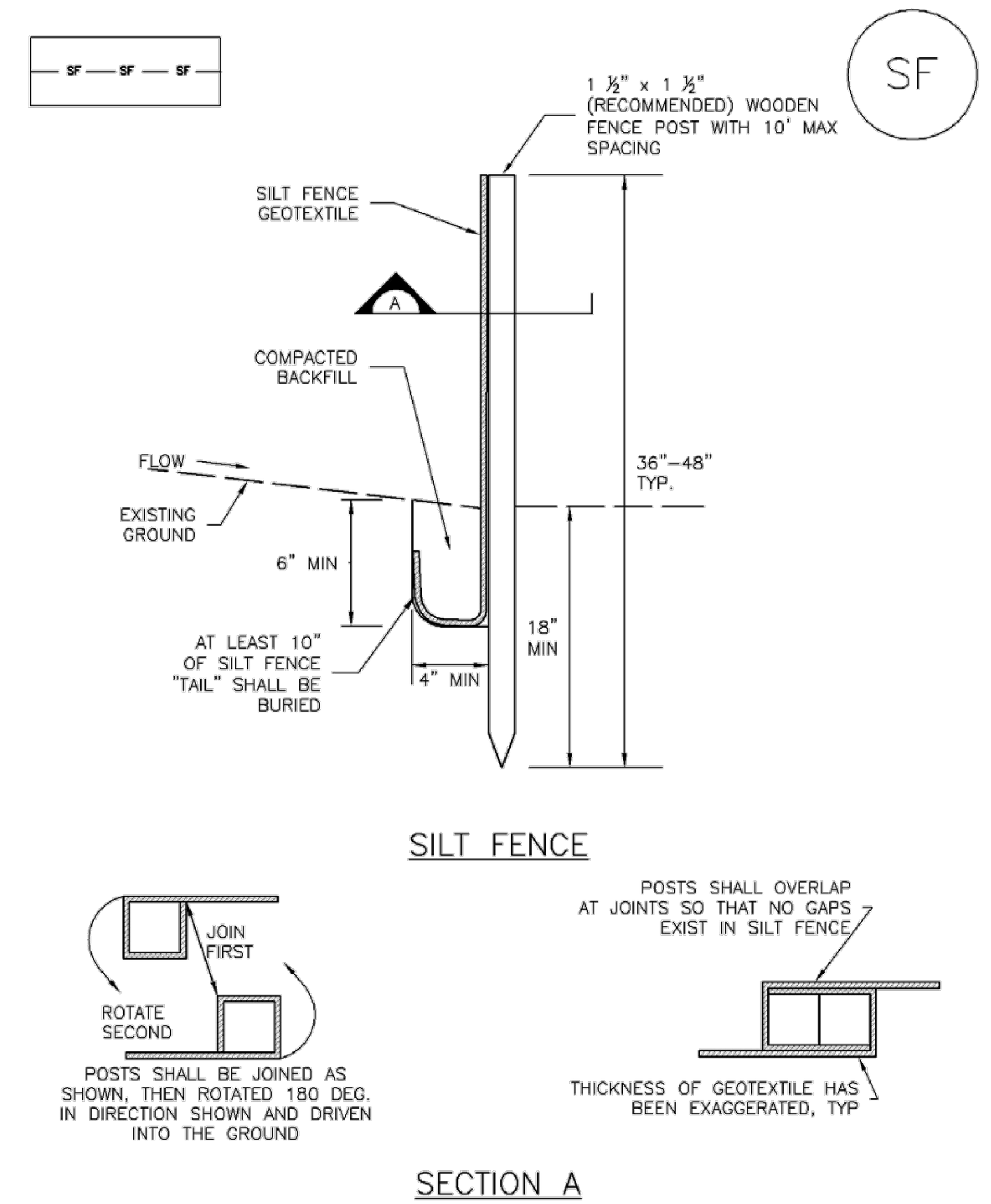
Silt Fence	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

Maintenance and Removal

Inspection of silt fence includes observing the material for tears or holes and checking for slumping fence and undercut areas bypassing flows. Repair of silt fence typically involves replacing the damaged section with a new section. Sediment accumulated behind silt fence should be removed, as needed to maintain BMP effectiveness, typically before it reaches a depth of 6 inches.

Silt fence may be removed when the upstream area has reached final stabilization.

Photograph SF-2. When silt fence is not installed along the contour, a "J-hook" installation may be appropriate to ensure that the BMP does not create concentrated flow parallel to the silt fence. Photo courtesy of Tom Gore.



SF-1. SILT FENCE

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' – 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".

5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Know what's below. Call before you dig.

REV	DATE	DESCRIPTION	BY

Kimley»Horn

PREPARED BY:

PREPARED FOR: McDonald's USA, LLC ©

DRAWN BY	ALS
STD ISSUE DATE	7/30/2024
REVIEWED BY	JJM
DATE ISSUED	7/30/2024

TITLE: CONSTRUCTION DRAWINGS

DESCRIPTION: EROSION CONTROL DETAILS

SITE ID: 51028

SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

C2.6

Description

A sediment control log is a linear roll made of natural materials such as straw, coconut fiber, or compost. The most common type of sediment control log has straw filling and is often referred to as a "straw wattle." All sediment control logs are used as a sediment barrier to intercept sheet flow runoff from disturbed areas.

Photographs SCL-1 and SCL-2. Sediment control logs used as 1) a perimeter control around a soil stockpile; and, 2) as a "J-hook" perimeter control at the corner of a construction site.

Appropriate Uses

Sediment control logs can be used in the following applications to trap sediment:

- As perimeter control for stockpiles and the site.
- As part of inlet protection designs.
- As check dams in small drainage ditches. (Sediment control logs are not intended for use in channels with high flow velocities.)
- On disturbed slopes to shorten flow lengths (as an erosion control).
- As part of multi-layered perimeter control along a receiving water such as a stream, pond or wetland.

Sediment control logs work well in combination with other layers of erosion and sediment controls.

Design and Installation

Sediment control logs should be installed along the contour to avoid concentrating flows. The maximum allowable tributary drainage area per 100 lineal feet of sediment control log, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to sediment control logs installed along the contour. When installed for other uses, such as perimeter control, it should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the BMP.

Sediment Control Log	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	No

Although sediment control logs initially allow runoff to flow through the BMP, they can quickly become a barrier and should be installed as if they are impermeable.

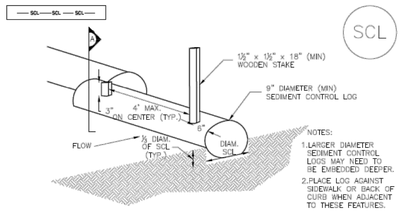
Design details and notes for sediment control logs are provided in the following details. Sediment logs must be properly installed per the detail to prevent undercutting, bypassing and displacement. When installed on slopes, sediment control logs should be installed along the contours (i.e., perpendicular to flow).

Improper installation can lead to poor performance. Be sure that sediment control logs are properly trenched (if lighter than 8 lb/foot), anchored and tightly jointed.

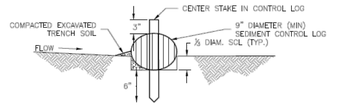
Maintenance and Removal

Be aware that sediment control logs will eventually degrade. Remove accumulated sediment before the depth is one-half the height of the sediment log and repair damage to the sediment log, typically by replacing the damaged section.

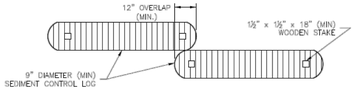
Once the upstream area is stabilized, remove and properly dispose of the logs. Areas disturbed beneath the logs may need to be seeded and mulched. Sediment control logs that are biodegradable may occasionally be left in place (e.g., when logs are used in conjunction with erosion control blankets as permanent slope breaks). However, removal of sediment control logs after final stabilization is typically appropriate when used in perimeter control, inlet protection and check dam applications. Compost from compost sediment control logs may be spread over the area and seeded as long as this does not cover newly established vegetation.



TRENCHED SEDIMENT CONTROL LOG

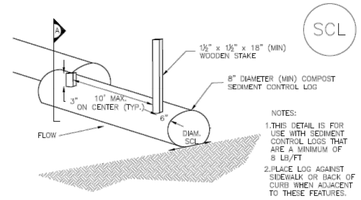


SECTION Ⓐ
TRENCHED SEDIMENT CONTROL LOG

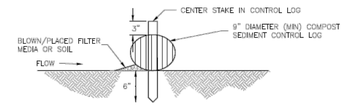


LOG JOINTS

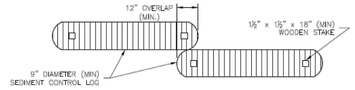
SCL–1. TRENCHED SEDIMENT CONTROL LOG



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

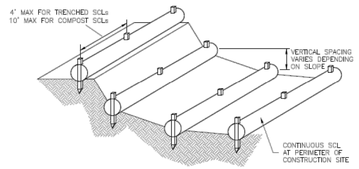


SECTION Ⓐ
COMPOST SEDIMENT CONTROL LOG



LOG JOINTS

SCL–2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



SCL–3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.

2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.

4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.

5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.

6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.

7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Description

Inlet protection consists of permeable barriers installed around an inlet to filter runoff and remove sediment prior to entering a storm drain inlet. Inlet protection can be constructed from rock socks, sediment control logs, silt fence, block and rock socks, or other materials approved by the local jurisdiction. Area inlets can also be protected by over-excavating around the inlet to form a sediment trap.

Photograph IP-1. Inlet protection for a curb opening inlet.

Appropriate Uses

Install protection at storm sewer inlets that are operable during construction. Consider the potential for tracked-out sediment or temporary stockpile areas to contribute sediment to inlets when determining which inlets must be protected. This may include inlets in the general proximity of the construction area, not limited to downgradient inlets. Inlet protection is not a stand-alone BMP and should be used in conjunction with other upgradient BMPs.

Design and Installation

To function effectively, inlet protection measures must be installed to ensure that flows do not bypass the inlet protection and enter the storm drain without treatment. However, designs must also enable the inlet to function without completely blocking flows into the inlet in a manner that causes localized flooding. When selecting the type of inlet protection, consider factors such as type of inlet (e.g., curb or area, sump or on-grade conditions), traffic, anticipated flows, ability to secure the BMP properly, safety and other site-specific conditions. For example, block and rock socks will be better suited to a curb and gutter along a roadway, as opposed to silt fence or sediment control logs, which cannot be properly secured in a curb and gutter setting, but are effective area inlet protection measures.

Several inlet protection designs are provided in the Design Details. Additionally, a variety of proprietary products are available for inlet protection that may be approved for use by local governments. If proprietary products are used, design details and installation procedures from the manufacturer must be followed. Regardless of the type of inlet protection selected, inlet protection is most effective when combined with other BMPs such as curb socks and check dams. Inlet protection is often the last barrier before runoff enters the storm sewer or receiving water.

Design details with notes are provided for these forms of inlet protection:

IP-1. Block and Rock Sock Inlet Protection for Sump or On-grade Inlets

IP-2. Curb (Rock) Socks Upstream of Inlet Protection, On-grade Inlets

Inlet Protection (various forms)	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

IP-3. Rock Sock Inlet Protection for Sump/Area Inlet

IP-4. Silt Fence Inlet Protection for Sump/Area Inlet

IP-5. Over-excavation Inlet Protection

IP-6. Straw Bale Inlet Protection for Sump/Area Inlet

CIP-1. Culvert Inlet Protection

Propriety inlet protection devices should be installed in accordance with manufacturer specifications.

More information is provided below on selecting inlet protection for sump and on-grade locations.

Inlets Located in a Sump

When applying inlet protection in sump conditions, it is important that the inlet continue to function during larger runoff events. For curb inlets, the maximum height of the protective barrier should be lower than the top of the curb opening to allow overflow into the inlet during larger storms without excessive localized flooding. If the inlet protection height is greater than the curb elevation, particularly if the filter becomes clogged with sediment, runoff will not enter the inlet and may bypass it, possibly causing localized flooding, public safety issues, and downstream erosion and damage from bypassed flows.

Area inlets located in a sump setting can be protected through the use of silt fence, concrete block and rock socks (on paved surfaces), sediment control logs/straw wattles embedded in the adjacent soil and stacked around the area inlet (on pervious surfaces), over-excavation around the inlet, and proprietary products providing equivalent functions.

Inlets Located on a Slope

For curb and gutter inlets on paved sloping streets, block and rock sock inlet protection is recommended in conjunction with curb socks in the gutter leading to the inlet. For inlets located along unpaved roads, also see the Check Dam Fact Sheet.

Maintenance and Removal

Inspect inlet protection frequently. Inspection and maintenance guidance includes:

- Inspect for tears that can result in sediment directly entering the inlet, as well as result in the contents of the BMP (e.g., gravel) washing into the inlet.
- Check for improper installation resulting in untreated flows bypassing the BMP and directly entering the inlet or bypassing to an unprotected downstream inlet. For example, silt fence that has not been properly trenched around the inlet can result in flows under the silt fence and directly into the inlet.
- Look for displaced BMPs that are no longer protecting the inlet. Displacement may occur following larger storm events that wash away or reposition the inlet protection. Traffic or equipment may also crush or displace the BMP.
- Monitor sediment accumulation upgradient of the inlet protection.

BY | DESCRIPTION | DATE | REV

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PREPARED BY:

PREPARED FOR: McDonald's USA, LLC

DRAWN BY ALS | STD ISSUE DATE 7/30/2024
REVIEWED BY JJM | DATE ISSUED 7/30/2024

TITLE CONSTRUCTION DRAWINGS

DESCRIPTION EROSION CONTROL DETAILS

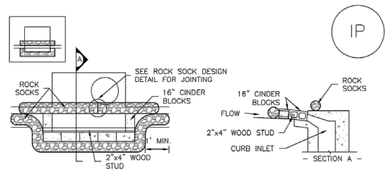
SITE ID 51028

SITE ADDRESS NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

C2.7

- Remove sediment accumulation from the area upstream of the inlet protection, as needed to maintain BMP effectiveness, typically when it reaches no more than half the storage capacity of the inlet protection. For silt fence, remove sediment when it accumulates to a depth of no more than 6 inches. Remove sediment accumulation from the area upstream of the inlet protection as needed to maintain the functionality of the BMP.
- Propriety inlet protection devices should be inspected and maintained in accordance with manufacturer specifications. If proprietary inlet insert devices are used, sediment should be removed in a timely manner to prevent devices from breaking and spilling sediment into the storm drain.

Inlet protection must be removed and properly disposed of when the drainage area for the inlet has reached final stabilization.



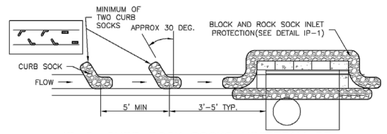
IP–1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.

3. GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP–2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

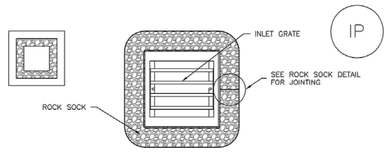
CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.

2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.

3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.

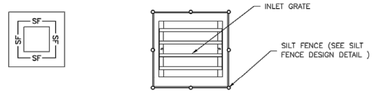
4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON–GRADE INLETS.



IP–3. ROCK SOCK SUMP/AREA INLET PROTECTION

ROCK SOCK SUMP/AREA INLET PROTECTION INSTALLATION NOTES
1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



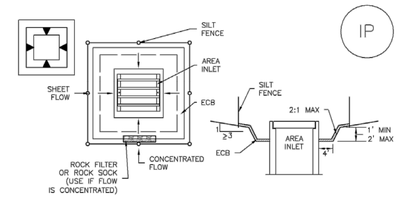
IP–4. SILT FENCE FOR SUMP INLET PROTECTION

SILT FENCE INLET PROTECTION INSTALLATION NOTES

1. SEE SILT FENCE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.

3. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF SILT FENCE FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



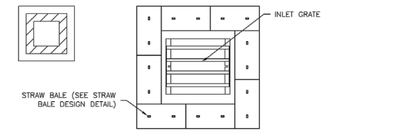
IP–5. OVEREXCAVATION INLET PROTECTION

OVEREXCAVATION INLET PROTECTION INSTALLATION NOTES

1. THIS FORM OF INLET PROTECTION IS PRIMARILY APPLICABLE FOR SITES THAT HAVE NOT YET REACHED FINAL GRADE AND SHOULD BE USED ONLY FOR INLETS WITH A RELATIVELY SMALL CONTRIBUTING DRAINAGE AREA.

2. WHEN USING FOR CONCENTRATED FLOWS, SHAPE BASIN IN 2:1 RATIO WITH LENGTH ORIENTED TOWARDS DIRECTION OF FLOW.

3. SEDIMENT MUST BE PERIODICALLY REMOVED FROM THE OVEREXCAVATED AREA.

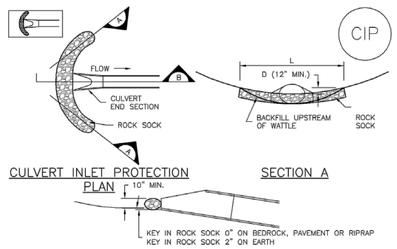


IP–6. STRAW BALE FOR SUMP INLET PROTECTION

STRAW BALE BARRIER INLET PROTECTION INSTALLATION NOTES

1. SEE STRAW BALE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. BALES SHALL BE PLACED IN A SINGLE ROW AROUND THE INLET WITH ENDS OF BALES TIGHTLY ABUTTING ONE ANOTHER.



CIP–1. CULVERT INLET PROTECTION

CULVERT INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
–LOCATION OF CULVERT INLET PROTECTION.

2. SEE ROCK SOCK DESIGN DETAIL FOR ROCK GRADATION REQUIREMENTS AND JOINTING DETAIL.

CULVERT INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS ½ THE HEIGHT OF THE ROCK SOCK.

5. CULVERT INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

GENERAL INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
–LOCATION OF INLET PROTECTION.
–TYPE OF INLET PROTECTION (IP.1, IP.2, IP.3, IP.4, IP.5, IP.6)

2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.

3. MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR ¼ OF THE HEIGHT FOR STRAW BALES.

5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.

6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY INLET PROTECTION; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION. CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.

Description

Vehicle tracking controls provide stabilized construction site access where vehicles exit the site onto paved public roads. An effective vehicle tracking control helps remove sediment (mud or dirt) from vehicles, reducing tracking onto the paved surface.

Photograph VTC-1. A vehicle tracking control pad constructed with properly sized rock reduces off-site sediment tracking.

Appropriate Uses

Implement a stabilized construction entrance or vehicle tracking control where frequent heavy vehicle traffic exits the construction site onto a paved roadway. An effective vehicle tracking control is particularly important during the following conditions:

- Wet weather periods when mud is easily tracked off site.
- During dry weather periods where dust is a concern.
- When poorly drained, clayey soils are present on site.

Although wheel washes are not required in designs of vehicle tracking controls, they may be needed at particularly muddy sites.

Design and Installation

Construct the vehicle tracking control on a level surface. Where feasible, grade the tracking control towards the construction site to reduce off-site runoff. Place signage, as needed, to direct construction vehicles to the designated exit through the vehicle tracking control. There are several different types of stabilized construction entrances including:

VTC-1. Aggregate Vehicle Tracking Control. This is a coarse-aggregate surfaced pad underlain by a geotextile. This is the most common vehicle tracking control, and when properly maintained can be effective at removing sediment from vehicle tires.

VTC-2. Vehicle Tracking Control with Construction Mat or Turf Reinforcement Mat. This type of control may be appropriate for site access at very small construction sites with low traffic volume over vegetated areas. Although this application does not typically remove sediment from vehicles, it helps protect existing vegetation and provides a stabilized entrance.

Vehicle Tracking Control	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	Yes

VTC-3. Stabilized Construction Entrance/Exit with Wheel Wash. This is an aggregate pad, similar to VTC-1, but includes equipment for tire washing. The wheel wash equipment may be as simple as hand-held power washing equipment to more advance proprietary systems. When a wheel wash is provided, it is important to direct wash water to a sediment trap prior to discharge from the site.

Vehicle tracking controls are sometimes installed in combination with a sediment trap to treat runoff.

Maintenance and Removal

Inspect the area for degradation and replace aggregate or material used for a stabilized entrance/exit as needed. If the area becomes clogged and ponds water, remove and dispose of excess sediment or replace material with a fresh layer of aggregate as necessary.

With aggregate vehicle tracking controls, ensure rock and debris from this area do not enter the public right-of-way.

Remove sediment that is tracked onto the public right of way daily or more frequently as needed. Excess sediment in the roadway indicates that the stabilized construction entrance needs maintenance.

Photograph VTC-2. A vehicle tracking control pad with wheel wash facility. Photo courtesy of Tom Gore.

Ensure that drainage ditches at the entrance/exit area remain clear.

A stabilized entrance should be removed only when there is no longer the potential for vehicle tracking to occur. This is typically after the site has been stabilized.

When wheel wash equipment is used, be sure that the wash water is discharged to a sediment trap prior to discharge. Also inspect channels conveying the water from the wash area to the sediment trap and stabilize areas that may be eroding.

When a construction entrance/exit is removed, excess sediment from the aggregate should be removed and disposed of appropriately. The entrance should be promptly stabilized with a permanent surface following removal, typically by paving.

BY	DESCRIPTION	DATE	REV

Kimley»Horn

PREPARED BY:

PREPARED FOR: McDonald's USA, LLC

DRAWN BY	STD ISSUE DATE
ALS	7/30/2024
REVIEWED BY	DATE ISSUED
JJM	7/30/2024

TITLE: CONSTRUCTION DRAWINGS

DESCRIPTION: EROSION CONTROL DETAILS

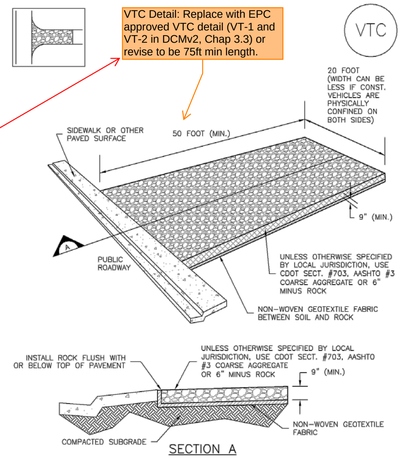
SITE ADDRESS: NEC FONTANE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

SITE ID: 51028

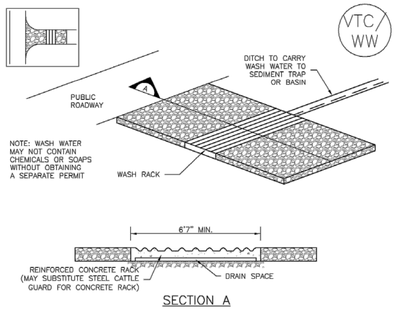
C2.8

VTC Detail: Replace with EPC approved VTC detail (VT-1 and VT-2 in DCMv2, Chap 3.3) or revise to be 75ft min length.

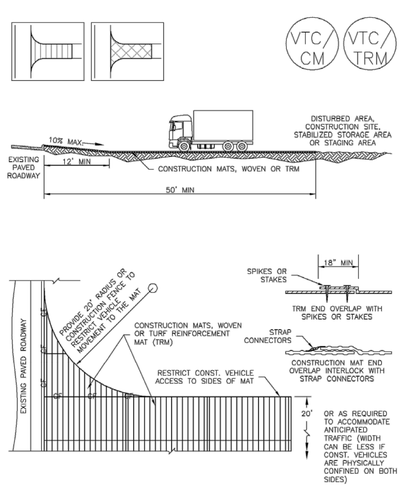
details replaced with VT-1 and VT-2 from DCMv2, Chap. 3.3



VTC–1. AGGREGATE VEHICLE TRACKING CONTROL



VTC–2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK



VTC–3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   –TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT–OF–WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON–WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)

Stockpile Management (SP) MM-2

Description

Stockpile management includes measures to minimize erosion and sediment transport from soil stockpiles.

Appropriate Uses

Stockpile management should be used when soils or other erodible materials are stored at the construction site. Special attention should be given to stockpiles in close proximity to natural or manmade storm systems.

Photograph SP-1. A topsoil stockpile that has been partially revegetated and is protected by silt fence perimeter control.

Design and Installation

Locate stockpiles away from all drainage system components including storm sewer inlets. Where practical, choose stockpile locations that that will remain undisturbed for the longest period of time as the phases of construction progress. Place sediment control BMPs around the perimeter of the stockpile, such as sediment control logs, rock socks, silt fence, straw bales and sand bags. See Detail SP-1 for guidance on proper establishment of perimeter controls around a stockpile. For stockpiles in active use, provide a stabilized designated access point on the upgradient side of the stockpile.

Stabilize the stockpile surface with surface roughening, temporary seeding and mulching, erosion control blankets, or soil binders. Soils stockpiled for an extended period (typically for more than 60 days) should be seeded and mulched with a temporary grass cover once the stockpile is placed (typically within 14 days). Use of mulch only or a soil binder is acceptable if the stockpile will be in place for a more limited time period (typically 30-60 days). Timeframes for stabilization of stockpiles noted in this fact sheet are "typical" guidelines. Check permit requirements for specific federal, state, and/or local requirements that may be more prescriptive.

Stockpiles should not be placed in streets or paved areas unless no other practical alternative exists. See the Stabilized Staging Area Fact Sheet for guidance when staging in roadways is unavoidable due to space or right-of-way constraints. For paved areas, rock socks must be used for perimeter control and all inlets with the potential to receive sediment from the stockpile (even from vehicle tracking) must be protected.

Maintenance and Removal

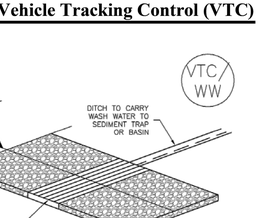
Inspect perimeter controls and inlet protection in accordance with their respective BMP Fact Sheets. Where seeding, mulch and/or soil binders are used, reseeding or reapplication of soil binder may be necessary.

When temporary removal of a perimeter BMP is necessary to access a stockpile, ensure BMPs are reinstalled in accordance with their respective design detail section.

Stockpile Management	
Functions	
Erosion Control	Yes
Sediment Control	Yes
Site/Material Management	Yes

Description

A stabilized staging area is a clearly designated area where construction equipment and vehicles, stockpiles, waste bins, and other construction-related materials are stored. The contractor office trailer may also be located in this area. Depending on the size of the construction site, more than one staging area may be necessary.



Photograph SSA-1. Example of a staging area with a gravel surface to prevent mud tracking and reduce runoff. Photo courtesy of Douglas County.

Appropriate Uses

Most construction sites will require a staging area, which should be clearly designated in SWMP drawings. The layout of the staging area may vary depending on the type of construction activity. Staging areas located in roadways due to space constraints require special measures to avoid materials being washed into storm inlets.

Design and Installation

Stabilized staging areas should be completed prior to other construction activities beginning on the site. Major components of a stabilized staging area include:

- Appropriate space to contain storage and provide for loading/unloading operations, as well as parking if necessary.
- A stabilized surface, either paved or covered, with 3-inch diameter aggregate or larger.
- Perimeter controls such as silt fence, sediment control logs, or other measures.
- Construction fencing to prevent unauthorized access to construction materials.
- Provisions for Good Housekeeping practices related to materials storage and disposal, as described in the Good Housekeeping BMP Fact Sheet.
- A stabilized construction entrance/exit, as described in the Vehicle Tracking Control BMP Fact Sheet, to accommodate traffic associated with material delivery and waste disposal vehicles.

Over-sizing the stabilized staging area may result in disturbance of existing vegetation in excess of that required for the project. This increases costs, as well as requirements for long-term stabilization following the construction period. When designing the stabilized staging area, minimize the area of disturbance to the extent practical.

Stabilized Staging Area	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material	Yes

Minimizing Long-Term Stabilization Requirements

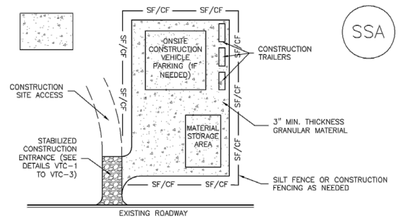
- Utilize off-site parking and restrict vehicle access to the site.
- Use construction mats in lieu of rock when staging is provided in an area that will not be disturbed otherwise.
- Consider use of a bermed contained area for materials and equipment that do not require a stabilized surface.
- Consider phasing of staging areas to avoid disturbance in an area that will not be otherwise disturbed.

See Detail SSA-1 for a typical stabilized staging area and SSA-2 for a stabilized staging area when materials staging in roadways is required.

Maintenance and Removal

Maintenance of stabilized staging areas includes maintaining a stable surface cover of gravel, repairing perimeter controls, and following good housekeeping practices.

When construction is complete, debris, unused stockpiles and materials should be recycled or properly disposed. In some cases, this will require disposal of contaminated soil from equipment leaks in an appropriate landfill. Staging areas should then be permanently stabilized with vegetation or other surface cover planned for the development.



SSA–1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

BY | DESCRIPTION | DATE | REV

Kimley»Horn

PREPARED BY:

PREPARED FOR: McDonald's USA, LLC

TITLE: CONSTRUCTION DRAWINGS

DESCRIPTION: EROSION CONTROL DETAILS

SITE ID: 51028

SITE ADDRESS: NEC FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

DRAWN BY ALS | STD ISSUE DATE 7/30/2024

REVIEWED BY JJM | DATE ISSUED 7/30/2024

C2.9

STABILIZED STAGING AREA MAINTENANCE NOTES

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

Description

A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. Sediment basins are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge. Sediment basins are often constructed in locations that will later be modified to serve as post-construction stormwater basins.

Photograph SB-1. Sediment basin at the toe of a slope. Photo courtesy of WWE.

Appropriate Uses

Most large construction sites (typically greater than 2 acres) will require one or more sediment basins for effective management of construction site runoff. On linear construction projects, sediment basins may be impractical; instead, sediment traps or other combinations of BMPs may be more appropriate.

Sediment basins should not be used as stand-alone sediment controls. Erosion and other sediment controls should also be implemented upstream.

When feasible, the sediment basin should be installed in the same location where a permanent post-construction detention pond will be located.

Design and Installation

The design procedure for a sediment basin includes these steps:

- **Basin Storage Volume**: Provide a storage volume of at least 3,600 cubic feet per acre of drainage area. To the extent practical, undisturbed and/or off-site areas should be diverted around sediment basins to prevent "clean" runoff from mixing with runoff from disturbed areas. For undisturbed areas (both on-site and off-site) that cannot be diverted around the sediment basin, provide a minimum of 500 ft^3/acre of storage for undeveloped (but stable) off-site areas in addition to the 3,600 ft^3/acre for disturbed areas. For stable, developed areas that cannot be diverted around the sediment basin, storage volume requirements are summarized in Table SB-1.
- **Basin Geometry:** Design basin with a minimum length-to-width ratio of 2:1 (L:W). If this cannot be achieved because of site space constraints, baffling may be required to extend the effective distance between the inflow point(s) and the outlet to minimize short-circuiting.
- **Dam Embankment**: It is recommended that embankment slopes be 4:1 (H:V) or flatter and no steeper than 3:1 (H:V) in any location.

Sediment Basins	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

Maintenance and Removal

Maintenance activities include the following:

- Dredge sediment from the basin, as needed to maintain BMP effectiveness, typically when the design storage volume is no more than one-third filled with sediment.
- Inspect the sediment basin embankments for stability and seepage.
- Inspect the inlet and outlet of the basin, repair damage, and remove debris. Remove, clean and replace the gravel around the outlet on a regular basis to remove the accumulated sediment within it and keep the outlet functioning.
- Be aware that removal of a sediment basin may require dewatering and associated permit requirements.
- Do not remove a sediment basin until the upstream area has been stabilized with vegetation.

Final disposition of the sediment basin depends on whether the basin will be converted to a permanent post-construction stormwater basin or whether the basin area will be returned to grade. For basins being converted to permanent detention basins, remove accumulated sediment and reconfigure the basin and outlet to meet the requirements of the final design for the detention facility. If the sediment basin is not to be used as a permanent detention facility, fill the excavated area with soil and stabilize with vegetation.

SEDIMENT BASIN MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E., TWO FEET BELOW THE SPILLWAY CREST).

5. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

811 Know what's below. Call before you dig.

REV	DATE	DESCRIPTION	BY

Kimley»Horn

PREPARED BY:

PREPARED FOR: McDonald's USA, LLC ©

DRAWN BY	CHECKED BY
ALS	JJM
STD ISSUE DATE	REVIEWED BY
7/30/2024	JJM
	DATE ISSUED
	7/30/2024

TITLE: CONSTRUCTION DRAWINGS

DESCRIPTION: EROSION CONTROL DETAILS

SITE ID: 51028

SITE ADDRESS: 1405 FONTAINE BLVD AND MARKSHEFFEL ROAD, COLORADO SPRINGS, CO

C2.10

2024 Financial Assurance Estimate Form
(with pre-plat construction)

project name and date included, as requested

updated with project number provided

Include Project Name & Date

Updated: 10/2023

PROJECT INFORMATION		
		PPR-24-27
Project Name	**Date**	**PCD File No.**

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining	
SECTION 1 - GRADING AND EROSION CONTROL (Construction and Permanent BMPs)								
Earthwork								*
less than 1,000; $5,300 min	569.	CY	$ 8.00	=	$ 5,300.00		$ 5,300.00	*
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		CY	$ 3.50	=	$ -		$ -	*
50,001-200,000; $175,000 min		CY	$ 2.50	=	$ -		$ -	*
greater than 200,000; $500,000 min		CY	$ 2.00	=	$ -		$ -	*
Permanent Erosion Control Blanket		SY	$ 9.00	=	$ -		$ -	*
Permanent Seeding (inc. noxious weed mgmnt.) & Mulching	.28	AC	$ 2,018.00	=	$ 573.11		$ 573.11	*
Permanent Pond/BMP (provide engineer's estimate)		EA		=	$ -		$ -	*
Concrete Washout Basin	1.	EA	$ 1,172.00	=	$ 1,172.00		$ 1,172.00	
Inlet Protection	7.	EA	$ 217.00	=	$ 1,519.00		$ 1,519.00	
Rock Check Dam		EA	$ 651.00	=	$ -		$ -	
Safety Fence	982.34	LF	$ 3.00	=	$ 2,947.03		$ 2,947.03	
Sediment Basin		EA	$ 2,294.00	=	$ -		$ -	
Sediment Trap		EA	$ 538.00	=	$ -		$ -	
Silt Fence	500.55	LF	$ 3.00	=	$ 1,501.65		$ 1,501.65	
Slope Drain		LF	$ 43.00		$ -		$ -	
Straw Bale		EA	$ 33.00	=	$ -		$ -	
Straw Wattle/Rock Sock		LF	$ 8.00	=	$ -		$ -	
Surface Roughening		AC	$ 269.00		$ -		$ -	
Temporary Erosion Control Blanket		SY	$ 3.00	=	$ -		$ -	
Temporary Seeding and Mulching		AC	$ 1,793.00	=	$ -		$ -	
Vehicle Tracking Control	1.	EA	$ 3,085.00	=	$ 3,085.00		$ 3,085.00	
				=	$ -		$ -	
[insert items not listed but part of construction plans]				=	$ -		$ -	
MAINTENANCE (35% of Construction BMPs)				=	$ 3,168.44		$ 3,168.44	
* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)		**Section 1 Subtotal**		**=**	**$ 19,266.24**		**$ 19,266.24**	
SECTION 2 - PUBLIC IMPROVEMENTS *								
ROADWAY IMPROVEMENTS								*
Construction Traffic Control		LS		=	$ -		$ -	*
Aggregate Base Course (135 lbs/cf)		Tons	$ 37.00	=	$ -		$ -	*
Aggregate Base Course (135 lbs/cf)		CY	$ 66.00		$ -		$ -	*
Asphalt Pavement (3" thick)		SY	$ 18.00		$ -		$ -	*
Asphalt Pavement (4" thick)		SY	$ 25.00		$ -		$ -	*
Asphalt Pavement (6" thick)		SY	$ 38.00		$ -		$ -	*
Asphalt Pavement (147 lbs/cf) __" thick		Tons	$ 114.00	=	$ -		$ -	*
Raised Median, Paved		SF	$ 11.00	=	$ -		$ -	*
Regulatory Sign/Advisory Sign		EA	$ 392.00	=	$ -		$ -	*
Guide/Street Name Sign		EA		=	$ -		$ -	*
Epoxy Pavement Marking		SF	$ 17.00	=	$ -		$ -	*
Thermoplastic Pavement Marking		SF	$ 30.00	=	$ -		$ -	*
Barricade - Type 3		EA	$ 259.00	=	$ -		$ -	*
Delineator - Type I		EA	$ 31.00	=	$ -		$ -	*
Curb and Gutter, Type A (6" Vertical)		LF	$ 38.00	=	$ -		$ -	*
Curb and Gutter, Type B (Median)		LF	$ 38.00	=	$ -		$ -	*
Curb and Gutter, Type C (Ramp)		LF	$ 38.00	=	$ -		$ -	*
4" Sidewalk (common areas only)		SY	$ 62.00	=	$ -		$ -	*
5" Sidewalk		SY	$ 77.00	=	$ -		$ -	*
6" Sidewalk		SY	$ 94.00	=	$ -		$ -	*
8" Sidewalk		SY	$ 125.00		$ -		$ -	*
Pedestrian Ramp		EA	$ 1,496.00	=	$ -		$ -	*
Cross Pan, local (8" thick, 6' wide to include return)		LF	$ 79.00	=	$ -		$ -	*
Cross Pan, collector (9" thick, 8' wide to include return)		LF	$ 119.00		$ -		$ -	*
Curb Opening with Drainage Chase		EA	$ 1,926.00	=	$ -		$ -	*
Guardrail Type 3 (W-Beam)		LF	$ 65.00	=	$ -		$ -	*
Guardrail Type 7 (Concrete)		LF	$ 94.00	=	$ -		$ -	*
Guardrail End Anchorage		EA	$ 2,731.00	=	$ -		$ -	*
Guardrail Impact Attenuator		EA	$ 4,902.00	=	$ -		$ -	*
Sound Barrier Fence (CMU block, 6' high)		LF	$ 102.00		$ -		$ -	*
Sound Barrier Fence (panels, 6' high)		LF	$ 104.00	=	$ -		$ -	*
Electrical Conduit, Size =		LF	$ 22.00	=	$ -		$ -	*
Traffic Signal, (provide engineer's estimate)		EA		=	$ -		$ -	*

PROJECT INFORMATION		
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]				=	$ -		$ -	*
STORM DRAIN IMPROVEMENTS								*
Concrete Box Culvert (M Standard), Size (W x H)		LF		=	$ -		$ -	*
18" Reinforced Concrete Pipe		LF	$ 82.00	=	$ -		$ -	*
24" Reinforced Concrete Pipe		LF	$ 98.00	=	$ -		$ -	*
30" Reinforced Concrete Pipe		LF	$ 123.00	=	$ -		$ -	*
36" Reinforced Concrete Pipe		LF	$ 151.00	=	$ -		$ -	*
42" Reinforced Concrete Pipe		LF	$ 201.00	=	$ -		$ -	*
48" Reinforced Concrete Pipe		LF	$ 245.00	=	$ -		$ -	*
54" Reinforced Concrete Pipe		LF	$ 320.00	=	$ -		$ -	*
60" Reinforced Concrete Pipe		LF	$ 374.00	=	$ -		$ -	*
66" Reinforced Concrete Pipe		LF	$ 433.00	=	$ -		$ -	*
72" Reinforced Concrete Pipe		LF	$ 495.00	=	$ -		$ -	*
18" Corrugated Steel Pipe		LF	$ 105.00	=	$ -		$ -	*
24" Corrugated Steel Pipe		LF	$ 121.00	=	$ -		$ -	*
30" Corrugated Steel Pipe		LF	$ 154.00	=	$ -		$ -	*
36" Corrugated Steel Pipe		LF	$ 184.00	=	$ -		$ -	*
42" Corrugated Steel Pipe		LF	$ 212.00	=	$ -		$ -	*
48" Corrugated Steel Pipe		LF	$ 223.00	=	$ -		$ -	*
54" Corrugated Steel Pipe		LF	$ 327.00	=	$ -		$ -	*
60" Corrugated Steel Pipe		LF	$ 353.00	=	$ -		$ -	*
66" Corrugated Steel Pipe		LF	$ 427.00	=	$ -		$ -	*
72" Corrugated Steel Pipe		LF	$ 502.00	=	$ -		$ -	*
78" Corrugated Steel Pipe		LF	$ 578.00	=	$ -		$ -	*
84" Corrugated Steel Pipe		LF	$ 691.00	=	$ -		$ -	*
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	$ 7,212.00	=	$ -		$ -	*
Curb Inlet (Type R) L=5', 5' ≤ Depth < 10'		EA	$ 9,377.00	=	$ -		$ -	*
Curb Inlet (Type R) L =5', 10' ≤ Depth < 15'		EA	$ 10,859.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', Depth < 5'		EA	$ 9,925.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', 5' ≤ Depth < 10'		EA	$ 10,230.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', 10' ≤ Depth < 15'		EA	$ 12,805.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', Depth < 5'		EA	$ 12,907.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', 5' ≤ Depth < 10'		EA	$ 13,835.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', 10' ≤ Depth < 15'		EA	$ 15,130.00	=	$ -		$ -	*
Curb Inlet (Type R) L =20', Depth < 5'		EA	$ 13,755.00	=	$ -		$ -	*
Curb Inlet (Type R) L =20', 5' ≤ Depth < 10'		EA	$ 15,181.00	=	$ -		$ -	*
Grated Inlet (Type C), Depth < 5'		EA	$ 6,037.00	=	$ -		$ -	*
Grated Inlet (Type D), Depth < 5'		EA	$ 7,458.00	=	$ -		$ -	*
Storm Sewer Manhole, Box Base		EA	$ 15,130.00	=	$ -		$ -	*
Storm Sewer Manhole, Slab Base		EA	$ 8,322.00	=	$ -		$ -	*
Geotextile (Erosion Control)		SY	$ 9.00	=	$ -		$ -	*
Rip Rap, d50 size from 6" to 24"		Tons	$ 104.00	=	$ -		$ -	*
Rip Rap, Grouted		Tons	$ 124.00	=	$ -		$ -	*
Drainage Channel Construction, Size (W x H)		LF		=	$ -		$ -	*
Drainage Channel Lining, Concrete		CY	$ 741.00	=	$ -		$ -	*
Drainage Channel Lining, Rip Rap		CY	$ 145.00	=	$ -		$ -	*
Drainage Channel Lining, Grass		AC	$ 1,911.00	=	$ -		$ -	*
Drainage Channel Lining, Other Stabilization				=	$ -		$ -	*
				=	$ -		$ -	
[insert items not listed but part of construction plans]				=	$ -		$ -	
* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)		**Section 2 Subtotal**		**=**	**$ -**		**$ -**	

PROJECT INFORMATION		
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	(with Pre-Plat Construction) Remaining
SECTION 3 - COMMON DEVELOPMENT IMPROVEMENTS (Private or District and NOT Maintained by EPC)**							
ROADWAY IMPROVEMENTS							
This section should include any road and storm water facilities which are being built for the overall common development, such as the shared access along the west property line. Disregard this comment				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
STORM DRAIN IMPROVEMENTS (Exception: Permanent Pond/BMP shall be itemized under Section 1)							
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
WATER SYSTEM IMPROVEMENTS							
Water Main Pipe (PVC), Size 8"		LF	$ 84.00	=	$ -		$ -
Water Main Pipe (Ductile Iron), Size 8"		LF	$ 98.00	=	$ -		$ -
Gate Valves, 8"		EA	$ 2,418.00	=	$ -		$ -
Fire Hydrant Assembly, w/ all valves		EA	$ 8,584.00	=	$ -		$ -
Water Service Line Installation, inc. tap and valves		EA	$ 1,723.00	=	$ -		$ -
Fire Cistern Installation, complete		EA		=	$ -		$ -
				=	$ -		$ -
[insert items not listed but part of construction plans]				=	$ -		$ -
SANITARY SEWER IMPROVEMENTS							
Sewer Main Pipe (PVC), Size 8"		LF	$ 84.00	=	$ -		$ -
Sanitary Sewer Manhole, Depth < 15 feet		EA	$ 5,708.00	=	$ -		$ -
Sanitary Service Line Installation, complete		EA	$ 1,825.00	=	$ -		$ -
Sanitary Sewer Lift Station, complete		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 is not subject to defect warranty requirements		**Section 3 Subtotal**		**=**	**$ -**		**$ -**

PROJECT INFORMATION		
Project Name	**Date**	**PCD File No.**

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining
AS-BUILT PLANS (Public Improvements inc. Permanent WQCV BMPs)				=	$ -		$ -
POND/BMP CERTIFICATION (inc. elevations and volume calculations)		LS		=	$ -		$ -

Total Construction Financial Assurance **$ 19,266.24**

(Sum of all section subtotals plus as-builts and pond/BMP certification)

Total Remaining Construction Financial Assurance (with Pre-Plat Construction) **$ 19,266.24**

(Sum of all section totals less credit for items complete plus as-builts and pond/BMP certification)

Total Defect Warranty Financial Assurance **$ 1,174.62**

(20% of all items identified as (*). To be collateralized at time of preliminary acceptance)

FINAL DRAINAGE REPORT for

McDonald's at Fontaine and Marksheffel
Village at Lorson Ranch
Filing No. 1, Lot 2
El Paso County, CO

Prepared for:

McDonald's USA, LLC.
110 North Carpenter Street
Chicago, IL 60607-2101
(206) 348-4374
Contact: Robert Yagusesky

Prepared by:

Kimley-Horn and Associates, Inc.
2 North Nevada Avenue, Suite 900
Colorado Springs, Colorado 80903
(719) 284-7275
Contact: Jessica McCallum, P.E.

Project #: 096806032

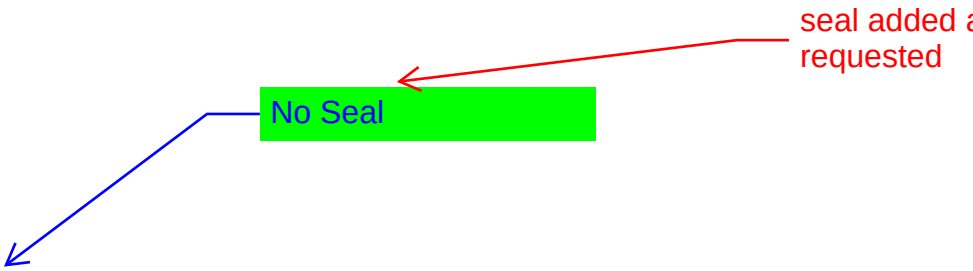
Prepared: July 30, 2024

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 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. 59054 Date

DEVELOPER'S STATEMENT

I, McDonald's USA, LLC, the developer has read and will comply with all of the requirements specified in this drainage report and plan.

_____
Business Name

_____
Authorized Signature Date

_____
Printed Name

_____
Title

_____
Address:

EL PASO COUNTY

Filed in accordance with Section 51.1 of the El Paso Land Development Code as amended.

_____ _____
Director of Public Works Date

Conditions:

TABLE OF CONTENTS

Please Segment Appendices (A, B, C etc). Update TOC.

table c
update

Kimley»Horn

INTRODUCTION

PURPOSE AND SCOPE OF STUDY

The purpose of this report is to outline the Final Drainage Report for Lot 2 of the Village at Lorson Ranch Filing No. 1 subdivision, located near the northeast corner of Marksheffel Road and Fontaine Boulevard (the "Property"), El Paso County, Colorado (the "County"). This Final Drainage Report identifies on-site and offsite drainage patterns, storm sewer and inlet locations, and areas tributary to the site and proposes to safely route developed storm water to adequate outfalls. The Property is approximately 1.263 acres in size.

The Property is located within the Jimmy Camp Creek Drainage Basin and is part of the subject area of the *Final Drainage Plan for Village at Lorson Ranch* dated June 2024, prepared by Core Engineering Group, LLC (the "FDP"). The FDP is in conformance with the *Lorson Ranch MDDP1* by Pentacor Engineering (approved November 7, 2006) and *Final Drainage Report for Carriage Meadows South at Lorson Ranch Filing No. 1* (approved September 7, 2017).

GENERAL PROJECT DESCRIPTION

The proposed improvements consist of the construction of an approximately 3,694-gross square-foot McDonald's, fast-food restaurant building with a dual drive-thru, parking lot, and landscaping (the "Project") within the Property (the "Site"). The Project will be processed through El Paso County. Additional outside agency review or processing is not anticipated as part of the Project.

The Project is located within a portion of the south half of the southeast quarter of Section 15, Township 15 South, Range 65 West of the 6th Principal Meridian, County of El Paso, State of Colorado (see Vicinity Map). The Property is bounded by Lot 1 of Village at Lorson Ranch Filing No. 1 to the west, private road and Lot 6 of Village at Lorson Ranch Filing No. 1 to the north, Lot 3 of Village at Lorson Ranch Filing No. 1 to the east, and Fontaine Boulevard to the south. The Property is currently undeveloped and native vegetation (grass with no shrubs). The Property generally slopes from northwest to southeast with the existing stormwater outfall being the existing 34"x53" HERCP south of the Site, routing flow under existing Fontaine Boulevard. Per the FDP, the anticipated ultimate outfall for this Property is the existing Pond G1/G2 south of the Site, ultimately tributary to Jimmy Camp Creek.

An ALTA and topographic field survey were completed for the Project by Kimley-Horn and Associates, Inc. dated September 6, 2024 and is the basis for design for the drainage improvements in conjunction with the Master Development design documents.

VICINITY MAP
NOT TO SCALE

and accompanying infrastructure

PROJECT CHARACTERISTICS

The Project Site is 1.263 acres in size. The Project involves the construction of an approximately 3,694 square foot McDonald's eating restaurant with a dual drive-thru.

The proposed building, parking lot, paved drives, and other impervious surfaces comprise 74.8 percent (55,034 square feet) of the overall Project Site. Landscape areas internal and on the perimeter of the site consist of landscape islands within the parking lot, and landscape zones adjacent to the building and landscape setback areas. The proposed internal landscaping areas make up 24.5 percent (13,486 square feet) of the Project Site.

Generally, the existing site slopes approximately 1-3% from the northwest to the southeast. This historic runoff pattern will generally be maintained and unaffected with the proposed Project.

There are no major irrigation facilities within the Site. The Project does not provide on-site water quality or detention for the Project area, but per the FDP, existing offsite full spectrum detention pond, Pond G1/G2 (the "EDB"), provides water quality and detention for the Site. The existing land use is undeveloped vacant land. The proposed land use is a fast food restaurant with drive-thru.

updated to include language from comment

SOILS CONDITIONS

NRCS soil data is available for this Site (see Appendix) and the onsite soils are USCS Hydrologic Soil Group C. Group C soils have a slow infiltration rate and possess a slow rate of water transmission. This site specifically is predominately comprised of Manzanst clay loam.

DRAINAGE DESIGN CRITERIA

REGULATIONS

The proposed development does not propose any deviations from the Drainage Criteria Manual County of El Paso, Colorado, dated October 31, 2018.

DEVELOPMENT DESIGN CRITERIA REFERENCE AND CONSTRAINTS

water

The proposed storm facilities follow the Drainage Criteria Manual County of El Paso, Colorado (the "CRITERIA"), El Paso County Engineering Criteria Manual (the "ECM"), and the 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.

constraints such as

updated to include language from comment

HYDROLOGIC CRITERIA

The 5-year and 100-year design storm events were used in determining rainfall and runoff for the proposed drainage system per Section 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 100-year detention and water quality capture volume are provided in the EDB. Based upon this approach, we feel that the drainage design provided for the Site is conservative and in keeping with the zoning and historic drainage concept for the area.

HYDRAULIC CRITERIA

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. Results of the hydraulic calculations are summarized in the Appendix.

Which one?

VARIANCES FROM CRITERIA

Due to existing grades and to match the historical flows presented at the Site, some drainage will be directed back to the County ROW. This is an existing condition. Besides this condition, no variances from the CRITERIA have been proposed for this development.

This paragraph is confusing. Please clarify.

updated to language to "Appendix C"

graph updated
quested

EXISTING DRAINAGE CONDITIONS

EXISTING DRAINAGE BASIN

The FDP defines 14 basins on the developed conditions drainage map. The Project lies within sub-basins PR3, PR4, PR5, and PR6. The sub-basins have 5-year and 100-year runoff coefficients of 0.83 and 0.90, respectively. The runoff for all sub-basins flows south towards the master developer-proposed 34"x53" HERCP. This historic surface runoff pattern will generally be maintained with the proposed Project. Per the FDP, the ultimate discharge from the Site is the master developer-proposed 34"x53" HERCP south of the Site.

MAJOR DRAINAGE BASIN DESCRIPTION

The Project is within the Jimmy Camp Creek Drainage Basin. The major drainage basin is mostly undeveloped land. Drainage facilities downstream of this Project are to be constructed per the master development. There are no known major irrigation facilities within 100 feet of the property.

The proposed drainage facilities for the Project are designed to generally follow the historic flow patterns of the Property as well as the intent of the original storm water design for the overall development. Please refer to the FDP for a full discussion of the original design for the subdivision. Applicable portions of the FDP are included in the Appendix for reference.

As documented within the FDP, this proposed Project lies within sub-basins PR3, PR4, PR5, and PR6. Drainage within sub-basin PR3 on the north side of the Site was designed to flow east to an inlet within the private drive. Drainage within sub-basin PR4 in the southwest corner of the Site was designed to flow southwest to an inlet within the drive aisle. Drainage within sub-basin PR5 on the west and south sides of the Site was designed to flow southeast to an inlet within the drive aisle. Drainage within sub-basin PR6, the majority of the site, on the north and east sides of the Site was designed to flow southwest to an inlet within the shared drive aisle. All sub-basins ultimately discharge to the master developer-proposed 34"x53" HERCP south of the Site which outfalls to the existing EDB south of the Site. The FDP states that both water quality capture volume ("WQCV") and 100-year detention would be provided within the EDB.

Table 1: Developed Drainage Conditions per the FDP

FDP Sub-Basin	Sub-Basin Area (acres)	FDP Developed Flows (Entire Sub-Basin)		DP Description	Ultimate Outfall
		5-year (CFS)	100-year (CFS)		
PR3	0.11	0.50	0.90	5' Type R, SUMP	Existing EDB
PR4	1.68	7.20	13.1	10' Type R on-grade curb inlet	Existing EDB
PR5	0.39	1.70	3.00	5' Type R, SUMP	Existing EDB
PR6	0.72	3.10	5.60	10' Type R on-grade curb inlet	Existing EDB

PROPOSED DRAINAGE CONDITIONS

The developed runoff from the Project will generally be collected by means of private roof drains and storm sewer inlets located in the paved driveways within each delineated basin area. The runoff collected from each basin and the roof system of the proposed building will be conveyed to the private storm sewer system and outfall to the master developer-proposed 34"x53" HERCP south of the Project. The master developer-proposed 34"x53" HERCP ultimately outfalls to the EDB south of the project. The storm sewer infrastructure connecting to the master developer-proposed 34"x53" HERCP is anticipated to be constructed in fourth quarter of 2024 or first quarter of 2025. The ultimate outfall per the FDP is to the EDB south of the Site and Jimmy Camp Creek.

The Property has been divided into 8 sub-basins, A1-A3, R1, EX1A, EX4, EX5, and OS1. The runoff generated on the building roof area, sub-basin R1, is collected and conveyed via a private roof drain system which outfalls to the master developer-proposed private storm sewer. Sub-basins A1-A3 are all internal areas within the parking lot, sidewalk, and landscaping areas. Sub-basins A1-A3 drain to inlets within the parking lot and drive aisles and are routed to the private storm sewer system. Sub-basin EX1A consists mostly of master development proposed private road and sidewalk and drains to master developer-proposed inlet within the private road. Sub-basins EX4 and EX5 consist of site area but drain to master developer-proposed inlets on-site that were sized to accommodate site flows. Sub-basin OS1 consists of landscape area that drains to the Fontaine Boulevard public right-of-way. A proposed conditions map is provided in the Appendix. No offsite flow will affect the site under proposed conditions.

Table 2: Peak Stormwater Runoff Calculation Summary

SUMMARY - PROPOSED RUNOFF TABLE					
DESIGN POINT	**BASIN DESIGNATION**	**BASIN AREA (ACRES)**	**DIRECT 5-YR RUNOFF (CFS)***	**DIRECT 100-YR RUNOFF (CFS)**	**BASIN IMP. (%)**
A1	A1	0.38	1.28	2.50	73.9%
A2	A2	0.15	0.65	1.19	91.9%
A3	A3	0.03	0.15	0.27	98.8%
R1	R1	0.09	0.32	0.68	90.0%
EX1A	EX1A	0.08	0.36	0.66	94.1%
EX4	EX4	0.09	0.39	0.71	94.6%
EX5	EX5	0.30	1.15	2.19	80.3%
OS1	OS1	0.15	0.16	0.58	12.1%

Table 3: Proposed Sub-basin Outfall Descriptions

DESIGN POINT (DP)/BASIN	CONVEYANCE TO DP	DP OUTFALL	OUTFALL DESCRIPTION(1)	OUTFALL CONDITION	ULTIMATE OUTFALL	TREATMENT METHOD
A1	SHEET FLOW/ C&G	STRC A1	5' CDOT TYPE R	IN SUMP	EXISTING EDB, JIMMY CAMP CREEK	EXISTING POND G1/G2
A2	SHEET FLOW/ C&G	STRC A2	COMBINATION DEN. NO. 13 GRATE INLET	IN SUMP	EXISTING EDB, JIMMY CAMP CREEK	EXISTING POND G1/G2
A3	SHEET FLOW/ C&G	STRC A3	COMBINATION DEN. NO. 13 GRATE INLET	ON GRADE	EXISTING EDB, JIMMY CAMP CREEK	EXISTING POND G1/G2
R1	ROOF DRAIN	R1	6" PVC ROOF DRAIN TO EX. 24" RCP		EXISTING EDB, JIMMY CAMP CREEK	EXISTING PONDS G1/G2
EX1A	SHEET FLOW/ C&G	STRC EX1A	EX. 5' CDOT TYPE R	IN SUMP	EXISTING EDB, JIMMY CAMP CREEK	EXISTING POND G1/G2
EX4	SHEET FLOW/ C&G	STRC EX4	EX. 10' CDOT TYPE R	ON GRADE	EXISTING EDB, JIMMY CAMP CREEK	EXISTING POND G1/G2
EX5	SHEET FLOW/ C&G	STRC EX5	EX. 5' CDOT TYPE R	IN SUMP	EXISTING EDB, JIMMY CAMP CREEK	EXISTING POND G1/G2
OS1	SHEET FLOW	FONTAINE BLVD ROW	EX. 25' CDOT TYPE R	IN SUMP	EXISTING EDB, JIMMY CAMP CREEK	EXISTING POND G1/G2

EMERGENCY OVERFLOW ROUTING

Emergency overflow routing for onsite clogged inlets is from northwest to southeast towards the existing 25' Type R sump inlet within the Fontaine Blvd ROW.

MAJOR DRAINAGEWAYS

There are no major drainageways on site or near the site.

HYDRAULIC ANALYSIS METHODOLOGY

The proposed drainage facilities will be 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, which makes use of the Standard Step method to compute the hydraulic profile. Results of the hydraulic calculations are provided in the Appendix. There will be no additional provisions selected or deviations from the CRITERIA.

Inlet capacity calculations are provided in the Appendix for the calculated 5-year and 100-year flows routed to the Type R curb inlets and private area drains on site. The capacity of each inlet is adequate for the 100 year developed flows for each sub-basin.

Storm Sewer Requirements

Proposed pipe sizes are 18" RCP.

DETENTION AND WATER QUALITY REQUIREMENTS

Detention and water quality for the proposed major and minor events is provided within the existing extended full spectrum detention Pond G1/G2. This pond was constructed with Carriage Meadows South at Lorson Ranch Filing No. 1 subdivision.

Pond G1/G2 provides 2.301 acre feet of water quality storage and 12.881 acre feet of storage for the 100-year event. The outlet structure was designed to release the WQCV in at least 40 hours per County requirements.

Please include the EURV Capacity as well.

Four-Step Process

The four-step process per the CRITERIA provides guidance and requirements for the selection of siting of structural Best Management Practices (BMPs) for new development and significant redevelopment.

Step 1: Employ Runoff Reduction Practices
Currently the site is vacant land. Development of the site will increase current runoff conditions due to the site being vacant. However, implementation of landscaping throughout the site and the proposed storm sewer infrastructure will help slow runoff and encourage infiltration.

Step 2: Stabilize Drainageways
Jimmy Camp Creek is the adjacent drainageway to the development. Jimmy Camp Creek was reconstructed and stabilized in 2006.

Step 3: Provide Water Quality Capture Volume (WQCV)
The water quality capture volume will be provided by the regional detention Pond G1/G2.

Step 4: Consider Need for Industrial and Commercial BMPs
Erosion control BMPs for both the initial and final stages of the Project were designed to reduce contamination. Source control BMPs will include the use of vehicle tracking control, 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. There are no Covering of Storage/Handling Areas or Spill Containment and Control BMP's anticipated with this development.

EROSION CONTROL PLAN

Erosion Control Plans will be submitted separately as a standalone construction document.

FLOODPLAIN STATEMENT

The Flood Insurance Rate Maps (FIRM) 08041C0543G effective date December 7, 2018, by FEMA, indicates that the Site is located in Zone X (outside of the 500-year flood plain). This panel is included in the Appendix.

COMPLIANCE WITH FDP

The FDP provides final drainage calculations for the Village at Lorson Ranch master development. This report shows compliance with the FDP.

Sub-Basins PR3, PR5, and PR6 in the FDP have assumed 5-ye
a 100-year runoff coefficient of 0.90. The proposed Project has a 5-year runoff coefficient of 0.71 and a 100-year runoff coefficient of 0.83. The 5-year and 100-year runoff events from the FDP for Sub-Basins PR3-PR6 total to 12.5 and 22.8 cfs, respectively. The proposed 5-year and 100-year runoff events calculated by this report are 4.30 and 8.2 cfs, respectively. Therefore, the proposed Project Site is generally in compliance with the FDP.

From the FDP Report, this is from 3a, not the basins listed.

The proposed Project Site drainage basins are captured by a private storm sewer network and routed to the existing full spectrum extended detention Pond G1'G2. Therefore, the proposed Project Site is in general compliance with the FDP.

Reference Appendix for applicable FDP sections.

Please describe where these flow rates came from (basins).

FEES DEVELOPMENT

DRAINAGE AND BRIDGE FEES

Lorson Ranch initiated the closure of Jimmy Camp Creek drainage basin for drainage/bridge fees and is awaiting a recorded closure agreement with El Paso County. There is an interim agreement with El Paso County that no fees are required at this time. Therefore, not drainage and bridge fees are required for this Project.

PRIVATE DRAINAGE FACILITY COST (NON-REIMBURSABLE)

Fee	QUANTITY	UNIT	$/UNIT	Fee Total
18" RCP	160	LF	82.00	$13,120
5' CDOT TYPE R	6	EA	7,212.00	$43,272
TOTAL				$56,392

Please review Line Item types and quantities. They do not match the drainage map.

GROUNDWATER CONSIDERATIONS

Per the Geotechnical Engineering Report prepared by Universal Engineering Sciences (UES), Inc on August 18, 2023 for McDonald's, groundwater was encountered within the top three feet of one boring at the time of field exploration. However, seasonal fluctuations in groundwater elevations and above average precipitation levels prior to the collection of boring samples may have influenced groundwater levels. Therefore, the shallow spread footing foundation and shallow excavations proposed for the Project are not anticipated to be affected by groundwater.

A perimeter drain system will not be provided for this Project.

SUMMARY

COMPLIANCE WITH STANDARDS

The drainage design presented within this report for Lot 2 of the Village at Lorson Ranch Filing No. 1 subdivision, conforms to the El Paso County Storm Drainage Criteria and the Mile High Flood District Manual. Additionally, the Site runoff and storm drain facilities is not anticipated to adversely affect the downstream and surrounding developments. This report and its findings are consistent with the drainage requirements documented in the FDP.

REFERENCES

1. El Paso County Drainage Criteria Manual, Vol. 1 and 2, October 1994
2. Mile High Flood District Drainage Criteria Manual (MHFD), Vol. 1, prepared by Wright-McLaughlin Engineers, June 2001, with latest revisions.
3. Flood Insurance Rate Map, El Paso County, Colorado and Incorporated Areas, Map Number 08041C0543G, Effective Date December 7, 2018, prepared by the Federal Emergency Management Agency (FEMA).
4. Lorson Ranch MDDP 1, November 7, 2006 by Pentacor.
5. Final Drainage Report for Carriage Meadows South at Lorson Ranch Filing No. 1 prepared by Core Engineering Group, approved September 7, 2017
6. Master Development Drainage Plan for Village at Lorson Ranch Filing No. 1 and Final Drainage Report for Village at Lorson Ranch Filing No. 1 Initial Infrastructure. Prepared by Core Engineering Group, LLC., April 2024. ("FDP")

7. Custom Soil Resource Report for El Paso County Area, Colorado. Prepared by NRCS, July 2024.

8. Final Plat for Village at Lorson Ranch Filing No. 1. Prepared by Civil Consultants, Inc., April 2024.

APPENDIX

SOILS MAP AND FEMA FIRM PANEL

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for El Paso County Area, Colorado

July 22, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:585 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 21, Aug 24, 2023

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

Date(s) aerial images were photographed: Aug 14, 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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
52	Manzanst clay loam, 0 to 3 percent slopes	1.3	100.0%
Totals for Area of Interest		**1.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

52—Manzanst clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w4nr
Elevation: 4,060 to 6,660 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Manzanst and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Manzanst

Setting

Landform: Terraces, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Clayey alluvium derived from shale

Typical profile

A - 0 to 3 inches: clay loam
Bt - 3 to 12 inches: clay
Btk - 12 to 37 inches: clay
Bk1 - 37 to 52 inches: clay
Bk2 - 52 to 79 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Slightly saline (4.0 to 7.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R067BY037CO - Saline Overflow
Hydric soil rating: No

Minor Components

Ritoazul

Percent of map unit: 7 percent
Landform: Drainageways, interfluves
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY042CO - Clayey Plains
Hydric soil rating: No

Arvada

Percent of map unit: 6 percent
Landform: Drainageways, interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY033CO - Salt Flat
Hydric soil rating: No

Wiley

Percent of map unit: 2 percent
Landform: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

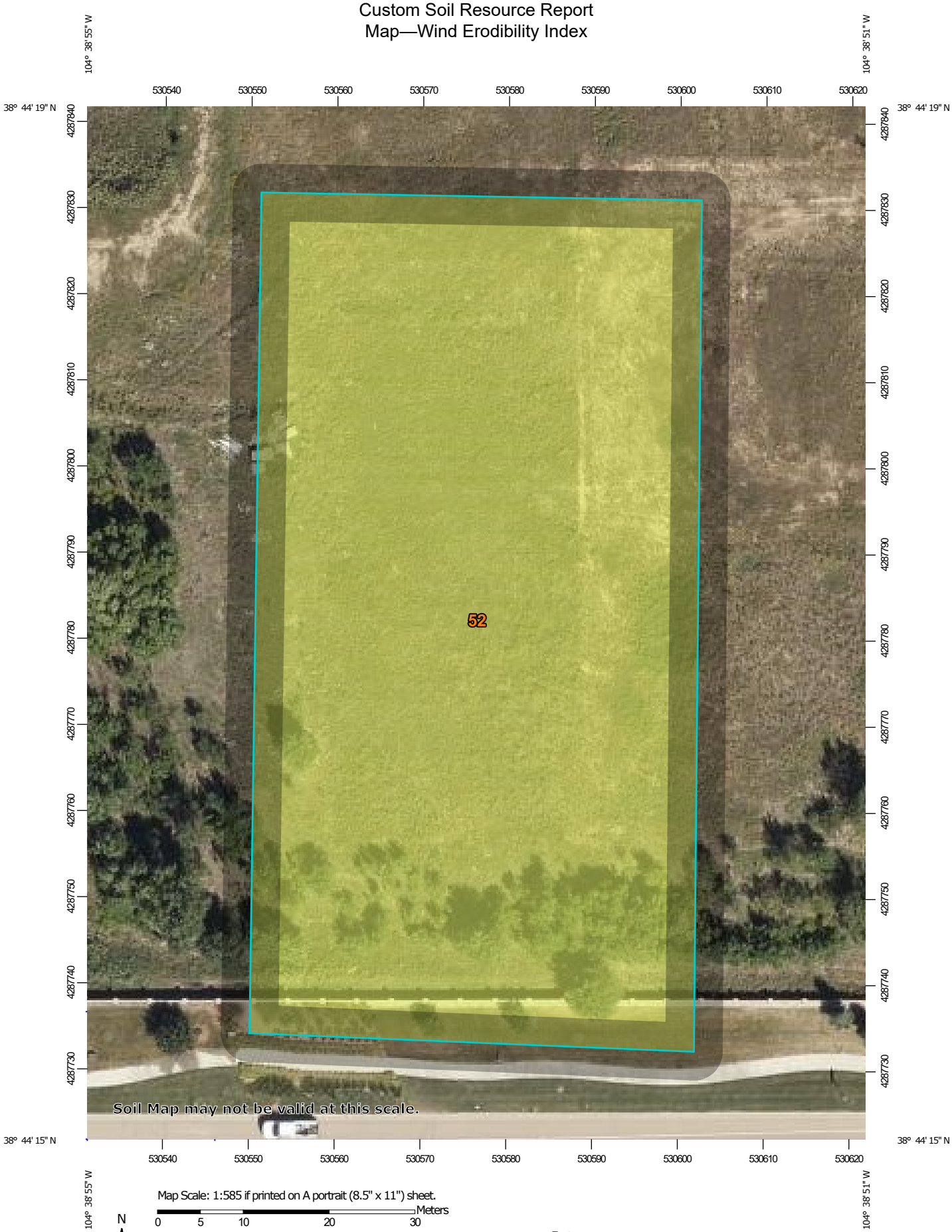
The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Erosion Factors

Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

Wind Erodibility Index

The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.



Map Scale: 1:585 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0
38
48
56
86
134
160
180
220
250
310
Not rated or not available

Soil Rating Lines

0
38
48
56
86
134
160
180
220
250
310
Not rated or not available

Soil Rating Points

0
38
48
56
86
134
160
180
220
250
310
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 21, Aug 24, 2023

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

Date(s) aerial images were photographed: Aug 14, 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.

Table—Wind Erodibility Index

Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
52	Manzanst clay loam, 0 to 3 percent slopes	86	1.3	100.0%
Totals for Area of Interest			**1.3**	**100.0%**

Rating Options—Wind Erodibility Index

Units of Measure: tons per acre per year

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

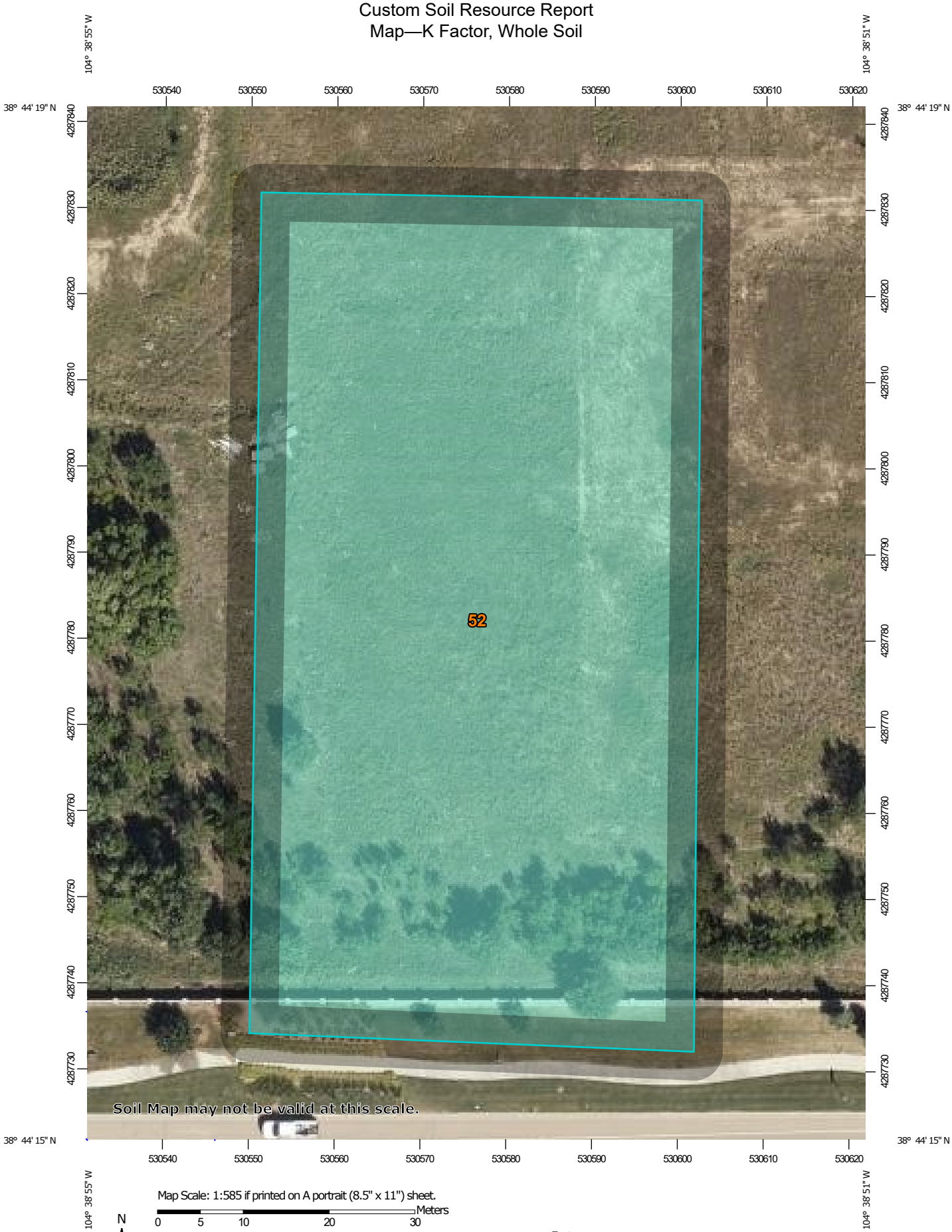
Tie-break Rule: Higher

K Factor, Whole Soil

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Factor K does not apply to organic horizons and is not reported for those layers.



Map Scale: 1:585 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Soil Rating Lines

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Soil Rating Points

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
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.

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Date(s) aerial images were photographed: Aug 14, 2018—Sep 23, 2018

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Table—K Factor, Whole Soil

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
52	Manzanst clay loam, 0 to 3 percent slopes	.32	1.3	100.0%
Totals for Area of Interest			**1.3**	**100.0%**

Rating Options—K Factor, Whole Soil

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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:

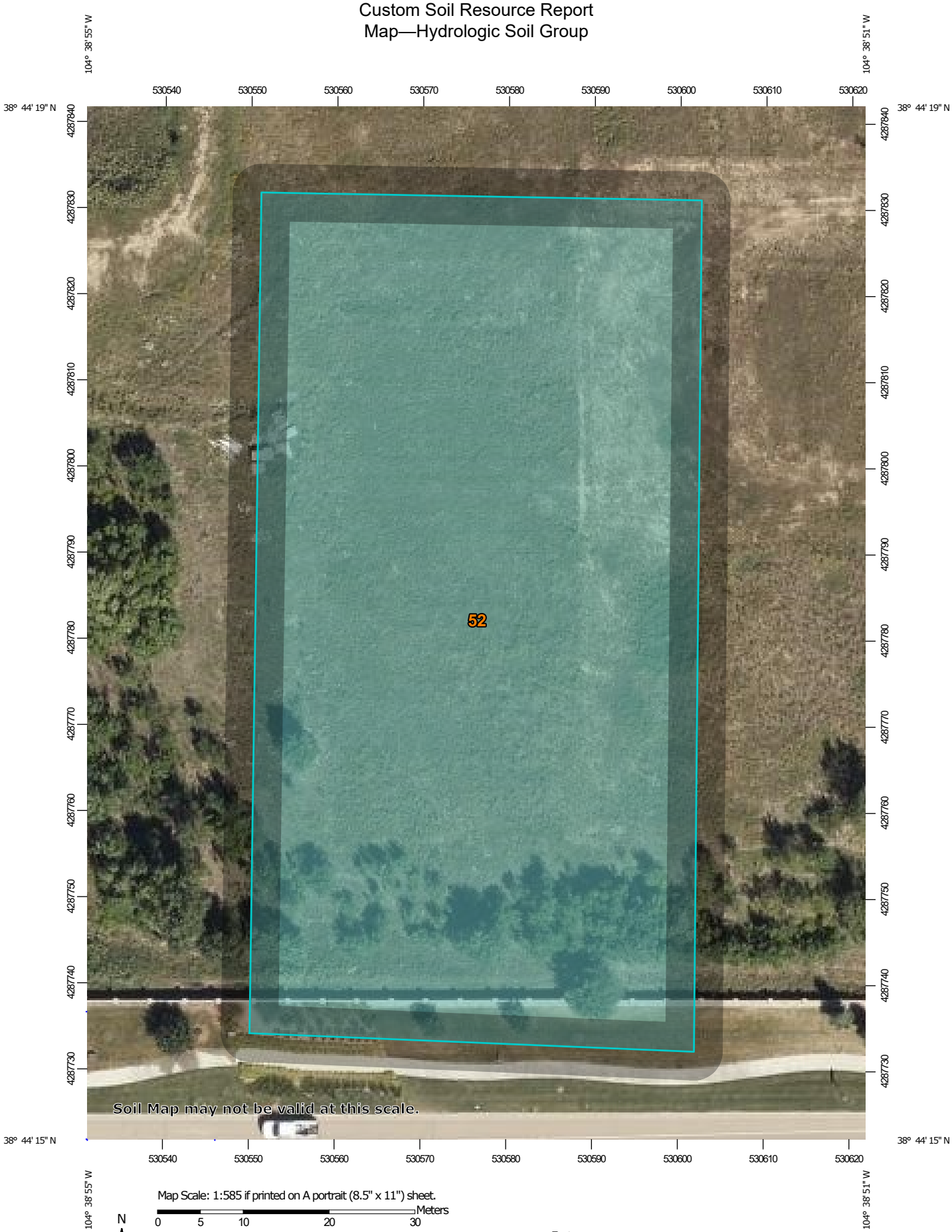
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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.



Map Scale: 1:585 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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

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Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
52	Manzanst clay loam, 0 to 3 percent slopes	C	1.3	100.0%
Totals for Area of Interest			**1.3**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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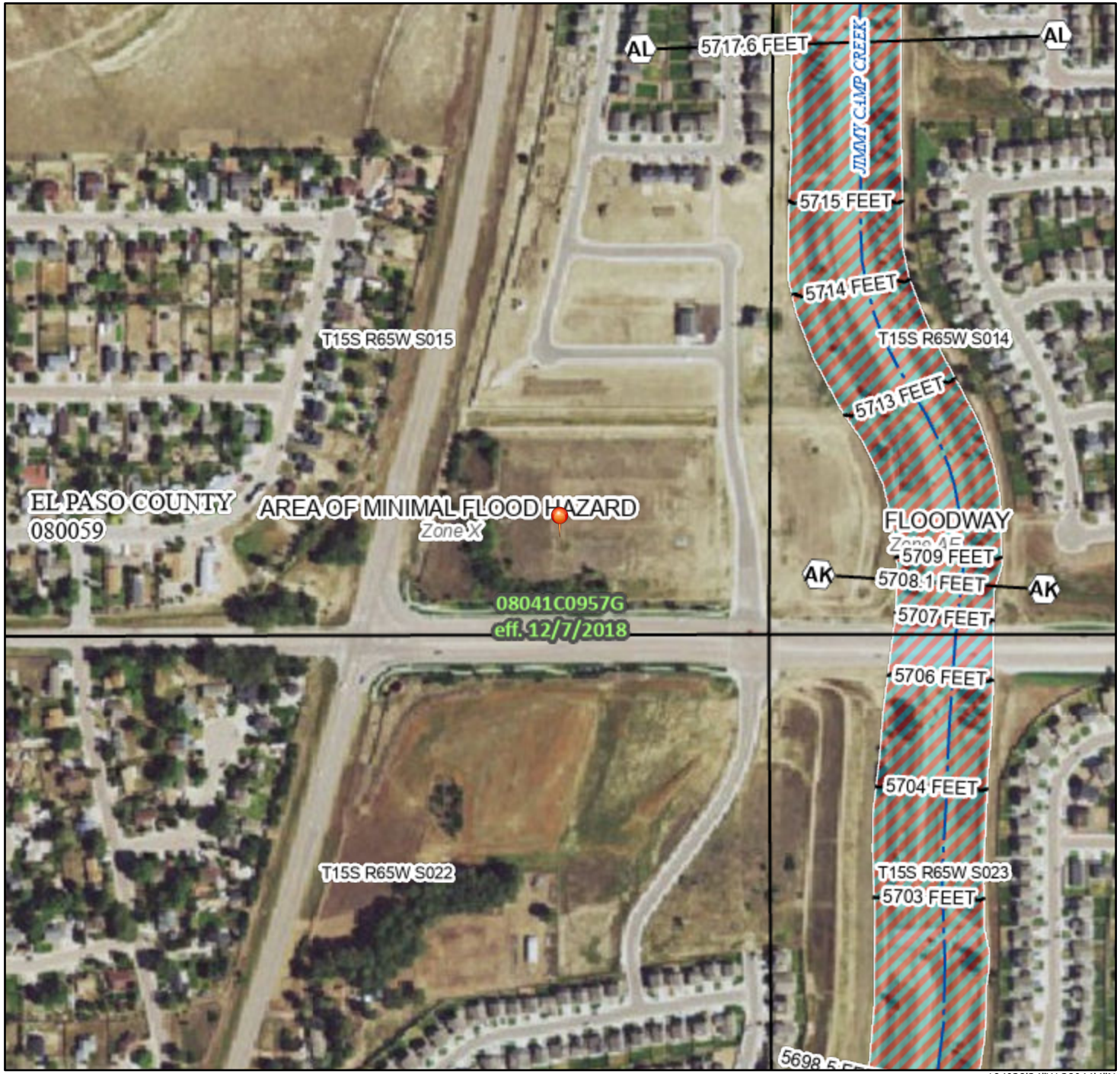
National Flood Hazard Layer FIRMette

FEMA

104°39'11"W 38°44'32"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

104°38'34"W 38°44'4"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/10/2024 at 11:50 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

HYDROLOGIC CALCULATIONS

IDF Equations:

I_{100} = -2.52ln(D) + 12.735
I_{50} = -2.25ln(D) + 11.375
I_{25} -2.00ln(D) + 10.111
I_{10} -1.75ln(D) + 8.847
I_{5} -1.50ln(D) + 7.583
I_{2} -1.19ln(D) + 6.035

Where:
I = Rainfall Intensity (in/hr)
D= Duration (minutes)

	2-yr	5-yr	10-yr	100-yr
P_1 =	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

McDonald's - Drainage Report
Proposed Runoff Calculations
Time of Concentration

Watercourse Coefficient

Forest & Meadow	2.50	Short Grass Pasture & Lawns	7.00	Grassed Waterway	15.00
Fallow or Cultivation	5.00	Nearly Bare Ground	10.00	Paved Area & Shallow Gutter	20.00

	SUB-BASIN DATA				INITIAL / OVERLAND TIME			TRAVEL TIME T(t)					T(c) CHECK (URBANIZED BASINS)			FINAL T(c)
DESIGN POINT	DRAIN BASIN	AREA sq. ft.	AREA ac.	C(5)	Length ft.	Slope %	T(i) min	Length ft.	Slope %	Coeff.	Velocity fps	T(t) min.	COMP. T(c)	TOTAL LENGTH	L/180+10	min.
A1	A1	16,437	0.38	0.70	100	2.1%	5.7	91	1.3%	20.00	2.3	0.7	6.4	191	11.1	6.4
A2	A2	6,545	0.15	0.84	100	1.6%	4.1	64	1.1%	20.00	2.1	0.5	5.0	164	10.9	5.0
A3	A3	1,451	0.03	0.89	25	2.8%	1.4	51	1.1%	20.00	2.1	0.4	5.0	76	10.4	5.0
R1	R1	3,719	0.09	0.75	80	1.0%	5.7			20.00	0.0	0.0	5.7	80	10.4	5.7
EX1A	EX1A	3,589	0.08	0.86	37	2.0%	2.2	131	1.4%	20.00	2.3	0.9	5.0	168	10.9	5.0
EX4	EX4	3,855	0.09	0.86	0	0.0%		205	1.2%	20.00	2.2	1.6	5.0	205	11.1	5.0
EX5	EX5	12,991	0.30	0.75	77	2.0%	4.5	94	1.6%	20.00	2.6	0.6	5.1	171	11.0	5.1
OS1	OS1	6,447	0.15	0.24	37	2.2%	7.3	28	4.2%	20.00	4.1	0.1	7.4	65	10.4	7.4

McDonald's - Drainage Report
Proposed Runoff Calculations ***Design Storm 5 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	
A1	A1	0.38	0.70	6.4	0.27	4.81	1.28					
A2	A2	0.15	0.84	5.0	0.13	5.17	0.65					
A3	A3	0.03	0.89	5.0	0.03	5.17	0.15					
R1	R1	0.09	0.75	5.7	0.06	4.97	0.32					
EX1A	EX1A	0.08	0.86	5.0	0.07	5.17	0.36					
EX4	EX4	0.09	0.86	5.0	0.08	5.17	0.39					
EX5	EX5	0.30	0.75	5.1	0.22	5.14	1.15					
OS1	OS1	0.15	0.24	7.4	0.04	4.58	0.16					

McDonald's - 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	
A1	A1	0.38	0.82	6.4	0.31	8.07	2.50					
A2	A2	0.15	0.91	5.0	0.14	8.68	1.19					
A3	A3	0.03	0.94	5.0	0.03	8.68	0.27					
R1	R1	0.09	0.95	5.7	0.08	8.35	0.68					
EX1A	EX1A	0.08	0.92	5.0	0.08	8.68	0.66					
EX4	EX4	0.09	0.92	5.0	0.08	8.68	0.71					
EX5	EX5	0.30	0.85	5.1	0.25	8.62	2.19					
OS1	OS1	0.15	0.51	7.4	0.08	7.69	0.58					

Weighted Imperviousness Calculations

SUB-BASIN	AREA (SF)	AREA (Acres)	ROOF AREA	ROOF IMPERVIOUSNESS	ROOF C2	ROOF C5	ROOF C10	ROOF C100	LANDSCAPE AREA	LANDSCAPE IMPERVIOUSNESS	LANDSCAPE C2	LANDSCAPE C5	LANDSCAPE C10	LANDSCAPE C100	PAVEMENT AREA	PAVEMENT IMPERVIOUSNESS	PAVEMENT C2	PAVEMENT C5	PAVEMENT C10	PAVEMENT C100	WEIGHTED IMPERVIOUSNESS	WEIGHTED COEFFICIENTS C2	WEIGHTED COEFFICIENTS C5	WEIGHTED COEFFICIENTS C10	WEIGHTED COEFFICIENTS C100
A1	16,437	0.38	0	90%	0.73	0.75	0.90	0.95	4,286	0%	0.04	0.15	0.30	0.45	12,151	100%	0.89	0.90	0.90	0.95	73.9%	0.67	0.70	0.74	0.82
A2	6,545	0.15	0	90%	0.73	0.75	0.90	0.95	530	0%	0.04	0.15	0.30	0.45	6,015	100%	0.89	0.90	0.90	0.95	91.9%	0.82	0.84	0.85	0.91
A3	1,451	0.03	0	90%	0.73	0.75	0.90	0.95	18	0%	0.04	0.15	0.30	0.45	1,433	100%	0.89	0.90	0.90	0.95	98.8%	0.88	0.89	0.89	0.94
R1	3,719	0.09	3,719	90%	0.73	0.75	0.90	0.95	0	0%	0.04	0.15	0.30	0.45	0	100%	0.89	0.90	0.90	0.95	90.0%	0.73	0.75	0.90	0.95
EX1A	3,589	0.08	0	90%	0.73	0.75	0.90	0.95	212	0%	0.04	0.15	0.30	0.45	3,377	100%	0.89	0.90	0.90	0.95	94.1%	0.84	0.86	0.86	0.92
EX4	3,855	0.09	0	90%	0.73	0.75	0.90	0.95	207	0%	0.04	0.15	0.30	0.45	3,648	100%	0.89	0.90	0.90	0.95	94.6%	0.84	0.86	0.87	0.92
EX5	12,991	0.30	0	90%	0.73	0.75	0.90	0.95	2,564	0%	0.04	0.15	0.30	0.45	10,427	100%	0.89	0.90	0.90	0.95	80.3%	0.72	0.75	0.78	0.85
OS1	6,447	0.15	0	90%	0.73	0.75	0.90	0.95	5,669	0%	0.04	0.15	0.30	0.45	778	100%	0.89	0.90	0.90	0.95	12.1%	0.14	0.24	0.37	0.51
TOTAL	55,034	1.26	3,719	90%	0.73	0.75	0.90	0.95	13,486	0%	0.04	0.15	0.30	0.45	37,829	100%	0.89	0.90	0.90	0.95	74.8%	0.67	0.71	0.75	0.83

SUMMARY - PROPOSED RUNOFF TABLE

DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMMULATIVE 5-YR RUNOFF (CFS)	CUMMULATIVE 100-YR RUNOFF (CFS)
A1	A1	0.38	1.28	2.50	1.28	2.50
A2	A2	0.15	0.65	1.19	0.65	1.19
A3	A3	0.03	0.15	0.27	0.81	1.46
R1	R1	0.09	0.32	0.68	0.32	0.68
EX1A	EX1A	0.08	0.36	0.66	0.36	0.66
EX4	EX4	0.09	0.39	0.71	1.20	2.17
EX5	EX5	0.30	1.15	2.19	2.35	4.36
OS1	OS1	0.15	0.16	0.58	0.16	0.58
TOTAL		1.26	4.47	8.77		

HYDRAULIC CALCULATIONS

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet A1	Inlet A2	Inlet A3
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT/Denver 13 Combination	CDOT/Denver 13 Combination

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	1.3	0.7	0.2
Major Q_{Known} (cfs)	2.5	1.2	0.3

Bypass (Carry-Over) Flow from Upstream

Inlets must be organized from upstream (left) to downstream (right) in order for bypass flows to be linked.

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

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)	1.3	0.7	0.2
Major Total Design Peak Flow, Q (cfs)	2.5	1.2	0.3
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	0.0

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet EX1A	Inlet EX4	Inlet EX5
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	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)	0.4	0.4	1.2
Major Q_{Known} (cfs)	0.7	0.7	2.2

Bypass (Carry-Over) Flow from Upstream

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

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

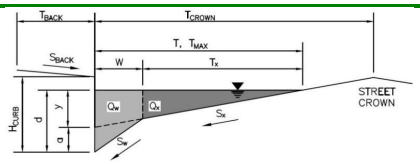
Minor Total Design Peak Flow, Q (cfs)	0.4	0.4	1.2
Major Total Design Peak Flow, Q (cfs)	0.7	0.7	2.2
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A

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

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

Project: McDonald's Fontaine and Marksheffel

Inlet ID: Inlet A1



Gutter Geometry:

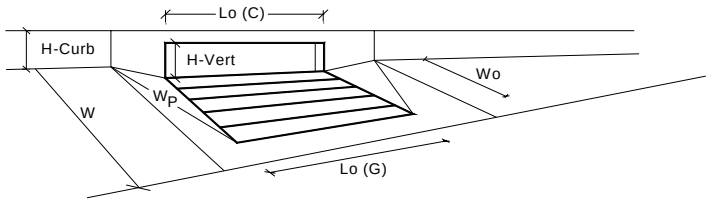
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	9.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.032	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	9.0	9.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



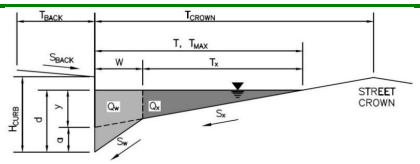
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	4.7	4.7	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.22	0.22	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	2.9	2.9	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	1.3	2.5	cfs

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

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

Project: McDonald's Fontaine and Marksheffel

Inlet ID: Inlet A2



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	10.0	10.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

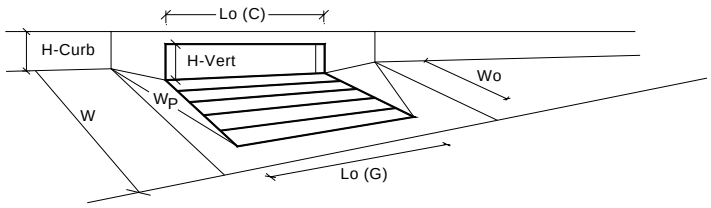
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

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

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT/Denver 13 Combination		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	2.00	2.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	3.9	3.9	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	3.00	3.00	feet
Width of a Unit Grate	W_o =	1.73	1.73	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	0.43	0.43	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	0.50	0.50	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	3.30	3.30	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	0.60	0.60	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	3.00	3.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.50	6.50	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	5.25	5.25	inches
Angle of Throat	Theta =	0.00	0.00	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.70	3.70	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.66	0.66	

Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	0.35	0.35	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.16	0.16	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	0.61	0.61	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	N/A	N/A	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.61	0.61	

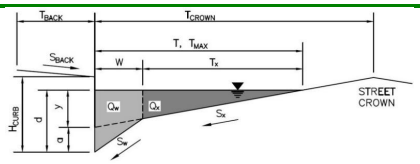
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	1.4	1.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.7	1.2	cfs

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

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

Project: McDonald's Fontaine and Marksheffel

Inlet ID: Inlet A3



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.024	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	6.0	6.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

MINOR STORM Allowable Capacity is based on Spread Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

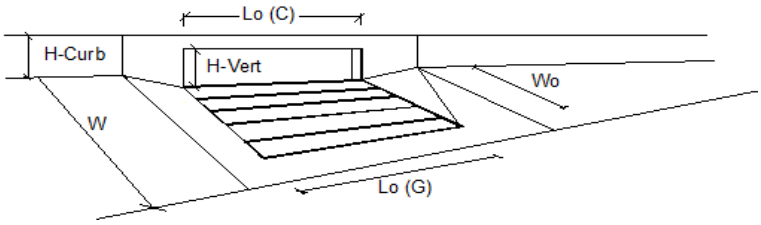
		Minor Storm	Major Storm	
	Q_{allow} =	1.4	1.4	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 0.15 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 0.27 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



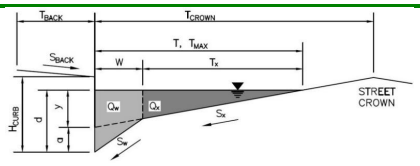
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT/Denver 13 Combination		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	2.0	2.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	3.00	3.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	1.73	1.73	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f (G) =	0.50	0.50	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f (C) =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	Q =	0.2	0.3	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q_b =	0.0	0.0	cfs
Capture Percentage = Q_a/Q_o	C% =	100	100	%

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

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

Project: McDonald's Fontaine and Marksheffel

Inlet ID: Inlet EX1A



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	7.0	7.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

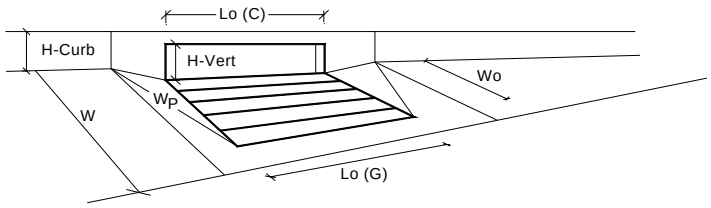
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

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

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



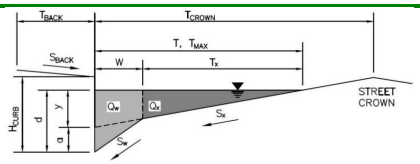
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	3.2	3.2	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.10	0.10	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.96	0.96	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	0.8	0.8	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.4	0.7	cfs

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

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

Project: McDonald's Fontaine and Marksheffel

Inlet ID: Inlet EX4



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.023	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	10.0	10.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

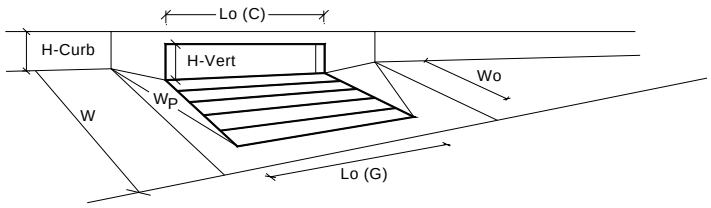
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

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

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



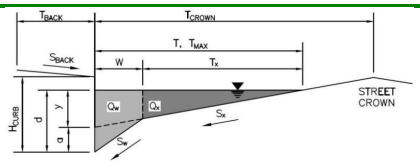
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	4.2	4.2	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.19	0.19	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.81	0.81	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.0	3.0	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.4	0.7	cfs

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

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

Project: McDonald's Fontaine and Marksheffel

Inlet ID: Inlet EX5



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.018	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	15.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

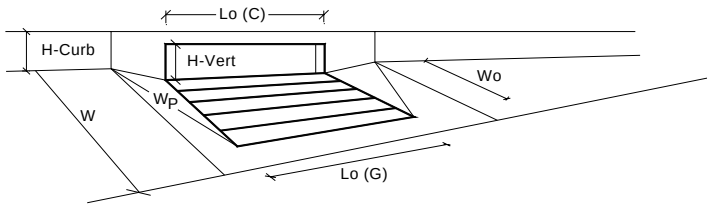
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

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

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	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 =	4.8	4.8	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.23	0.23	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.2	3.2	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	1.2	2.2	cfs

INLET PICTURES


CDOT Type R Curb Opening


Denver No. 14 Curb Opening


Colorado Springs D-10-R


CDOT/Denver 13 Valley Grate

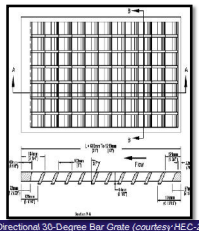

CDOT/Denver 13 Combination


Denver No. 16 Combination


Wheat Ridge Combination Inlet


Denver No. 16 Valley Grate

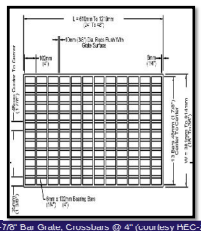

Directional Cast Vane Grate

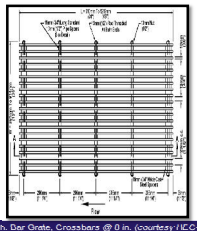

Directional 30-Degree Bar Grate (courtesy HEC-22)

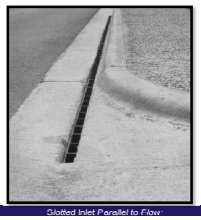

Directional 45-Degree Bar Grate


Reticuline Riveted Grate


1-7/8" Bar Grate, Crossbars @ 8"


1-7/8" Bar Grate, Crossbars @ 4" (courtesy HEC-22)


1-1/8 in. Bar Grate, Crossbars @ 8 in. (courtesy HEC-22)


Slotted Inlet Parallel to Flow


CDOT Type C Grate (Close Mesh)


CDOT Type C Grate


CDOT Type C Inlet

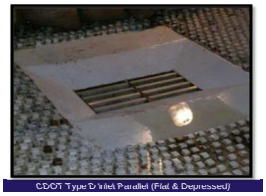

CDOT Type C Inlet in Depression


CDOT Type D Inlet In Series (Flat & Depressed)


CDOT Type D Inlet In Series (10° Incline & Depressed)

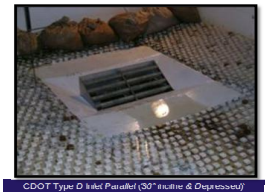

CDOT Type D Inlet In Series (20° Incline & Depressed)


CDOT Type D Inlet In Series (30° Incline & Depressed)

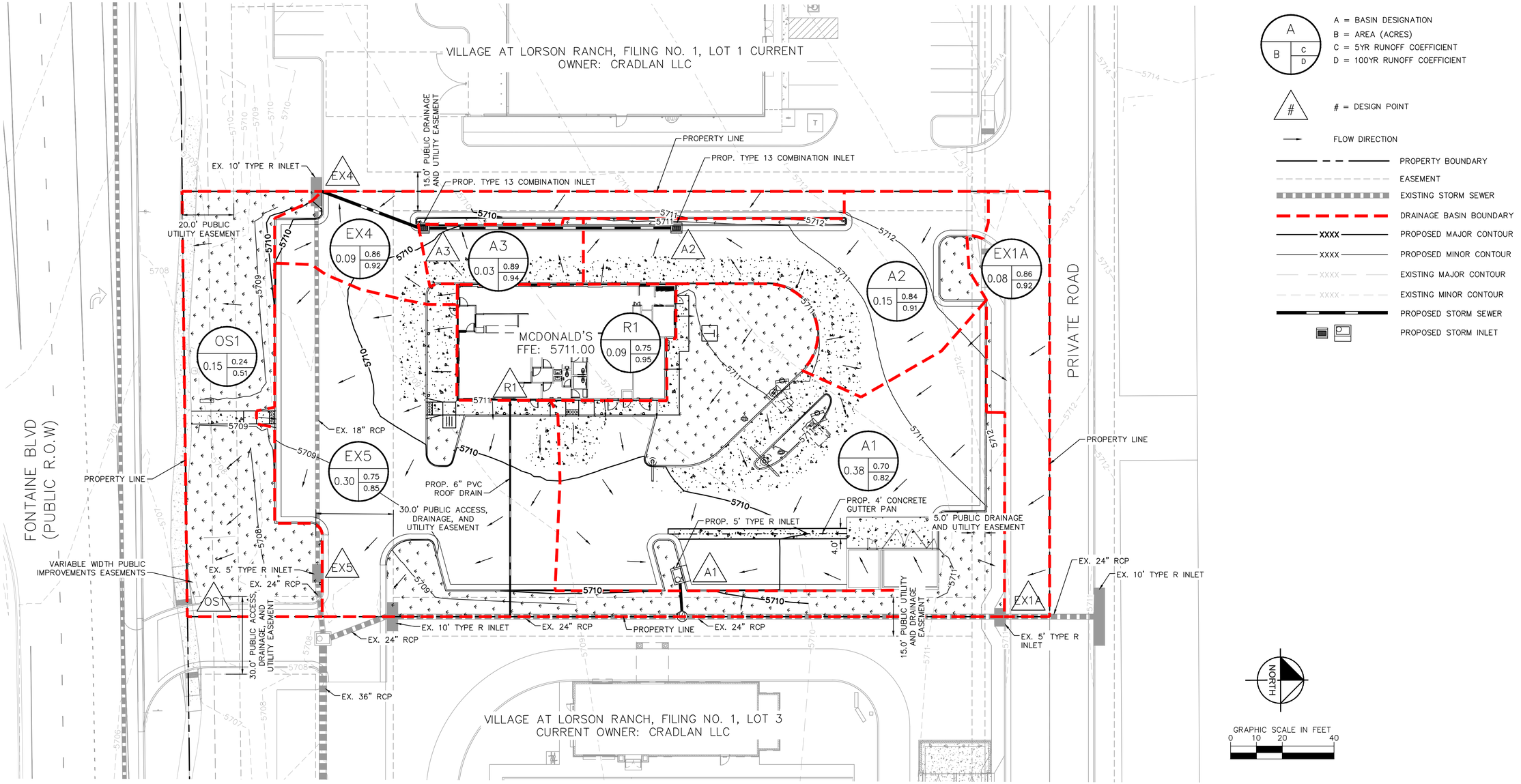

CDOT Type D Inlet Parallel (Flat & Depressed)


CDOT Type D Inlet Parallel (10° Incline & Depressed)


CDOT Type D Inlet Parallel (20° Incline & Depressed)


CDOT Type D Inlet Parallel (30° Incline & Depressed)

DRAINAGE EXHIBIT



LEGEND

A = BASIN DESIGNATION
B = AREA (ACRES)
C = 5YR RUNOFF COEFFICIENT
D = 100YR RUNOFF COEFFICIENT

= DESIGN POINT

FLOW DIRECTION

PROPERTY BOUNDARY

EASEMENT

EXISTING STORM SEWER

DRAINAGE BASIN BOUNDARY

XXXX PROPOSED MAJOR CONTOUR

XXXX PROPOSED MINOR CONTOUR

XXXX EXISTING MAJOR CONTOUR

XXXX EXISTING MINOR CONTOUR

PROPOSED STORM SEWER

PROPOSED STORM INLET

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

SUMMARY - PROPOSED RUNOFF TABLE

DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMMULATIVE 5-YR RUNOFF (CFS)	CUMMULATIVE 100-YR RUNOFF (CFS)
A1	A1	0.38	1.28	2.50	1.28	2.50
A2	A2	0.15	0.65	1.19	0.65	1.19
A3	A3	0.03	0.15	0.27	0.81	1.46
R1	R1	0.09	0.32	0.68	0.32	0.68
EX1A	EX1A	0.08	0.36	0.66	0.36	0.66
EX4	EX4	0.09	0.39	0.71	1.20	2.17
EX5	EX5	0.30	1.15	2.19	2.35	4.36
OS1	OS1	0.15	0.16	0.58	0.16	0.58
TOTAL		1.26	4.47	8.77		

DRAINAGE EXHIBIT – MCDONALD'S MARKSHEFFEL ROAD AND FONTAINE BOULEVARD, EL PASO COUNTY, CO

Kimley»Horn

MASTER DRAINAGE STUDIES

FINAL DRAINAGE PLAN
SF 248

VILLAGE AT LORSON RANCH

JUNE, 2024

Prepared for:

Lorson, LLC
212 N. Wahsatch Ave, Suite 301
Colorado Springs, Colorado 80903
(719) 635-3200

Prepared by:

Core Engineering Group, LLC
15004 1ST Avenue South
Burnsville, MN 55306
(719) 570-1100

Project No. 100.070

CORE
ENGINEERING GROUP

TABLE OF CONTENTS

ENGINEER'S 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 El Paso 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.

Richard L. Schindler, P.E. #33997 Date
For and on Behalf of Core Engineering Group, LLC

OWNER'S STATEMENT

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

Lorson, LLC Date

By
Jeff Mark

Title
Manager

Address
212 N. Wahsatch Avenue, Suite 301, Colorado Springs, CO 80903

FLOODPLAIN STATEMENT

To the best of my knowledge and belief, this development is not located within a designated floodplain as shown on Flood Insurance Rate Map Panel No. and 08041C0957 G, dated December 7, 2018. (See Appendix A, FEMA FIRM Exhibit)

Richard L. Schindler, #33997 Date

EL PASO COUNTY

Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual, Volume 1 and 2, and Engineering Criteria Manual, As Amended.

Joshua Palmer, P.E. Date
County Engineer/ECM Administrator

Conditions: _____

1.0 LOCATION and DESCRIPTION

Village at Lorson Ranch is located west of Jimmy Camp Creek. The site is located on approximately 9.722 acres of vacant land. This project will develop this site into a commercial development. The land for the commercial lots is currently owned by Cradlan, LLC.

The site is located in the Southeast 1/4 of Section 15, Township 15 South and Range 65 West of the 6th Principal Meridian. The site is bounded on the north by Carriage Meadows North Filing No. 1, on the west by Marksheffel Road, on the east by Carriage Meadows Drive, and the south by Fontaine Boulevard. For reference, a vicinity map is included in Appendix A of this report.

Conformance with applicable Drainage Basin Planning Studies

There is an existing (unapproved) DBPS for Jimmy Camp Creek prepared by Wilson & Company in 1987, and is referenced in this report. The only major drainage improvements for this study area according to the 1987 Wilson study was the reconstruction of the main stem of Jimmy Camp Creek. In 2006 the main stem of Jimmy Camp Creek was reconstructed in accordance with the 1987 study. There are no further improvements to be made on Jimmy Camp Creek.

Conformance with Lorson Ranch MDDP1 by Pentacor Engineering (approved November 7, 2006) and Final Drainage Report for Carriage Meadows South at Lorson Ranch Filing No. 1 (approved September 7, 2017)

Core Engineering Group has an approved MDDP for Lorson Ranch, which covers this study area for major infrastructure. The major infrastructure in the MDDP includes storm sewer in Fontaine Boulevard and relocation of the FMIC irrigation ditch which was constructed in 2006 conforming to the MDDP for Lorson Ranch. Other major infrastructure improvements constructed to serve this site include Pond G1/G2 constructed as part of Carriage Meadows South at Lorson Ranch Filing No. 1. Pond G1/G2 is an offsite full spectrum detention pond constructed in 2017 and included detention and water quality provisions that serve Village at Lorson Ranch.

The Village at Lorson Ranch is located within the ***"Jimmy Camp Creek Drainage Basin"***, which is a fee basin in El Paso County. Jimmy Camp Drainage Basin will be a closed basin within Lorson Ranch within a few months and drainage fees will not be administered per agreements with the county.

2.0 DRAINAGE CRITERIA

The supporting drainage design and calculations were performed in accordance with the City of Colorado Springs and El Paso County "Drainage Criteria Manual (DCM)", dated November, 1991, the El Paso County "Engineering Criteria Manual", Chapter 6 and Section 3.2.1 Chapter 13 of the City of Colorado Springs Drainage Criteria Manual dated May 2014, and the UDFCD "Urban Storm Drainage Criteria Manual" Volumes 1, 2 and 3 for inlet sizing and full spectrum ponds. No deviations from these published criteria are requested for this site.

The Rational Method as outlined in Section 6.3.0 of the May 2014 "Drainage Criteria Manual" and in Section 3.2.8.F of the El Paso County "Engineering Criteria Manual" was used for basins less than 130 acres to determine the rainfall and runoff conditions for the proposed development of the site. The runoff rates for the 5-year initial storm and 100-year major design storm were calculated.

Current updates to the Drainage Criteria manual for El Paso County states the if detention is necessary, Full Spectrum Detention will be included in the design, based on this criteria, Full Spectrum Detention will not be required for this development.

3.0 EXISTING HYDROLOGICAL CONDITIONS

This site is currently undeveloped with native vegetation (grass with no shrubs) and gentle slopes in a southerly direction to the north side of Fontaine Boulevard.

The Soil Conservation Service (SCS) classifies the soils within the Village at Lorson Ranch property as Manzanst clay loam and Ellicot loamy coarse sand. The clay loam is considered to be hydrologic soil group C and the sandy loams are considered hydrologic soil group A (see table 3.1 below). The clay loams are difficult to vegetate and comprise of the majority of the study area. These soils can be mitigated easily by limiting their use as topsoil since they this is a commercial site and most areas will be paved or landscaped with rock bedding.

Table 3.1: SCS Soils Survey for the Study Area

Soil No.	Soil	Hydro. Group	Shrink/Swell Potential	Permeability	Surface Runoff Potential	Erosion Hazard
28	Ellicott Loamy Coarse Sand (0.8%)	A	Low	Moderate	Medium	Moderate
52	Manzanst Clay Loam (2.2%)	C	High	Slow	Medium	Moderate

Excerpts from the SCS "Soil Survey of El Paso County Area, Colorado" are provided in ***Appendix A*** for further reference.

For the purpose of preparing hydrologic calculations for this report, the soils of each basin are assumed to be wholly comprised of the majority soil hydrologic group.

This site is not located within the delineated 100-year floodplain of the East Tributary of Jimmy Camp Creek per the Federal Emergency Management Agency (FEMA) Flood Rate Insurance Map (FIRM) number 08041C10957 G, effective December 7, 2018.

Basin EX1

This existing basin consists primarily of flows from the existing FMIC channel, a majority of these flows are from the offsite area west of the channel. Runoff from basin EX1 flows to the existing FMIC channel, then continues west toward Carriage Meadows Drive. The existing runoff from this 0.95 acre basin is 0.3cfs and 1.6cfs for the 5-year and 100-year events. No other runoff is directed to this basin.

The FMIC historically consisted of an open channel from Cottonwood Meadows to Jimmy Camp Creek (culvert under Marksheffel). Upon development of Lorson Ranch in 2007, a 48" pipe was installed from Cottonwood Meadows west and under Marksheffel Road. The 48" pipe carries FMIC water (50cfs) and stormwater to the east side of Marksheffel Road where a reconstructed open channel directs water east to Carriage Meadows Drive. In addition, this open channel section is designed to handle runoff from the full buildout of Marksheffel Road which is carried in a 30" RCP under Marksheffel Road. The 30" RCP is located directly north of the 48" FMIC pipe. Stormwater and FMIC water (113cfs & 214cfs in 5/100 year storm) travels east to Carriage Meadows Drive where a diversion structure and a box culvert effectively separate stormwater from FMIC water. The diversion structure is a 25' D-10-R inlet with a 1.5' opening and the box culvert is a 3x4 culvert with a gate to regulate or shut off flow. During times of FMIC operation, the gate is adjusted so that only the FMIC water is allowed to pass east in the FMIC channel. Additional runoff at this gate will pond up and flow into the 25' diversion structure. During times the FMIC is not operating, the gate is closed which forces all runoff into the 25' diversion structure. The outlet structure is drained by a 48" RCP that flows east under Carriage Meadows Drive. A 60" RCP at 0.95% slope continues east and outlets directly into Jimmy Camp Creek with a capacity of 270cfs. Just north of the 60" RCP, a 36" stub has been constructed to accept flows from a WQ basin in the Carriage

Meadows residential areas. This entire system is in place and has been fully operational since August, 2006.

Basin EX2
This existing basin consists of on-site undeveloped basin located approximately 100' east of Marksheffel Road, south of and adjacent to the existing FMIC channel, and north of Fontaine Boulevard. This basin has moderate slopes and flows overland south downstream to Fontaine Boulevard, then to an existing 34"x53" HERCP storm sewer that routes runoff southerly under Fontaine Boulevard. The total pre-developed flow from this 8.44 acre basin is 3.4cfs and 19.0cfs in the 5 and 100-year storm events.

Basin EX3
Basin EX3 is a self-contained basin and does not accept any offsite flows. Surface flows are FROM Marksheffel Road and are directed to an existing drainage swale that flows in a southerly-southwesterly direction to an existing 18" RCP, these flows are then routed within this existing 18" RCP to the aforementioned existing 34"x53" HERCP that flows southerly under Fountain Boulevard. The existing runoff from this 0.73 acre site is 0.4cfs and 2.4cfs for the 5-year and 100-year events. The drainage area and flows have not changed from the previous reports when the inlets/storm was designed.

Basin EX4
Basin EX4 consists of the west half of Carriage Meadows Drive, a developed north-south road. Flow is directed westerly to the existing curb and gutter, then continues southerly to an existing 5' Type "R" inlet. This inlet is located on west side of Carriage Meadows Drive, at the northwest corner of Fountaine Boulevard and Carriage Meadows Drive. Flow is routed westerly from this inlet to the aforementioned 34"x53" HERCP via an existing 30" RCP. The existing runoff from this 0.57 acre site is 2.6cfs and 4.7cfs for the 5-year and 100-year events.

4.0 DEVELOPED HYDROLOGICAL CONDITIONS

Hydrology for **Village at Lorson Ranch** drainage report was based on the City of Colorado Springs/El Paso County Drainage Criteria. Sub-basins that lie within this project were determined and the 5-year and 100-year peak discharges for the developed conditions have been presented in this report. Based on these flows, storm inlets will be added when the street capacity is exceeded.

Soil types A/B & C/D have been assumed for the developed hydrologic conditions. See Appendix A for SCS Soils Map.

The time of concentration for each basin and sub-basin was developed using an overland, ditch, street and pipe flow components. The maximum overland flow length for developed conditions was limited to 100 feet. Travel time velocities ranged from 2 to 6 feet per second. The travel time calculations are included in the back of this report.

Runoff coefficients for the various land uses were obtained from Table 6-6 dated May 2014 from the updated City of Colorado Springs/El Paso County Drainage Criteria Manual. See Appendix B.

Drainage for the site was divided into 8 proposed basins and 3 existing basins. Runoff coefficients for the 5/100-year events are 0.83 and 0.90 respectively. This is a commercial site, and most areas will be paved or landscaped with rock bedding. Analysis for each of the basins are briefly discussed as follows:

Basins EX1, EX3 & EX4
These offsite basins have been discussed in the existing Hydrological Conditions portion of this report, any additional discussion is not required.

Basin PR1
This basin consists of a commercial area, surface runoff will be directed to a future 10' Type "R" inlet in a sump condition at the southwest corner of this basin. Runoff from this inlet, (design point #7) will be conveyed westerly via future 18" RCP to the previously mentioned existing 34"x53" HERCP. Developed flow from this 1.24 acre basin is 5.3cfs for the 5-year storm event and 9.7cfs for the 100-year storm event. See the appendix for detailed calculations. Interim flows from this area (non-developed) will be conveyed south overland to a temporary sediment basin which flows into Inlet DP8 (5' Type R).

Basin PR2
This basin consists of a commercial area, surface runoff will be directed to a proposed 20' Type "R" inlet in a sump condition at the south-center part of this basin. Runoff from this inlet, (design point #1) will be conveyed southerly by a proposed 24" RCP, then easterly via proposed 36" RCP to the previously mentioned existing 34"x53" HERCP. Developed flow from this 2.41 acre basin is 9.4cfs for the 5-year storm event and 17.0cfs for the 100-year storm event. See the appendix for detailed calculations.

Basin PR3
This basin consists of a commercial area and street, surface runoff will be directed to a proposed 5' Type "R" inlet in a sump condition at the south-center portion of this basin. Runoff from this inlet, (design point #1a) will be conveyed southerly by a proposed 24" RCP, then easterly via proposed 36" RCP to the previously mentioned existing 34"x53" HERCP. Developed flow from this 0.11 acre basin is 0.5cfs for the 5-year storm event and 0.9cfs for the 100-year storm event. See the appendix for detailed calculations.

Basin PR4
This basin consists of a commercial area, surface runoff will be directed to a proposed continuous on-grade 10' Type "R" inlet at the southeast corner of this basin. Runoff from this inlet, (design point #4) will be conveyed easterly via proposed 18", 24", & 36" RCP to the previously mentioned existing 34"x53" HERCP. Developed flow from this 1.68 acre basin is 7.2cfs for the 5-year storm event and 13.1cfs for the 100-year storm event. See the appendix for detailed calculations.

Basin PR5
This basin consists of a fast-food type of commercial area, surface runoff from this basin is directed southerly, then easterly to a proposed 5' Type "R" inlet in a sump condition at the southeast corner of this basin. Runoff from this inlet, (design point #5) is routed by a proposed 24" RCP to the previously discussed proposed 36" RCP then continues easterly to the previously mentioned existing 34"x53" HERCP. Developed flow from this 0.39 acre basin is 1.7cfs for the 5-year storm event and 3.0cfs for the 100-year storm event. See the appendix for detailed calculations.

Basin PR6
This basin consists of a fast-food type of commercial area, surface runoff from this basin is directed easterly and southerly to a proposed 10' Type "R" inlet in a sump condition at the southeast corner of this basin. Runoff from this inlet, (design point #3) is routed southeasterly by a proposed 24" RCP to the previously discussed proposed 36" RCP then continues easterly to the existing 34"x53" HERCP. Developed flow from this 0.72 acre basin is 3.1cfs for the 5-year storm event and 5.6cfs for the 100-year storm event. See the appendix for detailed calculations.

Basin PR7
This basin consists of a fast-food type of commercial area, surface runoff from this basin is directed southerly to a future 10' Type "R" inlet in a sump condition at the south-center portion of this basin. Runoff from this inlet, (design point #8a) is routed by proposed 18" & 24" RCP's southwesterly and westerly to the existing 34"x53" HERCP. Developed flow from this 1.41 acre basin is 6.0cfs for the 5-year storm event and 11.0cfs for the 100-year storm event. See the appendix for detailed calculations.

Interim flows from this area (non-developed) will be conveyed south overland to a temporary sediment basin which flows into Inlet DP8 (5' Type R).

Basin PR8

This basin consists of parking for a future fast-food type of commercial area, surface flow from this basin is directed northerly to a proposed 5' Type "R" inlet in a sump condition at the north-center portion of this basin. This inlet will be constructed as part of the first phase of construction and stubs will be provided for future inlets for Basins PR1 and PR7. Runoff from this inlet, (design point #8) is routed westerly by proposed 24" RCP to the existing 34"x53" HERCP. Developed flow from this 0.22 acre basin is 0.9cfs for the 5-year storm event and 1.7cfs for the 100-year storm event. See the appendix for detailed calculations. Interim flows from this area (non-developed) will be conveyed directly to a temporary sediment basin which flows into Inlet DP8 (5' Type R).

See the Developed Conditions Hydrology Calculations in the back of this report and the Developed Conditions Drainage Map (Map Pocket) for the 5-year and 100-year storm event amounts.

5.0 HYDRAULIC SUMMARY

The sizing of the hydraulic structures was prepared by using the *StormSewers* software programs developed by Intellisolve, which conforms to the methods outlined in the "City of Colorado Springs/El Paso County Drainage Criteria Manual". Street capacities and Inlets were sized by Denver Urban Drainage's xcel spreadsheet UD-Inlet.

It is the intent of this drainage report to use the proposed parking area curb/gutter and storm sewer to convey runoff to an existing storm sewer system, then to the existing detention and water quality pond G1/G2 located in Carriage Meadows South. This pond has been adequately sized to accept the developed flow from this development. See Final Drainage Report for Carriage Meadows South at Lorson Ranch Filing No. 1 prepared by Core Engineering Group, Reference SF1711, approved September 7, 2017. Flows will then outlet to the East Tributary of Jimmy Camp Creek. Inlet size and location are shown on the storm sewer layout in the appendix. See the appendix for detailed calculations and the storm sewer model.

Table 1: Street Capacities (100-year capacity is only ½ of street)

	Residential Local		Residential Collector		Principal Arterial	
Street Slope	5-year	100-year	5-year	100-year	5-year	100-year
0.5%	6.3	26.4	9.7	29.3	9.5	28.5
0.6%	6.9	28.9	10.6	32.1	10.4	31.2
0.7%	7.5	31.2	11.5	34.6	11.2	33.7
0.8%	8.0	33.4	12.3	37.0	12.0	36.0
0.9%	8.5	35.4	13.0	39.3	12.7	38.2
1.0%	9.0	37.3	13.7	41.4	13.4	40.2
1.4%	10.5	44.1	16.2	49.0	15.9	47.6
1.8%	12.0	45.4	18.4	50.4	18.0	50.4
2.2%	13.3	42.8	19.4	47.5	19.5	47.5
2.6%	14.4	40.7	18.5	45.1	18.5	45.1
2.7%	14.7	40.6	18.4	45.0	18.4	45.0
3.0%	15.5	39.0	17.7	43.2	17.8	43.2
3.5%	16.7	37.2	16.9	41.3	17.0	41.3
4.0%	17.9	35.7	16.2	39.7	16.3	39.7
4.5%	19.0	34.5	15.7	38.3	15.7	38.3
5.0%	19.9	33.4	15.2	37.1	15.2	37.1

Note: all flows are in cfs (cubic feet per second).

Design Point 1

Design Point 1 is located on the north side of Center Village and accepts developed flows from Basin PR2. The runoff will be conveyed to Design Point 1 via curb/gutter. The street capacity of Street B (Res. Local, 8.5/35.4cfs at 0.9% slope) is not exceeded.

(5-year storm)

Tributary Basins: PR2 **Inlet/MH Number:** Inlet DP1
Upstream flowby: **Total Street Flow:** 9.4cfs

Flow Intercepted: 9.4cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 20' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 8.0cfs, okay half flow from each side

(100-year storm)

Tributary Basins: PR2 **Inlet/MH Number:** Inlet DP1
Upstream flowby: **Total Street Flow:** 17.0cfs

Flow Intercepted: 17.0cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 20' type R, SUMP

Street Capacity: Street slope = 0.9%, capacity = 35.4cfs (half street) is okay

Design Point 1a

Design Point 1a is located on the south side of Center Village and accepts developed flows from Basin PR3. The runoff will be conveyed to Design Point 1a via curb/gutter. The street capacity of Street B (Res. Local, 8.5/35.4cfs at 0.9% slope) is not exceeded.

(5-year storm)

Tributary Basins: PR3 **Inlet/MH Number:** Inlet DP1a
Upstream flowby: **Total Street Flow:** 0.5cfs

Flow Intercepted: 0.5cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 5' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 8.0cfs, okay half flow from each side

(100-year storm)

Tributary Basins: PR3 **Inlet/MH Number:** Inlet DP1a
Upstream flowby: **Total Street Flow:** 0.9cfs

Flow Intercepted: 0.9cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 5' type R, SUMP

Street Capacity: Street slope = 0.9%, capacity = 35.4cfs (half street) is okay

Design Point 2

Design Point 2 is located on the south side of Center Village and is the total pipe flow from Des. Pts 1 & 1a. The runoff will be conveyed to Design Point 3 via a 24" storm sewer. The total pipe flow is 9.8cfs/17.8cfs in the 5/100-year storm events.

Design Point 3

Design Point 3 is located on the north side of an access street and accepts developed flows from Basin PR6. The runoff will be conveyed to Design Point 3 via curb/gutter. The street capacity of the access street (Res. Local, 8.5/35.4cfs at 0.9% slope) is not exceeded.

(5-year storm)

Tributary Basins: PR6 **Inlet/MH Number:** Inlet DP3
Upstream flowby: **Total Street Flow:** 3.1cfs

Flow Intercepted: 3.1cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 10' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 8.0cfs, okay

(100-year storm)

Tributary Basins: PR6 **Inlet/MH Number:** Inlet DP3
Upstream flowby: **Total Street Flow:** 5.6cfs

Flow Intercepted: 5.6cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 10' type R, SUMP

Street Capacity: Street slope = 0.9%, capacity = 35.4cfs (half street) is okay

Design Point 3a

Design Point 3a is located on the north side of an access street and is the total pipe flow from Des. Pts 2 & 3. The runoff will be conveyed to Design Point 6 via a 24" storm sewer. The total pipe flow is 12.5cfs/22.8cfs in the 5/100-year storm events.

Design Point 4

Design Point 4 is located on the south side of an access street and accepts developed flows from Basin PR4. The runoff will be conveyed to Design Point 4 via curb/gutter. The street capacity of the access street (Res. Local, 8.5/35.4cfs at 0.9% slope) is not exceeded.

(5-year storm)

Tributary Basins: PR4 **Inlet/MH Number:** Inlet DP4
Upstream flowby: **Total Street Flow:** 7.2cfs

Flow Intercepted: 5.9cfs **Flow Bypassed:** 1.3cfs to DP5
Inlet Size: 10' type R, on-grade

Street Capacity: Street slope = 0.9%, capacity = 8.0cfs, okay

(100-year storm)

Tributary Basins: PR4 **Inlet/MH Number:** Inlet DP4
Upstream flowby: **Total Street Flow:** 13.1cfs

Flow Intercepted: 8.1cfs **Flow Bypassed:** 5.0cfs to DP5
Inlet Size: 10' type R, on-grade

Street Capacity: Street slope = 0.9%, capacity = 35.4cfs (half street) is okay

Design Point 5

Design Point 5 is located on the south side of an access street and accepts developed flows from Basin PR5. The runoff will be conveyed to Design Point 5 via curb/gutter. The street capacity of the access street (Res. Local, 8.5/35.4cfs at 0.9% slope) is not exceeded.

(5-year storm)

Tributary Basins: PR5 **Inlet/MH Number:** Inlet DP5
Upstream flowby: 1.3cfs from DP4 **Total Street Flow:** 1.7+1.3=3.0cfs

Flow Intercepted: 3.0cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 5' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 8.0cfs, okay

(100-year storm)

Tributary Basins: PR5 **Inlet/MH Number:** Inlet DP5
Upstream flowby: 5.0cfs from DP4 **Total Street Flow:** 5.0+3.0=8.0cfs

Flow Intercepted: 8.0cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 5' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 35.4cfs (half street) is okay

Design Point 5a

Design Point 5a is located on the south side of an access street and is the total pipe flow from Des. Pts 4 & 5. The runoff will be conveyed to Design Point 6 via a 24" storm sewer. The total pipe flow is 8.9cfs/16.1cfs in the 5/100-year storm events.

Design Point 6

Design Point 6 is located on the south side of an access street and is the total pipe flow from Des. Pts 3a & 5a. The runoff will be conveyed to Design Point 6 via a 24" storm sewer. The total pipe flow is 20.5cfs/37.3cfs in the 5/100-year storm events.

Design Point 7

Design Point 7 is located on the east end of an access street and accepts developed flows from Basin PR1 which will be developed in the future. The runoff will be conveyed to Design Point 7 via future curb/gutter. The street capacity of the access street (Res. Local, 8.5/35.4cfs at 0.9% slope) is not exceeded. A future inlet will be designed and the size verified before construction at this design point when the adjacent lot is developed. Interim flows from this area (non-developed) will be conveyed south overland to a temporary sediment basin which flows into Inlet DP8 (5' Type R).

(5-year storm)
Tributary Basins: PR1 **Inlet/MH Number:** future Inlet DP7
Upstream flowby: **Total Street Flow:** 5.3cfs

Flow Intercepted: 5.3cfs **Flow Bypassed:** 0.0cfs
Inlet Size: future 10' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 8.0cfs, okay

(100-year storm)
Tributary Basins: PR1 **Inlet/MH Number:** future Inlet DP7
Upstream flowby: **Total Street Flow:** 9.7cfs

Flow Intercepted: 9.7cfs **Flow Bypassed:** 0.0cfs
Inlet Size: future 10' type R, SUMP

Street Capacity: Street slope = 0.9%, capacity = 35.4cfs (half street) is okay

Design Point 8

Design Point 8 is located on the east end of an access street and accepts developed flows from Basin PR8 which will be developed in the future. The runoff will be conveyed to Design Point 8 via future curb/gutter. The street capacity of the access street (Res. Local, 8.5/35.4cfs at 0.9% slope) is not exceeded. Interim flows from this area (non-developed) will be conveyed overland directly to a temporary sediment basin which flows into Inlet DP8 (5' Type R).

(5-year storm)
Tributary Basins: PR8 **Inlet/MH Number:** Inlet DP8
Upstream flowby: **Total Street Flow:** 0.9cfs

Flow Intercepted: 0.9cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 5' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 8.0cfs, okay

(100-year storm)
Tributary Basins: PR8 **Inlet/MH Number:** Inlet DP8
Upstream flowby: **Total Street Flow:** 1.7cfs

Flow Intercepted: 1.7cfs **Flow Bypassed:** 0.0cfs
Inlet Size: 5' type R, SUMP

Street Capacity: Street slope = 0.9%, capacity = 35.4cfs (half street) is okay

Design Point 8a
Design Point 8a is located on the east end of an access street and accepts developed flows from Basin PR7 which will be developed in the future. The runoff will be conveyed to Design Point 8a via future curb/gutter. The total surface flow is 6.0cfs/11.0cfs in the 5/100-year storm events. The street capacity of the access street (Res. Local, 8.5/35.4cfs at 0.9% slope) is not exceeded. A future inlet will be designed and the size verified before construction at this design point when the adjacent lot is developed.

Design Point 9
Design Point 9 is located on the south side of an access street and is the total pipe flow from Des. Pts 7, 8 & 8a. The runoff will be conveyed to Design Point 10 via a 24" storm sewer. The total pipe flow is 12.2cfs/22.4cfs in the 5/100-year storm events.

Design Point 10
Design Point 10 is located on the south side of an access street and is the total pipe flow from Des. Pts 6 & 9. The runoff will be conveyed to an existing 34"x53" HERCP. The total pipe flow is 31.5cfs/57.3cfs in the 5/100-year storm events. The allowable flow into the existing HERCP is 32.2cfs/59.0cfs per the Fontaine Blvd. Phase 1 FDR which designed the existing system.

6.0 DETENTION AND WATER QUALITY PONDS

Detention and Storm Water Quality for Village at Lorson Ranch will be provided for in existing Pond G1/G2 located south of Fontaine Boulevard. Pond G1/G2 is an existing full spectrum detention pond constructed in 2017 as part of the Carriage Meadows South at Lorson Ranch Filing No. 1 subdivision (SF 1711) per El Paso County criteria. Pond G1/G2 was as-builted and certified on June 27, 2023 by Core Engineering Group. A copy of the certification letter, as-builts, and a pond drainage area map are located in the appendix of this report.

For additional information, see the approved Final Drainage Report and Plan for "Carriage Meadows South at Lorson Ranch Filing No. 1, SF 1711, dated 08/10/2017.

The following text was taken from the Carriage Meadows South final drainage report:

Detention Pond G1/G2 (Full Spectrum Design), (District Facility, SF1711)
This is an on-site permanent full spectrum detention pond that includes water quality. Pond G1/G2 is designed as a single pond in the UDCF Full Spectrum spreadsheets. The full spectrum print outs are in the appendix of this report. See map in appendix for watershed areas. This pond is sized to provide full spectrum and water quality for the Brownsville Subdivision No. 2 should it become a part of Lorson Ranch.

- Watershed Ares: 96 acres
- Watershed Imperviousness: 79%
- Hydrologic Soils Group A, B, C/D
- Zone 1 WQCV: 2.301 ac-ft, WSEL: 5683.93
- Zone 2 EURV: 8.104 ac-ft, WSEL: 5686.29
- Zone 3 (100-yr): 12.881ac-ft, WSEL: 5687.93
- Pipe Outlet: 36" RCP at 0.4%
- 5-yr outflow = 4.2cfs, 100-yr outflow = 55.6cfs

7.0 DRAINAGE AND BRIDGE FEES

Village at Lorson Ranch is located within the Jimmy Camp Creek drainage basin which is currently a fee basin in El Paso County. Current El Paso County regulations require drainage and bridge fees to be paid for platting of land as part of the plat recordation process. Lorson Ranch initiated the closure of Jimmy Camp Creek drainage basin for drainage/bridge fees a few years ago and will be approved by El Paso County and the Pikes Peak Drainage Board before this plat is recorded. In the event the basin isn't closed Lorson Ranch has interim agreements with the county that no fees are required at this time. Therefore, no drainage fees or bridge fees are required to be paid at this time. A copy of the drainage board meeting minutes is in the appendix of this report.

Table 7.1: Private Drainage Facility Costs (non-reimbursable)

Item	Quantity	Unit	Unit Cost	Item Total
5' Inlet	3	EA	$5,000/EA	$15,000
10' Inlet	4	EA	$8,000/EA	$32,000
20' Inlet	1	EA	$12,000/EA	$12,000
18" Storm	206	LF	$180	$37,080
24" Storm	351	LF	$240	$84,240
36" Storm	73	LF	$360	$26,280
Manholes	2	EA	$10,000	$20,000
			Subtotal	$226,600
			Eng/Cont (10%)	$22,660
			Total Est. Cost	$249,260

8.0 FOUR STEP PROCESS

The site has been developed to minimize wherever possible the rate of developed runoff that will leave the site and to provide water quality management for the runoff produced by the site as proposed on the development plan. The following four step process should be considered and incorporated into the storm water collection system and storage facilities where applicable.

Step 1: Employ Runoff Reduction Practices

Village at Lorson Ranch has employed several methods of reducing runoff.

- The street configuration was laid out to minimize the length of streets. Many streets are straight and perpendicular resulting in lots with less wasted space. Landscape buffers are provided for adjacent residential development
- Utilize existing Full Spectrum Detention Outlet Structure (Pond G1/G2) which has been previously constructed and sized for runoff from this development. The full spectrum detention mimics existing storm discharges and includes water quality.

Step 2: Stabilize Drainageways

Jimmy Camp Creek is a major drainageway located east of this site. In 2006 Jimmy Camp Creek was reconstructed and stabilized per county criteria. The design included a natural sand bottom and armored sides.

Step 3: Provide Water Quality Capture Volume

Treatment of the water quality capture volume (WQCV) is required for all new developments. Village at Lorson Ranch utilizes an existing full spectrum stormwater extended detention basin outlet structure within existing Pond G1/G2 which include Water Quality Volumes and WQ outlet structures.

Step 4: Consider Need for Industrial and Commercial BMP's

There are no industrial areas within this site. This site is commercial but will be mostly light use commercial areas such as restaurants, gas station, mini storage, etc which does not need specific BMP's.

9.0 CONCLUSIONS

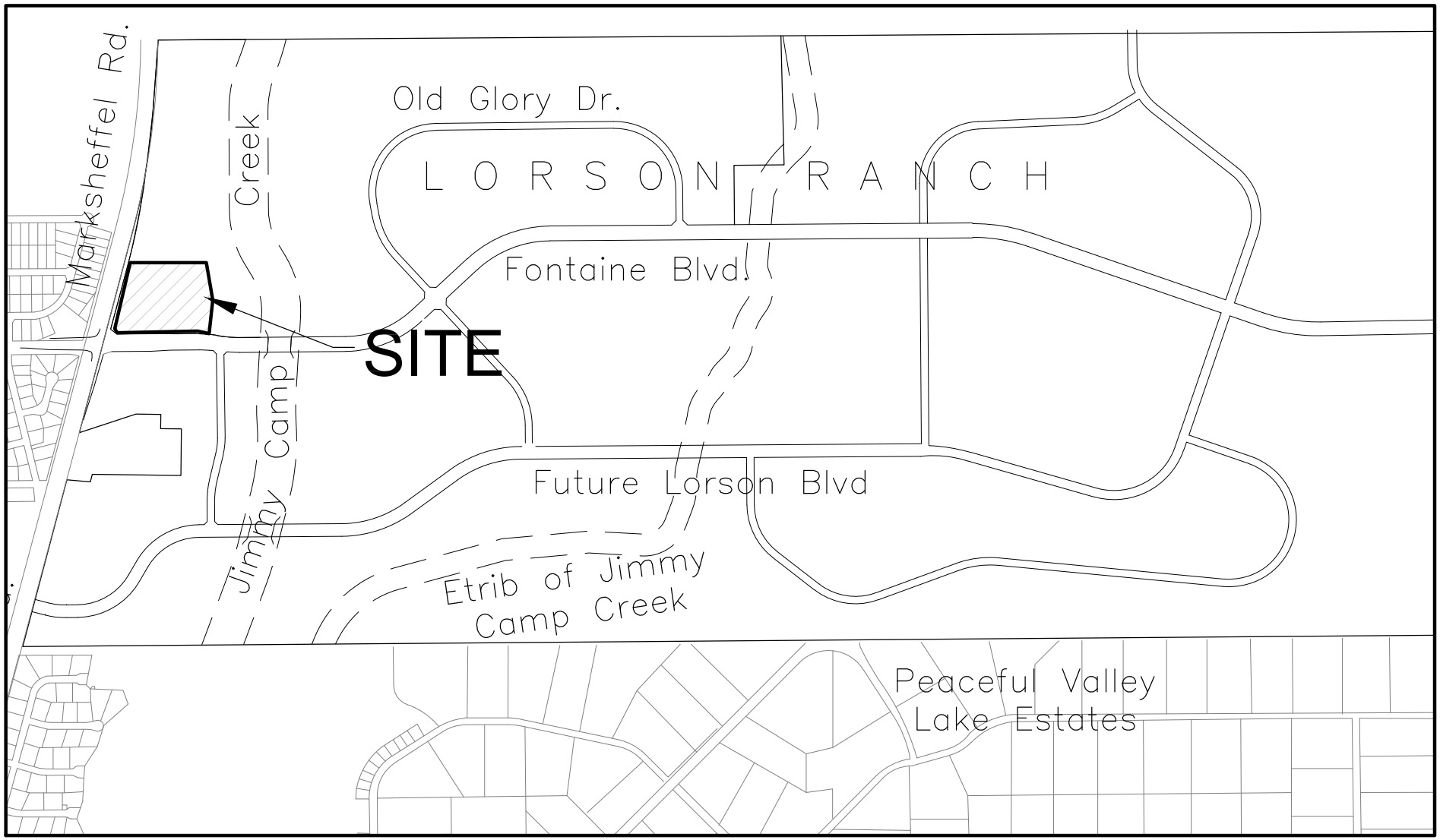
This drainage report has been prepared in accordance with the City of Colorado Springs/El Paso County Drainage Criteria Manual. The proposed development and drainage infrastructure will not cause adverse impacts to adjacent properties or properties located downstream. Several key aspects of the development discussed above are summarized as follows:

- Developed runoff will be conveyed via curb/gutter and storm sewer facilities
- Jimmy Camp Creek has been reconstructed east of this study area
- Detention and water quality for this site will be provided in Pond G1/G2 constructed as part of Carriage Meadows South (SF1711)

10.0 REFERENCES

1. City of Colorado Springs/El Paso County Drainage Criteria Manual DCM, dated November, 1991
2. Soil Survey of El Paso County Area, Colorado by USDA, SCS
3. Jimmy Camp Creek Drainage Basin Planning Study, Dated March 9, 2015, by Kiowa Engineering Corporation
4. City of Colorado Springs "Drainage Criteria Manual, Volume 2
5. El Paso County "Engineering Criteria Manual"
6. Lorson Ranch MDDP 1, November 7, 2006 by Pentacor.
7. El Paso County Resolution #15-042, El Paso County adoption of Chapter 6 and Section 3.2.1 of the City of Colorado Springs Drainage Criteria Manual dated May, 2014.
8. Final Drainage Report for Fontaine Boulevard Phase 1 Improvements prepared by Pentacor, dated November, 2006
9. Final Drainage Report for Carriage Meadows South at Lorson Ranch Filing No. 1 prepared by Core Engineering Group, Reference SF1711, approved September 7, 2017
10. Final Drainage Report for Carriage Meadows North prepared by Core Engineering Group, Reference SF1723, approved April 12, 2018

APPENDIX A – VICINTIY MAP, SOILS MAP, FEMA MAP



VICINITY MAP
NO SCALE

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VILLAGE AT LORSON RANCH FIL. NO. 1
VICINITY MAP

SCALE:	DATE:	FIGURE NO.
NTS	APRIL, 2024	--

National Flood Hazard Layer FIRMette

FEMA

104°39'11"W 38°44'32"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

104°38'34"W 38°44'4"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/16/2024 at 2:56 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soil Map—El Paso County Area, Colorado
(Villages at Lorson Ranch)

Map Scale: 1:1,370 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

El Paso County Area, Colorado

28—Ellicott loamy coarse sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 3680
Elevation: 5,500 to 6,500 feet
Mean annual precipitation: 13 to 15 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Ellicott and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ellicott

Setting

Landform: Stream terraces, flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

A - 0 to 4 inches: loamy coarse sand
C - 4 to 60 inches: stratified coarse sand to sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: R069XY031CO - Sandy Bottomland
Other vegetative classification: SANDY BOTTOMLAND (069AY031CO)
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquoll
Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Other soils
Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 20, Sep 2, 2022

El Paso County Area, Colorado

52—Manzanst clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w4nr
Elevation: 4,060 to 6,660 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Manzanst and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Manzanst

Setting

Landform: Drainageways, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Clayey alluvium derived from shale

Typical profile

A - 0 to 3 inches: clay loam
Bt - 3 to 12 inches: clay
Btk - 12 to 37 inches: clay
Bk1 - 37 to 52 inches: clay
Bk2 - 52 to 79 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Slightly saline (4.0 to 7.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4c

Hydrologic Soil Group: C
Ecological site: R067BY037CO - Saline Overflow
Hydric soil rating: No

Minor Components

Ritoazul
Percent of map unit: 7 percent
Landform: Interfluves, drainageways
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY042CO - Clayey Plains
Hydric soil rating: No

Arvada
Percent of map unit: 6 percent
Landform: Interfluves, drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY033CO - Salt Flat
Hydric soil rating: No

Wiley
Percent of map unit: 2 percent
Landform: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 20, Sep 2, 2022

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 21, Aug 24, 2023

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

Date(s) aerial images were photographed: Aug 14, 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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	0.1	1.2%
52	Manzanst clay loam, 0 to 3 percent slopes	8.5	98.8%
Totals for Area of Interest		**8.6**	**100.0%**

APPENDIX B – HYDROLOGY CALCULATIONS

CORE ENGINEERING GROUP

Standard Form SF-2. Storm Drainage System Design (Rational Method Procedure)

Calculated By: Leonard Beasley
Date: April, 2024
Checked By: Leonard Beasley

Job No: 100.070
Project: Village at Lorson Ranch FDR
Design Storm: **5 - Year Event (Current)**

Street or Basin	Design Point	Direct Runoff							Total Runoff				Street		Pipe			Travel Time			Remarks
		Area Design	Area (A)	Runoff Coeff. (C)	t_c	CA	i	Q	t_c	$\sum$ (CA)	i	Q	Slope	Street Flow	Design Flow	Slope	Pipe Size	Length	Velocity	t_t	
			ac.		min.		in/hr	cfs	min		in/hr	cfs	%	cfs	cfs	%	in	ft	ft/sec	min	
EX1			0.95	0.15	40.3	0.14	2.04	0.3													
EX2			8.44	0.15	26.4	1.27	2.68	3.4													
EX3			0.73	0.15	11.1	0.11	3.98	0.4													
EX4			0.57	0.90	5.0	0.51	5.17	2.6													

CORE ENGINEERING GROUP

Standard Form SF-2. Storm Drainage System Design (Rational Method Procedure)

Calculated By: Leonard Beasley
Date: April, 2024
Checked By: Leonard Beasley

Job No: 100.070
Project: Village at Lorson Ranch FDR
Design Storm: **100-Year Event (Current)**

Street or Basin	Design Point	Direct Runoff							Total Runoff				Street		Pipe			Travel Time			Remarks
		Area Design	Area (A)	Runoff Coeff. (C)	t_c	CA	i	Q	t_c	Σ (CA)	i	Q	Slope	Street Flow	Design Flow	Slope	Pipe Size	Length	Velocity	t_t	
			ac.		min.		in/hr	cfs	min		in/hr	cfs	%	cfs	cfs	%	in	ft	ft/sec	min	
EX1			0.95	0.50	40.3	0.48	3.42	1.6													
EX2			8.44	0.50	26.4	4.22	4.49	19.0													
EX3			0.73	0.50	11.1	0.37	6.68	2.4													
EX4			0.57	0.96	5.0	0.55	8.68	4.7													

2 10 10 15 15 15 15 15 15 28

CORE ENGINEERING GROUP

15004 1st Avenue South
Burnsville, MN 55306

PROJECT NAME: *Village at Lorson Ranch FDR*
PROJECT NUMBER: *100.070*
ENGINEER: *LAB*
DATE: *April, 2024*

Master Development Drainage Plan
CURRENT CONDITIONS COEFFICIENT "C" CALCULATIONS

BASIN	Soil No.	Hydro Group	Area	Cover (%)	C5	Wtd. C5	C100	Wtd. C100	CN	Wtd. CN	Impervious	Type of Cover
EX1	52	C	0.95	100.00%	0.15		0.50		51		0%	Pasture/Meadow
EX2	52	C	8.44	100.00%	0.15		0.50		51		0%	Pasture/Meadow
EX3	52	C	0.76	100.00%	0.15		0.50		51		0%	Pasture/Meadow
EX4	52	C	0.66	100.00%	0.90		0.96		51		100%	Paved Road

CORE ENGINEERING GROUP

Standard Form SF-1. Time of Concentration-Current

Calculated By: Leonard Beasley
Date: Feb. 15, 2024
Checked By: Leonard Beasley

Job No: 100.070
Project: Village at Lorson Ranch FDR

Sub-Basin Data				Initial Overland Time (t_i)				Travel Time (t_t)					Final t_c
BASIN or DESIGN	C_5	AREA (A) acres	NRCS Convey.	LENGTH (L) feet	SLOPE (S) %	VELOCITY (V) ft/sec	t_i minutes	LENGTH (L) feet	SLOPE (S) %	VELOCITY (V) ft/sec	t_t minutes	Computed t_c Minutes	USDCM Recommended t_c=ti+tt (min)
EX1	0.15	0.95	15.0	51.00	10.78%	0.15	5.59	1398.00	0.20%	0.67	34.73	40.32	40.32
EX2	0.15	8.44	7.0	226.00	3.10%	0.21	17.81	229.00	1.31%	0.80	4.76		
			15.0					284.00	0.70%	1.25	3.77	26.35	26.35
EX3	0.15	0.73	15.0	37.00	4.05%	0.09	6.58	442.00	1.20%	1.64	4.48	11.06	11.06
EX4	0.90	0.66	20.0	22.00	2.00%	0.27	1.35	462.00	1.75%	2.65	2.91	4.26	4.26

CORE ENGINEERING GROUP

Standard Form SF-2. Storm Drainage System Design (Rational Method Procedure)

Calculated By: Leonard Beasley
Date: April, 2024
Checked By: Leonard Beasley

Job No: 100.070
Project: Village at Lorson Ranch FDR
Design Storm: **5 - Year Event (Developed)**

Street or Basin	Design Point	Direct Runoff							Total Runoff				Street				Pipe				
		Area Design	Area (A)	Runoff Coeff. (C)	t_c	CA	i	Q	t_c	$\sum$ (CA)	i	Q	Slope / Pipe Slope	Full Street Max Flow	Max Allow street flow	Street Velocity	Design Pipe Flow	Slope	Pipe Size	Min Pipe Flow	Pipe Velocity
			ac.		min.		in/hr	cfs	min		in/hr	cfs	%	cfs	cfs	min	cfs	%	in	cfs	fps
EX1			0.95	0.15	40.3	0.14	2.04	0.3													
EX3			0.73	0.15	11.1	0.11	3.98	0.4													
EX4			0.57	0.90	5.0	0.51	5.17	2.6													
PR1	**7**		1.24	0.83	5.0	1.03	5.17	5.3													
PR2	**1**		2.41	0.83	6.9	2.00	4.68	9.4													
PR3	**1a**		0.11	0.83	5.0	0.09	5.17	0.5													
(PR2-PR3)	**2**	2.52		0.83					6.9	2.09	4.68	9.8									
PR4	**4**		1.68	0.83	5.0	1.39	5.17	7.2													
PR5			0.39	0.83	5.0	0.32	5.17	1.7													
(PR4-PR5)	**5a**	2.07		0.83					5.0	1.72	5.17	8.9									
PR6 (PR2,PR3&PR6)	**3a**		0.72	0.83	5.0	0.60	5.17	3.1	7.0	2.69	4.66	12.5									
(PR2-PR6)	**6**	5.31		0.83					7.1	4.41	4.65	20.5									
PR7	**8a**		1.41	0.83	5.0	1.17	5.17	6.0													
PR8	**8**		0.22	0.83	5.0	0.18	5.17	0.9													
(PR1,PR7&PR8)	**9**	2.87							5.1	2.38	5.14	12.2									
(PR1-PR8)	**10**	8.18							7.1	6.79	4.64	31.5									

Standard Form SF-2. Storm Drainage System Design (Rational Method Procedure)

CORE ENGINEERING GROUP

Calculated By: Leonard Beasley
Date: April, 2024
Checked By: Leonard Beasley

Job No: 100.070
Project: Village at Lorson Ranch FDR Design
Storm: **100 - Year Event (Developed)**

Street or Basin	Design Point	Direct Runoff							Total Runoff				Street				Pipe				
		Area Design	Area (A)	Runoff Coeff. (C)	t_c	CA	i	Q	t_c	Σ (CA)	i	Q	Slope / Pipe Slope	Full Street Max Flow	Max Allow street flow	Street Velocity	Design Pipe Flow	Slope	Pipe Size	Min Pipe Flow	Pipe Velocity
			ac.		min.		in/hr	cfs	min		in/hr	cfs	%	cfs	cfs	min	cfs	%	ft	cfs	fps
EX1			0.95	0.50	40.3	0.48	3.42	1.6													
EX3			0.73	0.50	11.1	0.37	6.68	2.4													
EX4			0.57	0.96	5.0	0.55	8.68	4.7													
PR1	**7**		1.24	0.90	5.0	1.12	8.68	9.7													
PR2	**1**		2.41	0.90	6.9	2.17	7.85	17.0													
PR3	**1a**		0.11	0.90	5.0	0.10	8.68	0.9													
(PR2-PR3)	**2**	2.52		0.90					7.0	2.27	7.83	17.8									
PR4	**4**		1.68	0.90	5.0	1.51	8.68	13.1													
PR5			0.39	0.90	5.0	0.35	8.68	3.0													
(PR4-PR5)	**5a**	2.07		0.90					5.0	1.86	8.66	16.1									
PR6 (PR2,PR3&PR6)	**3a**		0.72	0.90	5.0	0.65	8.68	5.6	7.0	2.92	7.83	22.8									
(PR2-PR6)	**6**	5.31		0.90					7.1	4.78	7.81	37.3									
PR7	**8a**		1.41	0.90	5.0	1.27	8.68	11.0													
PR8	**8**		0.22	0.90	5.0	0.20	8.68	1.7													
(PR1,PR7&PR8)	**9**	2.87							5.0	2.58	8.68	22.4									
(PR1-PR8)	**10**	8.18	8.18	0.90	7.1	7.36	7.79	57.3	7.1	7.36	7.79	57.3									

CORE ENGINEERING GROUP

Standard Form SF-1. Time of Concentration-Proposed

Calculated By: Leonard Beasley
Date: April, 2024
Checked By: Leonard Beasley

Job No: 100.070
Project: Village at Lorson Ranch

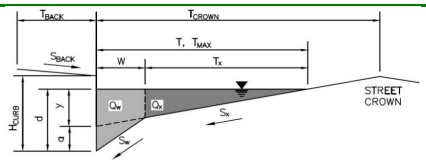
Sub-Basin Data				Initial Overland Time (t_i)				Travel Time (t_t)					t_c Check (urbanized Basins)		Final t_c
BASIN or DESIGN	C_5	AREA (A) acres	NRCS Convey.	LENGTH (L) feet	SLOPE (S) %	VELOCITY (V) ft/sec	τ_i minutes	LENGTH (L) feet	SLOPE (S) %	VELOCITY (V) ft/sec	τ_t minutes	Computed t_c Minutes	TOTAL LENGTH (L) feet	Regional tc tc=(L/180)+10 minutes	USDCM Recommended $t_c=\tau_i+\tau_t$ (min)
EX1	0.15	0.95	15.0	51.00	10.78%	0.15	5.59	1398.00	0.20%	0.67	34.73	40.32			40.32
EX3	0.15	0.73	15.0	37.00	4.05%	0.09	6.58	442.00	1.20%	1.64	4.48	11.06			11.06
EX4	0.90	0.66	20.0	22.00	2.00%	0.27	1.35	462.00	1.75%	2.65	2.91	4.26			4.26
PR1	0.90	1.24	20.0	15.00	2.00%	0.22	1.12	410.00	1.22%	2.21	3.09	4.21	425.00	12.36	4.21
PR2	0.90	2.41	7.0	36.00	2.00%	0.35	1.73	114.00	1.00%	0.70	2.71				
			20.0					300.00	1.00%	2.00	2.50	6.94	450.00	12.50	6.94
PR3	0.90	0.11	20.0	22.00	2.00%	0.27	1.35	128.00	1.00%	2.00	1.07	2.42	150.00	10.83	2.42
PR4	0.90	1.68	20.0	10.00	2.00%	0.18	0.91	597.00	1.60%	2.53	3.93	4.85	607.00	13.37	4.85
PR5	0.90	0.39	20.0	10.00	1.96%	0.18	0.92	353.00	1.60%	2.53	2.33	3.24	363.00	12.02	3.24
PR6	0.90	0.72	20.0	10.00	2.00%	0.18	0.91	368.00	1.34%	2.32	2.65	3.56	378.00	12.10	3.56
PR7	0.90	1.41	20.0	15.00	2.20%	0.23	1.08	320.00	1.56%	2.50	2.14	3.22	335.00	11.86	3.22
PR8	0.90	0.22	20.0	25.00	2.00%	0.29	1.44	108.00	1.56%	2.50	0.72	2.16	133.00	10.74	2.16

APPENDIX C – HYDRAULIC CALCULATIONS

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

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

Project: **Village at Lorson Ranch**
Inlet ID: **Inlet DP1**



Gutter Geometry:

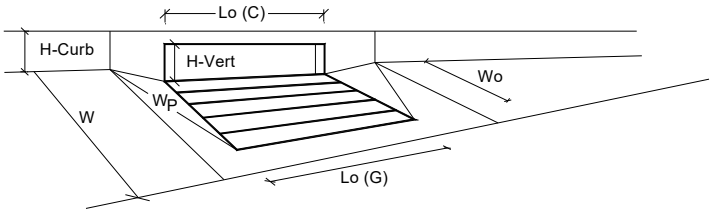
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.015	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.018	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.5	7.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



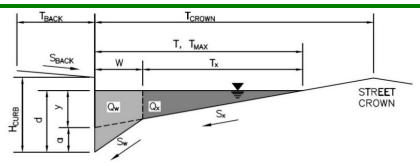
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.5	6.9	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	20.00	20.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.29	0.41	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.75	0.84	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**9.8**	**18.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	9.4	17.0	cfs

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

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

Project: **Village at Lorson Ranch**

Inlet ID: **Inlet DP1a**



Gutter Geometry:

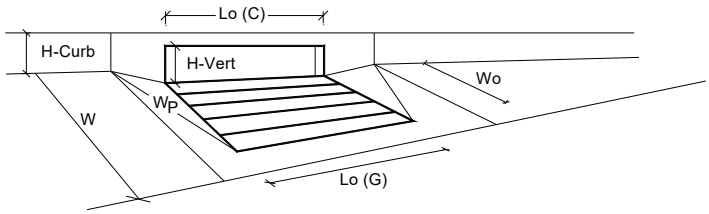
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.5	7.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	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 =	5.5	5.6	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.29	0.30	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**4.4**	**4.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.5	0.9	cfs

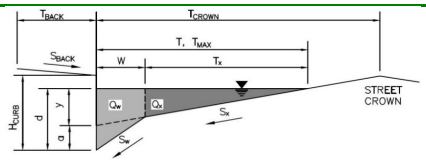
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **Village at Lorson Ranch**

Inlet ID: **Inlet DP3**



Gutter Geometry:

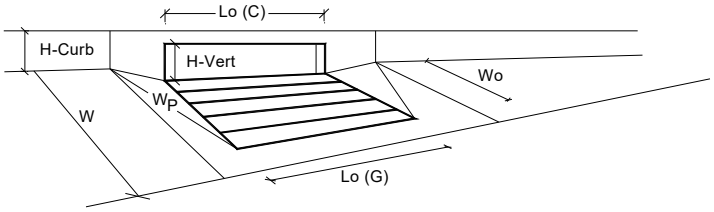
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.5	7.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	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 =	5.5	5.6	inches
Grate Information		MINOR	MAJOR	Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.29	0.30	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.90	0.91	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.6**	**6.9**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	3.1	5.6	cfs

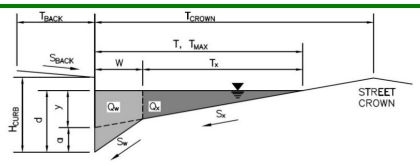
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **Village at Lorson Ranch**

Inlet ID: **Inlet DP4**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	19.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.009	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	19.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.5	6.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

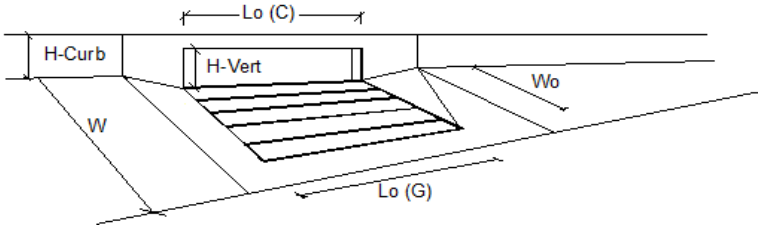
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**9.7**	**13.1**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 7.20 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 13.10 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	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)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10	10.10	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_f (G) =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f (C) =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**5.9**	**8.1**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**1.3**	**5.0**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**81**	**61**	**%**

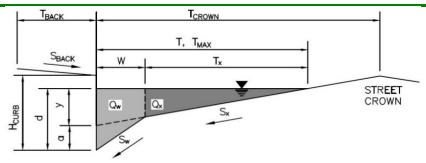
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **Village at Lorson Ranch**

Inlet ID: **Inlet DP5**



Gutter Geometry:

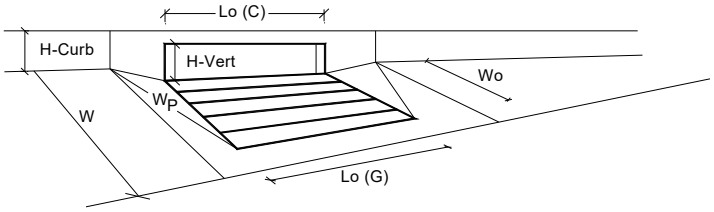
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.5	5.5	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)

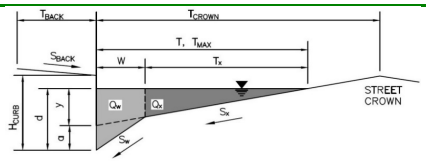


Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.5	7.2	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.29	0.43	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**4.4**	**8.0**	**cfs**
WARNING: Inlet Capacity < Q Peak for Major Storm	$Q_{PEAK\ REQUIRED}$ =	3.0	8.0	cfs

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

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

Project: **Village at Lorson Ranch**
Inlet ID: **Inlet DP7**



Gutter Geometry:

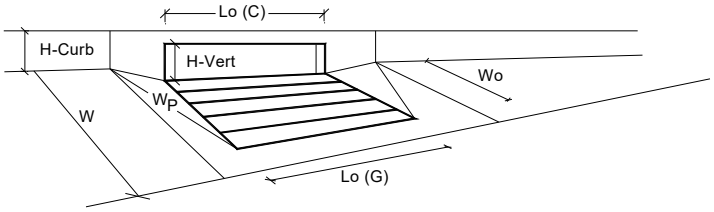
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.5	7.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)

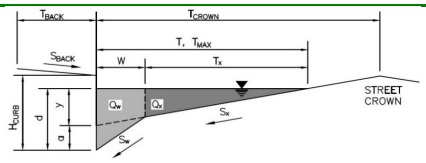


Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.5	6.5	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.29	0.38	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.90	0.96	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.6**	**10.2**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	5.3	9.7	cfs

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

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

Project: **Village at Lorson Ranch**
Inlet ID: **Inlet DP8**



Gutter Geometry:

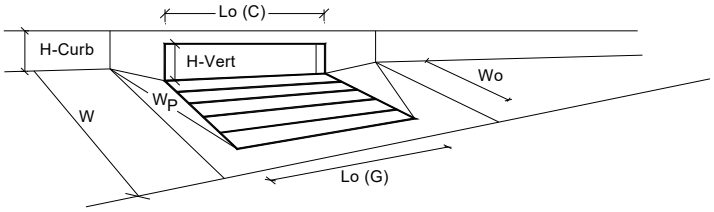
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.5	7.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

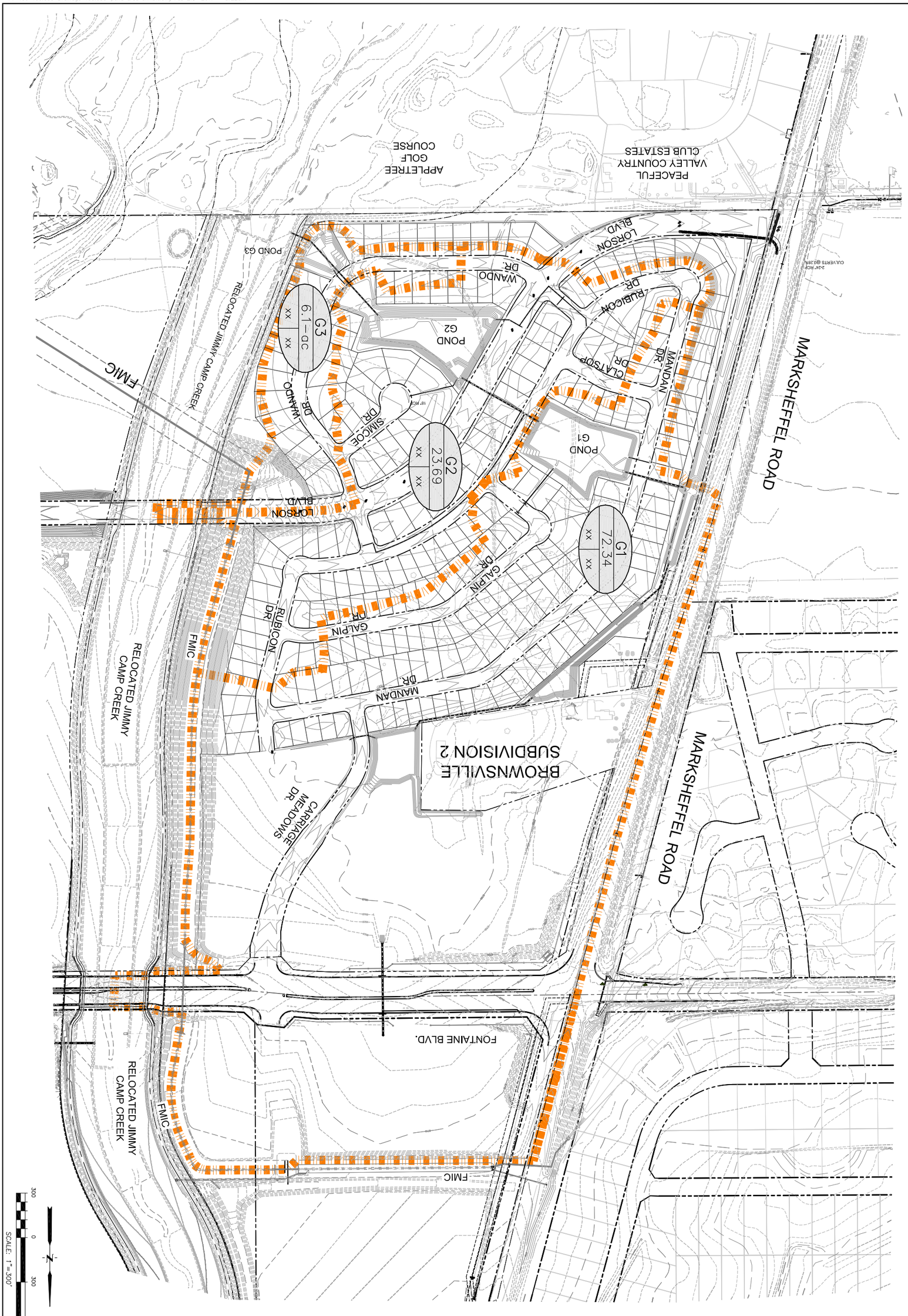
INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	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 =	5.5	5.6	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.29	0.30	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**4.4**	**4.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.9	1.7	cfs

APPENDIX D – POND G1/G2



DETENTION POND WATERSHEDS
DRAINAGE PLAN
CARRIAGE MEADOWS SOUTH

DATE	JANUARY, 2017
PROJECT NO.	100.030
SHEET NUMBER	1
TOTAL SHEETS:	1

DRAWN: RJS
DESIGNED: LAB
CHECKED: LAB

NO.	DESCRIPTION	DATE

PROJECT:
CARRIAGE MEADOWS SOUTH
FILING NO. 1
FONTAINE BLVD. – OLD GLORY DRIVE
EL PASO COUNTY, COLORADO

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

CORE
ENGINEERING GROUP
15004 1ST AVE. S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

CORE
ENGINEERING GROUP

June 27, 2023

El Paso County Planning and Community Development
2880 International Circle, Suite 110
Colorado Springs, CO 80910

RE: Carriage Meadows South Filing No. 1 (SF 17-011)
Certification Letter

Dear El Paso County PCD,

Based upon information gathered from as-built surveys and periodic visits to the project, Core Engineering Group is of the opinion that the subdivision improvements have been constructed in general conformance with the approved design plans as filed with El Paso County.

The site and adjacent properties (as affected by work performed under the County permit) appear to be stable with respect to settlement and subsidence, sloughing of cut and fill slopes, revegetation or other ground cover, and the improvements (public improvements, common development improvements, site grading and paving) visually appear to meet or exceed the minimum design requirements. There have been some service line utility trench settlements but that is currently being addressed as part of the punchlist process.

The sanitary and watermain located in the public ROW has also been completed in accordance with Widefield Water and Sanitation Districts criteria.

In addition, Core Engineering Group has verified that the Extended Detention Basin/WQ Pond G1, G2, and G3 have been constructed and certified and meet the volume and elevation requirements and have been constructed in general compliance with the approved construction plans. The outlet structure for Pond G3 did change slightly from the design so the full spectrum spreadsheet was updated for this pond and it meets the design output as shown in the approved final drainage report.

Based on information gathered during construction and post-construction, Core Engineering Group is of the opinion that the public streets and storm sewer have been constructed in general accordance with the approved construction documents.

Sincerely,
Core Engineering Group, LLC

COLORADO REGISTERED RICHARD L. SCHINDLER 33997 PROFESSIONAL ENGINEER
7-3-2023

Richard L. Schindler, P.E. 33997

Pond G1/G2, G3 As-builts
Street/storm As-builts

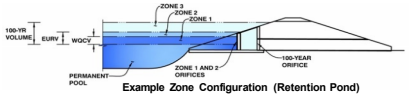
15004 1st Avenue S. • Burnsville, MN 55306
719.659.7800 (ph)

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Carriage Meadows South at Lorson Ranch

Basin ID: Full Spectrum Pond G3 - asbuilt



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	6.02	acres
Watershed Length =	790	ft
Watershed Slope =	0.016	ft/ft
Watershed Imperviousness =	55.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	0.111	acre-feet
Excess Urban Runoff Volume (EURV) =	0.357	acre-feet
2-yr Runoff Volume (P1 = 1.16 in.) =	0.283	acre-feet
5-yr Runoff Volume (P1 = 1.44 in.) =	0.378	acre-feet
10-yr Runoff Volume (P1 = 1.68 in.) =	0.501	acre-feet
25-yr Runoff Volume (P1 = 1.92 in.) =	0.678	acre-feet
50-yr Runoff Volume (P1 = 2.16 in.) =	0.802	acre-feet
100-yr Runoff Volume (P1 = 2.42 in.) =	0.966	acre-feet
500-yr Runoff Volume (P1 = 0 in.) =	0.000	acre-feet
Approximate 2-yr Detention Volume =	0.265	acre-feet
Approximate 5-yr Detention Volume =	0.355	acre-feet
Approximate 10-yr Detention Volume =	0.463	acre-feet
Approximate 25-yr Detention Volume =	0.503	acre-feet
Approximate 50-yr Detention Volume =	0.525	acre-feet
Approximate 100-yr Detention Volume =	0.580	acre-feet

Optional User Override 1-hr Precipitation

1.16	inches
1.44	inches
1.68	inches
1.92	inches
2.16	inches
2.42	inches
	inches

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.111	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.246	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.223	acre-feet
Total Detention Basin Volume =	0.580	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{TOTAL}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{MAIN}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
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^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{TOTAL}) =	user	acre-feet

asblt orifice=82.94

Depth Increment = 0.1 ft

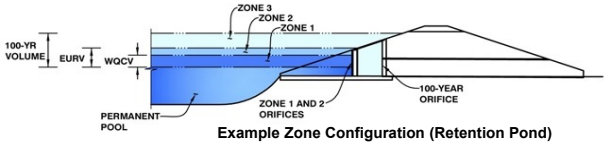
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	50	0.001		
5684	--	1.06	--	--	--	1,284	0.029	694	0.016
5685	--	2.06	--	--	--	5,841	0.134	4,269	0.098
5686	--	3.06	--	--	--	8,575	0.197	11,477	0.263
5687	--	4.06	--	--	--	10,539	0.242	21,034	0.483
5yr=5687.22	--	4.28	--	--	--	10,921	0.251	23,395	0.537
100yr=5687.81	--	4.87	--	--	--	11,948	0.274	30,141	0.692
5688	--	5.06	--	--	--	12,279	0.282	32,443	0.745
5689	--	6.06	--	--	--	14,100	0.324	45,632	1.048

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Carriage Meadows South at Lorson Ranch

Basin ID: Full Spectrum Pond G3 - asbuilt



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.16	0.111	Orifice Plate
Zone 2 (EURV)	3.52	0.246	Rectangular Orifice
Zone 3 (100-year)	4.45	0.223	Weir&Pipe (Restrict)
		0.580	Total

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

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

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)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	4.236E-03	ft^2
Depth at top of Zone using Orifice Plate =	2.16	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	N/A	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	0.61	sq. inches (diameter = 7/8 inch)	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

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	0.70	1.45					
Orifice Area (sq. inches)	0.61	0.61	0.61					

	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)

	Zone 2 Rectangular	Not Selected	
Invert of Vertical Orifice =	2.16	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	3.80	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Height =	2.00	N/A	inches
Vertical Orifice Width =	2.00		inches

Calculated Parameters for Vertical Orifice

	Zone 2 Rectangular	Not Selected	
Vertical Orifice Area =	0.03	N/A	ft^2
Vertical Orifice Centroid =	0.08	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	3.50	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.00	N/A	feet
Overflow Weir Slope =	0.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	5.00	N/A	feet
Overflow Grate Open Area % =	70%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	3.50	N/A	feet
Over Flow Weir Slope Length =	5.00	N/A	feet
Grate Open Area / 100-yr Orifice Area =	7.92	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	14.00	N/A	ft^2
Overflow Grate Open Area w/ Debris =	7.00	N/A	ft^2

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

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	2.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	18.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	18.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	1.77	N/A	ft^2
Outlet Orifice Centroid =	0.75	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	3.14	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	4.56	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	30.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

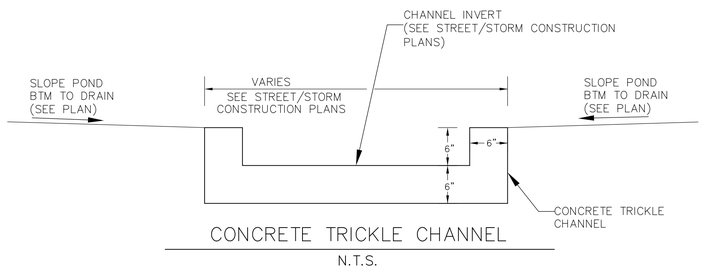
Calculated Parameters for Spillway

Spillway Design Flow Depth=	0.30	feet
Stage at Top of Freeboard =	5.86	feet
Basin Area at Top of Freeboard =	0.32	acres

asblt orifice-82.94

Routed Hydrograph Results

Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.16	1.44	1.68	1.92	2.16	2.42	0.00
Calculated Runoff Volume (acre-ft) =	0.111	0.357	0.283	0.378	0.501	0.678	0.802	0.966	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.110	0.356	0.283	0.377	0.501	0.678	0.802	0.966	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.02	0.17	0.57	0.80	1.08	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	0.1	0.1	1.0	3.5	4.8	6.5	0.0
Peak Inflow Q (cfs) =	1.7	5.4	4.3	5.8	7.6	10.3	12.1	14.6	#N/A
Peak Outflow Q (cfs) =	0.1	0.2	0.2	0.2	2.4	5.5	7.4	10.2	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	2.3	2.3	1.6	1.5	1.6	#N/A
Structure Controlling Flow =	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.1	0.4	0.5	0.7	#N/A
Max Velocity through Grate 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) =	29	42	39	42	42	40	39	37	#N/A
Time to Drain 99% of Inflow Volume (hours) =	31	46	43	47	47	46	45	44	#N/A
Maximum Ponding Depth (ft) =	2.07	3.35	3.01	3.44	3.64	3.76	3.82	3.90	#N/A
Area at Maximum Ponding Depth (acres) =	0.13	0.21	0.19	0.21	0.22	0.23	0.23	0.23	#N/A
Maximum Volume Stored (acre-ft) =	0.098	0.320	0.254	0.342	0.385	0.412	0.426	0.445	#N/A

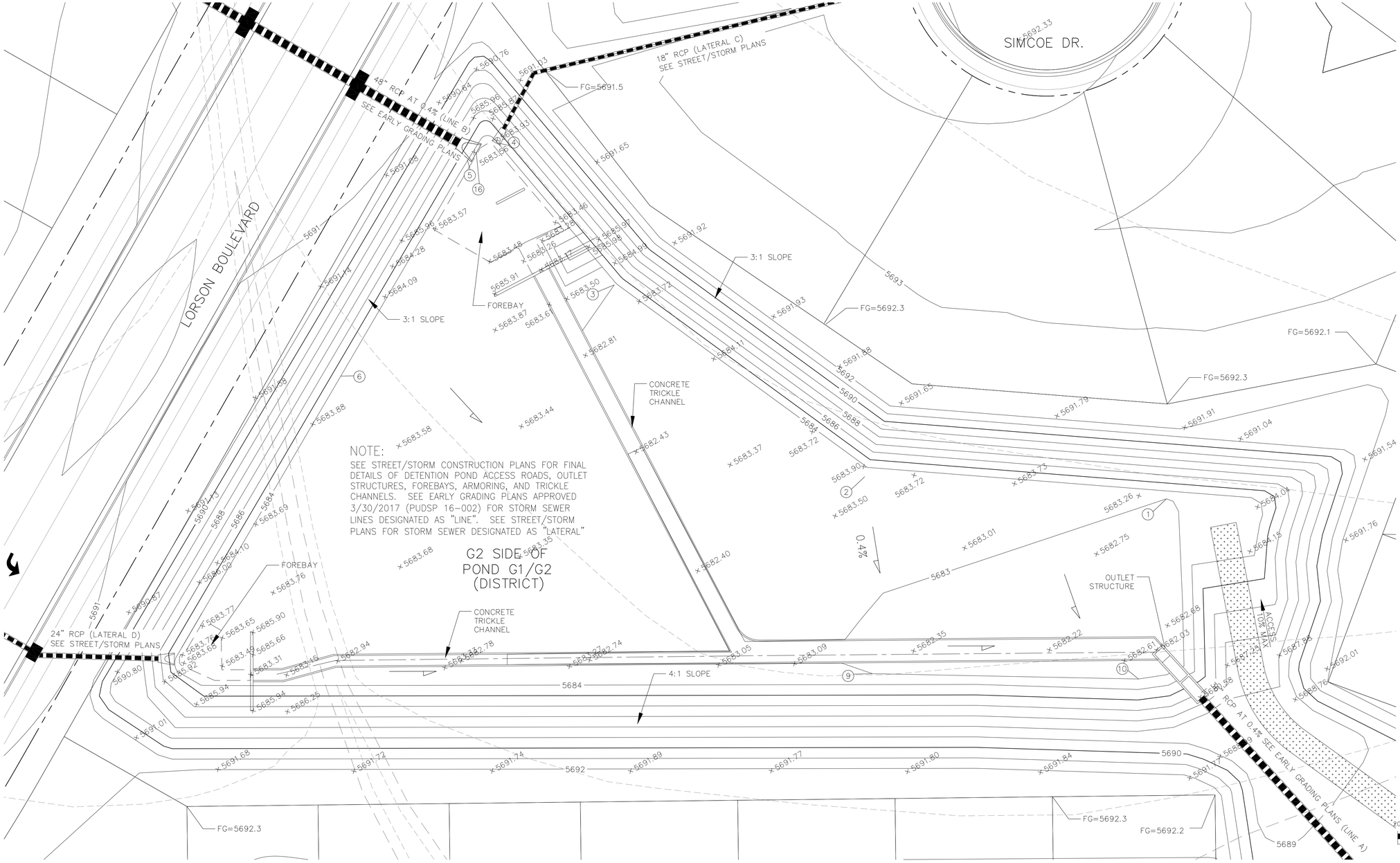


CONCRETE TRICKLE CHANNEL

N.T.S.

POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20426.91	20695.07	5683.00	POND BOTTOM
2	20435.42	20580.07	5683.19	POND BOTTOM
3	20508.55	20484.61	5683.80	POND BOTTOM
4	20562.75	20440.18	5684.00	POND BOTTOM
5	20556.24	20428.64	5684.00	POND BOTTOM
6	20473.78	20380.35	5684.00	POND BOTTOM
9	20360.30	20583.01	5683.00	POND BOTTOM

POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
10	20358.26	20684.49	5683.00	POND BOTTOM
16	20558.92	20432.02	5683.55	INVERT 48" RCP



CORE ENGINEERING GROUP
15004 1ST AVE. S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

DATE

DESCRIPTION

NO.

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
AT LORSON RANCH FIL. NO. 1
FONTAINE BLVD. - CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

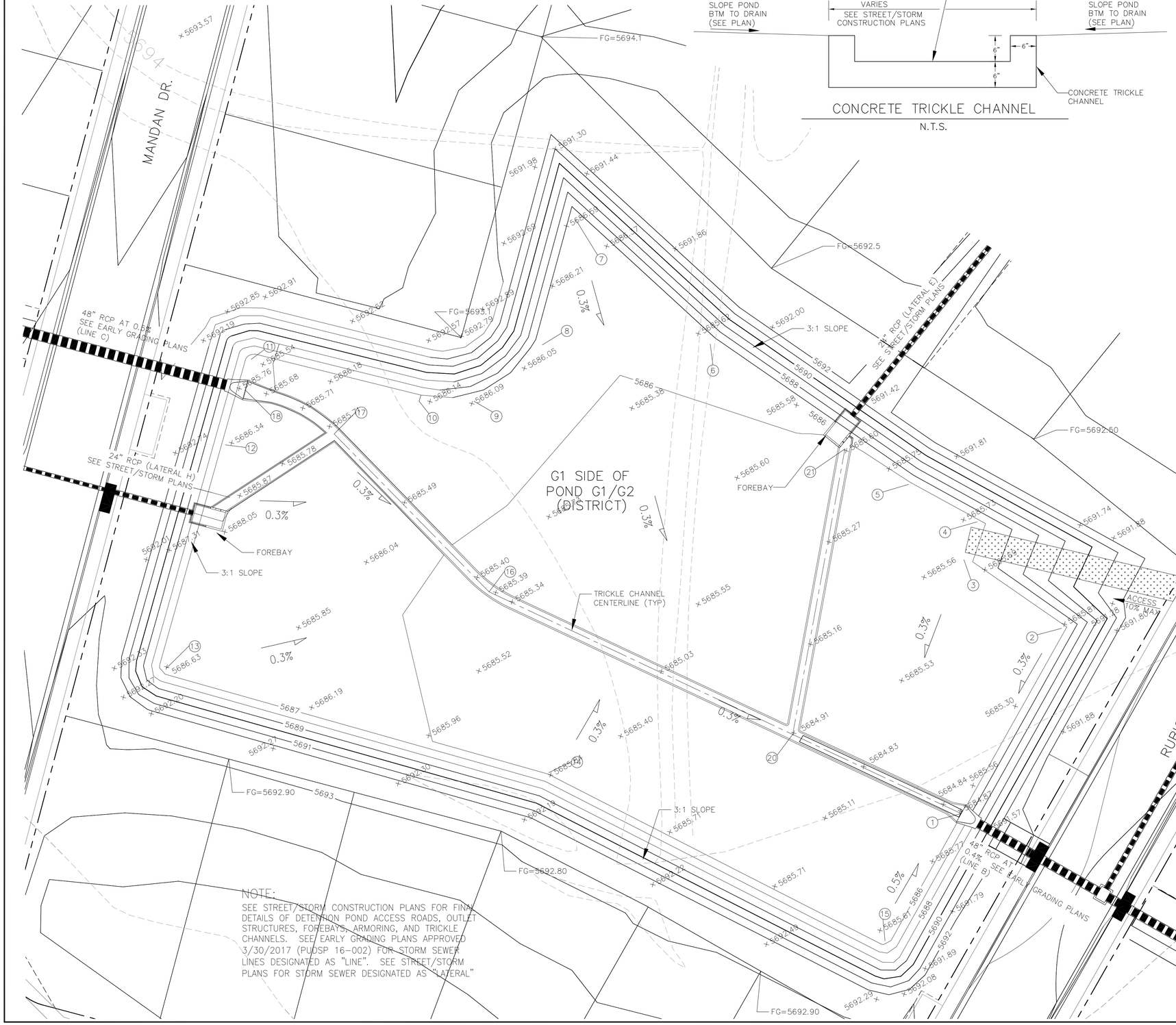
G2 SIDE OF DETENTION POND G1/G2 (DISTRICT) CARRIAGE MEADOWS SOUTH

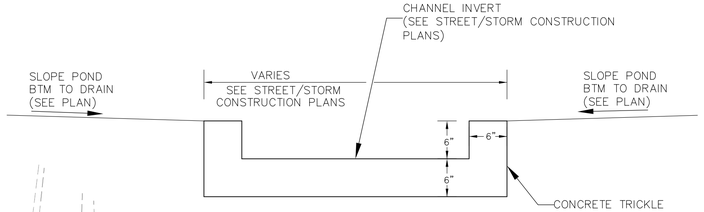
DATE
AUGUST 10, 2017

PROJECT NO.
100.030

SHEET NUMBER
C4.4

TOTAL SHEETS: 12





CONCRETE TRICKLE CHANNEL

N.T.S.

POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20714.71	20158.47	5684.80	INV 48" RCP (LINE B)
2	20786.15	20197.19	5685.54	POND BOTTOM
3	20812.62	20159.51	5685.65	POND BOTTOM
4	20827.21	20164.67	5685.70	POND BOTTOM
5	20841.64	20138.20	5685.74	POND BOTTOM
6	20895.71	20061.76	5686.10	POND BOTTOM
7	20943.87	20009.80	5686.20	POND BOTTOM
8	20895.38	19997.02	5686.11	POND BOTTOM
9	20873.70	19970.67	5686.17	POND BOTTOM
10	20873.69	19949.53	5686.21	POND BOTTOM
11	20889.83	19884.81	5686.30	POND BOTTOM
12	20856.85	19874.86	5686.55	POND BOTTOM
13	20770.85	19852.26	5686.28	POND BOTTOM
14	20730.51	19999.53	5685.88	POND BOTTOM
15	20665.63	20129.13	5685.60	POND BOTTOM
16	20800.21	19976.50	5685.40	TRICKLE CHANNEL INVERT
17	20861.06	19916.81	5685.66	TRICKLE CHANNEL INVERT
18	20878.04	19882.51	5685.80	INV 48" RCP (LINE C)
20	20745.23	20093.52	5685..01	TRICKLE CHANNEL INVERT
21	20855.30	20113.66	5685.45	TRICKLE CHANNEL INVERT

NOTE:
SEE STREET/STORM CONSTRUCTION PLANS FOR FINAL DETAILS OF DETENTION POND ACCESS ROADS, OUTLET STRUCTURES, FOREBAYS, ARMORING, AND TRICKLE CHANNELS. SEE EARLY GRADING PLANS APPROVED 3/30/2017 (PUDSP 16-002) FOR STORM SEWER LINES DESIGNATED AS "LINE". SEE STREET/STORM PLANS FOR STORM SEWER DESIGNATED AS "LATERAL"

AS-BUILT
DATE: APRIL 6, 2018

-N-

20 10 0 20 40
SCALE: 1"=20'

CORE ENGINEERING GROUP
15004 1ST AVE. S.
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PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlcs@coeg.com

DATE
DESCRIPTION
NO.

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
AT LORSON RANCH FIL. NO. 1
FONTAINE BLVD. - CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

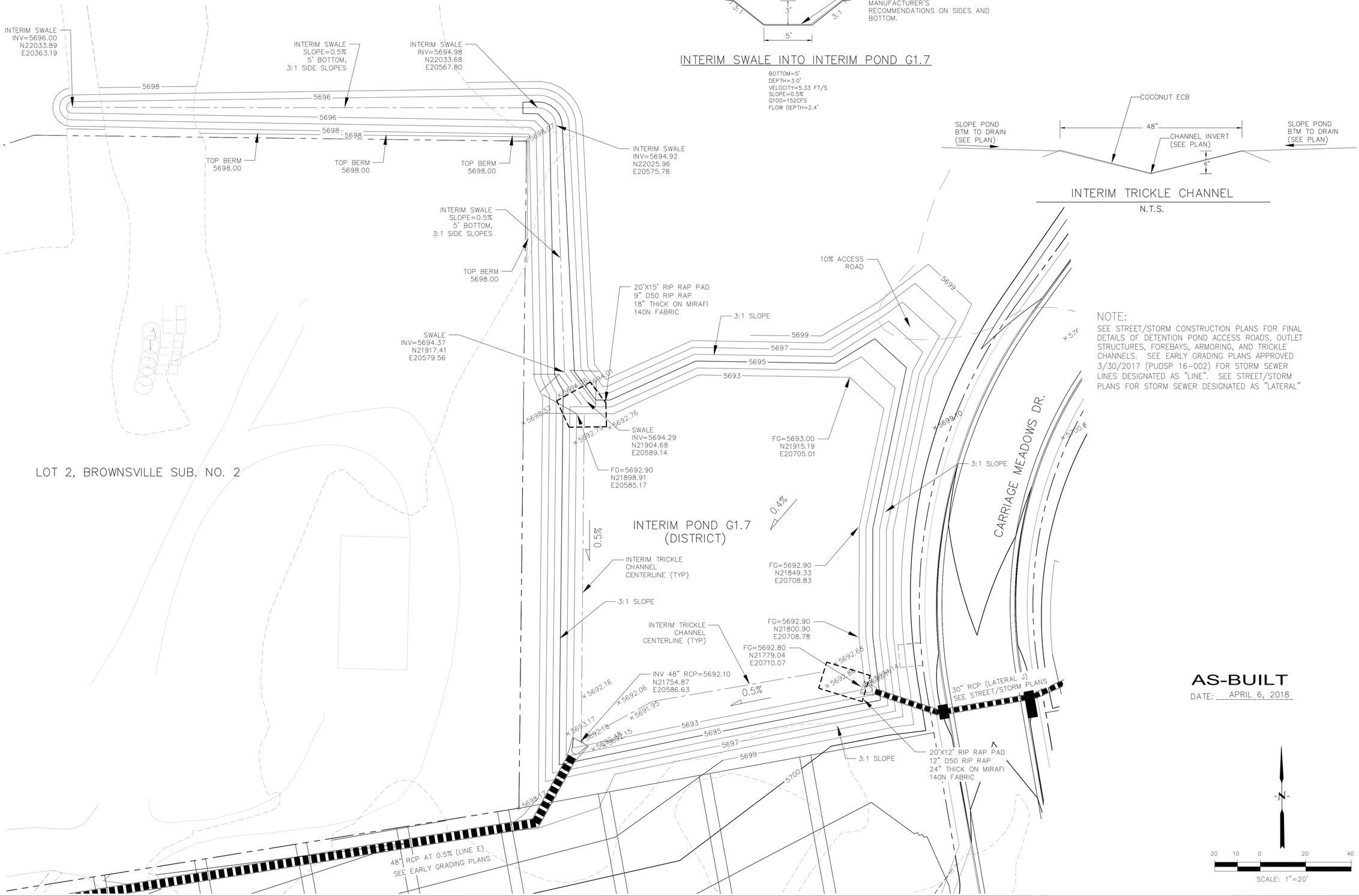
G1 SIDE OF DETENTION POND G1/G2 (DISTRICT) CARRIAGE MEADOWS SOUTH

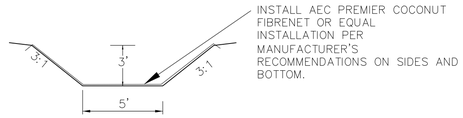
DATE
AUGUST 10, 2017

PROJECT NO.
100.030

SHEET NUMBER
C4.5

TOTAL SHEETS: 12





INTERIM SWALE INTO INTERIM POND G1.7

BOTTOM=5'
DEPTH=3.0'
VELOCITY=5.33 FT/S
SLOPE=0.5%
Q100=152CFS
FLOW DEPTH=2.4'

INTERIM TRICKLE CHANNEL

N.T.S.

NOTE:
SEE STREET/STORM CONSTRUCTION PLANS FOR FINAL DETAILS OF DETENTION POND ACCESS ROADS, OUTLET STRUCTURES, FOREBAYS, ARMORING, AND TRICKLE CHANNELS. SEE EARLY GRADING PLANS APPROVED 3/30/2017 (PUDSP 16-002) FOR STORM SEWER LINES DESIGNATED AS "LINE". SEE STREET/STORM PLANS FOR STORM SEWER DESIGNATED AS "LATERAL"

AS-BUILT
DATE: APRIL 6, 2018

SCALE: 1"=20'

CORE ENGINEERING GROUP
15004 1ST AVE. S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlschindler@ceg1.com

NO. | DESCRIPTION | DATE

PREPARED FOR:
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212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
AT LORSON RANCH FIL. NO. 1
FONTAINE BLVD. - CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

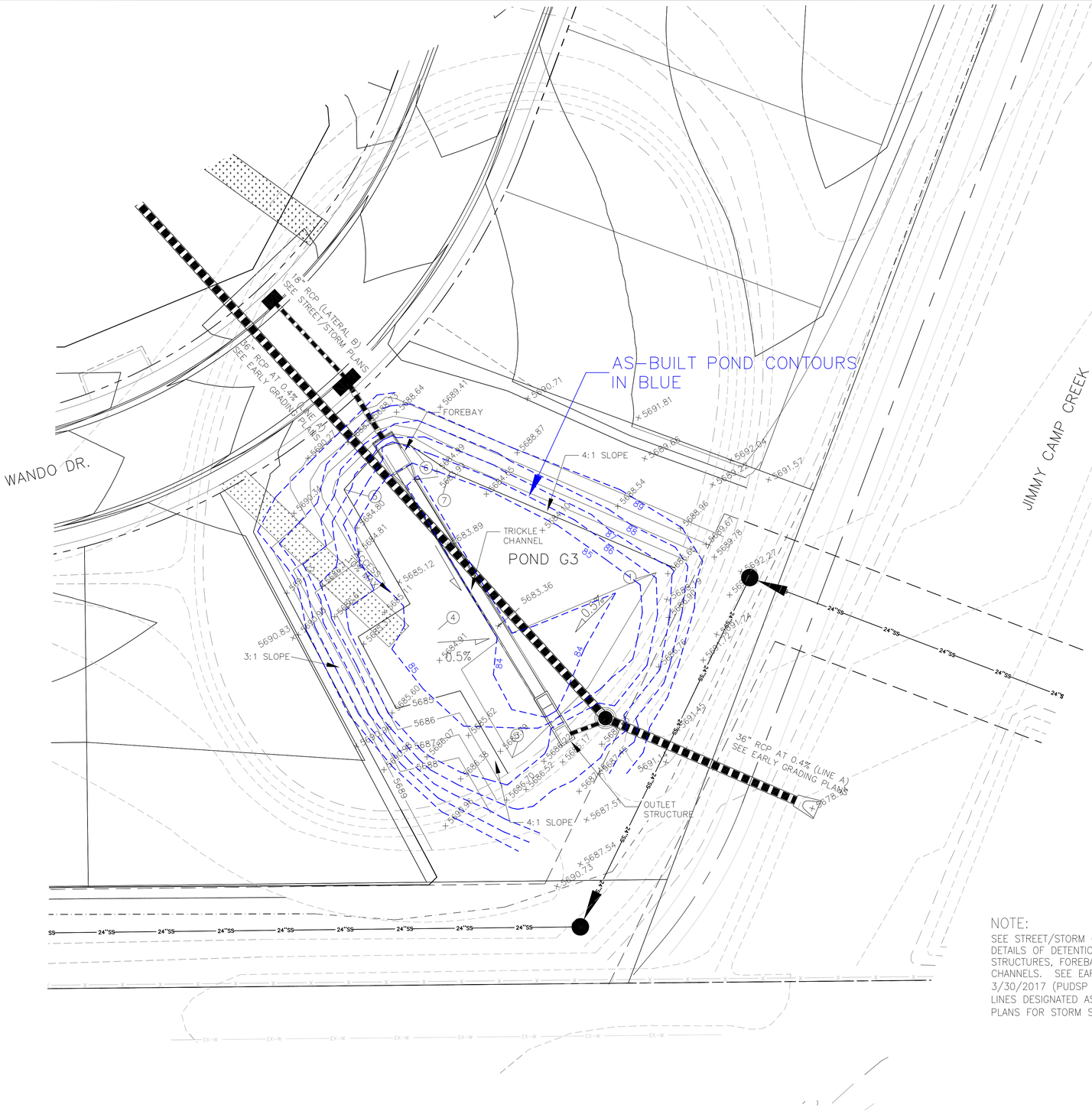
(DISTRICT)
INTERIM DETENTION POND G1.7
CARRIAGE MEADOWS SOUTH

DATE
AUGUST 10, 2017

PROJECT NO.
100.030

SHEET NUMBER
C4.6

TOTAL SHEETS: 12



POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20152.70	20951.65	5684	POND BOTTOM
3	20088.79	20901.93	5684	POND BOTTOM
4	20133.08	20876.39	5684.20	POND BOTTOM
5	20181.43	20843.88	5685	POND BOTTOM
6	20196.53	20866.94	5685	POND BOTTOM
7	20187.57	20880.42	5685	POND BOTTOM

NOTE:
SEE STREET/STORM CONSTRUCTION PLANS FOR FINAL DETAILS OF DETENTION POND ACCESS ROADS, OUTLET STRUCTURES, FOREBAYS, ARMORING, AND TRICKLE CHANNELS. SEE EARLY GRADING PLANS APPROVED 3/30/2017 (PUDSP 16-002) FOR STORM SEWER LINES DESIGNATED AS "LINE". SEE STREET/STORM PLANS FOR STORM SEWER DESIGNATED AS "LATERAL"

AS-BUILT
DATE: APRIL 6, 2018

20 10 0 20 40
SCALE: 1"=20'

CORE ENGINEERING GROUP
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PH: 719.570.1100
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NO. | DESCRIPTION | DATE

PREPARED FOR:
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(719) 635-3200
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PROJECT:
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AT LORSON RANCH FIL. NO. 1
FONTAINE BLVD. - CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

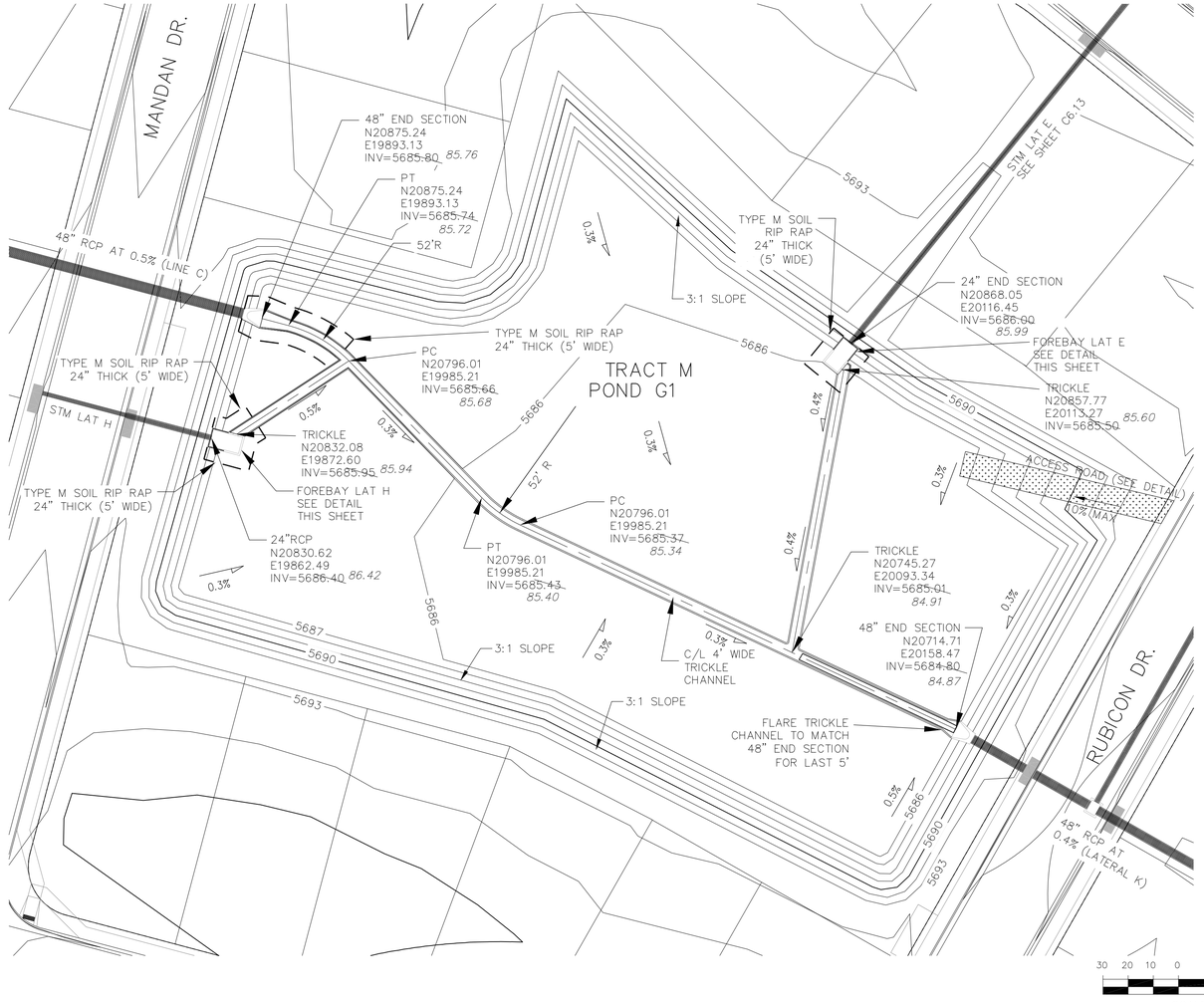
DETENTION POND G3 (DISTRICT)
CARRIAGE MEADOWS SOUTH

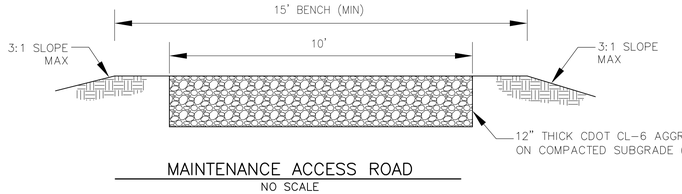
DATE
AUGUST 10, 2017

PROJECT NO.
100.030

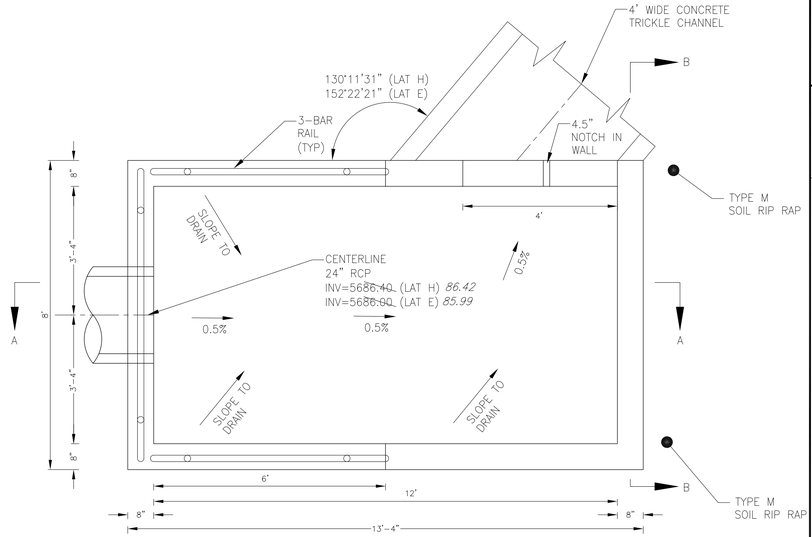
SHEET NUMBER
C4.8

TOTAL SHEETS: 12

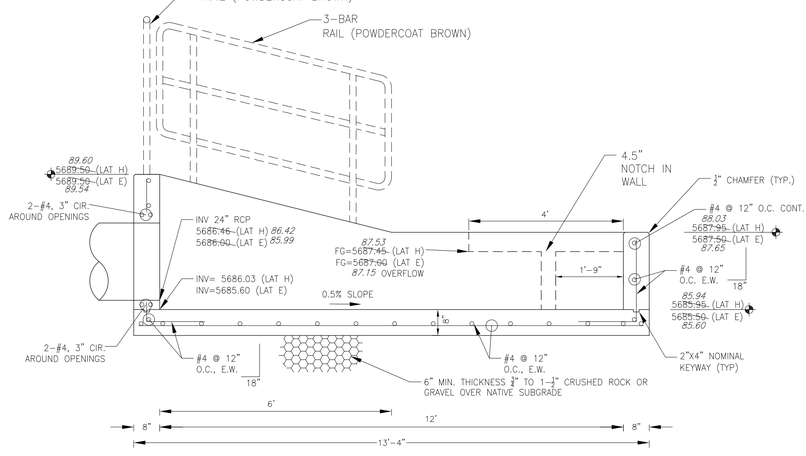




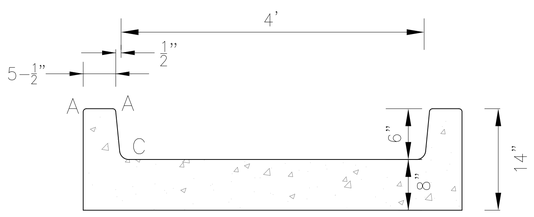
MAINTENANCE ACCESS ROAD
NO SCALE



FOREBAY DETAIL
NO SCALE

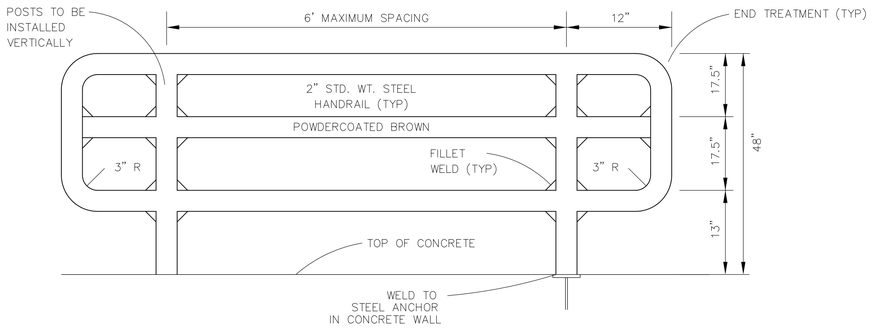


FOREBAY SECTION A–A
NO SCALE

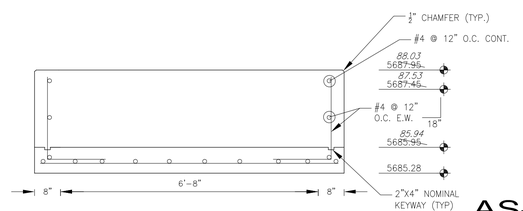


TRICKLE CHANNEL DETAIL
NO SCALE

LENGTH FOR RADII
A = 1/2"
C = 1-1/2"



3–BAR RAIL DETAIL
NO SCALE



FOREBAY SECTION B–B
NO SCALE

AS-BUILT
DATE: APRIL 6, 2018

CORE ENGINEERING GROUP
15004 1ST AVE. S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlschindler@ceg-i.com

DATE
DESCRIPTION
NO.

PREPARED FOR:
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COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
AT LORSON RANCH FIL. NO. 1
FONTAINE BLVD. – CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

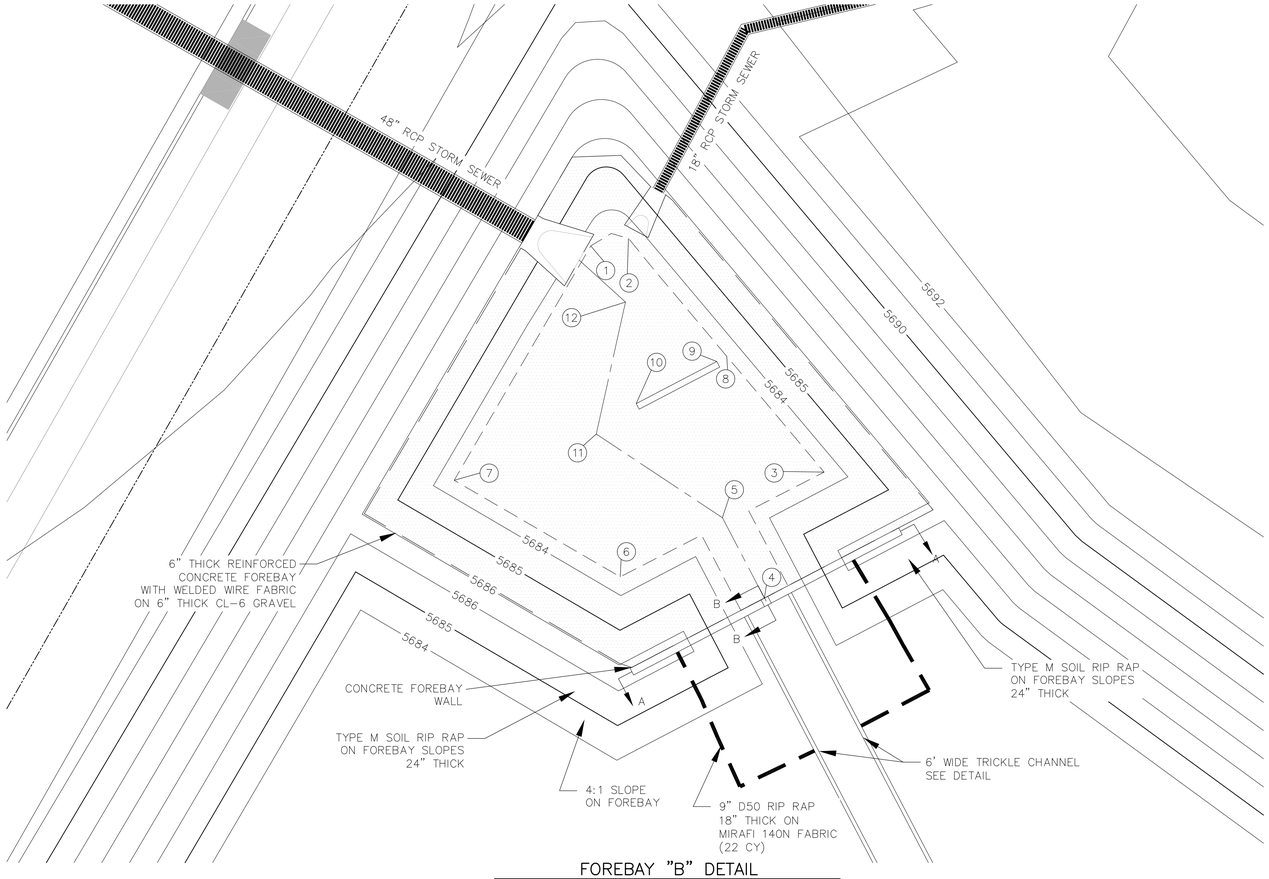
POND G1/G2 (DISTRICT)
G1 SIDE OF POND
TRICKLE AND FOREBAY DETAILS

DATE
AUGUST 28, 2017

PROJECT NO.
100.030

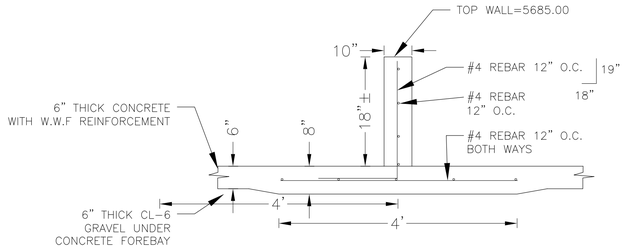
SHEET NUMBER
C9.1

TOTAL SHEETS: 39



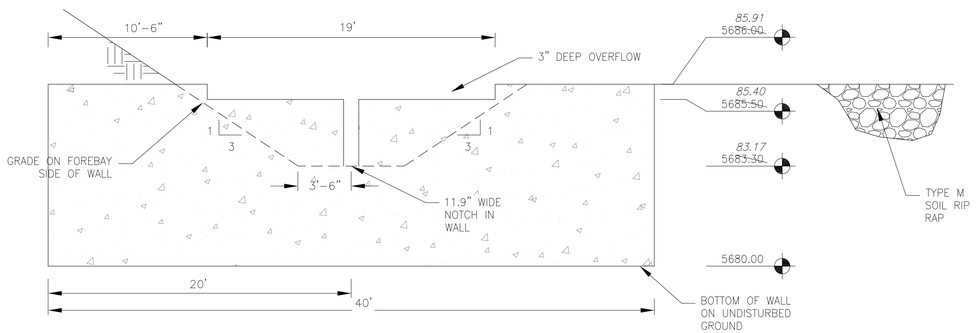
FOREBAY "B" DETAIL
1"=10'

POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20560.79	20433.55	5683.54	FOREBAY BOTTOM
2	20561.80	20438.53	5683.54	FOREBAY BOTTOM
3	20530.94	20464.35	5683.54	FOREBAY BOTTOM
4	20514.32	20456.47	5683.30	FOREBAY BOTTOM
5	20524.93	20450.92	5683.35	FOREBAY BOTTOM
6	20517.12	20437.44	5683.54	FOREBAY BOTTOM
7	20529.87	20415.52	5683.54	FOREBAY BOTTOM
8	20546.23	20451.50	5683.54	FOREBAY BOTTOM
9	20545.54	20450.19	5683.53	ENERGY DISSIPATER WALL
10	20539.98	20439.55	5683.48	ENERGY DISSIPATER WALL
11	20535.97	20434.28	5683.43	FOREBAY BOTTOM
12	20553.38	20438.13	5683.50	FOREBAY BOTTOM

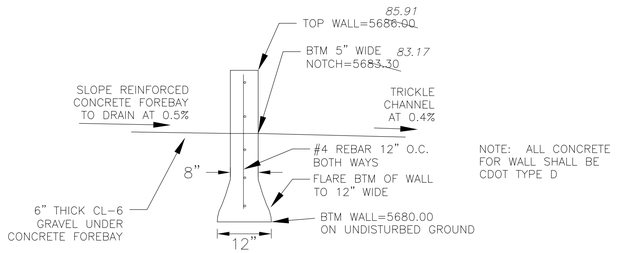


ENERGY DISSIPATER WALL
NO SCALE

NOTE: ALL CONCRETE FOR WALL SHALL BE CDOT TYPE D



WALL SECTION A-A
1"=10'



WALL SECTION B-B
NO SCALE

NOTE: ALL CONCRETE FOR WALL SHALL BE CDOT TYPE D

AS-BUILT
DATE: APRIL 6, 2018

CORE ENGINEERING GROUP
15004 1ST AVE. S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlcs@ceg1.com

NO. | DESCRIPTION | DATE

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
AT LORSON RANCH FIL. NO. 1
FONTAINE BLVD. - CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

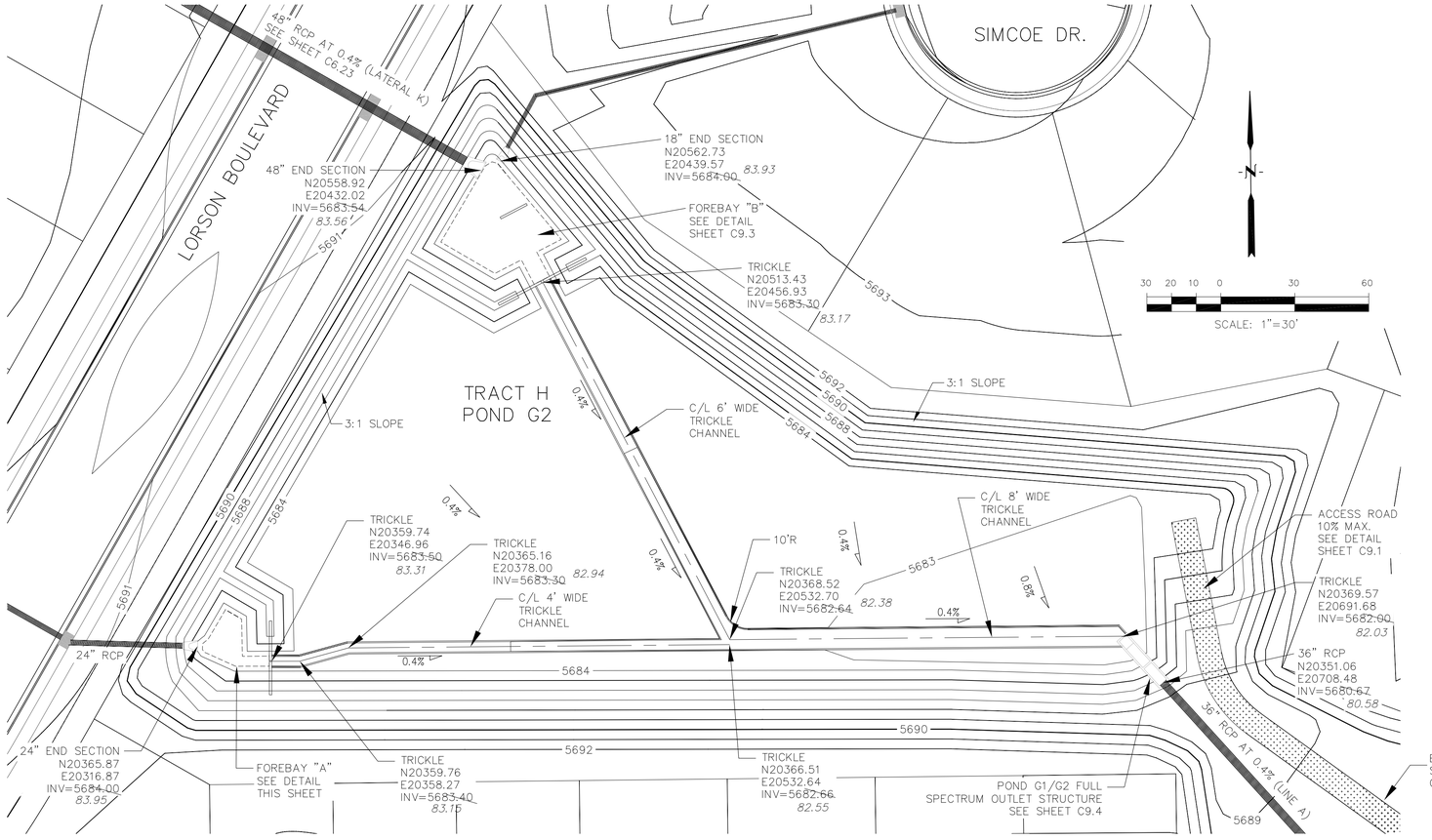
POND G1/G2 (DISTRICT)
G2 SIDE OF POND - FOREBAY "B"
TRICKLE AND FOREBAY DETAILS

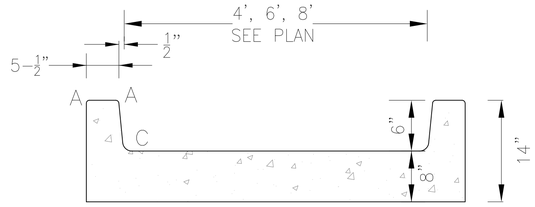
DATE
AUGUST 28, 2017

PROJECT NO.
100.030

SHEET NUMBER
C9.3

TOTAL SHEETS: 39

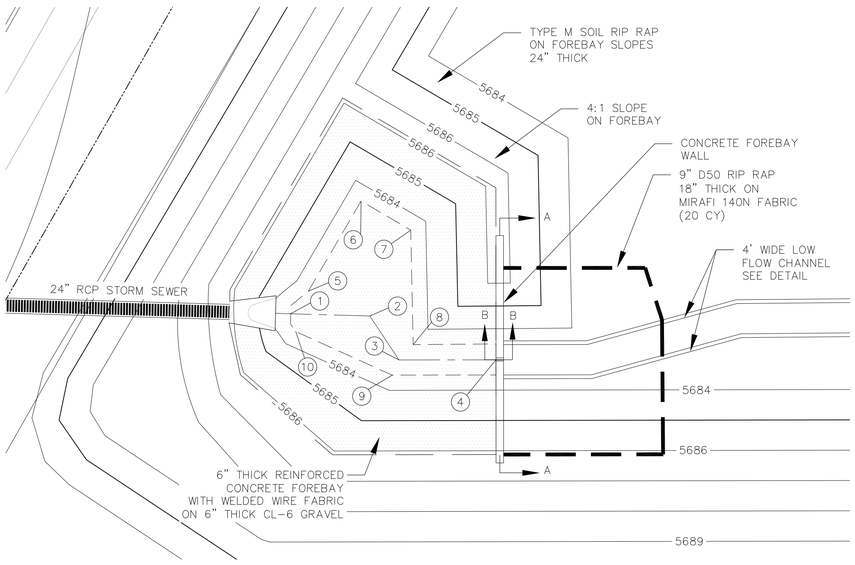




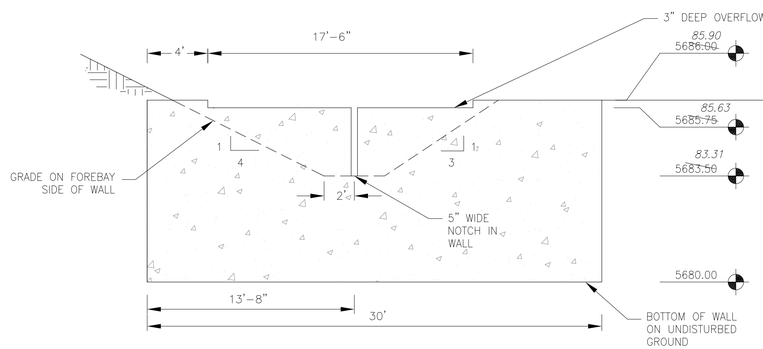
TRICKLE CHANNEL DETAIL
NO SCALE

LENGTH FOR RADII
A = 1/2"
C = 1-1/2"

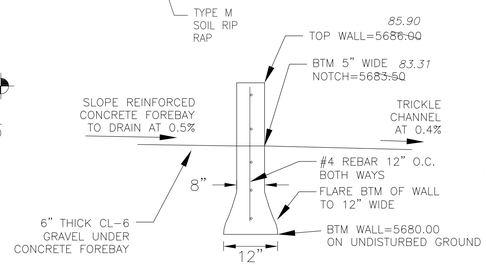
POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20365.82	20318.86	5683.65	FOREBAY BOTTOM
2	20365.52	20329.30	5683.60	FOREBAY BOTTOM
3	20359.71	20333.16	5683.57	FOREBAY BOTTOM
4	20359.74	20345.96	5683.50	FOREBAY BOTTOM
5	20368.80	20321.19	5683.67	FOREBAY BOTTOM
6	20380.69	20328.16	5683.67	FOREBAY BOTTOM
7	20376.85	20334.70	5683.66	FOREBAY BOTTOM
8	20361.75	20335.03	5683.58	FOREBAY BOTTOM
9	20357.71	20332.26	5683.58	FOREBAY BOTTOM
10	20363.46	20319.53	5683.67	FOREBAY BOTTOM



FOREBAY "A" DETAIL
1"=10'



WALL SECTION A-A
1"=10'



WALL SECTION B-B
NO SCALE

NOTE: ALL CONCRETE FOR WALL SHALL BE CDOT TYPE D

AS-BUILT
DATE: APRIL 6, 2018

CORE ENGINEERING GROUP
15004 1ST AVE. S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlcs@ceg1.com

NO. | DESCRIPTION | DATE

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
AT LORSON RANCH FIL. NO. 1
FONTAINE BLVD. - CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

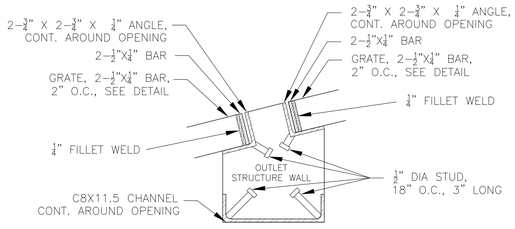
POND G1/G2 (DISTRICT)
G2 SIDE OF POND
TRICKLE AND FOREBAY DETAILS

DATE
AUGUST 28, 2017

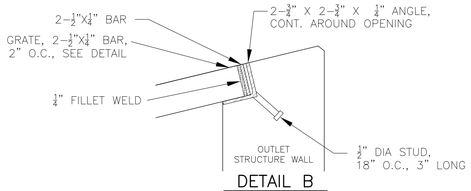
PROJECT NO.
100.030

SHEET NUMBER
C9.2

TOTAL SHEETS: 39

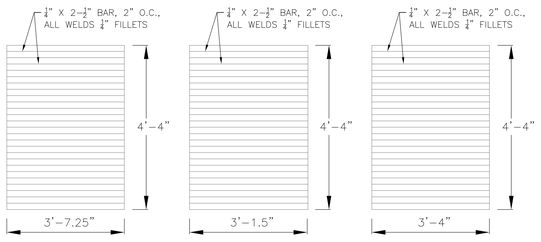


DETAIL A
NO SCALE



DETAIL B
NO SCALE

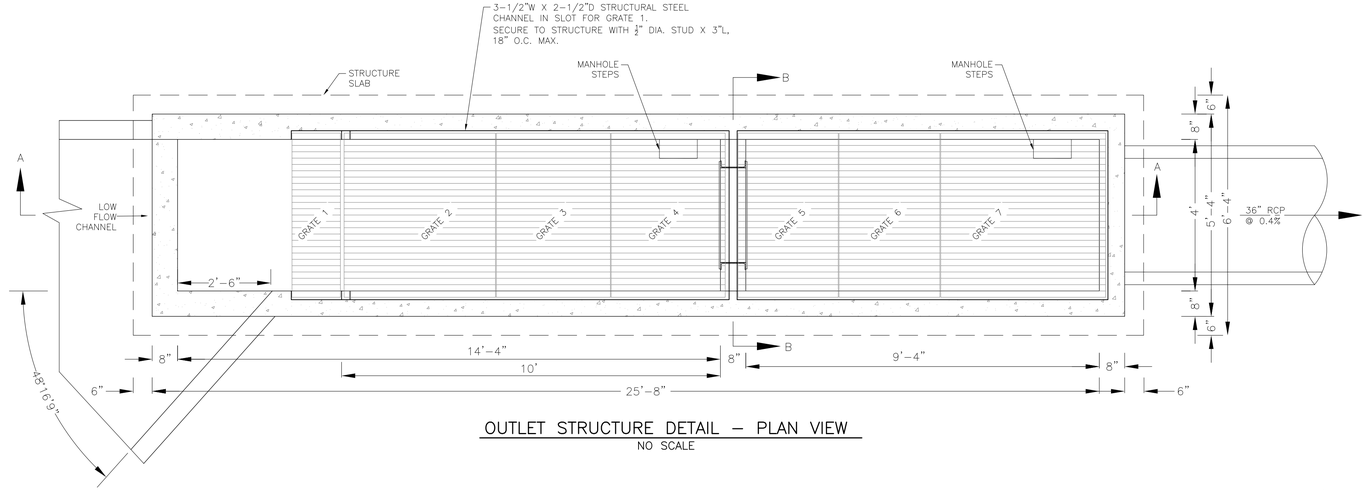
NOTE:
AFTER CONCRETE STRUCTURE HAS BEEN POURED ALL GRATE DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO GRATE CONSTRUCTION



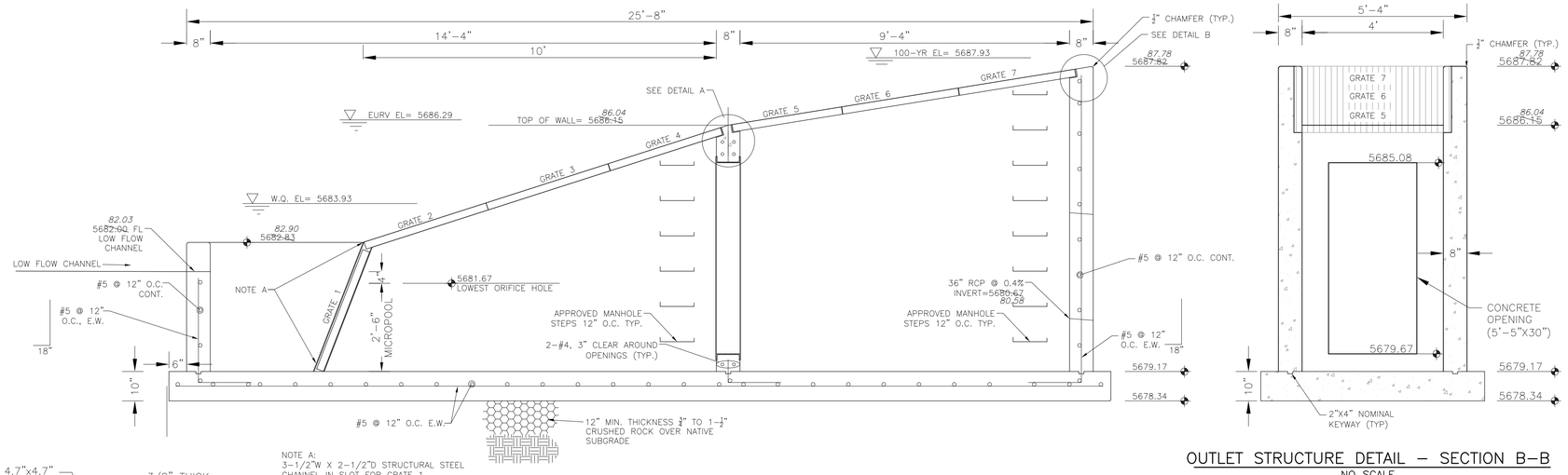
GRATE 1,2,3
NO SCALE

GRATE 5
NO SCALE

GRATE 4, 6, 7
NO SCALE

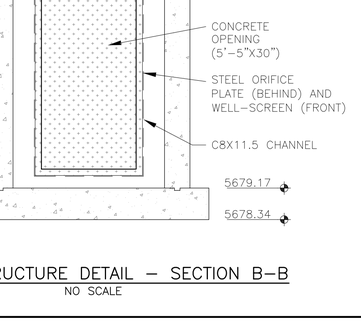


OUTLET STRUCTURE DETAIL – PLAN VIEW
NO SCALE

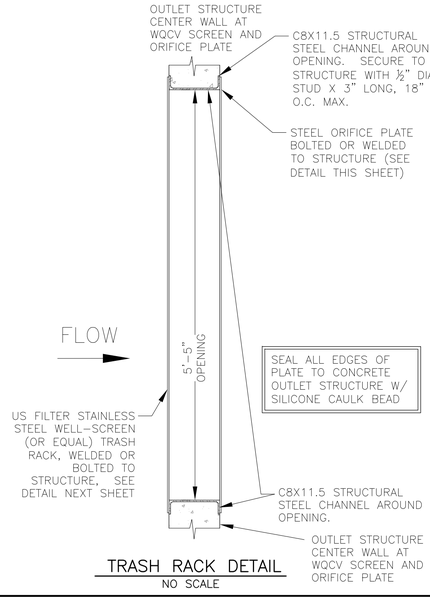


NOTE A:
3–1/2"W X 2–1/2"D STRUCTURAL STEEL CHANNEL IN SLOT FOR GRATE 1.
SECURE TO STRUCTURE WITH ½" DIA. STUD X 3"L, 18" O.C. MAX.

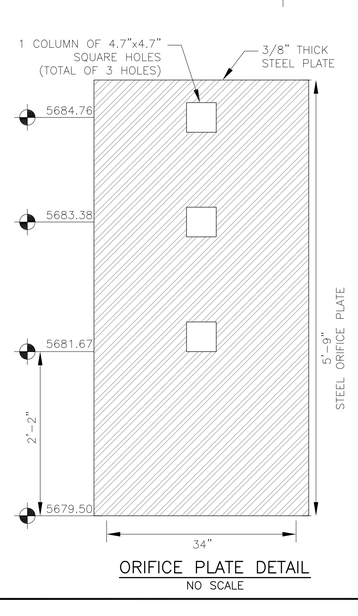
OUTLET STRUCTURE DETAIL – SECTION A–A
NO SCALE



OUTLET STRUCTURE DETAIL – SECTION B–B
NO SCALE



TRASH RACK DETAIL
NO SCALE



ORIFICE PLATE DETAIL
NO SCALE

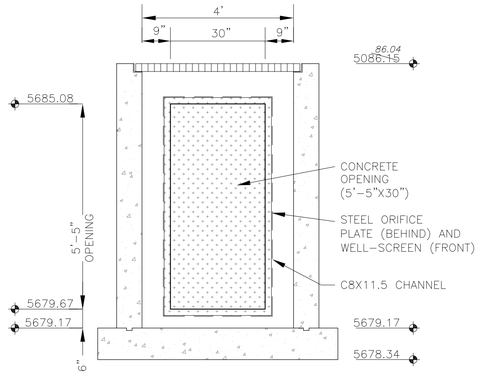
OUTLET STRUCTURE, FOREBAY, AND DRAIN CHANNEL NOTES:

1. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR ALL COMPONENTS OF THE OUTLET STRUCTURE.
2. GRADE 60 REINFORCING STEEL REQUIRED. SEE TABLE FOR THE MINIMUM LAP SPLICE LENGTH FOR REINFORCING BARS. ALL REINFORCING STEEL SHALL HAVE A TWO–INCH MINIMUM CLEARANCE FROM EDGE OF CONCRETE, UNLESS OTHERWISE NOTED.

BAR SIZE	#4	#5	#6
MIN. SPLICE LENGTH	1'–3"	1'–7"	2'–0"

3. CONCRETE FOR THE OUTLET STRUCTURE AND FOREBAY SHALL BE CDOT CLASS D CONCRETE.
4. CONCRETE FOR DRAIN CHANNELS SHALL BE CDOT CLASS B CONCRETE
5. EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M–213. EXPANSION JOINT MATERIAL SHALL BE ½" THICK, SHALL EXTEND THE FULL DEPTH OF CONTACT SURFACE AND THE JOINT SHALL BE SEALED, REFER TO DETAILS.
6. ALL EXPOSED CONCRETE CORNERS SHALL HAVE A ⅜" CHAMFER UNLESS OTHERWISE NOTED.
7. SUBGRADE TO BE 12" THICK CLEAN FILL COMPACTED TO 95% STANDARD PROCTOR DENSITY PER ASTM M698 UNDER STRUCTURE.
8. REFER TO SHEET XX FOR PRESEDIMENTATION/FOREBAY DESIGN.
9. ENGINEER SHALL BE NOTIFIED PRIOR TO BEGINNING CONSTRUCITON OF OUTLET STRUCTURE TO SCHEDULE OBSERVATION VISITS FOR STRUCTURES.

AS-BUILT
DATE: APRIL 6, 2018



OUTLET STRUCTURE DETAIL – SECTION B–B
NO SCALE

CORE ENGINEERING GROUP
15004 1ST AVENUE S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlschindler@ceg1.com

DATE

DESCRIPTION

NO.

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVENUE, SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635–3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
FONTAINE BLVD.–MARKSHEFFEL RD
COLORADO SPRINGS, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

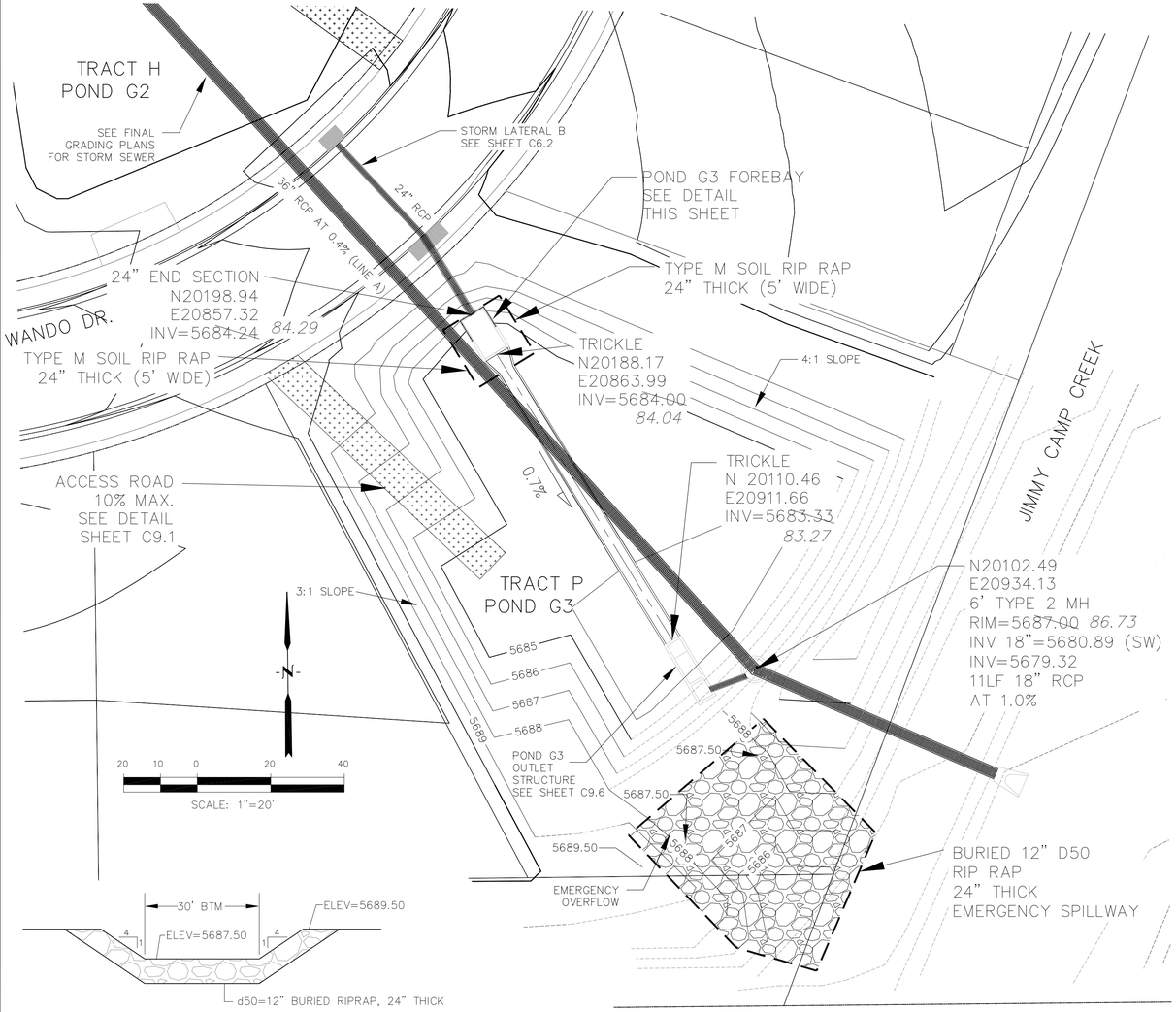
POND G1/G2
FULL SPECTRUM
OUTLET STRUCTURE DETAILS

DATE:
AUGUST 28, 2017

PROJECT NO.
100.030

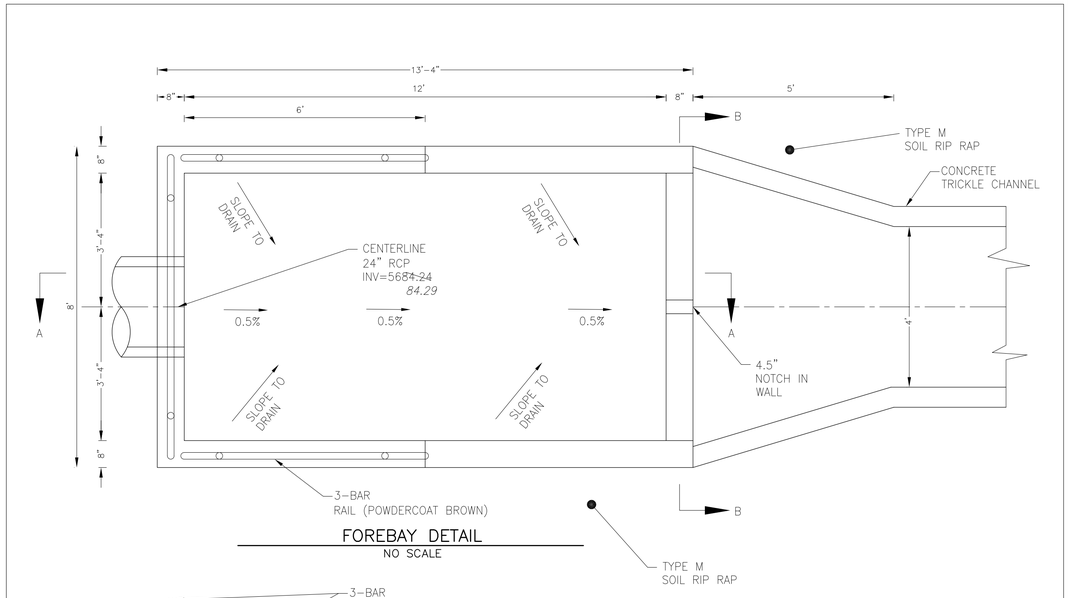
SHEET NUMBER
C9.4

TOTAL SHEETS: 39



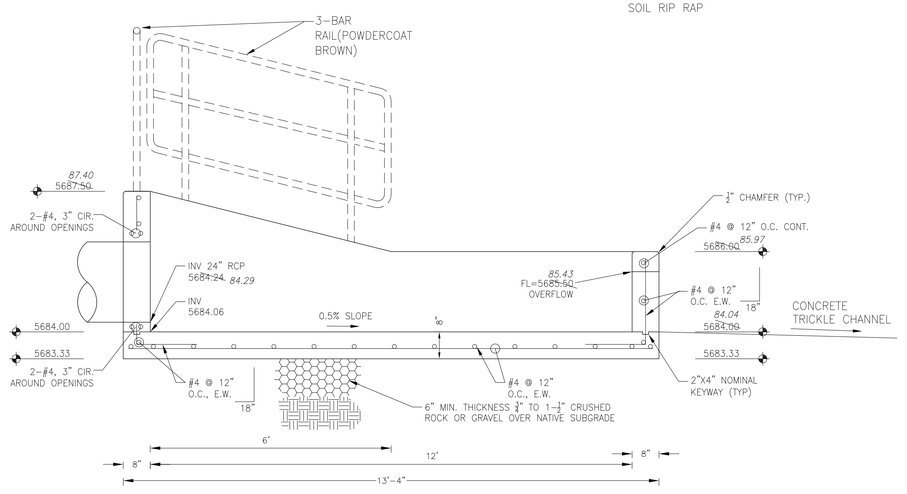
EMERGENCY SPILLWAY DETAIL

SCALE: NTS



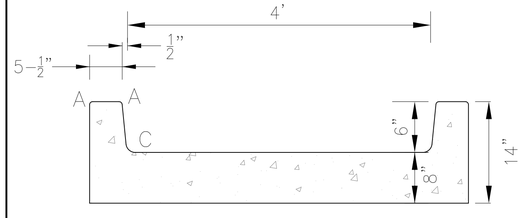
FOREBAY DETAIL

NO SCALE



FOREBAY SECTION A-A

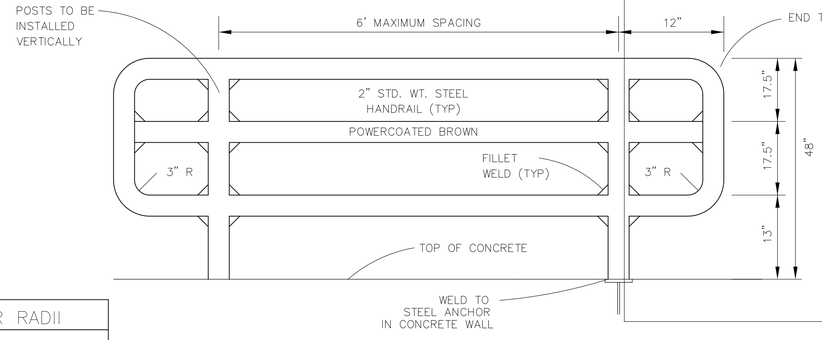
NO SCALE



TRICKLE CHANNEL DETAIL

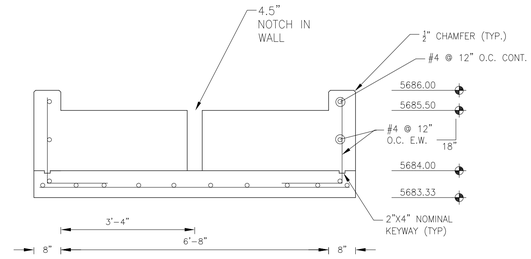
NO SCALE

LENGTH FOR RADII
A = 1/2"
C = 1-1/2"



3-BAR RAIL DETAIL

NO SCALE



FOREBAY SECTION B-B

NO SCALE

AS-BUILT

DATE: APRIL 6, 2018

CORE ENGINEERING GROUP
15004 1ST AVE. S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlcs@ceg1.com

NO.	DESCRIPTION	DATE

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
AT LORSON RANCH FIL. NO. 1
FONTAINE BLVD. - CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

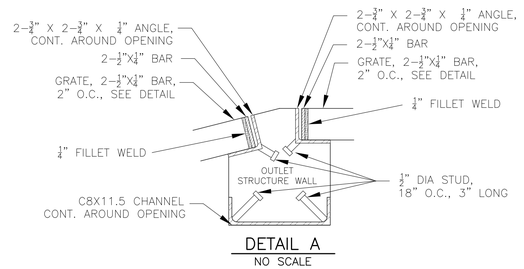
POND G3 (DISTRICT)
TRICKLE AND FOREBAY DETAILS

DATE
AUGUST 28, 2017

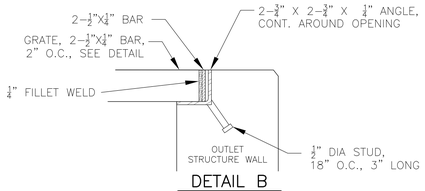
PROJECT NO.
100.030

SHEET NUMBER
C9.5

TOTAL SHEETS: 39

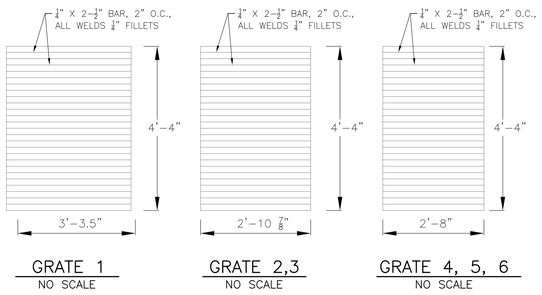


DETAIL A
NO SCALE



DETAIL B
NO SCALE

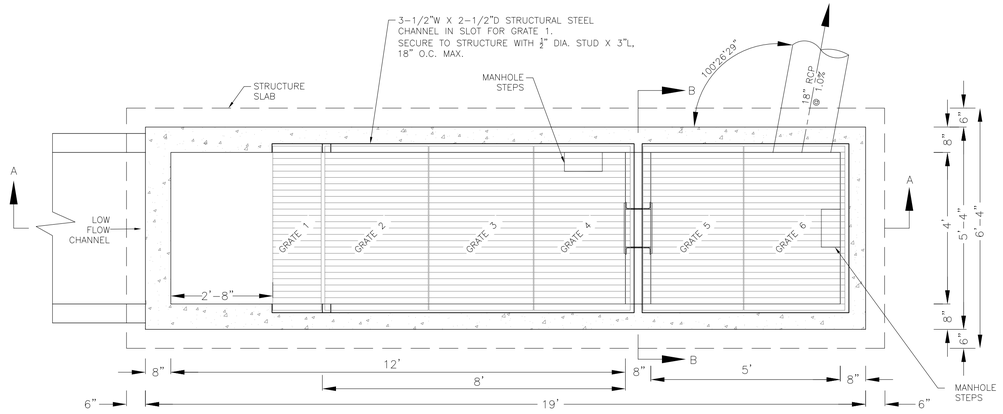
NOTE:
AFTER CONCRETE STRUCTURE HAS BEEN POURED
ALL GRATE DIMENSIONS SHALL BE FIELD VERIFIED
PRIOR TO GRATE CONSTRUCTION



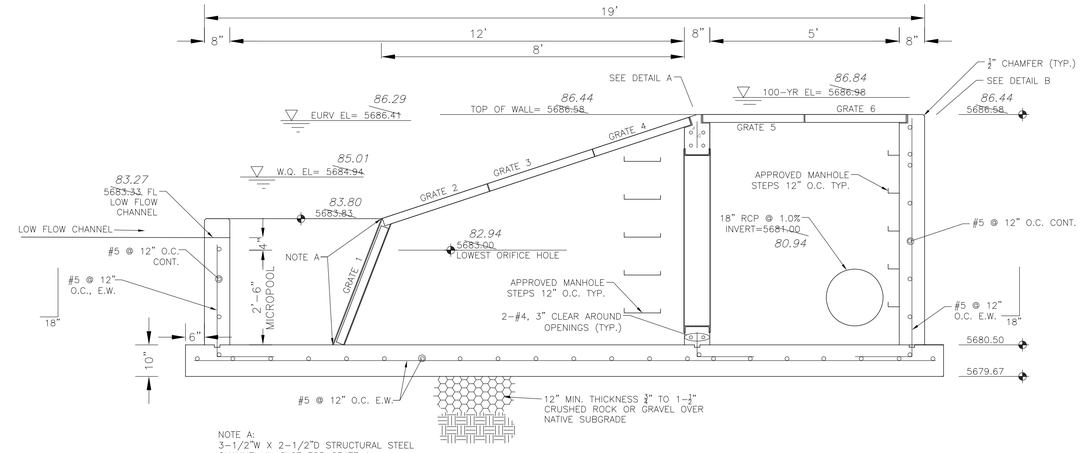
GRATE 1
NO SCALE

GRATE 2,3
NO SCALE

GRATE 4, 5, 6
NO SCALE

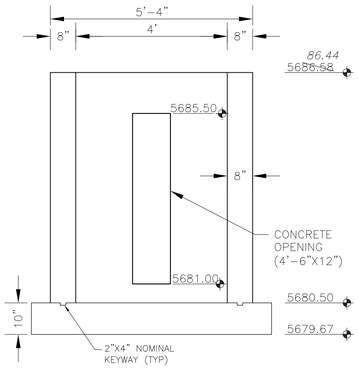


OUTLET STRUCTURE DETAIL – PLAN VIEW
NO SCALE

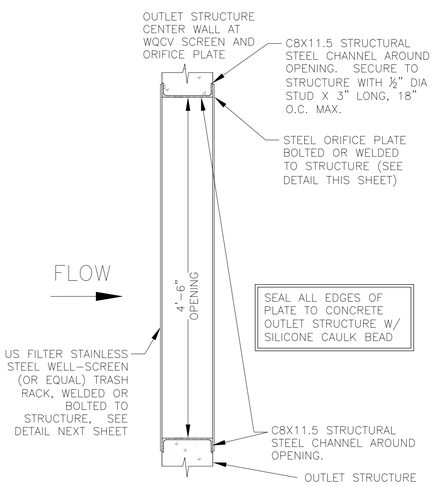


NOTE A:
3–1/2"W X 2–1/2"D STRUCTURAL STEEL CHANNEL IN SLOT FOR GRATE 1.
SECURE TO STRUCTURE WITH ½" DIA. STUD X 3"L, 18" O.C. MAX.

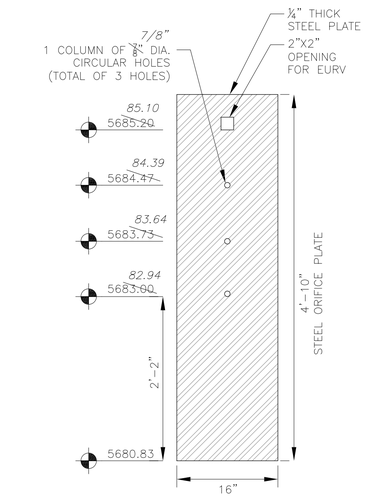
OUTLET STRUCTURE DETAIL – SECTION A–A
NO SCALE



OUTLET STRUCTURE DETAIL – SECTION B–B
NO SCALE



TRASH RACK DETAIL
NO SCALE



ORIFICE PLATE DETAIL
NO SCALE

OUTLET STRUCTURE, FOREBAY, AND DRAIN CHANNEL NOTES:

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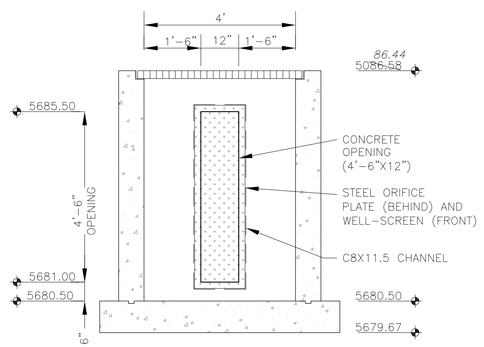
AS-BUILT
DATE: APRIL 6, 2018



OUTLET STRUCTURE DETAIL – SECTION B–B
NO SCALE

CORE ENGINEERING GROUP
15004 1ST AVENUE S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlschindler@ceg1.com

NO. | DESCRIPTION | DATE

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVENUE, SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
CARRIAGE MEADOWS SOUTH
FONTAINE BLVD.–MARKSHEFFEL RD
COLORADO SPRINGS, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

POND G3
FULL SPECTRUM
OUTLET STRUCTURE DETAILS

DATE:
AUGUST 28, 2017

PROJECT NO.
100.030

SHEET NUMBER
C9.6

TOTAL SHEETS: 39

APPENDIX E– DRAINAGE BOARD MINUTES, STORM SEWER SCHEMATIC AND HYDRAFLOW STORM SEWER CALCS

Minutes
City of Colorado Springs/ El Paso County
Drainage Board Meeting Summary
January 23, 2024

The City of Colorado Springs/ El Paso County Drainage Board held its meeting at 1:30 PM, Tuesday, January 23, 2024, at Pikes Peak Regional Building in the Pikes Peak Hearing Room.

MEMBERS PRESENT: Tim McConnell (Chair), Marc Whorton (Vice Chair), Grant Petik, Brett Louk, Mark Sherwood, Scott Smith

OTHERS PRESENT: Christina Aragon (City), Erin Powers (City), Erica Schmitz (City), Amy Tuten (City), Rebecca Greenberg (City), Daniel Torres (El Paso County), Carlos Hernandez (El Paso County), Jeff Rice (El Paso County), Greg Shaner (Matrix), Jesse Sullivan (Matrix), Tina Buschar (View Homes), JM Turley (View Homes), Jeff Mark (Landhuis), Rich Wray (Kiowa), Dave Gorman (MVE)

Item 1: Meeting called to order by ***Tim McConnell*** at 1:31 PM.

Item 2:

a) Approval of the November 14, 2023, Drainage Board minutes

Approval of the minutes from the November 14, 2023, Drainage Board Meeting. Motion was made by ***Scott Smith*** to approve the minutes of November 14, 2023, ***with the amendment to remove Marc Whorton's duplicate naming in the "Members Present"***. Motion was seconded by ***Mark Sherwood***.

Motion Passed 6-0

Item 3: Old Business – None.

Item 4: New Business

a) Partial Closure of Jimmy Camp Creek for Bull Hill/Rolling Meadows (County) – presented by ***Jeff Rice (County)***, ***Jeff Mark (Landhuis),*** and ***Rich Wray (Kiowa)***

Jeff Rice introduces the request for the closure of a portion of Jimmy Camp Creek Basin for Bull Hill, Rolling Meadows, and the remaining unplatted portions of Lorson Ranch development in unincorporated El Paso County. El Paso County supports the approval of the partial closure, but they are still reviewing to ensure this action will not significantly increase the drainage fee for the remaining parcels in the basin. *Tim McConnell* asks if this item will need to come back to Drainage Board once the determinations are made, or will it be approved administratively. *Jeff Rice* responds that could be decided by the Board whether or not they would like to have the item come back to the Board. *Jeff Mark* then states it would be preferred if the Item could be settled administratively, but agrees it is the Board's decision. *Jeff Rice* displays the map of Lorson Ranch to show the area of concern for this Item. *Jeff Mark* continues to describe the area in question and explain the background of the improvements already installed and future installments. Jeff explains this request is being brought to the Board

because the cost of the improvements is anticipated to far exceed what the basin fees would be based on the analysis. Mark Sherwood asks if they are fairly confident about the required improvements to be installed in the area. Jeff Rice answers that they are confident about the final design and associated fees. Rich Wray arrives and offers further details on the calculations of the drainage fees for the area. He then continues to explain justifications to support this request. Scott Smith asks Jeff Mark about the current status of this portion of Lorson Ranch in terms of the fees and reimbursable cost and if it's in balance. Jeff Rice responds by explaining the current status of this portion of Lorson Ranch discussing the fees and credits for the basin. Marc Whorton asks if the channel improvements have been accepted by the County. Jeff Rice confirms that the channels have been completed and accepted, and the metro district maintains it. Marc Whorton then asks when the updated DBPS will be completed, and Jeff Rice responds that it is anticipated to be completed within the year.

Marc Whorton asks if Jeff Mark would be ok with splitting up the request to close the portion of the basin with completed improvements while the County finishes their review and completes the updated DBPS. Jeff agrees the would be acceptable if the Board agrees.

Marc Whorton moves to approve the partial closure of Jimmy Camp Creek just for the remaining Lorson developments, pending confirmation that this action will not significantly raise the resulting drainage fees for the remaining parcels in the basin with the expectation that the applicant will bring the same request back to the Board for Rolling Meadows/ Bull Hill. ***Scott Smith*** seconds the motion.

Motion Passed 6-0

b) Sand Creek Channel Stabilization Reimbursement Request (City) – presented by ***Erica Schmitz (City)*** and ***Gregory Shaner (Matrix)***

Erica Schmitz introduces the request for reimbursement for Sand Creek channel improvements. Erica continues providing a bit of background for the request and states that City staff is remaining neutral on this request because the reimbursement request is greater than the 10% allotted by code. *Gregory Shaner* is introduced and continues to provide background on the project and history of the site. Gregory describes the difficulties and obstacles with the project, which helps to justify why they are requesting a larger reimbursement. Grant Petik asks for clarification on some of the additional costs shown in their analysis. Gregory explains the costs depicted and discusses more details about the project. Board members and applicant discuss the cost breakdown, and Tim McConnell mentions an analysis to determine whether a fee increase is warranted. There is further discussion amongst the Board.

Tim McConnell moves to approve the $553,188.31 channel improvements reimbursement request. ***Mark Sherwood*** seconds the motion.

Motion Passed 6-0

c) Sand Creek Request to Designate Reimbursable Infrastructure (City) – presented by ***Erica Schmitz (City)***

Erica Schmitz introduces the request for channel improvements associated with the Final Plat for The Crossing at Palmer Park Filing No. 5 be designated as reimbursable. Erica adds that City staff is remaining neutral on this request but offers options for possible motions. Erica introduces *Dave Gorman*, who takes the stand to explain the background of their improvements and the reason for their request. Dave explains there has been no improved or stabilization of the channel in this area previously. *Mike Turley* asks about drainage fees in association with platting the area. *Erin Powers*

addresses Mike's question with City policy. *Scott Smith* then asks if these improvements are installed already, and Dave responds that they have not. Dave explains that plans have been reviewed by the City and this is just an estimated cost for the improvements. *Scott Smith* confirms that this is a request to improvement costs to be considered reimbursable and Dave confirms. There is further discussion between the Board and applicant describing the project and development for The Crossing at Palmer Park Filing No. 5.

Scott Smith moves to approve the request to add this reimbursable amount to the Sand Creek Drainage Basin with a request for a fee analysis of the Sand Creek Basin upon request for reimbursement. ***Marc Whorton*** seconds the motion.

Motion Passed 6-0

e) Housekeeping

a. **February meeting cancellation**

Mark Sherwood moves to approve the cancellation of the schedule meeting in February 2024. ***Marc Whorton*** seconds the motion.

Motion Passed 6-0

f) Open Discussion

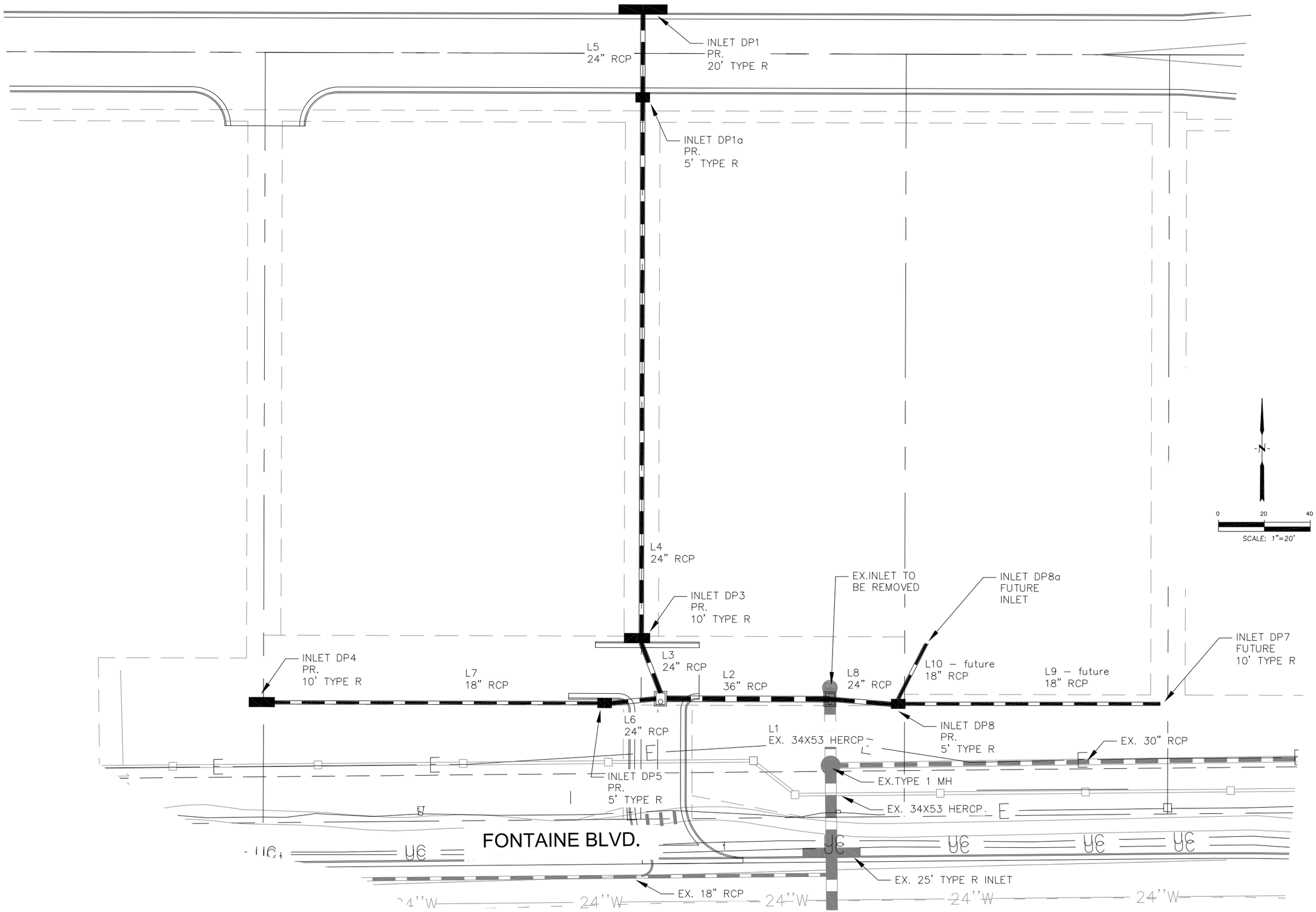
Tim McConnell asks about Gary's vacancy and the upcoming vacancies when his and Marc's terms expire in May 2024. *Erin Powers* responds explaining that the vacancies are posted and reviews the process for hiring.

Tim McConnell then asks about the financial update from the County and requests they could provide an update at the next meeting.

Tim McConnell asked about Amy's financial update and the unclaimed reimbursements, wanting more details on where the additional unclaimed funds were reallocated to. *Erin Powers* responds that she will speak with Amy to find out if the unclaimed funds will be reallocated to each individual basin versus the Interest fund.

Item 5: ***Tim McConnell*** **-** Meeting adjourned at 3:43 PM.

STORM SCHEMATIC



CORE ENGINEERING GROUP
15004 1ST AVE. S.
BURNSVILLE, MN 55306
PH: 763.210.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

NO. | DESCRIPTION | DATE

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
VILLAGES AT LORSON RANCH
FONTAINE BLVD – CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: LAB
CHECKED: LAB

STORM SEWER SCHEMATIC

VILLAGE AT LORSON RANCH

DATE
JUNE, 2024

PROJECT NO.
100.070

SHEET NUMBER
1

TOTAL SHEETS: 1

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	1	31.50	34x53	Ell	28.90	5701.86	5702.05	0.657	5704.47	5703.75	0.38	5703.75	End	Manhole
2	2	20.50	36	Cir	72.76	5702.15	5702.51	0.495	5703.75	5703.96	n/a	5703.96	1	Manhole
3	3	12.50	24	Cir	26.00	5703.26	5703.52	1.001	5704.32	5704.79	0.23	5704.79	2	Manhole
4	4	9.80	24	Cir	239.29	5703.62	5706.01	0.999	5704.79	5707.13	n/a	5707.13 j	3	Manhole
5	5	9.40	24	Cir	35.00	5706.11	5706.46	1.000	5707.13	5707.56	0.44	5707.56	4	Manhole
6	6	8.90	24	Cir	22.46	5703.26	5703.38	0.535	5704.31	5704.44	n/a	5704.44	2	Manhole
7	7	5.90	18	Cir	151.60	5703.88	5704.63	0.495	5704.89	5705.64	0.34	5705.98	6	Manhole
8	8	12.20	24	Cir	28.65	5702.90	5703.19	1.012	5703.94	5704.44	0.51	5704.44	1	Manhole
9	9	5.30	18	Cir	125.20	5703.69	5704.94	0.998	5704.44	5705.83	n/a	5705.83	8	None
10	10	6.00	18	Cir	29.57	5703.69	5703.99	1.016	5704.50	5704.94	0.41	5704.94	8	None

Village 5yr | Number of lines: 10 | Run Date: 3/28/2024

NOTES: Return period = 5 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	28.899	0.00	0.00	0.00	0.00	0.00	0.0	2.0	0.0	31.50	89.44	6.35	34 x 53 e	0.66	5701.86	5702.05	5704.47	5703.75	5707.84	5707.59	1
2	1	72.756	0.00	0.00	0.00	0.00	0.00	0.0	1.6	0.0	20.50	47.54	5.70	36	0.51	5702.15	5702.52	5703.75	5703.97	5707.59	5707.92	2
3	2	26.003	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	12.50	22.63	6.66	24	1.00	5703.26	5703.52	5704.32	5704.79	5707.92	5708.05	3
4	3	239.285	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	9.80	22.60	5.28	24	1.00	5703.62	5706.01	5704.79	5707.13	5708.05	5712.13	4
5	4	35.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	9.40	22.62	5.59	24	1.00	5706.11	5706.46	5707.13	5707.56	5712.13	5711.46	5
6	2	22.463	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	8.90	16.54	5.30	24	0.53	5703.26	5703.38	5704.31	5704.44	5707.92	5707.94	6
7	6	151.599	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.90	7.43	4.67	18	0.50	5703.88	5704.64	5704.89	5705.65	5707.94	5709.01	7
8	1	28.652	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	12.20	22.76	6.63	24	1.01	5702.90	5703.19	5703.94	5704.44	5707.59	5707.55	8
9	8	125.197	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.30	10.49	5.42	18	1.00	5703.69	5704.94	5704.44	5705.83	5707.55	5706.88	9
10	8	29.568	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.00	10.58	5.64	18	1.02	5703.69	5703.99	5704.50	5704.94	5707.55	5707.54	10

Village 5yr | Number of lines: 10 | Run Date: 6/9/2024

NOTES:Intensity = 501.75 / (Inlet time + 28.20) ^ 1.31; Return period =Yrs. 5 ; c = cir e = ellip b = box

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	1	57.30	34x53	Ell	29.00	5701.86	5702.05	0.655	5704.41	5704.32	n/a	5704.32	End	Manhole
2	2	37.30	36	Cir	72.76	5702.15	5702.51	0.495	5704.32	5704.52	0.81	5705.32	1	Manhole
3	3	22.80	24	Cir	26.00	5703.26	5703.52	1.001	5705.32*	5705.59*	0.34	5705.93	2	Manhole
4	4	17.80	24	Cir	239.29	5703.62	5706.01	0.999	5705.93	5707.53	n/a	5707.53 j	3	Manhole
5	5	17.00	24	Cir	35.00	5706.11	5706.46	1.000	5707.53	5707.95	0.72	5707.95	4	Manhole
6	6	16.10	24	Cir	22.46	5703.26	5703.38	0.535	5705.32*	5705.44*	0.06	5705.50	2	Manhole
7	7	8.10	18	Cir	151.60	5703.88	5704.63	0.495	5705.50*	5706.40*	0.33	5706.73	6	Manhole
8	8	22.40	24	Cir	29.00	5702.90	5703.19	1.000	5704.52	5704.88	0.92	5704.88	1	Manhole
9	9	9.70	18	Cir	125.20	5703.69	5704.94	0.998	5704.88	5706.14	0.64	5706.14	8	None
10	10	11.00	18	Cir	29.57	5703.69	5703.99	1.016	5704.98	5705.28	0.72	5706.00	8	None

Village 100yr | Number of lines: 10 | Run Date: 3/28/2024

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	29.000	0.00	0.00	0.00	0.00	0.00	0.0	1.1	0.0	57.30	89.28	7.87	34 x 53 e	0.65	5701.86	5702.05	5704.41	5704.32	5707.84	5708.48	1
2	1	72.756	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	37.30	47.54	7.15	36	0.51	5702.15	5702.52	5704.32	5704.51	5708.48	5708.48	2
3	2	26.003	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	22.80	22.63	7.26	24	1.00	5703.26	5703.52	5705.33	5705.60	5708.48	5708.71	3
4	3	239.285	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	17.80	22.60	6.31	24	1.00	5703.62	5706.01	5705.94	5707.53	5708.71	5712.17	4
5	4	35.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	17.00	22.62	6.96	24	1.00	5706.11	5706.46	5707.53	5707.95	5712.17	5711.79	5
6	2	22.463	0.00	0.00	0.00	0.00	0.00	0.0	0.6	0.0	16.10	16.54	5.13	24	0.53	5703.26	5703.38	5705.33	5705.45	5708.48	5707.92	6
7	6	151.599	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	8.10	7.43	4.58	18	0.50	5703.88	5704.64	5705.51	5706.41	5707.92	5709.01	7
8	1	29.000	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	22.40	22.62	8.07	24	1.00	5702.90	5703.19	5704.52	5704.88	5708.48	5708.74	8
9	8	125.197	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	9.70	10.49	6.43	18	1.00	5703.69	5704.94	5704.88	5706.14	5708.74	5706.75	9
10	8	29.568	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	11.00	10.58	6.80	18	1.02	5703.69	5703.99	5704.98	5705.28	5708.74	5705.79	10

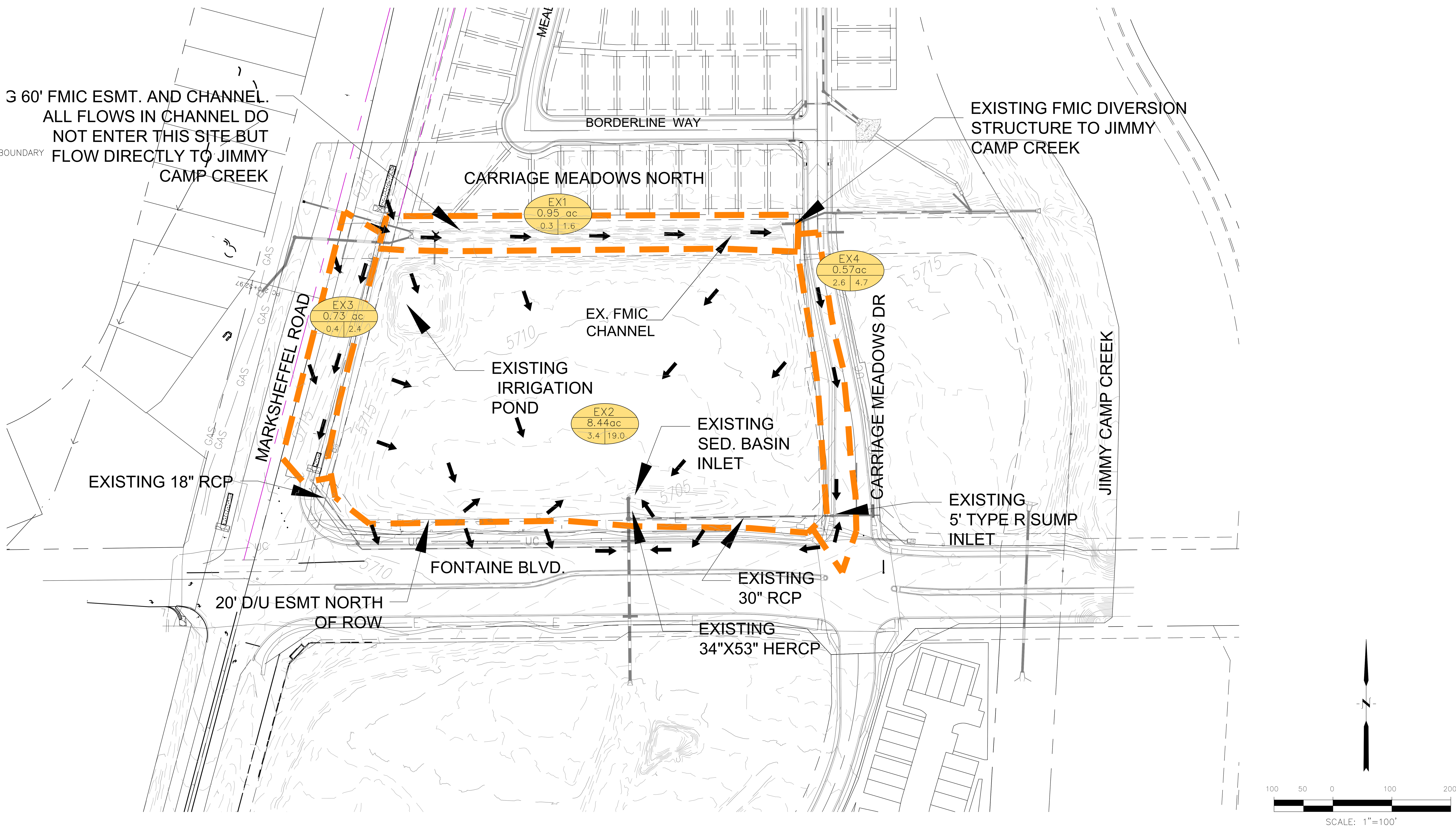
Village 100yr | Number of lines: 10 | Run Date: 6/9/2024

NOTES:Intensity = 1020.33 / (Inlet time + 30.10) ^ 1.34; Return period =Yrs. 100 ; c = cir e = ellip b = box

MAP POCKET

LEGEND

- BASIN BOUNDARY
- BASIN DESIGN POINT
- BASIN I.D. / ACREAGE / 5 YR/100 YR CFS (BASIN, XXAC, X.X, X.X)
- DIRECTION OF FLOW
- EXISTING CONTOUR (6690)
- EXISTING ROW/LORSON RANCH BOUNDARY
- EXISTING STORM SEWER
- TIME OF CONCENTRATION



CORE ENGINEERING GROUP
15004 1ST AVENUE S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

NO. | DESCRIPTION

PREPARED FOR:
LORSON LLC
212 NORTH WAHSATCH AVE, SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
VILLAGES AT LORSON RANCH
FONTAINE BLVD/CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

DRAWN: RLS
DESIGNED: LAB
CHECKED: RLS

EXISTING CONDITIONS
FINAL PLAT
VILLAGES AT LORSON RANCH

DATE: JUNE, 2024

PROJECT NO. 100.070

SHEET NUMBER 1

TOTAL SHEETS: 1

DESIGN POINT SUMMARY				
D.P.		5 YEAR cfs	100 YEAR cfs	NOTES
1		9.4	17.0	STREET FLOW
1a		0.5	0.9	STREET FLOW
2		9.8	17.8	PIPE FLOW
3		3.1	5.6	STREET FLOW
3a		12.5	22.8	PIPE FLOW
4		7.2	13.1	STREET FLOW
5		3.0	8.0	STREET FLOW (INCLUDES BYPASS FROM DP4)
5a		8.9	16.1	PIPE FLOW
6		20.5	37.3	PIPE FLOW
7		5.3	9.7	STREET FLOW

DESIGN POINT SUMMARY				
D.P.		5 YEAR cfs	100 YEAR cfs	NOTES
8		0.9	1.7	STREET FLOW
8a		6.0	11.0	STREET FLOW
9		12.2	22.4	PIPE FLOW
10		31.5	57.3	PIPE FLOW

DETENTION POND AREAS:

1. ALL BASINS DRAIN TO POND G1/G2 LOCATED IN CARRIAGE MEADOWS SOUTH AT LORSON RANCH
2. POND G1/G2 PROVIDES DETENTION AND WQ FOR THIS DEVELOPMENT
3. DETENTION POND G1/G2 WAS CONSTRUCTED PER SF 17-011 (CARRIAGE MEADOWS SOUTH AT LORSON RANCH FDR, APPROVED ON SEPTEMBER 7, 2017)

NOTES:

1. ALL PROPOSED STORM SEWER IS RCP ROUND PIPE AND IS A PRIVATE STORM SEWER SYSTEM UNLESS NOTED OTHERWISE.
2. CURB/GUTTER IS TYPE A EXCEPT AS NOTED

LEGEND

- PLAT BOUNDARY
- BASIN BOUNDARY
- BASIN DESIGN POINT
- BASIN I.D. / ACREAGE / 5 YR/100 YR CFS (DENOTES OVERALL BASIN)
- DIRECTION OF FLOW
- EXISTING CONTOUR
- PROPOSED CONTOUR
- ROW/LORSON RANCH BOUNDARY
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- TIME OF CONCENTRATION
- HP HIGH POINT
- LP LOW POINT
- CROSSPAN (6' OR 8')

CARRIAGE MEADOWS NORTH AT LORSON RANCH FIL. NO. 1 (SF17-023)

TRACT E
CARRIAGE MEADOWS NORTH AT LORSON RANCH FIL. NO. 1
(SF17-023)

EX. FMIC CHANNEL
EX. FMIC OVERFLOW STRUCTURE
EX. 48" RCP
EX. 3'X4' FMIC RCBC
EX. FMIC PIPE SYSTEM
EX. TYPE C INLET
NO FLOW FROM FMIC DITCH AND PIPE ENTERS THIS SITE.
EX. 30" RCP
EX. 48" FMIC
PR. 18" RCP @1.42%
CENTER VILLAGE HTS
PR. 20' TYPE "R" SUMP INLET #1
PR. 24" RCP @1.00%
PR. TYPE A C/G
PR. 5' TYPE "R" SUMP INLET #1a
50' D/U ESMT
15' D/U ESMT
PR. 24" RCP @1.0%
30' D/U ESMT
20' D/U ESMT
PR. 10' TYPE "R" SUMP INLET #3
PR. 10' TYPE "R" ON-GRADE INLET #4
PR. 5' TYPE "R" SUMP INLET #5
PR. 24" RCP @0.5%
PR. 18" RCP @0.5%
PR. 36" RCP @0.5%
PR. 18" RCP @1.0%
FUTURE SUMP INLET #8a
FUTURE 18" RCP @1.0%
FUTURE 10' TYPE "R" SUMP INLET #7
PR. 5' TYPE "R" SUMP INLET #8
EX. 30" RCP
EX. 5' TYPE R SUMP INLET
EX. 34"X53" HERCP
EX. 25' TYPE R SUMP INLET
EX. SWALE TO REMAIN
MARKSHEFFEL ROAD
FONTAINE BLVD. (ARTERIAL)
CARRIAGE MEADOWS DRIVE (COLLECTOR)

EX1 0.95ac 0.3 | 1.6
PR1 1.24ac 5.3 | 9.7
PR2 2.41ac 9.4 | 17.0
PR3 0.11ac 0.5 | 0.9
PR4 1.68ac 7.2 | 13.1
PR5 0.39ac 1.7 | 3
PR6 0.72ac 3.1 | 5.6
PR7 1.41ac 6.0 | 11.0
PR8 0.22ac 0.9 | 1.7
EX3 0.73ac 0.4 | 2.4
EX4 0.57ac 2.6 | 4.7

LP 11.15 | LP 07.81 | LP 07.80 | LP 07.75 | HP 14.33

50 25 0 50 100
SCALE: 1"=50'

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DEVELOPED CONDITIONS
FINAL PLAT
VILLAGES AT LORSON RANCH

DATE: JUNE, 2024
PROJECT NO. 100.070
SHEET NUMBER 1
TOTAL SHEETS: 1