WOODMOOR WATER AND SANITATION DISTRICT NO.1

LAKE PUMP STATION NO. 2 AND TRANSMISSION PIPELINE

EL PASO COUNTY, COLORADO

CONSTRUCTION SET

EL PASO COUNTY FILE NUMBER: PPR-21-019

CONTACTS

OWNER:	WOODMOOR WATER AND SANITATION DISTRICT NO. 1 1845 WOODMOOR DRIVE MONUMENT, CO 80132	JESSIE SHAFFER, P.E. (719) 488-2525 JESSIES@WOODMOORWATER.COM
ENVIRONMENTAL ENGINEER:	JVA, INC 1512 LARIMER STREET, SUITE 710 DENVER, CO 80202	RICHARD HOOD, P.E. (303) 565-4901 RHOOD@JVAJVA.COM
STRUCTURAL ENGINEER:	JVA, INC 1512 LARIMER STREET, SUITE 710 DENVER, CO 80202	ADAM TEUNISSEN, P.E. (303) 565-4936 ATEUNISSEN@JVAJVA.COM
ELECTRICAL ENGINEER:	BROWNS HILL ENGINEERING AND CONTROLS 8130 SHAFFER PARKWAY, SUITE A LITTLETON, CO 80127	TED WILLE, P.E. (720) 344-7771 TWILLE@BROWNSHILLENG.COM
MECHANICAL ENGINEER:	MEC, INC. 4919 W. 98TH WAY WESTMINSTER, CO 80031	BRYAN MOEN, P.E. (303) 907-4285 BMOEN@MECENGR.COM

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Glenwood Springs • Denver

NOVEMBER 2021

PREPARED UNDER THE SUPERVISION OF

JVA, Inc.

COLORADO REGISTERED JOSHUA J. MCCRIMMON 40279 11/16/2021 PROFESSIONAL ENGINEER

DRAWING INDEX

*CONDITIONS OF APPROVAL:
-Sheets CE1.0-1.6 have been replaced by the approved grading and erosion control plan dated July 7, 2021, located at the back of this set.
-Extents of the mil and overlay required for roads which have been overlaid or constructed in the past three years will be determined by the Department of Public Works in conjunction with the required work in the ROW permit.
-Approval of this plan set (and the GEC plan) does not approve the grading or installation of pipe on private property. Appropriate easements are required.

EL PASO COUNTY:

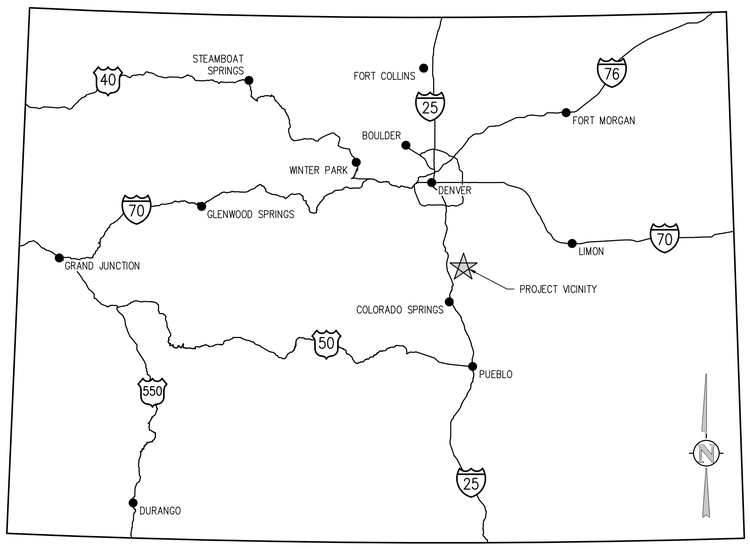
COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH THE COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/ OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE. DRAINAGE CRITERIA MANUAL VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL, AS AMENDED.

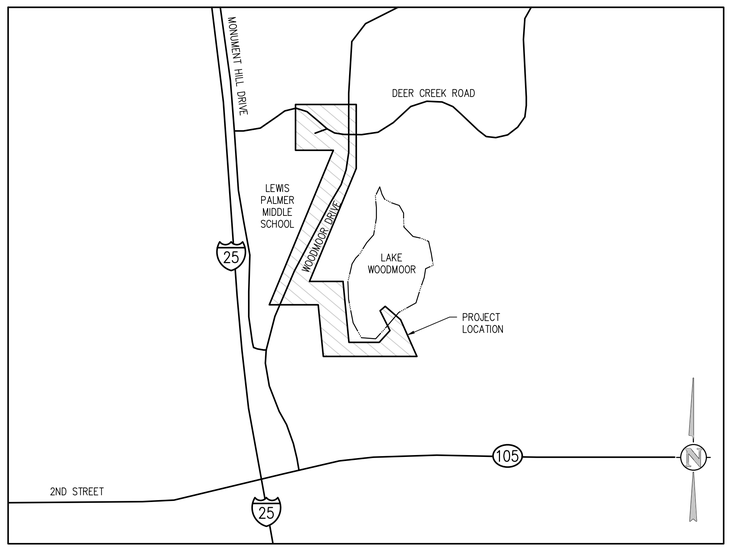
IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR'S DISCRETION.

*** APPROVED**
Engineering Department
12/02/2021 12:12:36 PM
dsdnijkamp
EPC Planning & Community Development Department

ECM Administrator/County Engineer



VICINITY MAP
NTS



PROJECT LOCATION MAP
NTS

N:\1051.6a\Drawings\1051.6a - G00 - G01.dwg, 11/18/2021 - 8:30 AM, JCD

ABBREVIATIONS

AASHTO	AMERICAN ASSOC. OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ABAN	ABANDON
AC	ASPHALTIC CONCRETE PAVING
ADDL	ADDITIONAL
ADDM	ADDENDUM
ADJ	ADJUSTABLE
AL	ALUMINUM
ALT	ALTERNATE
AMT	AMOUNT
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ARV	AIR RELIEF VALVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ASPH	ASPHALT
ASSY	ASSEMBLY
ASYM	ASYMMETRICAL
AUTO	AUTOMATIC
AVG	AVERAGE
AWWA	AMERICAN WATER WORKS ASSOC.
BC	BACK OF CURB
BFV	BUTTERFLY VALVE
BG	FINISHED GRADE ADJACENT TO BOTTOM OF WALL
BLDG	BUILDING
BLK	BLOCK
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BS	BACKSIGHT
BOS	BOTTOM OF STEP
BOT	BOTTOM
BSMT	BASEMENT
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
BW	BOTTOM OF WALL
CB	CATCH BASIN
CCW	COUNTER CLOCKWISE
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CIP	CAST IRON PIPE
CJ	CONSTRUCTION JOINT
CL	CENTER LINE OR CHAIN LINK
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS(ATION)
COR	CORNER
CR	CONCENTRIC REDUCER
CTR	CENTER
CY	CUBIC YARDS
DEMO	DEMOLITION
DIA	DIAMETER
DIAG	DIAGONAL
DIP	DUCTILE IRON PIPE
DOM	DOMESTIC
DN	DOWN
DR	DRAIN
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
ECC	ECCENTRIC
EJ	EXPANSION JT
EL	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
ENGR	ENGINEER
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ESMT	EASEMENT
EST	ESTIMATE
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EW	EACH WAY
EXP JT	EXPANSION JOINT
EXIST	EXISTING
FND	FOUNDATION
FES	FLARED END SECTION
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FN	FENCE
FOC	FACE OF CONCRETE
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
FTG	FOOTING OR FITTING
G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GCO	GRADE CLEANOUT
GIP	GALVANIZED IRON PIPE
GND	GROUND
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRATE
GRTG	GRATING
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
H	HIGH
HB	HOSE BIB
HE	HORIZONTAL ELLIPTICAL
HDWL	HEADWALL
HNDRL	HAND RAIL
HORIZ	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWY	HIGHWAY
HWL	HIGH WATER LINE
HYD	HYDRANT
INCL	INCLUDED
ID	INSIDE DIAMETER
IN	INLET
INSUL	INSULATION
INV	INVERT
IRR	IRRIGATION
JTS	JOINTS
KO	KNOCKOUT
KPL	KICK PLATE
KWY	KEYWAY
L	LEFT OR LITER
LSCAPE	LANDSCAPE(ING)
LF	LINEAR FOOT
LP	LOW POINT
LT	LIGHT
LWL	LOW WATER LEVEL
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMUM
ME	MATCH EXISTING
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
OPT	OPTIONAL
PC	POINT OF CURVATURE
PCO	PRESSURE CLEAN OUT
PCR	POINT OF CURVE RETURN
PI	POINT OF INTERSECTION
PVI	POINT OF VERTICAL INTERSECTION
PL	PROPERTY LINE
PE	POLYETHYLENE
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PREP	PREPARATION
PROP	PROPOSED
PRV	PRESSURE REDUCING VALVE OR PRESSURE RELIEF VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE OR POINT OF VERTICAL CURVATURE
PVMT	PAVEMENT
QTY	QUANTITY
R	RIGHT
RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RE	REFERENCE
RECT	RECTANGULAR
REINF	REINFORCE (D) (ING) (MENT)
REQD	REQUIRED
ROW	RIGHT OF WAY
SAN	SANITARY
SD	STORM DRAIN
SECT	SECTION
SPD	STANDARD PROCTOR DENSITY
SPEC	SPECIFICATION
SQ	SQUARE
SQ IN	SQUARE INCH
SQ FT	SQUARE FOOT
SQ YD	SQUARE YARD
SS	SANITARY SEWER
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SVC	SERVICE
SWMP	STORMWATER MANAGEMENT PLAN
SYM	SYMMETRICAL
TB	THRUST BLOCK
TBC	TOP BACK OF CURB
TBM	TEMPORARY BENCH MARK
TEMP	TEMPORARY
TG	FINISHED GRADE ADJACENT TO TOP OF WALL
THK	THICK
TOB	TOP OF BANK
TOC	TOP OF CONCRETE OR TOP OF CURB
TOS	TOP OF STEP
TOT	TOTAL
TW	TOP OF WALL OR CAP OF WALL
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UGE	UNDERGROUND ELECTRIC
UTIL	UTILITY
VERT	VERTICAL
VC	POINT OF VERTICAL CURVATURE
VCP	VITRIFIED CLAY PIPE
W	WIDE OR WIDTH
W/	WITH
W/O	WITHOUT
WQCE	WATER QUALITY CONTROL ELEVATION
WSE	WATER SURFACE ELEVATION
WW	WASTEWATER
X SECT	CROSS SECTION
XFMR	ELECTRONIC TRANSFORMER
YH	YARD HYDRANT

DESIGN LEGEND

- BENCHMARK
- MANHOLE
- AREA DRAIN
- COMBINATION INLET
- TYPE R INLET
- TYPE 13 FIELD INLET
- FLARED END SECTION W/ RIPRAP
- TEE W/ THRUST BLOCK
- BEND W/ THRUST BLOCK
- END CAP W/ THRUST BLOCK
- GATE VALVE
- REDUCER/INCREASER
- WATER METER
- FIRE HYDRANT
- SS — SANITARY SEWER
- FM — FORCE MAIN
- W — WATER
- NPW — NON POTABLE WATER
- PW — POTABLE WATER
- IRR — IRRIGATION
- CATV — CABLE TV
- D — DRAIN
- E — ELECTRIC
- UE — UNDERGROUND ELECTRIC
- OE — OVERHEAD ELECTRIC
- T — TELEPHONE
- FO — FIBER OPTIC
- G — GAS

- FENCE
- FLOW LINE OF DITCH OR WASH
- 5.0% — SLOPE ARROW
- +03.54 — PROPOSED SPOT ELEVATION
- +03.3 — EXIST SPOT ELEVATION
- 5220 — EXIST INDEX CONTOUR
- 5221 — EXIST INTERMEDIATE CONTOUR
- 20 — PROPOSED INDEX CONTOUR
- 21 — PROPOSED INTERMEDIATE CONTOUR
- CURB AND GUTTER
- SPILL/CATCH CURB TRANSITION
- SIGN W/ POST
- SIDEWALK
- CONCRETE PAVING
- HEAVY DUTY CONCRETE PAVING
- HEAVY DUTY ASPHALT PAVING
- LIGHT DUTY ASPHALT PAVING
- GRAVEL
- PROPOSED BUILDING
- BUILDING ACCESS
- RETAINING WALL
- BOULDER/ROCK WALL
- LIMITS OF SAWCUT
- LIMITS OF WORK
- EASEMENT LINE
- PROPERTY LINE
- ADJACENT PROPERTY LINE/ROW
- MATCHLINE

DEMOLITION LEGEND

- DEMO SUBSURFACE FEATURE
- DEMO SURFACE FEATURE
- DEMO BUILDING
- ABANDON SUBSURFACE FEATURE
- LIMITS OF SAWCUT
- REMOVE EXISTING TREE
- PROTECT EXISTING TREE

DETAIL TITLE

DETAIL TITLE (1 / –) — SCALE

- 1 — DETAIL NUMBER IDENTIFICATION
- – — SHEET WHERE THE SECTION OR ELEVATION IS CUT OR CALLED OUT – INDICATES SAME DRAWING

(1 / C1.0)

- 1 — DETAIL NUMBER IDENTIFICATION
- C1.0 — SHEET WHERE THE DETAIL IS DRAWN – INDICATES SAME DRAWING

SECTION CALLOUT

(A / –)

- A — SECTION NUMBER IDENTIFICATION
- – — SHEET WHERE THE SECTION IS – INDICATES SAME DRAWING

DETAIL MARKER

- REVISION CLOUD
- 1 — REVISION NUMBER

DUCTILE IRON PIPE LEGEND

- TEE
- CROSS
- TEE/CROSS (UP)
- TEE (DOWN)
- 90° BEND
- 90° BEND (UP)
- 90° BEND (DOWN)
- 45° BEND
- 45° BEND (UP)
- 45° BEND (DOWN)
- REDUCER
- REDUCER (UP)
- BUTTERFLY VALVE WAFER LEVER
- BUTTERFLY VALVE WAFER LEVER (FRONT)
- BUTTERFLY VALVE WAFER LEVER (SIDE)
- BUTTERFLY VALVE WAFER
- BUTTERFLY VALVE WAFER (FRONT)
- BUTTERFLY VALVE WAFER LEVER (SIDE)
- CHECK VALVE
- CHECK VALVE (FRONT)
- CHECK VALVE (SIDE)
- PLUG VALVE
- PLUG VALVE (FRONT)
- PLUG VALVE (SIDE)

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

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF EL PASO COUNTY, COLORADO, WOODMOOR WATER AND SANITATION DISTRICT, COLORADO DEPARTMENT OF TRANSPORTATION, TRI-LAKES MONUMENT FIRE PROTECTION DISTRICT REQUIREMENTS, AND APPLICABLE STATE AND LOCAL STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL HAVE IN POSSESSION AT THE JOB SITE AT ALL TIMES ONE (1) SIGNED COPY OF APPROVED PLANS, STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN EMERGENCY ACCESS ROUTES TO THE SITE AND STRUCTURE AT ALL TIMES PER THE APPLICABLE TRI-LAKES MONUMENT FIRE PROTECTION DISTRICT REQUIREMENTS. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ANY VARIANCE TO THE ABOVE DOCUMENTS. NOTIFY ENGINEER OF ANY CONFLICTING STANDARDS OR SPECIFICATIONS. IN THE EVENT OF ANY CONFLICTING STANDARD OR SPECIFICATION, THE MORE STRINGENT OR HIGHER QUALITY STANDARD, DETAIL OR SPECIFICATION SHALL APPLY.
2. THE CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL APPLICABLE CODES, LICENSES, STANDARD SPECIFICATIONS, PERMITS, BONDS, ETC., WHICH ARE NECESSARY TO PERFORM THE PROPOSED WORK, INCLUDING, BUT NOT LIMITED TO A LOCAL AND STATE GROUNDWATER DISCHARGE AND COLORADO DEPARTMENT OF HEALTH AND ENVIRONMENT (CDPHE) STORMWATER DISCHARGE PERMIT ASSOCIATED WITH CONSTRUCTION ACTIVITY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE REQUIRED PARTY (OWNER AND ENGINEER) AT LEAST 48 HOURS PRIOR TO START OF ANY CONSTRUCTION, PRIOR TO BACKFILLING, AND AS REQUIRED BY JURISDICTIONAL AUTHORITY AND/OR PROJECT SPECIFICATIONS. THE CONTRACTOR SHALL CONTINUE WITH NOTIFICATIONS THROUGHOUT THE PROJECT AS REQUIRED BY THE STANDARDS AND SPECIFICATIONS.
4. THE LOCATIONS OF EXISTING UTILITIES ARE SHOWN IN THE APPROXIMATE LOCATION BASED ON INFORMATION BY OTHERS. NOT ALL UTILITIES MAY BE SHOWN. THE CONTRACTOR SHALL DETERMINE THE EXACT SIZE, LOCATION AND TYPE OF ALL EXISTING UTILITIES WHETHER SHOWN OR NOT BEFORE COMMENCING WORK. THE ENGINEER AND/OR OWNER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS SHOWN ON PLANS. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGES AND COSTS WHICH MIGHT OCCUR BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES. THE CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY COMPANIES AND DETERMINE THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO PROCEEDING WITH GRADING AND CONSTRUCTION. ALL WORK PERFORMED IN THE AREA OF UTILITIES SHALL BE PERFORMED AND INSPECTED ACCORDING TO THE REQUIREMENTS OF THE UTILITY OWNER. LIKEWISE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAPPING ANY EXISTING UTILITY (INCLUDING DEPTH) WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION, AND FOR RELOCATING ENCOUNTERED UTILITIES AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL CONTACT AND RECEIVE APPROVAL FROM UTILITY OWNER AND ENGINEER BEFORE RELOCATING ANY ENCOUNTERED UTILITIES. CONTRACTOR RESPONSIBLE FOR SERVICE CONNECTIONS, AND RELOCATING AND RECONNECTING AFFECTED UTILITIES AS COORDINATED WITH UTILITY OWNER AND/OR ENGINEER, INCLUDING NON-MUNICIPAL UTILITIES (TELEPHONE, GAS, CABLE, ETC., WHICH SHALL BE COORDINATED WITH THE UTILITY OWNER). THE CONTRACTOR SHALL IMMEDIATELY CONTACT ENGINEER UPON DISCOVERY OF A UTILITY DISCREPANCY OR CONFLICT. AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY NOTIFICATION CENTER OF COLORADO (1-800-922-1987, WWW.UNCC.ORG). SEE SURVEY UTILITY LOCATION INFORMATION BELOW.
5. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PREPARE A TRAFFIC CONTROL PLAN FOR OWNER AND/OR CITY APPROVAL AND PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FENCING, FLAGMEN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR AGREES TO COMPLY WITH THE PROVISIONS OF THE TRAFFIC CONTROL PLAN AND THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," PART VI, FOR CONSTRUCTION SIGNAGE AND TRAFFIC CONTROL. ALL TEMPORARY AND PERMANENT TRAFFIC SIGNS SHALL COMPLY TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) WITH REGARD TO SIGN SHAPE, COLOR, SIZE, LETTERING, ETC. UNLESS OTHERWISE SPECIFIED. IF APPLICABLE, PART NUMBERS ON SIGNAGE DETAILS REFER TO MUTCD SIGN NUMBERS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY GROUNDWATER ENCOUNTERED DURING THE CONSTRUCTION OF ANY PORTION OF THIS PROJECT. GROUNDWATER SHALL BE PUMPED, PIPED, REMOVED AND DISPOSED OF IN A MANNER WHICH DOES NOT CAUSE FLOODING OF EXISTING STREETS NOR EROSION ON ABUTTING PROPERTIES IN ORDER TO CONSTRUCT THE IMPROVEMENTS SHOWN ON THESE PLANS. GROUNDWATER TO BE PUMPED SHALL BE TESTED, PERMITTED, AND PUMPED PER THE STATE OF COLORADO AND LOCAL GROUNDWATER DISCHARGING PERMIT REQUIREMENTS.
7. RIM AND GRATE ELEVATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS. THE CONTRACTOR SHALL ADJUST RIMS AND OTHER IMPROVEMENTS TO MATCH FINAL PAVEMENT AND FINISHED GRADE ELEVATIONS.
8. THE EXISTING AND PROPOSED ELEVATIONS OF FLATWORK, SIDEWALKS, CURBS, THRESHOLDS, PAVING, ETC. AS SHOWN HEREON ARE BASED ON EXTRAPOLATION OF FIELD SURVEY DATA, EXISTING CONDITIONS, AND DATA PROVIDED BY OTHERS. AT CRITICAL AREAS AND SITE FEATURES, CONTRACTOR SHALL HAVE FORMWORK INSPECTED AND APPROVED BY OWNER, OWNER'S REPRESENTATIVE, OR ENGINEER PRIOR TO PLACING CONCRETE. MINOR ADJUSTMENTS, AS APPROVED, TO PROPOSED GRADES, INVERTS, ETC. MAY BE REQUIRED TO PREVENT PONDING OR SLOPE NOT IN CONFORMANCE WITH MUNICIPAL STANDARDS. ALL FLATWORK MUST PREVENT PONDING AND PROVIDE POSITIVE DRAINAGE AWAY FROM EXISTING AND PROPOSED BUILDINGS, WALLS, ROOF DRAIN OUTFALLS, ACROSS DRIVES AND WALKS, ETC., TOWARDS THE PROPOSED INTENDED DRAINAGE FEATURES AND CONVEYANCES. EARTHEN FORM WORK SHALL NOT BE ALLOWED.
9. FINAL LIMITS OF REQUIRED ASPHALT SAWCUTTING AND PATCHING MAY VARY FROM LIMITS SHOWN ON PLANS. CONTRACTOR TO PROVIDE SAWCUT AND PATCH WORK TO ACHIEVE POSITIVE DRAINAGE AND A SMOOTH TRANSITION TO EXISTING ASPHALT WITHIN SLOPES ACCEPTABLE TO THE ENGINEER AND WITHIN MUNICIPAL STANDARDS. CONTRACTOR SHALL PROVIDE ADDITIONAL SAWCUTTING AND PATCHING AT UTILITY WORK, CONNECTION POINTS TO EXISTING PAVEMENT AND FEATURES, ETC. THAT MAY NOT BE DELINEATED ON PLANS.
10. ANY EXISTING MONITORING WELLS, CLEANOUTS, VALVE BOXES, ETC. TO BE PROTECTED AND TO REMAIN IN SERVICE. IF FEATURES EXIST, EXTEND OR LOWER TO FINAL SURFACE WITH LIKE KIND CAP WITH STANDARD CAST ACCESS LID WITH SAME MARKINGS. IN LANDSCAPED AREAS PROVIDE A CONCRETE COLLAR (18"X18"X6" THICK) AT ALL EXISTING AND PROPOSED MONITORING WELLS, CLEANOUTS, VALVE BOXES, ETC.
11. OWNER TO APPROVE ALL PRIVATE CONCRETE FINISHING, JOINT PATTERNS AND COLORING REQUIREMENTS PRIOR TO CONSTRUCTION. SUBMIT JOINT LAYOUT PLAN TO OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.
12. PIPE LENGTHS AND HORIZONTAL CONTROL POINTS SHOWN ARE FROM CENTER OF STRUCTURES, END OF FLARED END SECTIONS, ETC. SEE STRUCTURE DETAILS FOR EXACT HORIZONTAL CONTROL LOCATION. CONTRACTOR IS RESPONSIBLE FOR ADJUSTING ACTUAL PIPE LENGTHS TO ACCOUNT FOR STRUCTURES AND LENGTH OF FLARED END SECTIONS.
13. ALL SURPLUS MATERIALS, TOOLS, AND TEMPORARY STRUCTURES, FURNISHED BY THE CONTRACTOR, SHALL BE REMOVED FROM THE PROJECT SITE BY THE CONTRACTOR. ALL DEBRIS AND RUBBISH CAUSED BY THE OPERATIONS OF THE CONTRACTOR SHALL BE REMOVED, AND THE AREA OCCUPIED DURING CONSTRUCTION ACTIVITIES SHALL BE RESTORED TO ITS ORIGINAL CONDITION, WITHIN 48 HOURS OF PROJECT COMPLETION, UNLESS OTHERWISE DIRECTED BY THE MUNICIPALITY OR OWNER'S REPRESENTATIVE.
14. THE CONTRACTOR IS REQUIRED TO PROVIDE AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE LOCAL JURISDICTION, THE STATE OF COLORADO, THE M-STANDARD PLANS OF THE COLORADO DEPARTMENT OF TRANSPORTATION, AND THE APPROVED EROSION CONTROL PLAN. JURISDICTIONAL AUTHORITY MAY REQUIRE THE CONTRACTOR TO PROVIDE ADDITIONAL EROSION CONTROL MEASURES AT THE CONTRACTOR'S EXPENSE DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE PLANS DO NOT FUNCTION AS INTENDED. THE CONTRACTOR IS RESPONSIBLE FOR PROHIBITING SILT AND DEBRIS LADEN RUNOFF FROM LEAVING THE SITE, AND FOR KEEPING ALL PUBLIC AREAS FREE OF MUD AND DEBRIS. THE CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING FINAL GRADES AND FOR REMOVING ACCUMULATED SEDIMENTATION FROM ALL AREAS INCLUDING SWALES AND DETENTION/WATER QUALITY AREAS. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL MEASURES AND REPAIR AREAS AS REQUIRED AFTER VEGETATION IS ESTABLISHED AND ACCEPTED BY OWNER AND MUNICIPALITY.
15. PROTECT ALL TREES AND VEGETATION. PLACE CONSTRUCTION FENCING AT DRIP LINE OF TREES AND PLANTS NEAR THE WORK ZONE. DEEP WATER TREES WEEKLY. HAND EXCAVATION REQUIRED AT ROOT ZONES WHERE PROPOSED PAVING OR UTILITY WORK IS WITHIN DRIPLINE OF TREES.
16. SURVEY INFORMATION:
    - 16.1. BENCHMARK INFORMATION: TOPOGRAPHIC INFORMATION WAS PROVIDED BY FLATIRONS SURVEYING, INC. SEE "EFILE-C19-75763-LSP_2021-01-19" DATED 01/19/2021. PROJECT BENCHMARK ELEVATION: 7111.32' AT NGS CONTROL POINT T 395 (STAINLESS STEEL ROD). THE DATUM IS NAVD88 PER SURVEY. COORDINATE AND VERIFY ALL VERTICAL AND HORIZONTAL DATA SHOWN IN SURVEY AND REPORT ANY IRREGULARITIES OR DISCREPANCIES TO ENGINEER PRIOR TO CONSTRUCTION.
    - 16.2. BASIS OF BEARINGS: GPS DERIVED BEARINGS BASED ON A BEARING OF S64°36'08"E ALONG THE NORTHERLY LINE OF THE DUNES AT WOODMOOR, FILING NO. 2 AS DESCRIBED IN THE RECORDS OF EL PASO COUNTY, RECORDED ON DECEMBER 09, 2016 AT RECEPTION NO. 216713876, BETWEEN A FOUND #4 REBAR WITH 1 1/4" YELLOW PLASTIC CAP "EDWARD JAMES LS 33196" AT THE NORTHWESTERLY CORNER OF LOT 14 OF SAID PLAT AND A FOUND #4 REBAR WITH 1 1/4" YELLOW PLASTIC CAP "LS 31548" AT THE NORTHEASTERLY CORNER OF LOT 20 OF SAID PLAT AS SHOWN HEREON. COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983 (NAD83). ALL BEARINGS SHOWN HEREON ARE RELATIVE THERETO
    - 16.3. HORIZONTAL CONTROL INFORMATION: HORIZONTAL CONTROL COORDINATES ARE BASED ON THE REFERENCED SURVEY AND ARE PROVIDED BY THE FOLLOWING POINTS AS SHOWN ON THE PLANS:

CP-1	N1463889.46	E3181603.53	ELEV 7146.81	
CP-3	N1463758.58	E318955.55	ELEV 7147.60	
CP-4	N1463758.57	E3181955.58	ELEV 7147.85	
CP-28	N1461914.45	E3181634.98	ELEV 7096.08	PIN 4RBR 1.25IN YPC EDWARD JAMES LS 33196
CP-38	N1461267.86	E3181664.59	ELEV 7088.36	PIN 4RBR 1.25IN YPC EDWARD JAMES LS 33196
CP-45	N1460943.23	E3182734.55	ELEV 7102.66	PIN 4RBR 1.5IN OPC LS 25966

    - 16.4 SURVEY UTILITY LOCATION INFORMATION PER THE SURVEYOR: SUBSURFACE UTILITIES ARE SHOWN IN APPROXIMATE HORIZONTAL AND VERTICAL LOCATIONS CONSISTENT WITH ASCE 38-02 QUALITY LEVEL "B" (INFORMATION OBTAINED BY THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND HORIZONTAL POSITION OF VIRTUALLY ALL UTILITIES WITHIN THE PROJECT LIMITS. THE INFORMATION OBTAINED IN THIS MANNER IS SURVEYED TO PROJECT CONTROL.) AND QUALITY LEVEL "C" (INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D; INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS), AND BASED ON FIELD MEASUREMENTS PROVIDED BY THE OWNER AND THE CONTRACTOR. SUBSURFACE UTILITIES ARE NOT DEPICTED TO THE EXTENT SET FORTH IN ASCE 38-02 QUALITY LEVELS "A" (INFORMATION OBTAINED THROUGH THE NONDESTRUCTIVE EXPOSURE OF UNDERGROUND UTILITIES, AND ALSO PROVIDES THE TYPE, SIZE, CONDITION, MATERIAL AND OTHER CHARACTERISTICS OF UNDERGROUND FEATURES.). TO THE EXTENT DEEMED NECESSARY FOR THE PROTECTION OF PERSONS AND PROPERTY, POTHOLING OR OTHER PRECISE MAPPING MAY BE COMPLETED TO CONFIRM THE EXACT LOCATION OF ANY SUBSURFACE UTILITIES. NOTIFY OWNER AND ENGINEER WITH ALL UTILITY INFORMATION PRIOR TO CONSTRUCTION. VISIT HTTPS://WWW.FHWA.DOT.GOV/PROGRAMADMIN/SUEINDEX.CFM FOR MORE INFORMATION.
17. THE CONTRACTOR AT THE CONTRACTORS EXPENSE SHALL FURNISH THE OWNER AND ENGINEER OF RECORD A COMPLETE SET OF CONSTRUCTION RECORD DRAWINGS ("AS-BUILTS") FOR THE CONSTRUCTED IMPROVEMENTS. THE AS-BUILT SET SHALL SHOW SUFFICIENT DIMENSION TIES TO PERMANENT SURFACE FEATURES OR NORTHING/EASTING POINTS FOR ALL BURIED FACILITIES TO ALLOW FOR FUTURE LOCATING. THE AS-BUILT SET SHALL SHOW AS-BUILT CONTOURS AND ELEVATIONS OF ASPHALT AND CONCRETE FLATWORK, FLOWLINES, GRADE BREAKS, STAIRS, CROSS-SLOPES, HIGH AND LOW POINTS, AND ADDITIONAL ELEVATIONS TO DEMONSTRATE IMPROVEMENTS WERE CONSTRUCTED PER PLANS. THE AS-BUILT SET SHALL SHOW ELEVATIONS OF ALL DETENTION/WATER QUALITY FACILITIES, INCLUDING BUT NOT LIMITED TO BERMS, SPILLWAYS, BASIN BOTTOM, PIPE INVERTS, AND CONTROL STRUCTURE FEATURES (AS SURVEYED AND STAMPED BY A CERTIFIED P.L.S.). THE AS-BUILT SET SHALL ALSO INCLUDE ELEVATIONS OF MANHOLES, PIPES, INLETS, GRATES, AND SIZES OF ALL UTILITIES. THE AS-BUILT SET SHALL SHOW ANY AND ALL VARIATIONS FROM THE APPROVED PLAN. ENGINEER WILL PRODUCE FINAL RECORD DRAWINGS.

DEMOLITION NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REFER TO GENERAL NOTES FOR UTILITY LOCATION AND PROTECTION.
2. ACTUAL LIMITS MAY VARY, CONTRACTOR IS RESPONSIBLE FOR ADJUSTING LIMITS OF DEMOLITION AND CONSTRUCTION AS NECESSARY. COORDINATE DEMOLITION REQUIREMENTS, LIMITS OF DEMOLITION, SALVAGE ITEMS, PROTECTION OF ITEMS TO REMAIN, TREES, FENCING, ETC. WITH OWNER, ARCHITECT, ENGINEER, AND RELEVANT CONSTRUCTION AND PHASING PLANS.
3. REPLACE EXISTING FLATWORK AT UTILITY TRENCHES AS REQUIRED.
4. ALL SAWCUTTING AND PAVEMENT REMOVAL SHOULD BE TO THE NEAREST JOINT.
5. ALL DRY UTILITY AND ELECTRIC DEMOLITION OR RELOCATION SHOULD BE COORDINATED WITH PROPERTY OWNER, UTILITY OWNER, MECHANICAL ENGINEER, AND ARCHITECT PRIOR TO CONSTRUCTION.
6. ALL NECESSARY EROSION AND SEDIMENTATION CONTROLS MUST BE INSTALLED PRIOR TO CONSTRUCTION.
7. CONTRACTOR TO COMPLY WITH ALL REGULATORY REQUIREMENTS FOR HAZARDOUS MATERIAL REMOVAL AND DISPOSAL.
8. REFER TO GENERAL NOTES FOR TREE PROTECTION. COORDINATE WITH LANDSCAPE ARCHITECT FOR TREE REMOVAL.
9. CONTRACTOR TO MAINTAIN SAFE PEDESTRIAN ACCESS. PROVIDE TEMPORARY ROUTE AND SIGNAGE AS NEEDED.
10. CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO PROTECT AND MAINTAIN SERVICES DURING CONSTRUCTION.
11. CONTRACTOR TO REPAIR/REPLACE ALL DAMAGE TO EXISTING FLATWORK OR SITE FEATURES NOT INTENDED FOR DEMOLITION.

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED JOSHUA J. MCGILLEN 40279 11/16/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	KCT/MHT
DRAWN BY:	JCD
CHECKED BY:	RAH/JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

LEGEND, NOTES, AND ABBREVIATIONS

SHEET NO.
G0.1

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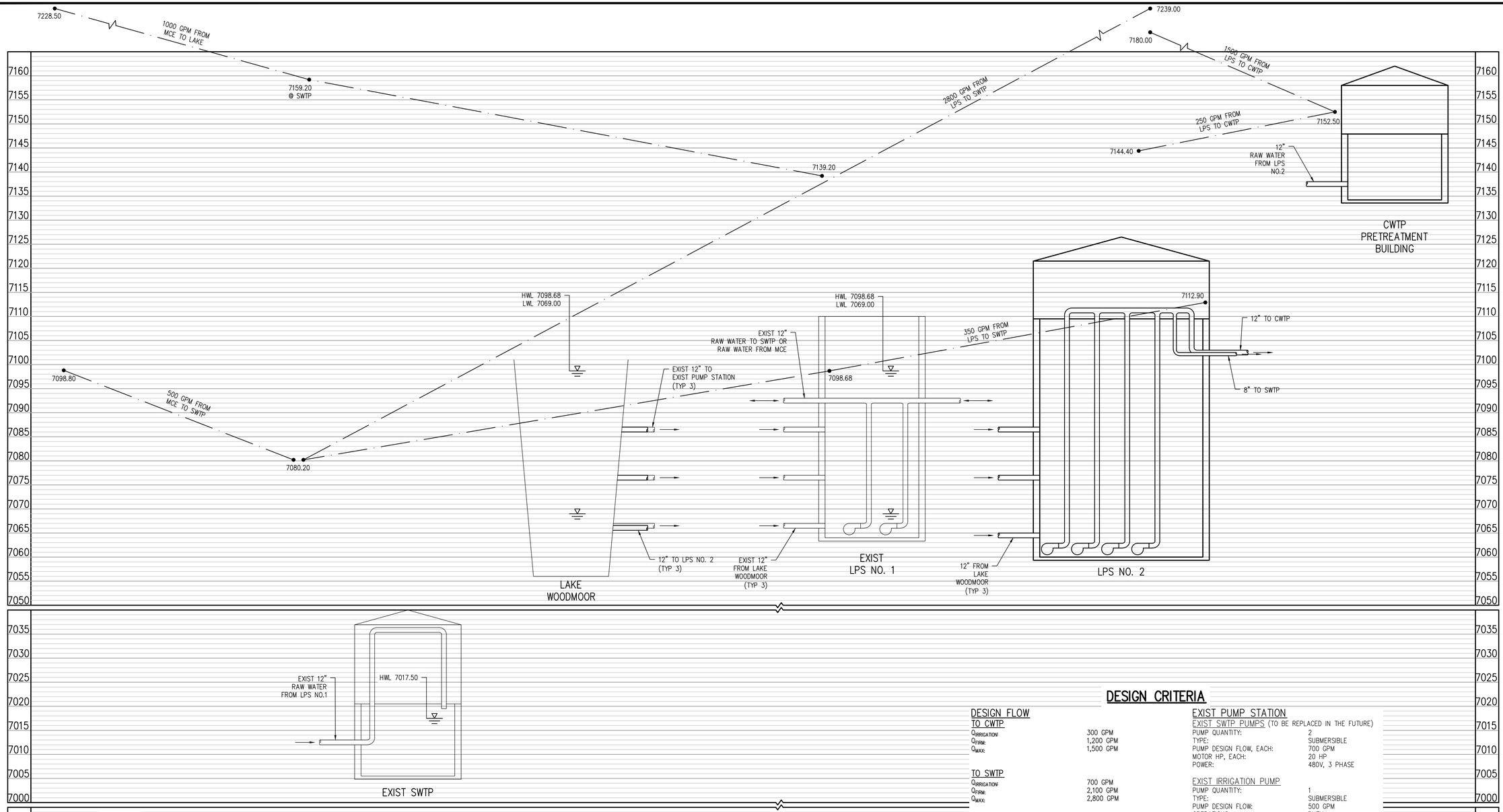

DESIGN CRITERIA

DESIGN FLOW

TO CWTP

$Q_{IRRIGATION}$:	300 GPM
Q_{FIRM}:	1,200 GPM
Q_{MAX}:	1,500 GPM

TO SWTP

$Q_{IRRIGATION}$:	700 GPM
Q_{FIRM}:	2,100 GPM
Q_{MAX}:	2,800 GPM

PUMP STATION

CWTP PUMPS

PUMP QUANTITY:	3
TYPE:	SUBMERSIBLE
PUMP DESIGN FLOW, EACH:	750 GPM
TDH:	120 FT
OPERATIONS:	LEAD/LAG/SWING
MOTOR HP, EACH:	40 HP
POWER:	480V, 3 PHASE

SWTP PUMPS

PUMP QUANTITY:	5 (4 FUTURE)
TYPE:	SUBMERSIBLE
PUMP DESIGN FLOW, EACH:	560 GPM
TDH:	179 FT
OPERATIONS:	LEAD/LAG/LAG/LAG/LAG (WITH 2 EXIST PUMPS)
MOTOR HP, EACH:	40 HP
POWER:	480V, 3 PHASE

EXIST PUMP STATION

EXIST SWTP PUMPS (TO BE REPLACED IN THE FUTURE)

PUMP QUANTITY:	2
TYPE:	SUBMERSIBLE
PUMP DESIGN FLOW, EACH:	700 GPM
MOTOR HP, EACH:	20 HP
POWER:	480V, 3 PHASE

EXIST IRRIGATION PUMP

PUMP QUANTITY:	1
TYPE:	SUBMERSIBLE
PUMP DESIGN FLOW:	500 GPM
OPERATIONS:	DUTY
MOTOR HP, EACH:	20 HP
POWER:	480V, 3 PHASE

AERATION SYSTEM

COMPRESSOR QUANTITY:	2
TYPE:	ROTARY SCREW
COMPRESSOR DESIGN FLOW:	69.2 CFM
OPERATIONS:	DUTY/DUTY
MOTOR HP, EACH:	15 HP
CONTROLS:	ONE VARIABLE SPEED, ONE CONSTANT SPEED
POWER:	480V, 3 PHASE

HYDRAULIC PROFILE

SCALE: VERT. 1" = 10'
HORIZ. NO SCALE

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COLORADO REGISTERED JOSHUA J. MCBRIDE 40279 11/16/2021 PROFESSIONAL ENGINEER

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CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

HYDRAULIC PROFILE AND DESIGN CRITERIA

SHEET NO.
G1.0

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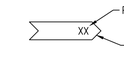
PROCESS LEGEND



PROCESS IDENTIFICATION NUMBER

NUMBER INDICATES SHEET OF PROCESS OR CONTROL CONTINUATION

MAIN PROCESS LINE

EXIST MAIN PROCESS LINE

SECONDARY PROCESS LINE

EXIST SECONDARY PROCESS LINE

BUILDING

HARDWIRED SIGNAL

DATA LINK OR SOFTWARE SIGNAL

VENDOR SUPPLIED EQUIPMENT

VALVE SYMBOLS

CLOSED OPEN

GATE VALVE

PLUG VALVE

GLOBE VALVE

BALL VALVE

DIAPHRAGM VALVE

BUTTERFLY VALVE

SWING CHECK VALVE

BALL CHECK VALVE

GLOBE CHECK VALVE

HAND OPERATED VALVE

PILOT OPERATED PRESSURE REDUCING VALVE W/ DOWNSTREAM PRESSURE SETTING

PILOT OPERATED PRESSURE REDUCING VALVE W/ UPSTREAM PRESSURE SETTING

SPRING PRESSURE RELIEF W/ PRESSURE RELIEF

ARV

AIR RELEASE VALVE

S

SOLENOID OPERATED VALVE

M

MOTOR OPERATED VALVE

P&ID EQUIPMENT SYMBOLS

DRY PIT WET PIT

CENTRIFUGAL PUMPS

SUBMERSIBLE PUMP

GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)

ROTARY LOBE PUMP

AIR COMPRESSOR

FILTER

HANDLE OR THROTTLE

M

MOTOR DRIVER

PRESSURE GAUGE

DIAPHRAGM SEAL

PRESSURE REGULATOR

MANUAL DRAIN/HOSE BIB

SAMPLE VALVE/PORT

CAM-LOCK FITTING/QUICK CONNECT

BLIND FLANGE

M

FLOW METER

ULTRASONIC LEVEL INDICATOR

HYDROSTATIC LEVEL SENSOR

PRESSURE TRANSDUCER

FLOAT SWITCH

REDUCER

CALIBRATION COLUMN

CHEMICAL FEED SYSTEM

FAN

WEIR

MOISTURE SWITCH

RADIO TRANSMITTER

RADIO RECEIVER

DRAIN

INSTRUMENT IDENTIFICATION LETTERS

(INSTRUMENT SOCIETY OF AMERICA)

	FIRST – LETTER		SUCCEEDING – LETTERS		
	MEASURED OR INITIATING VARIABLE		READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONTROL			CONTROL SWITCH	CLOSED
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE MOTOR	MOMENTARY			MIDDLE, INTERMEDIATE
N	TORQUE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	FAILURE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	COMMAND
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

P&ID INSTRUMENT SYMBOLS

PROCESS CONTROL SYSTEM INTERFACE SYMBOLS

YYY

INPUT/OUTPUT TO/FROM PLC, INSIDE PLC PANEL
YYY – INDICATES FUNCTION TYPE
XXX – INDICATES PANEL WHERE DEVICE IS LOCATED

GENERAL INSTRUMENT SYMBOLS

FIELD MOUNTED INSTRUMENT

XXX

INSTRUMENT MOUNTED ON FACE OF PANEL NORMALLY ACCESSIBLE TO THE OPERATOR.
XXX – INDICATES PANEL WHERE DEVICE IS LOCATED

XXX

INSTRUMENT MOUNTED BEHIND OR INSIDE PANEL.
XXX – INDICATES PANEL WHERE DEVICE IS LOCATED

SINGLE INSTRUMENT HOUSING CONTAINING TWO OR (MORE) INSTRUMENTATION FUNCTIONS

PLC I/O

PANEL NOMENCLATURE

CP-XXX: CONTROL PANEL (AREA CONTROL)

LCP-XXXA: LOCAL CONTROL PANEL (SPECIFICATION PROCESS CONTROL)
LETTERS A, B, C DENOTES VENDER SUPPLIED EQUIPMENT

LP-X LIGHTING PANEL

COMMON INSTRUMENT DESIGNATIONS

TAG	DESIGNATION
YL	EQUIPMENT RUNNING STATUS
YS	EQUIPMENT IN AUTO OR REMOTE STATUS
YY	EQUIPMENT RUN COMMAND
UA	EQUIPMENT FAULT STATUS
HC	HAND CONTROL
HS	HAND SWITCH
SI	SPEED INDICATION
SC	SPEED COMMAND
PSL	PRESSURE SWITCH LOW
PSH	PRESSURE SWITCH HIGH
FE	FLOW ELEMENT
FIT	FLOW INDICATOR/TRANSMITTER
ZSO	VALVE POSITION FULL OPEN
ZSC	VALVE POSITION FULL CLOSE
ZSI	VALVE POSITION INDICATOR
SP	SET POINT
PID	PROPORTIONAL-INTEGRAL-DERIVATIVE
HOA	HAND-OFF-AUTO
OCA	OPEN-CLOSE-AUTO
LCP	LOCAL CONTROL PANEL

GENERAL NOTES:

1. THIS IS A STANDARD LEGEND, THEREFORE NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.
2. P & ID INSTRUMENTATION DETAILS DO NOT REPRESENT INSTRUMENTS AND CONTROLS INTEGRAL TO VENDOR SUPPLIED CONTROL PANELS OR EQUIPMENT. SEE EQUIPMENT SPECIFICATIONS FOR THIS INFORMATION.
3. P & ID DOES NOT REPRESENT CONTROL STRATEGIES OR INTERACTIONS. REFERENCE SECTION 16950, CONTROL NARRATIVES, FOR THIS INFORMATION.
4. P & ID DOES NOT REPRESENT EQUIPMENT HARDWIRED INTERLOCK AND ENABLE CIRCUITRY, REFER TO SECTION 16950 FOR COMPLETE DESCRIPTION.

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COLORADO REGISTERED JOSHUA J. MCDANIEL 40279 PROFESSIONAL ENGINEER 11/16/2021

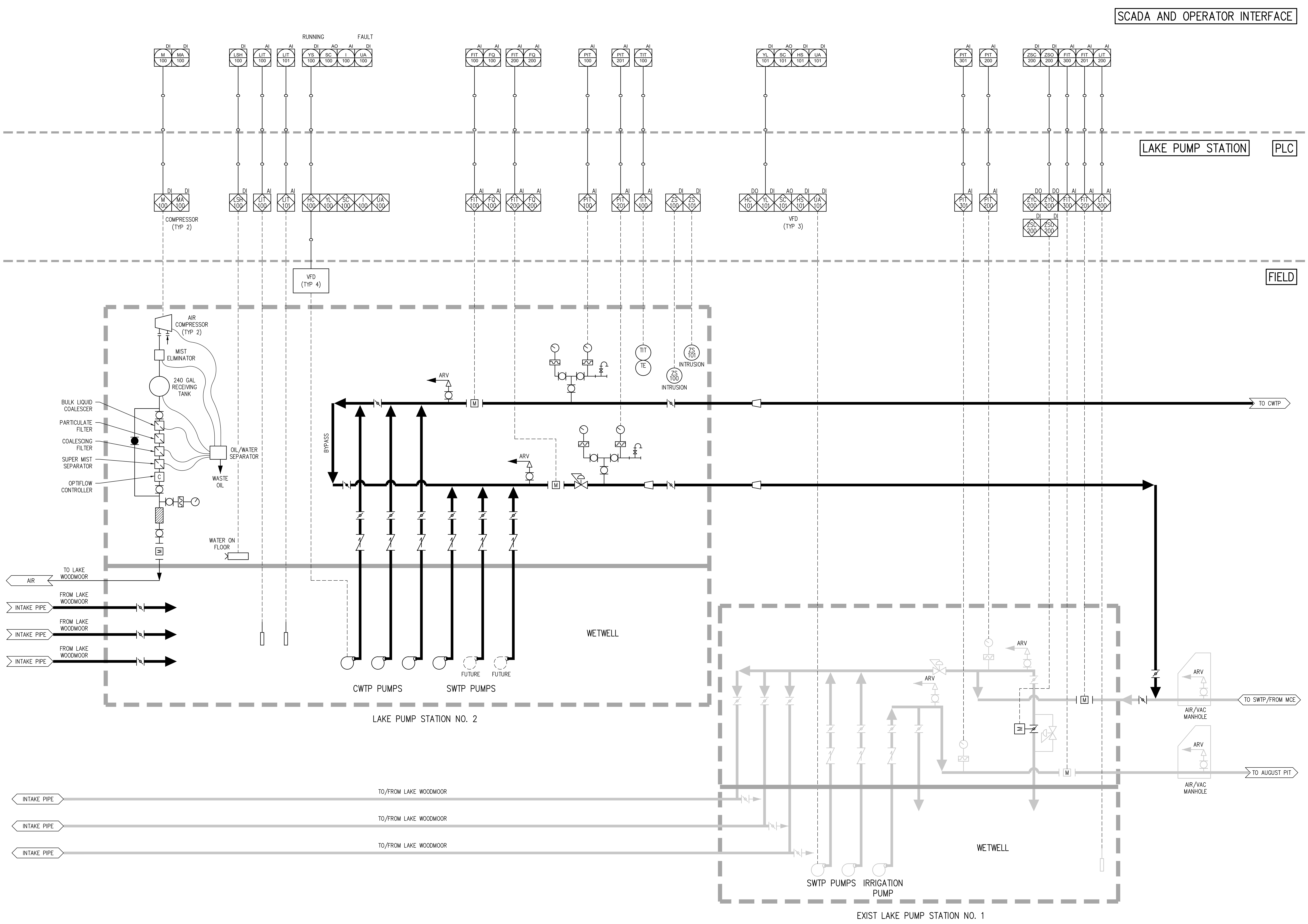
DESIGNED BY:	KCT/MHT
DRAWN BY:	JCD
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PROCESS DIAGRAM LEGEND

SHEET NO.

G1.1


SCADA AND OPERATOR INTERFACE
LAKE PUMP STATION
PLC
FIELD
RUNNING
FAULT
COMPRESSOR (TYP 2)
VFD (TYP 3)
VFD (TYP 4)
AIR COMPRESSOR (TYP 2)
MIST ELIMINATOR
240 GAL RECEIVING TANK
BULK LIQUID COALESCER
PARTICULATE FILTER
COALESCING FILTER
SUPER MIST SEPARATOR
OPTIFLOW CONTROLLER
OIL/WATER SEPARATOR
WASTE OIL
WATER ON FLOOR
TO LAKE WOODMOOR
AIR
FROM LAKE WOODMOOR
INTAKE PIPE
BYPASS
ARV
INTRUSION
TO CWTP
WETWELL
CWTP PUMPS
SWTP PUMPS
FUTURE
LAKE PUMP STATION NO. 2
TO SWTP/FROM MCE
AIR/VAC MANHOLE
TO AUGUST PIT
TO/FROM LAKE WOODMOOR
SWTP PUMPS
IRRIGATION PUMP
EXIST LAKE PUMP STATION NO. 1

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LITTLETON, CO 80127
(720) 344-7771

NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

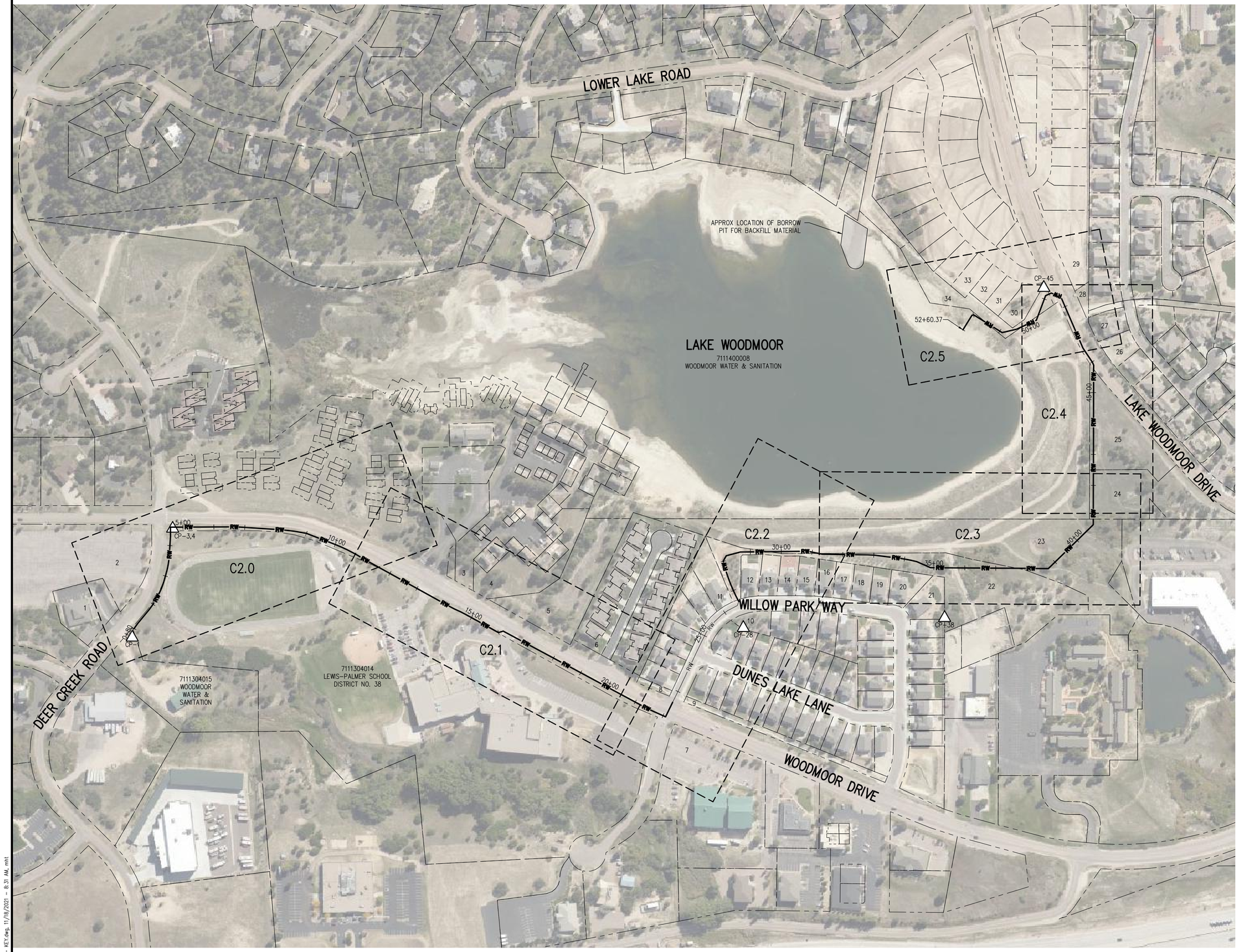
COLORADO REGISTERED PROFESSIONAL ENGINEER JOSHUA J. McGIBBON 40279 11/16/2021

DESIGNED BY:	KCT/MHT
DRAWN BY:	JCD
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PROCESS AND INSTRUMENTATION DIAGRAM

SHEET NO.
G1.2



ADJACENT PROPERTIES

REFERENCE NUMBER	PARCEL NUMBER	PARCEL OWNER
1	7111301009	REDNER FAMILY TRUST
2	7111301010	TRI-LAKES CHAPEL INC
3	7111406056	WOODMOOR LAKEHOUSE ASSN INC
4	7111406055	WOODMOOR LAKEHOUSE ASSN INC
5	7111305005	WOODMOOR WATER & SANITATION
6	7111305034	VILLAGE AT MOOR-WOOD OWNERS ASSN
7	7114204018	TAHSK LLC
8	7114205032	DUNES AT WOODMOOR HOMEOWNERS ASSN
9	7114207014	DUNES AT WOODMOOR HOMEOWNERS ASSN
10	7114208019	DUNES AT WOODMOOR HOMEOWNERS ASSN
11	7114205011	FORRISTAL JEFFREY
12	7114205012	ILARRAZA ERIC
13	7114205013	MATTEA MELISSA
14	7114205014	FRIEND EVA K
15	7114205015	MCGOUGH ALBERT C
16	7114205016	TRASK CRAIG
17	7114205017	HARRIS NATHAN P
18	7114205018	FLORIA JOHN JR
19	7114205019	KRAEMER MAX W
20	7114205020	ULRICH DAN L
21	7114205021	HAMILTON-SMITH DAVID
22	7114205030	DUNES AT WOODMOOR HOMEOWNERS ASSN
23	7114200041	WOODMOOR WATER & SANITATION
24	7114112001	CS LAND COMPANY LLC
25	7114112002	CS LAND COMPANY LLC
26	7114109007	JONES JENNIFER KRISTEN
27	7114109008	SARGENT GREGORY LEE
28	7114100015	WOODMOOR WATER & SANITATION
29	7114109034	LAKE WOODMOOR DEVELOPMENT INC
30	7114107019	CAMPBELL HOMES LLC
31	7114107020	CAMPBELL HOMES LLC
32	7114107021	KANGAS GARY E JR
33	7114107022	MAGILL ROBERT T
34	7114107034	LAKE WOODMOOR DEVELOPMENT INC

150 0 150 300
SCALE IN FEET

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COLORADO REGISTERED JOSHUA J. MCBRIDE 40279 11/16/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

OVERALL KEY MAP

SHEET NO.
C0.1

N:\1051.6e\Drawings\1051.6e - KEY.dwg, 11/15/2021 - 8:31 AM, mht

WOODMOOR DR
ROW= 80'

DEER CREEK RD
60' ROW

LIMIT OF RIGHT-OF-WAY

LIMITS OF CONSTRUCTION (TYP)

EDGE OF ASPHALT (TYP)

⚠ ADDED EXIST EDGE OF ASPHALT LABELS (TYP)

⚠ EXISTING EASEMENTS HIGHLIGHTED (TYP)

10' UTILITY EASEMENT (P1)

SANITARY MANHOLE RIM ELEV: 7150.97'

SEDIMENT CONTROL LOG PERPENDICULAR TO ROADSIDE DITCH (TYP)

PERMANENT SEEDING IN DISTURB VEGETATED GROUND RE: MHFCD EC-2 SHEET CE1.5 (TYP)

10' PUBLIC UTILITY & DRAINAGE EASEMENT (P2)

12" RAW WATER TRANSMISSION MAIN (TYP)

SEDIMENT CONTROL LOG RE: MHFCD SC-2 SHEET CE1.4 (TYP)

NOTE: CENTRAL WATER TREATMENT PLANT IS A SEPARATE PROJECT GRADING AND DRAINAGE BY OTHERS)

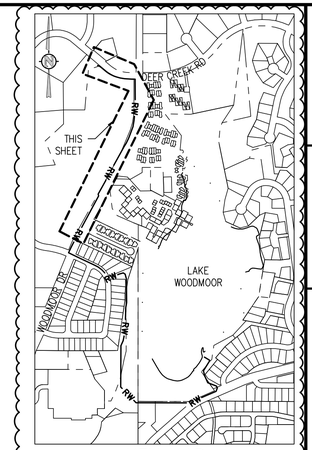
STABILIZED STAGING AREA RE: MHFCD SC-2 SHEET CE1.3 (COORDINATE LOCATION(S) WITH WSD)

MATCHLINE - SEE ABOVE

MATCHLINE - SEE BELOW

⚠ ADDED EXIST STRIPING AND PAVEMENT MARKINGS (TYP)

⚠ NOTES:
1. CUT/FILL NOT SHOWN ON THIS SHEET BECAUSE EARTHWORK IN THIS AREA IS LIMITED TO EXCAVATING AND BACKFILLING A TRENCH
2. SEE CORRESPONDING TRANSMISSION MAIN PLAN AND PROFILES (SHEETS C2.0-C2.5) FOR EXISTING STRUCTURES, EXISTING UTILITIES, SURFACE IMPROVEMENTS, DETAIL CALLOUTS
3. SEE SHEET C0.1 FOR ADJACENT PROPERTY INFORMATION
4. THE SHOULDER OF BOTH DEER CREEK ROAD AND WOODMOOR DRIVE WITHIN THE LIMITS OF DISTURBANCE CONSISTS OF LANDSCAPED GRASSES AND TREES, SCATTERED WEEDS, AND PRE-GRADED BARE LAND. THE VEGETATIVE COVER IS APPROXIMATELY 80% BASED ON VISUAL OBSERVATION.



KEY MAP
NTS

40 0 40 80
SCALE IN FEET

EROSION AND SEDIMENTATION NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL CONTROLS DURING INITIAL, INTERIM, AND FINAL CONDITIONS.
2. ALL CONTROLS SHALL BE INSTALLED WITHIN THE PROPERTY LINES UNLESS OTHERWISE SPECIFIED. WHEN CONSTRUCTION ACTIVITIES DISTURB ADJACENT AND/OR RIGHT-OF-WAY PROPERTIES, COORDINATION WITH PROPERTY OWNERS IS REQUIRED PRIOR TO CONSTRUCTION.

EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- ⚠ (LOC) LIMITS OF CONSTRUCTION/LIMITS OF DISTURBANCE
- (VTC) VEHICLE TRACKING CONTROL
- (SCL) SEDIMENT CONTROL LOG
- (RS) ROCK SOCK
- (CWA) CONCRETE WASHOUT AREA
- (SSA) STABILIZED STAGING AREA
- (PS) PERMANENT SEEDING
- HISTORIC DRAINAGE PATTERN
- ⚠ PROPOSED DRAINAGE PATTERN

WOODMOOR DR

EDGE OF ASPHALT (TYP)

ROCK SOCK RE: MHFCD SC-5 SHEET CE1.4 (TYP)

LIMIT OF RIGHT-OF-WAY

LIMITS OF CONSTRUCTION (TYP)

12" RAW WATER TRANSMISSION MAIN (TYP)

MOORWOOD POINT

SANITARY MANHOLE RIM ELEV: 7104.90' (UNABLE TO OPEN)

SANITARY MANHOLE

SEDIMENT CONTROL LOG PERPENDICULAR TO ROADSIDE DITCH (TYP)

⚠ SHOW ASPHALT AND PAVEMENT REPAIRS (TYP)

10' PUBLIC UTILITY & DRAINAGE EASEMENT (P2)

MATCHLINE - SEE ABOVE

MATCHLINE - SEE NEXT SHEET

40 0 40 80
SCALE IN FEET

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1	07/27/21	RAH	EL PASO COUNTY REVIEW EDITS
		JGJ	

COLORADO REGISTERED JOSHUA M. TURNER 40279 11/16/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
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EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

SHEET NO.
CE1.0

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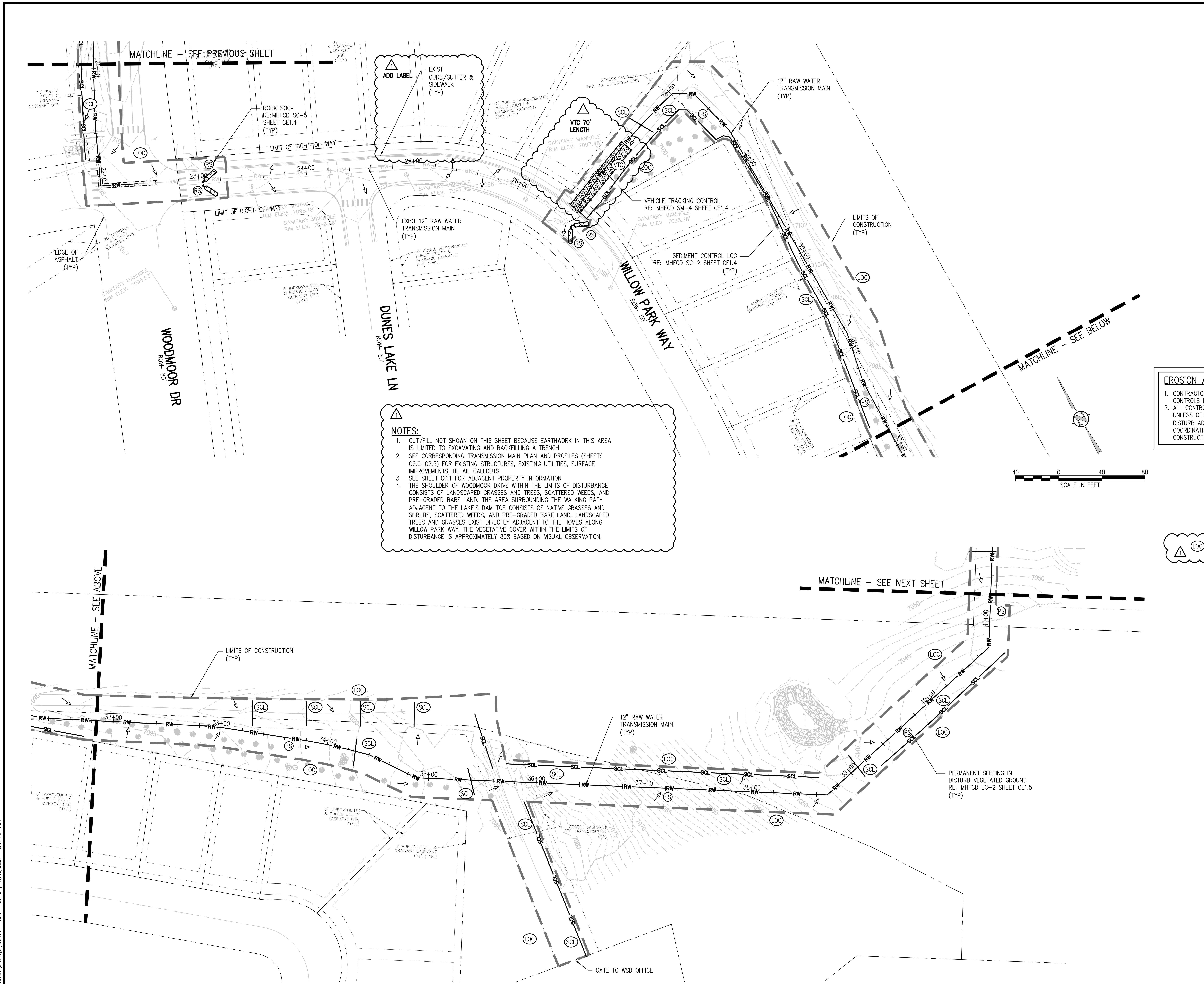
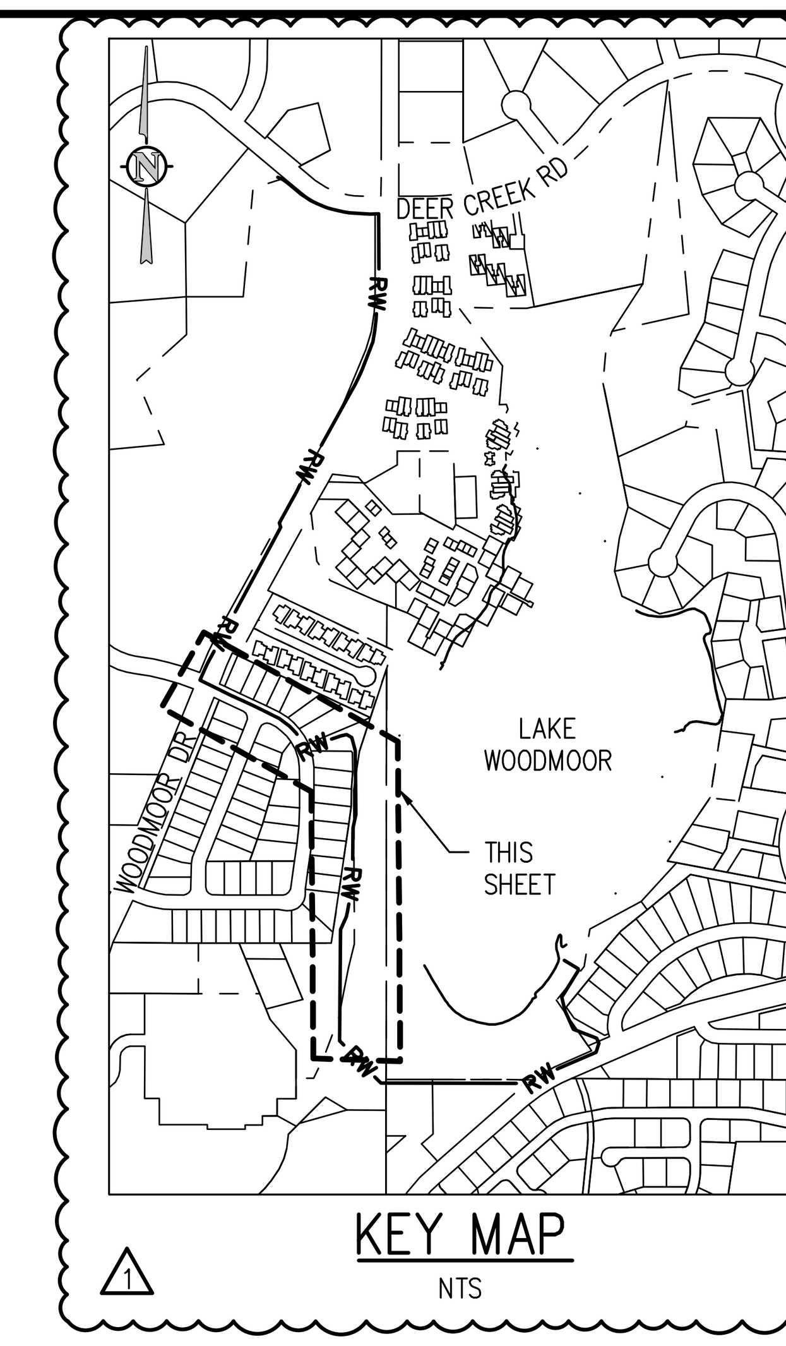


NOTES:

1. CUT/FILL NOT SHOWN ON THIS SHEET BECAUSE EARTHWORK IN THIS AREA IS LIMITED TO EXCAVATING AND BACKFILLING A TRENCH
2. SEE CORRESPONDING TRANSMISSION MAIN PLAN AND PROFILES (SHEETS C2.0–C2.5) FOR EXISTING STRUCTURES, EXISTING UTILITIES, SURFACE IMPROVEMENTS, DETAIL CALLOUTS
3. SEE SHEET C0.1 FOR ADJACENT PROPERTY INFORMATION
4. THE SHOULDER OF WOODMOOR DRIVE WITHIN THE LIMITS OF DISTURBANCE CONSISTS OF LANDSCAPED GRASSES AND TREES, SCATTERED WEEDS, AND PRE–GRADED BARE LAND. THE AREA SURROUNDING THE WALKING PATH ADJACENT TO THE LAKE'S DAM TOE CONSISTS OF NATIVE GRASSES AND SHRUBS, SCATTERED WEEDS, AND PRE–GRADED BARE LAND. LANDSCAPED TREES AND GRASSES EXIST DIRECTLY ADJACENT TO THE HOMES ALONG WILLOW PARK WAY. THE VEGETATIVE COVER WITHIN THE LIMITS OF DISTURBANCE IS APPROXIMATELY 80% BASED ON VISUAL OBSERVATION.



EROSION AND SEDIMENTATION NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL CONTROLS DURING INITIAL, INTERIM, AND FINAL CONDITIONS.
2. ALL CONTROLS SHALL BE INSTALLED WITHIN THE PROPERTY LINES UNLESS OTHERWISE SPECIFIED. WHEN CONSTRUCTION ACTIVITIES DISTURB ADJACENT AND/OR RIGHT–OF–WAY PROPERTIES, COORDINATION WITH PROPERTY OWNERS IS REQUIRED PRIOR TO CONSTRUCTION.

EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- LOC — LIMITS OF CONSTRUCTION/LIMITS OF DISTURBANCE
- VTC — VEHICLE TRACKING CONTROL
- SCL — SEDIMENT CONTROL LOG
- RS — ROCK SOCK
- CWA — CONCRETE WASHOUT AREA
- SSA — STABILIZED STAGING AREA
- PS — PERMANENT SEEDING
- HISTORIC DRAINAGE PATTERN
- PROPOSED DRAINAGE PATTERN

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SCALE IN FEET

JVA CONSULTING ENGINEERS
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Denver, CO 80202 303.444.1951
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Glenwood Springs • Denver

NO.	DATE	DES'D	DWN	REVISION DESCRIPTION
1	07/27/21	RAH	JGJ	EL PASO COUNTY REVIEW EDITS

COLORADO REGISTERED PROFESSIONAL ENGINEER JOSHUA J. McGIBBON 40279 11/16/2021

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

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CE1.1

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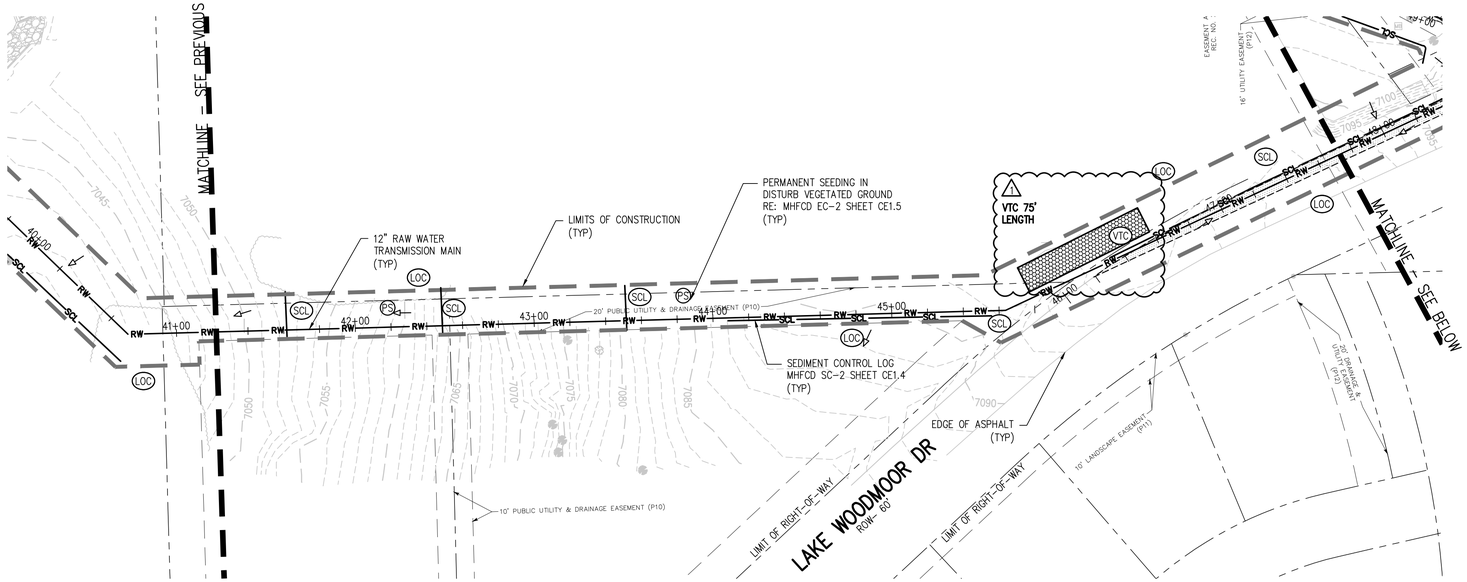

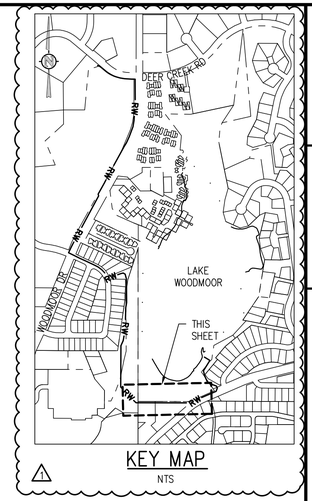

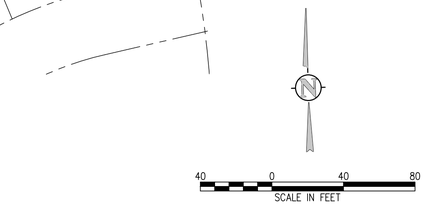

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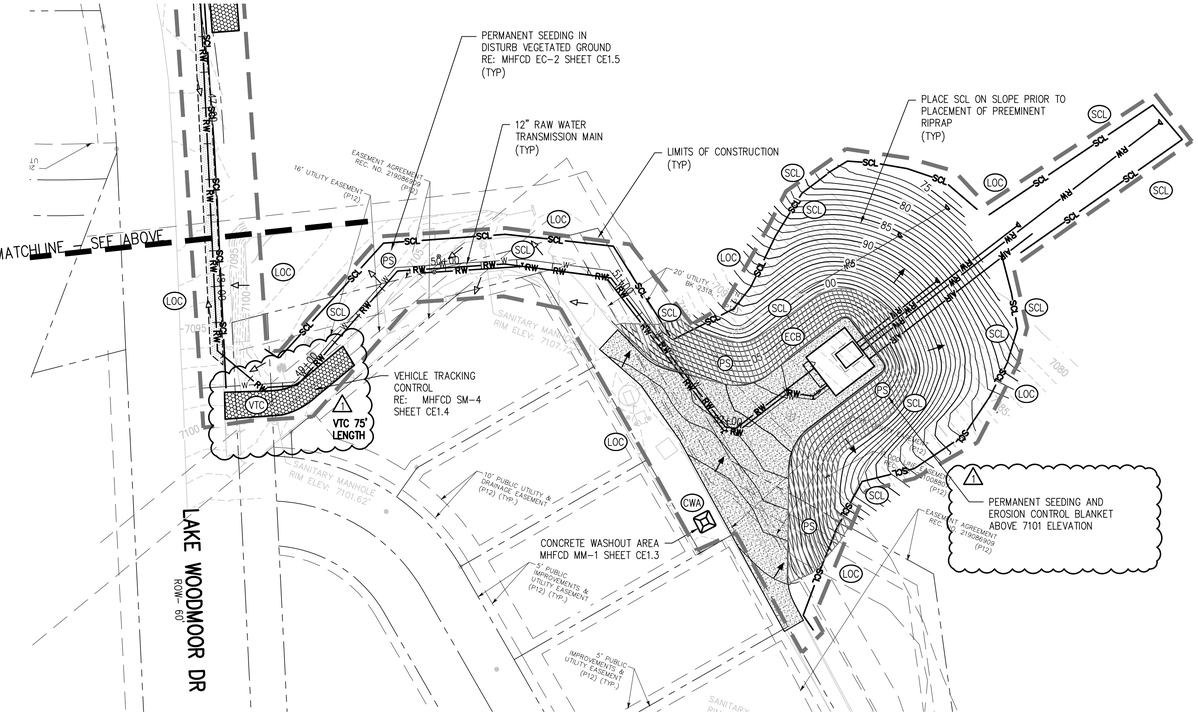

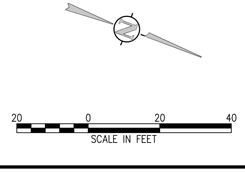

NOTES:

1. CUT/FILL NOT SHOWN ON THIS SHEET BECAUSE EARTHWORK IN ALL AREAS EXCEPT THE PUMP STATION IS LIMITED TO EXCAVATING AND BACKFILLING A TRENCH. SEE C1.0 FOR CUT/FILL AT THE PUMP STATION.
2. SEE CORRESPONDING TRANSMISSION MAIN PLAN AND PROFILES (SHEETS C2.0-C2.5) FOR EXISTING STRUCTURES, EXISTING UTILITIES, SURFACE IMPROVEMENTS, DETAIL CALLOUTS
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WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

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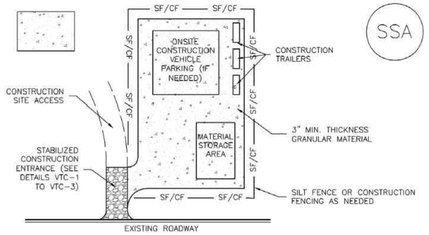

STORMWATER MANAGEMENT PLAN (SWMP)

THIS STORMWATER MANAGEMENT PLAN IS TO BE RETAINED AND MAINTAINED ONSITE INCLUDING FINAL LANDSCAPING PLANS AND ANY OTHER EROSION CONTROL DOCUMENTATION. A SWMP ADMINISTRATOR WILL BE DESIGNATED BY THE CONTRACTOR AND IS RESPONSIBLE FOR DEVELOPING, IMPLEMENTING, MAINTAINING, AND REVISING THIS SWMP. THE SWMP ADMINISTRATOR IS THE CONTACT FOR ALL SWMP-RELATED ISSUES AND IS RESPONSIBLE FOR ITS ACCURACY, COMPLETENESS, AND IMPLEMENTATION. THE FOLLOWING HAS BEEN DESIGNATED AS THE SWMP ADMINISTRATOR FOR THIS PROJECT:

NAME: ____

CONTACT INFO: ____

____

THE SITE IS LOCATED AT IN THE VICINITY OF WOODMOOR LAKE, MONUMENT COLORADO. THE WOODMOOR WATER AND SANITATION DISTRICT DEVELOPED A CAPITAL IMPROVEMENT PLAN (CIP) IN 2020. ONE OF THESE IMPROVEMENTS CONSISTS OF EXPANSION OF THE LAKE PUMP STATION CAPACITY AND ADDITION OF A RAW WATER TRANSMISSION PIPELINE. THESE IMPROVEMENTS ARE NECESSARY TO PROVIDE SURFACE WATER TO THEIR CENTRAL WATER TREATMENT PLANT. REFER TO SHEET C0.1 (OVERALL KEY MAP) FOR AND OVERVIEW OF THE EXTENTS OF THE PIPELINE ALIGNMENT AND LAKE PUMP STATION LOCATION. THE TOTAL SITE AREA (INCLUDING THE PIPELINE) IS APPROXIMATELY **1.5** ACRES WITH AT TOTAL DISTURBANCE OF **1.5** ACRES. NO CONSTRUCTION ACTIVITIES SHALL OCCUR OFFSITE OR OUTSIDE OF THE CONSTRUCTION LIMITS SHOWN ON THE CONSTRUCTION DOCUMENTS. THE SEQUENCE OF CONSTRUCTION STARTS IS AS FOLLOWS:

PHASE	ESTIMATED	ACTUAL
CONSTRUCTION START	JULY, 2021	____________________
ROAD AND OVERLOT GRADING	SEPTEMBER, 2021	____________________
TRANSMISSION PIPELINE CONSTRUCTION	AUGUST, 2021	____________________
LAKE PUMP STATION CONSTRUCTION	NOVEMBER, 2021	____________________
SITE RESTORATION	MAY, 2022	____________________

THE EXISTING SITE CONSISTS OF DEVELOPED LAND WITH RESIDENTIAL LOTS AND PAVED STREETS , NATIVE GRASSLAND, AND PARTIALLY LANDSCAPED VEGETATION, AND IS APPROXIMATELY 80% COVERED WITH VEGETATIVE GROUND COVER. A DRAINAGE REPORT WAS NOT PREPARED FOR THIS PROJECT BECAUSE THE MAJORITY OF DISTURB AREAS WILL BE RESTORED CLOSELY TO THE PRE-CONSTRUCTION GRADE AND VEGETATIVE COVER. NEW GRADING WILL OCCUR AT THE SITE OF THE PROPOSED LAKE PUMP STATION. HOWEVER, IT WILL BE ADJACENT TO WOODMOOR LAKE. RIPRAP AND OTHER PERMANENT SLOPE STABILIZATION MEASURE WILL BE IMPLEMENTED HERE.

OFFSITE RUNOFF FLOWS HAVE NOT BEEN DEFINED ALONG THE PIPELINE ALIGNMENT. A PORTION OF THE PIPELINE WILL BE CONSTRUCTED ADJACENT TO RESIDENTIAL STREETS. THEREFORE, MOST OF THE RUNOFF TO THE PIPELINE INSTALLATION AREA WILL COME FROM THE STREETS DURING STORM EVENTS. ADDITIONALLY, RUNOFF WILL COME FROM OVERLAND FLOW WITHIN THE NATIVE GRASSLAND AREAS WHERE THE PIPELINE WILL BE INSTALLED BELOW THE LAKE WOODMOOR DAM.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE LOCATION OF A STABILIZED STAGING AREA WITH THE WOODMOOR WATER AND SANITATION DISTRICT. OTHER POTENTIAL POLLUTION SOURCES SUCH AS VEHICLE FUELING, STORAGE OF FERTILIZER OR CHEMICALS WILL BE CONFINED TO THIS LOCATION (OR WILL NOT EXIST AT THIS SITE).

BEST MANAGEMENT PRACTICES FOR STORMWATER MANAGEMENT

NON STRUCTURAL BMPS WILL BE IMPLEMENTED TO THE MAXIMUM EXTENT POSSIBLE. THE UTILIZATION OF NON STRUCTURAL BMPS WILL BE AN ONGOING PROCESS DIRECTED AT PREVENTING EROSION. THE NON STRUCTURAL BMPS WILL RECEIVE CONTINUOUS EMPHASIS THROUGHOUT CONSTRUCTION BECAUSE THEY AVERT PROBLEMS BEFORE THEY OCCUR AND REDUCE THE NEED FOR STRUCTURAL BMPS. NON STRUCTURAL BMPS WILL CONSIST PRIMARILY OF PRESERVATION OF EXISTING MATURE VEGETATION AND TREES, PLANNING AND SCHEDULING CONSTRUCTION ACTIVITIES AIMED AT ACHIEVING THE GOAL OF MINIMIZING EROSION. FURTHERMORE, CONSTRUCTION PERSONNEL WILL BE INSTRUCTED AND SUPERVISED IN CONSTRUCTION METHODS CONSISTENT WITH EROSION PREVENTION PRACTICES.

PLANNED STRUCTURAL BMPS FOR EROSION AND SEDIMENT CONTROL ARE SHOWN ON THE EROSION AND SEDIMENTATION CONTROL PLAN. IMPLEMENTING THESE MEASURES SHOULD MINIMIZE NUISANCE SILT AND SEDIMENTATION EXITING THE SITE AND PREVENT CLOGGING EXISTING STORM SEWERS AND STREET GUTTERS.

APPLICATION OF THESE BMPS FOR STORMWATER MANAGEMENT ARE FOR CONSTRUCTION PERIODS AND ARE CONSIDERED TEMPORARY. POST-DEVELOPMENT STORMWATER MANAGEMENT IS PROVIDED THROUGH (VEGETATED LANDSCAPED AREAS, GRASSED SWALES, AND RIPRAP PROTECTION.

VEHICLE TRACKING CONTROL (VTC):

A STABILIZED CONSTRUCTION ENTRANCE WILL BE PROVIDED AS COORDINATED BY THE DISTRICT AND CONTRACTOR(S). THE EROSION CONTROL PLAN SHOWS POTENTIAL LOCATIONS BASED ON REASONABLE CONCLUSIONS. THE CONSTRUCTION ACCESS AND PARKING WILL BE GRADED AND COVERED WITH A CRUSHED STONE BASE COURSE DURING CONSTRUCTION. THE VEHICLE TRACKING CONTROL WILL BE RELOCATED WITH THE CONSTRUCTION ACCESS AS NECESSARY.

SILT FENCING (SF) AND SEDIMENT CONTROL LOGS (SCL):

SILT FENCING AND SEDIMENT CONTROL LOGS SHALL BE INSTALLED WITH RESPECT TO PROPOSED DRAINAGE PATTERNS. SEDIMENT CONTROL LOGS ARE SHOWN ON THE EROSION CONTROL PLAN INSTALLED ALONG THE PIPELINE ALIGNMENT AND ALONG ANY DRAINAGE AREAS SUBJECT TO EROSION. THE SILT FENCING AND SEDIMENT CONTROL LOGS SHALL BE INSTALLED AT THE DOWNHILL SIDE OF THE EXISTING SLOPES ACROSS THE SITE AND AT ALL POINT DISCHARGE AREAS WHETHER SHOWN OR NOT, SILT FENCE AND SEDIMENT CONTROL LOGS SHALL BE MAINTAINED AS NEEDED THROUGHOUT THE CONSTRUCTION PROCESS. THE TEMPORARY SILT FENCE AND SEDIMENT CONTROL LOGS WILL REMAIN UNTIL THE STORM SEWER STRUCTURES ARE COMPLETED AND GROUND COVER IS EFFECTIVE.

OVERLOT GRADING:

ALL OPEN AREAS WILL BE TREATED WITHIN 14 DAYS OF COMPLETION OF THE OVERLOT GRADING. ALL OVERLOT GRADING IN THE NON-IRRIGATED AREAS WILL HAVE THE SURFACE ROUGHENED AND WILL BE PERMANENTLY LANDSCAPED OR TEMPORARILY SEEDED UNTIL THE PLANNED INSTALLATIONS ARE COMPLETED. AT THE COMPLETION OF THE MASS GRADING, ALL EXPOSED SOIL AREAS WILL HAVE THE SURFACE ROUGHENED AND PLANTED WITH A REVEGETATION SEED MIX. VEGETATION IS TO BE MAINTAINED THROUGHOUT CONSTRUCTION BY THE CONTRACTOR UNTIL AREAS ARE PERMANENTLY LANDSCAPED. ALTERNATELY, ROUGH-CUT DRIVEWAYS OR PROPOSED PAVED AREAS CAN BE COVERED WITH A LAYER OF AGGREGATE, ROAD BASE OR ASPHALT PAVING.

DUST CONTROL MEASURES:

DISTURBED AREAS NOT YET READY TO BE SEEDED, LANDSCAPES, PAVED, OR OTHERWISE STABILIZED SHALL BE WATERED, OR RIPPED AS NECESSARY TO PRECLUDE VISIBLE DUST EMISSIONS.

ITEMS ARE SCHEDULED TO BE IMPLEMENTED ACCORDING TO THE CONSTRUCTION SCHEDULE. AS WORK PROCEEDS, IMPLEMENTATION OF INDIVIDUAL BMPS IS TO COINCIDE WITH THE CONSTRUCTION THEREBY MINIMIZING THE EXPOSURE OF UNPROTECTED AREAS. THE SILT FENCE, INLET PROTECTION (FOR EXISTING INLETS), AND GRAVELING OF THE CONSTRUCTION ENTRANCE WILL BE PERFORMED WHEN THE GRADING BEGINS. THE INLET PROTECTION WILL BE INSTALLED AS THE STORM SEWER STRUCTURES ARE CONSTRUCTED. THE RIPRAP PROTECTION WILL BE INSTALLED AS THE STORM SEWER OUTFALLS OR CULVERTS ARE CONSTRUCTED. THE STRUCTURAL BMPS THAT DO NOT BECOME PART OF THE PERMANENT STORMWATER MANAGEMENT PLAN ARE TO BE REMOVED, AS THE PAVING, LANDSCAPING, AND OTHER PERMANENT GROUNDCOVER INSTALLATIONS ARE COMPLETED. FUGITIVE DUST EMISSIONS RESULTING FROM GRADING ACTIVITIES AND/OR WIND SHALL BE CONTROLLED USING THE BEST AVAILABLE CONTROL TECHNOLOGY AS DEFINED BY THE COLORADO DEPARTMENT OF HEALTH AT THE TIME OF GRADING. THE GRAVELING IS TO BE MAINTAINED AND EXTENDED CONSTRUCTION PROGRESSES ESPECIALLY AROUND THE BUILDING SITE. THE STRUCTURAL BMPS ARE TO BE REMOVED, AS THE PERMANENT LANDSCAPING INSTALLATIONS ARE COMPLETED.

THE EROSION AND SEDIMENT CONTROL PLAN MAY BE MODIFIED BY THE OWNER'S ENGINEER, COUNTY ENGINEERING INSPECTORS, MUNICIPALITY, WSD, OR ITS AUTHORIZED REPRESENTATIVE AS FIELD CONDITIONS WARRANT.

ERMANENT STABILIZATION MEASURES:

PERMANENT LANDSCAPING WILL INCLUDE SEEDING TO OPEN AREAS. NATIVE PERENNIAL SEEDING WILL BE ESTABLISHED IN NON-IRRIGATED AREAS. ALL PERMANENT STABILIZATION MEASURES WILL BE SPECIFIED BY THE OWNER.

MATERIALS AND SPILL PREVENTION:

THE CONTRACTOR WILL STORE CONSTRUCTION MATERIALS AND EQUIPMENT IN CONFINED AREAS ON SITE FROM WHICH RUNOFF WILL BE CONTAINED AND FILTERED. MATERIALS WILL BE STORED OFF THE GROUND AND PROTECTED FROM THE WEATHER BY A COVER OR STORED IN A CONTAINER SUCH AS A VAN OR TRAILER. AN EARTHEN DIKE WILL BE CONSTRUCTED AROUND THE PERIMETER OF THE FUEL STORAGE AREA TO PREVENT MATERIALS FROM CONTACT WITH SURFACE RUNOFF. EQUIPMENT MAINTENANCE WILL BE PERFORMED IN A DESIGNATED AREA AND STANDARD MAINTENANCE PROCEDURES, SUCH AS THE USE OF DRIP PANS, WILL BE USED TO CONTAIN PETROLEUM PRODUCTS.

INSPECTION AND MAINTENANCE:

THE EROSION CONTROL MEASURES WILL BE INSPECTED DAILY DURING CONSTRUCTION BY THE CONTRACTOR AND AFTER EACH RAIN EVENT. ALL INSPECTIONS SHALL BE DOCUMENTED AND SHALL INCLUDE THE DATE OF INSPECTION, ANY INCIDENCE OF NON-COMPLIANCE, SIGNED CERTIFICATION THAT THE SITE IS IN COMPLIANCE, AND ANY NOTES, DRAWINGS, MAPS, ETC. PERTAINING TO REPAIRS. COPIES OF ALL DOCUMENTATION SHALL BE DISTRIBUTED TO MUNICIPALITIES AND OWNER ON A REGULAR BASIS AS SPECIFIED BY OWNER. SEDIMENTS DEPOSITED IN THE PUBLIC RIGHTS-OF-WAY WILL BE REMOVED IMMEDIATELY. THE TEMPORARY VEGETATION OF BARE SOILS WILL BE CHECKED REGULARLY AND AREAS WHERE IT IS LOST OR DAMAGED WILL BE RESEEDED. AT MINIMUM THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL BMPS EVERY 14 DAYS AND AFTER SIGNIFICANT PRECIPITATION OR SNOWMELT EVENTS. INSTALLATIONS AND MODIFICATIONS AS REQUIRED BY THE (CITY/TOWN/COUNTY/DISTRICT) WILL BE IMPLEMENTED WITHIN 48 HOURS OF NOTIFICATION. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL MEASURES AND REPAIR AREAS AS REQUIRED AFTER VEGETATION IS ESTABLISHED AND ACCEPTED BY OWNER AND MUNICIPALITY.

FINAL STABILIZATION AND LONG-TERM STORMWATER QUALITY:

FINAL STABILIZATION IS REACHED WHEN ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED, AND UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED WITH A DENSITY OF AT LEAST 70% OR PRE-DISTURBANCE LEVELS OR EQUIVALENT PERMANENT, PHYSICAL EROSION REDUCTION METHODS HAVE BEEN EMPLOYED. FINAL STABILIZATION WILL BE ACHIEVED USING NATIVE SEEDING, PERMANENT BMP'S, AND OTHER METHODS. CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL STABILIZATION REGARDLESS OF ACCEPTANCE BY OWNER OF THE CONTRACTOR ITEM.

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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 OR OFFSITE 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 TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR AND SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
4. ONCE THE ESQCP IS APPROVED AND A "NOTICE TO PROCEED"HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED GEC. A PRECONSTRUCTION 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 MAY CONTRIBUTE POLLUTANTS TO STORMWATER. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED 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 IS 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 PRIOR TO IMPLEMENTATION.
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. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE STABILIZED.
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 PERCENT OF PRE-DISTURBANCE 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 DEFINED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE HYDROLOGY OR HYDRAULICS OF A PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
10. ANY EARTH DISTURBANCE 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 INFEASIBLE.
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 SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED.
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 RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUT SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY.
14. DEWATERING OPERATIONS: UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON SITE, BUT MAY NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF.
15. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM CONSTRUCTION SITES 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, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM 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 CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
22. BULK STORAGE OF PETROLEUM PRODUCTS OR OTHER LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL HAVE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR 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. INDIVIDUALS 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 INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
26. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
27. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY TERRACON (DECEMBER 2020) 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 1 ACRE OR 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

STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
3. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
   A.EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   B.CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   C.COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   D.CDOT M & S STANDARDS
4. 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. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
5. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) -INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
8. CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PCD.
10. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
12. SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. [IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES WILL BE PROVIDED.]
14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
15. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

Stabilized Staging Area (SSA) SM-6

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.

November 2010 Urban Drainage and Flood Control District
Urban Storm Drainage Criteria Manual Volume 3 SSA-3

Concrete Washout Area (CWA) MM-1

CONCRETE WASHOUT AREA PLAN

SECTION A

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.

November 2010 Urban Drainage and Flood Control District
Urban Storm Drainage Criteria Manual Volume 3 CWA-3

CONSULTING ENGINEERS
JVA, Inc. 1512 Larimer Street, Suite 710
Denver, CO 80202 303.444.1951
www.jvajva.com
Boulder ● Fort Collins ● Winter Park
Glenwood Springs ● Denver

NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION
△1	07/27/21	RAH	JGJ	EL PASO COUNTY REVIEW EDITS

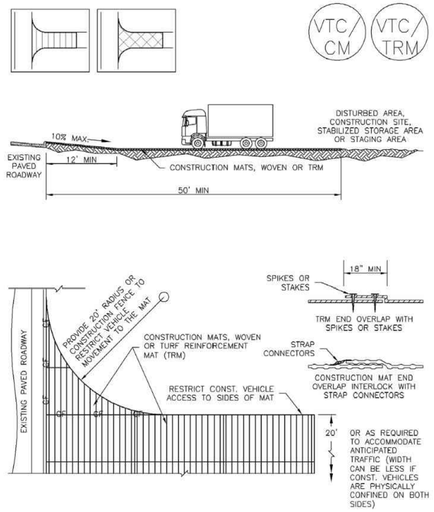
COLORADO REGISTERED PROFESSIONAL ENGINEER
JOSHUA J. McGIBBON
40279
11/16/2021

DESIGNED BY: RAH/MHT
DRAWN BY: JGJ
CHECKED BY: JJM
JOB #: 1051.6e
DATE: JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

SWMP NOTES AND EROSION CONTROL
DETAILS

SHEET NO.
CE1.3



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

SM-4 Vehicle Tracking Control (VTC)

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.

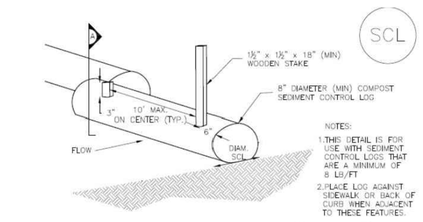
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

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

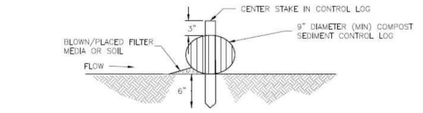
5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

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.

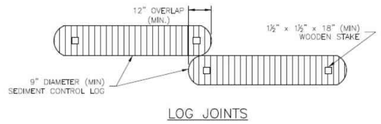
(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



SECTION (A)
COMPOST SEDIMENT CONTROL LOG



LOG JOINTS

SCL–2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

SC-2 Sediment Control Log (SCL)

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.

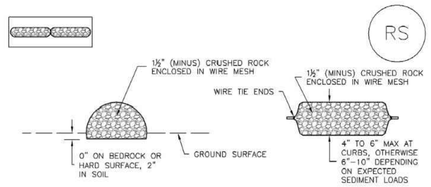
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

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.

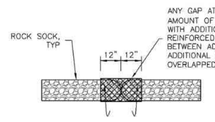
5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED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



ROCK SOCK SECTION ROCK SOCK PLAN



ROCK SOCK JOINTING

ANY GAP AT JOINT SHALL BE FILLED WITH AN ADEQUATE AMOUNT OF 1½" (MINUS) CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO ENDS OF ROCK REINFORCED SOCK. AS AN ALTERNATIVE TO FILLING JOINTS BETWEEN ADJOINING ROCK SOCKS WITH CRUSHED ROCK AND ADDITIONAL WIRE WRAPPING, ROCK SOCKS CAN BE OVERLAPPED (TYPICALLY 12–INCH OVERLAP) TO AVOID GAPS.

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1½"	90 – 100
1"	20 – 55
¾"	0 – 15
⅜"	0 – 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION(S) OF ROCK SOCKS.

2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).

3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½", RECOMMENDED MINIMUM ROLL WIDTH OF 48"

4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS–1. ROCK SOCK PERIMETER CONTROL

Rock Sock (RS) SC-5

ROCK SOCK 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 SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS 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 ROCK SOCK.

6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE 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, 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 ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER NOORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; 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.

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NO.	DATE	DES'D	DWN
1	07/27/21	RAH	JGJ

REVISION DESCRIPTION: EL PASO COUNTY REVIEW EDITS

DESIGNED BY:	RAH/MHT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL DETAILS

SHEET NO.
CE1.4

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soil amendments and rototill them into the soil to a depth of 6 inches or more.

Topsoil should be salvaged during grading operations for use and spread on areas to be revegetated later. Topsoil should be viewed as an important resource to be utilized for vegetation establishment, due to its water-holding capacity, structure, texture, organic matter content, biological activity, and nutrient content. The rooting depth of most native grasses in the semi-arid Denver metropolitan area is 6 to 18 inches. At a minimum, the upper 6 inches of topsoil should be stripped, stockpiled, and ultimately respread across areas that will be revegetated.

Where topsoil is not available, subsoils should be amended to provide an appropriate plant-growth medium. Organic matter, such as well digested compost, can be added to improve soil characteristics conducive to plant growth. Other treatments can be used to adjust soil pH conditions when needed. Soil testing, which is typically inexpensive, should be completed to determine and optimize the types and amounts of amendments that are required.

If the disturbed ground surface is compacted, rip or rototill the surface prior to placing topsoil. If adding compost to the existing soil surface, rototilling is necessary. Surface roughening will assist in placement of a stable topsoil layer on steeper slopes, and allow infiltration and root penetration to greater depth.

Prior to seeding, the soil surface should be rough and the seedbed should be firm, but neither too loose nor compacted. The upper layer of soil should be in a condition suitable for seeding at the proper depth and conducive to plant growth. Seed-to-soil contact is the key to good germination.

Seed Mix for Temporary Vegetation

To provide temporary vegetative cover on disturbed areas which will not be paved, built upon, or fully landscaped or worked for an extended period (typically 30 days or more), plant an annual grass appropriate for the time of planting and mulch the planted areas. Annual grasses suitable for the Denver metropolitan area are listed in Table TS/PS-1. These are to be considered only as general recommendations when specific design guidance for a particular site is not available. Local governments typically specify seed mixes appropriate for their jurisdiction.

Seed Mix for Permanent Revegetation

To provide vegetative cover on disturbed areas that have reached final grade, a perennial grass mix should be established. Permanent seeding should be performed promptly (typically within 14 days) after reaching final grade. Each site will have different characteristics and a landscape professional or the local jurisdiction should be contacted to determine the most suitable seed mix for a specific site. In lieu of a specific recommendation, one of the perennial grass mixes appropriate for site conditions and growth season listed in Table TS/PS-2 can be used. The pure live seed (PLS) rates of application recommended in these tables are considered to be absolute minimum rates for seed applied using proper drill-seeding equipment.

If desired for wildlife habitat or landscape diversity, shrubs such as rubber rabbitbrush (*Chrysothamnus nauseosus*), fourwing saltbush (*Atriplex canescens*) and skunkbrush sumac (*Rhus trilobata*) could be added to the upland seedmixes at 0.25, 0.5 and 1 pound PLS/acre, respectively. In riparian zones, planting root stock of such species as American plum (*Prunus americana*), woods rose (*Rosa woodsii*), plains cottonwood (*Populus sargentii*), and willow (*Populus spp.*) may be considered. On non-topsoiled upland sites, a legume such as Ladak alfalfa at 1 pound PLS/acre can be included as a source of nitrogen for perennial grasses.

Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-3 for appropriate seeding dates.

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species[a] (Common name)	Growth Season[b]	Pounds of Pure Live Seed (PLS)/acre[c]	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5–10	½ - ¾
7. Sorghum	Warm	5–10	½ - ¾
8. Winter wheat	Cool	20–35	1 - 2
9. Winter barley	Cool	20–35	1 - 2
10. Winter rye	Cool	20–35	1 - 2
11. Triticale	Cool	25–40	1 - 2

[a] Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

[b] See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

[c] Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses

Common Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Alakali Soil Seed Mix					
Alkali sacaton	*Sporobolus airoides*	Cool	Bunch	1,750,000	0.25
Basin wildrye	*Elymus cinereus*	Cool	Bunch	165,000	2.5
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Jose tall wheatgrass	*Agropyron elongatum 'Jose'*	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.75**
Fertile Loamy Soil Seed Mix					
Ephriam crested wheatgrass	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	2.0
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	7.0
Total					**15.5**
High Water Table Soil Seed Mix					
Meadow foxtail	*Alopecurus pratensis*	Cool	Sod	900,000	0.5
Redtop	*Agrostis alba*	Warm	Open sod	5,000,000	0.25
Reed canarygrass	*Phalaris arundinacea*	Cool	Sod	68,000	0.5
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Pathfinder switchgrass	*Panicum virgatum 'Pathfinder'*	Warm	Sod	389,000	1.0
Alkar tall wheatgrass	*Agropyron elongatum 'Alkar'*	Cool	Bunch	79,000	5.5
Total					**10.75**
Transition Turf Seed Mix[c]					
Ruebens Canadian bluegrass	*Poa compressa 'Ruebens'*	Cool	Sod	2,500,000	0.5
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Citation perennial ryegrass	*Lolium perenne 'Citation'*	Cool	Sod	247,000	3.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Total					**7.5**

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses (cont.)

Common Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Sandy Soil Seed Mix					
Blue grama	*Bouteloua gracilis*	Warm	Sod-forming bunchgrass	825,000	0.5
Camper little bluestem	*Schizachyrium scoparium 'Camper'*	Warm	Bunch	240,000	1.0
Prairie sandreed	*Calamovilfa longifolia*	Warm	Open sod	274,000	1.0
Sand dropseed	*Sporobolus cryptandrus*	Cool	Bunch	5,298,000	0.25
Vaughn sideoats grama	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**10.25**
Heavy Clay, Rocky Foothill Seed Mix					
Ephriam crested wheatgrass[d]	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	*Agropyron intermedium 'Oahe'*	Cool	Sod	115,000	5.5
Vaughn sideoats grama[e]	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.5**

[a] All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1. If hydraulic seeding is used, hydraulic mulching should be done as a separate operation.

[b] See Table TS/PS-3 for seeding dates.

[c] If site is to be irrigated, the transition turf seed rates should be doubled.

[d] Crested wheatgrass should not be used on slopes steeper than 6H to 1V.

[e] Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sideoats grama.

Table TS/PS-3. Seeding Dates for Annual and Perennial Grasses

	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
Seeding Dates	**Warm**	**Cool**	**Warm**	**Cool**
January 1–March 15			✓	✓
March 16–April 30	4	1,2,3	✓	✓
May 1–May 15	4		✓	
May 16–June 30	4,5,6,7			
July 1–July 15	5,6,7			
July 16–August 31				
September 1–September 30		8,9,10,11		
October 1–December 31			✓	✓

Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the Mulching BMP Fact Sheet for additional guidance.

Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.

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EROSION CONTROL DETAILS

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Description

Photograph RECP-1. Erosion control blanket protecting the slope from erosion and providing favorable conditions for revegetation.

Rolled Erosion Control Products (RECPs) include a variety of temporary or permanently installed manufactured products designed to control erosion and enhance vegetation establishment and survivability, particularly on slopes and in channels. For applications where natural vegetation alone will provide sufficient permanent erosion protection, temporary products such as netting, open weave textiles and a variety of erosion control blankets (ECBs) made of biodegradable natural materials (e.g., straw, coconut fiber) can be used. For applications where natural vegetation alone will not be sustainable under expected flow conditions, permanent rolled erosion control products such as turf reinforcement mats (TRMs) can be used. In particular, turf reinforcement mats are designed for discharges that exert velocities and sheer stresses that exceed the typical limits of mature natural vegetation.

Appropriate Uses

RECPs can be used to control erosion in conjunction with revegetation efforts, providing seedbed protection from wind and water erosion. These products are often used on disturbed areas on steep slopes, in areas with highly erosive soils, or as part of drainageway stabilization. In order to select the appropriate RECP for site conditions, it is important to have a general understanding of the general types of these products, their expected longevity, and general characteristics.

The Erosion Control Technology Council (ECTC 2005) characterizes rolled erosion control products according to these categories:

- **Mulch control netting**: A planar woven natural fiber or extruded geosynthetic mesh used as a temporary degradable rolled erosion control product to anchor loose fiber mulches.
- **Open weave textile**: A temporary degradable rolled erosion control product composed of processed natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.
- **Erosion control blanket (ECB)**: A temporary degradable rolled erosion control product composed of processed natural or polymer fibers which are mechanically, structurally or chemically bound together to form a continuous matrix to provide erosion control and facilitate vegetation establishment. ECBs can be further differentiated into rapidly degrading single-net and double-net types or slowly degrading types.

Rolled Erosion Control Products	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

Staking patterns are also provided in the design details according to these factors:

- ECB type
- Slope or channel type

For other types of RECPs including TRMs, these design details are intended to serve as general guidelines for design and installation; however, engineers should adhere to manufacturer's installation recommendations.

Maintenance and Removal

Inspection of erosion control blankets and other RECPs includes:

- Check for general signs of erosion, including voids beneath the mat. If voids are apparent, fill the void with suitable soil and replace the erosion control blanket, following the appropriate staking pattern.
- Check for damaged or loose stakes and secure loose portions of the blanket.

Erosion control blankets and other RECPs that are biodegradable typically do not need to be removed after construction. If they must be removed, then an alternate soil stabilization method should be installed promptly following removal.

Turf reinforcement mats, although generally resistant to biodegradation, are typically left in place as a dense vegetated cover grows in through the mat matrix. The turf reinforcement mat provides long-term stability and helps the established vegetation resist erosive forces.

EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF ECB.
   –TYPE OF ECB (STRAW, STRAW–COCONUT, COCONUT, OR EXCELSIOR).
   –AREA, A, IN SQUARE YARDS OF EACH TYPE OF ECB.

2. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE PREFERRED FOR RECPs, ALTHOUGH SOME JURISDICTIONS MAY ALLOW OTHER MATERIALS IN SOME APPLICATIONS.

3. IN AREAS WHERE ECBs ARE SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO ECB INSTALLATION AND THE ECB SHALL BE IN FULL CONTACT WITH SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.

4. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.

5. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL ECBs EXCEPT STRAW WHICH MAY USE AN OVERLAPPING JOINT.

6. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE–HALF ROLL LENGTH FOR COCONUT AND EXCELSIOR ECBs.

7. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER FOR ECBs ON SLOPES.

8. MATERIAL SPECIFICATIONS OF ECBs SHALL CONFORM TO TABLE ECB–1.

9. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING ECBS SHALL BE RESEEDED AND MULCHED.

10. DETAILS ON DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION WILL GOVERN IF DIFFERENT FROM THOSE SHOWN HERE.

TABLE ECB–1. ECB MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING**
STRAW*	–	100%	–	DOUBLE/ NATURAL
STRAW–COCONUT	30% MIN	70% MAX	–	DOUBLE/ NATURAL
COCONUT	100%	–	–	DOUBLE/ NATURAL
EXCELSIOR	–	–	100%	DOUBLE/ NATURAL

*STRAW ECBs MAY ONLY BE USED OUTSIDE OF STREAMS AND DRAINAGE CHANNEL.
**ALTERNATE NETTING MAY BE ACCEPTABLE IN SOME JURISDICTIONS

Table RECP-1. ECTC Standard Specification for Temporary Rolled Erosion Control Products
(Adapted from Erosion Control Technology Council 2005)

Product Description	Slope Applications*		Channel Applications*	Minimum Tensile Strength[1]	Expected Longevity
	Maximum Gradient	C Factor[2,5]	Max. Shear Stress[3,4,6]		
Mulch Control Nets	5:1 (H:V)	≤0.10 @ 5:1	0.25 lbs/ft^2 (12 Pa)	5 lbs/ft (0.073 kN/m)	Up to 12 months
Netless Rolled Erosion Control Blankets	4:1 (H:V)	≤0.10 @ 4:1	0.5 lbs/ft^2 (24 Pa)	5 lbs/ft (0.073 kN/m)	
Single-net Erosion Control Blankets & Open Weave Textiles	3:1 (H:V)	≤0.15 @ 3:1	1.5 lbs/ft^2 (72 Pa)	50 lbs/ft (0.73 kN/m)	
Double-net Erosion Control Blankets	2:1 (H:V)	≤0.20 @ 2:1	1.75 lbs/ft^2 (84 Pa)	75 lbs/ft (1.09 kN/m)	
Mulch Control Nets	5:1 (H:V)	≤0.10 @ 5:1	0.25 lbs/ft^2 (12 Pa)	25 lbs/ft (0.36 kN/m)	24 months
Erosion Control Blankets & Open Weave Textiles (slowly degrading)	1.5:1 (H:V)	≤0.25 @ 1.5:1	2.00 lbs/ft^2 (96 Pa)	100 lbs/ft (1.45 kN/m)	24 months
Erosion Control Blankets & Open Weave Textiles	1:1 (H:V)	≤0.25 @ 1:1	2.25 lbs/ft^2 (108 Pa)	125 lbs/ft (1.82 kN/m)	36 months

* C Factor and shear stress for mulch control nettings must be obtained with netting used in conjunction with pre-applied mulch material. (*See Section 5.3 of Chapter 7 Construction BMPs for more information on the C Factor.*)

[1] Minimum Average Roll Values, Machine direction using ECTC Mod. ASTM D 5035.

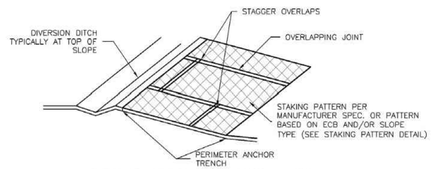
[2] C Factor calculated as ratio of soil loss from RECP protected slope (tested at specified or greater gradient, H:V) to ratio of soil loss from unprotected (control) plot in large-scale testing.

[3] Required minimum shear stress RECP (unvegetated) can sustain without physical damage or excess erosion (> 12.7 mm (0.5 in) soil loss) during a 30-minute flow event in large-scale testing.

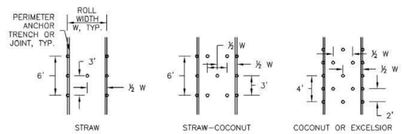
[4] The permissible shear stress levels established for each performance category are based on historical experience with products characterized by Manning's roughness coefficients in the range of 0.01 - 0.05.

[5] Acceptable large-scale test methods may include ASTM D 6459, or other independent testing deemed acceptable by the engineer.

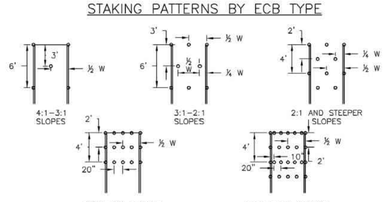
[6] Per the engineer's discretion. Recommended acceptable large-scale testing protocol may include ASTM D 6460, or other independent testing deemed acceptable by the engineer.



ECB–3. OUTSIDE OF DRAINAGEWAY



STAKING PATTERNS BY ECB TYPE



STAKING PATTERNS BY SLOPE OR CHANNEL TYPE

EROSION CONTROL BLANKET 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. ECBs SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE, UNLESS REQUESTED TO BE REMOVED BY THE LOCAL JURISDICTION.

5. ANY ECB PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW THE GEOTEXTILE THAT HAVE ERODED TO CREATED A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE ECB REINSTALLED.

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 AND TOWN OF PARKER COLORADO, NOT AVAILABLE IN AUTOCAD)

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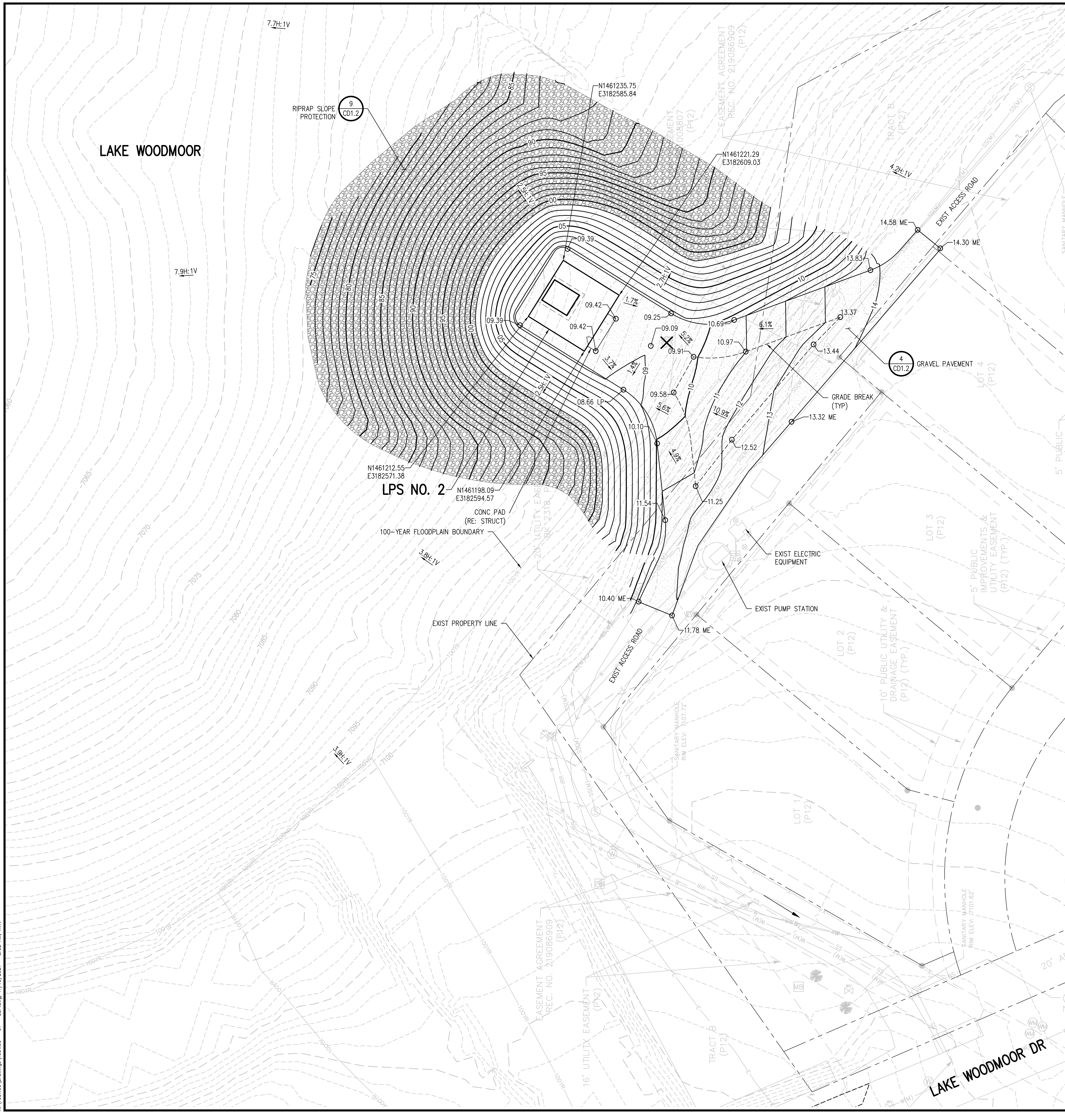

LAKE WOODMOOR
RIPRAP SLOPE PROTECTION
9 CD1.2
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E3182609.03
N1461212.55
E3182571.38
N1461198.09
E3182594.57
CONC PAD
(RE: STRUCT)
100-YEAR FLOODPLAIN BOUNDARY
EXIST PROPERTY LINE
EXIST ACCESS ROAD
EXIST ELECTRIC EQUIPMENT
EXIST PUMP STATION
GRAVEL PAVEMENT
4 CD1.2
GRADE BREAK
(TYP)
14.58 ME
14.30 ME
13.83
13.37
13.44
13.32 ME
12.52
11.25
11.54
10.40 ME
11.78 ME
10.10
10.69
10.97
09.91
09.58
09.39
09.42
09.25
09.09
08.66 LP
7.7H:1V
7.9H:1V
4.2H:1V
3.8H:1V
3.9H:1V
LOT 1
LOT 2
LOT 3
LOT 4
TRACT B
LAKE WOODMOOR DR

CUT/FILL SUMMARY						
NAME	CUT FACTOR	FILL FACTOR	2D AREA	CUT	FILL	NET
VOLUME	1.00	1.00	27523.04 SQ. FT.	143.18 CU. YD.	6433.99 CU. YD.	6290.81 CU. YD. <FILL>
TOTALS			27523.04 SQ. FT.	143.18 CU. YD.	6433.99 CU. YD.	6290.81 CU. YD. <FILL>

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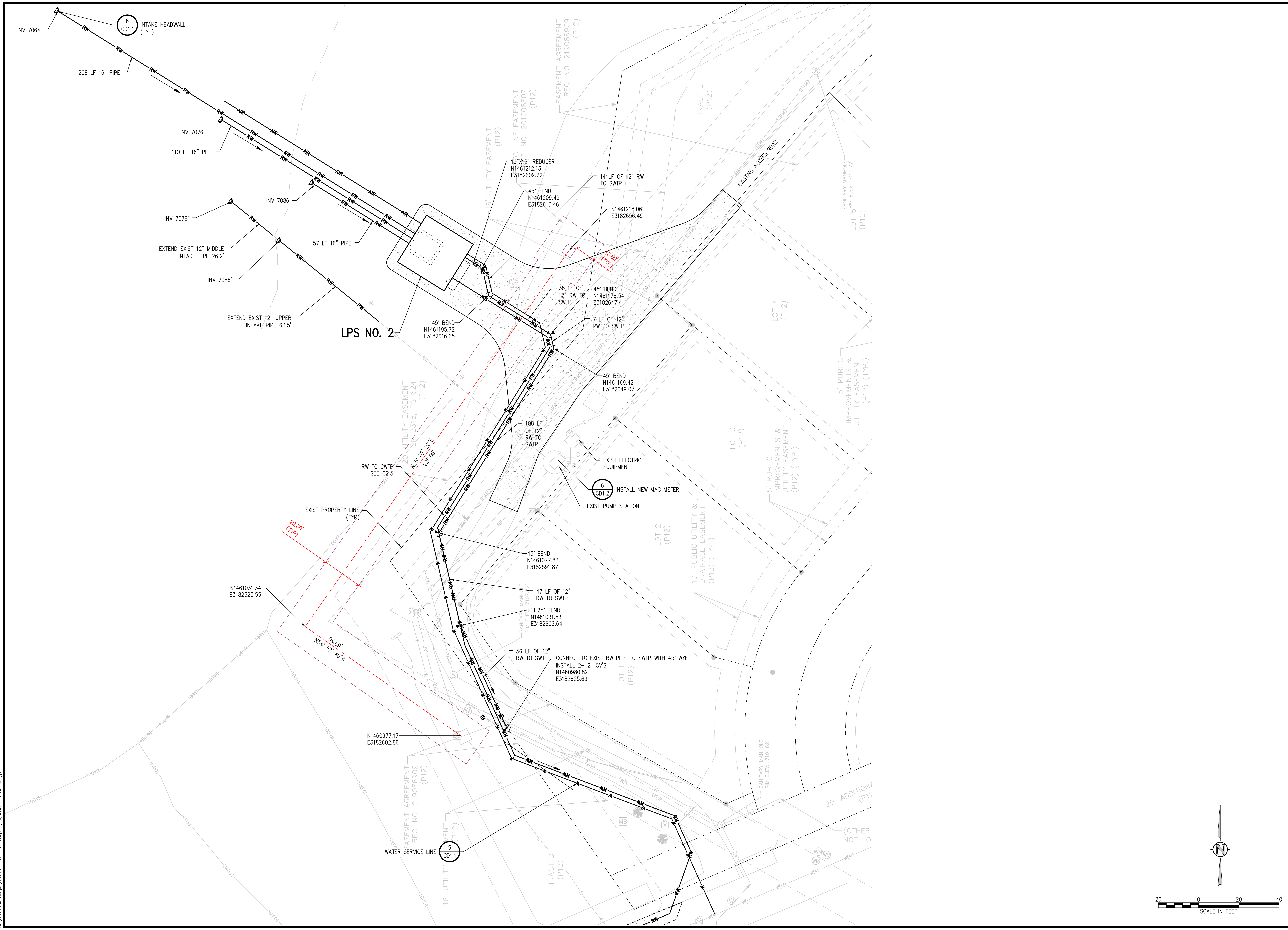
CIVIL SITE PLAN

SHEET NO.
C1.0


INV 7064
6 CD1.1 INTAKE HEADWALL (TYP)
208 LF 16" PIPE
INV 7076
110 LF 16" PIPE
INV 7086
INV 7076'
EXTEND EXIST 12" MIDDLE INTAKE PIPE 26.2'
57 LF 16" PIPE
INV 7086'
EXTEND EXIST 12" UPPER INTAKE PIPE 63.5'
LPS NO. 2
10"X12" REDUCER N1461212.13 E3182609.22
45° BEND N1461209.49 E3182613.46
14 LF OF 12" RW TO SWTP
N1461218.06 E3182656.49
10.00' (TYP)
36 LF OF 12" RW TO SWTP
45° BEND N1461176.54 E3182647.41
7 LF OF 12" RW TO SWTP
45° BEND N1461195.72 E3182616.65
45° BEND N1461169.42 E3182649.07
108 LF OF 12" RW TO SWTP
EXIST ELECTRIC EQUIPMENT
6 CD1.2 INSTALL NEW MAG METER
EXIST PUMP STATION
RW TO CWTP SEE C2.5
N35° 02' 20"E 228.06'
EXIST PROPERTY LINE (TYP)
20.00' (TYP)
45° BEND N1461077.83 E3182591.87
47 LF OF 12" RW TO SWTP
11.25° BEND N1461031.83 E3182602.64
N1461031.34 E3182525.55
94.69' N54° 57' 40"W
56 LF OF 12" RW TO SWTP
CONNECT TO EXIST RW PIPE TO SWTP WITH 45° WYE INSTALL 2-12" GV'S N1460980.82 E3182625.69
N1460977.17 E3182602.86
WATER SERVICE LINE 5 CD1.1
EXISTING ACCESS ROAD
EASEMENT AGREEMENT REC. NO. 219086909 (P12)
TRACT B (P12)
LOT 4 (P12)
LOT 3 (P12)
LOT 2 (P12)
LOT 1 (P12)
5' PUBLIC IMPROVEMENTS & UTILITY EASEMENT (P12) (TYP.)
10' PUBLIC UTILITY & DRAINAGE EASEMENT (P12) (TYP.)
16' UTILITY EASEMENT (P12)
20' ADDITIONAL (P12)
(OTHER NOT LO
20 0 20 40
SCALE IN FEET

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

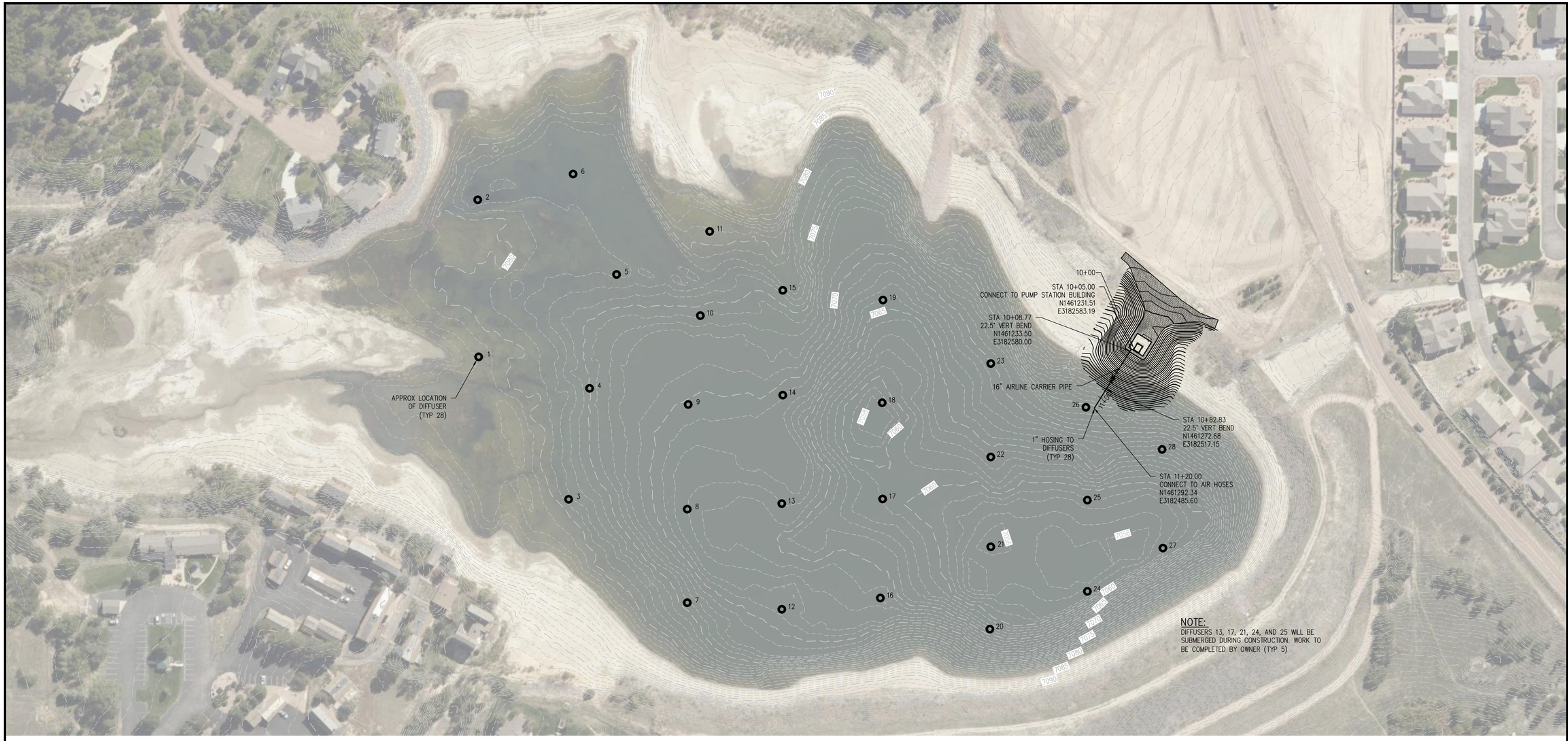
COLORADO REGISTERED PROFESSIONAL ENGINEER JOSHUA J. McGIBBON 40279 11/16/2021

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

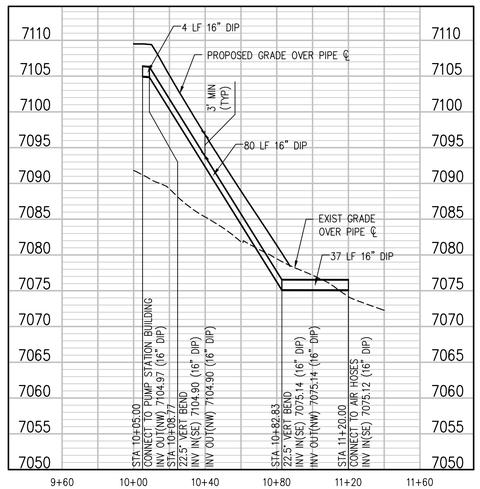
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

SITE PIPING PLAN

SHEET NO.
C1.1

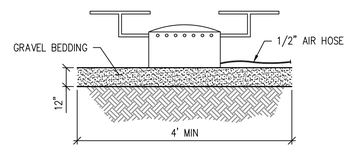


NOTE:
DIFFUSERS 13, 17, 21, 24, AND 25 WILL BE SUBMERGED DURING CONSTRUCTION. WORK TO BE COMPLETED BY OWNER (TYP 5)



AIRLINE CARRIER PIPE PROFILE

SCALE: 1"=40' HORIZ
1"=10' VERT



DIFFUSER BEDDING DETAIL 1
NTS

80 0 80 160
SCALE IN FEET

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COLORADO REGISTERED
JOSHUA J. MEYER
40279
11/16/2021
PROFESSIONAL ENGINEER

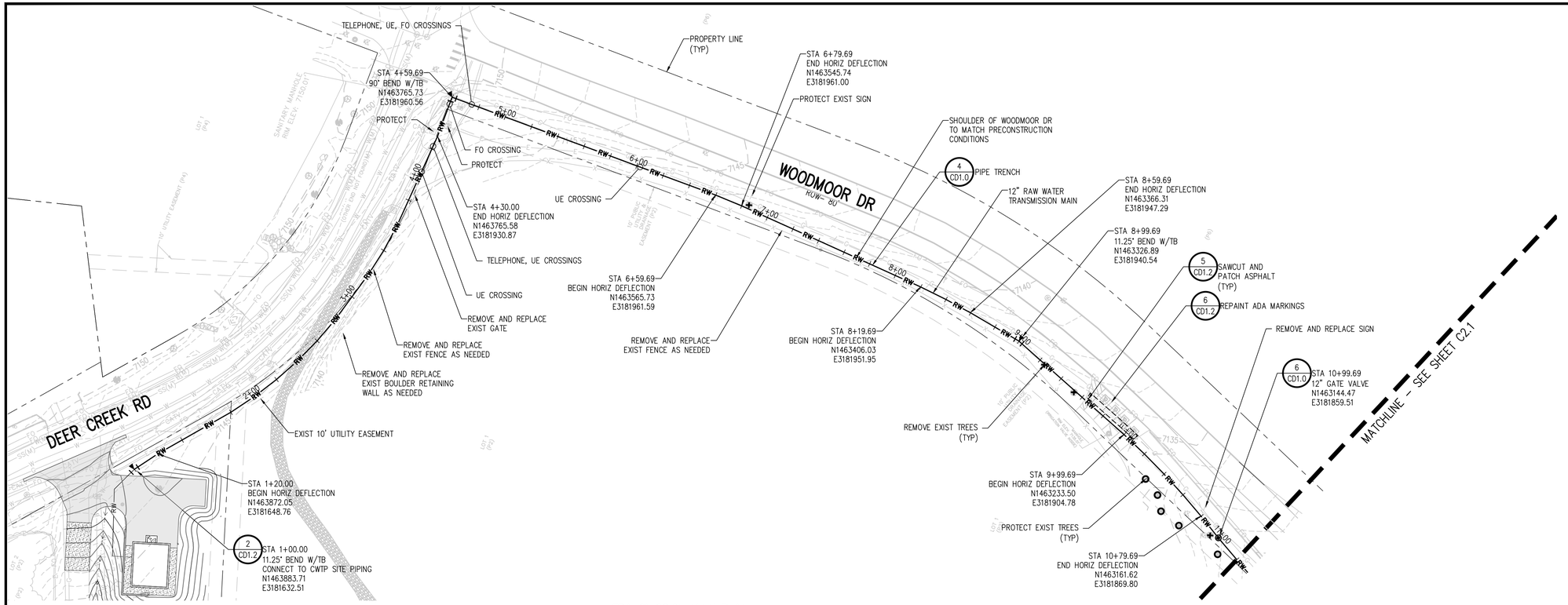
DESIGNED BY:	RAH/KCT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

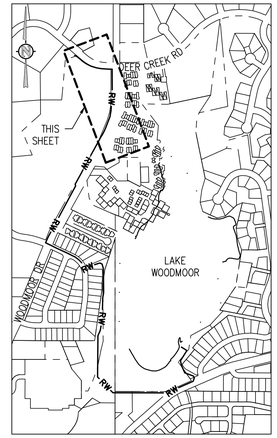
AERATION SITE PLAN

SHEET NO.
C1.2

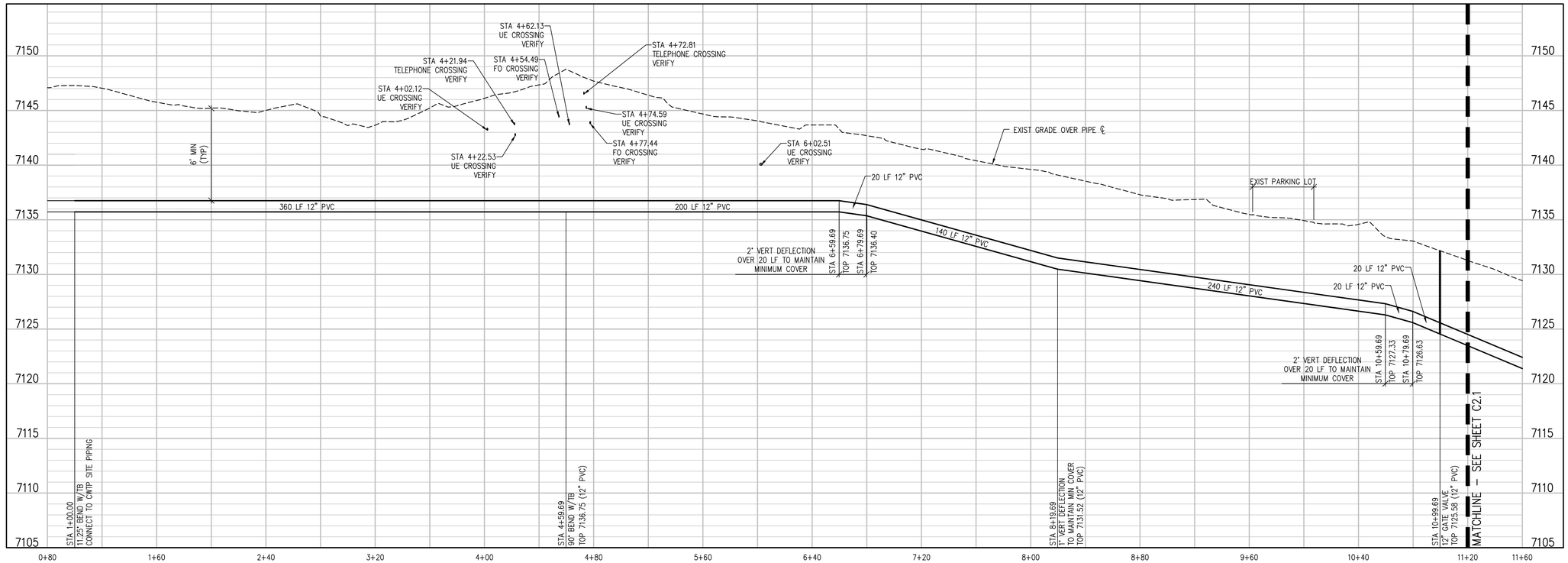
N:\1051.6e\Drawings\1051.6e – AER.dwg, 11/16/2021 – 8:32 AM, mht



TRANSMISSION MAIN PLAN
SCALE: 1" =40'



KEY MAP
NTS



TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

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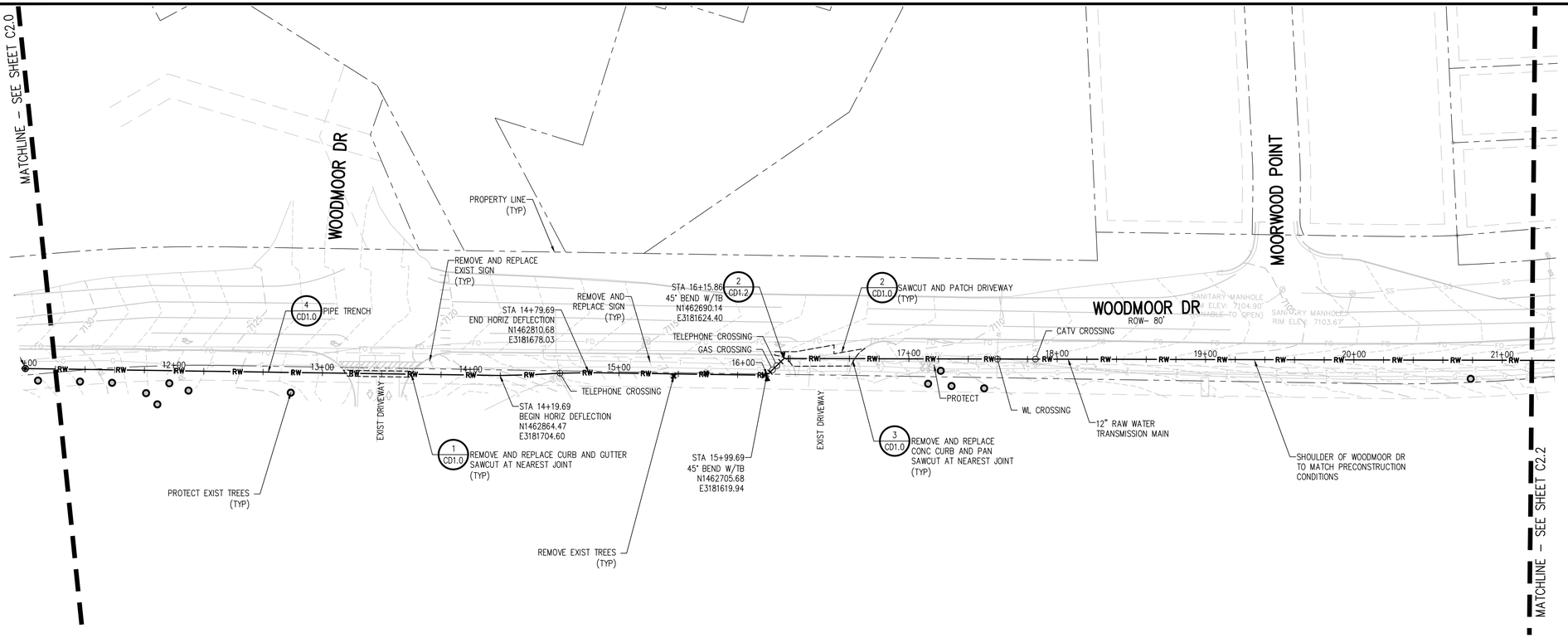
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

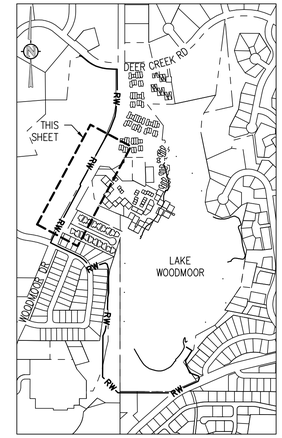
TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.0

N:\1051.6e\Drawings\1051.6e - C11 - PNP.dwg, 11/18/2021 - 8:32 AM, mht



TRANSMISSION MAIN PLAN
SCALE: 1" =40'



KEY MAP
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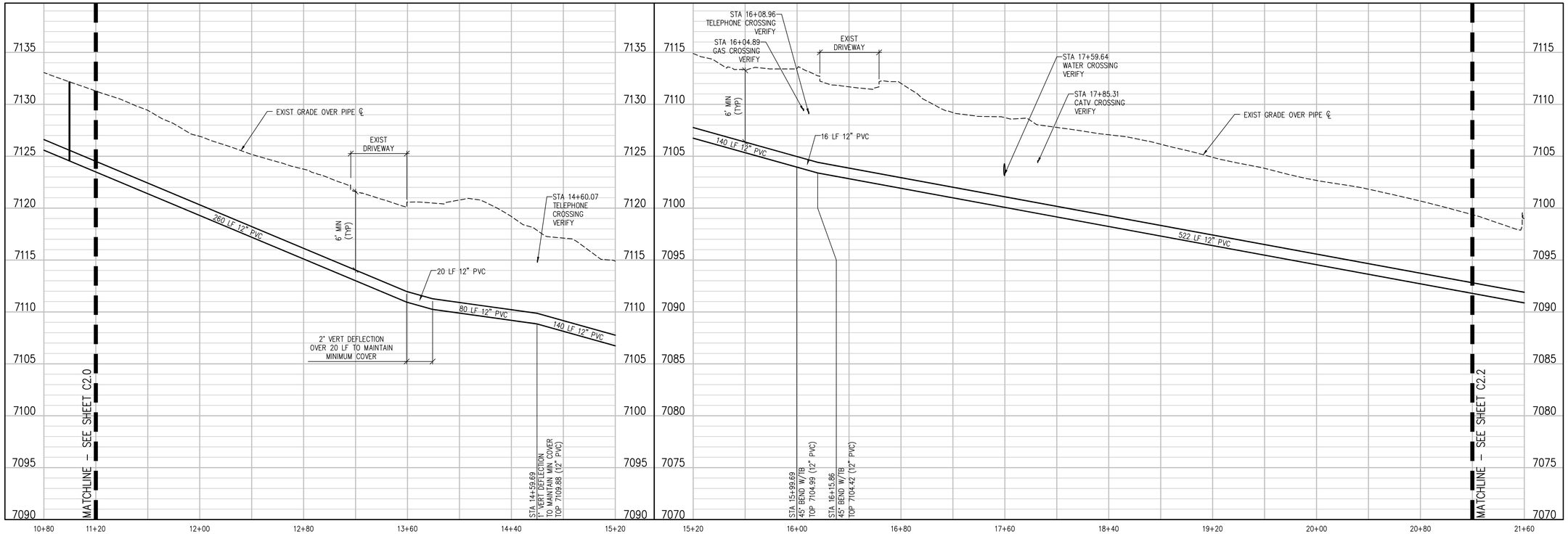

TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

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WOODMOOR WSD NO.1
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EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.1

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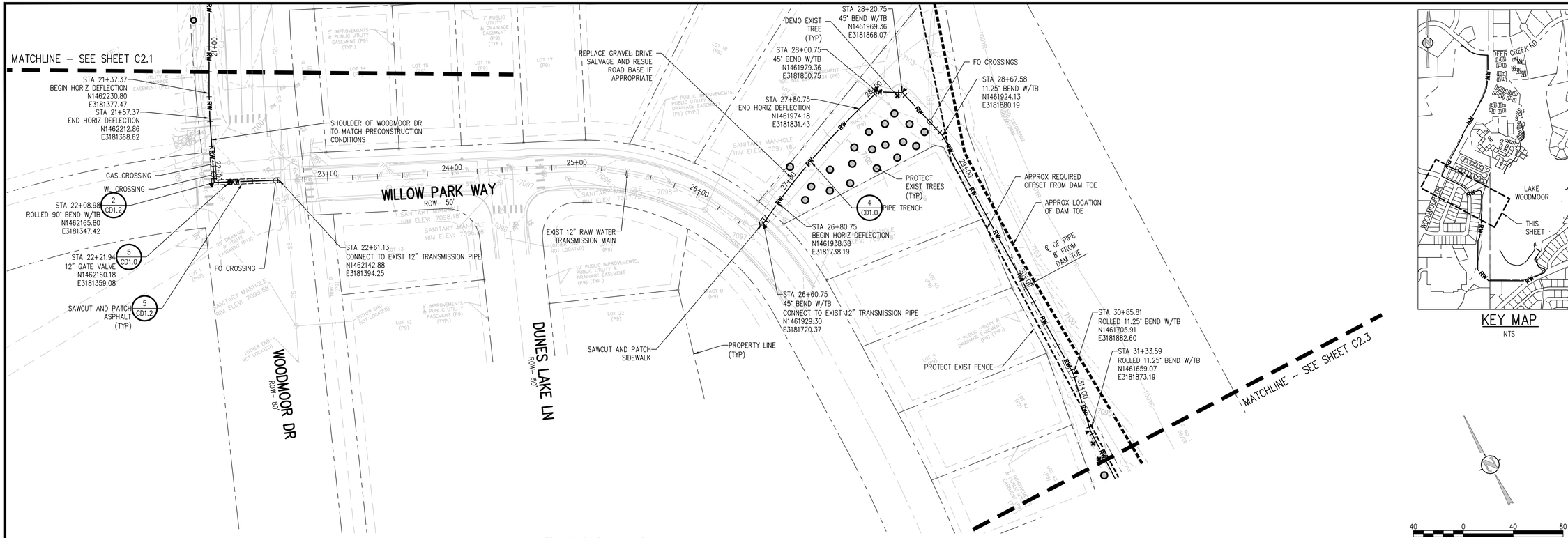
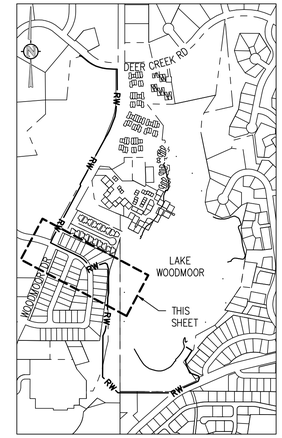


TRANSMISSION MAIN PLAN
SCALE: 1" =40'



KEY MAP
NTS

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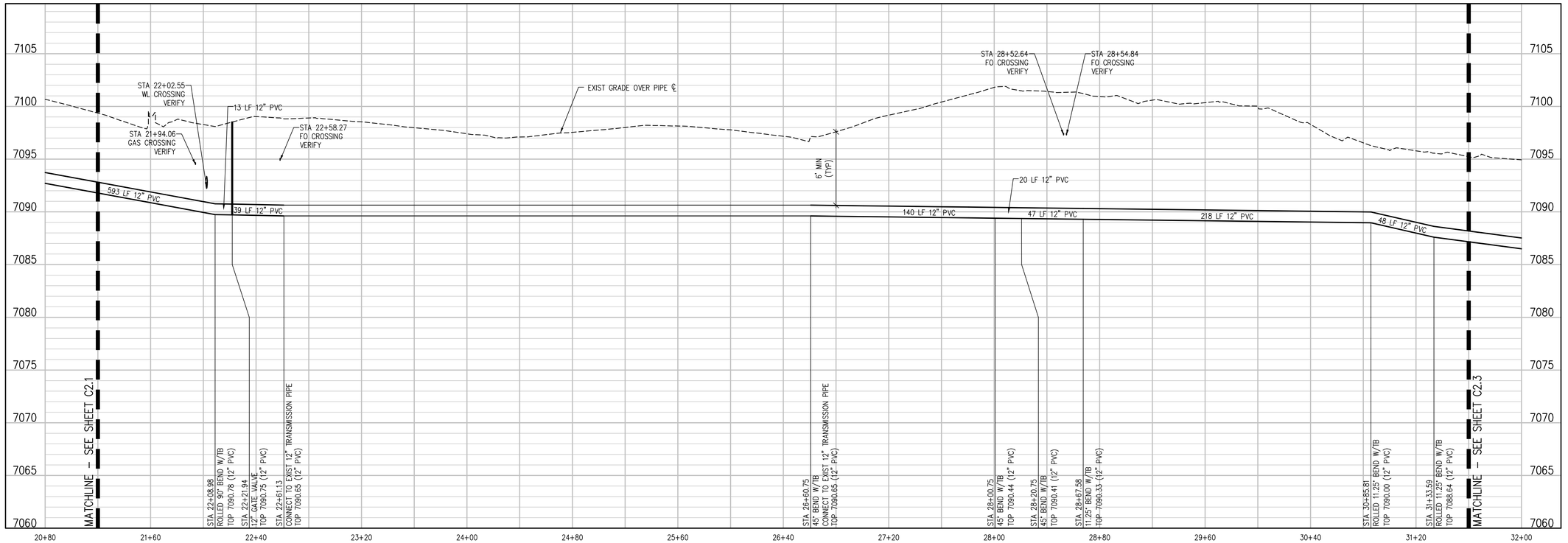
SCALE IN FEET



TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

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WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.2

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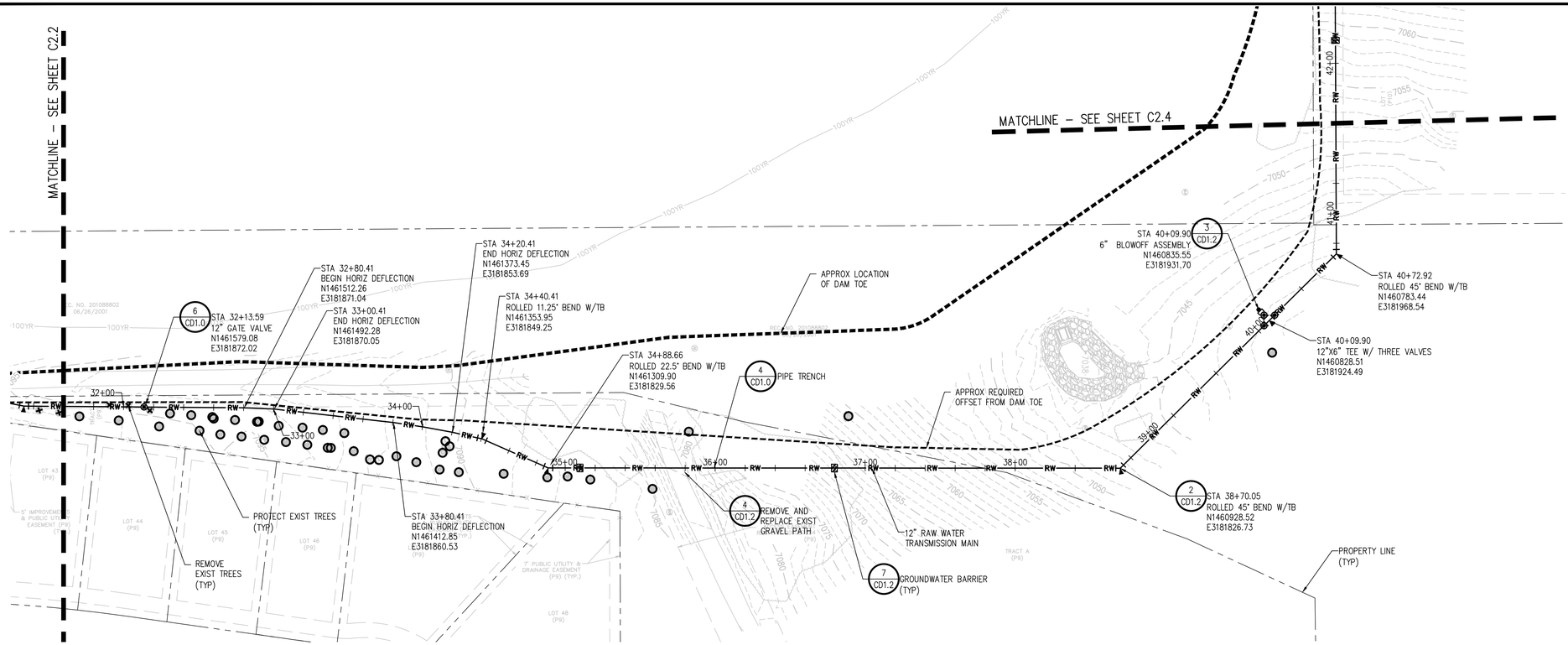
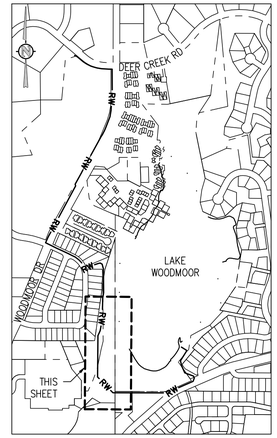


TRANSMISSION MAIN PLAN

SCALE: 1" =40'



KEY MAP

NTS

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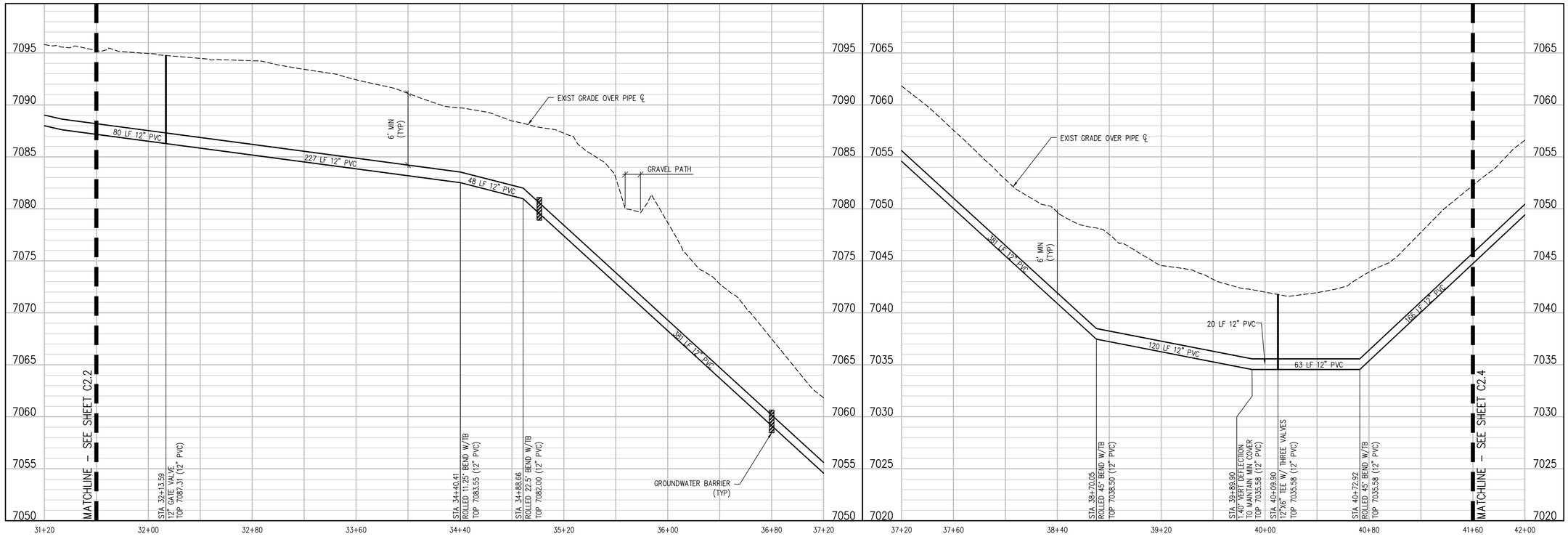
SCALE IN FEET



TRANSMISSION MAIN PROFILE

SCALE: 1"=40' HORIZ
1"=5' VERT

TRANSMISSION MAIN PROFILE

SCALE: 1"=40' HORIZ
1"=5' VERT

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WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.3

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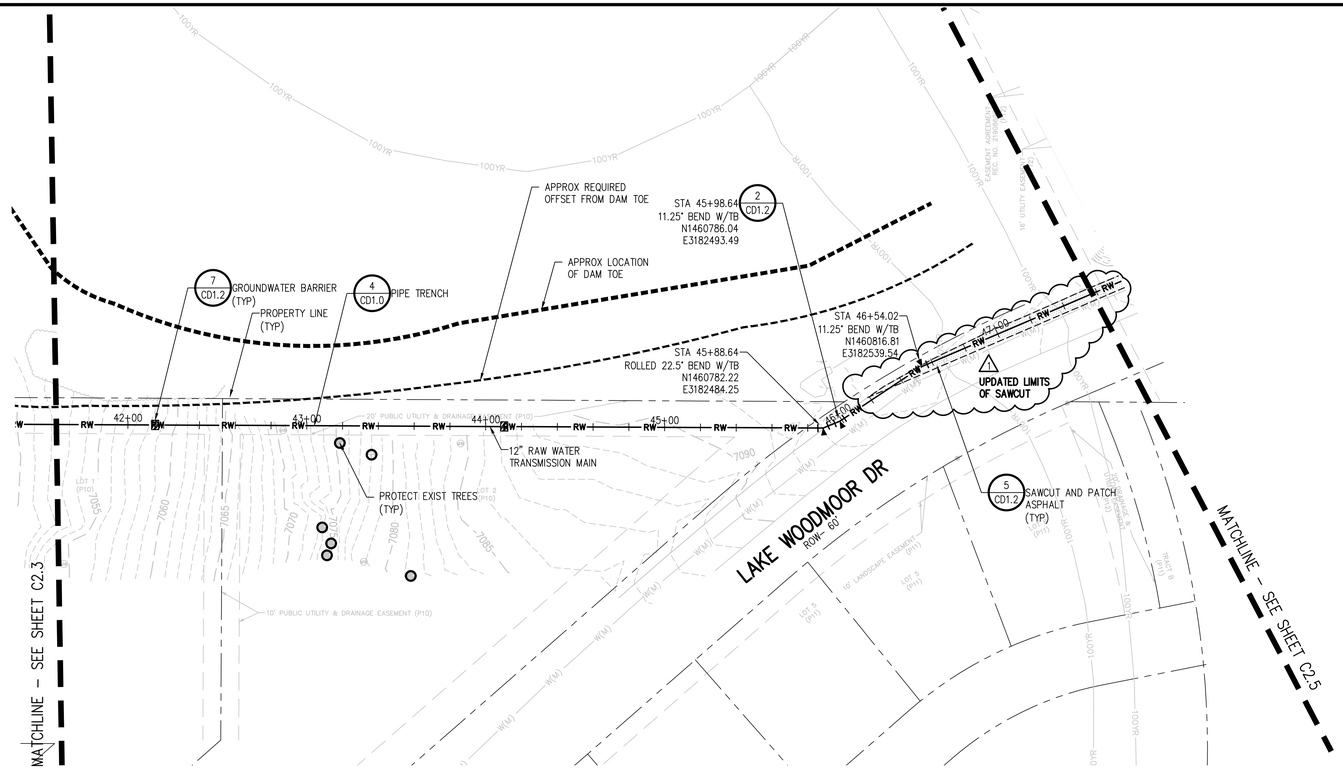
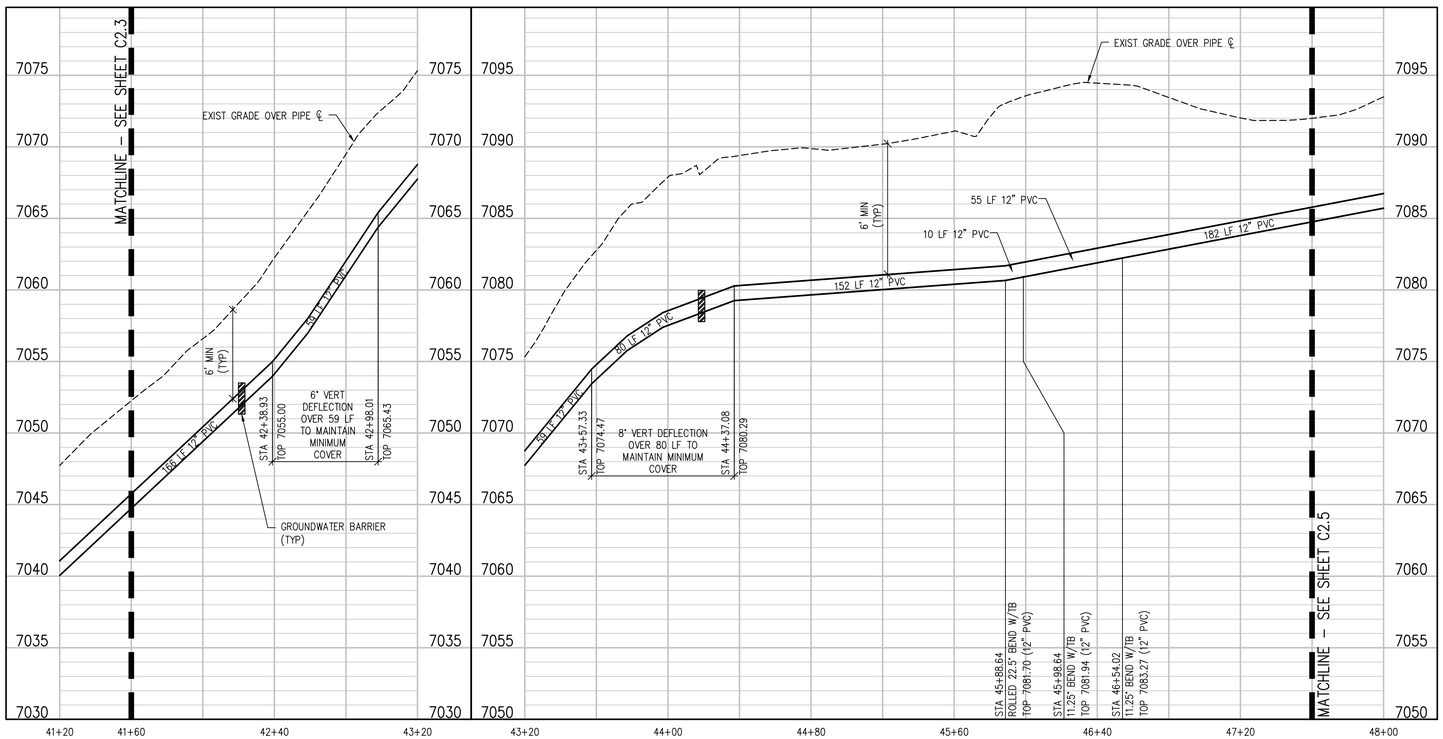
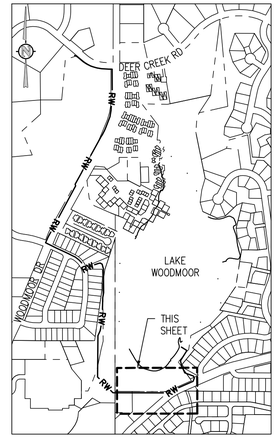


TRANSMISSION MAIN PLAN
SCALE: 1" =40'

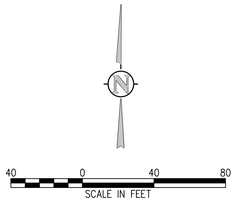


TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT



KEY MAP
NTS



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CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.4

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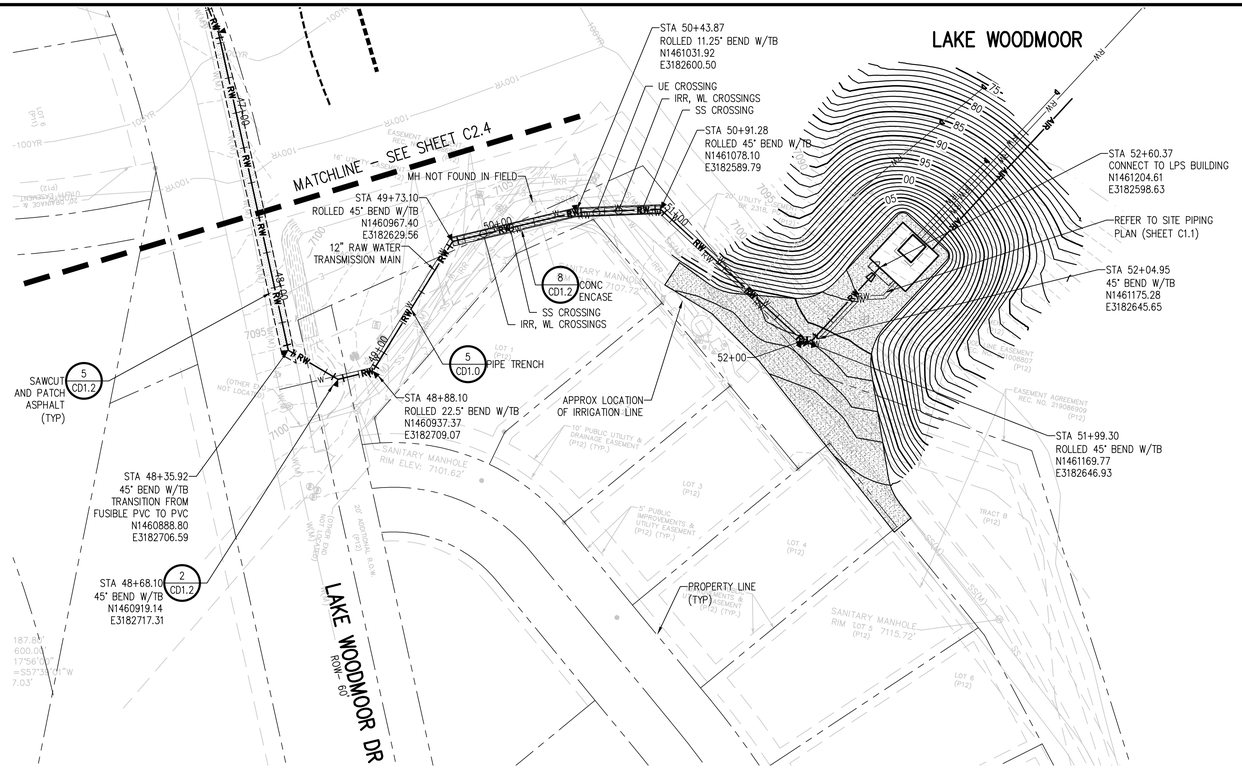
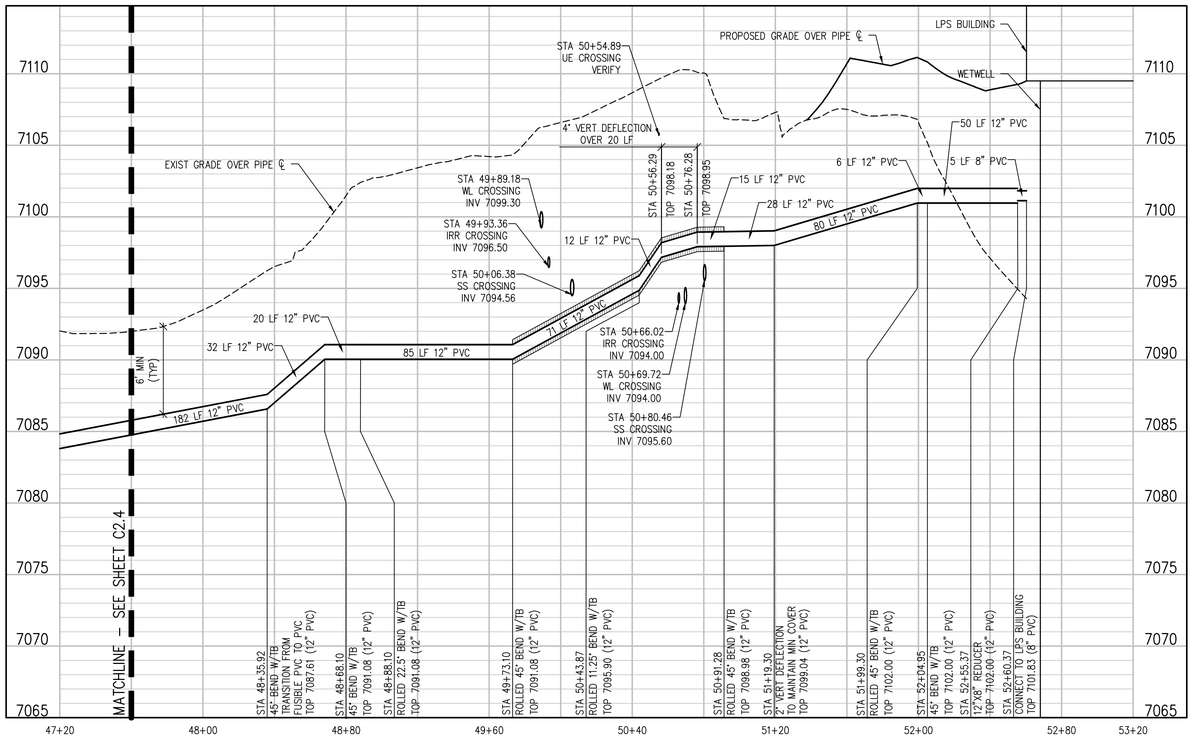
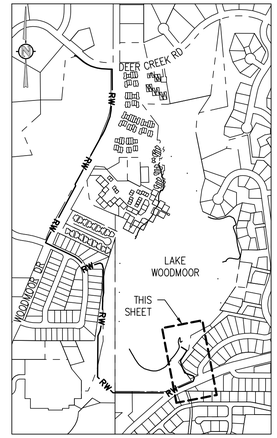


TRANSMISSION MAIN PLAN
SCALE: 1" =40'



TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT



KEY MAP
NTS

N

40 0 40 80
SCALE IN FEET

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WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.5

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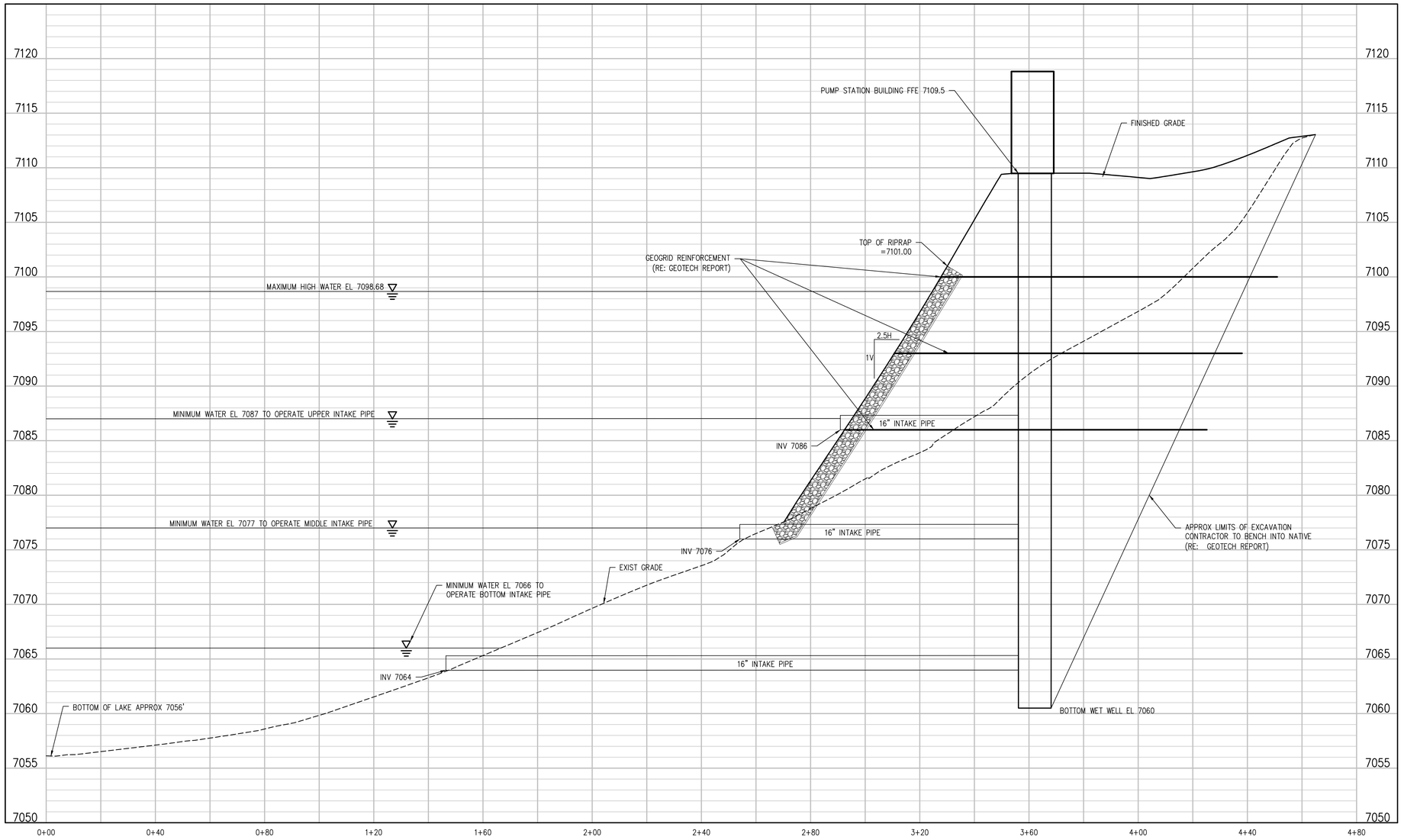

INTAKE PIPE PROFILE

SCALE: 1"=20' HORIZ
1"=5' VERT

20 0 20 40
SCALE IN FEET

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COLORADO REGISTERED JOSHUA J. MCGRATH 40279 11/16/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	KCT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

INTAKE PIPING PROFILE

SHEET NO.
C2.6

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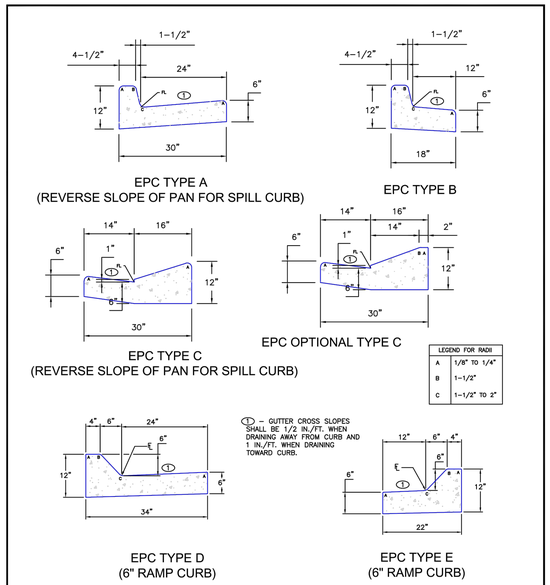
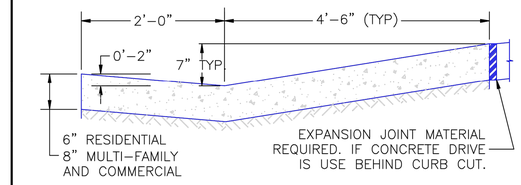


SCALE: NOT TO SCALE

DATE APPROVED:			
8/11/11	Typical Curb and Gutter Details Standard Drawing		
André P. Brackin DEPARTMENT OF TRANSPORTATION	REVISION DATE: 12/8/15	FILE NAME: SD_2-20	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION

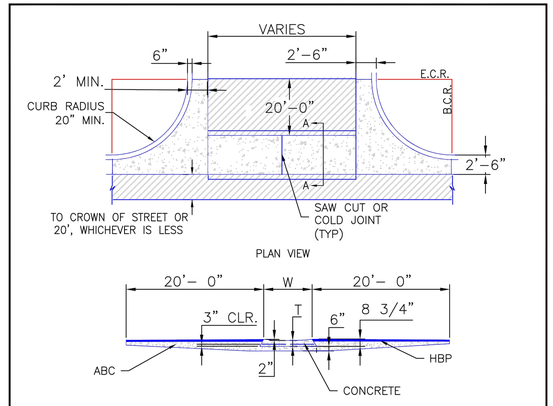
TYPICAL CURB AND GUTTER DETAIL 1 C2.1
NTS



SCALE: NOT TO SCALE

DATE APPROVED:			
8/11/11	Driveway Cut Detail Standard Drawing		
André P. Brackin DEPARTMENT OF TRANSPORTATION	REVISION DATE: 11/10/04	FILE NAME: SD_2-23	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION

DRIVEWAY CUT DETAIL 2 C2.1
NTS



NOTES

1. W – WIDTH SHALL BE 6' FOR LOCAL, 8' FOR COLLECTORS, AND 10' FOR ARTERIAL ROADS.

2. T – SQUARED–OFF RETURN TO BE POURED MONOLITHICALLY, 8" PCC FOR LOCAL ROADS, 9" FOR COLLECTORS WITH 6x6 – 4.4 W.W.F. OR #4 REINFORCING BAR @ 18" EACH WAY.

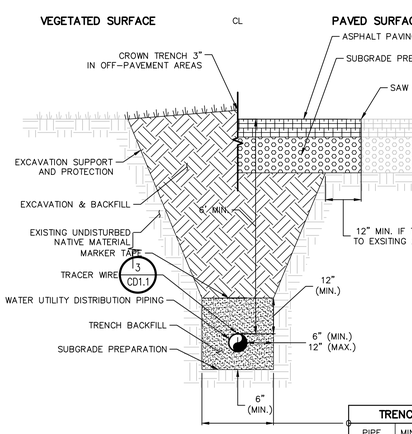
3. ▨ = 3" MINIMUM ASPHALT DEPTH (2 LIFTS).

4. DESIGN TO SPECIFY ELEVATIONS AT PI AND PCR.

SCALE: NOT TO SCALE

DATE APPROVED:			
8/11/11	Typical Cross Pan Layout Detail Standard Drawing		
André P. Brackin DEPARTMENT OF TRANSPORTATION	REVISION DATE: 12/8/15	FILE NAME: SD_2-26	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION

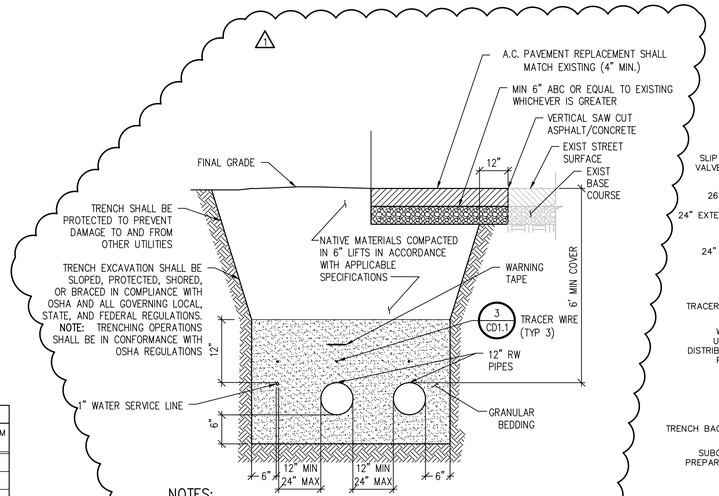
TYPICAL CROSS PAN LAYOUT DETAIL 3 C2.1
NTS



TRENCH WIDTH		
PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
4"	1'-4"	2'-4"
6"	1'-6"	2'-6"
8"	1'-8"	2'-8"
10"	1'-10"	2'-10"
12"	2'-0"	3'-0"
14"	2'-2"	3'-2"

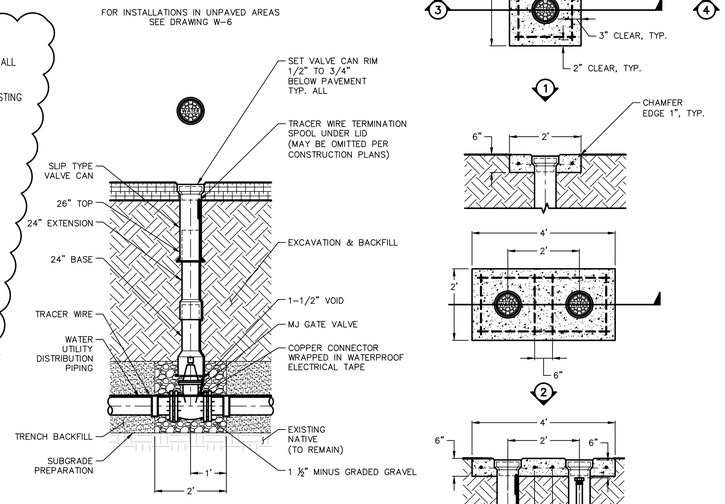
WOODMOOR WATER & SANITATION DISTRICT NO. 1 STANDARD DETAIL W-1

TYPICAL WATER TRENCH DETAIL 4 C2.0
NTS



NOTES:
1. IF UNSTABLE MATERIALS ARE FOUND IN TRENCH BOTTOM, OVER EXCAVATE 12" BELOW STD EMBEDMENT AND FILL WITH 3/4" CRUSHED ROCK, COMPACTED TO 95%
2. COMPACTED BACKFILL TO 90% STD PROCTOR DENSITY IN NON-DRIVING SURFACES AND 95% UNDER PAVEMENT
3. SHOULD THE TRENCH BE EXCAVATED WIDER THAN ALLOWED A CONCRETE CRADLE SHALL BE PLACED WITH 2500PSI CONCRETE FROM TRENCH BOTTOM TO PIPE SPRINGLINE

UTILITY TRENCH DETAIL 5 C1.1
NTS



GATE VALVE DETAIL 6 C2.0
NTS

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION
1	07/27/21	RAH	JGJ	EL PASO COUNTY REVIEW EDITS

COLORADO REGISTERED
JOSHUA J. MEYER
40279
11/16/2021
PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

CIVIL DETAILS

SHEET NO.
CD1.0

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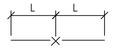
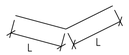
ROD DIAMETER, GRADE & LENGTH OF RESTRAINED PIPE

PIPE SIZE	4"			6"			8"			12"			16"			20"			24"		
FITTING	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G
90° BEND, TEE, OR PLUG	3/4"	30'	MS	3/4"	45'	MS	3/4"	60'	MS	3/4"	86'	HS	1"	108'	MS	1-1/4"	132'	HS	—	155'	—
VALVE	—	—	—	—	—	—	—	—	—	—	—	—	1"	108'	MS	1-1/4"	132'	HS	—	155'	—
45° BEND	3/4"	9'	MS	3/4"	13'	MS	3/4"	18'	MS	3/4"	25'	MS	1"	32'	MS	3/4"	39'	HS	—	45'	—
22-1/2° BEND	3/4"	1'	MS	3/4"	4'	MS	3/4"	5'	MS	3/4"	7'	MS	3/4"	8'	MS	3/4"	10'	MS	—	12'	—
11-1/4° BEND	—	—	—	—	—	—	3/4"	1'	MS	3/4"	2'	MS	3/4"	2'	MS	3/4"	3'	MS	—	3'	—



VALVE

90° BEND



BENDS

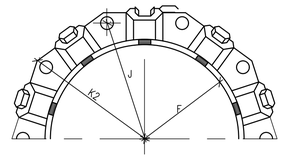
TEE

PLUG

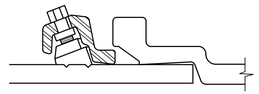
NOTES:

1. LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM VALVES AND BENDS
2. CLAMPS, RODS & MEGALUGS NOT ALLOWED FOR 24" & LARGER PIPES
3. D=DIAMETER, L=LENGTH, G=GRADE, MS=MILD STEEL, HS=HIGH STRENGTH
4. MINIMUM 4.5' GROUND COVER REQUIRED
5. MS MEANS MILD STEEL ROD ASTM STANDARD DESIGNATION A-36
6. HS MEANS HIGH STRENGTH ROD ASTM STANDARD DESIGNATION A-193 GRADE B-7
7. NUTS SHALL BE ASTM STANDARD DESIGNATION A-307 GRADE A OR B HEXAGON HEAVY SERIES. HIGH STRENGTH NUTS SHALL CONFORM TO MS-22
8. MEGALUG MECHANICAL JOINT RESTRAINT CAN BE USED IN LIEU OF TIE RODS FOR DIP OR PVC MAINS
9. LENGTH REFERS TO THE AMOUNT OF PIPE WHICH MUST BE RESTRAINED TOGETHER AND IS NOT NECESSARILY THE LENGTH OF THE RODS
10. LENGTH OF RESTRAINED PIPE CHART IS ALSO FOR THE LENGTH OF JOINT RESTRAINT FOR MEGALUGS
11. CROSSES MUST BE RESTRAINED IN ALL APPLICABLE DIRECTIONS
12. 12" AND SMALLER IN LINE VALVES AND TEES SHALL HAVE A MECHANICAL JOINT RESTRAINT DEVICES ON EACH SIDE OF THE FITTING OR VALVE. MECHANICAL JOINT RESTRAINT DEVICES SHALL BE PER MS-2 OF THE ENGINEERING STANDARDS.
13. A SECOND VALVE WILL BE REQUIRED TO BE CLOSED WHEN EXCAVATING NEXT TO AN EXISTING VALVE

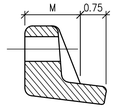
LENGTH OF RESTRAINED PIPE DETAIL (1)
NTS



MECHANICAL JOINT RESTRAINT



WEDGE DETAIL



BOLT HOLE DETAIL

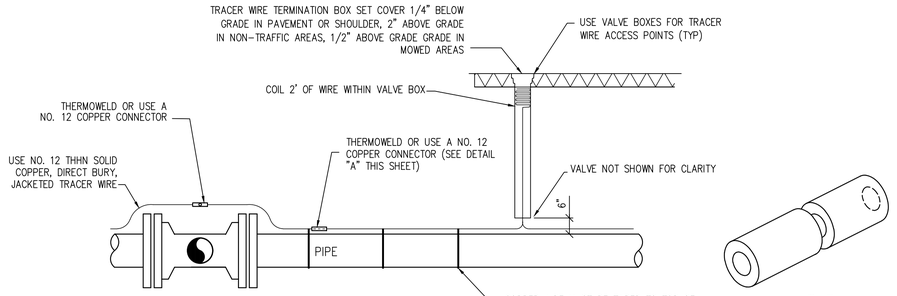
DIMENSIONS

	NOMINAL PIPE SIZE	NO. OF BOLTS	NO. OF WEDGES	K2 INCHES	J INCHES	F INCHES	M INCHES	
PVC	4"	2	2					PVC
	6"	6	3	11.12	9.50	7.00	0.88	
	8"	6	4	13.37	11.75	9.15	1.00	
	10"	8	6	15.62	14.00	11.20	1.00	
	12"	8	8	17.88	16.25	13.30	1.25	
DI	4"	4	2					DI
	6"	6	3	11.12	9.50	7.00	0.88	
	8"	6	4	13.37	11.75	9.15	1.00	
	10"	8	6	15.62	14.00	11.20	1.00	
	12"	8	8	17.88	16.25	13.30	1.25	
	16"	12	12	22.50	21.00	17.54	1.56	
	20"	14	14	27.00	25.50	21.74	1.69	

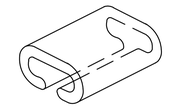
NOTE:

1. BASED ON "MEGA LUG" PIPE RESTRAINT SYSTEM BY EBAA IRON
2. OTHER MECHANICAL JOINT RESTRAINT DEVICES MUST BE APPROVED BEFORE INSTALLATION.

MECHANICAL JOINT RESTRAINT DETAIL (2)
NTS

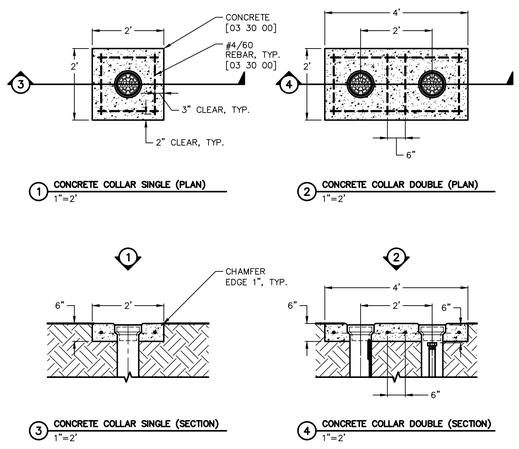


DETAIL "A"



DETAIL "B"

COPPER TRACER WIRE DETAIL (OPEN CUT METHOD) (3 / CD1.0)
NTS



1 CONCRETE COLLAR SINGLE (PLAN) 1"=2'

2 CONCRETE COLLAR DOUBLE (PLAN) 1"=2'

3 CONCRETE COLLAR SINGLE (SECTION) 1"=2'

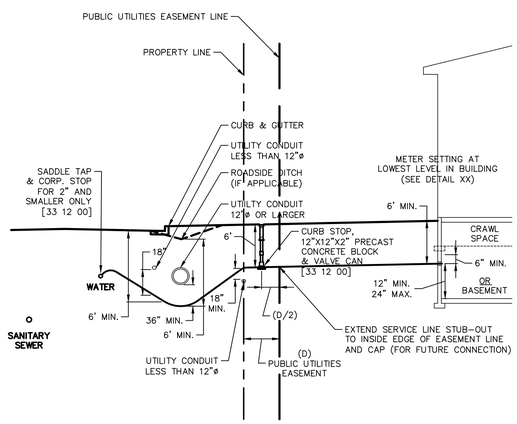
4 CONCRETE COLLAR DOUBLE (SECTION) 1"=2'

WOODMOOR WATER & SANITATION DISTRICT NO. 1 STANDARD DETAIL W-6

VALVE CANS IN UNPAVED AREAS (4)
NTS

REFER TO WATER & SEWER SERVICE LINE EQUIPMENT SPECIFICATIONS FOR SUPPLEMENTAL INFORMATION (APP C OF THE SYSTEM SPECIFICATIONS)

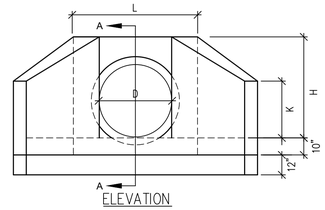
GENERAL NOTES:
- PROVIDE METAL T-POST AT CURB STOP WHEN CONSTRUCTION OF STUB-OUT TO LOT IS COMPLETE. T-POST MAY BE REMOVED AFTER CONNECTION TO SERVICE STUB.



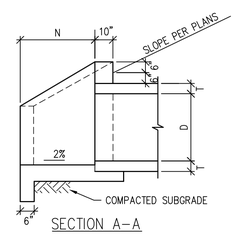
WOODMOOR WATER & SANITATION DISTRICT NO. 1 STANDARD DETAIL G-6

WATER SERVICE (3/4" TO 2") (5 / C1.1)
NTS

PLAN



ELEVATION



SECTION A-A

DIMENSIONS							
D	AREA SQ FT	T	H	K	L	M	N
15"	1.23	2 1/4"	2'-5 1/4"	1'-5"	3'-7"	1'-9"	1'-3"
18"	1.77	2 1/2"	2'-8 1/2"	1'-7"	3'-10"	2'-1 1/2"	1'-6"
24"	3.14	3"	3'-3"	1'-10 1/2"	4'-4"	2'-10"	2'-0"
30"	4.91	3 1/2"	3'-9 1/2"	2'-2"	4'-10"	3'-6 1/2"	2'-6"
36"	7.07	4"	4'-4"	2'-5 1/2"	5'-4"	4'-3"	3'-0"
42"	9.62	4 1/2"	4'-10 1/2"	2'-9"	5'-10"	4'-1 1/2"	3'-6"

NOTES:

1. CONCRETE SHALL BE CLASS B. CAST-IN-PLACE CONCRETE SHALL CONFORM TO ASTM C478
2. CAST-IN-PLACE CONCRETE WALL EDGES SHALL BE CHAMFERED 3/4".
3. ALL WALLS AND BASE SHALL BE REINFORCED WITH #4'S @ 12" OC EACH WAY. REINFORCING BARS SHALL BE DEFORMED AND SHALL HAVE 3" MINIMUM CLEARANCE FROM FACE OF CONCRETE.
4. DIMENSIONS AND MATERIAL REQUIREMENTS VARY DEPENDING ON APPLICATION. FOR COMPLETE DETAILS, MEASUREMENTS, MATERIALS LIST, AND OTHER FACTORS REFER TO THE CURRENT CDOT M7S STANDARDS.
5. TRASH RACK SHALL BE RFP, OR ENGINEER ACCEPTED CORROSION RESISTANT MATERIAL, WITH 1" OPENINGS. TRASH RACK SHALL BE SECURED TO THE CONCRETE HEADWALL WITH STAINLESS STEEL HARDWARE.

HEADWALL WITH CIRCULAR PIPE DETAIL (6 / C1.1)
NTS

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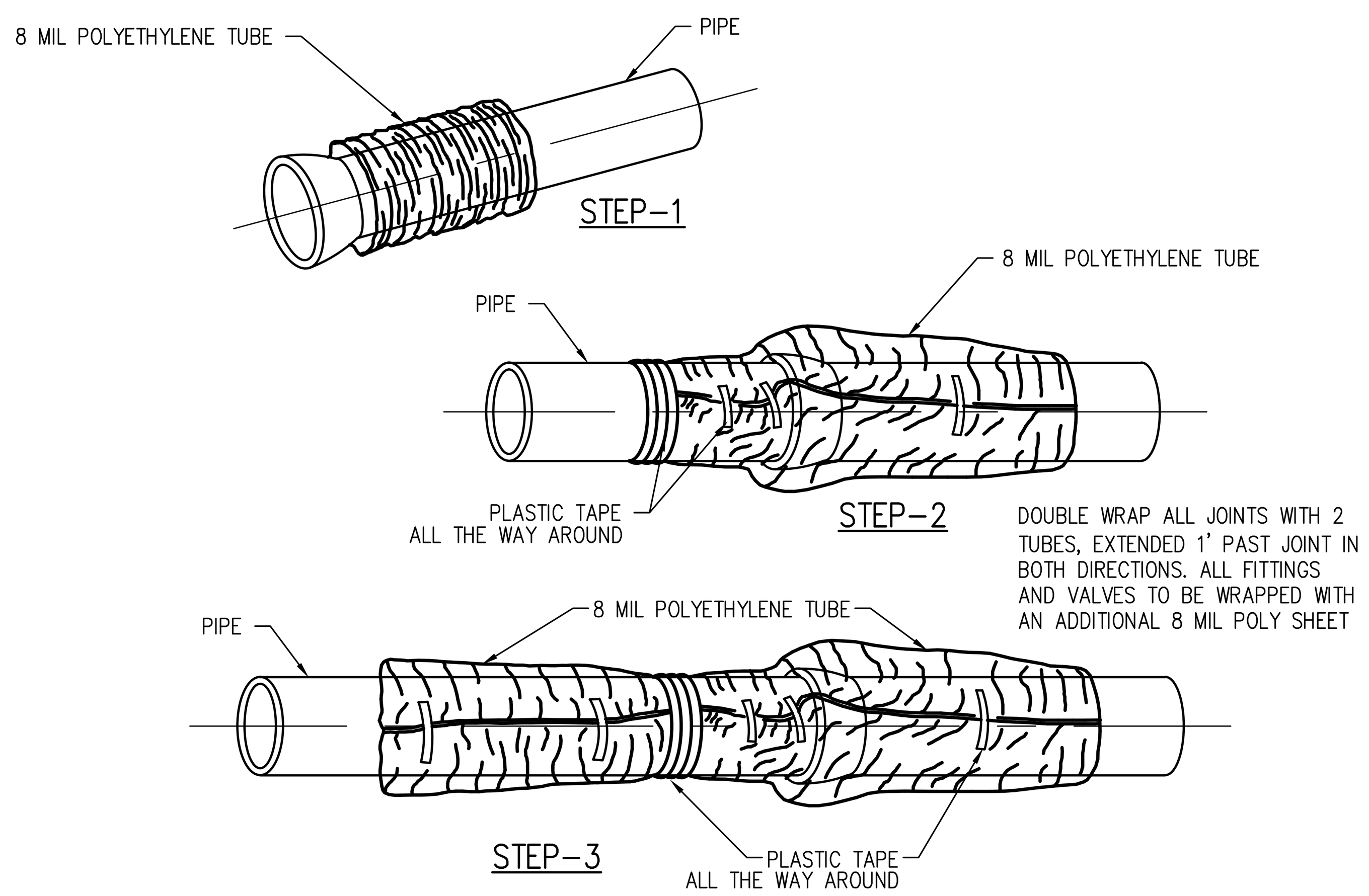


FIELD INSTALLATION-POLYETHYLENE WRAP

STEP-1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH

STEP-2 PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH THREE CIRCUMFERENTIAL TURNS OF TWO-INCH WIDE PLASTIC TAPE TO HOLD PLASTIC TUBE AROUND SPIGOT END

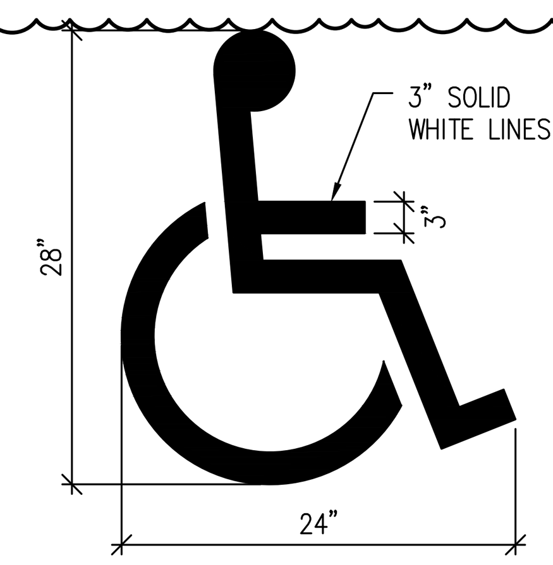
STEP-3 ADJACENT TUBE OVERLAPS FIRST TUBE AND IS SECURED WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE WILL BE LOOSE. EXCESS MATERIAL AND SHOULD BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED INTO AN OVERLAP ON TOP OF THE PIPE AND HELD IN PLACE BY MEANS OF PIECES OF THE PLASTIC TAPE AT APPROXIMATELY THREE TO FIVE FOOT INTERVALS

NOTE:
ALL RODDING TO BE ENCASED IN POLYETHYLENE SEPARATED FROM THE PIPE

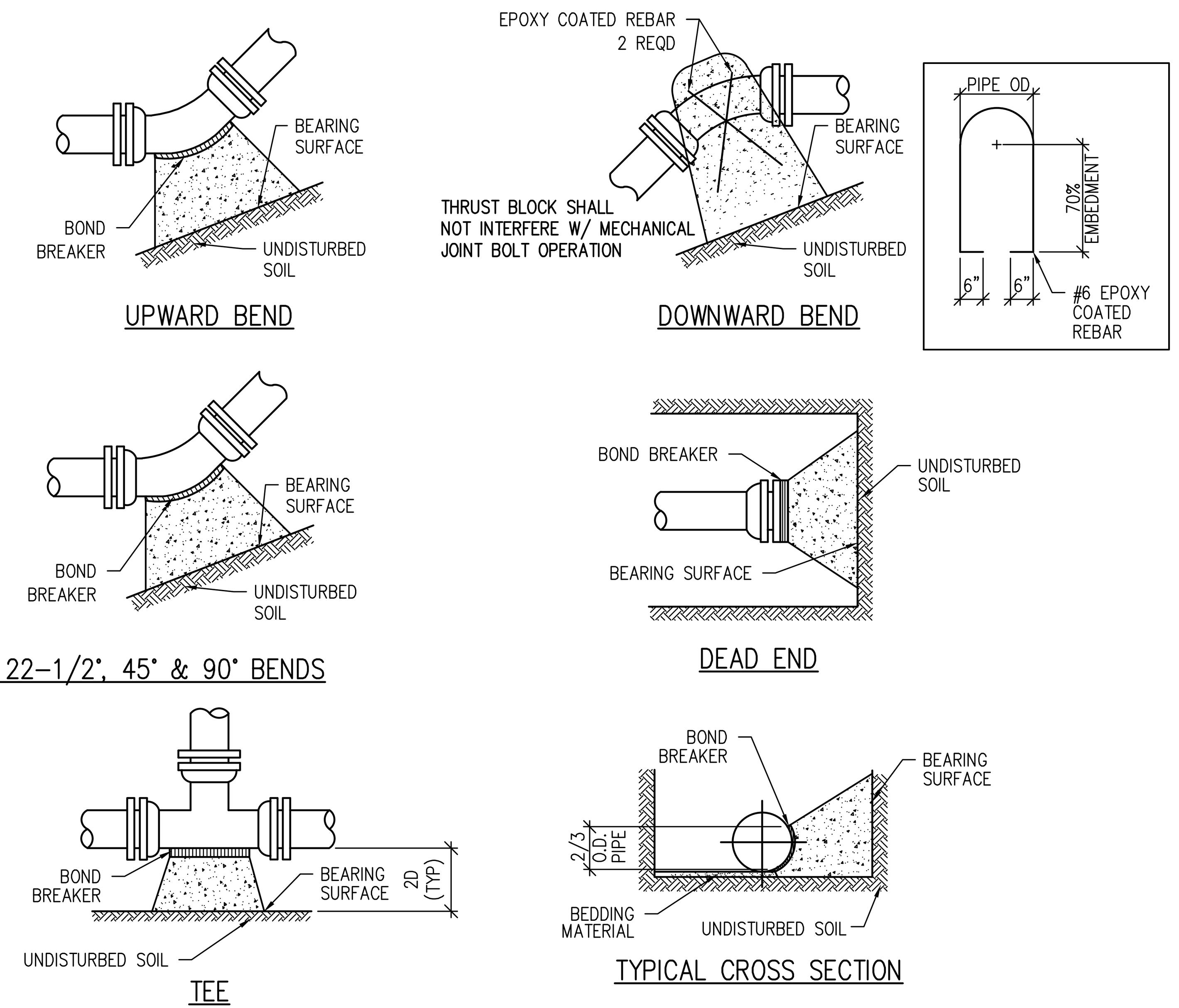
POLYETHLENE WRAP DETAIL (1)
NTS

STANDARD NOTES FOR EL PASO COUNTY SIGNAGE & STRIPING (1)

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE "D"SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4"UPPER-LOWER CASE LETTERING ON 8"BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6"LETTERING, UPPER-LOWER CASE ON 12"BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8"UPPER-LOWER CASE LETTERING ON 18"BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75"X 1.75"SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100"MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24"IN WIDTH. CROSSWALKS LINES SHALL BE 12"WIDE AND 8'LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.



ACCESSIBLE SYMBOL DETAIL (6 / C2.0)
NTS

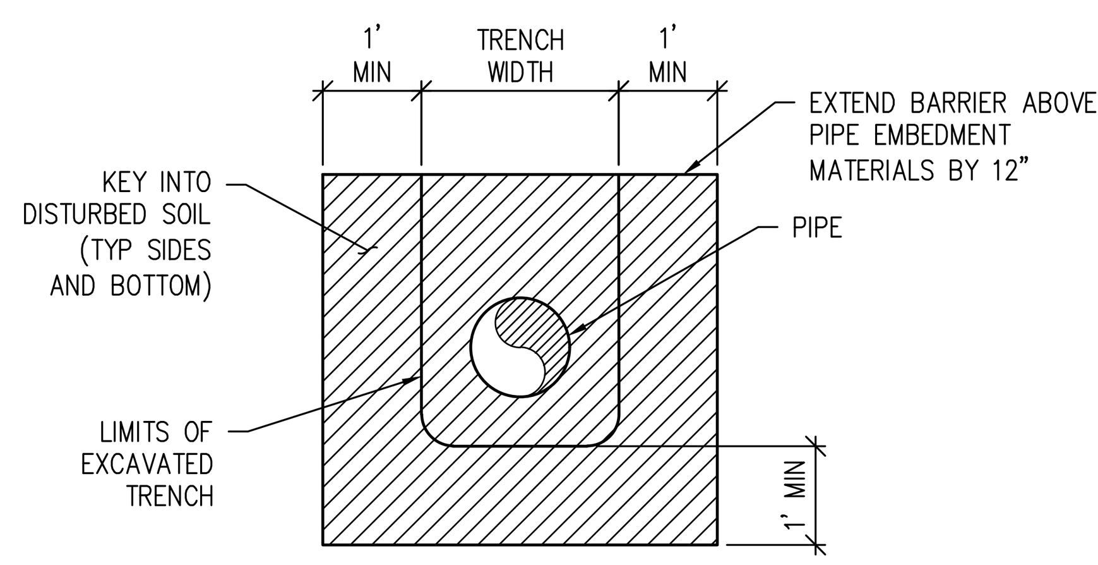


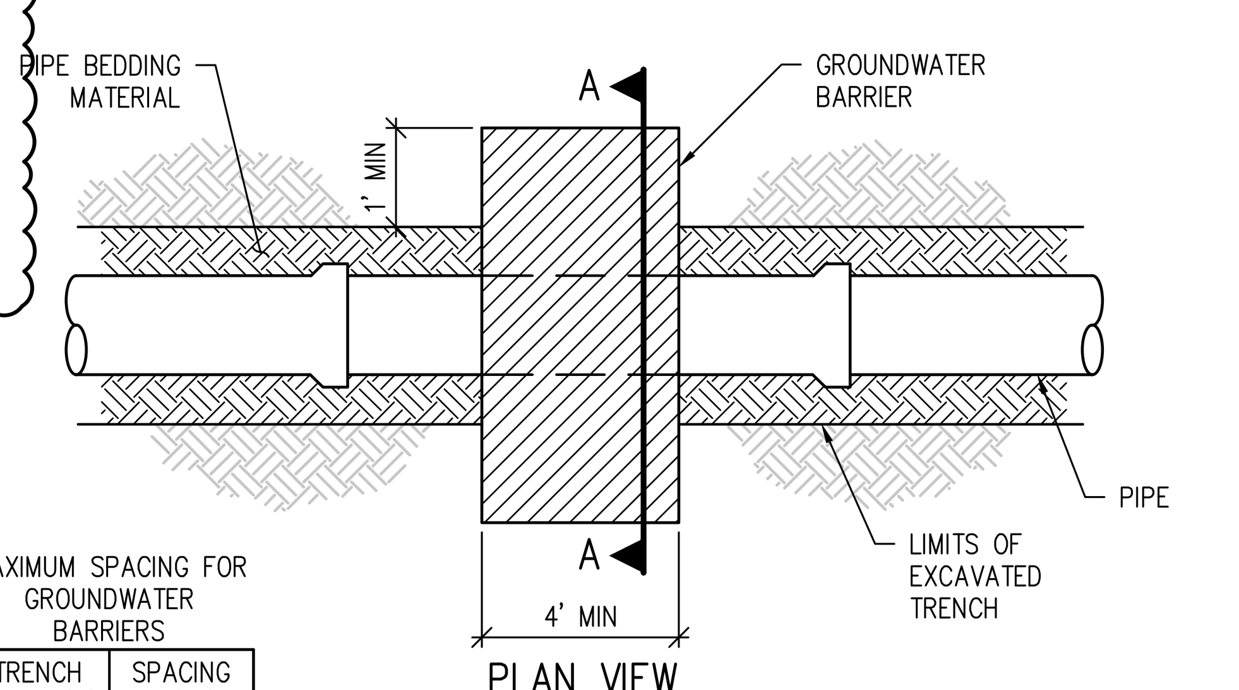
NOTES:
1. BEARING SURFACES SHOWN IN CHART ARE MINIMUM SQUARE FEET
2. BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER.
4", 6", 8", & 12" WATER HAMMER = 110 PSI
16", 20' AND 24" WATER HAMMER = 70 PSI
3. BASED ON 3000 PSF SOIL BEARING CAPACITY
4. USE TYPE II PORTLAND CEMENT 3000 PSI CONCRETE
5. ALL VALVES, TEES, BENDS AND PLUGS SHALL BE RESTRAINED AND KICKBLOCKED

SIZE OF PIPE	SURFACE AREA (SQ FT)					CONC VOL (CU YD)
	TEE OR DEAD END	BENDS				
		11-1/4°	22-1/2°	45°	90°	VERT 45°
2"	1.50	1.00	1.00	1.00	2.0	0.34
4"	1.50	1.00	1.00	1.00	2.0	0.34
6"	3.00	1.00	1.25	2.25	4.5	0.71
8"	5.25	1.00	2.00	4.00	8.0	1.22
12"	11.25	2.25	4.50	8.75	17.0	1.83
16"	19.00	3.50	7.50	14.50	27.00	2.59
20"	25.00	5.00	10.00	19.50	35.50	6.93
24"	36.00	6.50	14.00	27.75	51.00	9.88

MINIMUM BEARING SURFACE AREA (IN SQUARE FEET)

CONCRETE THRUST BLOCK DETAIL (2 / C2.0)
NTS



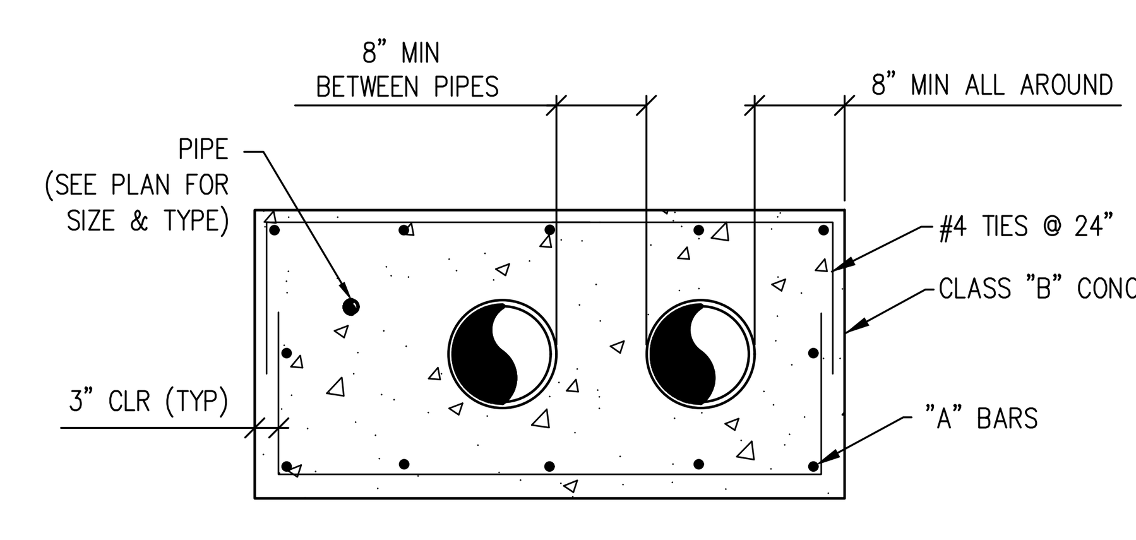


MAXIMUM SPACING FOR GROUNDWATER BARRIERS

TRENCH SLOPE (%)	SPACING L (FT)
< 5	1,000
5 – 15	500
15 – 25	300
25 – 35	200
35 – 100	100
> 100	50

NOTES:
1. LOCATE GROUNDWATER BARRIERS PER ACCEPTED CONSTRUCTION DRAWINGS AND WATER AND SEWER DEPARTMENT CONSTRUCTION STANDARDS.
2. GROUNDWATER BARRIER TO BE CLAY OR OTHER DISTRICT APPROVED MATERIAL.

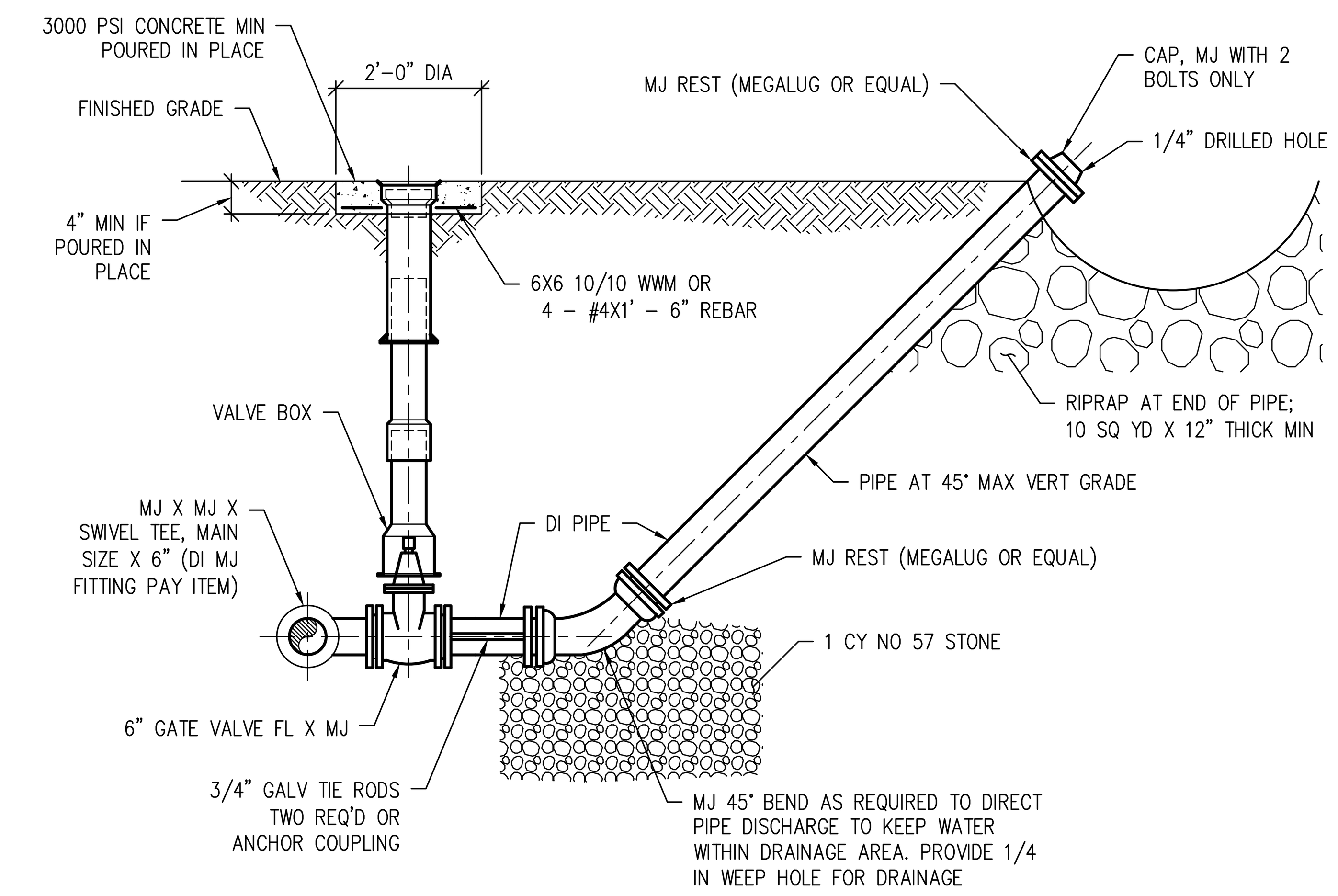
GROUNDWATER BARRIER DETAIL (7 / C2.3)
NTS



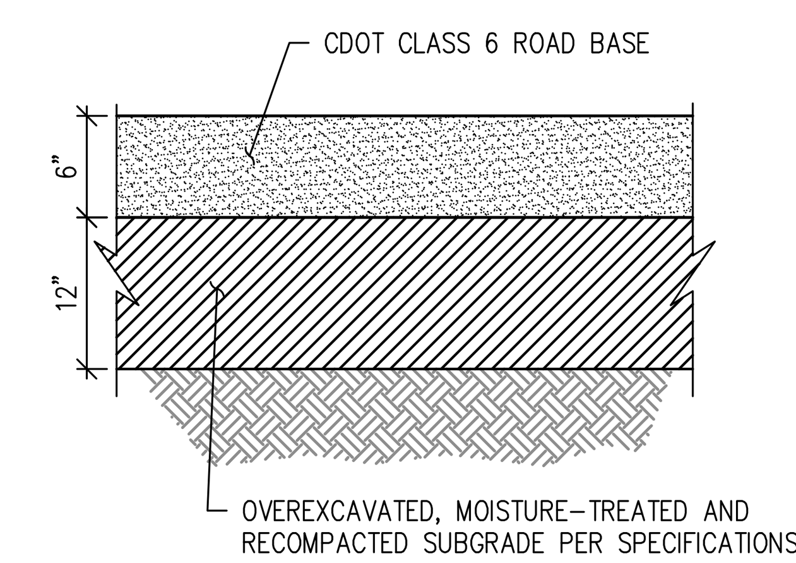
PIPE SIZE	"A" BARS
4" AND SMALLER PIPE	6-#4
5" TO 12" PIPE	12-#4
14" TO 36" PIPE	12-#5
42" AND LARGER PIPE	16-#5

NOTE:
EXTEND HORIZONTAL REINF. A MINIMUM OF 12" INTO STRUCTURE.

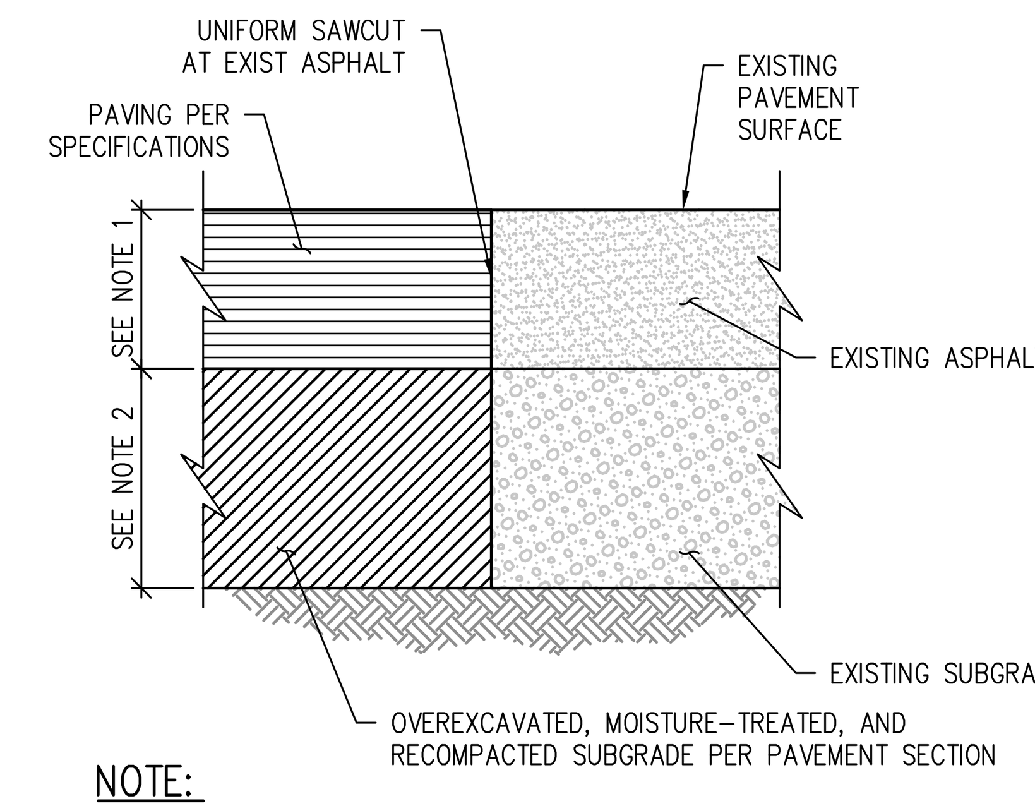
CONCRETE ENCASEMENT DETAIL (8 / C2.5)
NTS



6" BLOW-OFF ASSEMBLY DETAIL (3 / C2.3)
NTS

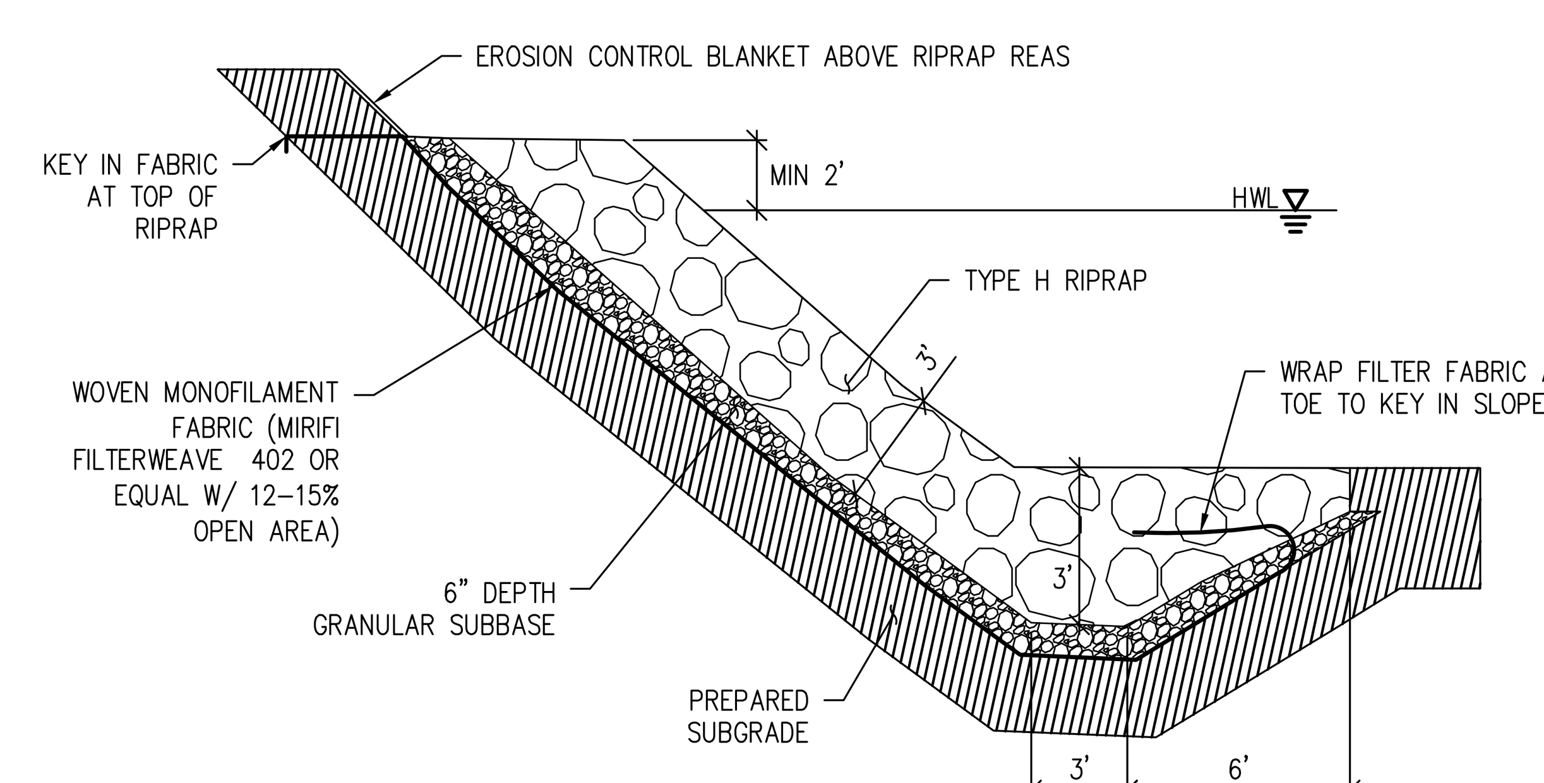


GRAVEL SECTION DETAIL (4 / C1.0)
NTS



NOTE:
1. MATCH EXISTING DEPTH +1" OR 3" MINIMUM, WHICHEVER IS GREATER
2. MATCH EXIST SUBGRADE DEPTH UNLESS OTHERWISE SPECIFIED
3. APPLY TACKIFIER AT SAWCUT PRIOR TO PAVING.

ASPHALT PATCH DETAIL (5 / C2.0)
NTS



NOTES:
1. REFERENCE PLAN SHEETS FOR RIPRAP LAYOUT AND FINISHED GRADE ELEVATIONS
2. RIPRAP SHALL BE HAND OR MACHINE PLACED. DUMPING ALONG SLOPE IS NOT ACCEPTABLE

TYPE H RIPRAP SLOPE PROTECTION (9 / C1.0)
NTS

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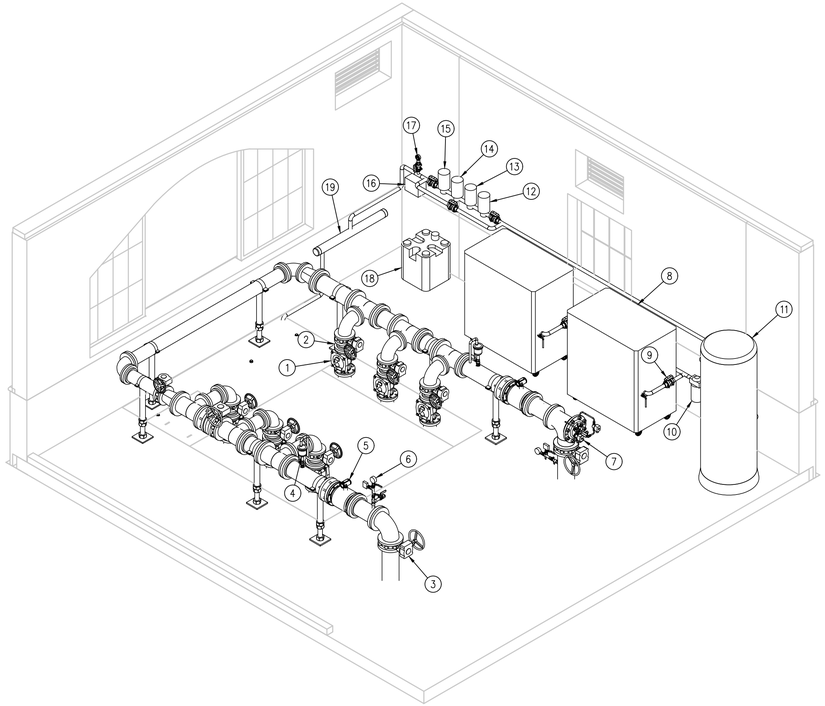
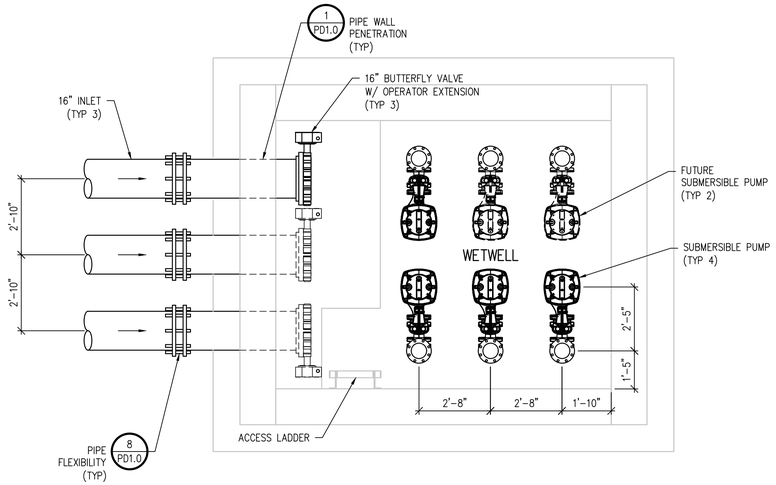
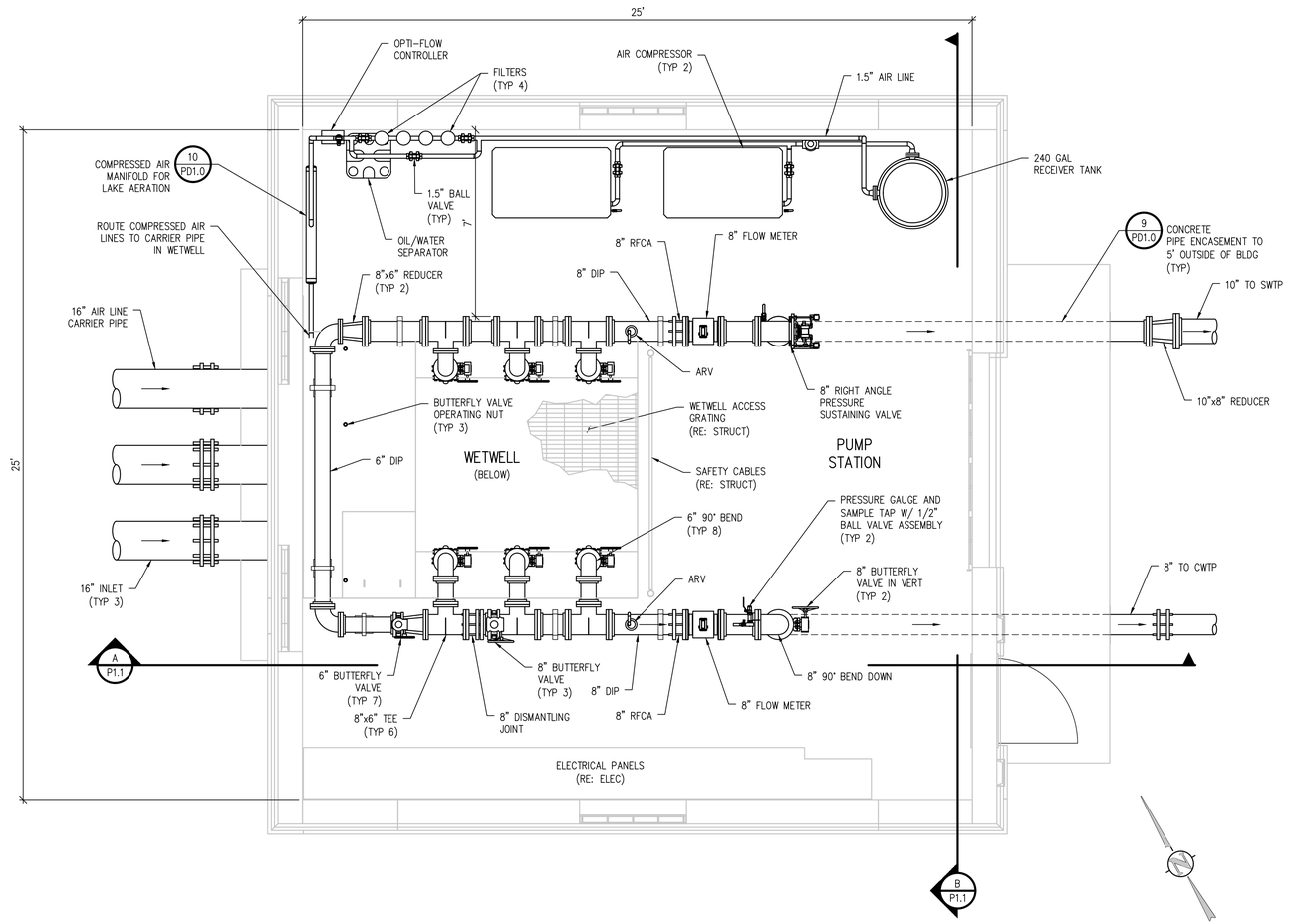


PUMP STATION ISOMETRIC
NTS

EQUIPMENT SCHEDULE	
ID	DESCRIPTION
1	6" CHECK VALVE (TYP 6)
2	6" BUTTERFLY VALVE (TYP 7)
3	8" BUTTERFLY VALVE (TYP 3)
4	AIR RELEASE VALVE (TYP 2)
5	8" FLOW METER (TYP 2)
6	PRESSURE GAUGE AND SAMPLE TAP W/ 1/2" BALL VALVE ASSY. (TYP 2)
7	8" RIGHT ANGLE PRESSURE SUSTAINING VALVE
8	AIR COMPRESSOR (TYP 2)
9	1.5" BALL VALVE (TYP 5)
10	MIST ELIMINATOR
11	240 GALLON RECEIVER TANK
12	BULK LIQUID COALESCER
13	PARTICULATE FILTER
14	COALESCING FILTER
15	SUPER MIST SEPARATOR
16	OPTI FLOW CONTROLLER
17	PRESSURE GAUGE W/ BALL VALVE
18	OIL/WATER SEPARATOR
19	COMPRESSED AIR MANIFOLD



WETWELL PLAN
3/8" = 1'-0"



PUMP STATION PLAN
3/8" = 1'-0"

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NO.	DATE	DESD	DWN	REVISION DESCRIPTION

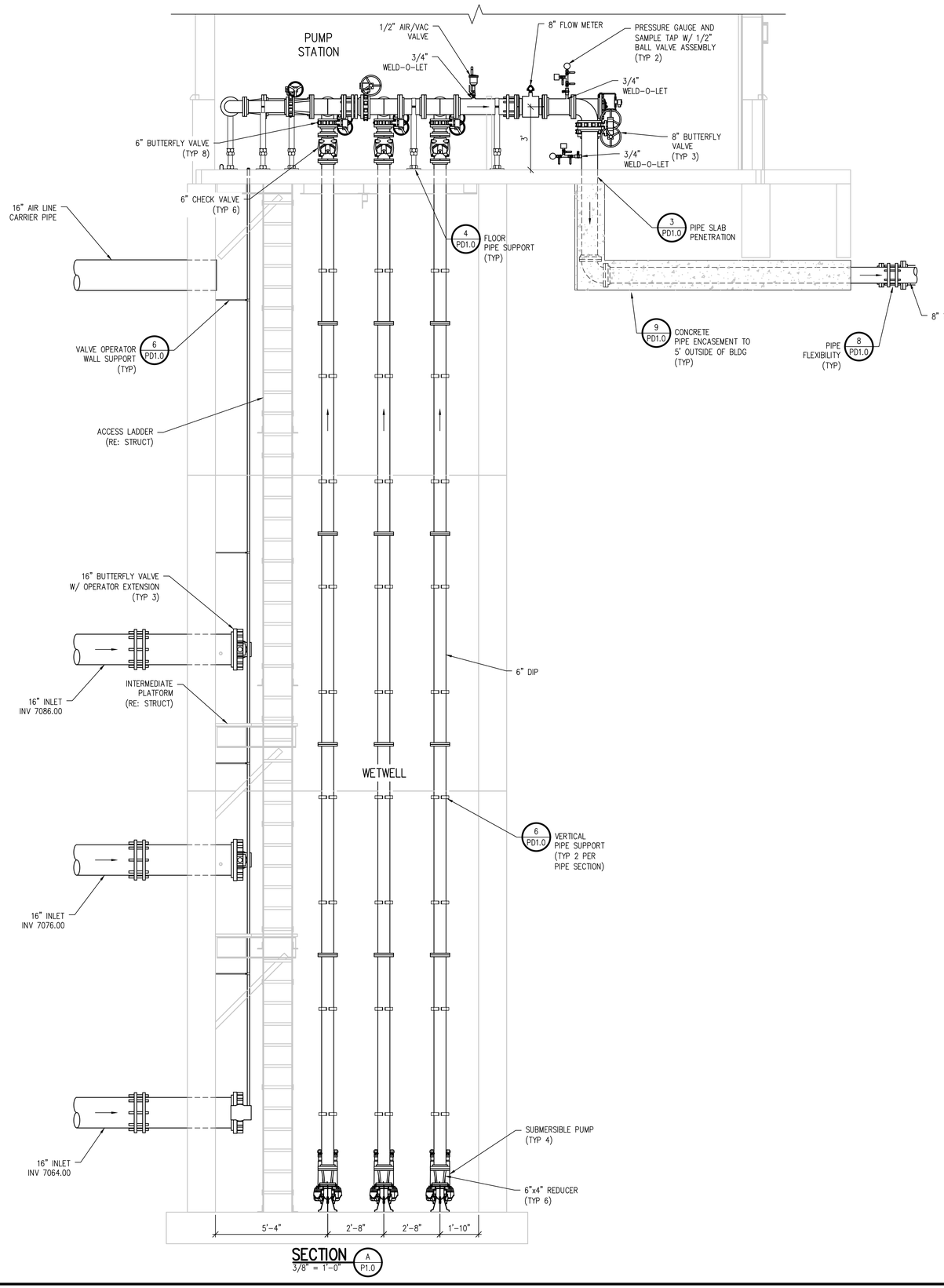
COLORADO REGISTERED JOSHUA J. MCGRATH 40279 11/16/2021 PROFESSIONAL ENGINEER

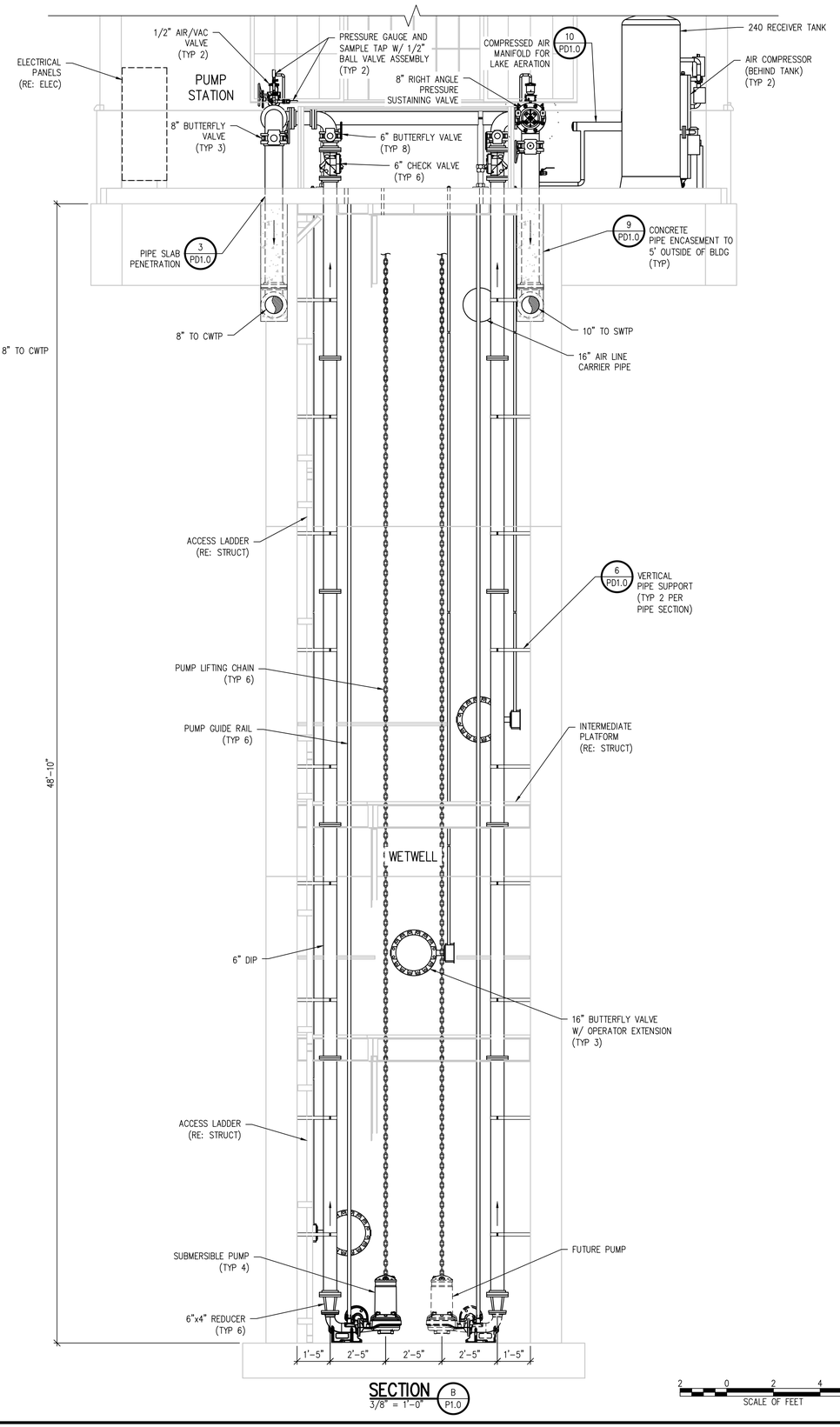
DESIGNED BY:	KCT/MHT
DRAWN BY:	JCD
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PUMP STATION PLANS

SHEET NO.
P1.0





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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

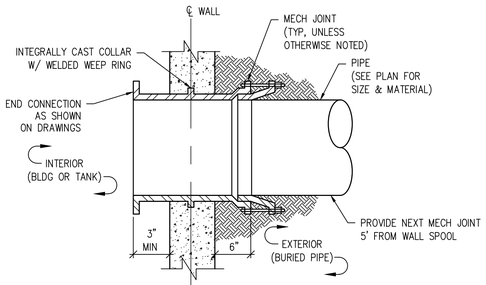
COLORADO REGISTERED JOSHUA J. MCKINNEY 40279 11/16/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	KCT/MHT
DRAWN BY:	JCD
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

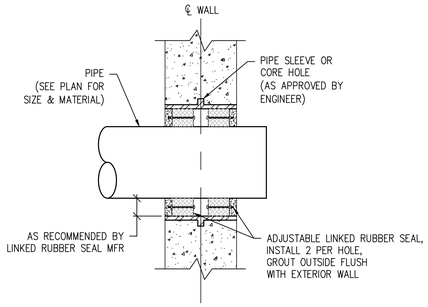
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PUMP STATION SECTIONS

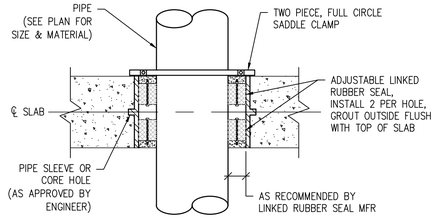
SHEET NO.
P1.1



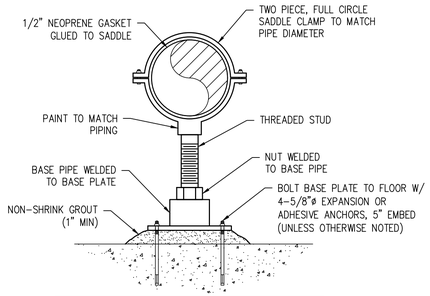
CAST IN PLACE WALL PENETRATION DETAIL 1/P1.0
NTS



WALL PENETRATION WITH CORE HOLE DETAIL 2/–
NTS



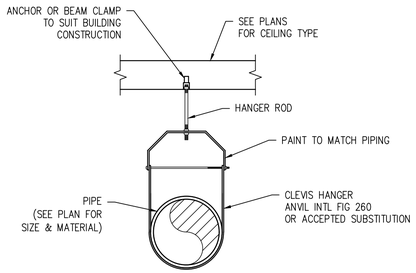
SLAB PENETRATION WITH CORE HOLE DETAIL 3/P1.1
NTS



PIPE SIZE	CLAMP SIZE	THREADED STUD ø	BASE PLATE	BASE PIPE
2", 3"	.375"x1.5"	.75"	6"x6"	2"
4"–12"	.5"x2"	1"	8"x8"	2"*
14"–16"	.625"x3"	1.5"	12"x12"	3"
18"–24"	.75"x4"	2"	12"x12"	4"

*USE MINIMUM 3" BASE PIPE FOR PIPE SUPPORT TALLER THAN 36"

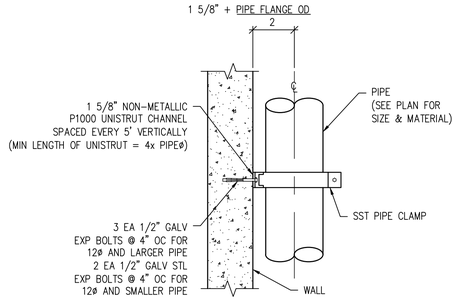
FLOOR PIPE SUPPORT DETAIL 4/P1.1
NTS



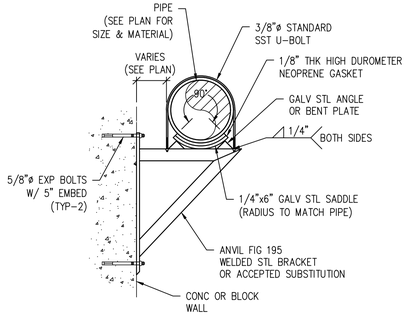
NOTE:
TOTAL LOADING ON EACH CONCRETE INSERT SHALL NOT EXCEED MANUFACTURER'S RECOMMENDED LOADINGS.

PIPE SIZE	HANGER ROD ø
2" & SMALLER	3/8"
2 1/2"	1/2"
3" & 4"	5/8"
6" THRU 12"	3/4"

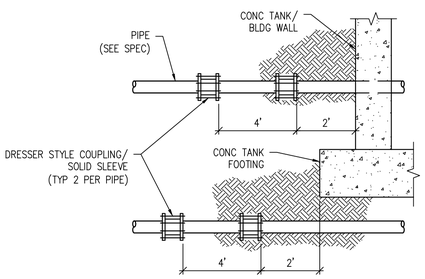
PIPE HANGER DETAIL 5/–
NTS



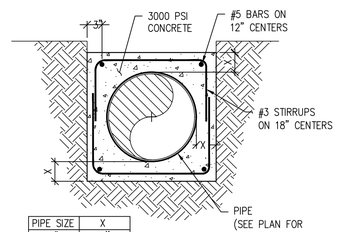
VERTICAL PIPE WALL SUPPORT DETAIL 6/P1.1
NTS



WALL PIPE SUPPORT DETAIL 7/–
NTS



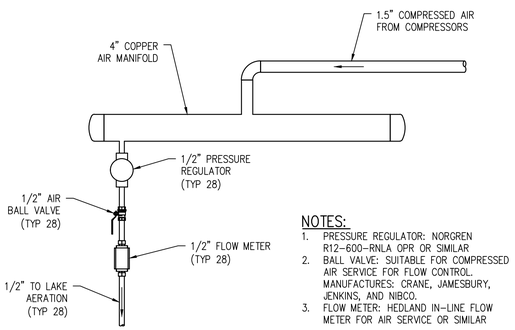
PIPE FLEXIBILITY DETAIL 8/P1.0
NTS



PIPE SIZE	X
6"	4"
8"	4"
12"	4"
18"	5"
24"	6"
36"	6"

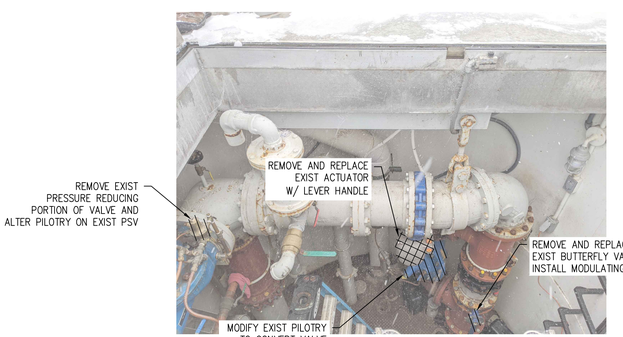
NOTE:
PROVIDE FLOWABLE FILL MATERIAL, NO REINFORCEMENT, AT ROAD AND DITCH CROSSINGS, 10' BEYOND EACH SIDE.

CONCRETE ENCASEMENT DETAIL 9/P1.0
NTS

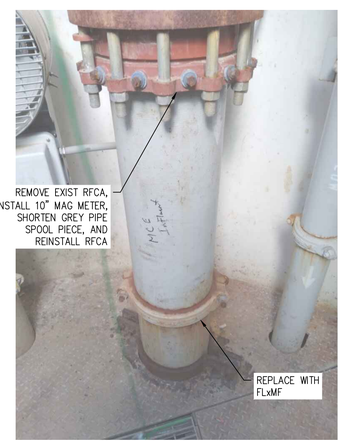


NOTES:
1. PRESSURE REGULATOR: NORGREN R12-600-RNLA OPR OR SIMILAR
2. BALL VALVE: SUITABLE FOR COMPRESSED AIR SERVICE FOR FLOW CONTROL. MANUFACTURES: CRANE, JAMESBURY, JENKINS, AND NIBCO.
3. FLOW METER: HEDLAND IN-LINE FLOW METER FOR AIR SERVICE OR SIMILAR

COMPRESSED AIR MANIFOLD DETAIL 10/P1.0
NTS



PIPING IMPROVEMENT DETAIL 11/–
NTS



DEMO AND INSTALL NEW MAG METER 12/C1.1
NST

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED
JOSHUA J. MEYER
40279
11/16/2021
PROFESSIONAL ENGINEER

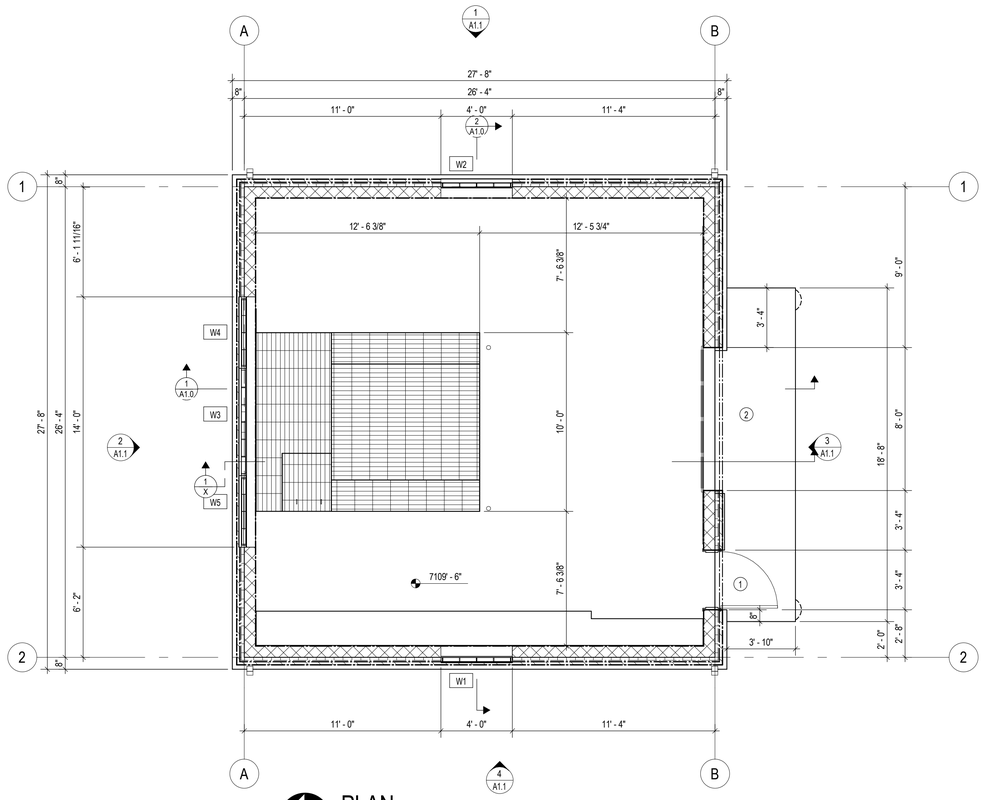
DESIGNED BY:	KCT/MHT
DRAWN BY:	JCD
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PROCESS DETAILS

SHEET NO.
PD1.0

N:\1051.6e\Drawings\1051.6e – PD10.dwg, 11/18/2021 – 8:34 AM, JCD

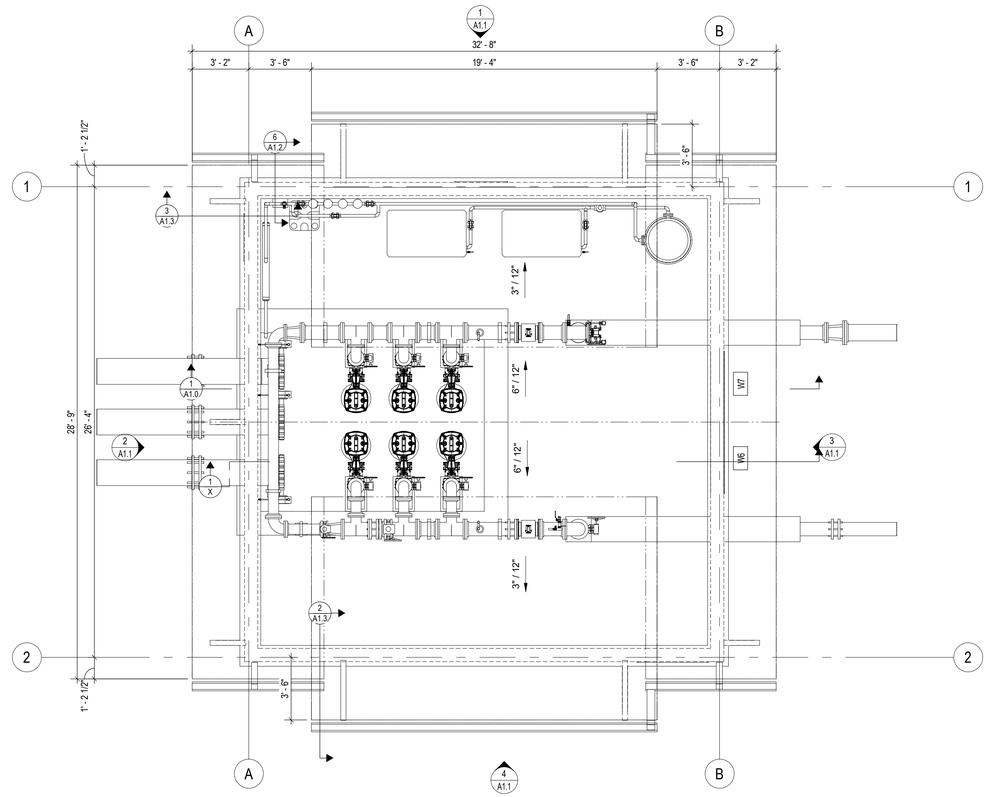


PLAN

1/4" = 1'-0"

NORTH

0 1' 2' 4' 8'

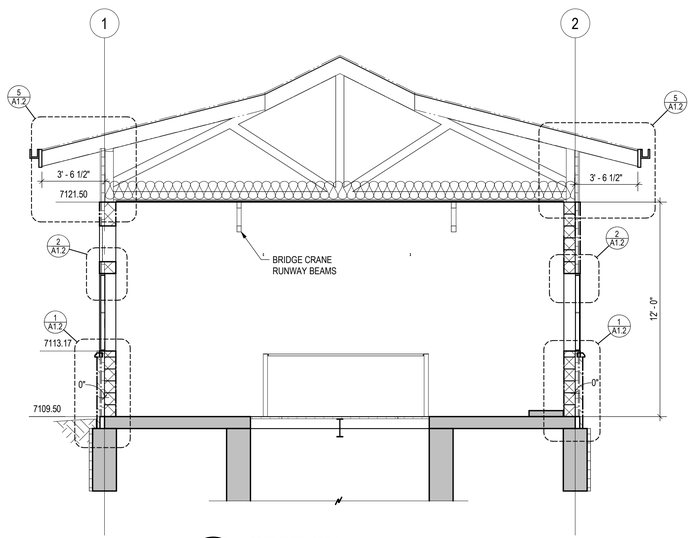


ROOF FRAMING PLAN

1/4" = 1'-0"

NORTH

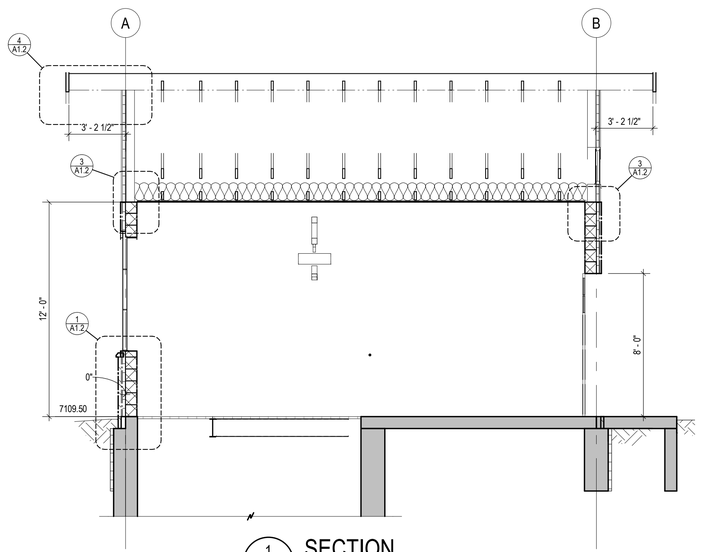
0 1' 2' 4' 8'



SECTION

2 / A1.0

1/4" = 1'-0"



SECTION

1 / A1.0

1/4" = 1'-0"

0 1' 2' 4' 8'

2015 IBC CODE ANALYSIS

SITE ADDRESS:	LAKE WOODMOOR DRIVE MONUMENT, CO 80132
CLIMATE ZONE:	5
OCCUPANCY CLASSIFICATION:	U
CONSTRUCTION TYPE:	TYPE V-B
BUILDING AREA:	625 SF MAIN LEVEL 625 SF < 5,500 SF ALLOWABLE (PER TABLE 506.2)
NO. OF STORIES	1 1<2 ALLOWABLE STORIES ABOVE GRADE (PER TABLE 504.4)
BUILDING HEIGHT:	20'-2" PROPOSED HEIGHT AT TALLEST POINT 20'-2" < 55'-0" ALLOWABLE HEIGHT (PER TABLE 504.3)
FIRE RATINGS:	NO REQUIRED BUILDING ELEMENT RATINGS PER TABLE 601
FIRE PROTECTION:	NO AUTOMATIC SPRINKLER SYSTEM IS REQUIRED FOR U OCCUPANCY PER SECTION 903.2.11 PORTABLE FIRE EXTINGUISHERS ARE NOT REQUIRED PER SECTION 906.1 NO FIRE ALARM IS REQUIRED FOR GROUP U PER SECTION 907.2
OCCUPANT LOAD:	625 SF/300 SF PER OCC = 3 OCCUPANTS
EXITS:	1 EXIT IS REQUIRED FOR EACH SPACE PER TABLE 1006.3.2(2) AS OCCUPANCY <49 1 EXITS IS PROVIDED AT MAIN LEVEL
ADA ACCESSIBILITY:	THE NEW BUILDING IS NOT REQUIRED TO BE ADA ACCESSIBLE. THE OCCUPANTS OF THIS BUILDING, BY NATURE OF THEIR JOBS, CANNOT PERFORM THIER WORK WITH DISABILITIES. PER SECTION 1103.2.9, SPACES FREQUENTED ONLY BY PERSONNEL FOR MAINTENANCE, REPAIR AND MONITORING OF EQUIPMENT ARE NOT REQUIRED TO BE ACCESSIBLE. SUCH SPACES INCLUDE WATER PUMP STATIONS

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED
KEVIN TEUNISSEN
48518
11/16/2021
PROFESSIONAL ENGINEER

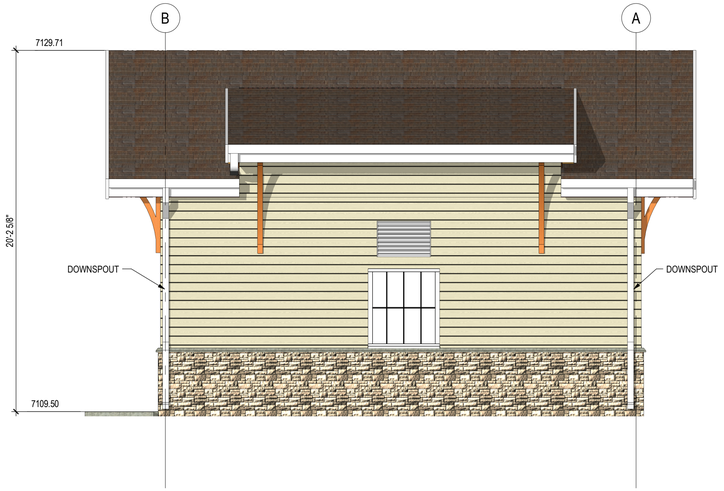
DESIGNED BY:	AJT
DRAWN BY:	AJT
CHECKED BY:	-
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

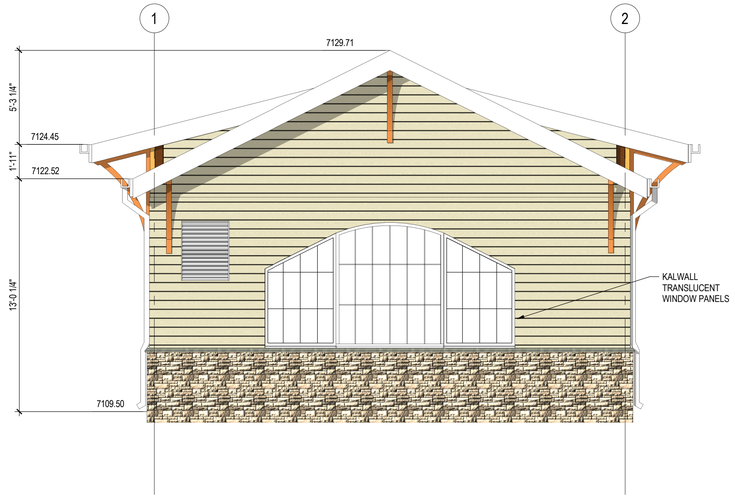
PUMP STATION PLANS AND SECTIONS

SHEET NO.

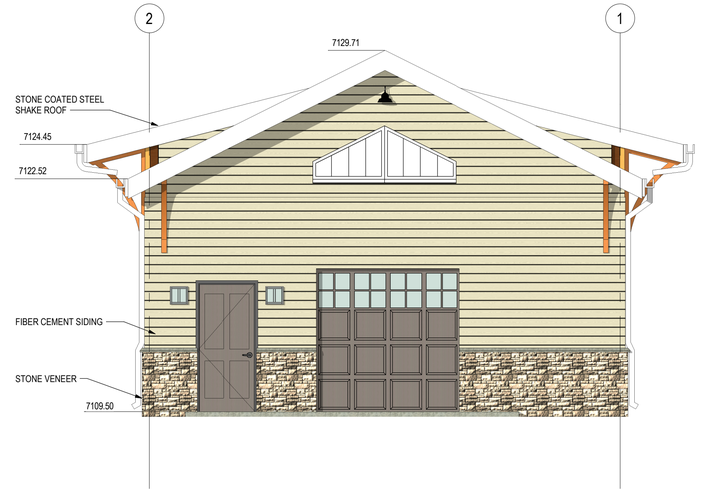
A1.0



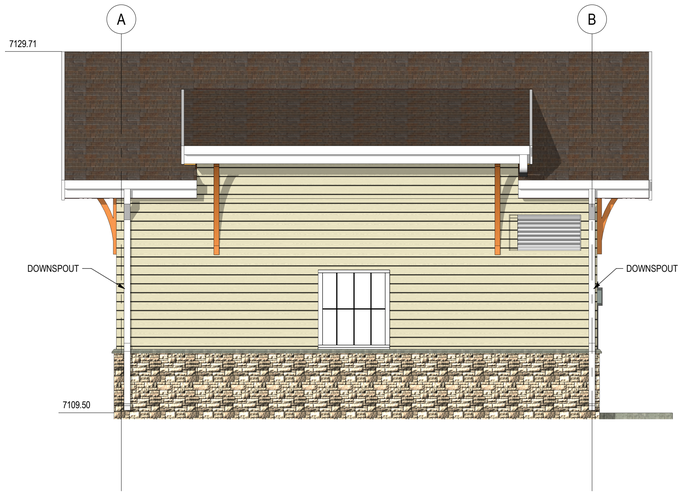
1 A1.1 EAST ELEVATION
1/4" = 1'-0"



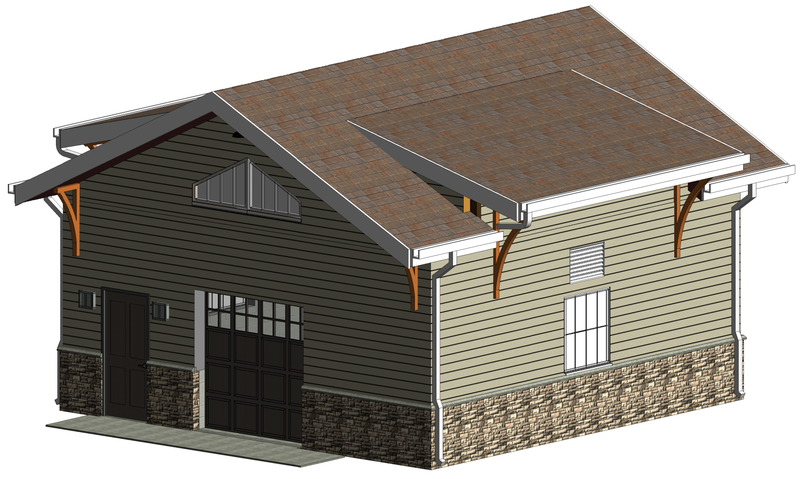
2 A1.1 NORTH ELEVATION
1/4" = 1'-0"



3 A1.1 SOUTH ELEVATION
1/4" = 1'-0"



4 A1.1 WEST ELEVATION
1/4" = 1'-0"



5 A1.1 3D VIEW

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

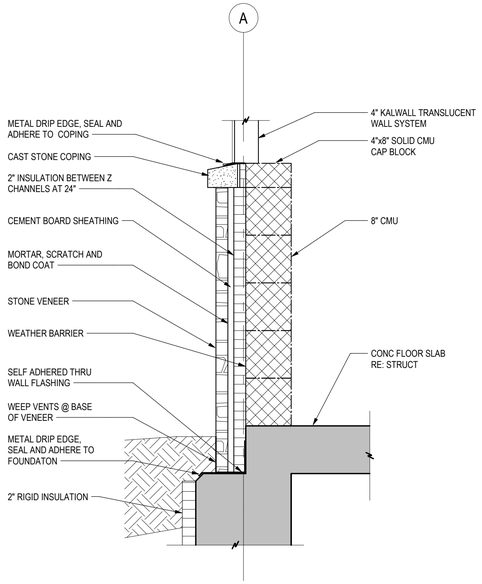
COLORADO REGISTERED
ADAM TEUNISSEN
48518
11/16/2021
PROFESSIONAL ENGINEER

DESIGNED BY:	AJT
DRAWN BY:	AJT
CHECKED BY:	-
JOB #:	1051.6e
DATE:	APRIL 2021

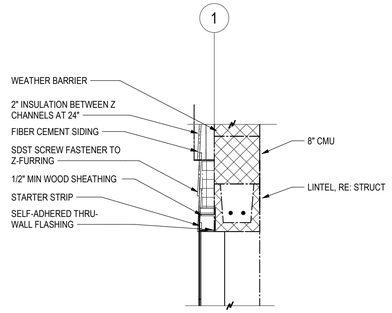
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

ELEVATIONS AND 3D VIEW

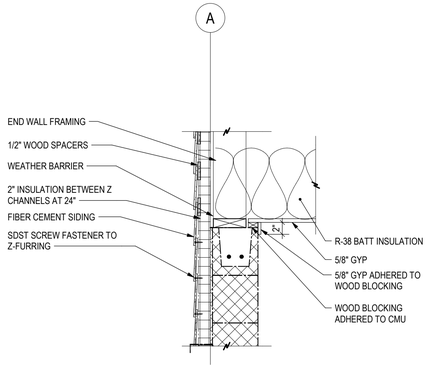
SHEET NO.
A1.1



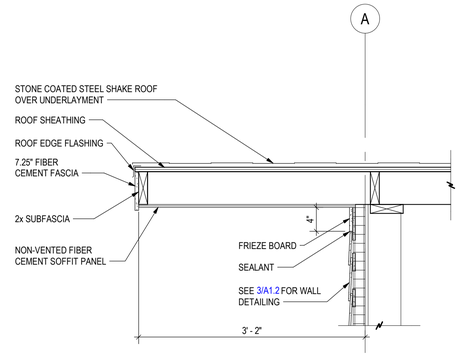
1 A1.2 **DETAIL**
1" = 1'-0"



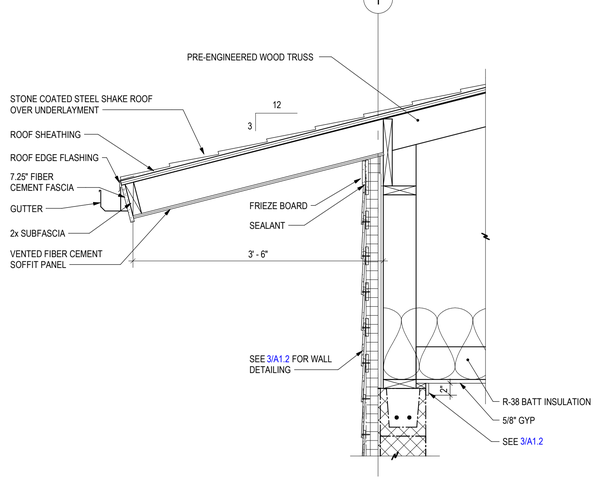
2 A1.2 **DETAIL**
1" = 1'-0"



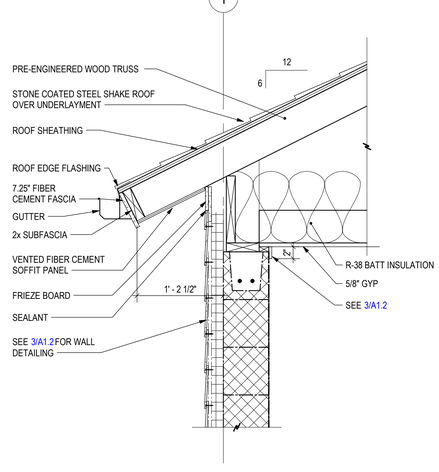
3 A1.2 **DETAIL**
1" = 1'-0"



4 A1.2 **DETAIL**
1" = 1'-0"



5 A1.2 **DETAIL**
1" = 1'-0"



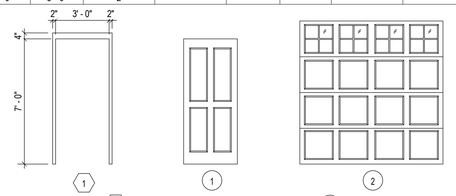
6 A1.2 **DETAIL**
1" = 1'-0"

ROOM FINISH SCHEDULE

ROOM	FLOOR		WALL		CEILING	
	CONCRETE	SEALED	CMU	PAINT	GYP	PAINT
WET WELL	CONCRETE	EXPOSED	CONCRETE	EXPOSED	-	-

DOOR SCHEDULE

Mark	Rough Width	Rough Height	Door Type	Door Material	Frame Type	Frame Material	Hardware Set	Notes
1	3' - 4"	7' - 4"	1	GALV STEEL	1	GALV STEEL	1	
2	8' - 0"	8' - 0"	2		-	-	-	

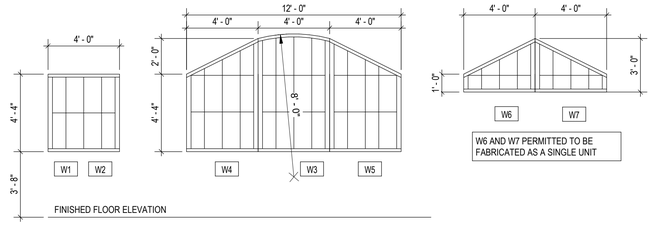


FRAME TYPE = X

DOOR TYPE = X

WINDOW SCHEDULE

Mark	Type	Width	Height	Sill Height
W1	Kalwall Wall Facade - Standard	4' - 0"	4' - 4"	3' - 8"
W2	Kalwall Wall Facade - Standard	4' - 0"	4' - 4"	3' - 8"
W4	Kalwall Wall Facade - Sloped Head	4' - 0"	8' - 0"	3' - 8"
W5	Kalwall Wall Facade - Sloped Head	4' - 0"	8' - 0"	3' - 8"
W6	Kalwall Wall Facade - Sloped Head	4' - 0"	3' - 0"	13' - 0"
W7	Kalwall Wall Facade - Sloped Head	4' - 0"	3' - 0"	13' - 0"



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NO.	DATE	DESD	DWN	REVISION DESCRIPTION

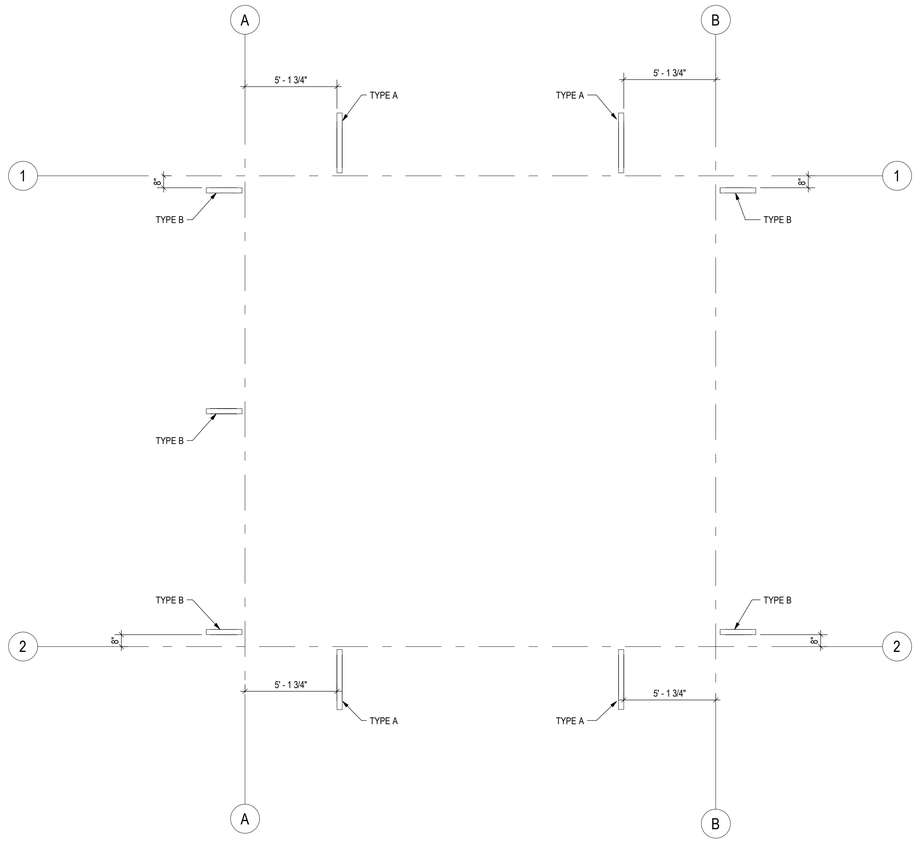
COLORADO REGISTERED KEVIN M TEUNISSEN 48518 11/16/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	AJT
DRAWN BY:	AJT
CHECKED BY:	-
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

DETAILS AND SCHEDULES

SHEET NO.
A1.2

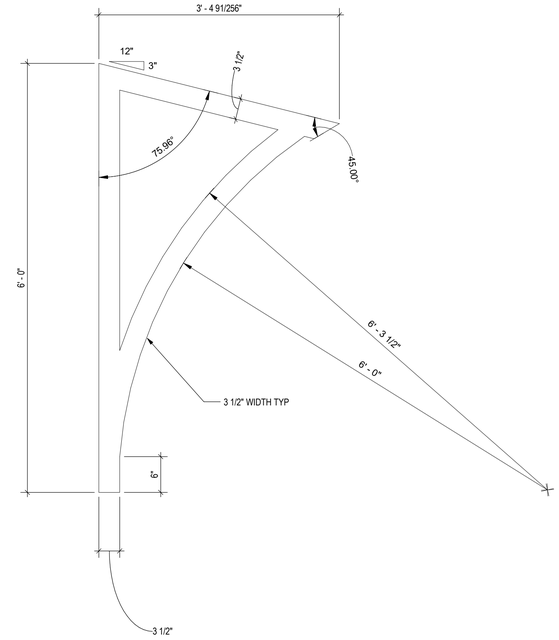


CORBEL DETAILS

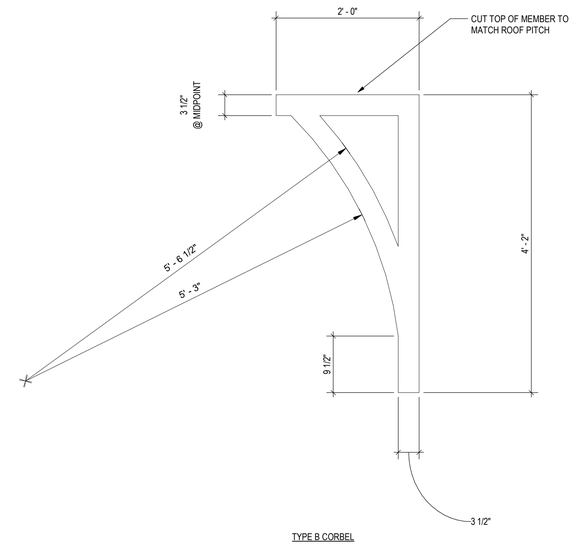
1/4" = 1'-0"

NORTH

0 1' 2' 4' 8'



TYPE A CORBEL
1" = 1'-0"



TYPE B CORBEL
1" = 1'-0"

JVA, Inc. 1512 Larimer Street, Suite 710
Denver, CO 80202 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
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NO.	DATE	DES'D	DWN.	REVISION DESCRIPTION

COLORADO REGISTERED
KEVIN TEUNISSEN
48518
11/16/2021
PROFESSIONAL ENGINEER

DESIGNED BY:	AJT
DRAWN BY:	AJT
CHECKED BY:	AJT
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

CORBEL DETAILS

SHEET NO.
A1.3

STRUCTURAL GENERAL NOTES

DESIGN LOADS:

1. DESIGN LOADS: 2015 INTERNATIONAL BUILDING CODE WITH PIKES PEAK REGIONAL BUILDING DEPARTMENT AMENDMENTS, ASCE 7-10
2. RISK CATEGORY: III SUBSTANTIAL HAZARD
3. ROOFS:
    - A. ROOF DEAD LOAD 15 PSF
    - B. GROUND SNOW LOAD, Pg 65 PSF (SEAC DESIGN SNOW LOADS)
    - C. FLAT-ROOF SNOW LOAD, Pf 50 PSF
    - D. SNOW EXPOSURE FACTOR, Ce 1.0
    - E. SNOW IMPORTANCE FACTOR, Is 1.1
    - F. THERMAL FACTOR, Ct 1.0
4. FLOOR LIVE LOADS:

OCCUPANCY OR USE	UNIFORMLY DISTRIBUTED (PSF)	CONCENTRATED LOAD (LBS)	LIVE LOAD REDUCTION
UPPER SLAB	150	N/A	NO
INTERMEDIATE PLATFORM	150	N/A	NO

5. WIND:
    - A. ULTIMATE DESIGN WIND SPEED, V_{ULT}, (3-SECOND GUST) 140 MPH
    - B. NOMINAL DESIGN WIND SPEED, V_{ASD}, (3-SECOND GUST) 109 MPH
    - C. INTERNAL PRESSURE COEFFICIENT 0.18 (ENCLOSED)
    - D. WIND EXPOSURE C
    - E. AIR DENSITY COEFFICIENT 0.809
    - F. COMPONENTS AND CLADDING ULTIMATE DESIGN WIND PRESSURES
        - 1. WALLS:
            - a. WITHIN 3.5 FEET OF CORNERS +35.5 PSF -47.6 PSF
            - b. AWAY FROM CORNERS +35.5 PSF -38.5 PSF
        - 2. ROOFS:
            - a. WITHIN 3.5 FEET OF CORNERS +20.5 PSF -83.7 PSF
            - b. WITHIN 3.5 FEET OF EDGES +20.5 PSF -56.6 PSF
            - c. AWAY FROM EDGES +20.5 PSF -32.5 PSF
        - 3. OVERHANGS:
            - a. WITHIN 3.5 FEET OF CORNERS +20.5 PSF -111.4 PSF
            - b. AWAY FROM CORNERS +20.5 PSF -66.2 PSF
        - 4. PRESSURES MAY BE REDUCED FOR EFFECTIVE WIND AREAS LARGER THAN 10 SQUARE FEET, BUT NOT BELOW 16 PSF.
6. SEISMIC:
    - A. SPECTRAL RESPONSE ACCELERATION PARAMETERS
        - 1. SHORT PERIOD
            - a. S_S 0.187g
            - b. S_{DS} 0.149g
        - 2. ONE SECOND
            - a. S_1 0.061g
            - b. S_{D1} 0.069g
    - B. SOILS SITE CLASS C
    - C. SEISMIC IMPORTANCE FACTOR 1.25
    - D. SEISMIC DESIGN CATEGORY B
    - E. BASIC SEISMIC-FORCE-RESISTING SYSTEM(S)
        - INTERMEDIATE REINFORCED MASONRY SHEAR WALLS
    - F. DESIGN BASE SHEAR(S) 3.5 KIPS
    - G. SEISMIC RESPONSE COEFFICIENT(S), C_S 0.053
    - H. RESPONSE MODIFICATION COEFFICIENT(S), R 3.5
    - I. ANALYSIS PROCEDURE EQUIVALENT LATERAL FORCE

FOUNDATION DESIGN:

1. REFER TO SOILS REPORT NO. 23205117 BY TERRACON CONSULTANTS, INC., DATED 12/17/2020.
2. GEOTECHNICAL ENGINEER SHALL VERIFY SOIL CONDITIONS AND TYPES DURING EXCAVATION AND PRIOR TO PLACEMENT OF FORMWORK OR CONCRETE.
3. MINIMUM FROST DEPTH SHALL BE 2'-6" BELOW EXTERIOR GRADE.

DRILLED PIERS (CAST-IN-PLACE DEEP FOUNDATIONS):

1. STRAIGHT SHAFT DRILLED PIERS ARE DESIGNED FOR
    - A. MAXIMUM END BEARING PRESSURE 20,000 PSF
    - B. ALLOWABLE SIDE SHEAR 800 PSF
    - C. UPLIFT SIDE SHEAR 533 PSF.
    - D. MINIMUM PENETRATION INTO BEDROCK 5 FEET
    - E. MINIMUM TOTAL LENGTH 20 FEET
2. SEE PLANS FOR ADDITIONAL PENETRATION AND LENGTH REQUIREMENTS.
3. ASSUMED AVERAGE USGS TOP OF BEDROCK ELEVATION, FOR BIDDING PURPOSES ONLY, SHALL BE 7081.5'.
4. SEE BORING LOGS IN THE SOILS REPORT FOR INDICATED VARIATION IN BEDROCK SURFACE.
5. MUSHROOMING AT THE TOPS OF PIERS IS NOT PERMITTED.
6. PROVIDE FOR OVERRUN OR UNDERRUN IN DRILLING LENGTHS AND INSTALLED QUANTITIES OF CONCRETE AND REINFORCING.
7. PIER HOLES SHALL BE THOROUGHLY CLEANED AND DEWATERED AND SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO CONCRETE PLACEMENT. CASING OF DRILLED PIER HOLES MAY BE REQUIRED.

EARTH RETAINING STRUCTURES:

1. EARTH EQUIVALENT FLUID LATERAL PRESSURE:
    - A. WALLS RESTRAINED AT TOP (AT REST) 65 PCF UNSATURATED, 95 PCF SUBMERGED
    - B. CANTILEVERED WALLS (ACTIVE) 45 PCF UNSATURATED, 85 PCF SUBMERGED
    - C. PASSIVE RESISTING 330 PCF UNSATURATED, 220 PCF SUBMERGED
2. COEFFICIENT OF SLIDING FRICTION 0.53

REINFORCED CONCRETE:

1. DESIGN IS BASED ON ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE."
2. CONCRETE WORK SHALL CONFORM TO ACI 301 "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE."
3. STRUCTURAL CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES:

INTENDED USE	EXPOSURE CLASS	f'c, PSI 28 DAYS	MAX W/CM RATIO	MAXIMUM AGGREGATE	SLUMP, INCHES (+/- 1")	AIR CONTENT PERCENT (+/- 1.5%)	CEMENT TYPE
DRILLED PIERS	F0-S0-W0-C1	4000	0.55	3/4" STONE	7	2%	I/II
GRADE BEAMS	F2-S0-W0-C1	4500	0.45	3/4" STONE	4	6%	I/II
WALLS	F0-S0-W0-C0	4000	0.45	3/4" STONE	4	3%	I/II
FORMED STRUCTURAL SLAB	F0-S0-W0-C0	4000	0.45	3/4" STONE	4	3%	I/II
INTERIOR SLAB ON GRADE	F0-S0-W0-C0	4000	0.45	3/4" STONE	4	3%	I/II
EXTERIOR SLAB ON GRADE	F3-S0-W0-C2	5000	0.40	3/4" STONE	4	6%	I/II

4. DETAILING, FABRICATION, AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT."
5. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60.
6. AT CORNERS AND INTERSECTIONS, MAKE HORIZONTAL BARS CONTINUOUS OR PROVIDE MATCHING CORNER BARS FOR EACH LAYER OF REINFORCEMENT.
7. TRIM OPENINGS IN WALLS AND SLABS WITH (2) #5 FOR EACH LAYER OF REINFORCEMENT, FULLY DEVELOPED BY EXTENSION OR HOOK.
8. IN CONTINUOUS MEMBERS, SPLICE TOP BARS AT MID-SPAN AND SPLICE BOTTOM BARS OVER SUPPORTS.
9. FORM INTERMITTENT SHEAR KEYS AT ALL CONSTRUCTION JOINTS AND AS SHOWN ON THE STRUCTURAL DRAWINGS.
10. EXCEPT AS NOTED ON THE DRAWINGS, CONCRETE PROTECTION FOR REINFORCEMENT IN CAST-IN-PLACE CONCRETE SHALL BE AS FOLLOWS:
    - A. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
        - 1. EXPOSED TO EARTH OR WEATHER:
            - a. #6 THROUGH #18 BARS 2"
            - b. #5 BAR, W31 OR D31 WIRE, AND SMALLER 1-1/2"
    - B. NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
        - 1. SLABS, WALLS, JOISTS: #11 BARS AND SMALLER 3/4"

POST-INSTALLED ANCHORS

1. ALL CAST IN PLACE ANCHORS DESIGNED IN ACCORDANCE WITH ACI 318.
2. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER-OF-RECORD PRIOR TO INSTALLING POST-INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS.
3. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REBAR. EXISTING REINFORCING BARS SHALL NOT BE CUT UNLESS APPROVED BY THE EOR.
4. ALL ANCHORS MUST BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INFORMATION (MPII) IN CONJUNCTION WITH EDGE DISTANCE, SPACING, AND EMBEDMENT DEPTH AS INDICATED ON THE DRAWINGS. HOLES SHALL BE DRILLED AND CLEANED IN ACCORDANCE WITH THE MPII.
5. SUBSTITUTION REQUESTS, FOR PRODUCTS OTHER THAN THOSE SPECIFIED, SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER-OF-RECORD ALONG WITH CALCULATIONS THAT ARE PREPARED & SEALED BY A REGISTERED PROFESSIONAL ENGINEER; REGISTRATION MUST BE IN THE STATE IN WHICH THE PROJECT IS LOCATED. THE CALCULATIONS SHALL DEMONSTRATE THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING EQUIVALENT PERFORMANCE VALUES (MINIMUM) OF THE SPECIFIED PRODUCT USING THE APPROPRIATE DESIGN PROCEDURE AND/OR STANDARD(S) AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION.
6. THE CONTRACTOR SHALL ARRANGE FOR A MANUFACTURER'S FIELD REPRESENTATIVE TO PROVIDE INSTALLATION TRAINING FOR ALL PRODUCTS TO BE USED, PRIOR TO THE ANCHOR INSTALLATION. A RECORD OF TRAINING SHALL BE KEPT ON SITE AND MADE AVAILABLE TO THE EOR/ SPECIAL INSPECTOR AS REQUESTED.
7. ADHESIVE ANCHORS INSTALLED IN HORIZONTAL TO VERTICALLY OVERHEAD ORIENTATION THAT SUPPORT SUSTAINED TENSION LOADS SHALL BE DONE BY A CERTIFIED ANCHOR INSTALLER (AAI) AS CERTIFIED THROUGH ACI/CRSI (ACI 318-11 D 9.2.2, ACI 318-14 17.8.2.2). PROOF OF CURRENT CERTIFICATION SHALL BE SUBMITTED TO THE EOR FOR APPROVAL PRIOR TO COMMENCEMENT OF INSTALLATION.
8. ADHESIVE ANCHORS MUST BE INSTALLED IN CONCRETE AGED A MINIMUM OF 21 DAYS (ACI 318-11 D 2.2, ACI 318-14 17.1.2)
9. ALL POST INSTALLED ANCHORS SHALL BE INSTALLED IN DRY HOLES THAT HAVE BEEN DRILLED, CLEANED, AND PREPARED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INFORMATION AND THE RESPECTIVE ICC-ES EVALUATION REPORTS.
10. PROVIDE SPECIAL INSPECTION FOR ALL MECHANICAL AND ADHESIVE ANCHORS PER THE APPLICABLE BUILDING CODE AND PER THE CURRENT ICC-ES REPORT (IBC 2012/2015 TABLE 1705.3 NOTE B).

CONCRETE POST INSTALLED ANCHORS			
ANCHOR TYPE	DEWALT	HILTI	SIMPSON
EXPANSION	POWER-STUD+ SD2 (ICC ESR-2502)	KWIK BOLT TZ (ICC ESR-1917)	STRONG-BOLT 2 (ICC ESR-3037)
CONCRETE SCREW	SCREW-BOLT+ (ICC ESR 3889)	KWIK HUS-EZ (ICC ESR-3027)	TITEN HD (ICC ESR 2713)
ADHESIVE	AC200+ (ICC ESR-4027)	HIT-HY 200 (ICC ESR-3187)	AT-XP (UES ER-263)

MASONRY POST INSTALLED ANCHORS			
ANCHOR TYPE	DEWALT	HILTI	SIMPSON
EXPANSION	POWER-STUD+ SD1 (ICC ESR-2966)	KWIK BOLT 3 (ICC ESR-1385)	WEDGE-ALL (ICC ESR-1396)
SCREW	SCREW-BOLT+ (ICC ESR-4042)	HUS-EZ (ICC ESR-3056)	TITEN HD (ICC ESR-1056)
ADHESIVE	AC100+ GOLD (ICC ESR-3200)	HIT HY-70 (ICC ESR-2682)	AT-XP (UES ER-281)

STRUCTURAL STEEL:

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (AISC 360) AND THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (AISC 303) BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC).
2. STRUCTURAL STEEL WIDE FLANGE BEAMS SHALL CONFORM TO ASTM A992, 50 KSI YIELD.
3. ROLLED STEEL FLOOR PLATES SHALL CONFORM TO ASTM A786, COMMERCIAL GRADE.
4. OTHER ROLLED SHAPES, INCLUDING PLATES, CHANNELS, WTS, AND ANGLES SHALL CONFORM TO ASTM A36, 36 KSI YIELD.
5. HOLLOW STRUCTURAL SECTION (HSS) RECTANGULAR SHAPES SHALL CONFORM TO ASTM A500, GRADE C, 50 KSI YIELD.
6. HSS ROUND SHAPES SHALL CONFORM TO ASTM A500, GRADE C, 46 KSI YIELD.
7. PIPE SHAPES SHALL CONFORM TO ASTM A53, GRADE B, 35 KSI YIELD.
8. ALL STRUCTURAL STEEL SHALL BE GALVANIZED.
9. EXCEPT AS NOTED, FRAMED BEAM CONNECTIONS SHALL BE BEARING-TYPE WITH 3/4" DIAMETER, SNUG TIGHT, ASTM F3125 BOLTS, DETAILED IN CONFORMANCE WITH THE STRUCTURAL DRAWINGS AND THE "STEEL CONSTRUCTION MANUAL" BY THE AISC. INSTALL BOLTS IN ACCORDANCE WITH AISC'S "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS".
10. ALL BEAMS SHALL HAVE FULL DEPTH WEB STIFFENERS EACH SIDE OF WEBS ABOVE AND BELOW COLUMNS.
11. HEADED ANCHOR STUDS (HAS) SHALL CONFORM TO ASTM A108 AND SHALL BE CONNECTED TO STRUCTURAL STEEL WITH EQUIPMENT APPROVED BY THE STUD MANUFACTURER ACCORDING TO THE STUD MANUFACTURER'S RECOMMENDATIONS.
12. WELDING SHALL BE DONE BY A CERTIFIED WELDER IN ACCORDANCE WITH THE AISC DOCUMENTS LISTED ABOVE, THE AMERICAN WELDING SOCIETY (AWS) D1.1: STRUCTURAL WELDING CODE, AND THE RECOMMENDATIONS FOR USE OF WELD E70 ELECTRODES. WHERE NOT SPECIFICALLY NOTED, MINIMUM WELD SHALL BE 3/16" FILLET BY LENGTH OF CONTACT EDGE.
13. GROUT BENEATH COLUMN BASE AND BEAM BEARING PLATES SHALL HAVE A MINIMUM 28-DAY, COMPRESSIVE STRENGTH OF 7,500 PSI AND SHALL BE NON-SHRINK, NON-METALLIC, AND TESTED IN ACCORDANCE WITH ASTM C1107.

STRUCTURAL MASONRY:

1. DESIGN IS BASED ON ACI 530/ASCE 5/TMS 402, "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES," ALLOWABLE STRESS DESIGN.
2. 28-DAY COMPRESSIVE STRENGTH OF MASONRY ASSEMBLY USED FOR DESIGN IS 2,000 PSI, BASED ON NET-BEDDED AREA.
3. EXCEPT AT MASONRY LINTELS USING STANDARD LINTEL UNITS, BOND BEAM UNITS SHALL BE PRODUCED FROM STANDARD VERTICALLY VOIDED UNITS WITH PRE-CUT KNOCKOUT CROSS WALLS.
4. HOLLOW LOAD-BEARING CONCRETE MASONRY UNITS (CMU) SHALL BE LIGHTWEIGHT, 85 TO 105 PCF DENSITY, CONFORMING TO ASTM C90, WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 2,000 PSI BASED ON AVERAGE NET AREA.
5. MORTAR SHALL BE TYPE S CONFORMING TO ASTM C270.
6. MASONRY CEMENT SHALL NOT BE USED UNLESS PART OF A PRE-PACKAGED MORTAR OR GROUT MIX APPROVED BY THE STRUCTURAL ENGINEER.
7. ADMIXTURES SHALL NOT BE USED UNLESS APPROVED BY THE ARCHITECT AND/OR STRUCTURAL ENGINEER.
8. GROUT USED IN MASONRY WALLS AND BLOCK CELLS SHALL BE COARSE GROUT, AS DEFINED BY ARTICLE 2.2 OF TMS 602/ACI530.1/ASCE 6, WITH A MINIMUM CUBE STRENGTH = 2,000 PSI OR 3,000 PSI CONCRETE USING 3/8" DIAMETER AGGREGATE AND PLACED BY VIBRATING UNLESS AN APPROVED SELF-CONSOLIDATING MIX IS USED.
9. PLACEMENT OF MORTAR, GROUT, MASONRY UNITS AND WALL TIES SHALL COMPLY WITH TMS 602 / ACI 530.1 / ASCE 6.
10. PROVIDE FULL SHOVED MORTAR IN ALL HEAD AND BED JOINTS.
11. 'LOW-LIFT' GROUTING SHALL NOT EXCEED 5 FEET IN HEIGHT UNLESS ACI 530.1 'HIGH-LIFT' GROUTING PROCEDURES ARE REVIEWED AND APPROVED BY THE ARCHITECT AND STRUCTURAL ENGINEER.
12. VERTICALLY SPACE CONTINUOUS HORIZONTAL JOINT REINFORCING AT 16" MAXIMUM IN ALL CMU WALLS. JOINT REINFORCING SHALL BE WELDED TYPE WITH 9 GAGE SIDE RODS AND 9 GAGE LADDER CROSS RODS. IN EXTERIOR WALLS, JOINT REINFORCEMENT SHALL BE STAINLESS STEEL OR HOT-DIP GALVANIZED. ALL OTHER JOINT REINFORCEMENT SHALL BE MILL GALVANIZED, HOT-DIP GALVANIZED, OR STAINLESS STEEL.
13. WIRE TIES FOR VENEER SHALL BE 9 GAGE DIAMETER FOR CAVITY WIDTHS 2" OR LESS. WHERE NOMINAL CAVITY WIDTH EXCEEDS 2 INCHES, VENEER TIES SHALL BE 1/4" DIAMETER. TIES SHALL BE SPACED A MAXIMUM OF 16" IN EACH DIRECTION.
14. REINFORCING BARS SHALL BE AS FOR REINFORCED CONCRETE EXCEPT AS NOTED. UNLESS OTHERWISE NOTED ON THE STRUCTURAL DRAWINGS, LAP BARS 50 DIAMETERS (MINIMUM) AT SPLICES. REINFORCEMENT SHALL BE SECURED AGAINST DISPLACEMENT PRIOR TO GROUTING BY WIRE BAR LOCATORS OR OTHER SUITABLE DEVICES AT INTERVALS NOT EXCEEDING 200 BAR DIAMETERS OR 10 FEET.
15. REINFORCE AND GROUT VERTICAL CELLS AT CORNERS, ENDS OF WALLS, JAMBS OF OPENINGS, EACH SIDE OF VERTICAL CONTROL JOINTS, AND AT SPACING SHOWN ON DRAWINGS.
16. WHERE NOTED ON THE DRAWINGS, PROVIDE CLEARANCE BETWEEN MASONRY AND STRUCTURAL ELEMENTS, OR WRAP STEEL WITH POLYETHYLENE FILM.
17. LOCATE VERTICAL CONTROL JOINTS IN ALL MASONRY WALLS AS SHOWN ON THE ARCHITECTURAL DRAWINGS, STRUCTURAL DRAWINGS, OR SPACED HORIZONTALLY AT 25'-0 MAXIMUM SPACING WHERE NOT SHOWN.

CORROSION CONTROL:

1. ALL STEEL MEMBERS EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED PER ASTM A123.
2. FASTENERS AND HARDWARE SHALL BE HOT DIPPED GALVANIZED PER ASTM A153 OR ASTM B695 CLASS 50 (A490 BOLTS SHALL NOT BE HOT DIPPED GALVANIZED). STAINLESS STEEL FASTENERS AND HARDWARE MAY ALSO BE USED.
3. ALL FIELD CUT OR DAMAGED SURFACES, FIELD WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS AS INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE REPAIRED WITH (2) COATS OF A 95% ZINC RICH PAINT PER ASTM A780 (ZRC PREFERRED).

STRUCTURAL WOOD FRAMING:

1. IN-GRADE BASE VALUES HAVE BEEN USED FOR DESIGN.
2. DIMENSIONAL LUMBER FRAMING SHALL BE S4S HEM FIR NO. 2 AND BETTER UNO.
3. TOP PLATES SHALL BE DOUGLAS FIR-LARCH NO. 2 AND BETTER UNO.
4. ALL LUMBER SHALL BE 19% MAXIMUM MOISTURE CONTENT AT THE TIME OF INSTALLATION UNO.
5. ALL WOOD EXPOSED TO WEATHER OR IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE TREATED DOUGLAS FIR-LARCH OR SOUTHERN YELLOW PINE. PRESERVATIVE-TREATED WOOD SHALL BE TREATED IN ACCORDANCE WITH AWPA STANDARDS U1 AND M4. TREATMENTS SHALL HAVE NO AMMONIA ADDED AND SHALL BE THE FOLLOWING USE CATEGORY:
    - A. UC2 AT INTERIOR
6. FASTENERS FOR USE WITH TREATED WOOD SHALL BE CORROSION RESISTANT IN ACCORDANCE WITH SECTION 2304.10.5 OF THE IBC.
7. ALL CONNECTORS USED WITH PRESSURE-TREATED MATERIAL SHALL BE STAINLESS STEEL ASTM 304 OR 316, OR HAVE A SIMPSON Z-MAX (G185) OR HDG COATING. STANDARD COATING (G90) IS ACCEPTABLE AT INTERIOR CONDITIONS WITH NON PRESSURE-TREATED LUMBER ONLY. CONNECTORS ARE TO BE IN ACCORDANCE WITH ASTM A653 OR ASTM 123.
8. ALL IRON AND STEEL PRODUCTS ATTACHED TO TREATED LUMBER SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 OR SHALL BE TYPE 304 OR 316 STAINLESS STEEL.
9. STRUCTURAL MEMBERS SHALL NOT BE CUT FOR PIPES, ETC. UNLESS SPECIFICALLY NOTED OR DETAILED ON THE STRUCTURAL DRAWINGS.
10. ALL BOLTS SHALL BE RETIGHTENED PRIOR TO CLOSING IN OF WALLS, FLOORS, AND ROOFS.
11. ALL BOLTS BEARING ON WOOD SHALL HAVE STANDARD CUT WASHERS UNDER HEAD AND/OR NUT, UNO.
12. METAL FRAMING ANCHORS SHOWN OR REQUIRED, SHALL BE SIMPSON STRONG-TIE OR EQUAL CODE APPROVED CONNECTORS AND INSTALLED WITH ALL HOLES FILLED (ROUND AND TRIANGULAR) WITH THE MAXIMUM SIZE NAIL RECOMMENDED BY THE MANUFACTURER TO DEVELOP THE MAXIMUM RATED CAPACITY.
13. CONNECTOR BOLTS AND LAG SCREWS SHALL CONFORM TO ANSI/ASME B18.2.1 AND ASTM SAE J429 GRADE 1.
14. NAILS AND SPIKES SHALL CONFORM TO ASTM F1667.
15. WOOD SCREWS SHALL CONFORM TO ANSI/ASME B18.6.1.
16. LEAD HOLES FOR LAG SCREWS SHALL BE 40%-70% OF THE SHANK DIAMETER AT THE THREADED SECTION AND EQUAL TO THE SHANK DIAMETER AT THE UNTHREADED SECTION.
17. CONVENTIONAL LIGHT FRAMING SHALL COMPLY WITH IBC SECTION 2308.
18. ALL BEAMS AND TRUSSES SHALL BE BRACED AGAINST ROTATION AT POINTS OF BEARING.
19. VENTING IS REQUIRED IN ALL ENCLOSED ROOF AND CRAWL SPACE FRAMING CAVITIES, SEE ARCHITECTURAL DRAWINGS.
20. EXCEPT AS NOTED OTHERWISE, MINIMUM NAILING SHALL BE PROVIDED AS SPECIFIED IN TABLE 2304.9.1 "FASTENING SCHEDULE" (2304.10.1 IN 2015 IBC) OF THE IBC.
21. ALL ROOF RAFTERS, JOISTS, TRUSSES, AND BEAMS SHALL BE ANCHORED TO SUPPORTS WITH H3 METAL FRAMING ANCHORS UNO. PROVIDE (2) WITHIN 4'-0" OF ALL CORNERS.

WOOD SHEATHING:

1. PLYWOOD AND ORIENTED STRAND BOARD (OSB) FLOOR AND ROOF SHEATHING SHALL BE APA RATED WITH STAMP INCLUDING APA TRADEMARK AND PANEL SPAN RATING.
    - A. MINIMUM ROOF SHEATHING: 15/32" OSB OR CDX PLYWOOD, APA 32/16, NAILED.
2. ALL SHEATHING SHEETS SHALL HAVE 1/8" GAP AT ALL EDGES AND JOINTS.
3. PROVIDE (1) PANEL SHEATHING CLIP AT ALL UNSUPPORTED ROOF SHEATHING PANEL EDGES. WHERE SPANS ARE GREATER THAN 32" PROVIDE (2) CLIPS.

LIGHT-METAL-PLATE-CONNECTED WOOD TRUSSES:

1. TRUSS MANUFACTURER SHALL COMPLY WITH ALL REQUIREMENTS AS STATED IN SECTION 2303.4 OF THE IBC.
2. ALL PRE-ENGINEERED GABLE END TRUSSES OR TRUSSES WITH INTEGRATED PARAPETS SHALL BE DESIGNED FOR WIND FORCES PERPENDICULAR TO THE TRUSS.
3. ALL PRE-ENGINEERED TRUSSES SHALL BE FABRICATED SUCH THAT THEY INCORPORATE ALL ROOF PLANES. AT CONTRACTOR'S OPTION, STANDARD SHAPE TRUSSES MAY BE USED IN CONJUNCTION WITH OVERFRAMING.
4. FULL HEIGHT BLOCKING SHALL BE PLACED BETWEEN TRUSSES AT ALL SUPPORTS.
5. CROSS BRIDGING DESIGN SHALL BE PROVIDED BY TRUSS MANUFACTURER AS REQUIRED FOR LATERAL EFFECTS.
6. TRUSS MEMBERS AND COMPONENTS SHALL NOT BE CUT, NOTCHED, DRILLED, SPLICED OR OTHERWISE ALTERED IN ANY WAY WITHOUT WRITTEN APPROVAL OF A REGISTERED DESIGN PROFESSIONAL.
7. MANUFACTURE AND INSTALLATION OF METAL PLATED WOOD TRUSSES SHALL COMPLY WITH ANSI/TPI 1 "NATIONAL DESIGN STANDARD FOR METAL-PLATE-CONNECTED WOOD TRUSS CONSTRUCTION," BCSI (BUILDING COMPONENT SAFETY INFORMATION) "GUIDE TO GOOD PRACTICE FOR HANDLING,
8. INSTALLING & BRACING OF METAL PLATE CONNECTED WOOD TRUSSES," AND DSB-89 "RECOMMENDED DESIGN SPECIFICATION FOR TEMPORARY BRACING OF METAL PLATE CONNECTED WOOD TRUSSES."
9. PRE-ENGINEERED, PREFABRICATED TRUSSES SHALL BE DESIGNED BY AN ENGINEER REGISTERED IN THE STATE IN WHICH TO PROJECT IS LOCATED TO CARRY THE LOADS INDICATED ON THE STRUCTURAL DRAWINGS IN WHICH THE PROJECT IS LOCATED.
10. TRUSSES SHALL BE DESIGNED TO SUPPORT THE FULL DEAD LOADS AND THE SUPERIMPOSED DESIGN LOADS NOTED ABOVE OR ON THE DRAWINGS.
11. STRESSES SHALL NOT EXCEED THOSE LISTED IN THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (AF&PA NDS).
12. THE FABRICATOR SHALL DETERMINE TRUSS WEB ARRANGEMENTS AND MEMBER FORCES.
13. TRUSS TO TRUSS CONNECTIONS SPECIFIED SHALL BE BY TRUSS SUPPLIER, UNLESS SPECIFICALLY NOTED ON THE DRAWINGS.
14. TRUSSES SHALL BE DESIGNED IN BEARING TO NOT EXCEED THE PERPENDICULAR TO GRAIN BEARING VALUES FOR THE TOP PLATE GRADES INDICATED IN THE "STRUCTURAL WOOD FRAMING" GENERAL NOTES. WHERE TRUSS BEARING EXCEED THIS VALUE THE TRUSS MANUFACTURER SHALL PROVIDE BEARING ENHANCERS TO COMPENSATE FOR OVERSTRESSES. TRUSS MANUFACTURER SHALL SPECIFY SIZE, SPECIES, AND NAILING FOR BEARING BLOCKS.
15. TRUSS FABRICATOR SHALL SPECIFY ALL FLOOR AND ROOF TRUSS BRACING AND BRIDGING.
16. CALCULATIONS AND SHOP DRAWINGS, INCLUDING MEMBER SIZES, LUMBER SPECIES AND GRADES, AND SUBSTANTIATING DATA FOR CONNECTOR CAPACITIES, SHALL BE SUBMITTED TO THE ARCHITECT, GC, AND STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION.
17. DEFLECTION LIMITS FOR TRUSSES SHALL NOT EXCEED THE FOLLOWING DEFLECTION CRITERIA:
    - A. ROOF LIVE LOAD = L/360
    - B. ROOF TOTAL LOAD = L/240 (1" MAXIMUM)
    - C. FLOOR LIVE LOAD = L/480
    - D. FLOOR TOTAL LOAD = L/240 (1" MAXIMUM)

SHOP DRAWINGS:

1. THE STRUCTURAL DRAWINGS ARE COPYRIGHTED AND SHALL NOT BE COPIED FOR USE AS ERECTION PLANS OR SHOP DETAILS. USE OF JVA'S ELECTRONIC FILES AS THE BASIS FOR SHOP DRAWINGS REQUIRES PRIOR APPROVAL BY JVA, A SIGNED RELEASE OF LIABILITY BY THE GENERAL CONTRACTOR AND/OR HIS SUBCONTRACTORS, AND DELETION OF JVA'S NAME AND LOGO FROM ALL SHEETS SO USED.
2. THE GENERAL CONTRACTOR SHALL SUBMIT IN WRITING ANY REQUESTS TO MODIFY THE STRUCTURAL DRAWINGS OR PROJECT SPECIFICATIONS.
3. ALL SHOP AND ERECTION DRAWINGS SHALL BE CHECKED AND STAMPED (AFTER HAVING BEEN CHECKED) BY THE GENERAL CONTRACTOR PRIOR TO SUBMISSION FOR STRUCTURAL ENGINEER'S REVIEW; SHOP DRAWING SUBMITTALS NOT CHECKED BY THE GENERAL CONTRACTOR PRIOR TO SUBMISSION TO THE STRUCTURAL ENGINEER WILL BE RETURNED WITHOUT REVIEW.
4. FURNISH ELECTRONIC VERSION (PDF) OF SHOP AND ERECTION DRAWINGS TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION. SUBMIT IN A TIMELY MANNER TO PERMIT 10 WORKING DAYS FOR REVIEW BY THE STRUCTURAL ENGINEER.
5. SHOP DRAWINGS SUBMITTED FOR REVIEW DO NOT CONSTITUTE "REQUEST FOR CHANGE IN WRITING" UNLESS SPECIFIC SUGGESTED CHANGES ARE CLEARLY MARKED. IN ANY EVENT, CHANGES MADE BY MEANS OF THE SHOP DRAWING SUBMITTAL PROCESS BECOME THE RESPONSIBILITY OF THE ONE INITIATING THE CHANGE.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS:

1. THE STRUCTURAL DRAWINGS ILLUSTRATE AND DESCRIBE THE COMPLETED STRUCTURE WITH ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED, CONNECTED, AND/OR BRACED.
2. THE STRUCTURAL DRAWINGS ILLUSTRATE TYPICAL AND REPRESENTATIVE DETAILS TO ASSIST THE GENERAL CONTRACTOR. DETAILS SHOWN APPLY AT ALL SIMILAR CONDITIONS UNLESS OTHERWISE INDICATED. ALTHOUGH DUE DILIGENCE HAS BEEN APPLIED TO MAKE THE DRAWINGS AS COMPLETE AS POSSIBLE, NOT EVERY DETAIL IS ILLUSTRATED AND NOT EVERY EXCEPTIONAL CONDITION IS ADDRESSED.
3. ALL PROPRIETARY CONNECTIONS AND ELEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS.
4. ALL WORK SHALL BE ACCOMPLISHED IN A WORKMANLIKE MANNER AND IN ACCORDANCE WITH THE APPLICABLE CODES AND LOCAL ORDINANCES.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL WORK, INCLUDING LAYOUT AND DIMENSION VERIFICATION, MATERIALS COORDINATION, SHOP DRAWING REVIEW, AND THE WORK OF SUBCONTRACTORS. ANY DISCREPANCIES OR OMISSIONS DISCOVERED IN THE COURSE OF THE WORK SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR RESOLUTION.
6. CONTINUATION OF WORK WITHOUT NOTIFICATION OF DISCREPANCIES RELIEVES THE ARCHITECT AND STRUCTURAL ENGINEER FROM ALL CONSEQUENCES.
7. UNLESS OTHERWISE SPECIFICALLY INDICATED, THE STRUCTURAL DRAWINGS DO NOT DESCRIBE METHODS OF CONSTRUCTION.
8. THE GENERAL CONTRACTOR, IN THE PROPER SEQUENCE, SHALL PERFORM OR SUPERVISE ALL WORK NECESSARY TO ACHIEVE THE FINAL COMPLETED STRUCTURE, AND TO PROTECT THE STRUCTURE, WORKMEN, AND OTHERS DURING CONSTRUCTION. SUCH WORK SHALL INCLUDE, BUT NOT BE LIMITED TO TEMPORARY BRACING, SHORING FOR CONSTRUCTION EQUIPMENT, SHORING FOR EXCAVATION, FORMWORK, SCAFFOLDING, SAFETY DEVICES AND PROGRAMS OF ALL KINDS, SUPPORT AND BRACING FOR CRANES AND OTHER ERECTION EQUIPMENT.
9. TEMPORARY BRACING SHALL REMAIN IN PLACE UNTIL ALL FLOORS, WALLS, ROOFS AND ANY OTHER SUPPORTING ELEMENTS ARE IN PLACE.
10. THE ARCHITECT AND STRUCTURAL ENGINEER BEAR NO RESPONSIBILITY FOR THE ABOVE ITEMS, AND OBSERVATION VISITS TO THE SITE DO NOT IN ANY WAY INCLUDE INSPECTIONS OF THESE ITEMS.

DEFERRED SUBMITTALS:

1. PORTIONS OF THE STRUCTURE HAVE ELEMENTS OF PROPRIETARY DESIGN AND FABRICATION, WHICH SHALL BE SUBMITTED BY THE SUPPLIER FOR APPROVAL AFTER AWARD OF CONTRACT.
2. THESE ITEMS SHALL CONFORM TO THE LOAD, CAPACITY, SIZE, GEOMETRY, CONNECTION, AND SUPPORT CRITERIA NOTED ON THE STRUCTURAL DRAWINGS.
3. SHOP DRAWINGS AND CALCULATIONS SHALL BE PREPARED BY AN ENGINEER REGISTERED IN THE STATE IN WHICH THE PROJECT IS LOCATED. FINAL SHOP DRAWING SUBMITTALS SHALL BE STAMPED AND SIGNED.
4. FURNISH DEFERRED SUBMITTALS FOR:
    - A. OPEN-WEB WOOD TRUSSES
    - B. LADDERS
    - C. PRECAST CONCRETE LINTEL ABOVE CURVED WINDOW OPENING
5. SUBMITTALS WILL BE REVIEWED BY THE STRUCTURAL ENGINEER OF RECORD FOR COMPLIANCE WITH THE SPECIFIED DESIGN REQUIREMENTS, STAMPED AS "REVIEWED," AND FORWARDED TO THE LOCAL BUILDING AUTHORITY FOR REVIEW AS REQUIRED.
6. FINAL ISSUE OF THE BUILDING PERMIT MAY, AT THE APPROVAL AUTHORITY'S OPTION, BE CONTINGENT ON ITS APPROVAL OF THE DEFERRED SUBMITTAL DOCUMENTS.
7. DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THEIR DESIGN CALCULATIONS AND DRAWINGS HAVE BEEN REVIEWED BY THE ARCHITECT, STRUCTURAL ENGINEER, AND/OR LOCAL BUILDING AUTHORITY AS REQUIRED.

LETTERS OF CONSTRUCTION COMPLIANCE:

1. THE GENERAL CONTRACTOR SHALL DETERMINE FROM THE LOCAL BUILDING AUTHORITY, AT THE TIME THE BUILDING PERMIT IS OBTAINED, WHETHER ANY LETTERS OF CONSTRUCTION COMPLIANCE WILL BE REQUESTED FROM THE STRUCTURAL ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ALL SUCH REQUIREMENTS IN WRITING PRIOR TO THE START OF CONSTRUCTION.
3. TWO-DAY ADVANCE NOTICE SHALL BE GIVEN WHEN REQUESTING SITE VISITS NECESSARY AS THE BASIS FOR THE COMPLIANCE LETTER.
4. THE GENERAL CONTRACTOR SHALL PROVIDE COPIES OF ALL THIRD-PARTY TESTING AND INSPECTION REPORTS TO THE ARCHITECT AND STRUCTURAL ENGINEER A MINIMUM OF ONE WEEK PRIOR TO THE DATE THAT THE COMPLIANCE LETTER IS NEEDED.

MASONRY, STEEL, AND MECHANICAL SUB CONTRACTORS NOTE:
STRUCTURAL DRAWINGS DO NOT INDICATE ALL WALL, FLOOR, OR ROOF PENETRATIONS FOR MECH DUCTS, DRAINS, VENTS, ETC.; DRAWINGS INDICATE TYPICAL AND SPECIAL CONDITIONS FOR FRAMING AT THE PENETRATIONS, SEE 4/S0.4 AND 6/S0.5; GENERAL CONTRACTOR AND SUB CONTRACTORS SHALL BE RESPONSIBLE FOR DETERMINING AND/OR MODIFYING OPENING LOCATIONS, ELEVATIONS AND DIMENSIONS FOR MECH UNLESS NOTED OTHERWISE.

CONSULTING ENGINEERS
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Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED PROFESSIONAL ENGINEER
PAUL J. HAUSE
33508
Paul J. Hause
Digitally signed by Paul J. Hause
DN: C=US, E=PHause@jvajva.com, O="JVA, Incorporated.", CN=Paul J. Hause
Date: 2021.04.07 10:20:53-06'00'
04/06/2021

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

GENERAL NOTES

SHEET NO.
S0.1

2 S0.2 3D VIEW

ABBREVIATIONS KEY							
@	ON CENTER SPACING	DWG	DRAWING	LGS	LIGHT GAGE STEEL		
(E)	EXISTING	DWL	DOWEL	LL	LIVE LOAD	REINF	REINFORCE, -ED, -ING
(N)	NEW	EA	EACH	LLH	LONG LEG HORIZONTAL	REQ	REQUIRED
(R)	REMOVE	ECC	ECCENTRIC	LLV	LONG LEG VERTICAL	REQMT	REQUIREMENT
AB	ANCHOR ROD (BOLT)	E-E	END TO END	LOC	LOCATION	RET	RETAINING
ADDL	ADDITIONAL	EF	EACH FACE	LP	LOW POINT	RM	ROOM
ADJ	ADJUSTABLE	EJ	EXPANSION JOINT	LSL	LAMINATED STRAND LUMBER (GENERIC TERM)	RMO	ROUGH MASONRY OPENING
AESS	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL	EL	ELEVATION	LT	LIGHT	RO	ROUGH OPENING
AFF	ABOVE FINISHED FLOOR	ELEC	ELECTRIC, ELECTRICAL	LVL	LAMINATED VENEER LUMBER (GENERIC TERM)	SC	SLIP-CRITICAL
ALT	ALTERNATE	EMBED	EMBEDMENT	MACH	MACHINE	SCH	SCHEDULE
AMT	AMOUNT	ENGR EOR	ENGINEER ENGINEER OF RECORD	MASY	MASONRY	SDST	SELF-DRILLING/ SELF-TAPPING
ANCH	ANCHOR, ANCHORAGE	EQ	EQUAL	MATL	MATERIAL	SECT	SECTION
APPROX	APPROXIMATE	EQUIP	EQUIPMENT	MAX	MAXIMUM	SF	SQUARE FEET, SUB-FLOOR
ARCH	ARCHITECT, -URAL	EQUIV	EQUIVALENT	MB	MACHINE BOLT	SHT	SHEET
ATR	ALL THREAD ROD	ES	EACH SIDE	MECH	MECHANICAL	SHTG	SHEATHING
AVG	AVERAGE	EST	ESTIMATE	MEZZ	MEZZANINE	SIM	SIMILAR
BC	BOTTOM OF CONCRETE	E-W	EAST TO WEST	MFR	MANUFACTURE, -ER, -ED	SLH	SHORT LEG HORIZONTAL
BL	BRICK LEDGE	EXC	EXCAVATE	MIN	MINIMUM	SLV	SHORT LEG VERTICAL
BLK	BLOCK	EXP	EXPANSION	ML	MICROLLAM (TRUS-JOIST BRAND LVL), MASONRY LINTEL	SOG	SLAB ON GRADE
BLKG	BLOCKING	EXT	EXTERIOR	MO	MASONRY OPENING	SP	SPACES, SPACED
BM	BEAM	FD	FLOOR DRAIN	MTL	METAL	SPEC	SPECIFICATIONS
BOT	BOTTOM	FDN	FOUNDATION	NF	NEAR FACE	SQ	SQUARE
BRG	BEARING	FF	FINISHED FLOOR, FAR FACE	NIC	NOT IN CONTRACT	SSR	SHEAR STUD RAIL
BW	BOTTOM OF WALL	F-F	FACE TO FACE	NS	NEAR SIDE	ST	SNUG-TIGHT
CB	COUNTERBORE	FIG	FIGURE	N-S	NORTH TO SOUTH	STD	STANDARD
CF	CUBIC FOOT	FL	FLUSH	NTS	NOT TO SCALE	STIFF	STIFFENER
CFS	COLD FORMED STEEL	FLG	FLANGE	OCJ	OSHA COLUMN JOIST	STL	STEEL
CG	CENTER OF GRAVITY	FLR	FLOOR	OD	OUTSIDE DIAMETER	STRUCT	STRUCTURE, -AL
CIP	CAST-IN-PLACE	FO	FACE OF	OH	OPPOSITE HAND	SUPT	SUPPORT
CJ	CONSTRUCTION JOINT, CONTROL JOINT	FP	FULL PENETRATION	OPNG	OPENING	SY	SQUARE YARD
CJP	COMPLETE JOINT PENETRATION	FS	FOOTING STEP, FAR SIDE	OPP	OPPOSITE	SYM	SYMMETRICAL
CL	CENTER LINE	FTG	FOOTING	OS	OUTSIDE FACE	T&B	TOP AND BOTTOM
CLG	CEILING	GA	GAGE, GAUGE	OSB	ORIENTED STRAND BOARD	T&G	TONGUE AND GROOVE
CLR	CLEAR	GALV	GALVANIZED	PAF	POWDER ACTUATED FASTENER	TB	TOP OF BEAM
CM	CONSTRUCTION MANAGER, -MENT	GC	GENERAL CONTRACTOR	PC	PRECAST	TC	TOP OF CONCRETE
CMU	CONCRETE MASONRY UNIT	GEN	GENERAL	PCF	POUNDS PER CUBIC FOOT	TCA	TORQUE-CONTROLLED ANCHOR
COL	COLUMN	GL	GLUED LAMINATED, GLULAM	PE	PRE-ENGINEERED	TD	TOP OF DECK
COM	COMMON	GND	GROUND	PEN	PENETRATION	THD	THREAD
COMB	COMBINATION	GR	GRADE	PERP	PERPENDICULAR	THK	THICK, -NESS
CONC	CONCRETE	GT	GIRDER TRUSS	PJP	PARTIAL JOINT PENETRATION	TJ	TOP OF JOIST
CONN	CONNECTION	GYP BD	GYPSUM BOARD	PL	PLATE	TL	TOTAL LOAD
CONT	CONTINUOUS, CONTINUE	HAS	HEADED ANCHOR STUD	PLF	POUND PER LINEAR FOOT	TPG	TOPPING
COORD	COORDINATE, COORDINATION	HDG	HOT-DIP GALVANIZED	PNL	PANEL	TRANS	TRANSVERSE
CS	COUNTERSINK	HDR	HEADER	PP	PANEL POINT	TW	TOP OF WALL
CTR	CENTER	HORIZ	HORIZONTAL	PS	PRESTRESSED	TYP	TYPICAL
CY	CUBIC YARD	HP	HIGH POINT	PSF	POUNDS PER SQUARE FOOT	ULT	ULTIMATE
DAB	DEFORMED ANCHOR BAR	HT	HEIGHT	PSI	POUNDS PER SQUARE INCH	UNO	UNLESS NOTED OTHERWISE
DET	DETAIL	ID	INSIDE DIAMETER	PSL	PARALLEL STRAND LUMBER (GENERIC TERM)	VERT	VERTICAL
DEV	DEVELOP	IF	INSIDE FACE	PT	POST TENSIONED PRESSURE TREATED	VIF	VERIFY IN FIELD
DIAG	DIAGONAL	INT	INTERIOR, INTERMEDIATE	PTN	PARTITION	WP	WORK POINT
DIM	DIMENSION	IT	INVERTED TEE	PWD	PLYWOOD	WT	WEIGHT
DL	DEAD LOAD	JB	JOIST BEARING	QTY	QUANTITY	WWF	WELDED WIRE FABRIC
DN	DOWN	JST	JOIST	R	RADIUS	XS	EXTRA STRONG
DP	DRILLED PIER	JT	JOINT	RE	REFERENCE, REFER TO	XSECT	CROSS SECTION
DT	DOUBLE TEE	K	KIP (1,000 LBS)	RECT	RECTANGLE	XXS	DOUBLE EXTRA STRONG

SYMBOLS KEY			
	DIRECTION OF DECK SPAN	XXX'-X	TOP OF CONCRETE OR MASONRY ELEVATION
GRID	GRID DESIGNATION	[XXX'-X]	TOP OF BEAM ELEVATION
X	REVISION	JB XXX'-X	JOIST BEARING ELEVATION
	CMU (CONCRETE MASONRY UNIT)	BL XXX'-X	BRICK LEDGE ELEVATION
	BRICK	(XXX'-X)	TOP OF FOOTING ELEVATION
	CIP CONCRETE	XXX'-X	TOP OF FLOOR ELEVATION
	EXISTING CONCRETE	F.X.X	ISOLATED SPREAD FOOTING MARK
	BEDROCK	FXX	SPREAD FOOTING MARK
	EARTH	STEP	STEP IN BOTTOM OF WALL/GRADE BEAM
		DP-XXM (Y) (XX'-X")	DRILLED PIER: XX = Ø, M = PIER MARK, (Y) = BEDROCK PENETRATION (XX'-X") = TOP OF PIER ELEVATION
		XX:12	ROOF SLOPE
		SLOPE	DIRECTION OF SLOPE (DOWN)
		DN UP	STAIR OR RAMP DIRECTION

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NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

COLORADO REGISTERED PROFESSIONAL ENGINEER
PAUL J. HAUSE
39508
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04/06/2021

Paul J. Hause, P.E. #39508

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

STRUCTURAL LEGEND AND ABBREVIATIONS

SHEET NO.
S0.2

STEEL SPECIAL INSPECTION (IBC 1705.2, 1705.12.1 & 1705.13.1)

ITEM	REQUIRED QUALIFICATIONS	FREQUENCY	DETAILED INSTRUCTIONS
FABRICATORS			(IBC 1704.2.5 & 1705.10)
In-plant Inspection	AWS/AISC-SSI ICC-SWSI		Required unless Fabricator is approved and follows procedures of 1704.2.5.2
PRIOR TO WELDING			(TABLE N5.4-1, AISC 360-10)
Verify welding procedures (WPS) and consumable certificates	AWS-CWI ASNT	Continuous	
Material identification	AWS-CWI ASNT	Periodic	Verify type and grade of material.
Welder identification	AWS-CWI ASNT	Periodic	A system shall be maintained by which a welder who has welded a joint or member can be identified.
Fit-up groove welds	AWS-CWI ASNT	Periodic	Verify joint preparation, dimensions, cleanliness, tacking, and backing.
Access holes	AWS-CWI ASNT	Periodic	Verify configuration and finish.
Fit-up of fillet welds	AWS-CWI ASNT	Periodic	Verify alignment, gaps at root, cleanliness of steel surfaces, and tack weld quality and location.
DURING WELDING			(TABLE N5.4-2, AISC 360-10)
Use of qualified welders	AWS-CWI ASNT	Periodic	Verify that welders are appropriately qualified.
Control and handling of welding consumables	AWS-CWI ASNT	Periodic	Verify packaging and exposure control.
Cracked tack welds	AWS-CWI ASNT	Periodic	Verify that welding does not occur over cracked tack welds.
Environmental conditions	AWS-CWI ASNT	Periodic	Verify wind speed is within limits as well as precipitation and temperature.
WPS followed	AWS-CWI ASNT	Periodic	Verify items such as settings on welding equipment, travel speed, welding materials, shielding gas type/flow rate, preheat applied, interpass temperature maintained, and proper position.
Welding techniques	AWS-CWI ASNT	Periodic	Verify interpass and final cleaning, each pass is within profile limitations, and quality of each pass.
AFTER WELDING			(TABLE N5.4-3, AISC 360-10)
Welds cleaned	AWS-CWI ASNT	Periodic	Verify that welds have been properly cleaned.
Size, length, and location of welds	AWS-CWI ASNT	Continuous	
Welds meet visual acceptance criteria	AWS-CWI ASNT	Continuous	
Arc strikes	AWS-CWI ASNT	Continuous	
k-area	AWS-CWI ASNT	Continuous	
Backing & weld tabs removed	AWS-CWI ASNT	Continuous	
Repair activities	AWS-CWI ASNT	Continuous	
Document acceptance or rejection of welded joint/member	AWS-CWI ASNT	Continuous	
NONDESTRUCTIVE TESTING			(SECTION N5.5, AISC 360-10)
CJP welds (Risk Cat. III or IV)	AWS-CWI ASNT	Continuous	A reduction in the rate of ultrasonic testing is allowed per Section N5.5e.
Welded joints subject to fatigue	AWS-CWI ASNT	Continuous	
PRIOR TO BOLTING			(TABLE N5.6-1, AISC 360-10)
- Not required if only snug-tight joints are specified per Section N5.6(1) of AISC 360-10.			
Certifications of fasteners	AWS/AISC-SSI ICC-SWSI	Continuous	
Fasteners marked	AWS/AISC-SSI ICC-SWSI	Periodic	Verify that fasteners have been marked in accordance with ASTM requirements.
Proper fasteners for joint	AWS/AISC-SSI ICC-SWSI	Periodic	Verify grade, type, and bolt length if threads are excluded from the shear plane.
Proper bolting procedure	AWS/AISC-SSI ICC-SWSI	Periodic	Verify proper procedure is used for the joint detail.
Connecting elements	AWS/AISC-SSI ICC-SWSI	Periodic	Verify appropriate faying surface condition and hole preparation, if specified, meet requirements.
Pre-installation verification testing	AWS/AISC-SSI ICC-SWSI	Periodic	Observe and document verification testing by installation personnel for fastener assemblies and methods used.
Proper storage	AWS/AISC-SSI ICC-SWSI	Periodic	Verify proper storage of bolts, nuts, washers, and other fastener components.
DURING BOLTING			(TABLE N5.6-2, AISC 360-10)
- Not required if only snug-tight joints are specified per Section N5.6(1) of AISC 360-10.			
- Not required for pretensioned joints using turn-of-the-nut method with match-marking, direct-tension-indicators, or twist-off type tension control method per Section N5.6(2) of AISC 360-10.			
Fastener assemblies	AWS/AISC-SSI ICC-SWSI	Periodic	Verify that fastener assemblies are of suitable condition, paced in all holes, and washers are positioned as required.
Snug-tight prior to pretensioning	AWS/AISC-SSI ICC-SWSI	Periodic	Verify that joints are brought to snug-tight condition prior to pretensioning operation.
Fastener component	AWS/AISC-SSI ICC-SWSI	Periodic	Verify that fastener component is not turned by wrench prevented from rotating.
Pretensioned fasteners	AWS/AISC-SSI ICC-SWSI	Periodic	Verify that fasteners are Pretensioned in accordance with RCSC Specification, progressing systematically from the most rigid point toward the free edges.
AFTER BOLTING			(TABLE N5.6-3, AISC 360-10)
Document acceptance or rejection of bolted connections	AWS/AISC-SSI ICC-SWSI	Continuous	
OTHER STEEL INSPECTIONS			(SECTION N5.7, AISC 360-10; Tables J8-1 & J10-1, AISC 341-10)
Structural steel details	PE/SE	Periodic	All fabricated steel or steel frames shall be inspected to verify compliance with the details shown in the construction documents, such as braces, stiffeners, member locations, and proper application of joint details at each connection.
Anchor rods and other embedments supporting structural steel	ACI-CCI	Periodic	Shall be on the premises during the placement of anchor rods and other embedments supporting structural steel for compliance with construction documents. Verify the diameter, grade, type, and length of the anchor rod or embedded item, and the extent or depth of embedment prior to placement of concrete.

MASONRY SPECIAL INSPECTION (IBC 1705.4)

ITEM	REQUIRED QUALIFICATIONS	FREQUENCY	DETAILED INSTRUCTIONS
PRIOR TO CONSTRUCTION			(ARTICLE 3.1.1, TMS-402/ACI 530.1-13)
Review material certificates, mix designs, test results and construction procedures	PE	Periodic	Verify that materials conform to the requirements of the approved construction documents. Mix design, test results, material certificates, and construction procedures should be submitted for review. Mortar mix designs shall conform to ASTM C 270 while grout shall conform to ASTM C 476. Material certificates shall be provided for the following: reinforcement; anchors, ties, fasteners, and metal accessories; masonry units; mortar and grout materials. Construction procedures for cold-weather or hot-weather construction shall be reviewed.
AS CONSTRUCTION BEGINS			(TABLE 3.1.2, TMS-402/ACI 530-13)
Proportions of site-prepared mortar	ICC-SMSI	Periodic	Verify that mortar is of the type and color specified on the construction documents, that it conforms to ASTM C 270, and that it is mixed in accordance with Article 2.6 A of TMS-602.
Construction of mortar joints	ICC-SMSI	Periodic	Verify that mortar joints comply with Article 3.3 B of TMS-602.
Location of reinforcement, connectors, and prestressing tendons and anchorages	ICC-SMSI	Periodic	Verify that reinforcement is placed in accordance with Article 3.4 of TMS-602. Prestressing tendons shall be placed per Article 3.6 A.
PRIOR TO GROUTING			(TABLE 3.1.2, TMS-402/ACI 530-13)
Grout space	ICC-SMSI	Periodic	Verify that grout space is free of mortar droppings, debris, loose aggregate, and other deleterious materials and that cleanouts are provided per Article 3.2 D and 3.2 F of TMS-602.
Grade, type, and size of reinforcement and anchor bolts, and prestressing tendons and anchorages	ICC-SMSI	Periodic	Verify that reinforcement, joint reinforcement, wall ties, anchor bolts and veneer anchors comply with the approved construction documents and Section 1.6 of TMS 402.
Placement of reinforcement, connectors, and prestressing tendons and anchorages	ICC-SMSI	Periodic	Verify that reinforcement, joint reinforcement, wall ties, anchor bolts and veneer anchors are installed in accordance with the approved construction documents and Articles 3.2 E, 3.4, and 3.6 A of TMS 602.
Proportions of site-prepared grout and prestressing grout for bonded tendons	ICC-SMSI	Periodic	Verify that grout is proportioned per ASTM C 476 and has a slump between 8-11 inches. Self-consolidated grout shall not be proportioned onsite. (see Articles 2.6 B and 2.4 G.1.b of TMS 602.)
Construction of mortar joints	ICC-SMSI	Periodic	Verify that mortar joints are placed in accordance with Article 3.3 B of TMS 602.
DURING MASONRY CONSTRUCTION			(TABLE 3.1.2, TMS-402/ACI 530-13)
Size and location of structural elements	ICC-SMSI	Periodic	Verify the locations of structural elements with respect to the approved plans and confirm that tolerances meet the requirements of Article 3.3 F of TMS 602.
Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction	ICC-SMSI	Periodic	Verify that correct anchorages and connections are provided per the approved plans and Sections 1.16.4.3 and 1.17.1 of TMS 402
Welding of reinforcement	ICC-SMSI AWS-CWI	Continuous	
Preparation, construction, and protection of masonry during cold weather (<40°F) or hot weather (>90°F).	ICC-SMSI	Periodic	Verify that cold-weather construction is performed in accordance with Article 1.8 C of TMS 602 and hot weather construction per Article 1.8 D of TMS 602.
Placement of grout and prestressing grout for bonded tendons is in compliance	ICC-SMSI	Continuous	
Construction of mortar joints	ICC-SMSI	Periodic	Verify that mortar joints are placed in accordance with Article 3.3 B of TMS 602.

CONCRETE SPECIAL INSPECTION (IBC 1705.3 & 1705.12.1)

ITEM	REQUIRED QUALIFICATIONS	FREQUENCY	DETAILED INSTRUCTIONS
Reinforcing steel	ACI-CCI ICC-RCSI	Periodic	Verify prior to placing concrete that reinforcing is of specified type, grade and size; that it is free of oil, dirt and rust; that it is located and spaced properly; that hooks, bends, ties, stirrups and supplemental reinforcement are placed correctly; that lap lengths, stagger and offsets are provided; and that all mechanical connections are installed per the manufacturer's instructions and/or evaluation report.
Welding of reinforcing steel	AWS-CWI	Periodic	Visually inspect all welds and also verify weldability of reinforcing steel based upon carbon equivalent and in accordance with AWS D1.4.
Cast-in bolts & embeds	ACI-CCI ICC-RCSI	Periodic	Inspection of anchors or embeds cast in concrete is required when allowable loads have been increased or where strength design is used.
Post-installed anchors or dowels	ACI-CCI ICC-RCSI	Periodic	All post-installed anchors/dowels shall be specially inspected as required by the approved ICC-ES report. Horizontally or upwardly inclined anchors that resist sustained tension loads require continuous inspection and approved installers.
Use of required mix design	ACI-CCI ICC-RCSI	Periodic	Verify that all mixes used comply with the approved construction documents; ACI 318: Ch. 19, 26.4.3, 26.4.4; and IBC 1904.1, 1904.2, 1908.2, 1908.3.
Concrete sampling for strength tests, slump, air content, and temperature	ACI-CFTT ACI-SIT	Continuous	
Concrete & shotcrete placement	ACI-CCI ICC-RCSI	Continuous	
Curing temperature and techniques	ACI-CCI ICC-RCSI	Periodic	Verify that the ambient temperature for concrete is kept at > 50°F for at least 7 days after placement. High-early-strength concrete shall be kept at > 50°F for at least 3 days. Accelerated curing methods may be used (see ACI 318: 26.4.7-26.4.9). The ambient temperature for shotcrete shall be > 40°F for the same period of time as noted for concrete. Shotcrete shall be kept continuously moist for at least 24 hours after shotcreting. All concrete materials, reinforcement, forms, fillers, and ground shall be free from frost. In hot weather conditions ensure that appropriate measures are taken to avoid plastic shrinkage cracking and that the specified water/cement ratio is not exceeded.
Strength verification	ACI-STT	Periodic	Verify that adequate strength has been achieved prior to the removal of shores and forms or the stressing of post-tensioned tendons.
Formwork		Periodic	Verify that the forms are placed plumb and conform to the shapes, lines, and dimensions of the members as required by the approved construction documents.

SOIL SPECIAL INSPECTION (IBC 1705)

ITEM	REQUIRED QUALIFICATIONS	FREQUENCY	DETAILED INSTRUCTIONS
CONTROLLED STRUCTURAL FILL			(IBC 1705.6)
Excavations	PE/GE	Periodic	Verify excavations extend to proper depth and material prior to placement of compacted fill or concrete.
Fill materials	PE/GE	Periodic	Perform classification and testing of compacted fill materials. Check for proper classifications and gradations at each lift and not less than once for each 10,000ft² of surface area.
Placement and compaction		Continuous	Verify proper materials, densities and lift thicknesses during placement and compaction.
Subgrade preparation	PE/GE	Periodic	Verify that subgrade has been appropriately prepared prior to placing compacted fill.
Density		Continuous	Test density of each lift by nuclear methods (ASTM D2922).
CAST-IN-PLACE DEEP FOUNDATIONS			(IBC 1705.8)
Drilling operation	PE/GE	Continuous	Observe drilling operations and maintain complete and accurate records for each element.
Drilling operation	PE/GE	Continuous	Verify placement locations & plumbness, confirm element diameters, lengths, embedment and adequate end-bearing capacity. Record concrete or grout volumes.
Additional inspections	PE/GE	Continuous	Concrete per IBC 1705.3

WOOD SPECIAL INSPECTION (IBC 1705.5)

ITEM	REQUIRED QUALIFICATIONS	FREQUENCY	DETAILED INSTRUCTIONS
Fabricator Certification/Quality Control Procedures		Periodic	Inspect shop fabrication process and quality control procedures of wood structural elements and assemblies in accordance with Section 1704.2.5.
Material Grading		Periodic	Verify grade or certificate of inspection of sawn lumber.
Connections		Periodic	Inspection of wood / wood connection of elements.
Lateral Connections		Continuous	Inspection of lateral connections (e.g. hold downs and straps).
Framing Details		Continuous	Verify that framing details comply with construction documents or approved submittals.
Permanent Truss Bracing		Periodic	Verify installation of permanent truss bracing in accordance with construction documents and approved truss package.
Roof and Floor Diaphragm Systems			(IBC 1706.2 & 1706.3)
Member Size and Connection		Periodic	Verify thickness and grade of sheathing, size of framing members at panel edges, nail/staple diameters and length, and the number of fastener lines and fastener spacing per approved plans.

STATEMENT OF SPECIAL INSPECTIONS

This *Statement of Special Inspections* is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the Building Code. It includes a schedule of Special Inspection services applicable to this project as well as the name of the Special Inspection Coordinator and the identity of other approved agencies to be retained for conducting these inspections and tests. This *Statement of Special Inspections* encompass the following disciplines:

The Special Inspection Coordinator shall keep records of all inspections and shall furnish inspection reports to the Building Official and the Registered Design Professional in Responsible Charge. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Registered Design Professional in Responsible Charge. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

Interim reports shall be submitted to the Building Official and the Registered Design Professional in Responsible Charge.
Interim Report Frequency: Within 48 hours of inspection, unless indicated otherwise.

A *Final Report of Special Inspections* documenting completion of all required Special Inspections, testing and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Use and Occupancy.

Job site safety and means and methods of construction are solely the responsibility of the Contractor.

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agency Number* on the Schedule.

PE/SE — Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE — Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT — Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

American Concrete Institute (ACI) Certification
ACI-CFTT — Concrete Field Testing Technician – Grade 1
ACI-CCI — Concrete Construction Inspector
ACI-LTT — Laboratory Testing Technician – Grade 1 & 2
ACI-STT — Strength Testing Technician

American Welding Society (AWS) Certification
AWS-CWI — Certified Welding Inspector
AWS/AISC-SSI — Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification
ASNT — Non-Destructive Testing Technician – Level II or III

International Code Council (ICC) Certification
ICC-SMSI — Structural Masonry Special Inspector
ICC-SWSI — Structural Steel and Welding Special Inspector
ICC-SFSI — Spray-Applied Fireproofing Special Inspector
ICC-PCSI — Prestressed Concrete Special Inspector
ICC-RCSI — Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)
NICET-CT — Concrete Technician – Levels I, II, III & IV
NICET-ST — Soils Technician - Levels I, II, III & IV
NICET-GET — Geotechnical Engineering Technician - Levels I, II, III & IV

Exterior Design Institute (EDI) Certification
EDI-EIFS — EIFS Third Party Inspector

Quality Assurance Plans

Quality Assurance for Seismic Resistance
Seismic Design Category: B
Quality Assurance Plan Required: No

Quality Assurance for Wind Requirements
Basic Wind Speed V_{asd} (3 second gust): 140 mph
Basic Wind Speed V_{ult} (3 second gust): 109 mph
Wind Exposure Category: C
Quality Assurance Plan Required: No

Statement of Responsibility
Each contractor responsible for the construction or fabrication of a system or component designated above must submit a Statement of Responsibility.

Statement of Responsibility
Each contractor responsible for the construction or fabrication of a system or component designated above must submit a Statement of Responsibility.

Prepared by:

EOR NAME / Signature Date

Owner's Authorization:

Signature Date

Building Official's Acceptance:

Signature Date

SCHEDULE OF INSPECTION AND TESTING AGENCIES

SPECIAL INSPECTION AGENCIES	FIRM	ADDRESS, TELEPHONE, E-MAIL
Special Inspection Coordinator	TBD	
Inspector	TBD	
Inspector	TBD	
Testing Agency	TBD	
Testing Agency	TBD	
Continuous	TBD	
Other	TBD	

JVA CONSULTING ENGINEERS
JVA, Inc. 1512 Larimer Street, Suite 710
Denver, CO 80202 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED PAUL J. HAUSE 33508 PROFESSIONAL ENGINEER
Digitally signed by Paul J. Hause DN: C=US, E=PHause@jvajva.com, O="JVA, Incorporated.", CN=Paul J. Hause Date: 2021.04.06 15:54:35-06'00'
Paul J. Hause
04/06/2021

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

STATEMENT OF SPECIAL INSPECTION

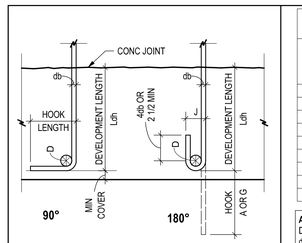
SHEET NO.
S0.3

TYPICAL CONCRETE REINFORCING LAP & EMBEDMENT LENGTHS (UNO)

BAR SIZE	TYPE	Fc = 3000 PSI (TOP)	Fc = 3000 PSI (OTHER)	Fc = 4000 PSI (TOP)	Fc = 4000 PSI (OTHER)	Fc = 5000 PSI (TOP)	Fc = 5000 PSI (OTHER)
#4	EMBED	29	22	25	19	22	17
	LAP	37	29	32	25	29	22
#5	EMBED	36	28	31	24	28	22
	LAP	47	36	40	31	36	28
#6	EMBED	43	33	37	29	33	26
	LAP	56	43	48	37	43	33
#7	EMBED	63	48	54	42	49	37
	LAP	81	63	70	54	63	49
#8	EMBED	72	55	62	48	55	43
	LAP	93	72	80	62	72	55
#9	EMBED	81	62	70	54	63	48
	LAP	105	81	91	70	81	63
#10	EMBED	91	70	79	61	70	54
	LAP	118	91	102	79	91	70
#11	EMBED	101	78	87	67	78	60
	LAP	131	101	113	87	101	78

NOTES:
1. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF FRESH CONCRETE CAST BELOW BAR
2. TABULATED VALUES ARE BASED ON GRADE 60 NON-EPOXY-COATED REINFORCING BARS AND NORMAL WEIGHT CONCRETE
3. VALUES ARE IN INCHES

1 S0.4 REINFORECEMENT SCHEDULE
3/4" = 1'-0"



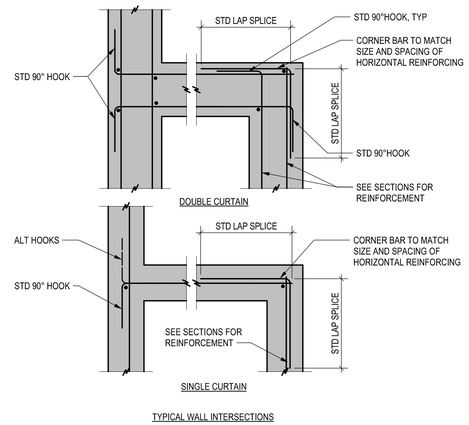
STANDARD HOOKS

BAR SIZE	D	180° HOOK LENGTH (A OR G)	180° HOOK WIDTH (J)	90° HOOK LENGTH (A OR G)	Ldh*
#3	2 1/4"	5"	3"	6"	6"
#4	3"	6"	4"	8"	7"
#5	3 3/4"	7"	5"	10"	9"
#6	4-1/2"	8"	6"	1'-0	10"
#7	5-1/4"	10"	7"	1'-2	12"
#8	6"	11"	8"	1'-4	14"
#9	9 1/2"	1'-3	11 3/4"	1'-7	15"
#10	10 3/4"	1'-5	1'-1 1/4	1'-10	17"
#11	12"	1'-7	1'-2 3/4	2'-0	19"

ALL GRADES OF STEEL
D = FINISHED INSIDE BEND DIAMETER
db = NOMINAL BAR DIAMETER
MIN D = 6 db FOR #3 THROUGH #8
MIN D = 8 db FOR #9, #10, AND #11

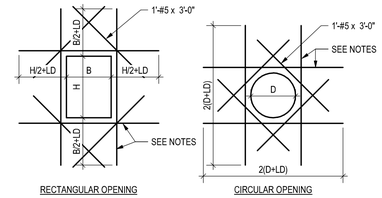
* FOR f'c = 4,0 OR 4,5 KSI AND COMPLYING WITH MIN COVER REQUIREMENTS OF ACI 318, 12.5.3.

2 S0.4 HOOK SCHEDULE
3/4" = 1'-0"



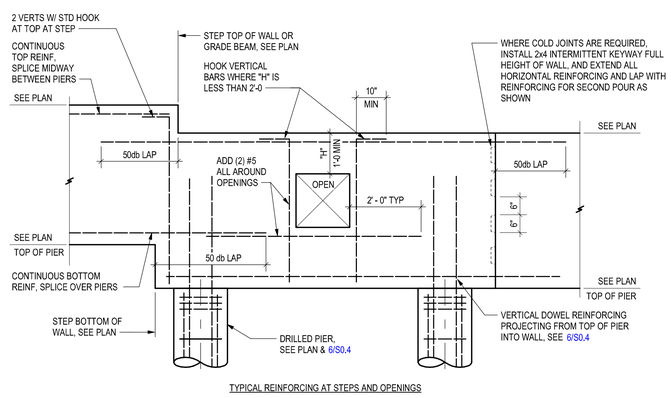
TYPICAL WALL INTERSECTIONS

3 S0.4 WALL INTERSECTIONS
3/4" = 1'-0"



NOTES:
1. THESE DETAILS APPLY TO ALL OPENINGS IN CONCRETE WALLS AND SLABS WHEN THE LARGEST OPENING DIMENSION IS GREATER THAT TWO TIMES SECTION THICKNESS OR GREATER THAN REINFORCING SPACING IN THE SECTION, UNLESS OTHERWISE INDICATED IN THE DRAWINGS.
2. THE AREA OF ADDITIONAL REINFORCING REQUIRED IN EACH FACE ON EACH SIDE OF AN OPENING SHALL EQUAL OR EXCEED ONE HALF OF THE AREA OF THE INTERCEPTED BARS IN EACH FACE, IN EACH DIRECTION, RESPECTIVELY WITH A MINIMUM OF (1)-#5 BAR EACH FACE.
3. PLACE THE ADDED BARS IN THE SAME LAYERS AS THE WALL OR SLAB REINFORCING.
4. LD = EMBEDMENT LENGTH, SEE 1/S0.4

4 S0.4 OPENING THRU WALLS OR SLABS
3/8" = 1'-0"

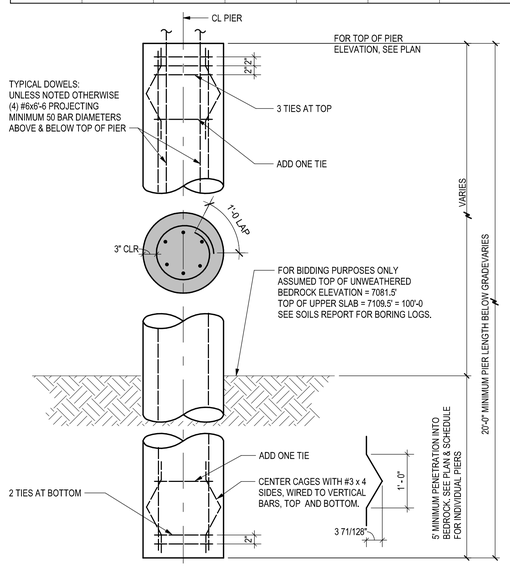


TYPICAL REINFORCING AT STEPS AND OPENINGS

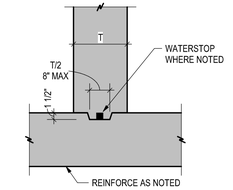
5 S0.4 SECTION
1/2" = 1'-0"

PIER SCHEDULE

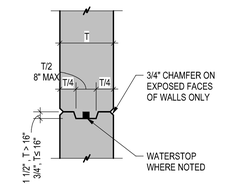
MARK	DIAMETER	PENETRATION INTO BEDROCK (MINIMUM)	MINIMUM PIER LENGTH	REINFORCING	TIES	COMMENTS
DP16-A	1' - 4"	12' - 0"	25' - 0"	(6) #5	#4@12"	BOTTOM OF PIER ELEVATION < 7053.33'
DP16-B	1' - 4"	5' - 0"	25' - 0"	(6) #5	#4@12"	BOTTOM OF PIER ELEVATION < 7069.33'



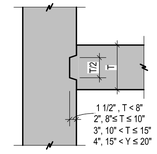
6 S0.4 DRILLED PIER SCHEDULE
3/4" = 1'-0"



BASE OF WALL JOINT



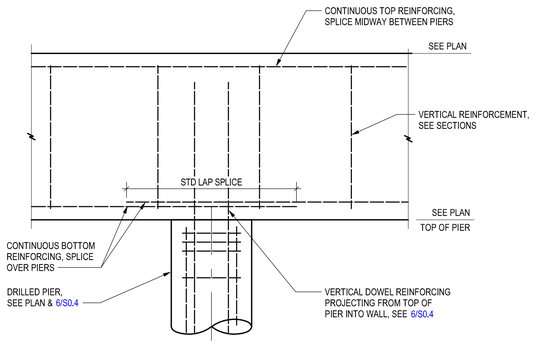
JOINT IN WALLS OR SLABS



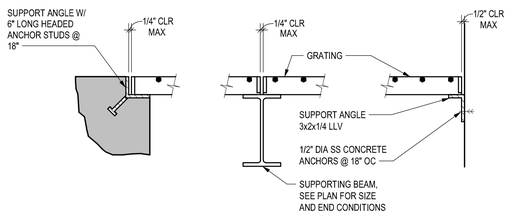
NOTES:
1. IF KEY DEPTH EXCEEDS COVER ON REINFORCING, PROVIDE FULL DEPTH KEY BETWEEN BARS

SLAB/WALL JOINT

7 S0.4 CONSTRUCTION JOINT DETAILS
3/4" = 1'-0"



8 S0.4 ELEVATION
3/4" = 1'-0"



NOTES:
1. PROVIDE GRATING SUPPORTS ALL AROUND OPENING UNLESS OTHERWISE NOTED.
2. GRATING MAY BE CONTINUOUS OVER INTERIOR SUPPORT UNLESS OTHERWISE NOTED.

9 S0.4 GRATING BEARING SUPPORTS
12" = 1'-0"

JVA CONSULTING ENGINEERS
JVA, Inc. 1512 Larimer Street, Suite 710
Denver, CO 80202 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

NO.	DATE	DES'D	D'WN

REVISION DESCRIPTION

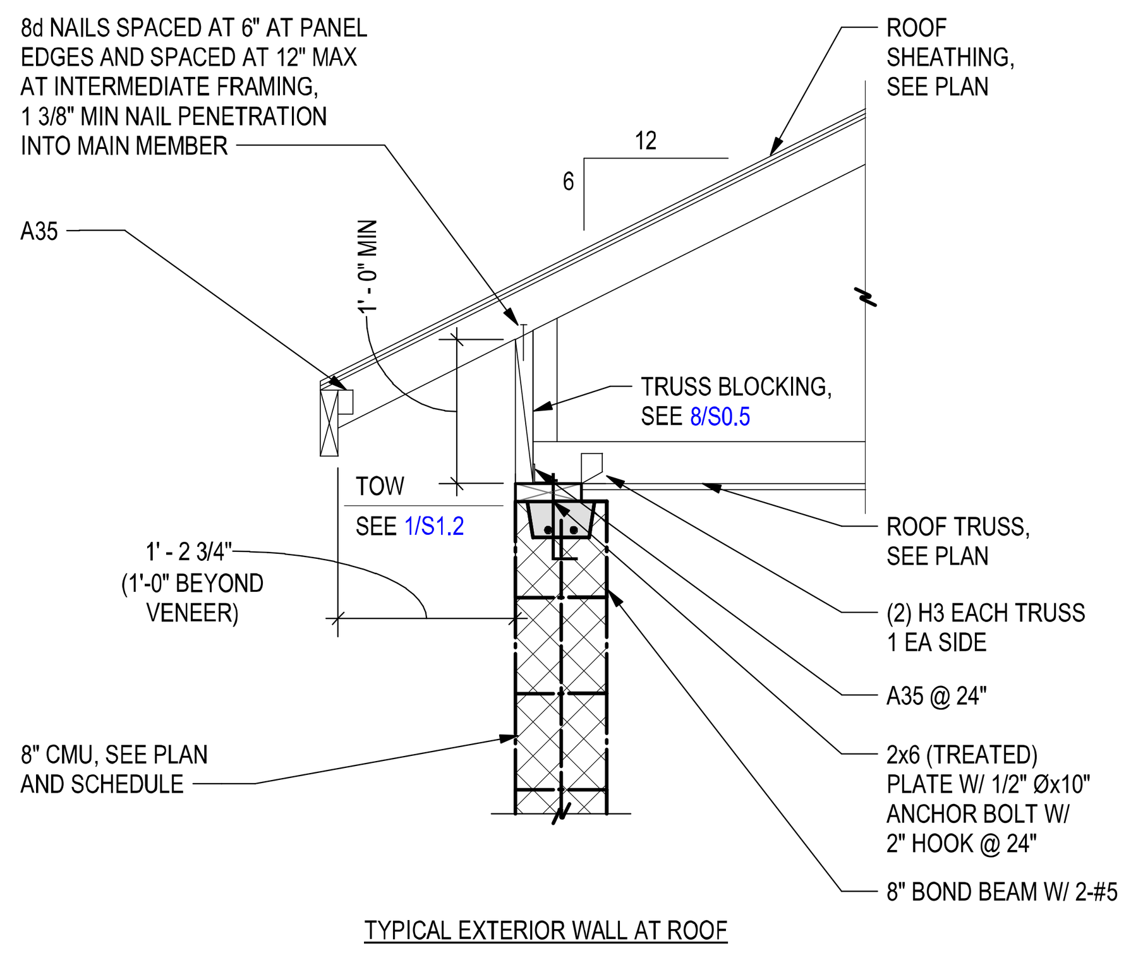
COLORADO REGISTERED PAUL J. HAHN 33508 PROFESSIONAL ENGINEER
Digitally signed by Paul J. Hahn DN: cn=Paul J. Hahn, o=JVA, Inc., ou=Engineering, email=phahn@jvajva.com, c=US Date: 2021.04.06 10:54:09-06'00'
04/06/2021

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

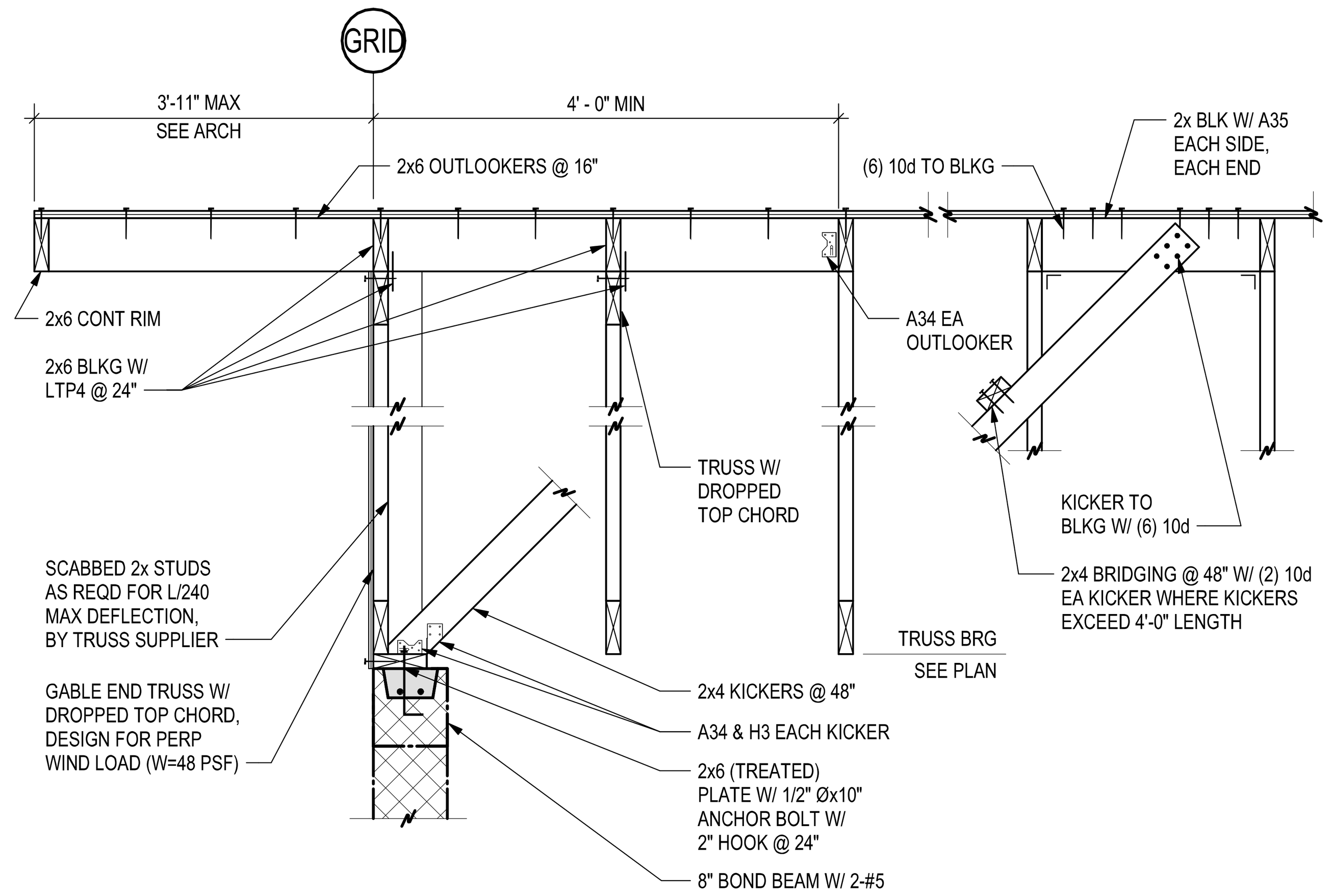
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TYPICAL DETAILS

SHEET NO.
S0.4



1 WOOD TRUSS TO CMU
S0.5 3/4" = 1'-0"



2 ROOF TRUSS AT GABLE/OUTLOOKERS
S0.5 3/4" = 1'-0"

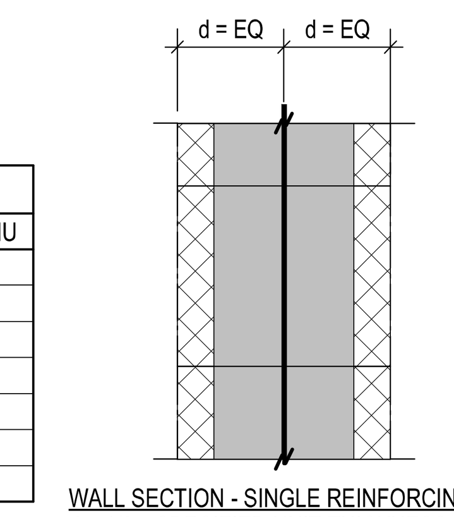
LAP SPLICE LENGTHS FOR MASONRY WALLS (INCHES) - SINGLE REINF., CENTERED

BARS CENTERED IN WALL (SINGLE REINFORCING)						
BAR SIZE	6" CMU	8" CMU	10" CMU	12" CMU	14" CMU	16" CMU
#3	18	18	18	18	18	18
#4	24	24	24	24	24	24
#5	-	30	30	30	30	30
#6	-	**38**	36	36	36	36
#7	-	-	42	42	42	42
#8	-	-	-	**50**	48	48
#9	-	-	-	**64**	54	54

DESIGN CRITERIA:
fy = 60,000 PSI
f'm = 2,000 PSI

LEGEND:
VALUES IN BOLD BASED ON 2011 MSJC, ALL OTHER VALUES BASED ON STANDARD PRACTICE FOR BRACING MASONRY WALLS UNDER CONSTRUCTION

NOTE: WALL BRACING DESIGN AND IMPLEMENTATION SHALL BE BY CONTRACTOR.

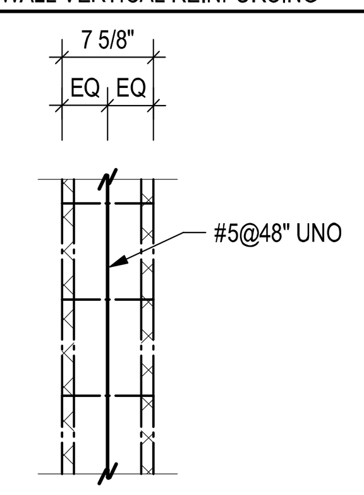


WALL SECTION - SINGLE REINFORCING
d = 1/2 x SPECIFIED UNIT THICKNESS

3 MASONRY LAP SPLICE SCHEDULE
S0.5 NO SCALE

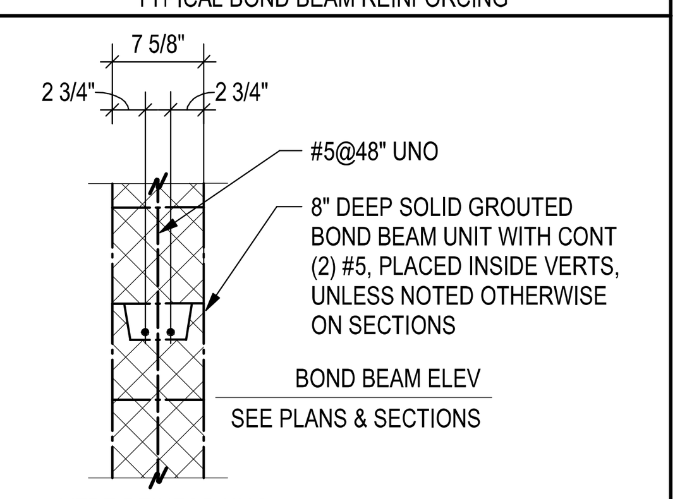
TYPICAL CMU WALL/REINFORCING ASSEMBLIES

TYPICAL WALL VERTICAL REINFORCING



VERT REINFORCING CENTERED

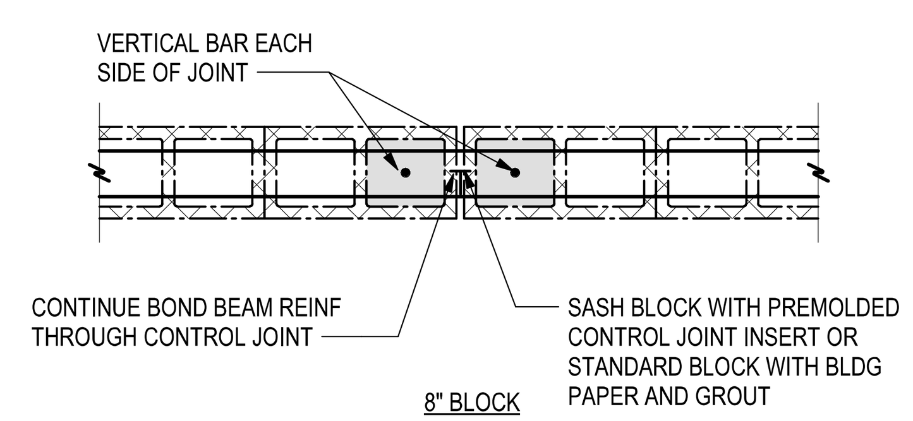
TYPICAL BOND BEAM REINFORCING



VERT REINFORCING CENTERED

1. VERTICAL REINFORCING INSTALLED FULL HEIGHT IN SOLID GROUTED VERTICAL CELLS AT SPACING SHOWN AND LOCATED AT OPENING JAMBS, VERTICAL CONTROL JOINTS (AS IN 5/S0.5), WALL ENDS, CORNERS, AND INTERSECTIONS.
2. STANDARD LADDER-TYPE CONTINUOUS HORIZONTAL JOINT REINFORCING VERTICALLY @ 16" UNLESS OTHERWISE NOTED.
3. ADD BOND BEAMS AT ALL FLOOR AND ROOF ELEVATIONS AS NOTED IN SECTIONS AND AT ALL TOP OF WALL LOCATIONS, MAXIMUM VERTICAL SPACING = 8'-0.

4 TYP CMU WALL ASSEMBLIES
S0.5 NO SCALE

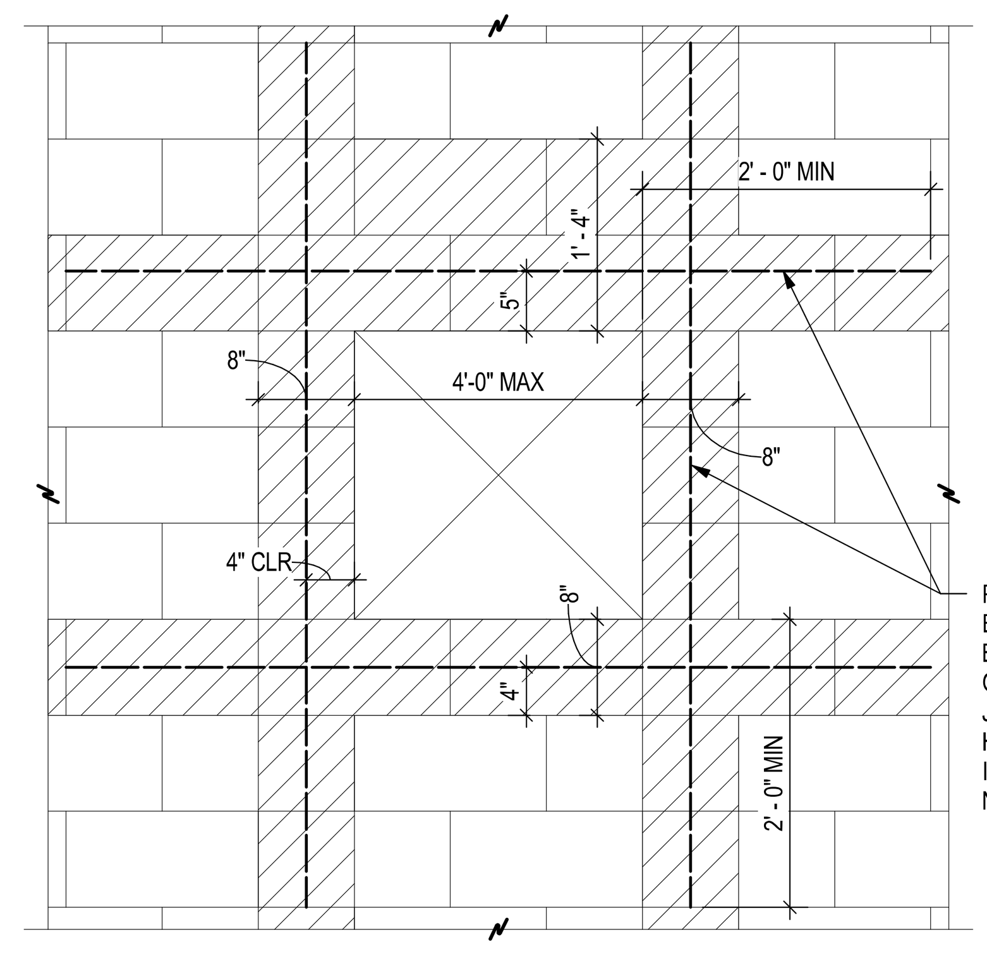


STOP ALL HORIZONTAL JOINT REINFORCING (NOT SHOWN) AT CONTROL JOINTS UNLESS NOTED

NOTE:
MASONRY CONTROL JOINTS MAY NOT OCCUR AT LINTEL OR JAMB LOCATIONS. SEE ARCH FOR JOINT LOCATIONS. CONTRACTOR TO CONTACT JVA IF JOINTS OCCUR AT LINTELS OR JAMBS

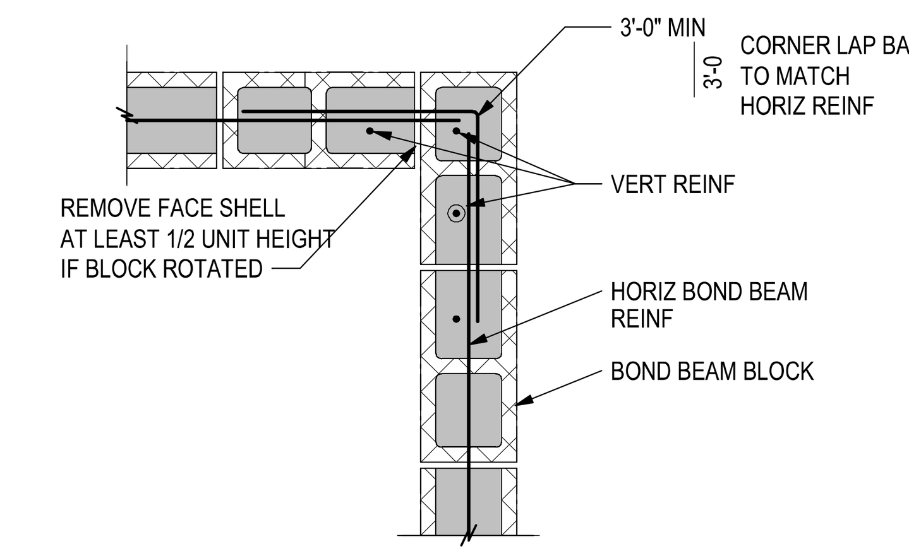
TYPICAL VERTICAL CONTROL JOINT IN CMU WALL
SEE ARCH DRAWINGS FOR LOCATIONS

5 TYP VERTICAL CONTROL JOINT
S0.5 3/4" = 1'-0"



TYPICAL OPENING IN CMU WALL

6 TYP MASONRY LINTEL - SMALL OPENING
S0.5 NO SCALE

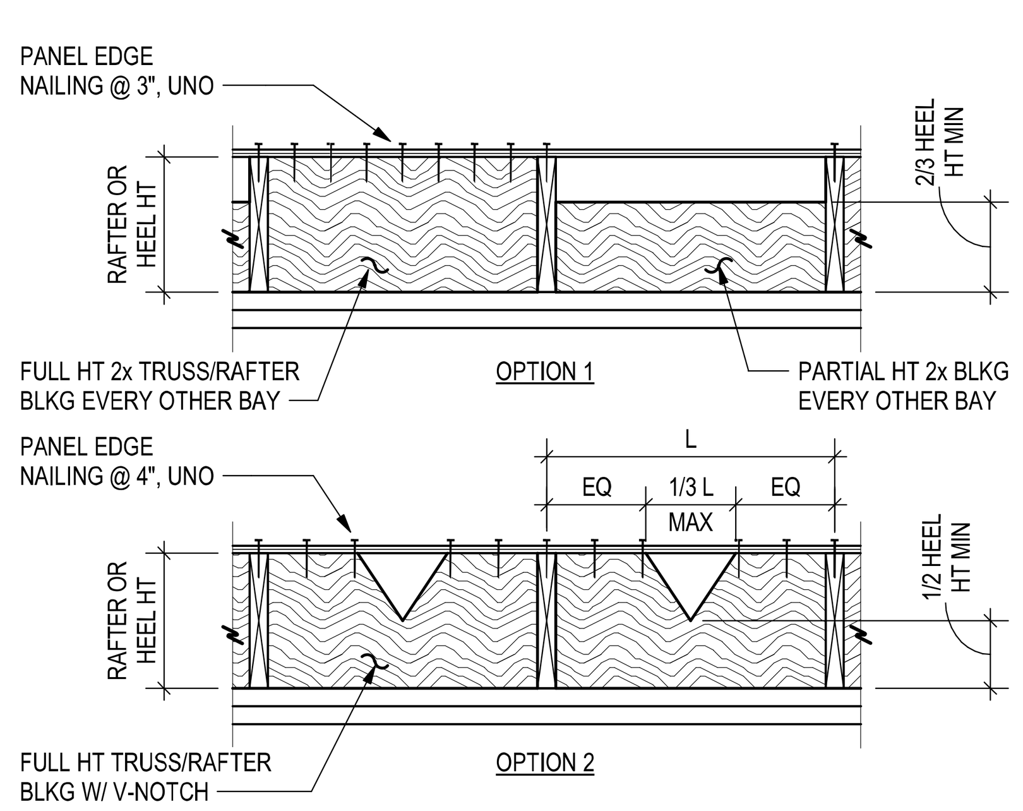


RIGHT ANGLE AND ACUTE ANGLE CORNERS

TYPICAL CMU HORIZONTAL REINFORCING CORNERS

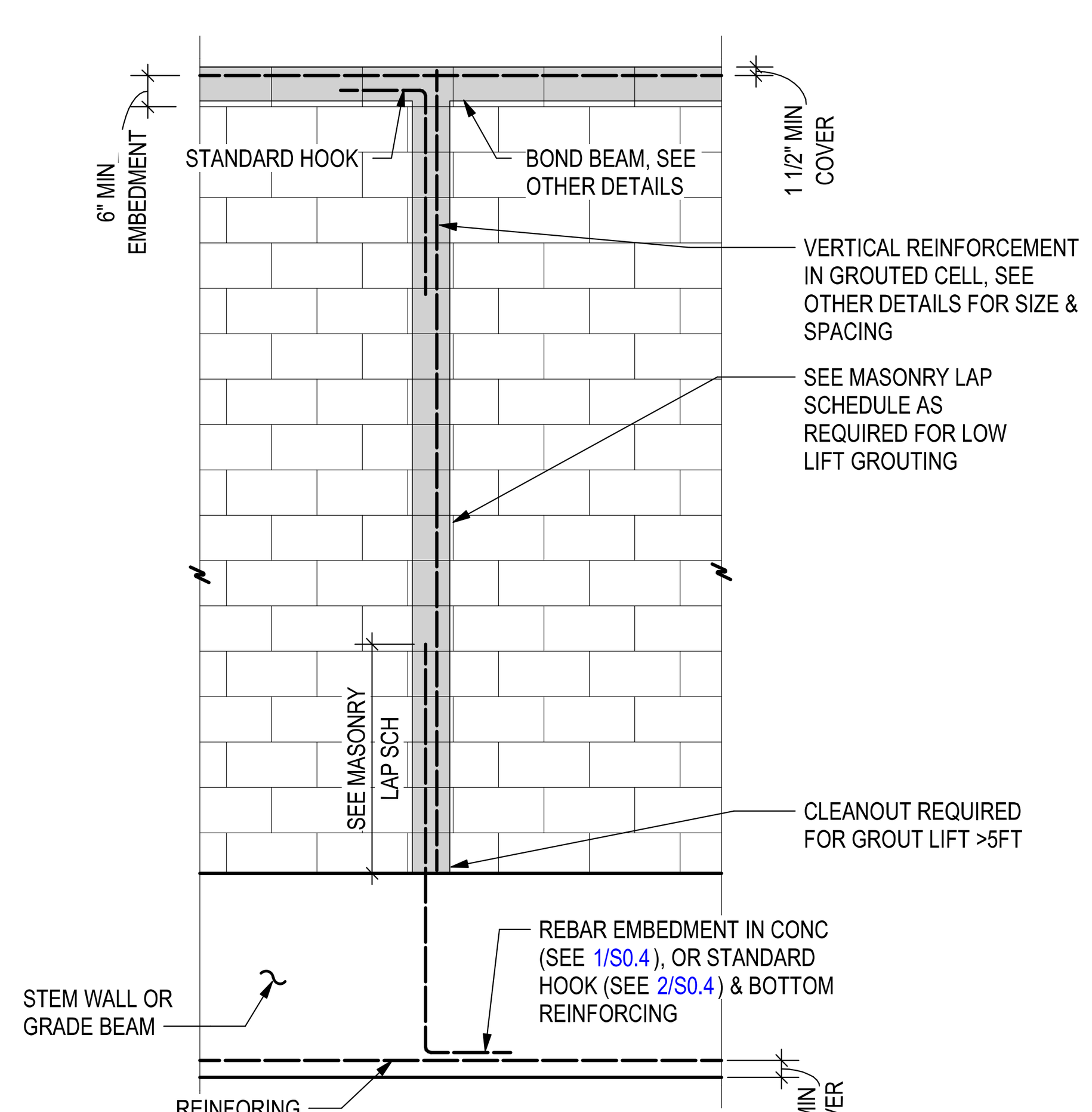
TYPICAL MASONRY WALL REINFORCING:
TYPICAL VERTICAL REINFORCING SHALL BE #5 BARS UNO. HORIZONTAL BOND BEAM REINFORCING SHALL BE (2) #5 UNO. CELLS ARE TO BE GROUTED AT REINFORCING ONLY UNO. VERTICAL REINFORCING SHALL BE LOCATED AS FOLLOWS:
1. AT CORNERS.
2. AT JAMBS.
3. AT CONSTRUCTION/CONTROL JOINTS.
4. AT "T" INTERSECTIONS.
5. AND AT 48" C/C MAXIMUM UNO.

7 TYP CMU WALL CORNERS
S0.5 3/4" = 1'-0"



TYPICAL TRUSS/RAFTER BLOCKING AT HEEL

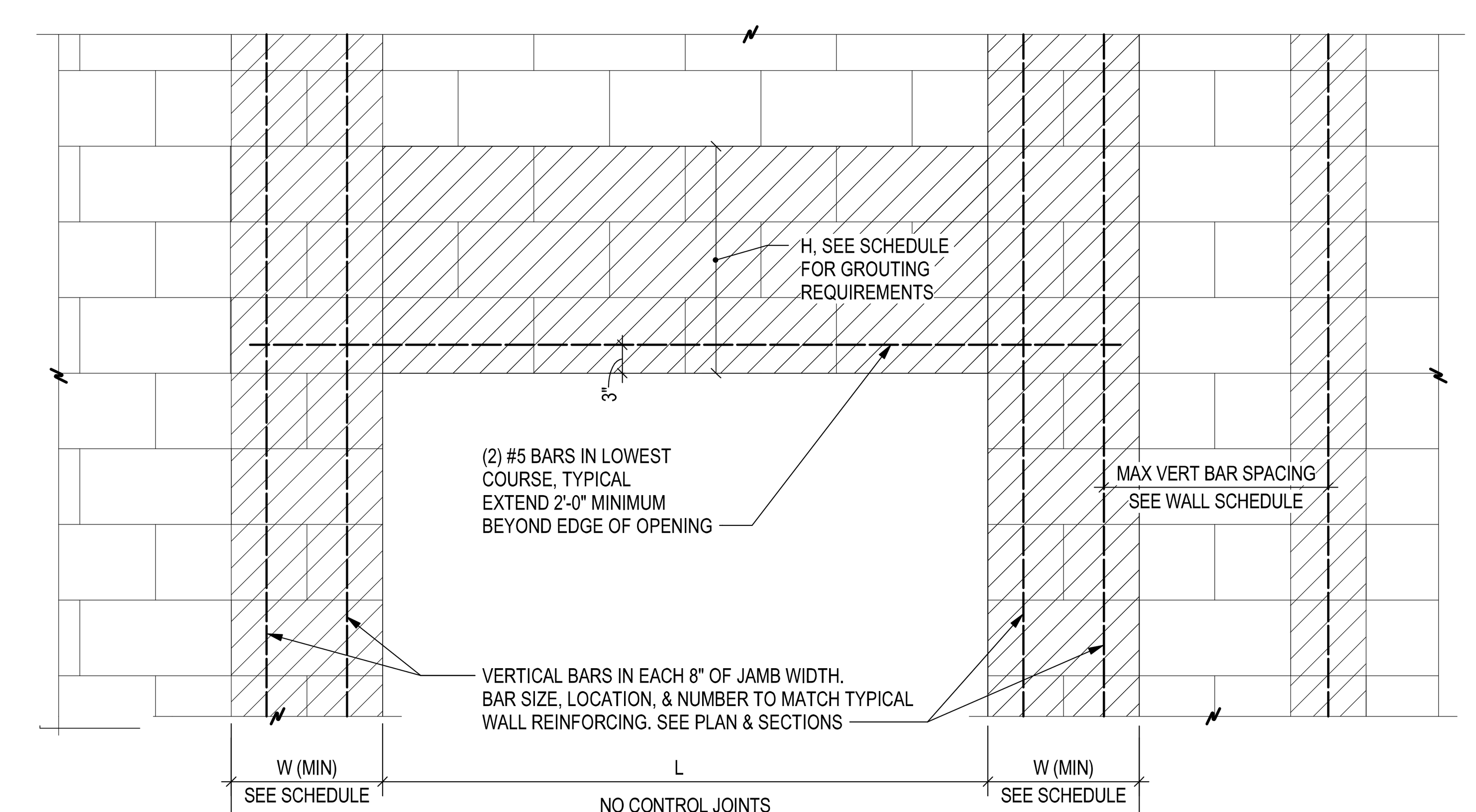
8 TYP TRUSS BLOCKING AT HEEL
S0.5 3/4" = 1'-0"



VERTICAL REINFORCEMENT CONTINUITY - ONE-STORY

9 MASONRY CONTINUITY
S0.5 NO SCALE

TYPICAL MASONRY LINTELS OVER 4'-1 (UNO)		
L (OPENING WIDTH)	H (HEIGHT OF SOLID GROUTED LINTEL)	W (SOLID GROUTED JAMB WIDTH)
4'-1 TO 6'-0	8"	8"
6'-1 TO 10'-0	1'-4"	1'-4"



TYPICAL MASONRY LINTEL IN CMU WALL:
OPENING WIDTH 4'-1 TO 10'-0

NOTE:
MASONRY CONTROL JOINTS MAY NOT OCCUR AT LINTEL OR JAMB LOCATIONS. SEE ARCH FOR JOINT LOCATIONS. CONTRACTOR TO CONTACT JVA IF JOINTS OCCUR AT LINTELS OR JAMBS

10 MASONRY LINTELS
S0.5 3/4" = 1'-0"

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Boulder • Fort Collins • Winter Park
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NO. | DATE | DES'D | DWN | REVISION DESCRIPTION

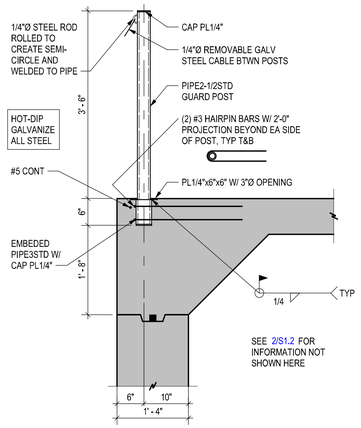
COLORADO REGISTERED PROFESSIONAL ENGINEER PAUL J. HAUSE 33506
04/06/2021

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

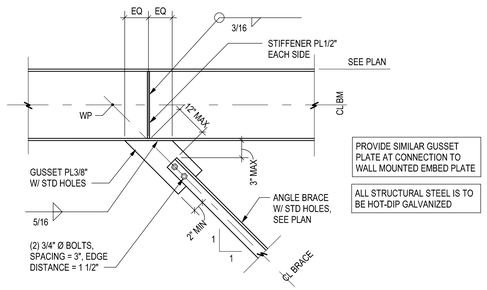
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TYPICAL DETAILS

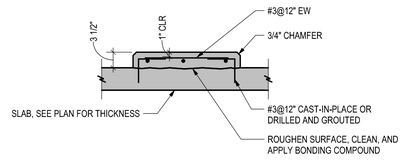
SHEET NO.
S0.5



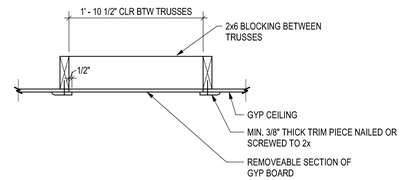
1 S0.6 **GUARD POST ATTACHMENT**
3/4" = 1'-0"



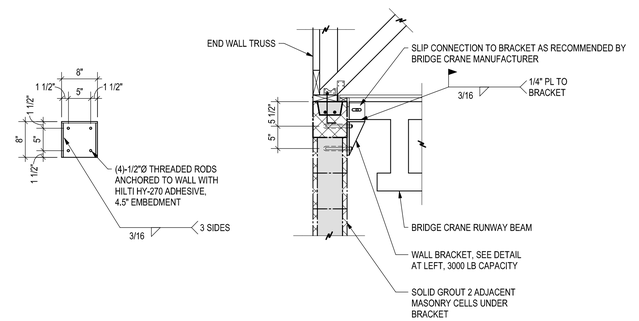
2 S0.6 **KICKER CONNECTION**
3/4" = 1'-0"



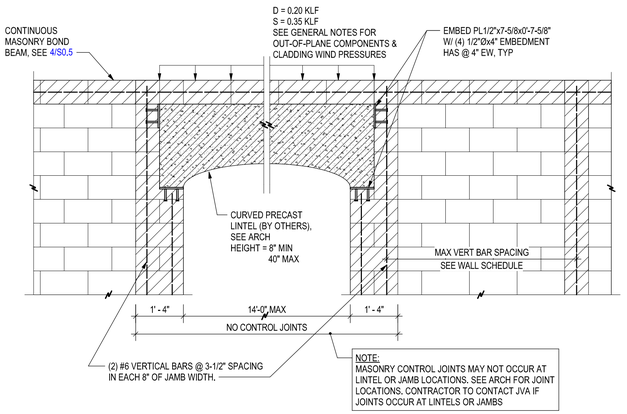
3 S0.6 **EQUIPMENT PAD DETAIL**
3/4" = 1'-0"



4 S0.6 **ATTIC ACCESS DETAIL**
1" = 1'-0"



5 S0.6 **BRIDGE BEAM BEARING DETAIL**
3/4" = 1'-0"



6 S0.6 **CURVED PRECAST CONCRETE LINTEL**
1/2" = 1'-0"

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NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

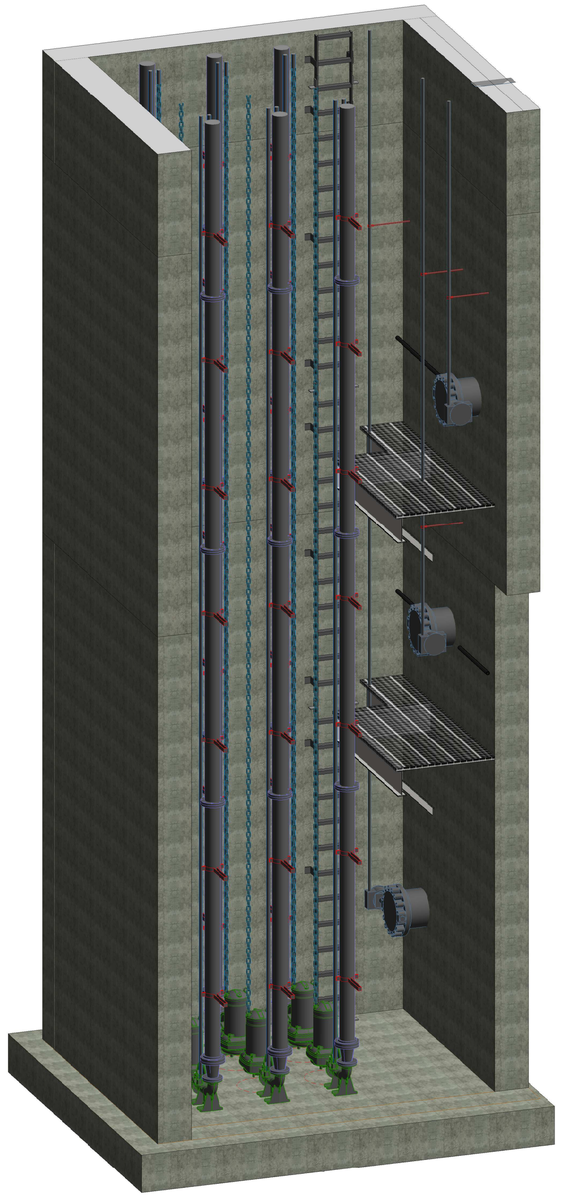
COLORADO REGISTERED PAUL J. HOUSE 38508 PROFESSIONAL ENGINEER
Paul J. House, P.E. #38508
04/06/2021

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

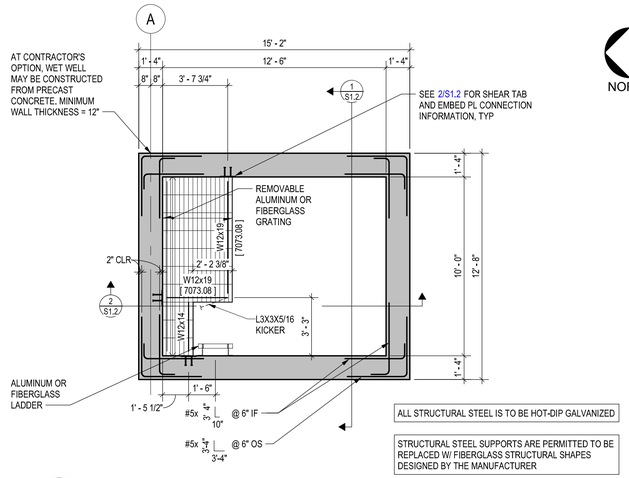
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TYPICAL DETAILS

SHEET NO.
S0.6



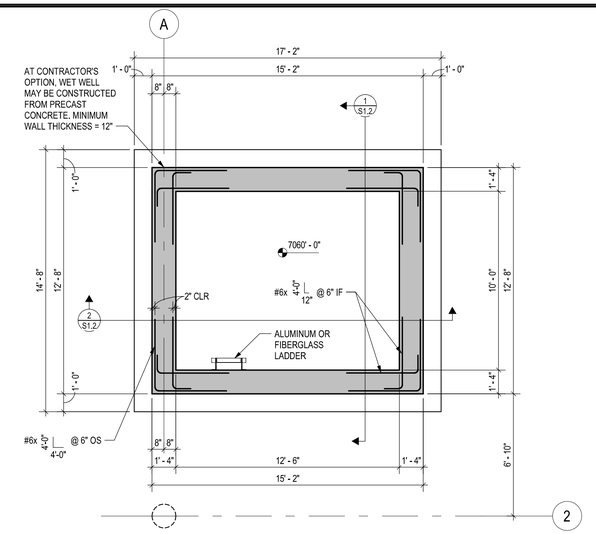
PUMP STATION 3D VIEW
NO SCALE



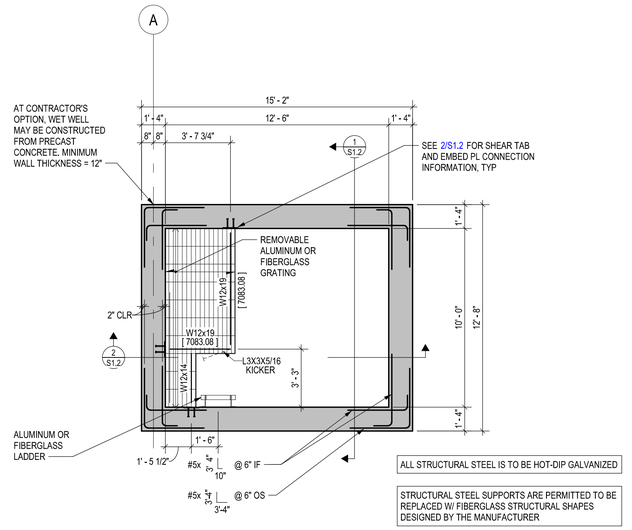
ALL STRUCTURAL STEEL IS TO BE HOT-DIP GALVANIZED

STRUCTURAL STEEL SUPPORTS ARE PERMITTED TO BE REPLACED W/ FIBERGLASS STRUCTURAL SHAPES DESIGNED BY THE MANUFACTURER

PIPE INTAKE PLATFORM 2
1/4" = 1'-0"
NORTH 0 1' 2' 4' 8'



WET WELL FOUNDATION PLAN
1/4" = 1'-0"
NORTH 0 1' 2' 4' 8'



ALL STRUCTURAL STEEL IS TO BE HOT-DIP GALVANIZED

STRUCTURAL STEEL SUPPORTS ARE PERMITTED TO BE REPLACED W/ FIBERGLASS STRUCTURAL SHAPES DESIGNED BY THE MANUFACTURER

PIPE INTAKE PLATFORM 1
1/4" = 1'-0"
NORTH 0 1' 2' 4' 8'

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NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

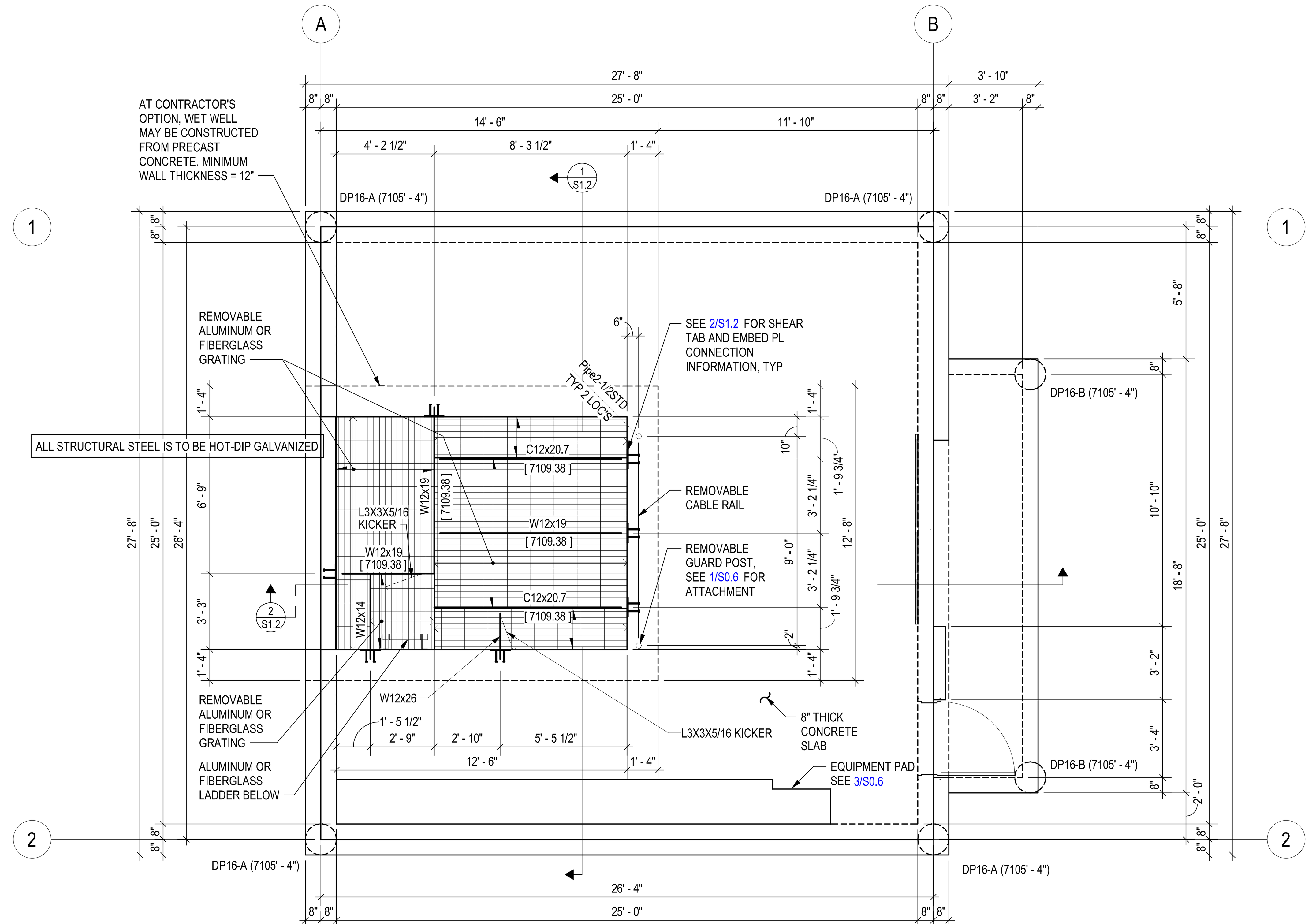
COLORADO REGISTERED PAUL J. HIGGINS 39508 PROFESSIONAL ENGINEER
Paul J. Higgins
04/05/2021

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

WET WELL PLANS AND 3D VIEW

SHEET NO.
S1.0



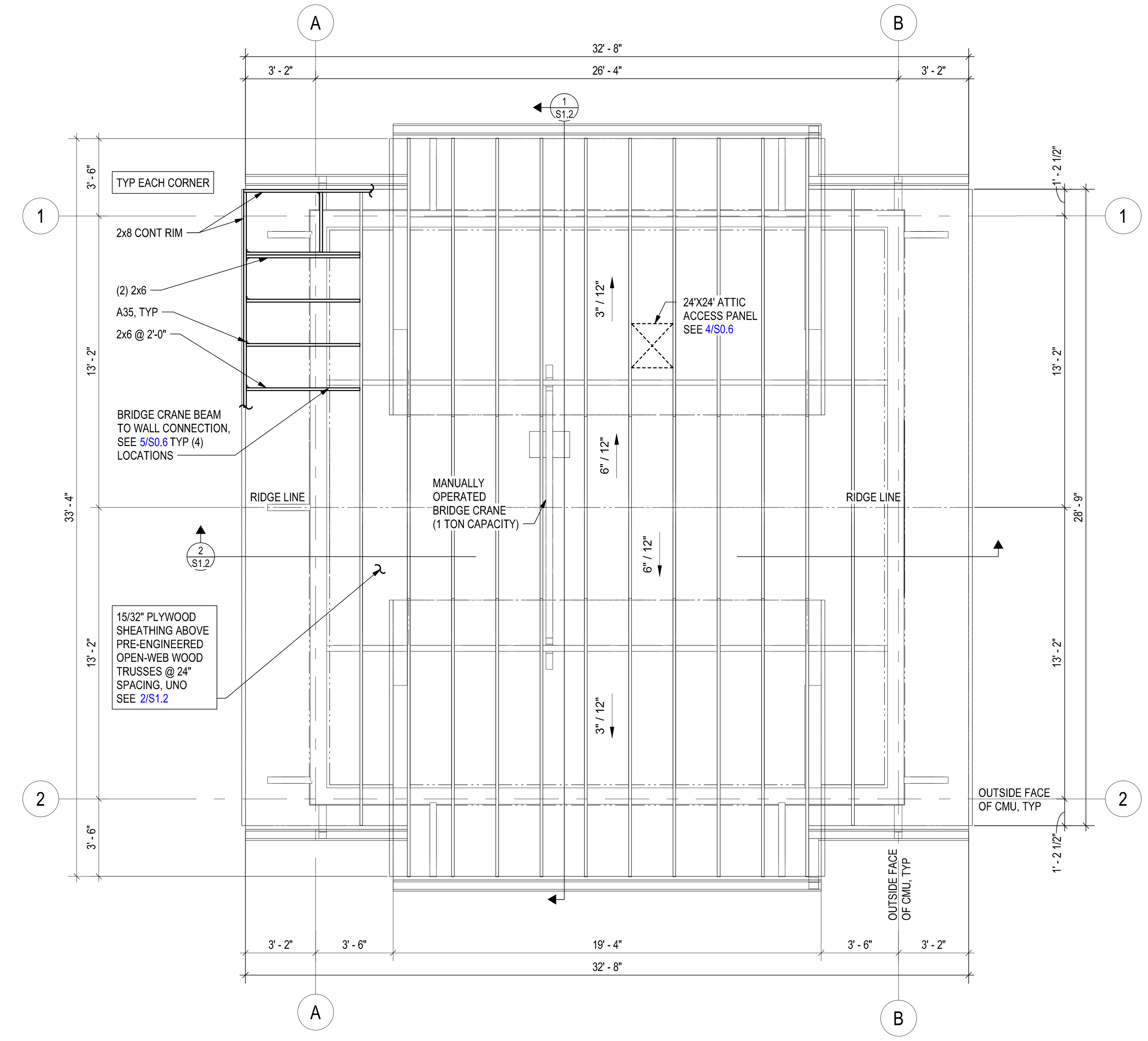
ALL STRUCTURAL STEEL IS TO BE HOT-DIP GALVANIZED

STRUCTURAL STEEL SUPPORTS ARE PERMITTED TO BE REPLACED W/ FIBERGLASS STRUCTURAL SHAPES DESIGNED BY THE MANUFACTURER

UPPER LEVEL PLAN

1/4" = 1'-0"

NORTH



ROOF FRAMING PLAN

1/4" = 1'-0"

NORTH

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED PAUL J. HAUSE 33608

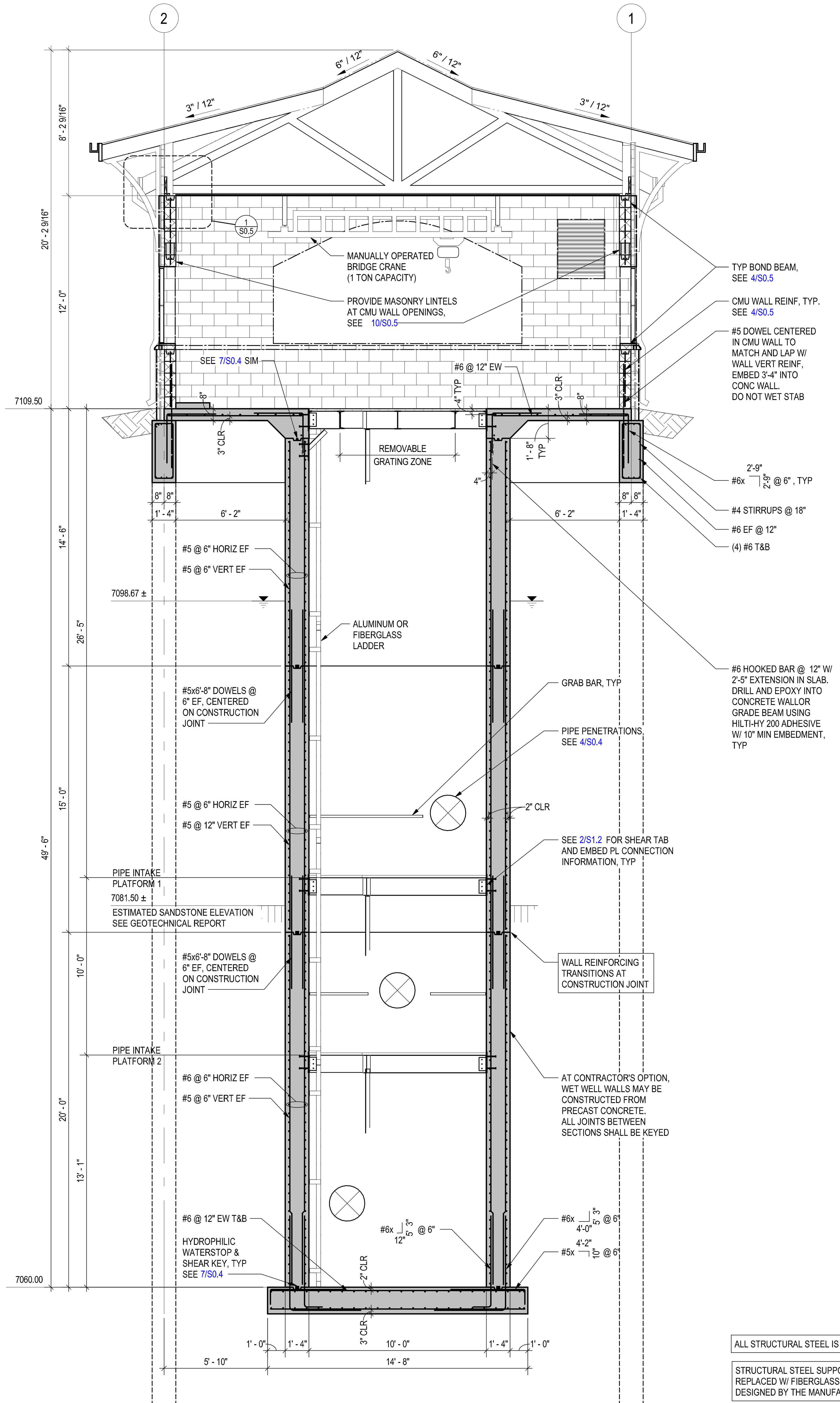
04/06/2021

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PUMP STATION PLANS

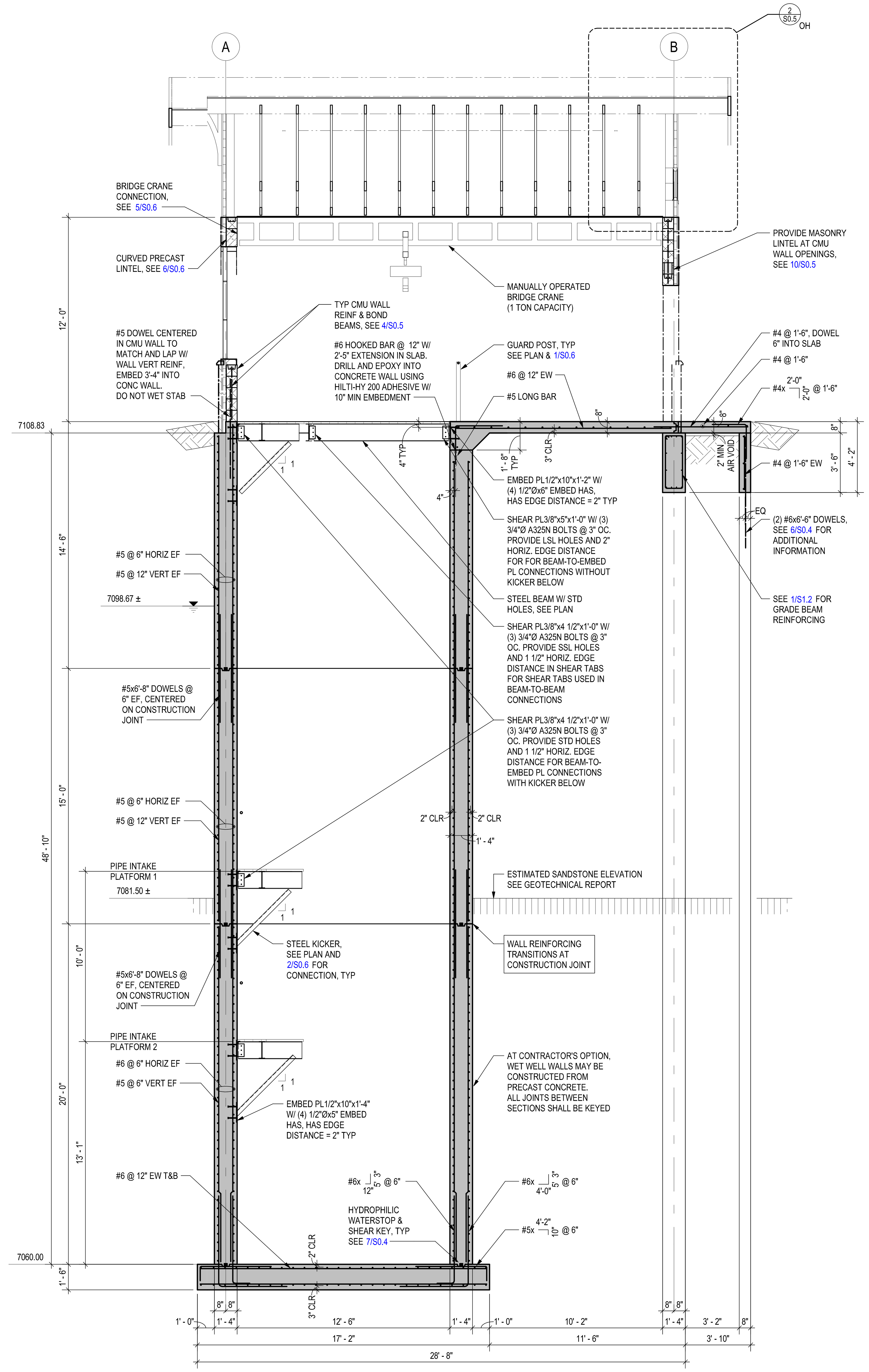
SHEET NO.
S1.1



1 S1.2 SECTION
1/4" = 1'-0"

ALL STRUCTURAL STEEL IS TO BE HOT-DIP GALVANIZED

STRUCTURAL STEEL SUPPORTS ARE PERMITTED TO BE REPLACED W/ FIBERGLASS STRUCTURAL SHAPES DESIGNED BY THE MANUFACTURER



2 S1.2 SECTION
1/4" = 1'-0"

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED PROFESSIONAL ENGINEER 33506
04/06/2021

DESIGNED BY:	KAC
DRAWN BY:	KAC
CHECKED BY:	PJH
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PUMP STATION SECTIONS

SHEET NO.
S1.2

GENERAL NOTES

1. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE STATE CODES, LOCAL CODES, AND OWNER'S STANDARDS INDICATED BY THE CONSTRUCTION DOCUMENTS.

2. MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM STRUCTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK, VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.

3. CONTRACTOR SHALL COORDINATE WORK INDICATED WITH OTHER DIVISIONS. VERIFY FIT OF MECHANICAL AND PLUMBING SYSTEMS PRIOR TO FABRICATION. COORDINATE ALL CHASE, SLEEVE, AND SLAB BLOCKOUT REQUIREMENTS BEFORE CONCRETE IS POURED OR BLOCK IS SET.

4. PROVIDE ALL EQUIPMENT SCHEDULED OR INDICATED ON THE DRAWINGS BUT NOT INCLUDED WITHIN THE SPECIFICATIONS INCLUDING ANY REQUIRED BUT NOT LISTED MISC ITEMS NEEDED TO PROVIDE COMPLETELY OPERATIONAL SYSTEMS AS INDICATED WHETHER SPECIFICALLY CALLED FOR OR NOT. INSTALLATION SHALL CONFORM TO MANUFACTURERS RECOMMENDATIONS AND APPLICABLE CODES. PROVIDE SUBMITTALS FOR ALL PROPOSED EQUIPMENT AND MATERIALS TO BE UTILIZED. PROVIDE OPERATION AND MAINTENANCE MANUAL FOR ALL SYSTEMS AND EQUIPMENT AT END OF PROJECT.

5. ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT SHALL BE VERIFIED WITH ELECTRICAL DRAWINGS AND ELECTRICAL CONTRACTOR PRIOR TO EQUIPMENT ORDER RELEASE. ADDITIONAL ELECTRICAL WORK RESULTING FROM EQUIPMENT SUBSTITUTION IS THE RESPONSIBILITY OF THIS CONTRACTOR.

6. DRAIN PIPING FROM EQUIPMENT SHALL BE ROUTED SO AS NOT TO CREATE A TRIPPING HAZARD. COORDINATE ACTUAL DRAIN CONNECTIONS WITH PLUMBING CONTRACTOR.

7. ITEM DESIGNATIONS INDICATED HEREON ARE FOR PURPOSES OF THESE DOCUMENTS ONLY. CONTRACTOR SHALL VERIFY WITH OWNERS REPRESENTATIVE ACTUAL "TAGGING" INFORMATION TO BE PROVIDED FOR EACH ITEM OF MECHANICAL EQUIPMENT PRIOR TO NAMEPLATE ORDER RELEASE.

8. PROVIDE VALVE TAGS AND PIPE IDENTIFICATION BANDS. TAGS SHALL BE BRASS WITH CHAIN. IDENTIFICATION BANDS SHALL BE LOCATED EVERY 25 FEET AND ON EITHER SIDE OF INTERMEDIATE BARRIER.

9. PROVIDE 18" X 18" MINIMUM ACCESS DOOR IN INACCESSIBLE CEILINGS AND WALLS FOR EQUIPMENT AND VALVES REQUIRING ACCESS OR ADJUSTMENT. COORDINATE LOCATIONS AND SUBMIT TO ARCHITECT FOR APPROVAL PRIOR TO BEGINNING WORK.

10. VALVES SHALL BE LOCATED WITHIN EASY REACH OF CEILING WHERE CEILINGS OCCUR & DROPPED TO WITHIN A MAXIMUM 10'-0" ABOVE FINISHED FLOOR WHERE NO CEILING OCCURS.

11. DUCT SIZES INDICATED ARE OUTSIDE DIMENSIONS, BRANCH RUNOUT DUCTS TO DIFFUSERS AND GRILLES TO BE SAME SIZE AS DIFFUSER OR GRILLE CONNECTION SIZE UNLESS OTHERWISE NOTED.

12. AT THE COMPLETION OF WORK, PROVIDE TESTING AND BALANCING SERVICES FOR MECHANICAL SYSTEM. SUBMIT WRITTEN REPORT TO ARCHITECT LISTING SYSTEM AIRFLOWS, ELECTRIC DATA, TEMPERATURES, AND PRESSURE DROPS.

13. AT THE COMPLETION OF THE WORK AND PRIOR TO FINAL ACCEPTANCE, ALL PARTS OF THE WORK INSTALLED UNDER THIS SPECIFICATION SHALL BE THOROUGHLY CLEANED.

14. ALL EQUIPMENT, MATERIALS, AND INSTALLATION IS TO BE WARRANTEED FOR ONE YEAR TO BE FREE FROM DEFECT. PROVIDE WRITTEN WARRANTY TO OWNER.

15. THE OWNER AND ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES, CONSTRUCTION SEQUENCES, OR PROCEDURES REQUIRED TO PERFORM HIS WORK.

MECHANICAL LEGEND

ABBR	SYMBOL	DESCRIPTION
S OR W		SOIL, WASTE OR SEWER BELOW GRADE OR FLOOR
S OR W		SOIL, WASTE OR SEWER ABOVE GRADE OR FLOOR
FCO/GCO		FLOOR OR GRADE CLEANOUT
V		VENT
CW		COLD WATER
HW		HOT WATER
HWR		HOT WATER RETURN
D	D	DRAIN
SOV		SHUT-OFF VALVE
TV		THROTTLING VALVE
T-STAT	T	THERMOSTAT
STR		STRAINER
U		UNION
SOL V	S	SOLENOID VALVE
AUTO D	M	MOTORIZED DAMPER
MVD		MANUAL VOLUME DAMPER
OBD		OPPOSED BLADE DAMPER
BDD	BDD	BACKDRAFT DAMPER
SA		SUPPLY AIR
RA		RETURN AIR
EA		EXHAUST AIR
OA		OUTSIDE AIR
FD		FLOOR DRAIN
FS		FLOOR SINK
GBS		GALVANIZED BIRD SCREEN
PC		PIPE CAP
AFF		ABOVE FINISHED FLOOR
AFG		ABOVE FINISHED GRADE
AAV		AIR ADMITTANCE VALVE
UNO		UNLESS NOTED OTHERWISE
AFF		ABOVE FINISHED FLOOR

SHEET INDEX

ISSUE	SHEET NO.	SHEET DESCRIPTION
04-05-21 100%CD SET	M0.1	COVER SHEET – MECHANICAL
	M1.0	PUMP STATION – MECHANICAL
	M3.0	SCHEDULES – MECHANICAL
	M4.0	DETAILS – MECHANICAL

MECHANICAL SPECIFICATIONS

SUPPLY, RETURN, EXHAUST AND OUTSIDE AIR DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED STEEL PER SMACNA DUCT CONSTRUCTION STANDARDS. SUPPLY, RETURN, EXHAUST AND OUTSIDE AIR DUCTWORK SHALL BE CONSTRUCTED FOR 1" W.C. STATIC PRESSURE. SPIRAL LOCK-FORMED ROUND DUCT MAY BE UTILIZED WHERE SPACE ALLOWS. TRANSVERSE JOINTS AND LONGITUDINAL SEAMS SHALL BE SEALED AIR-TIGHT WITH MASTIC, MASTIC SHALL BE APPLIED ONLY TO THE INSIDE OF EXPOSED DUCTWORK. RADIUSED ELBOWS (R/D=1.5) OR MITERED ELBOWS WITH SINGLE THICKNESS TURNING VANES SHALL BE UTILIZED WHERE POSSIBLE. TURNING VANES SHALL BE SUPPORTED AT INTERVALS OF 36" MAXIMUM. TURNING VANE RUNNERS SHALL HAVE A VANE IN EVERY SLOT AND SHALL CONFORM TO SMACNA DUCT CONSTRUCTION STANDARDS FOR STANDARD SPACING.

OUTSIDE AIR INTAKE DUCTS INSTALLED IN CONDITIONED AREAS SHALL BE INSULATED WITH R-6.0 INSULATION. DUCT INSULATION TO BE FLEXIBLE FIBERGLASS WITH FOIL SCRIM FACING. INSULATION SHALL HAVE A MAXIMUM CONDUCTIVITY, K-VALUE, OF 0.29 AT 75°F AND HAVE FLAME SPREAD/SMOKE DEVELOPED RATING OF 25/50 OR LESS. INSULATION SHALL BE SECURED WITH WIRE TIES AT 12" ON CENTER OR WITH SELF-SEALING LAP AND TAPE JOINTS 3" ON CENTER AT FITTINGS. JOINTS SHALL BE COVERED WITH 3" WIDE FOIL REINFORCED KRAFT TAPE. ADHESIVE OR MECHANICAL FASTENERS SHALL BE USED WHERE NECESSARY TO PREVENT SAGGING. VAPOR BARRIER PENETRATIONS BY MECHANICAL FASTENERS SHALL BE SEALED WITH VAPOR BARRIER ADHESIVE. INSULATION SHALL STOP AND POINT AROUND ACCESS DOORS AND DAMPER OPERATORS TO ALLOW OPERATION WITHOUT DISTURBING WRAPPING.

DUCT HANGERS SHALL BE CONSTRUCTED OF GALVANIZED STEEL. DUCTS SHALL BE SUPPORTED AND CONNECTED TO THE STRUCTURE PER SMACNA DUCT CONSTRUCTION STANDARDS. HANGERS AND SUPPORTS FOR GREASE DUCT SHALL BE OF NONCOMBUSTIBLE MATERIALS. FLEXIBLE DUCTS SHALL BE SUPPORTED WITH GALVANIZED STRAPS.

HEAVY FLEXIBLE CONNECTIONS SHALL BE FURNISHED AND INSTALLED AT DUCT CONNECTIONS TO FANS AND AIR HANDLING UNITS EXCEPT HIGH TEMPERATURE KITCHEN HOOD EXHAUST FANS. FLEXIBLE CONNECTIONS SHALL BE 6" MINIMUM AND 10" MAXIMUM IN LENGTH. MATERIAL FOR INTERIOR INSTALLATIONS SHALL BE VENTFLEX MANUFACTURED BY VENTFABRICS, EXCELON MANUFACTURED BY DURO-DYNE OR APPROVED EQUAL. MATERIAL FOR EXTERIOR INSTALLATIONS SHALL BE VENTLON MANUFACTURED BY VENTFABRICS, DUROLON MANUFACTURED BY DURO-DYNE OR APPROVED EQUAL.

AIR DEVICES SHALL BE AS SCHEDULED. EXPOSED SCREWS SHALL BE THE FINISHING TYPE AND PAINTED TO MATCH THE AIR DEVICE. SQUARE TO ROUND ADAPTORS SHALL BE PROVIDED WHERE REQUIRED FOR AIR DEVICES IN CEILINGS. AIR DEVICES SHALL BE FINISHED WITH WHITE BAKED ENAMEL UNLESS NOTED OTHERWISE. AIR DEVICES SHALL BE SECURED TO T-BAR CEILINGS WHERE APPLICABLE.

MECHANICAL EQUIPMENT SHALL BE SECURED AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND APPLICABLE SECTIONS OF THE JURISDICTIONAL BUILDING AND MECHANICAL CODES.

MECHANICAL EQUIPMENT SHALL BE IDENTIFIED WITH BAKELITE NAMEPLATES. COLOR CODING OF NAMEPLATES AND IDENTIFICATION INFORMATION SHALL BE COORDINATED WITH THE OWNER.

AN INDEPENDENT TEST AND BALANCE FIRM WHICH IS AABC OR NEBB CERTIFIED SHALL BE RETAINED FOR CHECK/TEST-START-UP AND TESTING AND BALANCING OF AIR AND WATER SYSTEMS. THE TEST REPORT SHALL BE IN A FORMAT APPROVED BY AABC FOR SYSTEMS OF THIS TYPE AND COMPLEXITY. QUALIFICATIONS OF INDEPENDENT TEST AND BALANCE FIRM SHALL BE SUBMITTED FOR REVIEW.

WATER PIPING ABOVE GRADE SHALL BE TYPE L, HARD DRAWN COPPER WITH WROUGHT COPPER FITTINGS SOLDERED WITH 95-5 TIN-ANTIMONY SOLDER OR BRAZED WITH SILVER BASED FILLER METAL.

COMPRESSED AIR PIPING SHALL BE TYPE L, HARD DRAWN COPPER WITH WROUGHT COPPER FITTINGS SOLDERED WITH 95-5 TIN-ANTIMONY SOLDER OR BRAZED WITH SILVER BASED FILLER METAL.

SHUT-OFF VALVES ARE TO BE BRONZE BALL VALVES, TWO PIECE OR UNI-BODY FULL PORT WITH CHROME PLATED BALL, REINFORCED TFE SEATS AND STUFFING BOX, LEVER HANDLE AND SCREWED OR SOLDER ENDS. 400 PSI W.O.G., 150 PSI SATURATED STEAM.

WATER PIPING SHALL BE TESTED WITH WATER AT 125 PSIG. TEST PRESSURE SHALL BE MAINTAINED FOR A MINIMUM OF 30 MINUTES WITH NO LOSS. DOMESTIC WATER PIPING SHALL BE DISINFECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE JURISDICTIONAL HEALTH AND PLUMBING CODES.

EQUIPMENT AND CONDENSATE DRAINS SHALL BE TYPE M HARD DRAWN COPPER TUBING WITH WROUGHT COPPER FITTINGS. COPPER TUBING SHALL BE SOLDERED WITH 95-5 TIN-ANTIMONY SOLDER OR BRAZED WITH SILVER BASED FILLER MATERIAL.

PIPE HANGERS FOR INSULATED PIPE SIZES 1/2" TO 1-1/2" SHALL BE ADJUSTABLE, STEEL, BAND TYPE. PIPE HANGERS FOR INSULATED PIPE SIZES 2" AND OVER SHALL BE ADJUSTABLE, STEEL CLEVIS TYPE. SHIELDS SHALL BE USED WHERE HANGER SUPPORTS INSULATED PIPE. SHIELDS SHALL BE 18 GAGE GALVANIZED STEEL OVER INSULATION 180 DEGREES AND A MINIMUM OF 12 INCHES LONG. PIPE HANGERS FOR BARE PIPE SHALL BE ADJUSTABLE, MALLEABLE STEEL, SPLIT RING TYPE. BARE COPPER PIPE SHALL BE PROTECTED FROM CORROSION BY TRISOLATOR OR SIMILAR PRODUCT. HANGERS SHALL BE PROVIDED AT INTERVALS IN ACCORDANCE WITH THE JURISDICTIONAL PLUMBING CODE. PIPING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS IN ACCORDANCE WITH THE SMACNA SEISMIC RESTRAINT MANUAL – GUIDELINES FOR MECHANICAL SYSTEMS.

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Glenwood Springs • Denver

COLORADO LICENSED 30.1463 PROFESSIONAL ENGINEER

NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

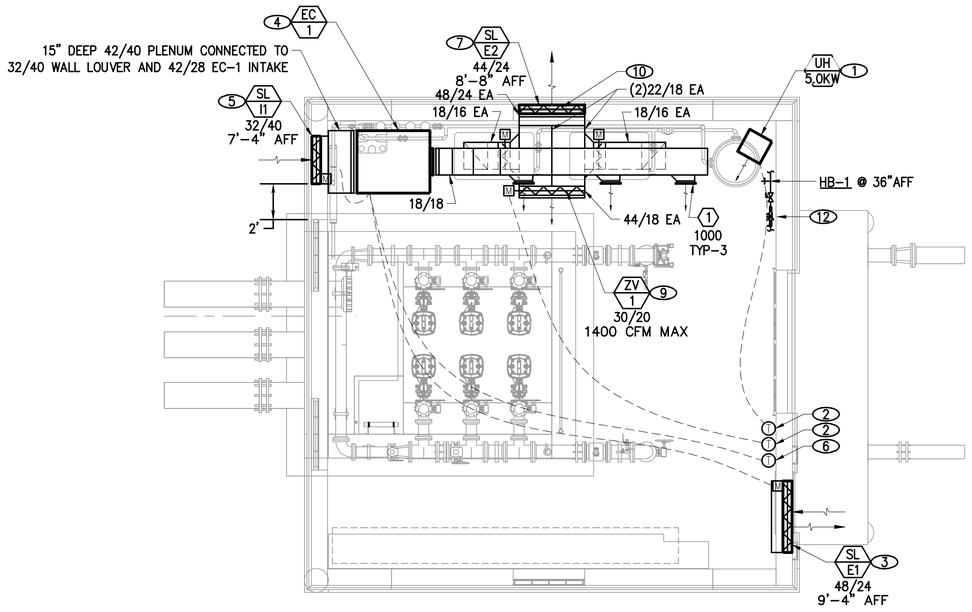
MOEN ENGINEERING CONSULTANTS INC
4640 PECOS STREET, UNIT F
DENVER, CO 80211
P: (303)907-4285

DESIGNED BY:	BEM
DRAWN BY:	BEM
CHECKED BY:	BEM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION
EL PASO COUNTY, COLORADO

COVER SHEET – MECHANICAL

SHEET NO.
M0.1



PUMP STATION - MECHANICAL PLAN 1

1/4" = 1'-0" M1.0

KEYNOTES

1. UNIT HEATER SUSPENDED FROM STRUCTURE BELOW CEILING AS HIGH AS POSSIBLE. SET THERMOSTAT AT 50 DEG F.
2. HEATING THERMOSTAT MOUNTED ON WALL AT 60"AFF.
3. EXHAUST LOUVER, PROVIDE MOTORIZED DAMPER INTERLOCKED TO OPEN WHENEVER ANY AIR COMPRESSOR OR EC-1 IS OPERATING.
4. EVAPORATIVE COOLER MOUNTED IN CEILING SUSPENDED FROM STRUCTURE WITH SPRING VIBRATION ISOLATORS. DISCHARGE OPEN TO ROOM. CONNECT 1/2"CW MAKE-UP, 3/4" DRAIN AND 3/4" OVERFLOW DRAIN TO EVAPORATIVE COOLER. RE: EVAPORATIVE COOLER PIPING DETAIL 2/M4.0.
5. INTAKE LOUVER, PROVIDE MOTORIZED DAMPER INTERLOCKED TO OPEN WITH EC-1.
6. EC-1 COOLING THERMOSTAT MOUNTED ON WALL AT 60"AFF.
7. EXHAUST LOUVER, PROVIDE 18" DEEP PLENUM BEHIND LOUVER.
8. AIR COMPRESSOR, RE: 1/M4.0
9. AIRFLOW ZONE VALVE, SET HEATING TEMP AT 70 DEG F.
10. PROVIDE OPPOSED BLADE BALANCE DAMPER, SET TO PROVIDE 1,400 CFM THROUGH ZV-1 DAMPER WHEN ZV-1 DAMPER IS 100% OPEN.
12. 3/4" DOMESTIC WATER SERVICE WITH 3/4" REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY BFP-1 AND 3/4" PRESSURE REDUCING VALVE PRV-1 INSTALLED AT 18" ABOVE FINISHED FLOOR. EXTEND DRAIN FROM BACKFLOW PREVENTOR THROUGH EXTERIOR WALL AND DISCHARGE AT 12" AFG.

MECHANICAL HVAC SEQUENCE OF OPERATION

ROOM TEMPERATURE IS ABOVE 80 DEG F:
- EC-1 EVAPORATIVE COOLER SET AT 75 DEG F IS ON IN STAGE 2 COOLING WITH EVAPORATIVE COOLER CIRCULATION PUMP ON AND FAN ON TO PROVIDE EVAPORATIVE COOLING.
- SL-I1 MOTORIZED DAMPER IS OPEN
- SL-E1 MOTORIZED DAMPER IS OPEN
- ZV-1 ZONE VALVE SET AT 70 DEG F FOR HEATING IS CLOSED
- UH-5.0KW ELECTRIC UNIT HEATER SET FOR 50 DEG F FREEZE PROTECTION IS OFF

ROOM TEMPERATURE IS BELOW 80 DEG F AND ABOVE 75 DEG F:
- EC-1 EVAPORATIVE COOLER SET AT 75 DEG F IS ON IN STAGE 1 COOLING WITH EVAPORATIVE COOLER CIRCULATION PUMP OFF AND FAN ON TO PROVIDE OUTSIDE AIR COOLING.
- SL-I1 MOTORIZED DAMPER IS OPEN
- SL-E1 MOTORIZED DAMPER IS OPEN
- ZV-1 ZONE VALVE SET AT 70 DEG F FOR HEATING IS CLOSED
- UH-5.0KW ELECTRIC UNIT HEATER SET FOR 50 DEG F FREEZE PROTECTION IS OFF

ROOM TEMPERATURE IS BELOW 75 DEG F AND ABOVE 70 DEG F:
- EC-1 EVAPORATIVE COOLER SET AT 75 DEG F IS OFF
- SL-I1 MOTORIZED DAMPER IS CLOSED
- SL-E1 MOTORIZED DAMPER IS OPEN
- ZV-1 ZONE VALVE SET AT 70 DEG F FOR HEATING IS CLOSED
- UH-5.0KW ELECTRIC UNIT HEATER SET FOR 50 DEG F FREEZE PROTECTION IS OFF

ROOM TEMPERATURE IS BELOW 70 DEG F AND ABOVE 50 DEG F:
- EC-1 EVAPORATIVE COOLER SET AT 75 DEG F IS OFF
- SL-I1 MOTORIZED DAMPER IS CLOSED
- SL-E1 MOTORIZED DAMPER IS OPEN
- ZV-1 ZONE VALVE SET AT 70 DEG F FOR HEATING WILL MODULATE FROM 0% OPEN AT 70 DEG F TO FULL OPEN AT 60 DEG F TO PROVIDE HEAT FROM AIR COMPRESSORS TO ROOM
- UH-5.0KW ELECTRIC UNIT HEATER SET FOR 50 DEG F FREEZE PROTECTION IS OFF

ROOM TEMPERATURE IS BELOW 50 DEG F:
- EC-1 EVAPORATIVE COOLER SET AT 75 DEG F IS OFF
- SL-I1 MOTORIZED DAMPER IS CLOSED
- SL-E1 MOTORIZED DAMPER IS OPEN
- ZV-1 ZONE VALVE SET AT 70 DEG F FOR HEATING WILL BE FULL OPEN TO PROVIDE HEAT FROM AIR COMPRESSORS TO ROOM
- UH-5.0KW ELECTRIC UNIT HEATER SET FOR 50 DEG F FREEZE PROTECTION IS ON

EC-1, ZV-1, AND UH-5.0KW ARE ALL STAND ALONE THERMOSTATIC CONTROLS AND ARE NOT REQUIRED TO BE NETWORKED TOGETHER.

SL-I1 LOUVER IS INTERLOCKED TO EC-1 OPERATION AND IS NOT REQUIRED TO BE INTERLOCKED TO OTHER EQUIPMENT OPERATION.

SL-E1 IS INTERLOCKED TO OPEN WHENEVER ANY AIR COMPRESSOR OR EC-1 OPERATES AND IS NOT REQUIRED TO BE INTERLOCKED TO OTHER EQUIPMENT OPERATOIN.

4 0 4 8
SCALE OF FEET

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COLORADO LICENSED 39463 PROFESSIONAL ENGINEER

NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

MOEN ENGINEERING CONSULTANTS INC
4640 PECOS STREET, UNIT F
DENVER, CO 80211
P: (303)907-4285

DESIGNED BY:	BEM
DRAWN BY:	BEM
CHECKED BY:	BEM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION
EL PASO COUNTY, COLORADO

PUMP STATION
MECHANICAL PLAN

SHEET NO.
M1.0

AIRFLOW ZONE VALVE

ITEM	MANUFACTURER/ MODEL	LOCATION/ SERVICE	NOTES
ZV 1	JACKSON SYSTEMS/ ZD	SUPPLY AIR/ TEMP CONTROL	(1)(2)(3)(4)(5)

NOTES:

(1) MODULATING DAMPER SIZE TO MATCH DUCT SIZE ON DRAWINGS

(2) PROVIDE WALL MOUNTED JACKSON SYSTEMS Z-2000-T TSTAT WITH PROPORTIONAL CONTROL AND CLEAR LOCKABLE COVER.

(3) PROVIDE 40VA TRANSFORMER

(4) UNIT TO PROVIDE AUTO-CHANGEOVER FROM HEATING TO COOLING

(5) UNIT TO HAVE 90 SECOND TIMING FROM FULLY OPENED TO FULLY CLOSED

AIR HANDLER SCHEDULE (DIRECT EVAPORATIVE COOLING)

ITEM	LOCATION/ SERVICE	MANUFACTURER/ MODEL	DIRECT EVAPORATIVE COOLING MODULE									SUPPLY FAN					MAX. OPER. WT. (LBS.)	OVERALL DIMENSIONS	NOTES
			CFM	ENT. AIR TEMP. (°F)		LEAVING AIR TEMP. (°F)		PUMP				CFM	SUPPLY ESP (IN. WC)	MAX. FAN RPM	MIN. MOTOR HP	VOLTS/PH			
				DB	WB	DB	WB	GPM	TDH (FT)	MIN. MOTOR WATTS	VOLTS/PHASE								
EC 1	CEILING/ COOLING	CHAMPION/ AS1C5112	3,000	95	60	65	–	–	5	146	115/1	3,000	0.2	–	3/4	115/1	300	49"L X 42"W X 28"TALL	(1)(2)(3)(4)(5)(6)

NOTES:

(1) DIRECT EVAPORATIVE COOLER IN SIDE DISCHARGE CONFIGURATION WITH 12" DEEP DIRECT EVAPORATIVE COOLING HEAT EXCHANGER.

(2) FURNISH WITH FACTORY INSTALLED SINGLE POINT POWER CONNECTION KIT PRE-CONFIGURED WITH OVERLOAD SIZED PER HORSEPOWER AND VOLTAGE REQUIREMENTS WITH NEMA 3R UL LISTED NON-FUSED DISCONNECT, TERMINAL BLOCKS/RELAYS TO OPERATE FILL AND DRAIN KIT, AND FACTORY PROVIDED TRANSFORMER FOR PUMPS.

(3) SUSPENDED IN CEILING SPACE FROM STRUCTURE.

(4) PROVIDE 2 STAGE COOLING ONLY 24V THERMOSTAT SET AT 75 DEG F. STAGE 1 COOLING IS OUTSIDE AIR ONLY WITH CIRCULATION PUMP OFF, STAGE 2 IS CIRCULATION PUMP ON.

(5) PROVIDE WATER BLEED-OFF KIT.

(6) FURNISH WITH THERMOSTATICALLY CONTROLLED FILL AND DRAIN KIT SET TO DRAIN RESERVOIR WHEN OUTSIDE AIR TEMP IS BELOW 40 DEG F. PROVIDE 24 HOUR TIMER CONTROL SET TO DRAIN RESERVOIR AND ALLOW SYSTEM TO DRY OUT FOR 2 HOURS EVERY 24 HOUR PERIOD FROM 4 AM TO 6AM.

PLUMBING EQUIPMENT SCHEDULE

ITEM	DESCRIPTION
PRV-1	WILKINS #500XLYSBR DIRECT ACTING ASSE 1003 LISTED PRESSURE REGULATING VALVE CONSTRUCTED OF LOW LEAD CAST BRONZE AND STAINLESS STEEL WITH BUNA NITRILE ELASTOMERS, SUITABLE FOR 33 DEG F. -140 DEG F. AND 300 PSI MAXIMUM WORKING PRESSURE MEETING NSF 61 REQUIREMENTS. PROVIDE INLINE Y TYPE STRAINER AHEAD OF VALVE. SIZES AS INDICATED ON DRAWINGS.
BFP-1	WILKINS #975XL2 3/4"-2" LEAD-FREE REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY. ASSE LISTED 1013 AND APPROVED BY THE FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH AT THE UNIVERSITY OF SOUTHERN CALIFORNIA. SUPPLIED WITH FULL PORT BALL VALVES. THE MAIN BODY AND ACCESS COVER SHALL BE CAST BRONZE (ASTM B 584). THE SEAT DISC ELASTOMERS SHALL BE EPDM.
HB-1	WALL MOUNTED HOSE BIBB OF CHROME PLATED CAST BRASS CONSTRUCTION WITH 3/4" HOSE END CONNECTION, RENEWABLE SEAT WASHER, INTEGRAL VACUUM BREAKER.

HEATER (ELECTRIC)

ITEM	MANUFACTURER/ MODEL	LOCATION/ SERVICE	HEATING CAP. (KW)	MAX. CFM	VOLTS/PHASE	MCA	MAX. OPER. WT. (LBS.)	OVERALL DIMENSIONS	NOTES
UH 5.0KW	INDEECO/ UCI	CEILING/ HEAT	5.0	700	480/3	6.7	50	17" DEEP X 16-1/2" WIDE X 12" TALL	(1)

NOTES:

(1) FURNISH FACTORY INSTALLED DISCONNECT AND REMOTE THERMOSTAT SET AT 50 DEG F

DIFFUSER & REGISTER SCHEDULE

SUPPLY AIR				RETURN/EXHAUST AIR			
ITEM	NECK SIZE	CFM RANGE	TYPE	ITEM	NECK SIZE	CFM RANGE	TYPE
1	12/12	0 – 1,000	S1				

DIFFUSER & REGISTER SPECIFICATIONS

SUPPLY AIR

TYPE S1: KRUEGER MODEL 880H DOUBLE DEFLECTION STEEL SUPPLY GRILLE, 3/4" BLADE SPACING, OBD, WHITE FINISH. USE CONCEALED MOUNTING IN PUBLIC AREAS.

STATIONARY LOUVER SCHEDULE

ITEM	MANUFACTURER/ MODEL	LOCATION/ SERVICE	MINIMUM % FREE AREA	NOTES
SL I1	RUSKIN/ LC6375D	WALL/ INTAKE	40	(1)(2)
SL E1	RUSKIN/ LC6375D	WALL/ EXHAUST	40	(1)(2)
SL E2	RUSKIN/ LC6375D	WALL/ EXHAUST	40	(1)

NOTES:

(1) COMBINATION LOUVER AND DAMPER WITH GALVANIZED STEEL DRAINABLE BLADES WITH NEOPRENE BLADE SEALS AND ALUMINUM BIRDSCREEN, SIZE AS NOTED ON PLANS

(2) FURNISH WITH 120VAC NORMALLY OPEN MOTORIZED DAMPER

(3) FURNISH WITH GRAVITY BAROMETRIC BACKDRAFT DAMPER

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COLORADO LICENSED PROFESSIONAL ENGINEER BRYAN EDWARD MOEN 36163

NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

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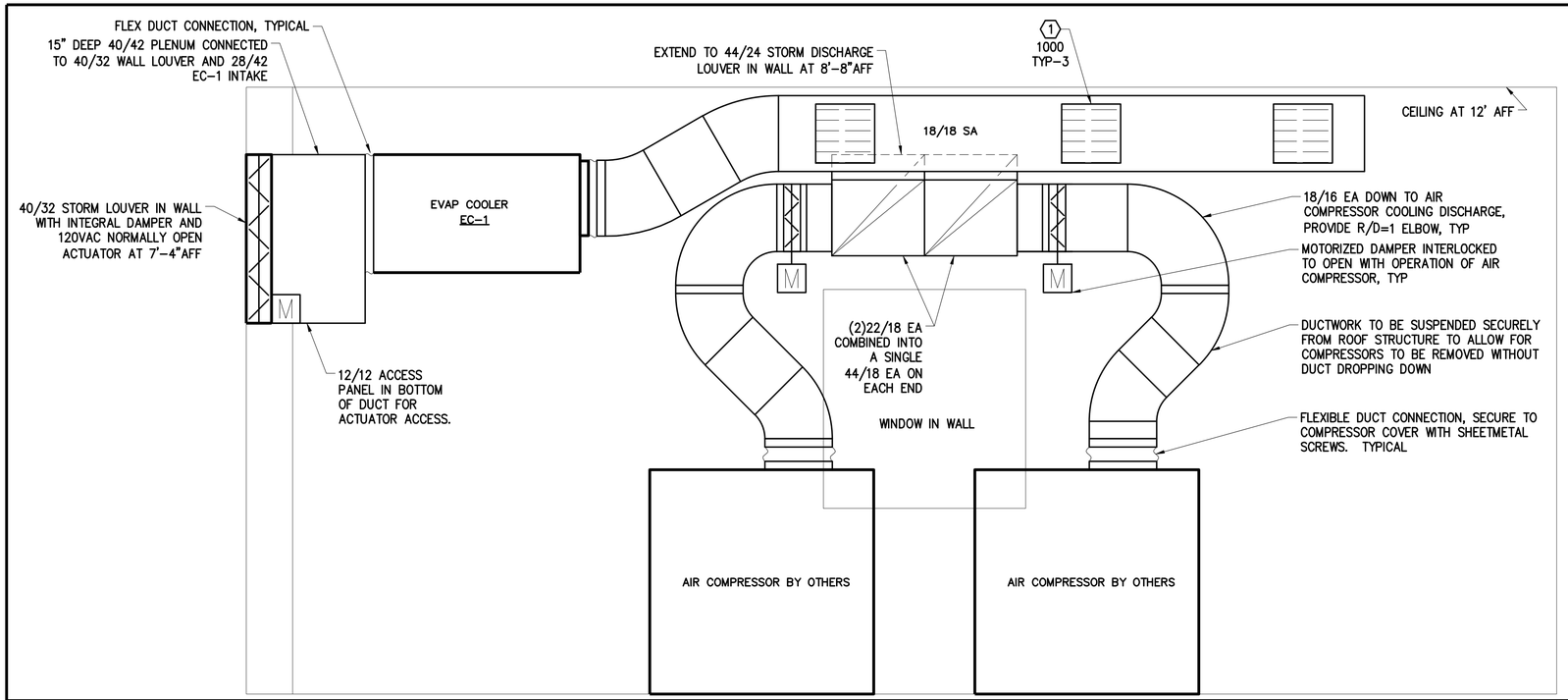
DESIGNED BY:	BEM
DRAWN BY:	BEM
CHECKED BY:	BEM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION
EL PASO COUNTY, COLORADO

SCHEDULES – MECHANICAL

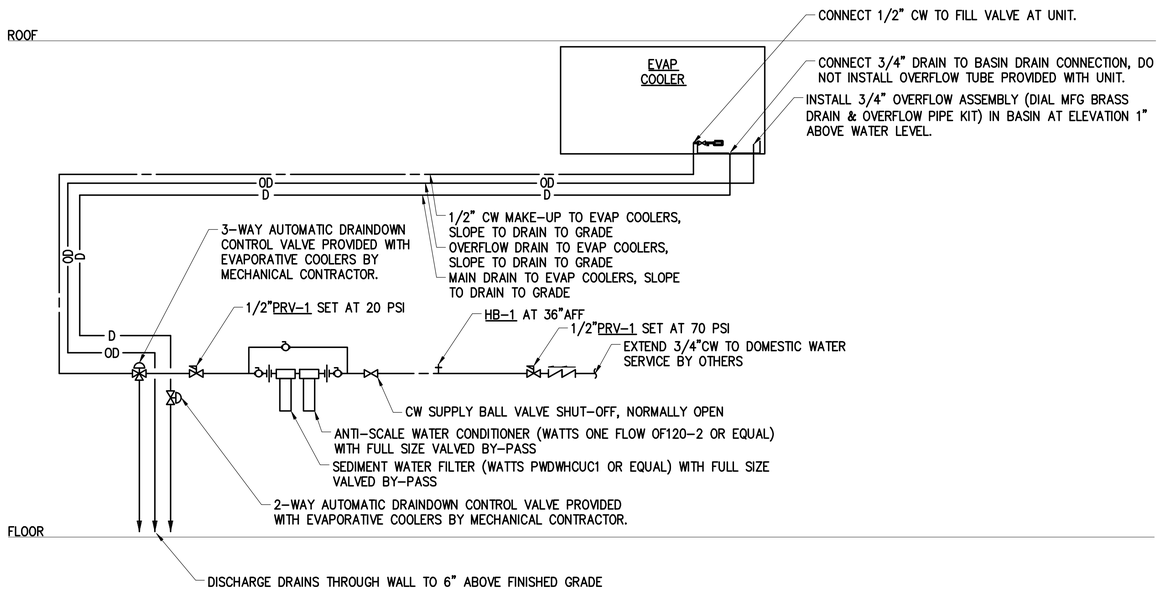
SHEET NO.
M3.0



AIR COMPRESSOR PIPING DETAIL

NO SCALE

1 / M4.0



EVAPORATIVE COOLER PIPING DETAIL

NO SCALE

2 / M4.0

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COLORADO LICENSED 39463 PROFESSIONAL ENGINEER

NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

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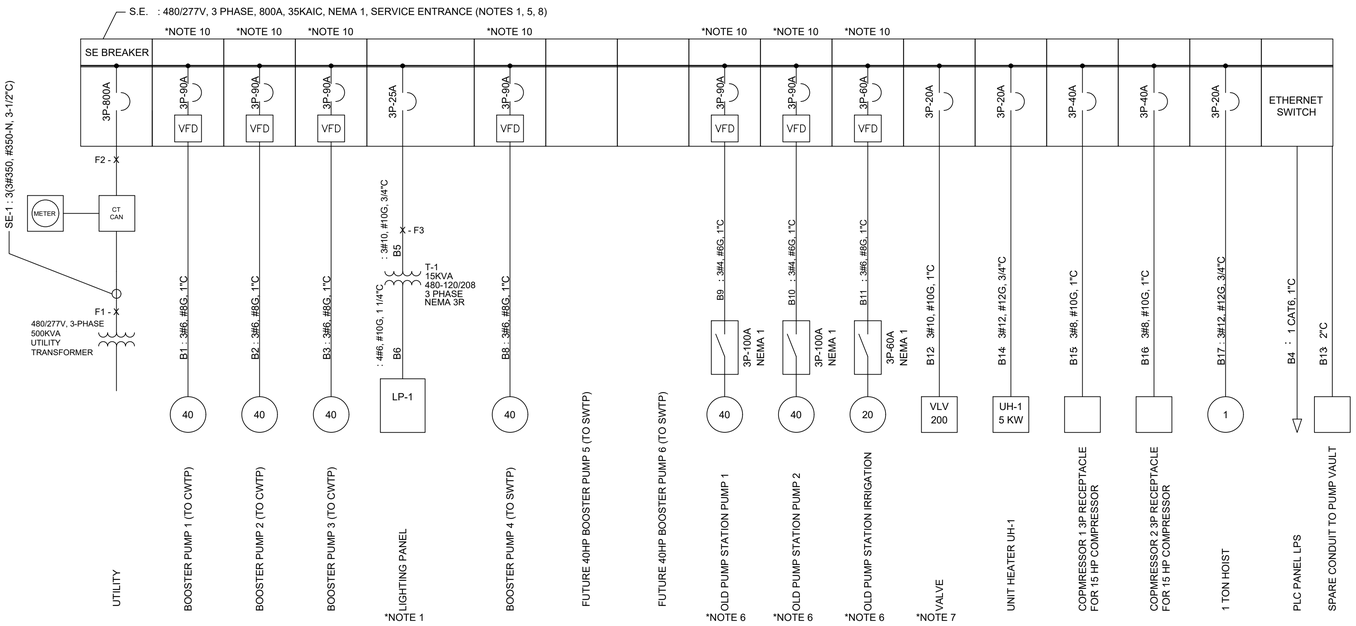
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION
EL PASO COUNTY, COLORADO

DETAILS - MECHANICAL

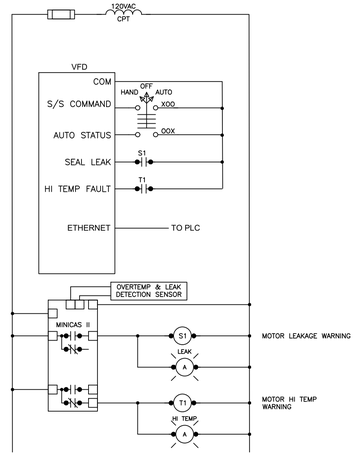
SHEET NO.
M4.0

SEE SHEET E1.1 FOR TOTAL LOAD CALCUATIONS

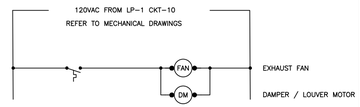


MCC
ONE-LINE DIAGRAMS

FAULT CURRENT	
F1	33400 AMPS
F2	23068 AMPS
F3	9217 AMPS



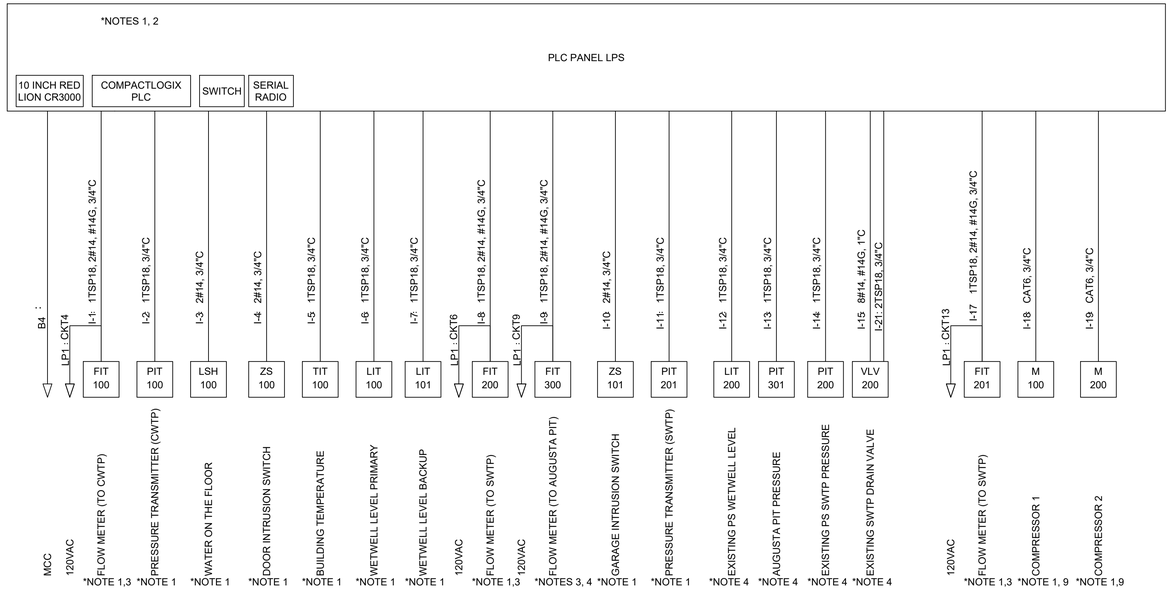
BOOSTER PUMP #1
SCHEMATIC
TYPICAL FOR ALL PUMPS



EXHAUST FAN
SCHEMATIC

NAME:		LP-1		BUS:		COPPER			MAINS:		3P-50A	
SERVICE:		120/208 VAC		RATING:		100A			LOCATION:		LAKE PUMP STATION	
MOUNTING:		SURFACE, NEMA 1		AIC RATING:		10,000A						
V.A.					CIRCUIT NUMBER					V.A.		
A	B	C	LOAD	PHASE	BREAKER		BREAKER	PHASE	LOAD	A	B	C
600			PLC PANEL LPS	1	20	1 2	20	1	RECEPTACLES	720		
	300		INTERIOR LIGHTS	1	20	3 4	20	1	FIT-100		25	
		45	WETWELL LIGHT	1	20	5 6	20	1	FIT-200			25
300			EXISTING PUMP VAULT LIGHTS	1	20	7 8	20	1	EXTERIOR LIGHTS	240		
	25		EXISTING FIT-300	1	20	9 10	20	1	EXHAUST FAN		100	
		360	EVAPORATIVE COOLER	1	20	11 12	20	1	EXISTING PUMP STATION HEATER			1000
25			FIT-201	1	20	13 14	20	1	EXISTING PUMP STATION HEATER	1000		
	720		EXISTING PUMP STATION RECEPTACLES	1	20	15 16	20	1	EXISTING PUMP STATION BLOWER		240	
		0	SPARE	1	20	17 18	20	1	SPARE			0
0			SPARE	1	20	19 20	20	1	SPARE	0		
	0		SPARE	1	20	21 22	20	1	SPARE		0	
		0	SPARE	1	20	23 24	20	1	SPARE			0
925	1045	405	TOTALS PER PHASE PER SIDE							1960	365	1025
2885	1410	1430	TOTALS PER PHASE									
	5725		PANEL TOTAL									

LP-1
LOCATED IN LAKE PUMP STATION



PLC PANEL LPS
ONE-LINE DIAGRAMS

NOTES:
1) EQUIPMENT TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
2) EXISTING SERIAL RADIO IS AN EATON 105U-G-MD1. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE PLC COMMUNICATION IS ESTABLISHED USING THE EXISTING RADIO.
3) FLOW METERS TO READ FORWARD AND REVERSE FLOW.
4) EXISTING EQUIPMENT, NEW CONDUIT AND WIRE TO BE PROVIDED, INSTALLED, AND TERMINATED BY CONTRACTOR.
5) ALL VFDS SHALL BE ETHERNET CONTROLLED. ETHERNET SWITCH SHALL BE PROVIDED IN A DEDICATED MCC BUCKET.
6) NEW DISCONNECTS TO BE PROVIDED AND INSTALLED IN EXISTING PUMP STATION BY CONTRACTOR.
7) EXISTING VALVE, ACTUATOR SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.
8) ALL VFDS SHALL HAVE COOLING FANS MOUNTED TO THE DOOR OF EACH INDIVIDUAL VFD.
9) MODBUS TCP/IP COMMUNICATION
10) VFD SHALL BE RATED AT A MINIMUM OF 125% OF THE FLA OF THE MOTOR, AS PER NEC 430.122.

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED THEODORE W. TFW 30647 PROFESSIONAL ENGINEER

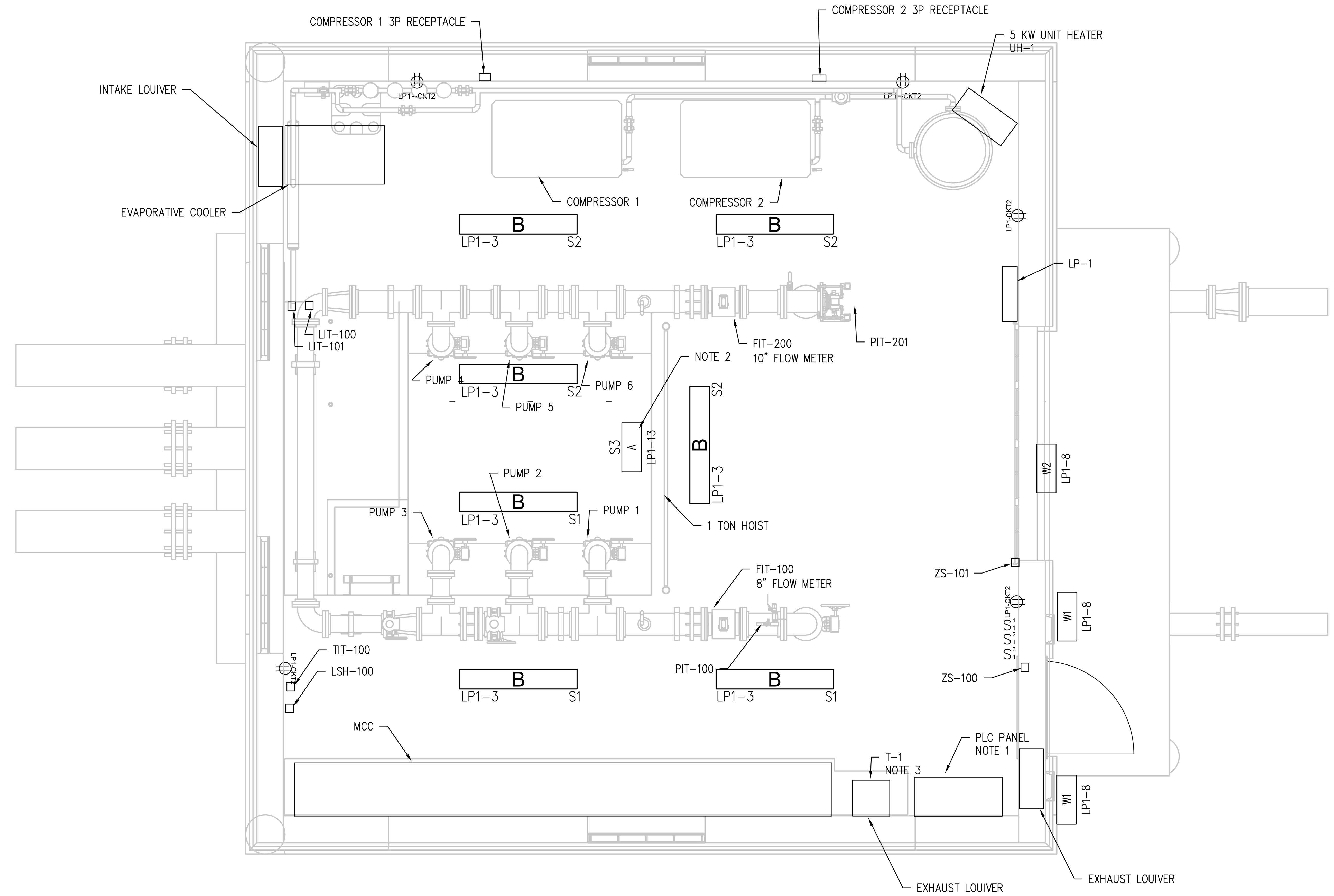
DESIGNED BY:	CSM
DRAWN BY:	CSM
CHECKED BY:	TFW
JOB #:	1051.6e
DATE:	MARCH 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PUMP STATION
ONE LINE DIAGRAM

SHEET NO.
E1.0

LIGHTING FIXTURE SCHEDULE				
SYMBOL	LAMP	MTG HEIGHT	DESCRIPTION	MANUFACTURER
B	LED, 120V	MOUNT AT 10' AFF	4 FOOT FIXTURE-HEAVY DUTY AND MOUNTING HARDWARE SUITABLE FOR WET LOCATIONS	LITHONIA LIGHTING: STL440LEZ1LP840
A	LED, 120V	MOUNT AT HATCH OPENING	45W LED FLOOD LIGHT	RAB: PIP45/D10
W2	LED, 120V	MOUNT AT PEAK OF ROOF	LED WALL LIGHT	HI-LITE H-1312-B
W1	LED, 120V	BOTH SIDES OF DOOR	DIE CAST ALUMINUM FOR RUGGED MOUNTING AND HEAT DISSIPATION, SPECULAR REFLECTOR, VERTICAL LAMP AND REFRACTOR WITH PHOTOELECTRIC CONTROL	WILLIAMS: VWMH-L10/840-TL-DBZ-CGL-QS-DIM-UNV



PUMP STATION PLAN

3/8" - 1'-0"

NOTES:

1) PLC PANEL NOT TO EXCEED 36 INCHES WIDE. ALL CONDUIT PENETRATIONS SHALL BE ON THE SIDE OR UNDER THE PANEL. NO PENETRATIONS ON THE TOP OF THE CABINET SHALL BE PERMITTED.
2) WETWELL LIGHT SWITCH TO BE INSTALLED ON WALL IN THE PUMP ROOM. THE LIGHT SHALL BE INSTALLED IN THE WETWELL ON THE CEILING AND SHALL BE ACCESSIBLE FROM THE LADDER FOR MAINTENANCE AND SHALL SHINE DOWN ON THE WETWELL.
3) TRANSFORMER SHALL BE PAD MOUNTED AND RATED NEMA 3R

LOAD LIST				
DESCRIPTION	HP/KW	VOLTS	AMPS	KVA
BOOSTER PUMP #1	40	480	52	43.2
BOOSTER PUMP #2	40	480	52	43.2
BOOSTER PUMP #3	40	480	52	43.2
LP-1		480	5.8	4.8
BOOSTER PUMP #4	40	480	52	43.2
PUMP #1	40	480	52	43.2
PUMP #2	40	480	52	43.2
IRRIGATION PUMP	20	480	27	22.4
VLV-200	0.5	480	1.1	0.9
UH-1	5 KW	480	6.0	5.0
COMPRESSOR 1	5	480	7.6	6.3
COMPRESSOR 2	5	480	7.6	6.3
HOIST	1	480	2.1	1.5
SWTP PCV VALVE	0.5	480	1.1	0.9
		TOTALS	370.2	307.4

LOAD CALCULATIONS:

TOTAL LOAD: 370.2 AMPS
125% OF ALL LOADS: 462.8 AMPS
SERVICE SIZE: 800.0 AMPS

2 0 2 4 6
SCALE OF FEET

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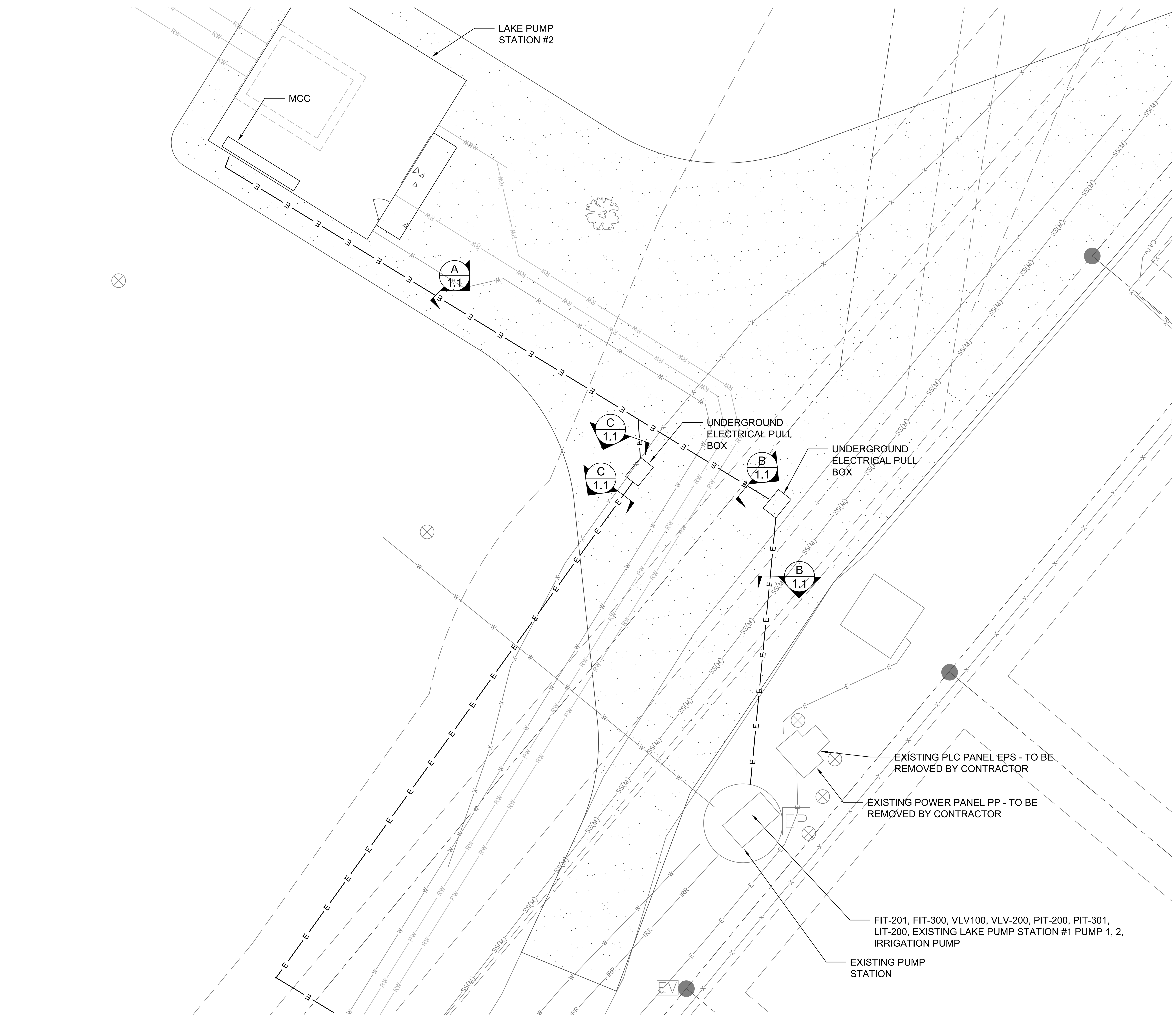
COLORADO REGISTERED PROFESSIONAL ENGINEER 30647

DESIGNED BY:	CSM
DRAWN BY:	CSM
CHECKED BY:	TFW
JOB #:	1051.6e
DATE:	MARCH 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PUMP STATION ELECTRICAL
PLAN AND SECTION

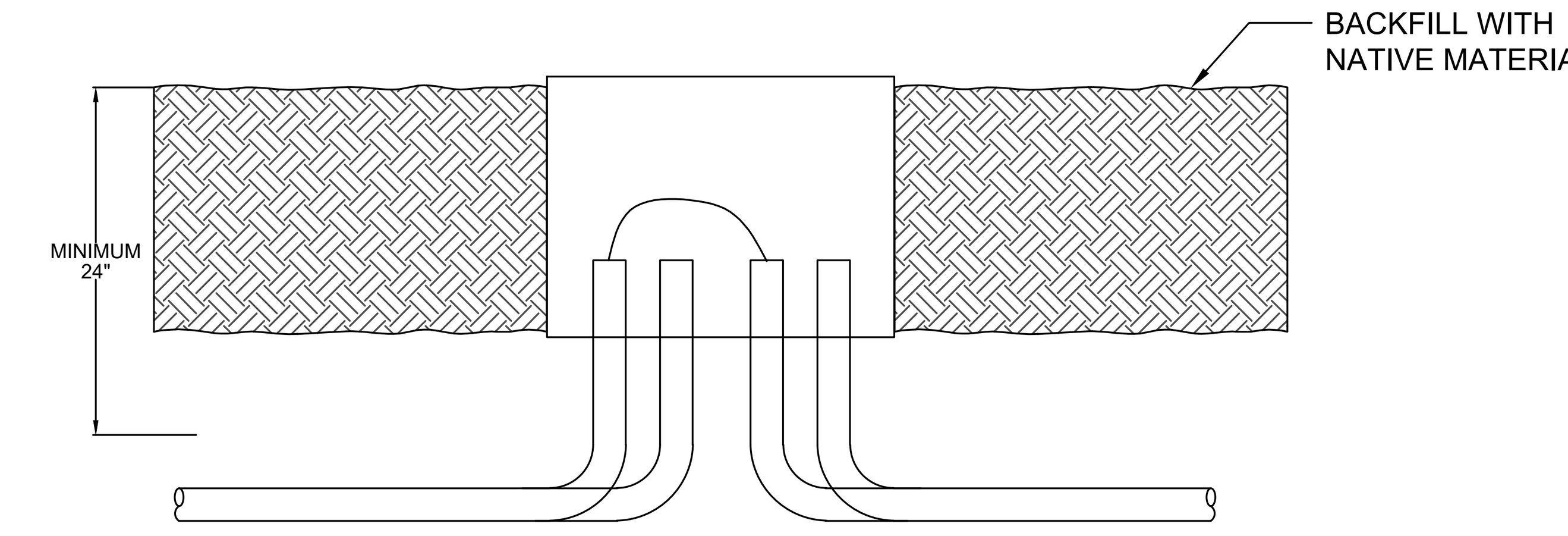
SHEET NO.
E1.1



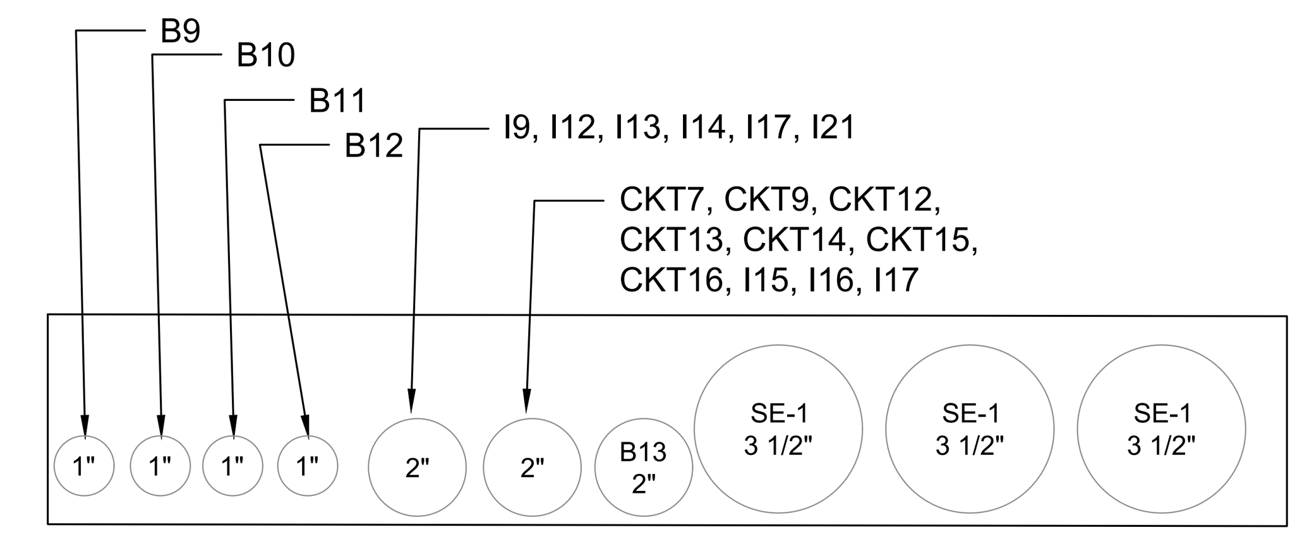
UTILITY METER AND TRANSFORMER. LOCATED 250 FEET AWAY FROM HAND HOLE

NOTE:
CONTRACTOR TO DEMO EXISTING PLC PANEL EPS, EXISTING POWER PANEL, AND ALL OTHER ABOVE GROUND EQUIPMENT.

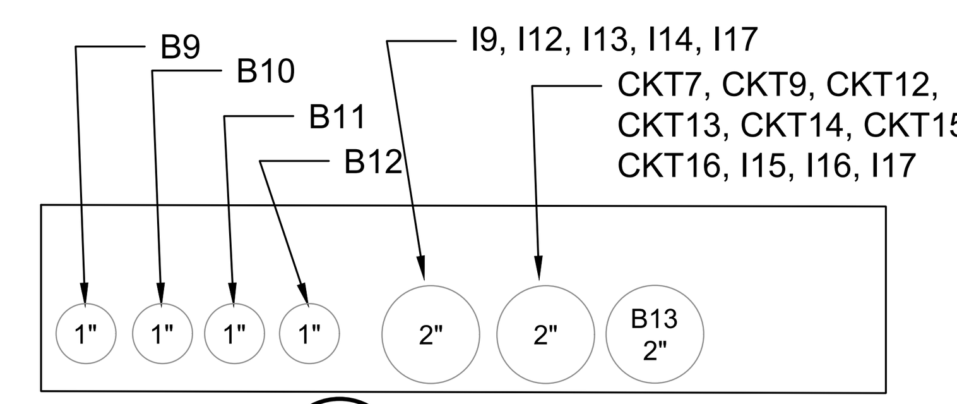
8 0 8 16 24
SCALE OF FEET



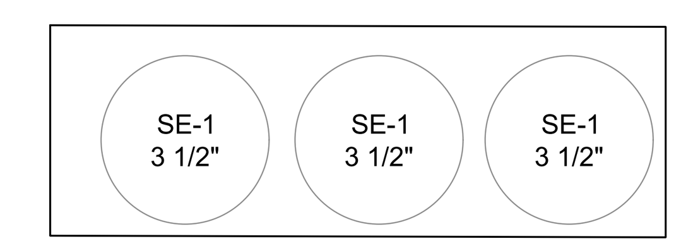
UNDERGROUND ELECTRICAL PULL BOX DETAIL
NO SCALE



A / 1.1 DUCT BANK
SCALE: NTS

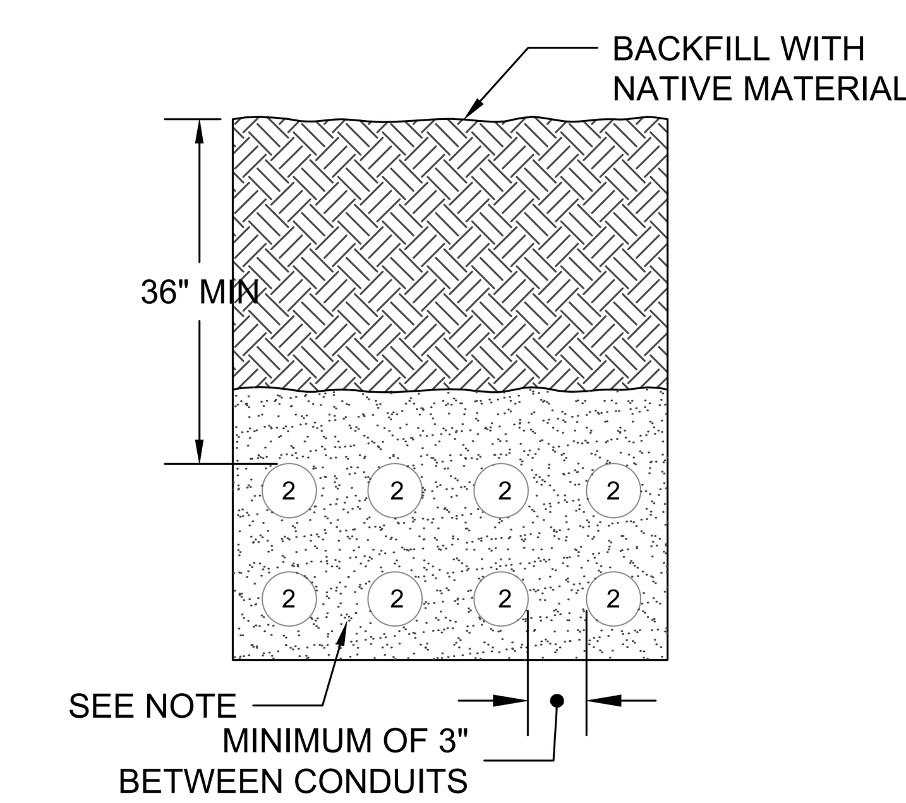


B / 1.1 DUCT BANK
SCALE: NTS



C / 1.1 DUCT BANK
SCALE: NTS

EQUIPMENT TO BE REMOVED BY CONTRACTOR



NOTE:
CONDUITS SHALL BE EMBEDDED IN SAND. THE SAND SHALL COVER ALL CONDUITS BY AT LEAST 3 INCHES

2 / - ELECTRICAL DUCT BANK DETAIL
SCALE: NTS

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED PROFESSIONAL ENGINEER 30647 5-10-21

DESIGNED BY:	CSM
DRAWN BY:	CSM
CHECKED BY:	TFW
JOB #:	1051.6e
DATE:	DEC 2020

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

PUMP STATION ELECTRICAL SITE PLAN

SHEET NO.
E2.0

WOODMOOR WATER AND SANITATION DISTRICT NO.1
LAKE PUMP STATION NO. 2 AND TRANSMISSION PIPELINE
EL PASO COUNTY, COLORADO
GRADING AND EROSION CONTROL PLAN

PPR-21-019

CONTACTS

OWNER:	WOODMOOR WATER AND SANITATION DISTRICT NO. 1 1845 WOODMOOR DRIVE MONUMENT, CO 80132	JESSIE SHAFFER, P.E. (719) 488-2525 JESSIES@WOODMOORWATER.COM
ENVIRONMENTAL ENGINEER:	JVA, INC 1512 LARIMER STREET, SUITE 710 DENVER, CO 80202	RICHARD HOOD, P.E. (303) 565-4901 RHOOD@JVAJVA.COM
STRUCTURAL ENGINEER:	JVA, INC 1512 LARIMER STREET, SUITE 710 DENVER, CO 80202	ADAM TEUNISSEN, P.E. (303) 565-4936 ATEUNISSEN@JVAJVA.COM
ELECTRICAL ENGINEER:	BROWNS HILL ENGINEERING AND CONTROLS 8130 SHAFFER PARKWAY, SUITE A LITTLETON, CO 80127	TED WILLE, P.E. (720) 344-7771 TWILLE@BROWNSHILLENG.COM
MECHANICAL ENGINEER:	MEC, INC. 4919 W. 98TH WAY WESTMINSTER, CO 80031	BRYAN MOEN, P.E. (303) 907-4285 BMOEN@MECENGR.COM

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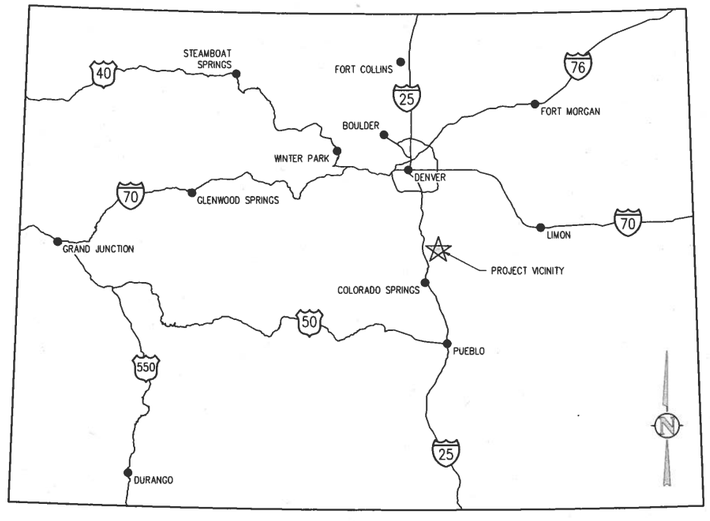
JULY 2021

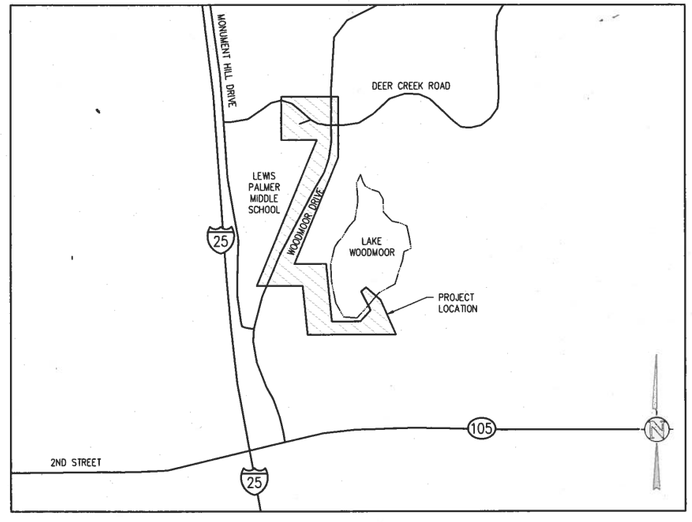
PREPARED UNDER THE SUPERVISION OF

JVA, Inc.

DRAWING INDEX



VICINITY MAP
NTS



PROJECT LOCATION MAP
NTS

ENGINEER'S STATEMENT:

THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE 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.

Kenneth J. Clifton — COLORADO LICENSED — 41654 — PROFESSIONAL ENGINEER

ENGINEER OF RECORD SIGNATURE — 7/1/2021 DATE

OWNER'S STATEMENT:

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

Jessie J. Shaffer 7-6-21

OWNER SIGNATURE — DATE

EL PASO COUNTY:

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH THE COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/ OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE. DRAINAGE CRITERIA MANUAL VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL, AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF 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.

APPROVED
Engineering Department
07/12/2021 3:40:18 PM
dsdnijkamp
EPC Planning & Community Development Department

COUNTY ENGINEER SIGNATURE

N:\1051.6a\Drawings\1051.6a - Site Development Plan - Cover.dwg, 7/01/2021 - 2:30 PM, mmh

ABBREVIATIONS

AASHTO	AMERICAN ASSOC. OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ABAN	ABANDON
AC	ASPHALTIC CONCRETE PAVING
ADDL	ADDITIONAL
ADDM	ADDENDUM
ADJ	ADJUSTABLE
AL	ALUMINUM
ALT	ALTERNATE
AMT	AMOUNT
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ARV	AIR RELIEF VALVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ASPH	ASPHALT
ASSY	ASSEMBLY
ASYM	ASYMMETRICAL
AUTO	AUTOMATIC
AVG	AVERAGE
AWWA	AMERICAN WATER WORKS ASSOC.
BC	BACK OF CURB
BFV	BUTTERFLY VALVE
BG	FINISHED GRADE ADJACENT TO BOTTOM OF WALL
BLDG	BUILDING
BLK	BLOCK
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BS	BACKSIGHT
BOS	BOTTOM OF STEP
BOT	BOTTOM
BSMT	BASEMENT
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
BW	BOTTOM OF WALL
CB	CATCH BASIN
CCW	COUNTER CLOCKWISE
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CIP	CAST IRON PIPE
CJ	CONSTRUCTION JOINT
CL	CENTER LINE OR CHAIN LINK
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS(ATION)
COR	CORNER
CR	CONCENTRIC REDUCER
CTR	CENTER
CY	CUBIC YARDS
DEMO	DEMOLITION
DIA	DIAMETER
DIAG	DIAGONAL
DIP	DUCTILE IRON PIPE
DOM	DOMESTIC
DN	DOWN
DR	DRAIN
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
ECC	ECCENTRIC
EJ	EXPANSION JT
EL	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
ENGR	ENGINEER
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ESMT	EASEMENT
EST	ESTIMATE
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EW	EACH WAY
EXP JT	EXPANSION JOINT
EXIST	EXISTING
FND	FOUNDATION
FES	FLARED END SECTION
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FN	FENCE
FOC	FACE OF CONCRETE
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
FTG	FOOTING OR FITTING
G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GCO	GRADE CLEANOUT
GIP	GALVANIZED IRON PIPE
GND	GROUND
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRATE
GRTG	GRATING
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
H	HIGH
HB	HOSE BIB
HE	HORIZONTAL ELLIPTICAL
HDWL	HEADWALL
HNDRL	HAND RAIL
HORIZ	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWY	HIGHWAY
HWL	HIGH WATER LINE
HYD	HYDRANT
INCL	INCLUDED
ID	INSIDE DIAMETER
IN	INLET
INSUL	INSULATION
INV	INVERT
IRR	IRRIGATION
JTS	JOINTS
KO	KNOCKOUT
KPL	KICK PLATE
KWY	KEYWAY
L	LEFT OR LITER
LSCAPE	LANDSCAPE(ING)
LF	LINEAR FOOT
LP	LOW POINT
LT	LIGHT
LWL	LOW WATER LEVEL
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMUM
ME	MATCH EXISTING
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
OPT	OPTIONAL
PC	POINT OF CURVATURE
PCO	PRESSURE CLEAN OUT
PCR	POINT OF CURVE RETURN
PI	POINT OF INTERSECTION
PVI	POINT OF VERTICAL INTERSECTION
PL	PROPERTY LINE
PE	POLYETHYLENE
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PREP	PREPARATION
PROP	PROPOSED
PRV	PRESSURE REDUCING VALVE OR PRESSURE RELIEF VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE OR POINT OF VERTICAL CURVATURE
PVMT	PAVEMENT
QTY	QUANTITY
R	RIGHT
RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RE	REFERENCE
RECT	RECTANGULAR
REINF	REINFORCE (D) (ING) (MENT)
REQD	REQUIRED
ROW	RIGHT OF WAY
SAN	SANITARY
SD	STORM DRAIN
SECT	SECTION
SPD	STANDARD PROCTOR DENSITY
SPEC	SPECIFICATION
SQ	SQUARE
SQ IN	SQUARE INCH
SQ FT	SQUARE FOOT
SQ YD	SQUARE YARD
SS	SANITARY SEWER
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SVC	SERVICE
SWMP	STORMWATER MANAGEMENT PLAN
SYM	SYMMETRICAL
TB	THRUST BLOCK
TBC	TOP BACK OF CURB
TBM	TEMPORARY BENCH MARK
TEMP	TEMPORARY
TG	FINISHED GRADE ADJACENT TO TOP OF WALL
THK	THICK
TOB	TOP OF BANK
TOC	TOP OF CONCRETE OR TOP OF CURB
TOS	TOP OF STEP
TOT	TOTAL
TW	TOP OF WALL OR CAP OF WALL
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UGE	UNDERGROUND ELECTRIC
UTIL	UTILITY
VERT	VERTICAL
VC	POINT OF VERTICAL CURVATURE
VCP	VITRIFIED CLAY PIPE
W	WIDE OR WIDTH
W/	WITH
W/O	WITHOUT
WQCE	WATER QUALITY CONTROL ELEVATION
WSE	WATER SURFACE ELEVATION
WW	WASTEWATER
X SECT	CROSS SECTION
XFMR	ELECTRONIC TRANSFORMER
YH	YARD HYDRANT

DESIGN LEGEND

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

DEMOLITION LEGEND

DETAIL TITLE

DUCTILE IRON PIPE LEGEND

SECTION CALLOUT

DETAIL MARKER

DESIGN CRITERIA

DESIGN FLOW

TO CWTP

$Q_{IRRIGATION}$:	300 GPM
Q_{FIRM}:	1,200 GPM
Q_{MAX}:	1,550 GPM

TO SWTP

$Q_{IRRIGATION}$:	700 GPM
Q_{FIRM}:	2,100 GPM
Q_{MAX}:	2,800 GPM

PUMP STATION

CWTP PUMPS

PUMP QUANTITY:	3
TYPE:	SUBMERSIBLE
PUMP DESIGN FLOW, EACH:	750 GPM
TDH:	120 FT
OPERATIONS:	LEAD/LAG/SWING
MOTOR HP, EACH:	45 HP
POWER:	480V, 3 PHASE

SWTP PUMPS

PUMP QUANTITY:	5 (4 FUTURE)
TYPE:	SUBMERSIBLE
PUMP DESIGN FLOW, EACH:	560 GPM
TDH:	179 FT
OPERATIONS:	LEAD/LAG/LAG/LAG/LAG (WITH 2 EXIST PUMPS)
MOTOR HP, EACH:	45 HP
POWER:	480V, 3 PHASE

EXIST PUMP STATION

EXIST SWTP PUMPS (TO BE REPLACED IN THE FUTURE)

PUMP QUANTITY:	2
TYPE:	SUBMERSIBLE
PUMP DESIGN FLOW, EACH:	700 GPM
TDH:	_____ FT
MOTOR HP, EACH:	20 HP
POWER:	480V, 3 PHASE

EXIST IRRIGATION PUMP

PUMP QUANTITY:	1
TYPE:	SUBMERSIBLE
PUMP DESIGN FLOW:	500 GPM
TDH:	______ FT
OPERATIONS:	DUTY
MOTRO HP, EACH:	20 HP
POWER:	480V, 3 PHASE

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF EL PASO COUNTY, COLORADO, WOODMOOR WATER AND SANITATION DISTRICT, COLORADO DEPARTMENT OF TRANSPORTATION, TRI-LAKES MONUMENT FIRE PROTECTION DISTRICT REQUIREMENTS, AND APPLICABLE STATE AND LOCAL STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL HAVE IN POSSESSION AT THE JOB SITE AT ALL TIMES ONE (1) SIGNED COPY OF APPROVED PLANS, STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN EMERGENCY ACCESS ROUTES TO THE SITE AND STRUCTURE AT ALL TIMES PER THE APPLICABLE TRI-LAKES MONUMENT FIRE PROTECTION DISTRICT REQUIREMENTS. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ANY VARIANCE TO THE ABOVE DOCUMENTS. NOTIFY ENGINEER OF ANY CONFLICTING STANDARDS OR SPECIFICATIONS. IN THE EVENT OF ANY CONFLICTING STANDARD OR SPECIFICATION, THE MORE STRINGENT OR HIGHER QUALITY STANDARD, DETAIL OR SPECIFICATION SHALL APPLY.

2. THE CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL APPLICABLE CODES, LICENSES, STANDARD SPECIFICATIONS, PERMITS, BONDS, ETC., WHICH ARE NECESSARY TO PERFORM THE PROPOSED WORK, INCLUDING, BUT NOT LIMITED TO A LOCAL AND STATE GROUNDWATER DISCHARGE AND COLORADO DEPARTMENT OF HEALTH AND ENVIRONMENT (CDPHE) STORMWATER DISCHARGE PERMIT ASSOCIATED WITH CONSTRUCTION ACTIVITY.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE REQUIRED PARTY (OWNER AND ENGINEER) AT LEAST 48 HOURS PRIOR TO START OF ANY CONSTRUCTION, PRIOR TO BACKFILLING, AND AS REQUIRED BY JURISDICTIONAL AUTHORITY AND/OR PROJECT SPECIFICATIONS. THE CONTRACTOR SHALL CONTINUE WITH NOTIFICATIONS THROUGHOUT THE PROJECT AS REQUIRED BY THE STANDARDS AND SPECIFICATIONS.

4. THE LOCATIONS OF EXISTING UTILITIES ARE SHOWN IN THE APPROXIMATE LOCATION BASED ON INFORMATION BY OTHERS. NOT ALL UTILITIES MAY BE SHOWN. THE CONTRACTOR SHALL DETERMINE THE EXACT SIZE, LOCATION AND TYPE OF ALL EXISTING UTILITIES WHETHER SHOWN OR NOT BEFORE COMMENCING WORK. THE ENGINEER AND/OR OWNER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS SHOWN ON PLANS. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGES AND COSTS WHICH MIGHT OCCUR BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES. THE CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY COMPANIES AND DETERMINE THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO PROCEEDING WITH GRADING AND CONSTRUCTION. ALL WORK PERFORMED IN THE AREA OF UTILITIES SHALL BE PERFORMED AND INSPECTED ACCORDING TO THE REQUIREMENTS OF THE UTILITY OWNER. LIKEWISE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAPPING ANY EXISTING UTILITY (INCLUDING DEPTH) WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION, AND FOR RELOCATING ENCOUNTERED UTILITIES AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL CONTACT AND RECEIVE APPROVAL FROM UTILITY OWNER AND ENGINEER BEFORE RELOCATING ANY ENCOUNTERED UTILITIES. CONTRACTOR RESPONSIBLE FOR SERVICE CONNECTIONS, AND RELOCATING AND RECONNECTING AFFECTED UTILITIES AS COORDINATED WITH UTILITY OWNER AND/OR ENGINEER, INCLUDING NON-MUNICIPAL UTILITIES (TELEPHONE, GAS, CABLE, ETC., WHICH SHALL BE COORDINATED WITH THE UTILITY OWNER). THE CONTRACTOR SHALL IMMEDIATELY CONTACT ENGINEER UPON DISCOVERY OF A UTILITY DISCREPANCY OR CONFLICT. AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY NOTIFICATION CENTER OF COLORADO (1-800-922-1987, WWW.UNCC.ORG). SEE SURVEY UTILITY LOCATION INFORMATION BELOW.

5. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PREPARE A TRAFFIC CONTROL PLAN FOR OWNER AND/OR CITY APPROVAL AND PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FENCING, FLAGMEN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR AGREES TO COMPLY WITH THE PROVISIONS OF THE TRAFFIC CONTROL PLAN AND THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," PART VI, FOR CONSTRUCTION SIGNAGE AND TRAFFIC CONTROL. ALL TEMPORARY AND PERMANENT TRAFFIC SIGNS SHALL COMPLY TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) WITH REGARD TO SIGN SHAPE, COLOR, SIZE, LETTERING, ETC. UNLESS OTHERWISE SPECIFIED. IF APPLICABLE, PART NUMBERS ON SIGNAGE DETAILS REFER TO MUTCD SIGN NUMBERS.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY GROUNDWATER ENCOUNTERED DURING THE CONSTRUCTION OF ANY PORTION OF THIS PROJECT. GROUNDWATER SHALL BE PUMPED, PIPED, REMOVED AND DISPOSED OF IN A MANNER WHICH DOES NOT CAUSE FLOODING OF EXISTING STREETS NOR EROSION ON ABUTTING PROPERTIES IN ORDER TO CONSTRUCT THE IMPROVEMENTS SHOWN ON THESE PLANS. GROUNDWATER TO BE PUMPED SHALL BE TESTED, PERMITTED, AND PUMPED PER THE STATE OF COLORADO AND LOCAL GROUNDWATER DISCHARGING PERMIT REQUIREMENTS.

7. RIM AND GRATE ELEVATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS. THE CONTRACTOR SHALL ADJUST RIMS AND OTHER IMPROVEMENTS TO MATCH FINAL PAVEMENT AND FINISHED GRADE ELEVATIONS.

8. THE EXISTING AND PROPOSED ELEVATIONS OF FLATWORK, SIDEWALKS, CURBS, THRESHOLDS, PAVING, ETC. AS SHOWN HEREON ARE BASED ON EXTRAPOLATION OF FIELD SURVEY DATA, EXISTING CONDITIONS, AND DATA PROVIDED BY OTHERS. AT CRITICAL AREAS AND SITE FEATURES, CONTRACTOR SHALL HAVE FORMWORK INSPECTED AND APPROVED BY OWNER, OWNER'S REPRESENTATIVE, OR ENGINEER PRIOR TO PLACING CONCRETE. MINOR ADJUSTMENTS, AS APPROVED, TO PROPOSED GRADES, INVERTS, ETC. MAY BE REQUIRED TO PREVENT PONDING OR SLOPE NOT IN CONFORMANCE WITH MUNICIPAL STANDARDS. ALL FLATWORK MUST PREVENT PONDING AND PROVIDE POSITIVE DRAINAGE AWAY FROM EXISTING AND PROPOSED BUILDINGS, WALLS, ROOF DRAIN OUTFALLS, ACROSS DRIVES AND WALKS, ETC., TOWARDS THE PROPOSED INTENDED DRAINAGE FEATURES AND CONVEYANCES. EARTHEN FORM WORK SHALL NOT BE ALLOWED.

9. FINAL LIMITS OF REQUIRED ASPHALT SAWCUTTING AND PATCHING MAY VARY FROM LIMITS SHOWN ON PLANS. CONTRACTOR TO PROVIDE SAWCUT AND PATCH WORK TO ACHIEVE POSITIVE DRAINAGE AND A SMOOTH TRANSITION TO EXISTING ASPHALT WITHIN SLOPES ACCEPTABLE TO THE ENGINEER AND WITHIN MUNICIPAL STANDARDS. CONTRACTOR SHALL PROVIDE ADDITIONAL SAWCUTTING AND PATCHING AT UTILITY WORK, CONNECTION POINTS TO EXISTING PAVEMENT AND FEATURES, ETC. THAT MAY NOT BE DELINEATED ON PLANS.

10. ANY EXISTING MONITORING WELLS, CLEANOUTS, VALVE BOXES, ETC. TO BE PROTECTED AND TO REMAIN IN SERVICE. IF FEATURES EXIST, EXTEND OR LOWER TO FINAL SURFACE WITH LIKE KIND CAP WITH STANDARD CAST ACCESS LID WITH SAME MARKINGS. IN LANDSCAPED AREAS PROVIDE A CONCRETE COLLAR (18"X18"X6" THICK) AT ALL EXISTING AND PROPOSED MONITORING WELLS, CLEANOUTS, VALVE BOXES, ETC.

11. OWNER TO APPROVE ALL PRIVATE CONCRETE FINISHING, JOINT PATTERNS AND COLORING REQUIREMENTS PRIOR TO CONSTRUCTION. SUBMIT JOINT LAYOUT PLAN TO OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.

12. PIPE LENGTHS AND HORIZONTAL CONTROL POINTS SHOWN ARE FROM CENTER OF STRUCTURES, END OF FLARED END SECTIONS, ETC. SEE STRUCTURE DETAILS FOR EXACT HORIZONTAL CONTROL LOCATION. CONTRACTOR IS RESPONSIBLE FOR ADJUSTING ACTUAL PIPE LENGTHS TO ACCOUNT FOR STRUCTURES AND LENGTH OF FLARED END SECTIONS.

13. ALL SURPLUS MATERIALS, TOOLS, AND TEMPORARY STRUCTURES, FURNISHED BY THE CONTRACTOR, SHALL BE REMOVED FROM THE PROJECT SITE BY THE CONTRACTOR. ALL DEBRIS AND RUBBISH CAUSED BY THE OPERATIONS OF THE CONTRACTOR SHALL BE REMOVED, AND THE AREA OCCUPIED DURING CONSTRUCTION ACTIVITIES SHALL BE RESTORED TO ITS ORIGINAL CONDITION, WITHIN 48 HOURS OF PROJECT COMPLETION, UNLESS OTHERWISE DIRECTED BY THE MUNICIPALITY OR OWNER'S REPRESENTATIVE.

14. THE CONTRACTOR IS REQUIRED TO PROVIDE AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE LOCAL JURISDICTION, THE STATE OF COLORADO, THE M-STANDARD PLANS OF THE COLORADO DEPARTMENT OF TRANSPORTATION, AND THE APPROVED EROSION CONTROL PLAN. JURISDICTIONAL AUTHORITY MAY REQUIRE THE CONTRACTOR TO PROVIDE ADDITIONAL EROSION CONTROL MEASURES AT THE CONTRACTOR'S EXPENSE DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE PLANS DO NOT FUNCTION AS INTENDED. THE CONTRACTOR IS RESPONSIBLE FOR PROHIBITING SILT AND DEBRIS LADEN RUNOFF FROM LEAVING THE SITE, AND FOR KEEPING ALL PUBLIC AREAS FREE OF MUD AND DEBRIS. THE CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING FINAL GRADES AND FOR REMOVING ACCUMULATED SEDIMENTATION FROM ALL AREAS INCLUDING SWALES AND DETENTION/WATER QUALITY AREAS. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL MEASURES AND REPAIR AREAS AS REQUIRED AFTER VEGETATION IS ESTABLISHED AND ACCEPTED BY OWNER AND MUNICIPALITY.

15. PROTECT ALL TREES AND VEGETATION. PLACE CONSTRUCTION FENCING AT DRIP LINE OF TREES AND PLANTS NEAR THE WORK ZONE. DEEP WATER TREES WEEKLY. HAND EXCAVATION REQUIRED AT ROOT ZONES WHERE PROPOSED PAVING OR UTILITY WORK IS WITHIN DRIPLINE OF TREES.

16. SURVEY INFORMATION:
    - 16.1. BENCHMARK INFORMATION: TOPOGRAPHIC INFORMATION WAS PROVIDED BY FLATIRONS SURVEYING, INC. SEE "EFILE-C19-75763-LSP_2021-01-19" DATED 01/19/2021. PROJECT BENCHMARK ELEVATION: 7111.32' AT NGS CONTROL POINT T 395 (STAINLESS STEEL ROD). THE DATUM IS NAVD88 PER SURVEY. COORDINATE AND VERIFY ALL VERTICAL AND HORIZONTAL DATA SHOWN IN SURVEY AND REPORT ANY IRREGULARITIES OR DISCREPANCIES TO ENGINEER PRIOR TO CONSTRUCTION.
    - 16.2. BASIS OF BEARINGS: GPS DERIVED BEARINGS BASED ON A BEARING OF S64°36'08"E ALONG THE NORTHERLY LINE OF THE DUNES AT WOODMOOR, FILING NO. 2 AS DESCRIBED IN THE RECORDS OF EL PASO COUNTY, RECORDED ON DECEMBER 09, 2016 AT RECEPTION NO. 216713876, BETWEEN A FOUND #4 REBAR WITH 1 1/4" YELLOW PLASTIC CAP "EDWARD JAMES LS 33196" AT THE NORTHWESTERLY CORNER OF LOT 14 OF SAID PLAT AND A FOUND #4 REBAR WITH 1 1/4" YELLOW PLASTIC CAP "LS 31548" AT THE NORTHEASTERLY CORNER OF LOT 20 OF SAID PLAT AS SHOWN HEREON. COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983 (NAD83). ALL BEARINGS SHOWN HEREON ARE RELATIVE THERETO
    - 16.3. HORIZONTAL CONTROL INFORMATION: HORIZONTAL CONTROL COORDINATES ARE BASED ON THE REFERENCED SURVEY AND ARE PROVIDED BY THE FOLLOWING POINTS AS SHOWN ON THE PLANS:

CP-1	N1463889.46	E3181603.53	ELEV 7146.81	
CP-3	N1463758.58	E318955.55	ELEV 7147.60	
CP-4	N1463758.57	E3181955.58	ELEV 7147.85	
CP-28	N1461914.45	E3181634.98	ELEV 7096.08	PIN 4RBR 1.25IN YPC EDWARD JAMES LS 33196
CP-38	N1461267.86	E3181664.59	ELEV 7088.36	PIN 4RBR 1.25IN YPC EDWARD JAMES LS 33196
CP-45	N1460943.23	E3182734.55	ELEV 7102.66	PIN 4RBR 1.5IN OPC LS 25966

    - 16.4 SURVEY UTILITY LOCATION INFORMATION PER THE SURVEYOR: SUBSURFACE UTILITIES ARE SHOWN IN APPROXIMATE HORIZONTAL AND VERTICAL LOCATIONS CONSISTENT WITH ASCE 38-02 QUALITY LEVEL "B" (INFORMATION OBTAINED BY THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND HORIZONTAL POSITION OF VIRTUALLY ALL UTILITIES WITHIN THE PROJECT LIMITS. THE INFORMATION OBTAINED IN THIS MANNER IS SURVEYED TO PROJECT CONTROL.) AND QUALITY LEVEL "C" (INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D; INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS), AND BASED ON FIELD MEASUREMENTS PROVIDED BY THE OWNER AND THE CONTRACTOR. SUBSURFACE UTILITIES ARE NOT DEPICTED TO THE EXTENT SET FORTH IN ASCE 38-02 QUALITY LEVELS "A" (INFORMATION OBTAINED THROUGH THE NONDESTRUCTIVE EXPOSURE OF UNDERGROUND UTILITIES, AND ALSO PROVIDES THE TYPE, SIZE, CONDITION, MATERIAL AND OTHER CHARACTERISTICS OF UNDERGROUND FEATURES.). TO THE EXTENT DEEMED NECESSARY FOR THE PROTECTION OF PERSONS AND PROPERTY, POTHOLING OR OTHER PRECISE MAPPING MAY BE COMPLETED TO CONFIRM THE EXACT LOCATION OF ANY SUBSURFACE UTILITIES. NOTIFY OWNER AND ENGINEER WITH ALL UTILITY INFORMATION PRIOR TO CONSTRUCTION. VISIT HTTPS://WWW.FHWA.DOT.GOV/PROGRAMADMIN/SUEINDEX.CFM FOR MORE INFORMATION.

17. THE CONTRACTOR AT THE CONTRACTORS EXPENSE SHALL FURNISH THE OWNER AND ENGINEER OF RECORD A COMPLETE SET OF CONSTRUCTION RECORD DRAWINGS ("AS-BUILTS") FOR THE CONSTRUCTED IMPROVEMENTS. THE AS-BUILT SET SHALL SHOW SUFFICIENT DIMENSION TIES TO PERMANENT SURFACE FEATURES OR NORTHING/EASTING POINTS FOR ALL BURIED FACILITIES TO ALLOW FOR FUTURE LOCATING. THE AS-BUILT SET SHALL SHOW AS-BUILT CONTOURS AND ELEVATIONS OF ASPHALT AND CONCRETE FLATWORK, FLOWLINES, GRADE BREAKS, STAIRS, CROSS-SLOPES, HIGH AND LOW POINTS, AND ADDITIONAL ELEVATIONS TO DEMONSTRATE IMPROVEMENTS WERE CONSTRUCTED PER PLANS. THE AS-BUILT SET SHALL SHOW ELEVATIONS OF ALL DETENTION/WATER QUALITY FACILITIES, INCLUDING BUT NOT LIMITED TO BERMS, SPILLWAYS, BASIN BOTTOM, PIPE INVERTS, AND CONTROL STRUCTURE FEATURES (AS SURVEYED AND STAMPED BY A CERTIFIED P.L.S.). THE AS-BUILT SET SHALL ALSO INCLUDE ELEVATIONS OF MANHOLES, PIPES, INLETS, GRATES, AND SIZES OF ALL UTILITIES. THE AS-BUILT SET SHALL SHOW ANY AND ALL VARIATIONS FROM THE APPROVED PLAN. ENGINEER WILL PRODUCE FINAL RECORD DRAWINGS.

DEMOLITION NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REFER TO GENERAL NOTES FOR UTILITY LOCATION AND PROTECTION.
2. ACTUAL LIMITS MAY VARY, CONTRACTOR IS RESPONSIBLE FOR ADJUSTING LIMITS OF DEMOLITION AND CONSTRUCTION AS NECESSARY. COORDINATE DEMOLITION REQUIREMENTS, LIMITS OF DEMOLITION, SALVAGE ITEMS, PROTECTION OF ITEMS TO REMAIN, TREES, FENCING, ETC. WITH OWNER, ARCHITECT, ENGINEER, AND RELEVANT CONSTRUCTION AND PHASING PLANS.
3. REPLACE EXISTING FLATWORK AT UTILITY TRENCHES AS REQUIRED.
4. ALL SAWCUTTING AND PAVEMENT REMOVAL SHOULD BE TO THE NEAREST JOINT.
5. ALL DRY UTILITY AND ELECTRIC DEMOLITION OR RELOCATION SHOULD BE COORDINATED WITH PROPERTY OWNER, UTILITY OWNER, MECHANICAL ENGINEER, AND ARCHITECT PRIOR TO CONSTRUCTION.
6. ALL NECESSARY EROSION AND SEDIMENTATION CONTROLS MUST BE INSTALLED PRIOR TO CONSTRUCTION.
7. CONTRACTOR TO COMPLY WITH ALL REGULATORY REQUIREMENTS FOR HAZARDOUS MATERIAL REMOVAL AND DISPOSAL.
8. REFER TO GENERAL NOTES FOR TREE PROTECTION. COORDINATE WITH LANDSCAPE ARCHITECT FOR TREE REMOVAL.
9. CONTRACTOR TO MAINTAIN SAFE PEDESTRIAN ACCESS. PROVIDE TEMPORARY ROUTE AND SIGNAGE AS NEEDED.
10. CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO PROTECT AND MAINTAIN SERVICES DURING CONSTRUCTION.
11. CONTRACTOR TO REPAIR/REPLACE ALL DAMAGE TO EXISTING FLATWORK OR SITE FEATURES NOT INTENDED FOR DEMOLITION.

EPC 7/12/2021

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Denver, CO 80202 303.444.1951
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Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

KENNETH JAMES CLIFFORD
41654
7/1/2021

DESIGNED BY:	KCT/MHT
DRAWN BY:	JCD
CHECKED BY:	RAH/JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

LEGEND, NOTES, & ABBREVIATIONS

SHEET NO.
G0.1

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NOTES:

1. PARCELS AFFECTED BY THE PUMP STATION AND/OR THE TRANSMISSION MAIN ARE HIGHLIGHTED IN YELLOW. INFORMATION REGARDING THESE PARCELS IS INCLUDED IN THE "SITE DEVELOPMENT PLAN SUBJECT PROPERTY" AND "PROPERTIES AFFECTED BY TRANSMISSION PIPELINE" TABLES BELOW. EACH AFFECTED PARCEL IS ASSIGNED A REFERENCE LETTER FOR CLARITY. LEGAL DESCRIPTIONS ARE ATTACHED FOR REFERENCE.
2. ADJACENT PARCELS ARE SHOWN FOR REFERENCE. INFORMATION REGARDING THESE PARCELS IS INCLUDED IN THE "ADJACENT PROPERTIES" TABLES BELOW. EACH ADJACENT PARCEL IS ASSIGNED A REFERENCE NUMBER FOR CLARITY

150 0 150 300
SCALE IN FEET

SITE DEVELOPMENT PLAN SUBJECT PROPERTY

REFERENCE LETTER	PARCEL NUMBER	ADDRESS	PARCEL OWNER	ZONING DESIGNATION	LAND USE	PARCEL SIZE (AC)
A	7111400008	1596 LAKE WOODMOOR DRIVE	WOODMOOR WATER & SANITATION	R-4	PLANNED DEVELOPMENT	43.19

PROPERTIES AFFECTED BY TRANSMISSION PIPELINE

REFERENCE LETTER	PARCEL NUMBER	ADDRESS	PARCEL OWNER	ZONING DESIGNATION	LAND USE	PARCEL SIZE (AC)
B	7114107034	1592 LAKE WOODMOOR DRIVE	BEACH AT WOODMOOR HOA	PUD	HOMEOWNERS ASSOCIATION	0.66
C	7114112002	1640 LAKE WOODMOOR DRIVE	CS LAND COMPANY LLC	PUD	VACANT COMMERCIAL LOTS	1.20
D	7114112001	1680 LAKE WOODMOOR DRIVE	CS LAND COMPANY LLC	PUD	VACANT COMMERCIAL LOTS	1.34
E	7114200041		WOODMOOR WATER & SANITATION	C-2; RR-5	POLITICAL SUBDIVISION	4.68
F	7114205030	1754 WILLOW PARKWAY	DUNES AT WOODMOOR HOA	PUD	HOMEOWNERS ASSOCIATION	2.62
G	7111304014	1776 WOODMOOR DRIVE	LEWIS PALMER SCHOOL DISTRICT #38	RR-5	POLITICAL SUBDIVISION	21.63
H	7111304015	1765 DEER CREEK ROAD	WOODMOOR WATER & SANITATION	I-2	POLITICAL SUBDIVISION	2.32

ADJACENT PROPERTIES

REFERENCE NUMBER	PARCEL NUMBER	PARCEL OWNER	ZONING DESIGNATION	LAND USE
1	7111301009	REDNER FAMILY TRUST	CC	SPECIAL PURPOSE
2	7111301010	TRI-LAKES CHAPEL INC	A-5	RELIGIOUS WORSHIP
3	7111406056	WOODMOOR LAKEHOUSE ASSN INC	R-4	HOMEOWNERS ASSOCIATION
4	7111406055	WOODMOOR LAKEHOUSE ASSN INC	R-4	HOMEOWNERS ASSOCIATION
5	7111305005	WOODMOOR WATER & SANITATION	RR-5	POLITICAL SUBDIVISION
6	7111305034	VILLAGE AT MOOR-WOOD OWNERS ASSN	R-4	HOMEOWNERS ASSOCIATION
7	7114204018	TAHSK LLC	CC	RECREATION
8	7114205032	DUNES AT WOODMOOR HOMEOWNERS ASSN	R-4; PUD	HOMEOWNERS ASSOCIATION
9	7114207014	DUNES AT WOODMOOR HOMEOWNERS ASSN	R-4; PUD	HOMEOWNERS ASSOCIATION
10	7114208019	DUNES AT WOODMOOR HOMEOWNERS ASSN	PUD	HOMEOWNERS ASSOCIATION
11	7114205011	FORRISTAL JEFFREY	PUD	SINGLE FAMILY RES
12	7114205012	ILARRAZA ERIC	PUD	SINGLE FAMILY RES
13	7114205013	MATTEA MELISSA	PUD	SINGLE FAMILY RES
14	7114205014	FRIEND EVA K	PUD	SINGLE FAMILY RES
15	7114205015	MCGOUGH ALBERT C	PUD	SINGLE FAMILY RES

ADJACENT PROPERTIES

REFERENCE NUMBER	PARCEL NUMBER	PARCEL OWNER	ZONING DESIGNATION	LAND USE
16	7114205016	TRASK CRAIG	PUD	SINGLE FAMILY RES
17	7114205017	HARRIS NATHAN P	PUD	SINGLE FAMILY RES
18	7114205018	FLORIA JOHN JR	PUD	SINGLE FAMILY RES
19	7114205019	KRAEMER MAX W	PUD	SINGLE FAMILY RES
20	7114205020	ULRICH DAN L	PUD	SINGLE FAMILY RES
21	7114205021	HAMILTON-SMITH DAVID	PUD	SINGLE FAMILY RES
22	7114109007	JONES JENNIFER KRISTEN	PUD	VACANT RESIDENTIAL LOTS
23	7114109008	SARGENT GREGORY LEE	PUD	SINGLE FAMILY RES
24	7114100015	WOODMOOR WATER & SANITATION	RR-5	POLITICAL SUBDIVISION
25	7114109034	BEACH AT WOODMOOR HOA	PUD	HOMEOWNERS ASSOCIATION
26	7114107019	CAMPBELL HOMES LLC	PUD	SINGLE FAMILY RES
27	7114107020	CASEY JEFFREY S	PUD	SINGLE FAMILY RES
28	7114107021	KANGAS GARY E JR	PUD	SINGLE FAMILY RES
29	7114107022	MAGILL ROBERT T	PUD	SINGLE FAMILY RES

EPC 7/12/2021

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO LICENSED
KENNETH JAMES HOLT
41654
7/1/2021
PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

VICINITY MAP

SHEET NO.
C0.1

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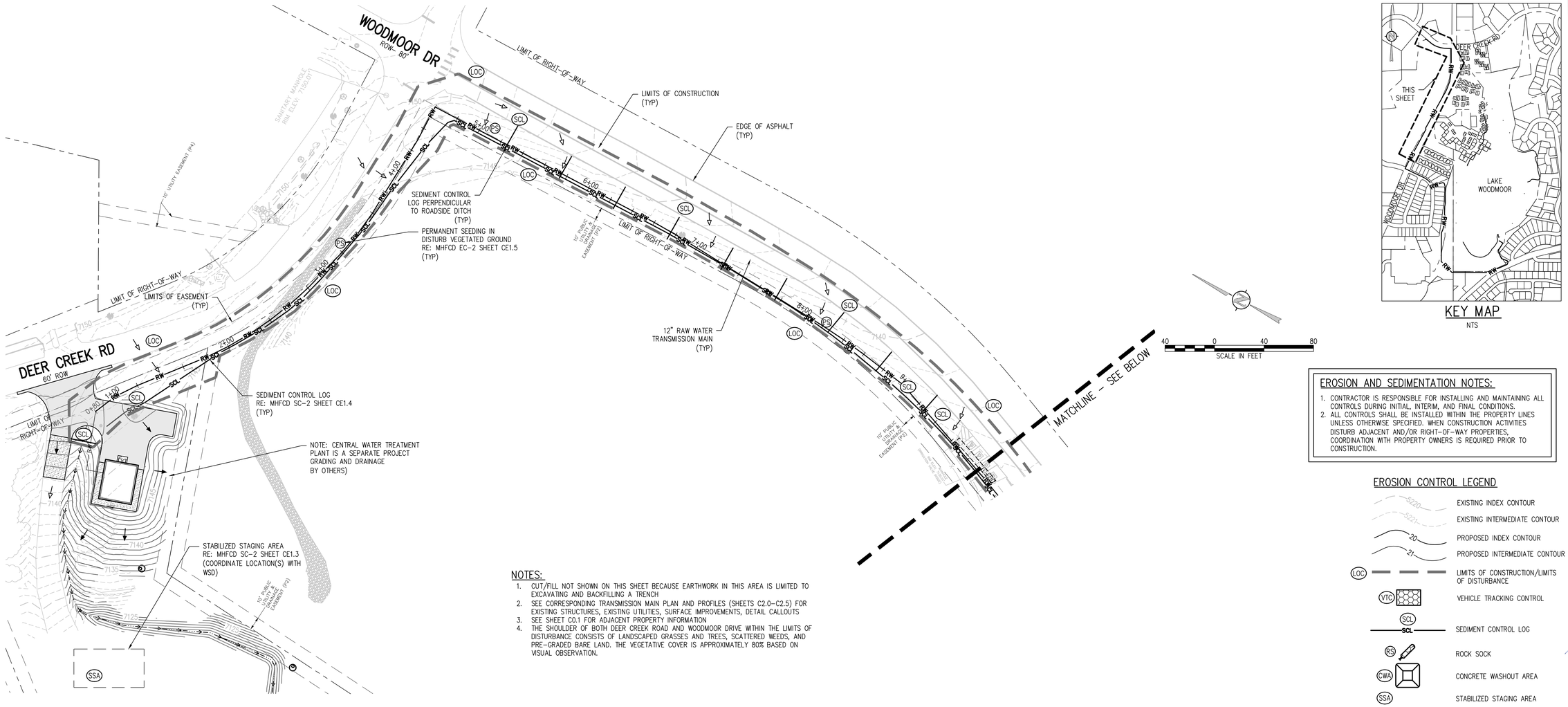


KEY MAP
NTS

EROSION AND SEDIMENTATION NOTES:

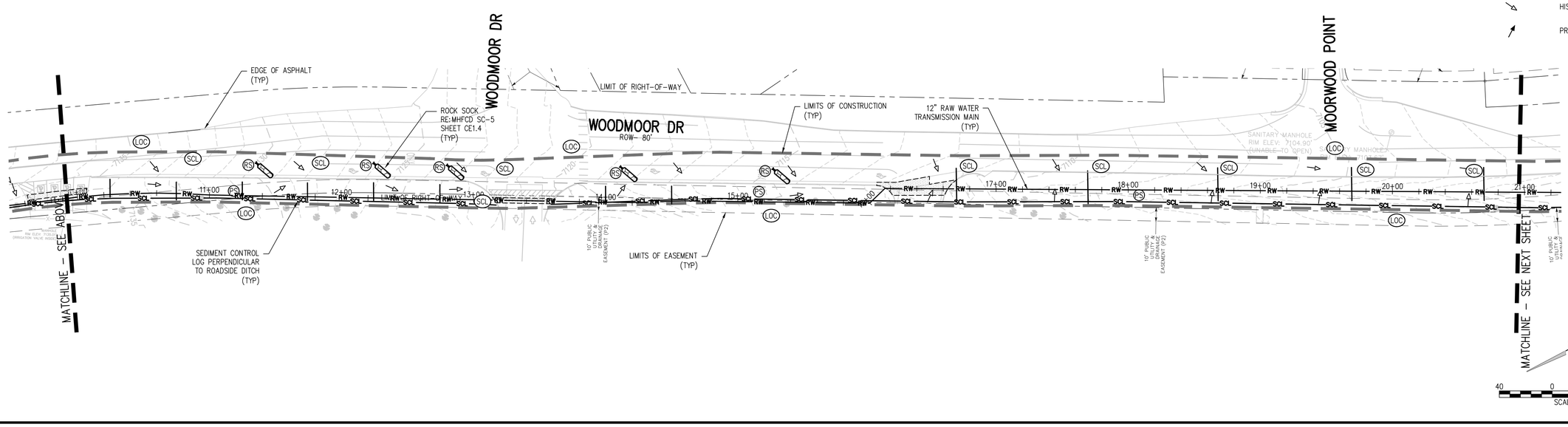
1. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL CONTROLS DURING INITIAL, INTERIM, AND FINAL CONDITIONS.
2. ALL CONTROLS SHALL BE INSTALLED WITHIN THE PROPERTY LINES UNLESS OTHERWISE SPECIFIED. WHEN CONSTRUCTION ACTIVITIES DISTURB ADJACENT AND/OR RIGHT-OF-WAY PROPERTIES, COORDINATION WITH PROPERTY OWNERS IS REQUIRED PRIOR TO CONSTRUCTION.

EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- LOC — LIMITS OF CONSTRUCTION/LIMITS OF DISTURBANCE
- VTC — VEHICLE TRACKING CONTROL
- SCL — SEDIMENT CONTROL LOG
- RS — ROCK SOCK
- CWA — CONCRETE WASHOUT AREA
- SSA — STABILIZED STAGING AREA
- PS — PERMANENT SEEDING
- HISTORIC DRAINAGE PATTERN
- PROPOSED DRAINAGE PATTERN

NOTES:

1. CUT/FILL NOT SHOWN ON THIS SHEET BECAUSE EARTHWORK IN THIS AREA IS LIMITED TO EXCAVATING AND BACKFILLING A TRENCH
2. SEE CORRESPONDING TRANSMISSION MAIN PLAN AND PROFILES (SHEETS C2.0-C2.5) FOR EXISTING STRUCTURES, EXISTING UTILITIES, SURFACE IMPROVEMENTS, DETAIL CALLOUTS
3. SEE SHEET C0.1 FOR ADJACENT PROPERTY INFORMATION
4. THE SHOULDER OF BOTH DEER CREEK ROAD AND WOODMOOR DRIVE WITHIN THE LIMITS OF DISTURBANCE CONSISTS OF LANDSCAPED GRASSES AND TREES, SCATTERED WEEDS, AND PRE-GRADED BARE LAND. THE VEGETATIVE COVER IS APPROXIMATELY 80% BASED ON VISUAL OBSERVATION.



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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO LICENSED
KENNETH J. AMES
41654
7/1/2021
PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

SHEET NO.
CE1.0

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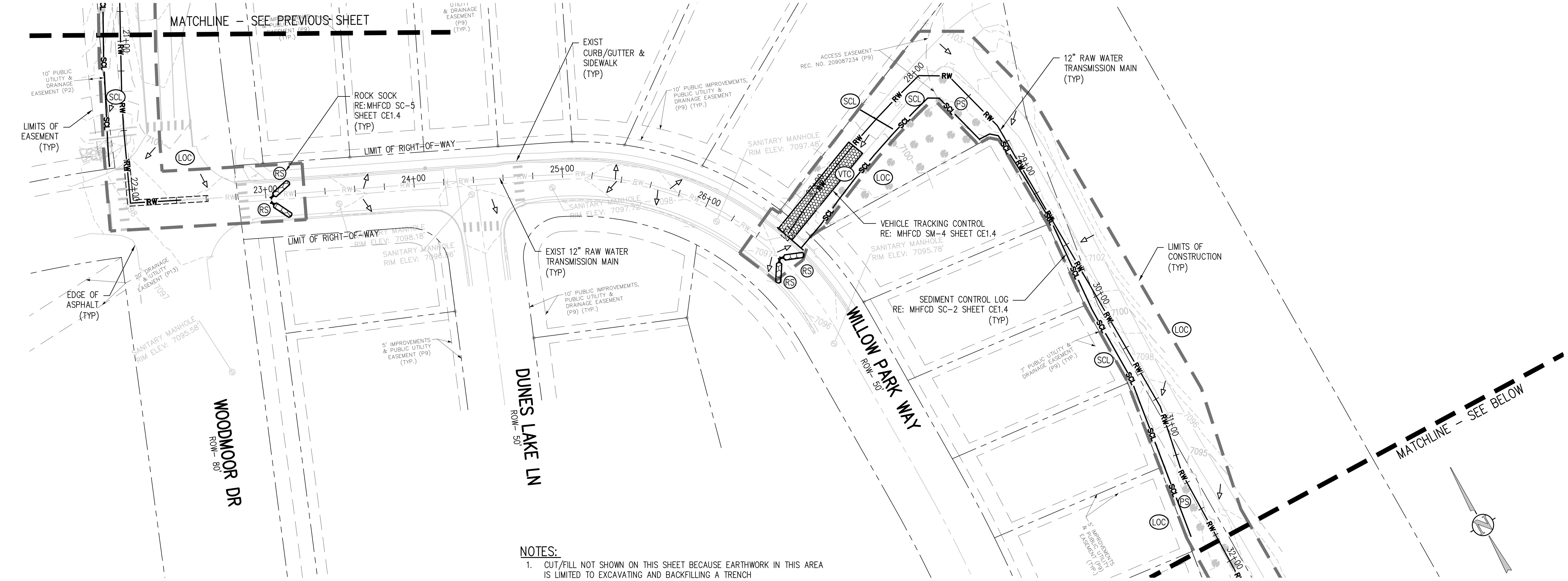

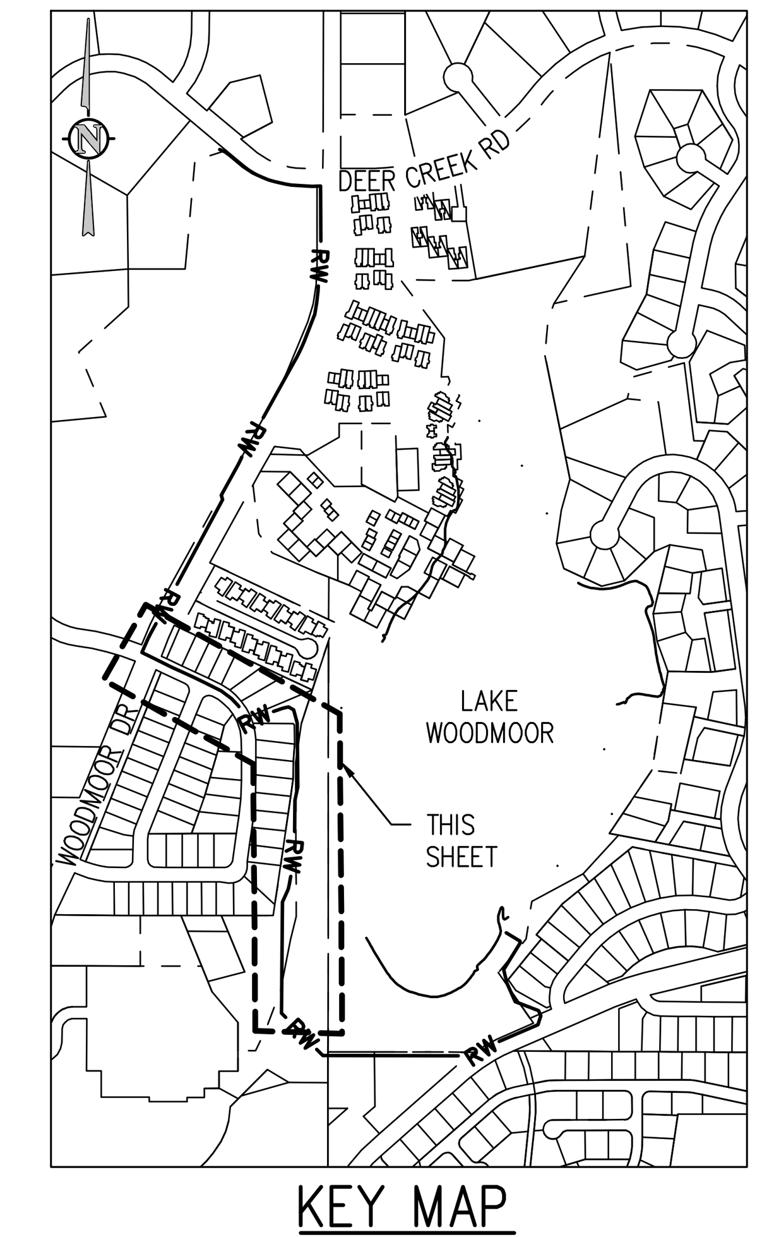

EROSION AND SEDIMENTATION NOTES:

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4. THE SHOULDER OF WOODMOOR DRIVE WITHIN THE LIMITS OF DISTURBANCE CONSISTS OF LANDSCAPED GRASSES AND TREES, SCATTERED WEEDS, AND PRE-GRADED BARE LAND. THE AREA SURROUNDING THE WALKING PATH ADJACENT TO THE LAKE'S DAM TOE CONSISTS OF NATIVE GRASSES AND SHRUBS, SCATTERED WEEDS, AND PRE-GRADED BARE LAND. LANDSCAPED TREES AND GRASSES EXIST DIRECTLY ADJACENT TO THE HOMES ALONG WILLOW PARK WAY. THE VEGETATIVE COVER WITHIN THE LIMITS OF DISTURBANCE IS APPROXIMATELY 80% BASED ON VISUAL OBSERVATION.

40 0 40 80
SCALE IN FEET

EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
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- PROPOSED INTERMEDIATE CONTOUR
- LOC — LIMITS OF CONSTRUCTION/LIMITS OF DISTURBANCE
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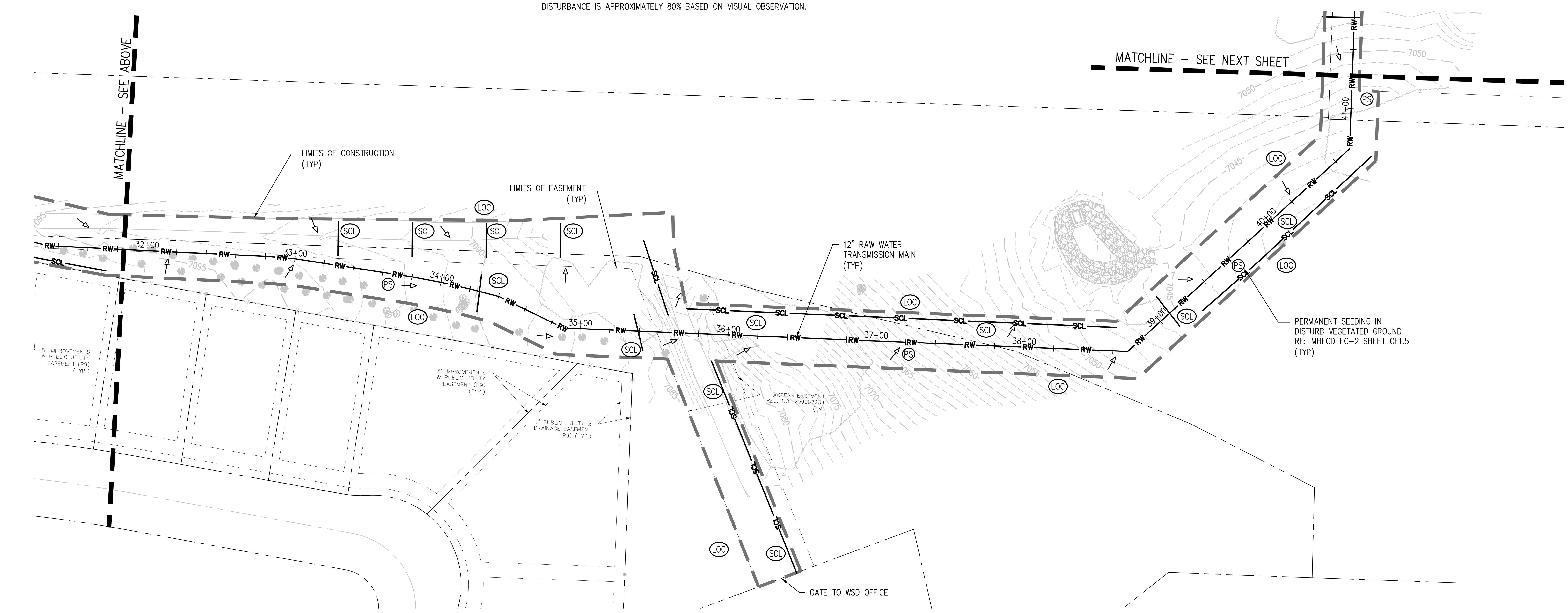

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SCALE IN FEET

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO LICENSED KENNETH JAMES CLIFFORD 41654 7/1/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1 LAKE PUMP STATION NO. 2 AND PIPELINE EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

SHEET NO.
CE1.1

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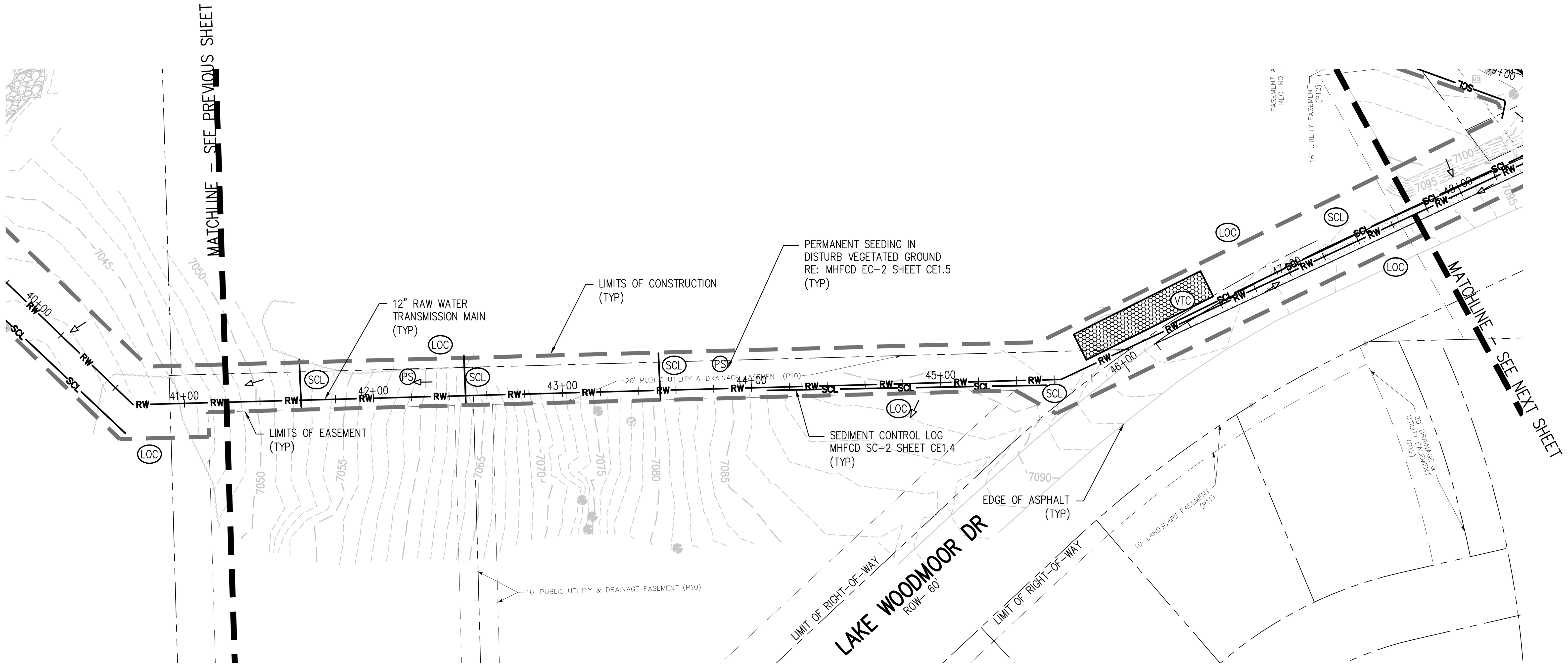

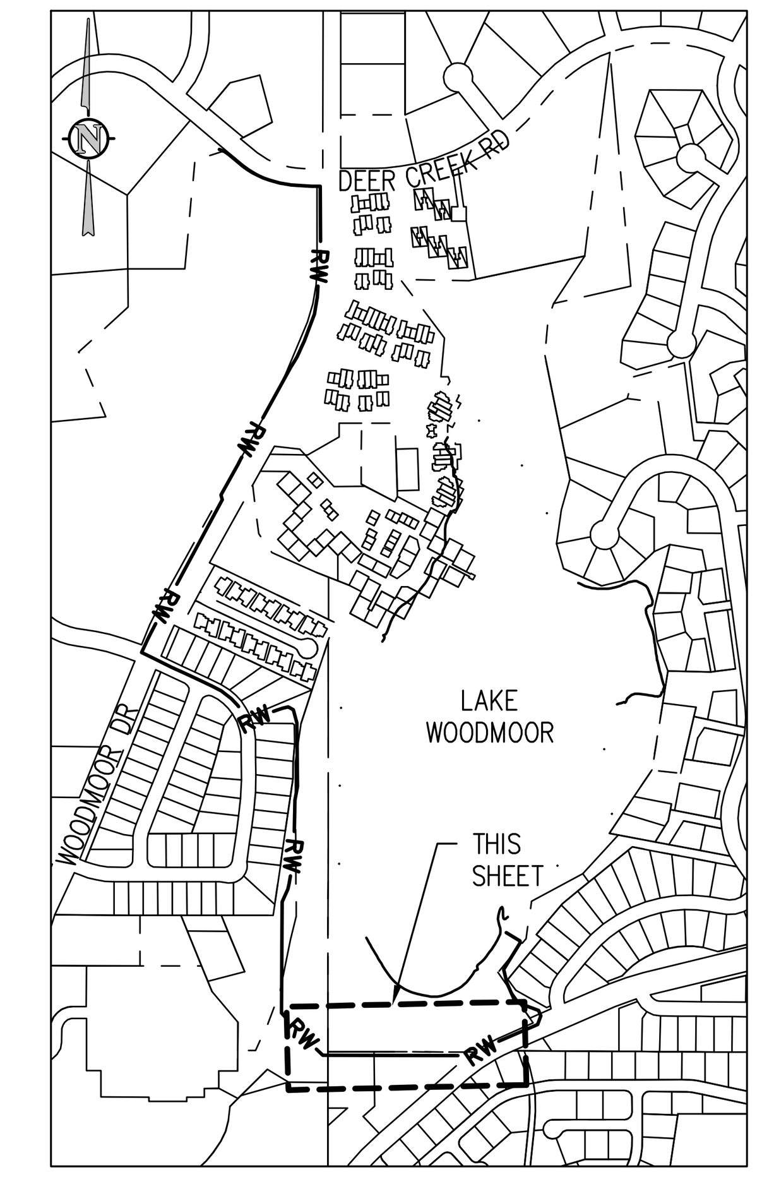

KEY MAP
NTS

NOTES:

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3. SEE SHEET C0.1 FOR ADJACENT PROPERTY INFORMATION
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40 0 40 80
SCALE IN FEET

EROSION AND SEDIMENTATION NOTES:

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EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
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- HISTORIC DRAINAGE PATTERN
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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO LICENSED PROFESSIONAL ENGINEER KENNETH JAMES CLIFF 41654 7/1/2021

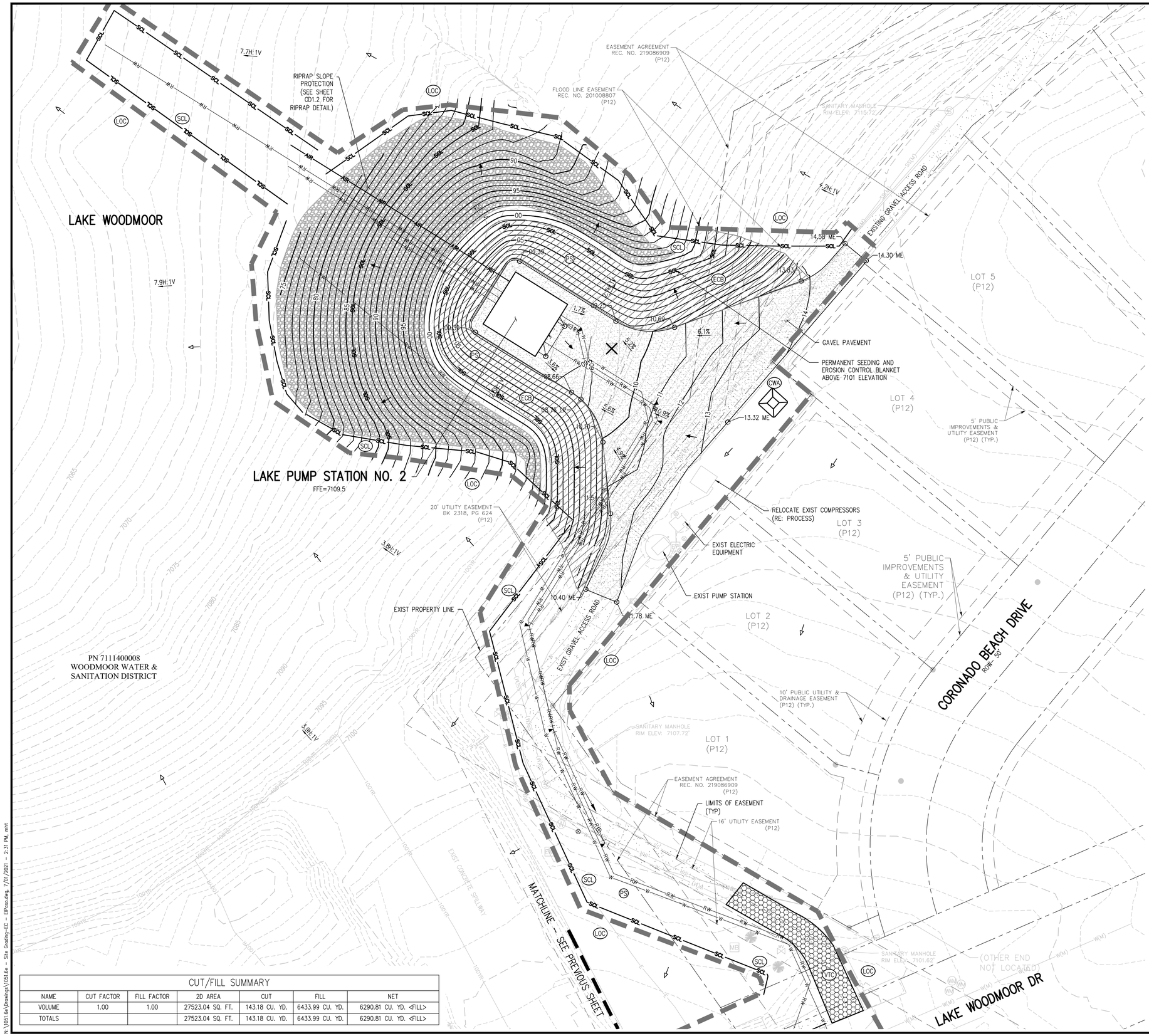
DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

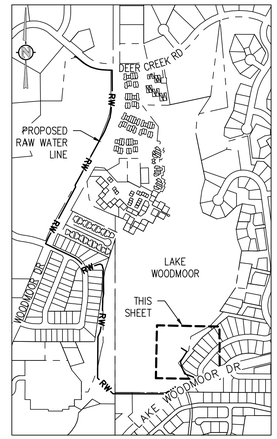
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

EPC 7/12/2021

SHEET NO.
CE1.2





KEY MAP
NTS

EROSION AND SEDIMENTATION NOTES:

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EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR (5220)
- EXISTING INTERMEDIATE CONTOUR (5221)
- PROPOSED INDEX CONTOUR (20)
- PROPOSED INTERMEDIATE CONTOUR (21)
- LOC — LIMITS OF CONSTRUCTION
- VTC — VEHICLE TRACKING CONTROL
- SCL — SEDIMENT CONTROL LOG
- CWA — CONCRETE WASHOUT AREA
- PS — PERMANENT SEEDING
- ECB — EROSION CONTROL BLANKET
- HISTORIC DRAINAGE PATTERN
- PROPOSED DRAINAGE PATTERN

NOTES:

1. SEE CORRESPONDING TRANSMISSION MAIN PLAN AND PROFILES (SHEETS C2.0–C2.5) FOR EXISTING STRUCTURES, EXISTING UTILITIES, SURFACE IMPROVEMENTS, DETAIL CALLOUTS
2. SEE SHEET C0.1 FOR ADJACENT PROPERTY INFORMATION
3. THE AREA SURROUNDING THE SHOULDER OF LAKE WOODMOOR DRIVE WITHIN THE LIMITS OF DISTURBANCE AS WELL AS THE AREA SURROUNDING THE EXISTING PUMP STATION ACCESS PATH CONSISTS OF NATIVE GRASSES AND SHRUBS, SCATTERED WEEDS AND TREES, AND PRE-GRADED BARE LAND. THE VEGETATIVE COVER WITHIN THE LIMITS OF DISTURBANCE IS APPROXIMATELY 80% BASED ON VISUAL OBSERVATION. IT IS ASSUMED THE AREA DIRECTLY ADJACENT TO THE HOMES ON CORONADO DRIVE WILL CONSIST OF LANDSCAPED GRASSES AND TREES.

EPC 7/12/2021

20 0 20 40
SCALE IN FEET

CUT/FILL SUMMARY

NAME	CUT FACTOR	FILL FACTOR	2D AREA	CUT	FILL	NET
VOLUME	1.00	1.00	27523.04 SQ. FT.	143.18 CU. YD.	6433.99 CU. YD.	6290.81 CU. YD. <FILL>
TOTALS			27523.04 SQ. FT.	143.18 CU. YD.	6433.99 CU. YD.	6290.81 CU. YD. <FILL>

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO LICENSED
KENNETH J. CARLSON
41654
7/1/2021
PROFESSIONAL ENGINEER

DESIGNED BY:	KCT
DRAWN BY:	JGJ
CHECKED BY:	KJC
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

GRADING AND EROSION CONTROL PLAN

SHEET NO.
CE1.3

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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 OR OFFSITE 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 TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR AND SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
4. ONCE THE ESQCP IS APPROVED AND A "NOTICE TO PROCEED"HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED GEC. A PRECONSTRUCTION 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 MAY CONTRIBUTE POLLUTANTS TO STORMWATER. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED 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 IS 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 PRIOR TO IMPLEMENTATION.
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. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE STABILIZED.
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 PERCENT OF PRE-DISTURBANCE 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 DEFINED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE HYDROLOGY OR HYDRAULICS OF A PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
10. ANY EARTH DISTURBANCE 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 INFEASIBLE.
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 SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED.
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 RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUT SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY.
14. DEWATERING OPERATIONS: UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON SITE, BUT MAY NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF.
15. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM CONSTRUCTION SITES 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, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM 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 CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
22. BULK STORAGE OF PETROLEUM PRODUCTS OR OTHER LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL HAVE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR 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. INDIVIDUALS 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 INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
26. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
27. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY TERRACON (DECEMBER 2020) 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 1 ACRE OR 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

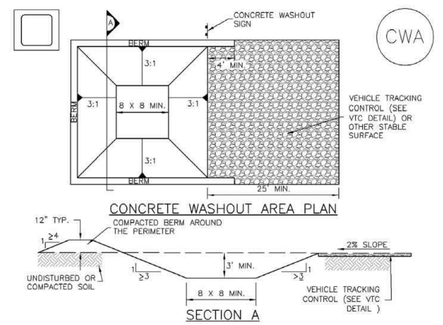
STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
3. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
   A.EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   B.CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   C.COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   D.CDOT M & S STANDARDS
4. 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. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
5. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) -INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
8. CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PCD.
10. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
12. SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. [IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES WILL BE PROVIDED.]
14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
15. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

STANDARD NOTES FOR EL PASO COUNTY SIGNAGE & STRIPING

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE "D"SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4"UPPER-LOWER CASE LETTERING ON 8"BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6"LETTERING, UPPER-LOWER CASE ON 12"BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8"UPPER-LOWER CASE LETTERING ON 18"BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75"X 1.75"SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100"MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24"IN WIDTH. CROSSWALKS LINES SHALL BE 12"WIDE AND 8'LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.

Concrete Washout Area (CWA) MM-1



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.

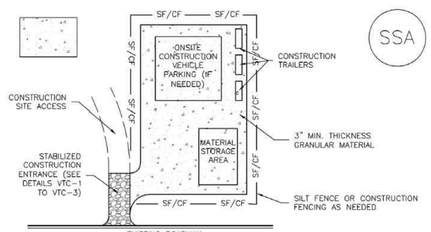
5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.

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.

Stabilized Staging Area (SSA) SM-6



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.

MM-1 Concrete Washout Area (CWA)

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.

EPC 7/12/2021

JVA CONSULTING ENGINEERS
JVA, Inc. 1512 Larimer Street, Suite 710
Denver, CO 80202 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO LICENSED KENNETH JAMES HOLT 41654 7/1/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

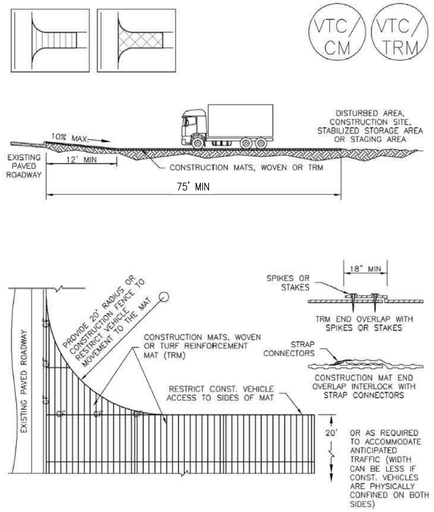
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL DETAILS AND COUNTY NOTES

SHEET NO.
CE1.4

N:\1051.6e\Drawings\1051.6e - Site Development Plan - ECP - DET.dwg, 7/01/2021 - 2:31 PM, jgj

Vehicle Tracking Control (VTC) SM-4



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

SM-4 Vehicle Tracking Control (VTC)

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.

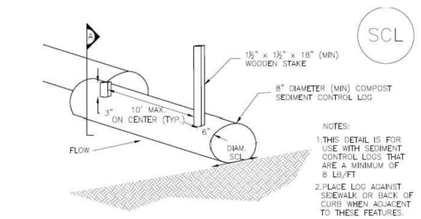
4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

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.

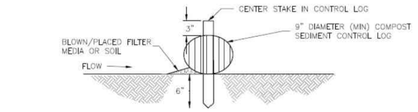
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

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

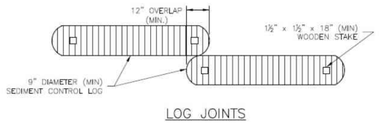
SC-2 Sediment Control Log (SCL)



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



SECTION (A)
COMPOST SEDIMENT CONTROL LOG



LOG JOINTS

SCL–2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

SC-2 Sediment Control Log (SCL)

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.

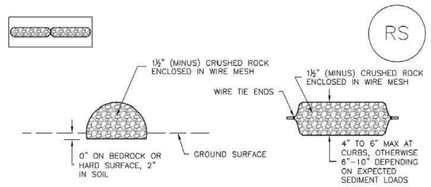
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

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.

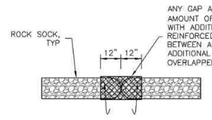
(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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.

SC-5 Rock Sock (RS)



ROCK SOCK SECTION ROCK SOCK PLAN



ROCK SOCK JOINTING

ANY GAP AT JOINT SHALL BE FILLED WITH AN ADEQUATE AMOUNT OF 1½" (MINUS) CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO ENDS OF ROCK REINFORCED SOCK. AS AN ALTERNATIVE TO FILLING JOINTS BETWEEN ADJOINING ROCK SOCKS WITH CRUSHED ROCK AND ADDITIONAL WIRE WRAPPING, ROCK SOCKS CAN BE OVERLAPPED (TYPICALLY 12–INCH OVERLAP) TO AVOID GAPS.

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1½"	90 – 100
1"	20 – 55
¾"	0 – 15
⅜"	0 – 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION(S) OF ROCK SOCKS.

2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).

3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½", RECOMMENDED MINIMUM ROLL WIDTH OF 48"

4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS–1. ROCK SOCK PERIMETER CONTROL

Rock Sock (RS) SC-5

ROCK SOCK 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 SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS 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 ROCK SOCK.

6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE 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, 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 ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER NOORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; 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.

EPC 7/12/2021

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Denver, CO 80202 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO LICENSED
KENNETH JAMES HOFBAUER
41654
7/1/2021
PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL DETAILS

SHEET NO.
CE1.5

N:\1051.6e\Drawings\1051.6e – Site Development Plan – ECP – DET.dwg, 7/01/2021 – 2:31 PM, JGJ

soil amendments and rototill them into the soil to a depth of 6 inches or more.

Topsoil should be salvaged during grading operations for use and spread on areas to be revegetated later. Topsoil should be viewed as an important resource to be utilized for vegetation establishment, due to its water-holding capacity, structure, texture, organic matter content, biological activity, and nutrient content. The rooting depth of most native grasses in the semi-arid Denver metropolitan area is 6 to 18 inches. At a minimum, the upper 6 inches of topsoil should be stripped, stockpiled, and ultimately respread across areas that will be revegetated.

Where topsoil is not available, subsoils should be amended to provide an appropriate plant-growth medium. Organic matter, such as well digested compost, can be added to improve soil characteristics conducive to plant growth. Other treatments can be used to adjust soil pH conditions when needed. Soil testing, which is typically inexpensive, should be completed to determine and optimize the types and amounts of amendments that are required.

If the disturbed ground surface is compacted, rip or rototill the surface prior to placing topsoil. If adding compost to the existing soil surface, rototilling is necessary. Surface roughening will assist in placement of a stable topsoil layer on steeper slopes, and allow infiltration and root penetration to greater depth.

Prior to seeding, the soil surface should be rough and the seedbed should be firm, but neither too loose nor compacted. The upper layer of soil should be in a condition suitable for seeding at the proper depth and conducive to plant growth. Seed-to-soil contact is the key to good germination.

Seed Mix for Temporary Vegetation

To provide temporary vegetative cover on disturbed areas which will not be paved, built upon, or fully landscaped or worked for an extended period (typically 30 days or more), plant an annual grass appropriate for the time of planting and mulch the planted areas. Annual grasses suitable for the Denver metropolitan area are listed in Table TS/PS-1. These are to be considered only as general recommendations when specific design guidance for a particular site is not available. Local governments typically specify seed mixes appropriate for their jurisdiction.

Seed Mix for Permanent Revegetation

To provide vegetative cover on disturbed areas that have reached final grade, a perennial grass mix should be established. Permanent seeding should be performed promptly (typically within 14 days) after reaching final grade. Each site will have different characteristics and a landscape professional or the local jurisdiction should be contacted to determine the most suitable seed mix for a specific site. In lieu of a specific recommendation, one of the perennial grass mixes appropriate for site conditions and growth season listed in Table TS/PS-2 can be used. The pure live seed (PLS) rates of application recommended in these tables are considered to be absolute minimum rates for seed applied using proper drill-seeding equipment.

If desired for wildlife habitat or landscape diversity, shrubs such as rubber rabbitbrush (*Chrysothamnus nauseosus*), fourwing saltbush (*Atriplex canescens*) and skunkbrush sumac (*Rhus trilobata*) could be added to the upland seedmixes at 0.25, 0.5 and 1 pound PLS/acre, respectively. In riparian zones, planting root stock of such species as American plum (*Prunus americana*), woods rose (*Rosa woodsii*), plains cottonwood (*Populus sargentii*), and willow (*Populus spp.*) may be considered. On non-topsoiled upland sites, a legume such as Ladak alfalfa at 1 pound PLS/acre can be included as a source of nitrogen for perennial grasses.

Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-3 for appropriate seeding dates.

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species[a] (Common name)	Growth Season[b]	Pounds of Pure Live Seed (PLS)/acre[c]	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5–10	½ - ¾
7. Sorghum	Warm	5–10	½ - ¾
8. Winter wheat	Cool	20–35	1 - 2
9. Winter barley	Cool	20–35	1 - 2
10. Winter rye	Cool	20–35	1 - 2
11. Triticale	Cool	25–40	1 - 2

[a] Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

[b] See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

[c] Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses

Common[a] Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Alakali Soil Seed Mix					
Alkali sacaton	*Sporobolus airoides*	Cool	Bunch	1,750,000	0.25
Basin wildrye	*Elymus cinereus*	Cool	Bunch	165,000	2.5
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Jose tall wheatgrass	*Agropyron elongatum 'Jose'*	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.75**
Fertile Loamy Soil Seed Mix					
Ephriam crested wheatgrass	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	2.0
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	7.0
Total					**15.5**
High Water Table Soil Seed Mix					
Meadow foxtail	*Alopecurus pratensis*	Cool	Sod	900,000	0.5
Redtop	*Agrostis alba*	Warm	Open sod	5,000,000	0.25
Reed canarygrass	*Phalaris arundinacea*	Cool	Sod	68,000	0.5
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Pathfinder switchgrass	*Panicum virgatum 'Pathfinder'*	Warm	Sod	389,000	1.0
Alkar tall wheatgrass	*Agropyron elongatum 'Alkar'*	Cool	Bunch	79,000	5.5
Total					**10.75**
Transition Turf Seed Mix[c]					
Ruebens Canadian bluegrass	*Poa compressa 'Ruebens'*	Cool	Sod	2,500,000	0.5
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Citation perennial ryegrass	*Lolium perenne 'Citation'*	Cool	Sod	247,000	3.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Total					**7.5**

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses (cont.)

Common Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Sandy Soil Seed Mix					
Blue grama	*Bouteloua gracilis*	Warm	Sod-forming bunchgrass	825,000	0.5
Camper little bluestem	*Schizachyrium scoparium 'Camper'*	Warm	Bunch	240,000	1.0
Prairie sandreed	*Calamovilfa longifolia*	Warm	Open sod	274,000	1.0
Sand dropseed	*Sporobolus cryptandrus*	Cool	Bunch	5,298,000	0.25
Vaughn sideoats grama	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**10.25**
Heavy Clay, Rocky Foothill Seed Mix					
Ephriam crested wheatgrass[d]	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	*Agropyron intermedium 'Oahe'*	Cool	Sod	115,000	5.5
Vaughn sideoats grama[e]	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.5**

[a] All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1. If hydraulic seeding is used, hydraulic mulching should be done as a separate operation.

[b] See Table TS/PS-3 for seeding dates.

[c] If site is to be irrigated, the transition turf seed rates should be doubled.

[d] Crested wheatgrass should not be used on slopes steeper than 6H to 1V.

[e] Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sideoats grama.

Table TS/PS-3. Seeding Dates for Annual and Perennial Grasses

	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
Seeding Dates	**Warm**	**Cool**	**Warm**	**Cool**
January 1–March 15			✓	✓
March 16–April 30	4	1,2,3	✓	✓
May 1–May 15	4		✓	
May 16–June 30	4,5,6,7			
July 1–July 15	5,6,7			
July 16–August 31				
September 1–September 30		8,9,10,11		
October 1–December 31			✓	✓

Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the Mulching BMP Fact Sheet for additional guidance.

Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.

EPC 7/12/2021

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Glenwood Springs • Denver

NO.	DATE	DES'D	D'WN	REVISION DESCRIPTION

COLORADO LICENSED PROFESSIONAL ENGINEER
KENNETH JAMES CLIFFORD
41654
7/1/2021

DESIGNED BY:	RAH/MHT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL DETAILS

SHEET NO.
CE1.6

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Description

Rolled Erosion Control Products (RECPs) include a variety of temporary or permanently installed manufactured products designed to control erosion and enhance vegetation establishment and survivability, particularly on slopes and in channels. For applications where natural vegetation alone will provide sufficient permanent erosion protection, temporary products such as netting, open weave textiles and a variety of erosion control blankets (ECBs) made of biodegradable natural materials (e.g., straw, coconut fiber) can be used. For applications where natural vegetation alone will not be sustainable under expected flow conditions, permanent rolled erosion control products such as turf reinforcement mats (TRMs) can be used. In particular, turf reinforcement mats are designed for discharges that exert velocities and sheer stresses that exceed the typical limits of mature natural vegetation.

Photograph RECP-1. Erosion control blanket protecting the slope from erosion and providing favorable conditions for revegetation.

Appropriate Uses

RECPs can be used to control erosion in conjunction with revegetation efforts, providing seedbed protection from wind and water erosion. These products are often used on disturbed areas on steep slopes, in areas with highly erosive soils, or as part of drainageway stabilization. In order to select the appropriate RECP for site conditions, it is important to have a general understanding of the general types of these products, their expected longevity, and general characteristics.

The Erosion Control Technology Council (ECTC 2005) characterizes rolled erosion control products according to these categories:

- **Mulch control netting**: A planar woven natural fiber or extruded geosynthetic mesh used as a temporary degradable rolled erosion control product to anchor loose fiber mulches.
- **Open weave textile**: A temporary degradable rolled erosion control product composed of processed natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.
- **Erosion control blanket (ECB)**: A temporary degradable rolled erosion control product composed of processed natural or polymer fibers which are mechanically, structurally or chemically bound together to form a continuous matrix to provide erosion control and facilitate vegetation establishment. ECBs can be further differentiated into rapidly degrading single-net and double-net types or slowly degrading types.

Rolled Erosion Control Products	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

Staking patterns are also provided in the design details according to these factors:

- ECB type
- Slope or channel type

For other types of RECPs including TRMs, these design details are intended to serve as general guidelines for design and installation; however, engineers should adhere to manufacturer's installation recommendations.

Maintenance and Removal

Inspection of erosion control blankets and other RECPs includes:

- Check for general signs of erosion, including voids beneath the mat. If voids are apparent, fill the void with suitable soil and replace the erosion control blanket, following the appropriate staking pattern.
- Check for damaged or loose stakes and secure loose portions of the blanket.

Erosion control blankets and other RECPs that are biodegradable typically do not need to be removed after construction. If they must be removed, then an alternate soil stabilization method should be installed promptly following removal.

Turf reinforcement mats, although generally resistant to biodegradation, are typically left in place as a dense vegetated cover grows in through the mat matrix. The turf reinforcement mat provides long-term stability and helps the established vegetation resist erosive forces.

EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF ECB.
   - TYPE OF ECB (STRAW, STRAW-COCONUT, COCONUT, OR EXCELSIOR).
   - AREA, A, IN SQUARE YARDS OF EACH TYPE OF ECB.
2. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE PREFERRED FOR RECPs, ALTHOUGH SOME JURISDICTIONS MAY ALLOW OTHER MATERIALS IN SOME APPLICATIONS.
3. IN AREAS WHERE ECBs ARE SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO ECB INSTALLATION AND THE ECB SHALL BE IN FULL CONTACT WITH SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
4. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.
5. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL ECBs EXCEPT STRAW WHICH MAY USE AN OVERLAPPING JOINT.
6. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE-HALF ROLL LENGTH FOR COCONUT AND EXCELSIOR ECBs.
7. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER FOR ECBs ON SLOPES.
8. MATERIAL SPECIFICATIONS OF ECBs SHALL CONFORM TO TABLE ECB-1.
9. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING ECBS SHALL BE RESEEDED AND MULCHED.
10. DETAILS ON DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION WILL GOVERN IF DIFFERENT FROM THOSE SHOWN HERE.

TABLE ECB-1. ECB MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING**
STRAW*	–	100%	–	DOUBLE/ NATURAL
STRAW-COCONUT	30% MIN	70% MAX	–	DOUBLE/ NATURAL
COCONUT	100%	–	–	DOUBLE/ NATURAL
EXCELSIOR	–	–	100%	DOUBLE/ NATURAL

*STRAW ECBs MAY ONLY BE USED OUTSIDE OF STREAMS AND DRAINAGE CHANNEL.
**ALTERNATE NETTING MAY BE ACCEPTABLE IN SOME JURISDICTIONS

Table RECP-1. ECTC Standard Specification for Temporary Rolled Erosion Control Products
(Adapted from Erosion Control Technology Council 2005)

Product Description	Slope Applications*		Channel Applications*	Minimum Tensile Strength[1]	Expected Longevity
	Maximum Gradient	C Factor[2,5]	Max. Shear Stress[3,4,6]		
Mulch Control Nets	5:1 (H:V)	≤0.10 @ 5:1	0.25 lbs/ft² (12 Pa)	5 lbs/ft (0.073 kN/m)	Up to 12 months
Netless Rolled Erosion Control Blankets	4:1 (H:V)	≤0.10 @ 4:1	0.5 lbs/ft² (24 Pa)	5 lbs/ft (0.073 kN/m)	
Single-net Erosion Control Blankets & Open Weave Textiles	3:1 (H:V)	≤0.15 @ 3:1	1.5 lbs/ft² (72 Pa)	50 lbs/ft (0.73 kN/m)	
Double-net Erosion Control Blankets	2:1 (H:V)	≤0.20 @ 2:1	1.75 lbs/ft² (84 Pa)	75 lbs/ft (1.09 kN/m)	
Mulch Control Nets	5:1 (H:V)	≤0.10 @ 5:1	0.25 lbs/ft² (12 Pa)	25 lbs/ft (0.36 kN/m)	24 months
Erosion Control Blankets & Open Weave Textiles (slowly degrading)	1.5:1 (H:V)	≤0.25 @ 1.5:1	2.00 lbs/ft² (96 Pa)	100 lbs/ft (1.45 kN/m)	24 months
Erosion Control Blankets & Open Weave Textiles	1:1 (H:V)	≤0.25 @ 1:1	2.25 lbs/ft² (108 Pa)	125 lbs/ft (1.82 kN/m)	36 months

* C Factor and shear stress for mulch control nettings must be obtained with netting used in conjunction with pre-applied mulch material. (*See Section 5.3 of Chapter 7 Construction BMPs for more information on the C Factor.*)

[1] Minimum Average Roll Values, Machine direction using ECTC Mod. ASTM D 5035.

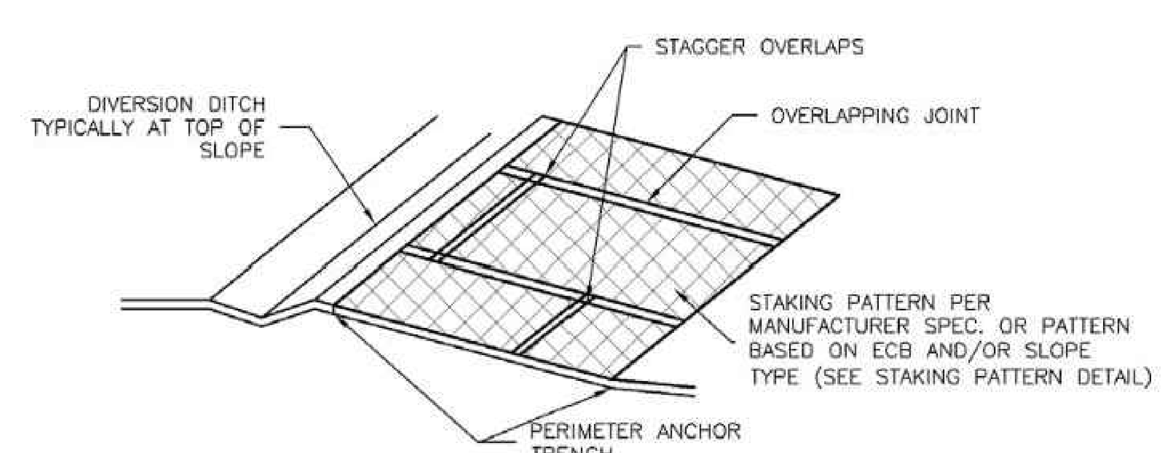
[2] C Factor calculated as ratio of soil loss from RECP protected slope (tested at specified or greater gradient, H:V) to ratio of soil loss from unprotected (control) plot in large-scale testing.

[3] Required minimum shear stress RECP (unvegetated) can sustain without physical damage or excess erosion (> 12.7 mm (0.5 in) soil loss) during a 30-minute flow event in large-scale testing.

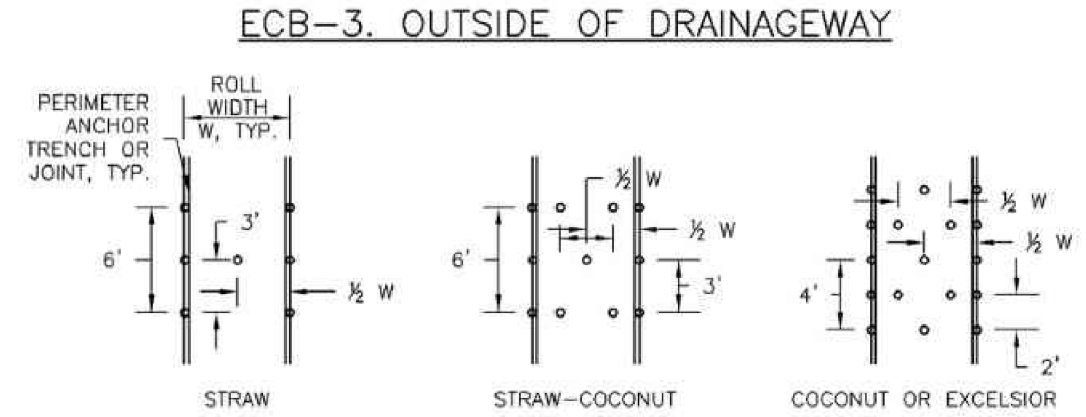
[4] The permissible shear stress levels established for each performance category are based on historical experience with products characterized by Manning's roughness coefficients in the range of 0.01 - 0.05.

[5] Acceptable large-scale test methods may include ASTM D 6459, or other independent testing deemed acceptable by the engineer.

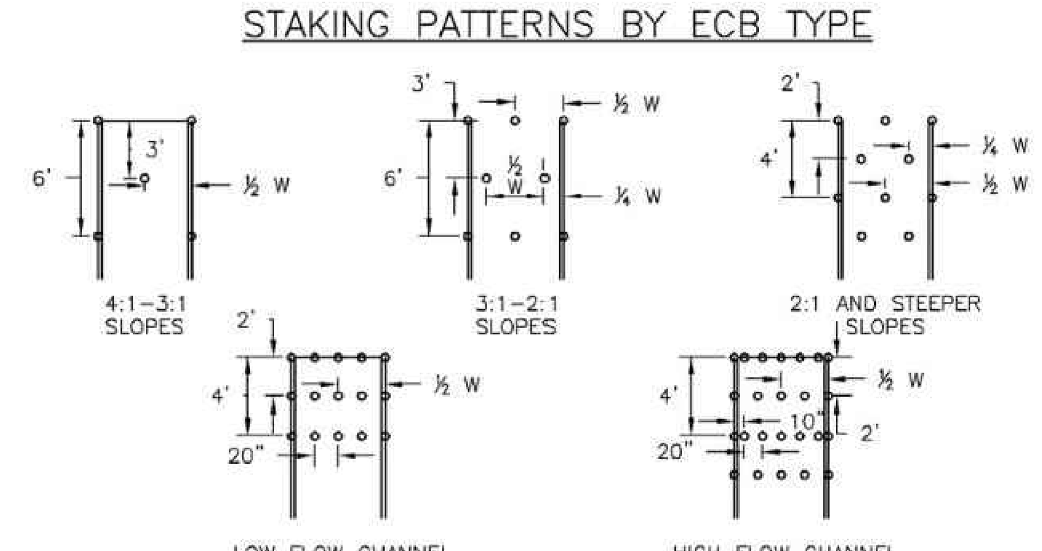
[6] Per the engineer's discretion. Recommended acceptable large-scale testing protocol may include ASTM D 6460, or other independent testing deemed acceptable by the engineer.



ECB-3. OUTSIDE OF DRAINAGEWAY



STAKING PATTERNS BY ECB TYPE



STAKING PATTERNS BY SLOPE OR CHANNEL TYPE

EROSION CONTROL BLANKET 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. ECBs SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE, UNLESS REQUESTED TO BE REMOVED BY THE LOCAL JURISDICTION.
5. ANY ECB PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW THE GEOTEXTILE THAT HAVE ERODED TO CREATED A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE ECB REINSTALLED.

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 AND TOWN OF PARKER COLORADO, NOT AVAILABLE IN AUTOCAD)

EPC 7/12/2021

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

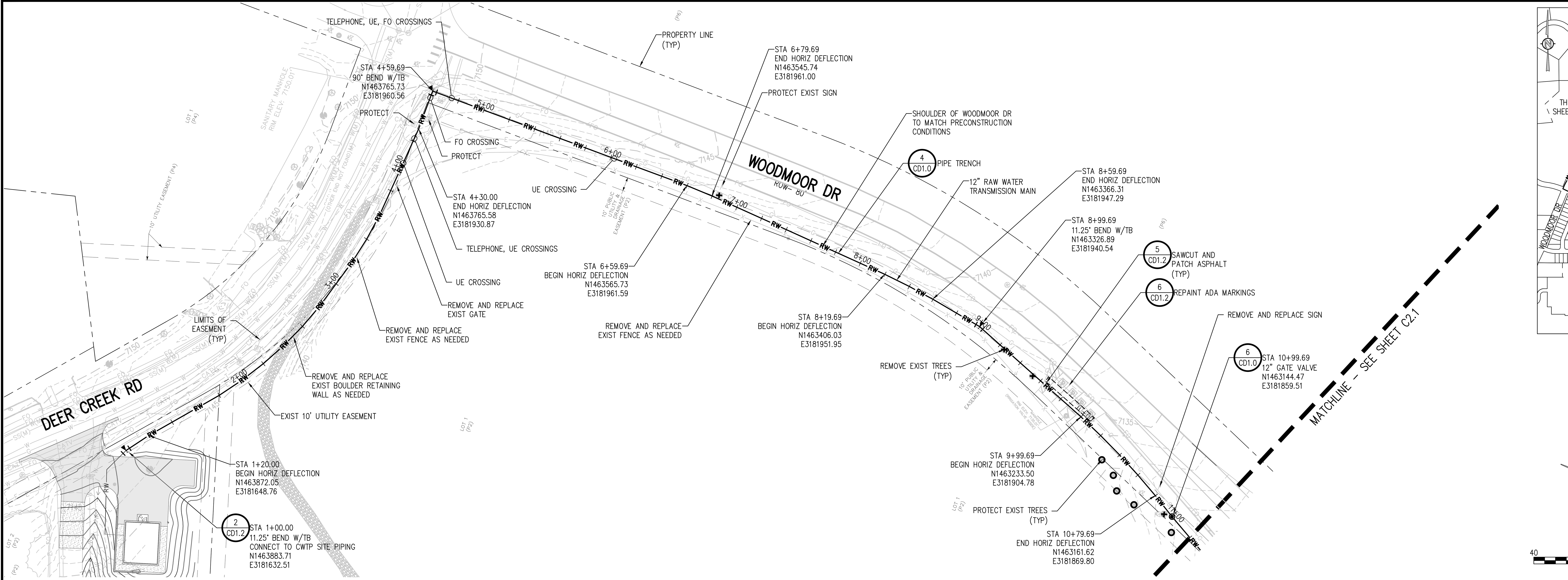
COLORADO LICENSED PROFESSIONAL ENGINEER 41654 7/1/2021

DESIGNED BY:	RAH/MHT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

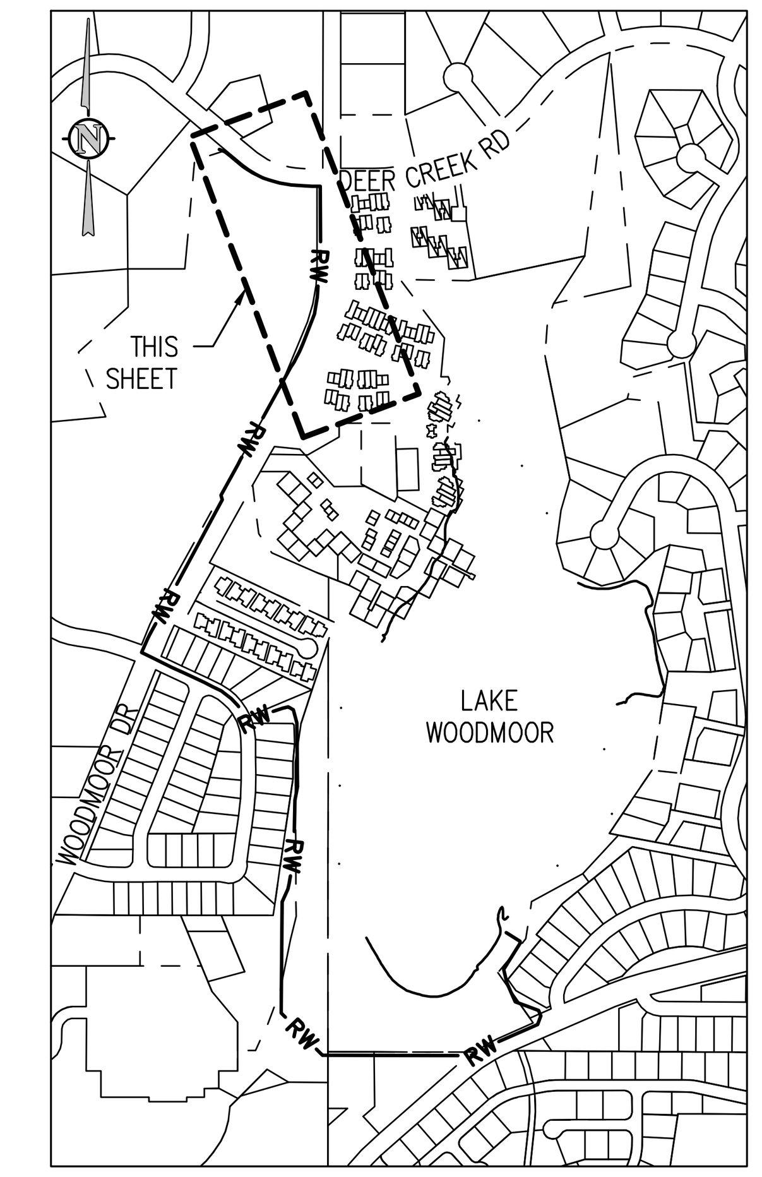
EROSION CONTROL DETAILS

SHEET NO.
CE1.7



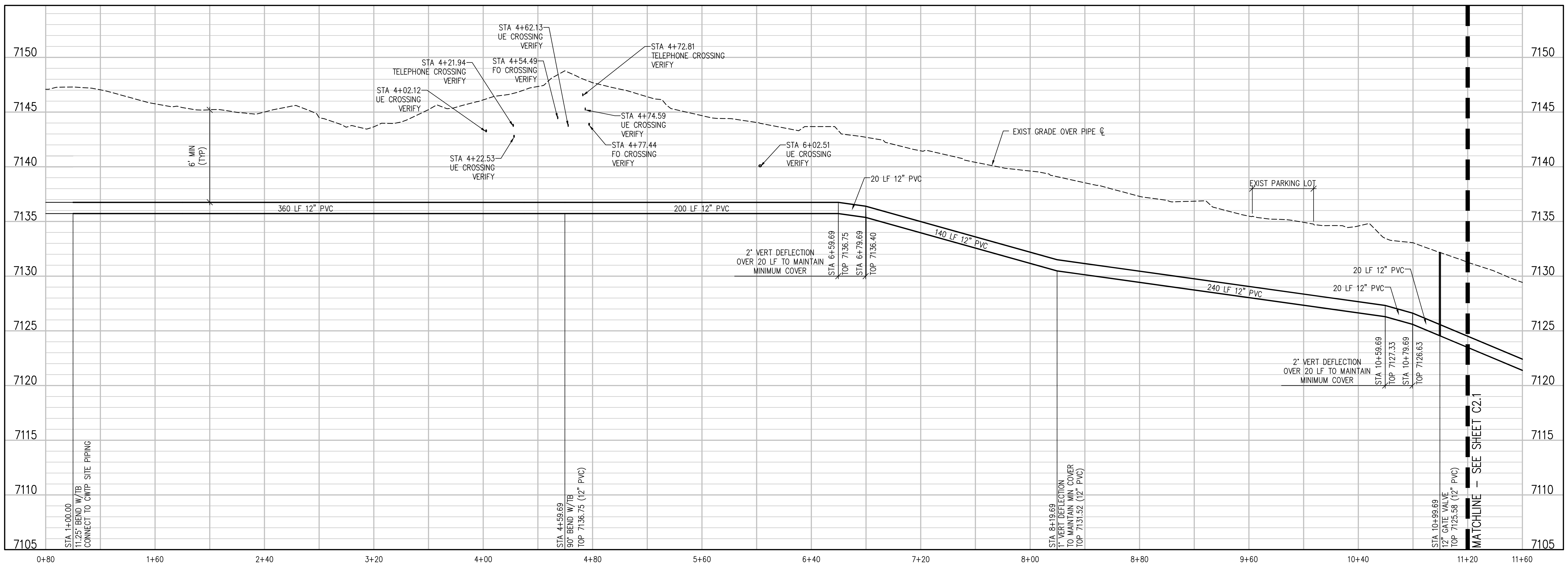
TRANSMISSION MAIN PLAN

SCALE: 1" =40'



KEY MAP

NTS



TRANSMISSION MAIN PROFILE

SCALE: 1"=40' HORIZ
1"=5' VERT

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COLORADO LICENSED KENNETH JAMES CLINE 41654 7/1/2021 PROFESSIONAL ENGINEER

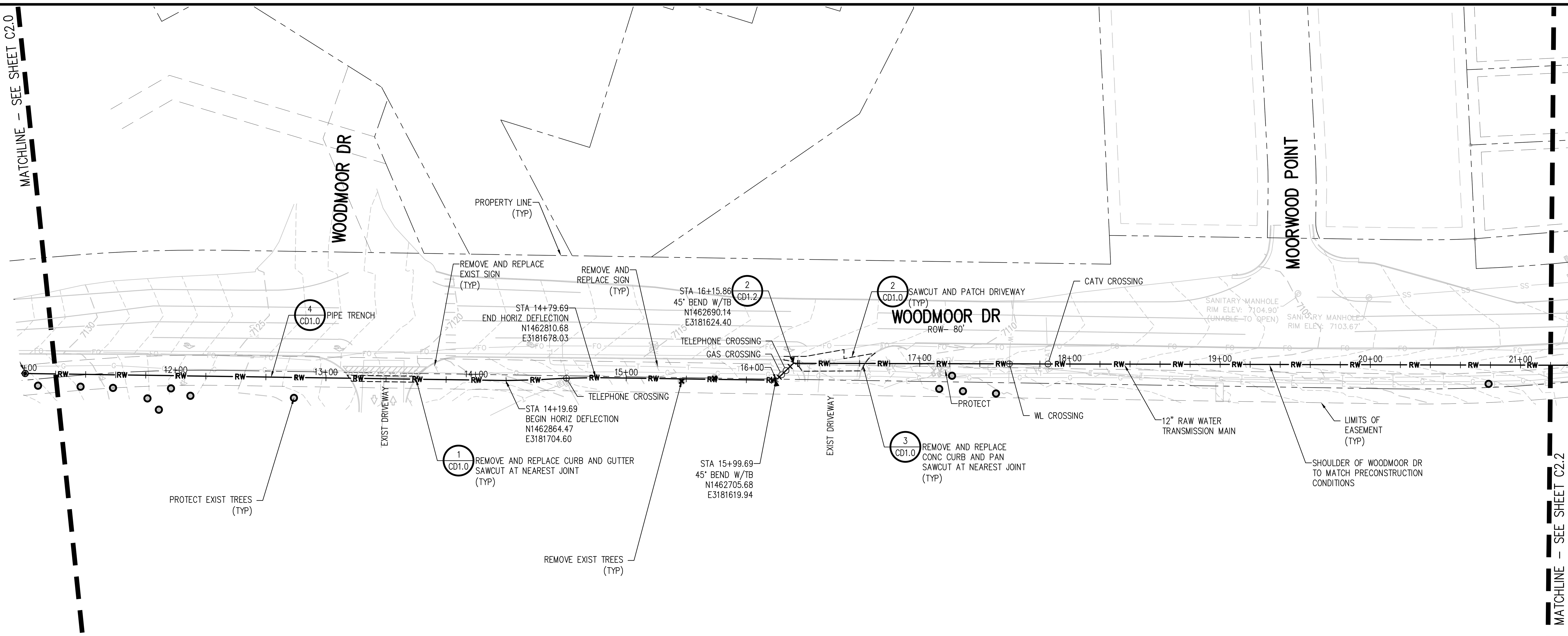
DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.

C2.0



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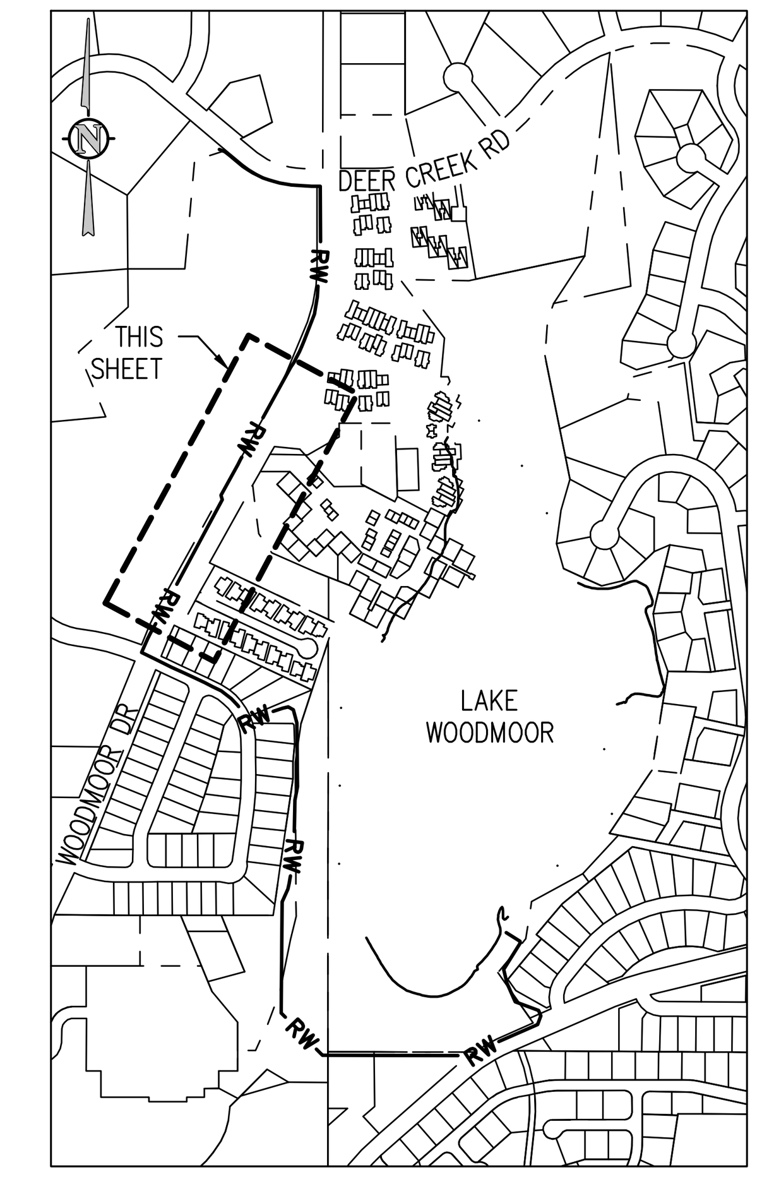

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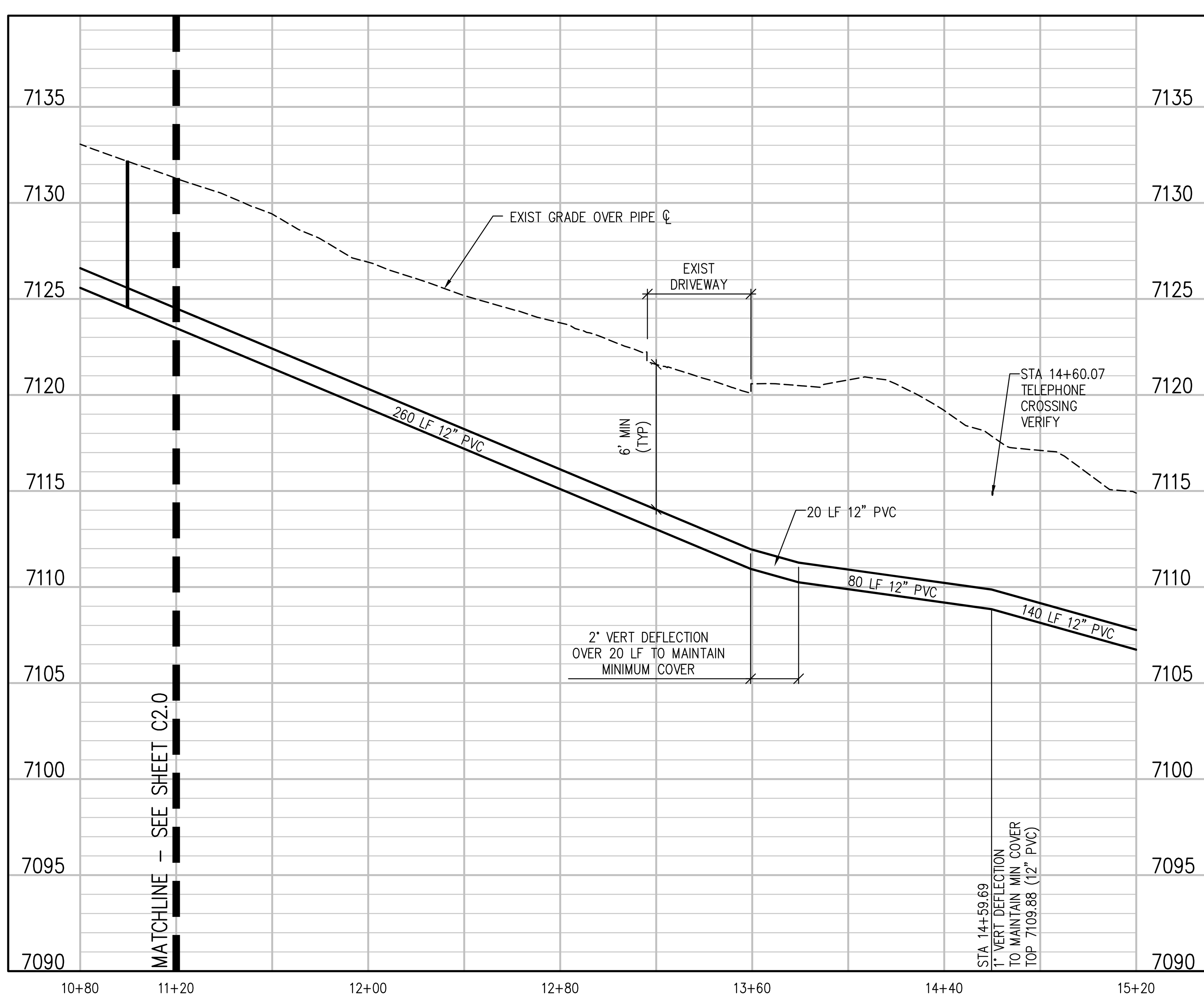

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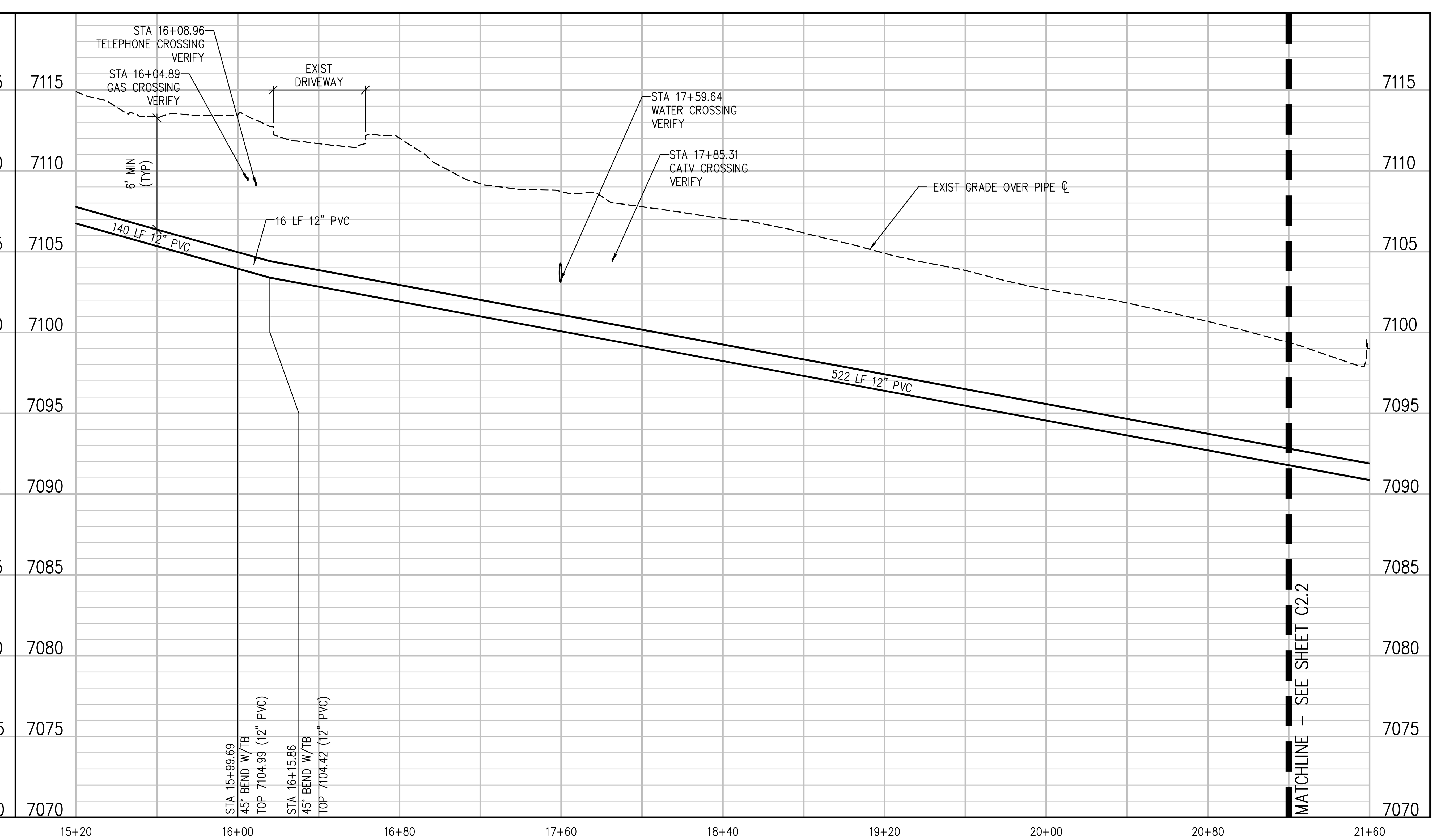

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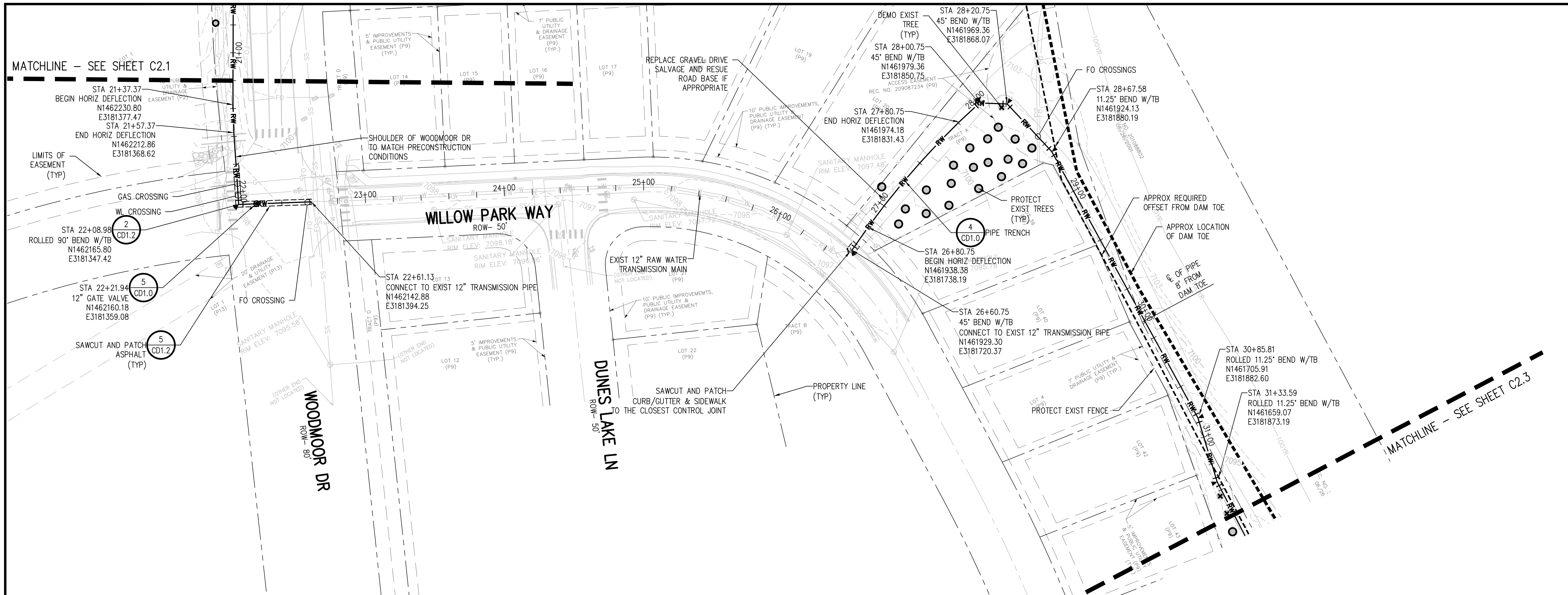

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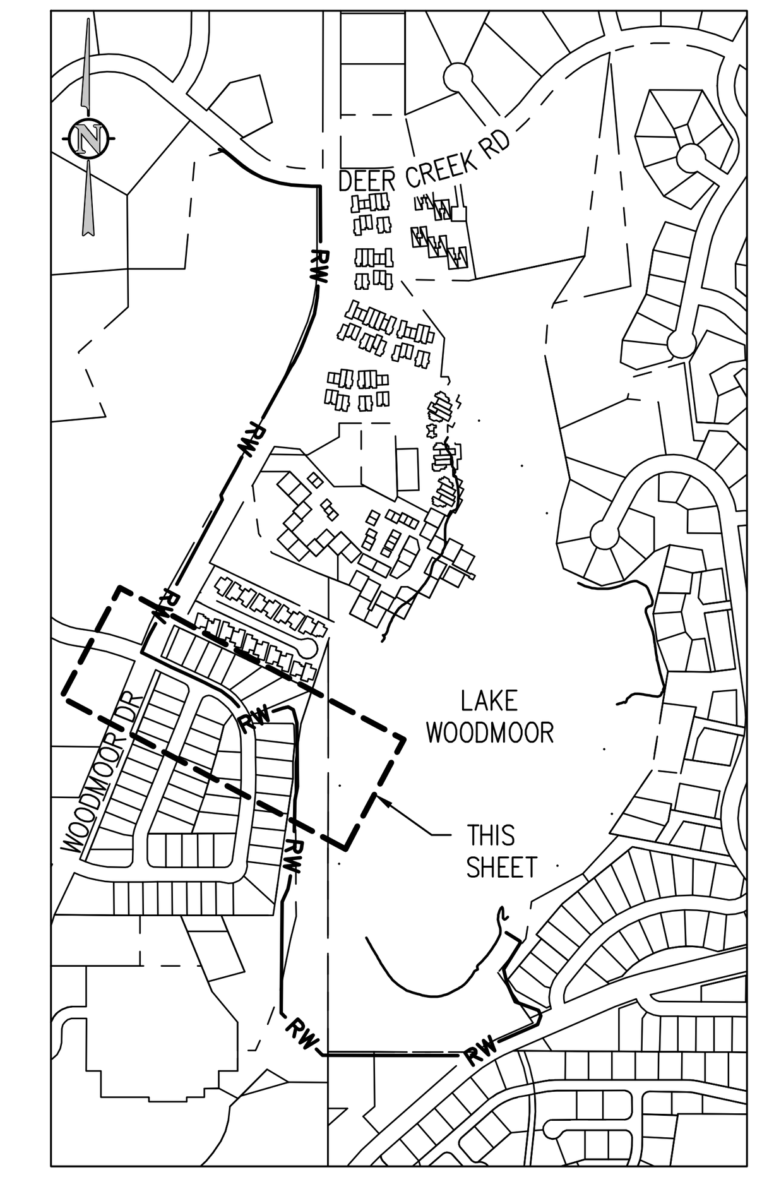

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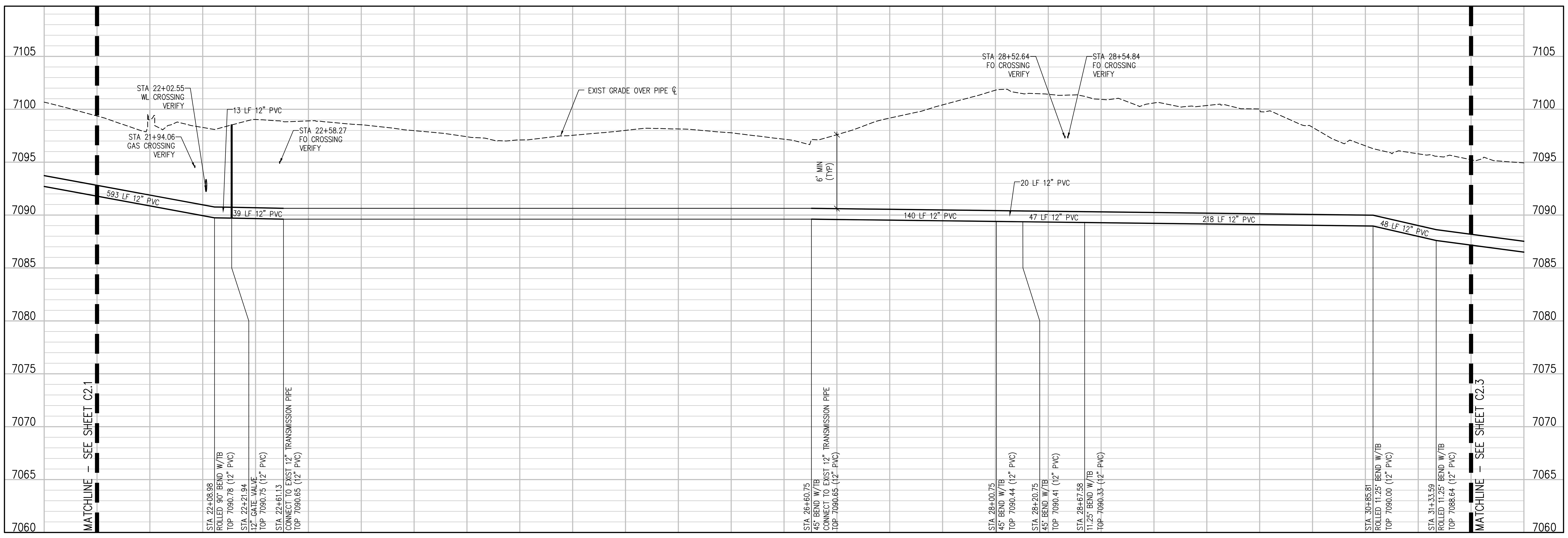

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C2.2

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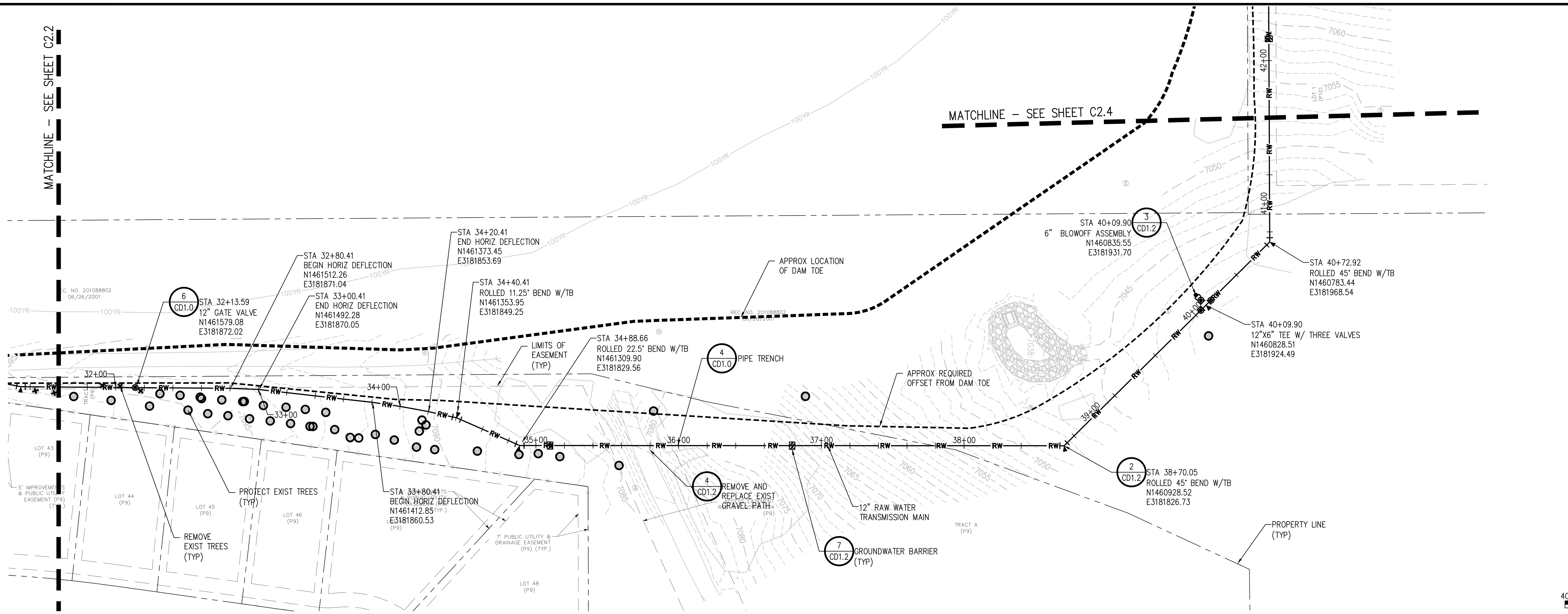

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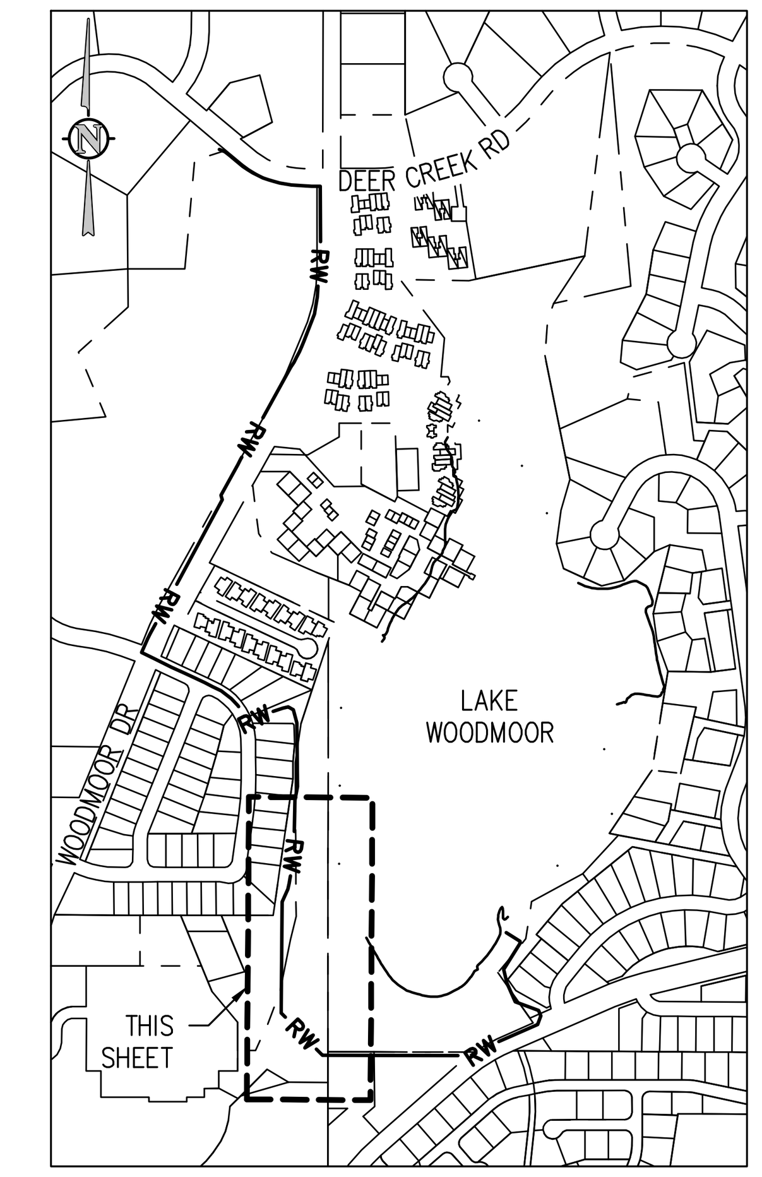

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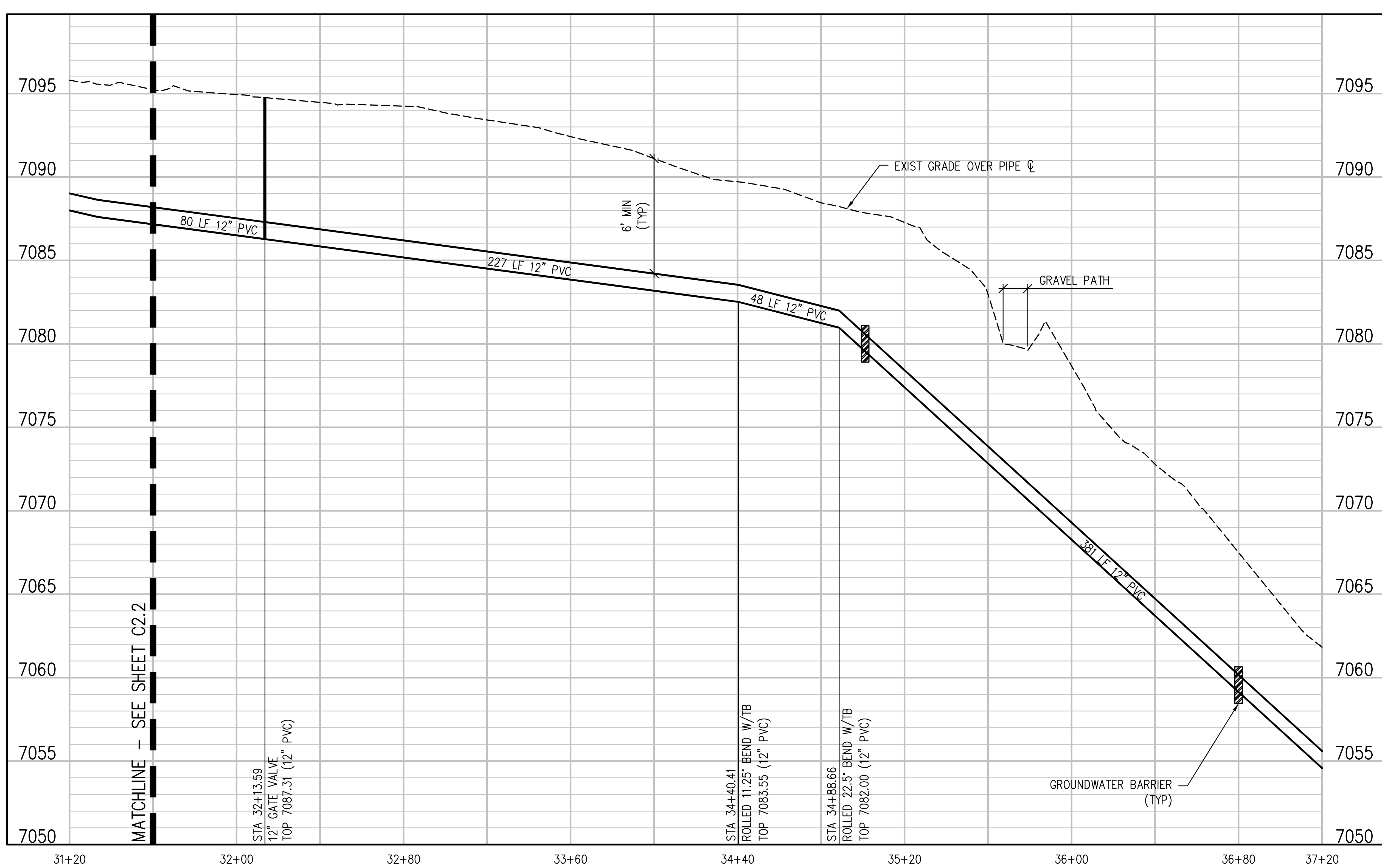

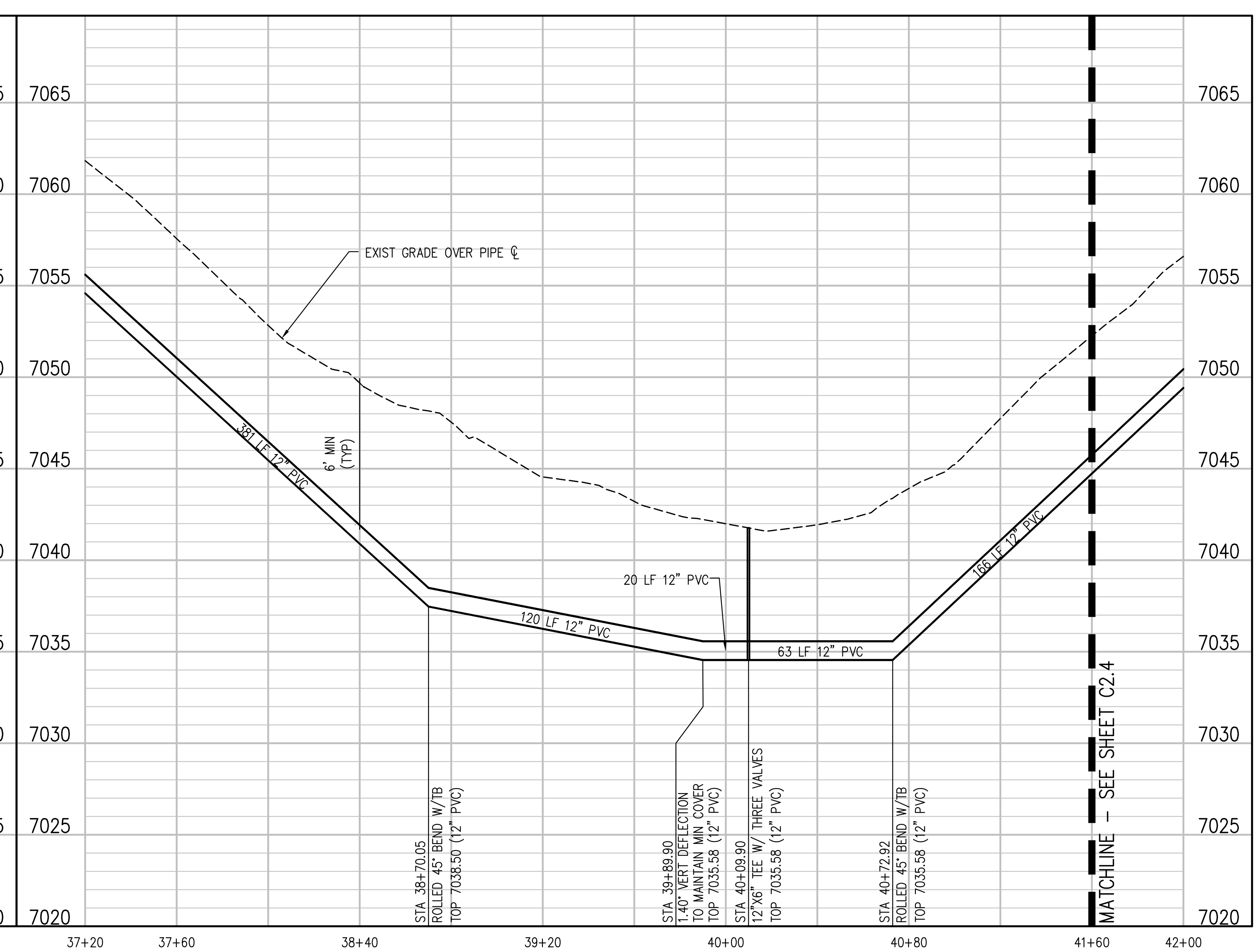

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DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

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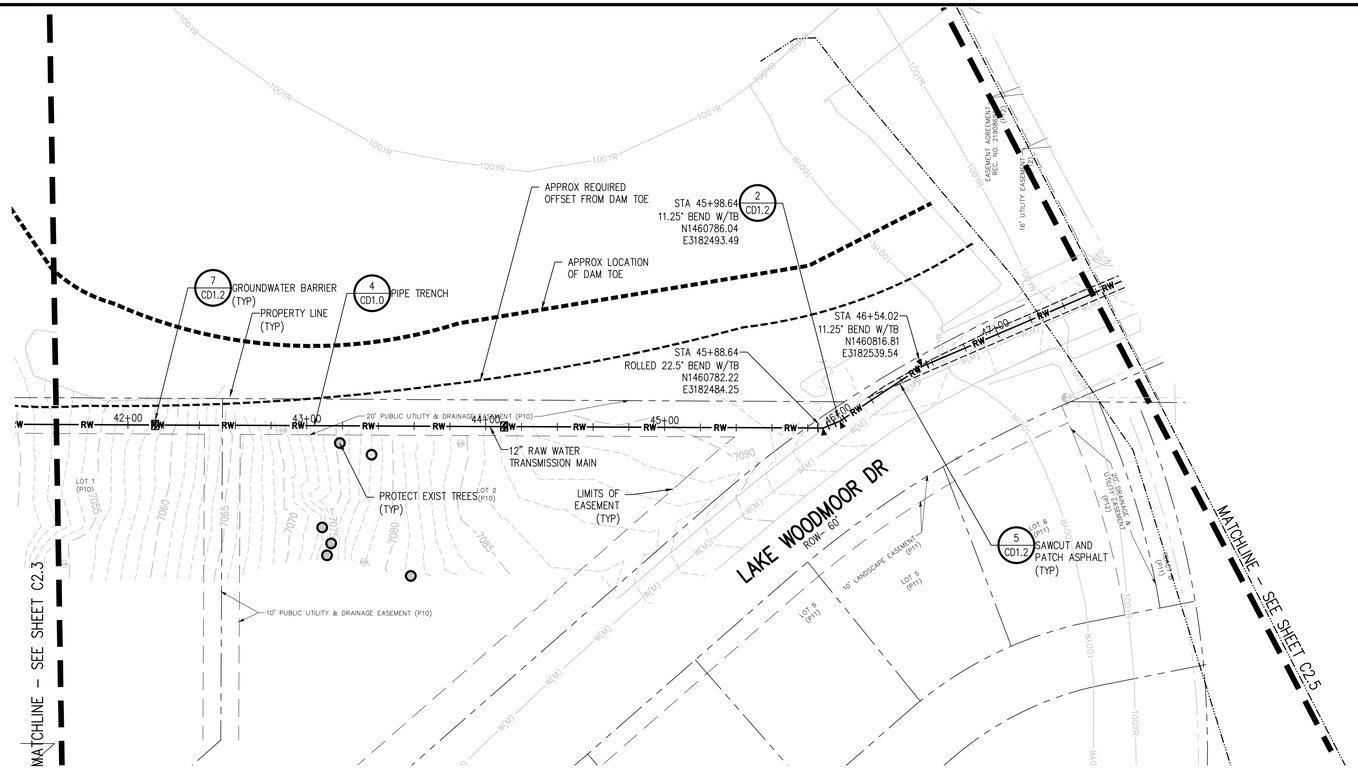

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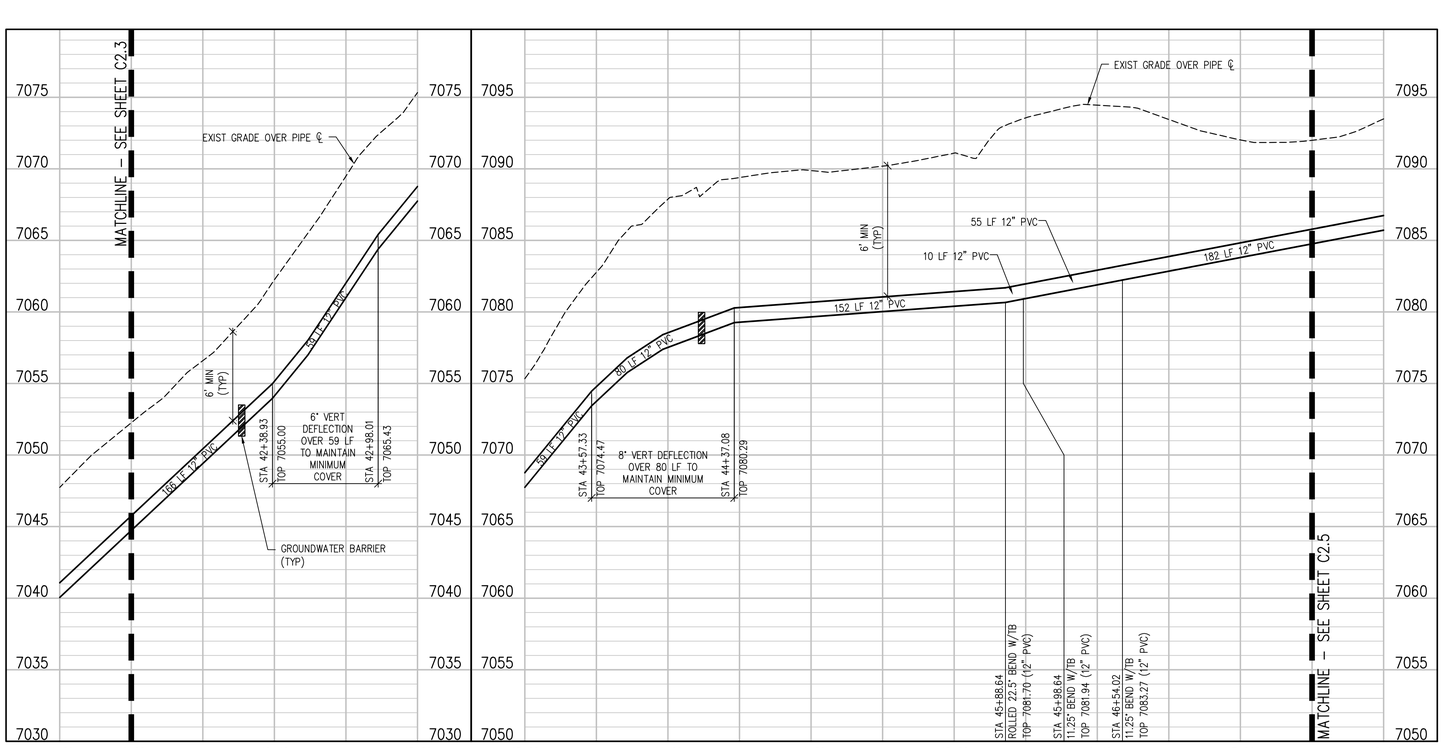

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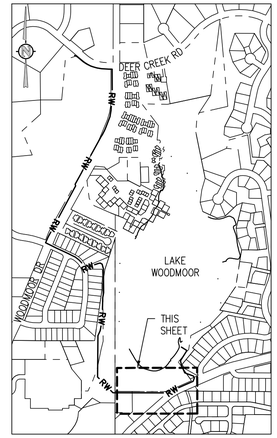

KEY MAP
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KENNETH JAMES HOLT
41654
7/1/2021
PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

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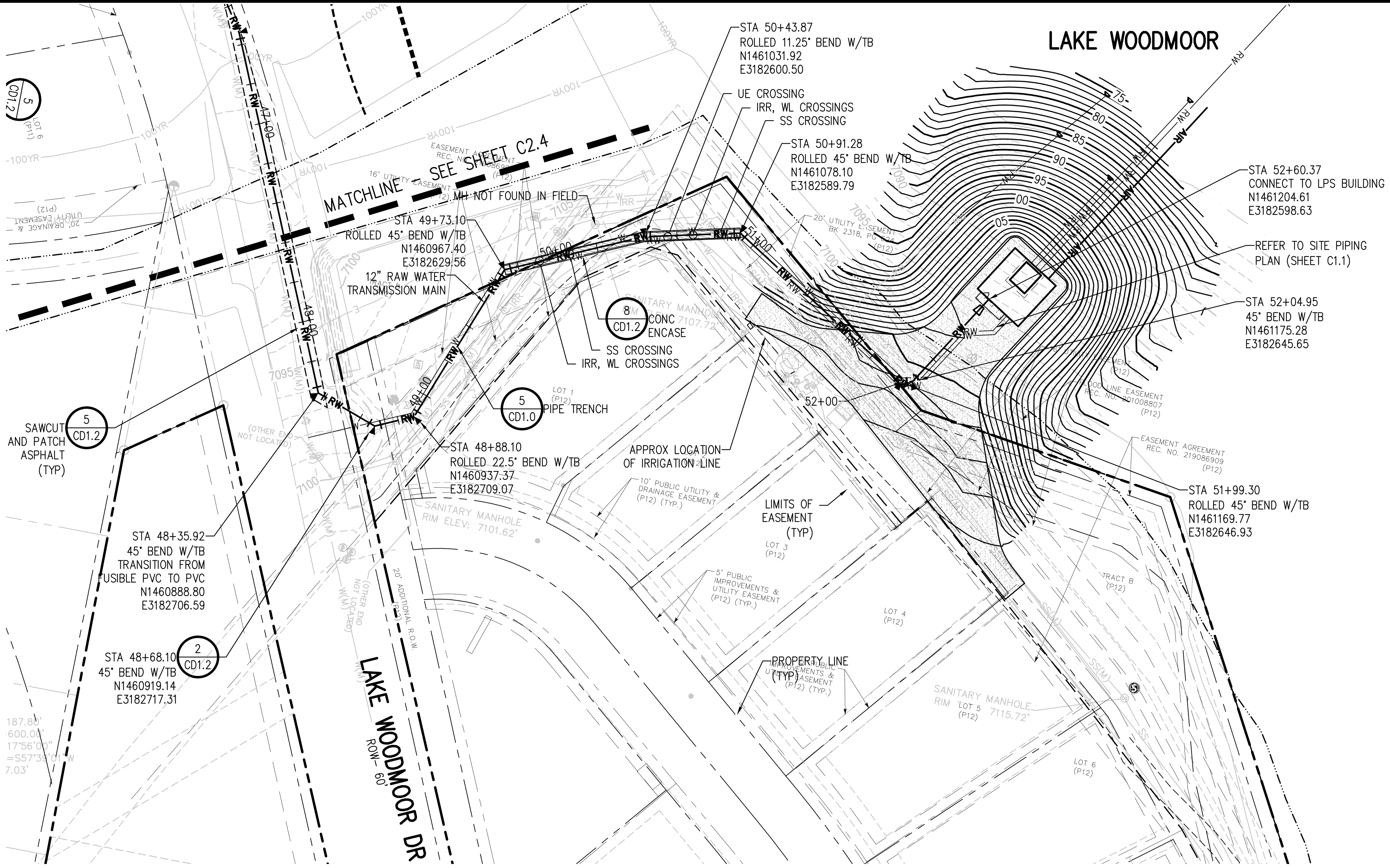

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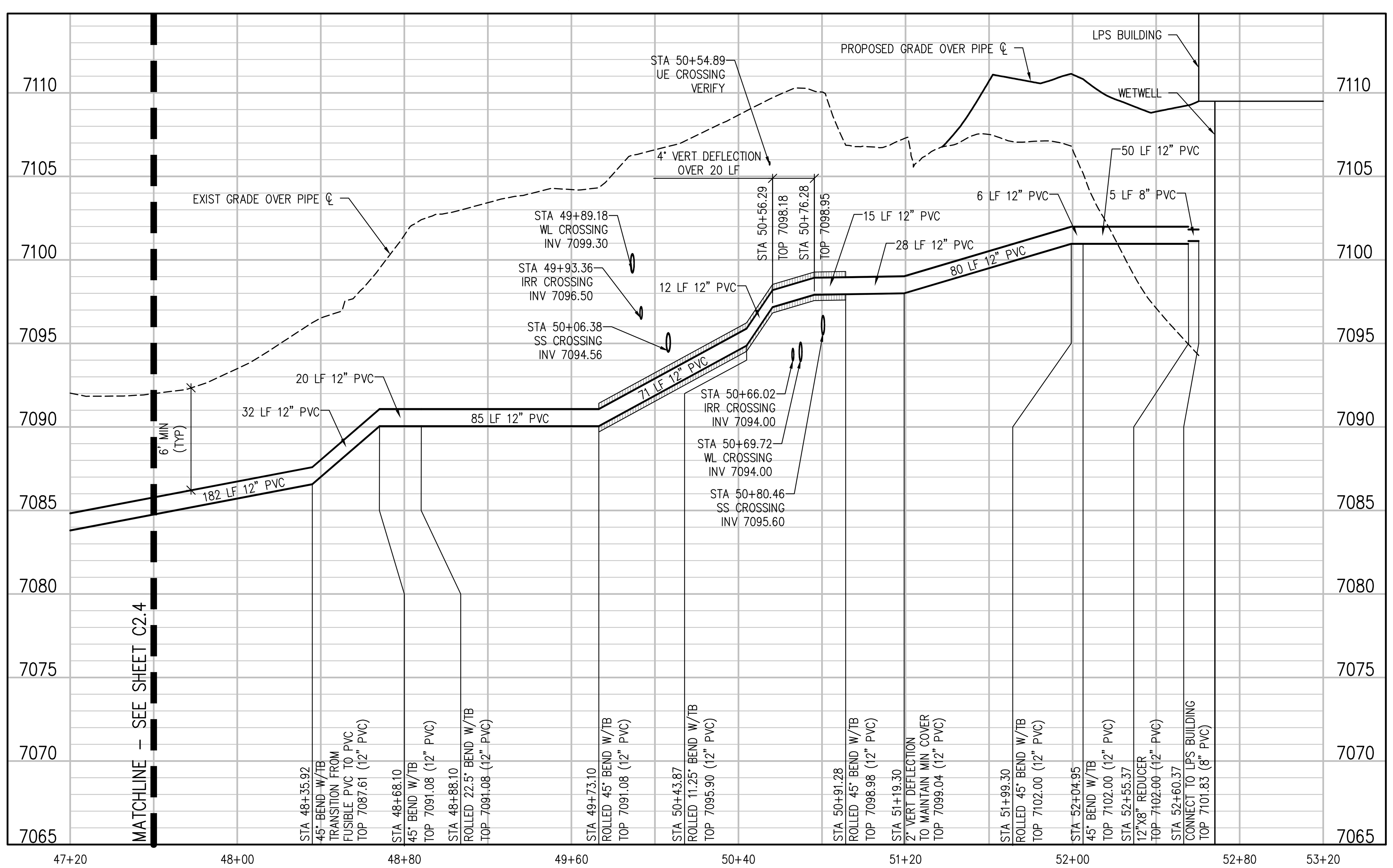

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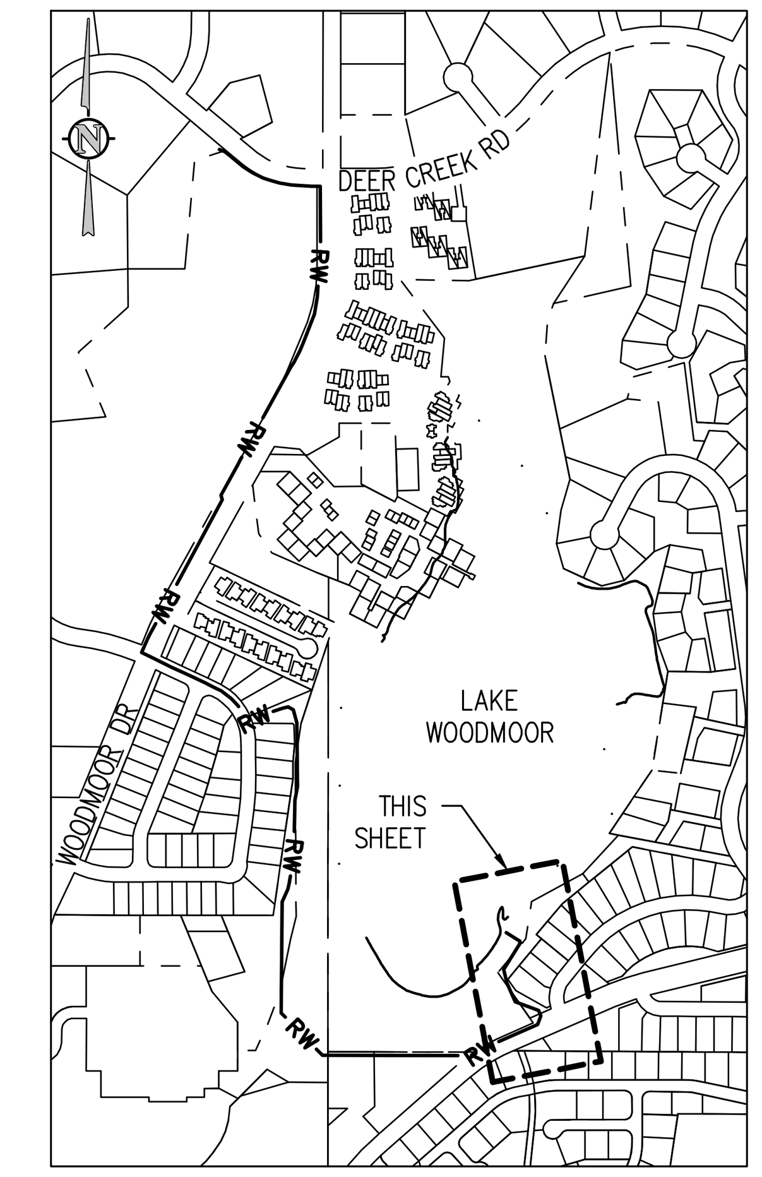

KEY MAP

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DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

WOODMOOR WSD NO.1
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EL PASO COUNTY, COLORADO

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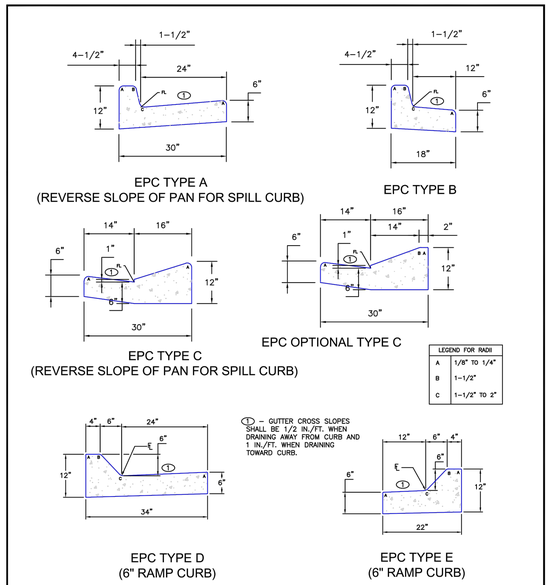
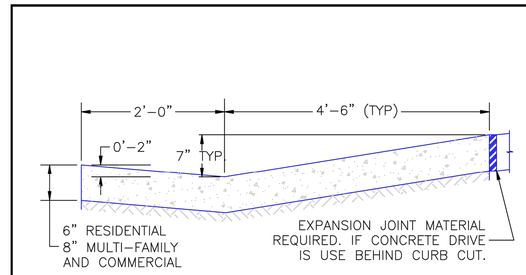


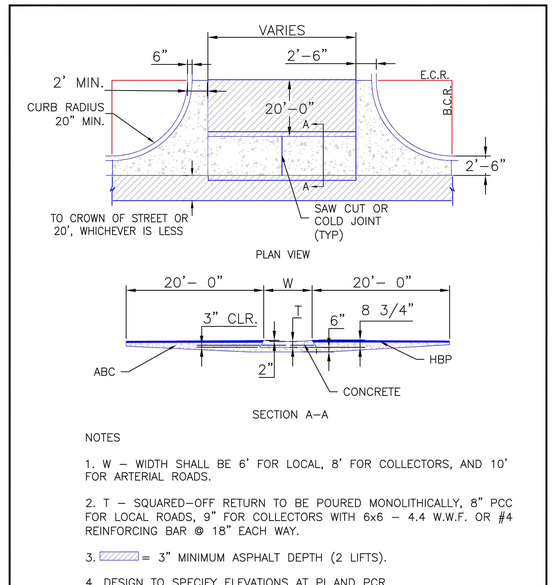
8/11/11 DATE APPROVED: André P. Brackin DEPARTMENT OF TRANSPORTATION	Typical Curb and Gutter Details Standard Drawing REVISION DATE: 12/8/15 FILE NAME: SD_2-20	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION

TYPICAL CURB AND GUTTER DETAIL
NTS — 1 / C2.1



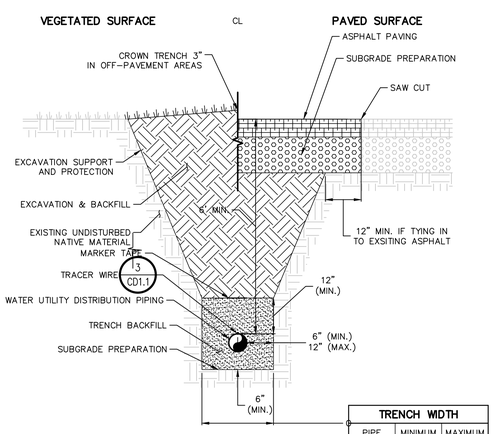
8/11/11 DATE APPROVED: André P. Brackin DEPARTMENT OF TRANSPORTATION	Driveway Cut Detail Standard Drawing REVISION DATE: 11/10/04 FILE NAME: SD_2-23	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION

DRIVEWAY CUT DETAIL
NTS — 2 / C2.1



8/11/11 DATE APPROVED: André P. Brackin DEPARTMENT OF TRANSPORTATION	Typical Cross Pan Layout Detail Standard Drawing REVISION DATE: 12/8/15 FILE NAME: SD_2-26	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION

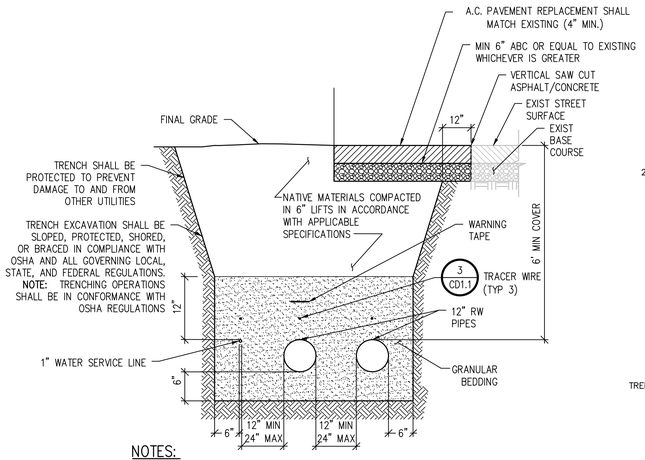
TYPICAL CROSS PAN LAYOUT DETAIL
NTS — 3 / C2.1



TRENCH WIDTH		
PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
4"	1'-4"	2'-4"
6"	1'-6"	2'-6"
8"	1'-8"	2'-8"
10"	1'-10"	2'-10"
12"	2'-0"	3'-0"
14"	2'-2"	3'-2"

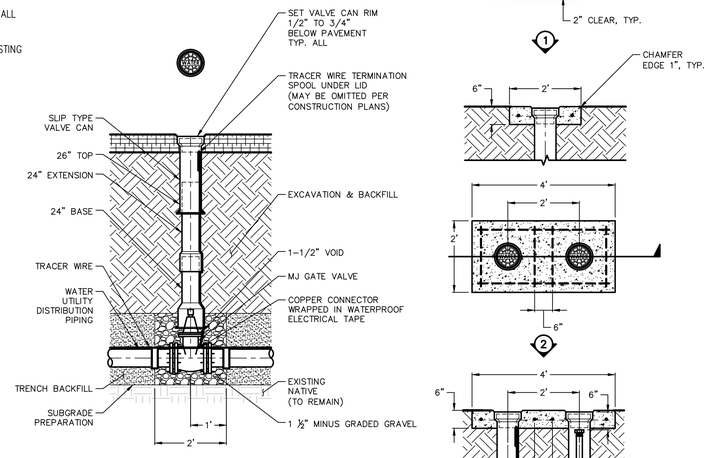
WOODMOOR WATER & SANITATION DISTRICT NO. 1 STANDARD DETAIL W-1

TYPICAL WATER TRENCH DETAIL
NTS — 4 / C2.0



NOTES:
1. IF UNSTABLE MATERIALS ARE FOUND IN TRENCH BOTTOM, OVER EXCAVATE 12" BELOW STD EMBEDMENT AND FILL WITH 3/4" CRUSHED ROCK, COMPACTED TO 95%
2. COMPACTED BACKFILL TO 90% STD PROCTOR DENSITY IN NON-DRIVING SURFACES AND 95% UNDER PAVEMENT
3. SHOULD THE TRENCH BE EXCAVATED WIDER THAN ALLOWED A CONCRETE CRADLE SHALL BE PLACED WITH 2500PSI CONCRETE FROM TRENCH BOTTOM TO PIPE SPRINGLINE

UTILITY TRENCH DETAIL
NTS — 5 / C1.1



WOODMOOR WATER & SANITATION DISTRICT NO. 1 STANDARD DETAIL W-4

WOODMOOR WATER & SANITATION DISTRICT NO. 1 STANDARD DETAIL W-6

GATE VALVE DETAIL
NTS — 6 / C2.0

EPC 7/12/2021

N:\1051.6e\Drawings\1051.6e – Site Development Plan – CD10.dwg, 7/01/2021 – 2:32 PM, rbj

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Denver, CO 80202 303.444.1951
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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO LICENSED KENNETH J. JAMES 41654 7/1/2021 PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	JULY 2021

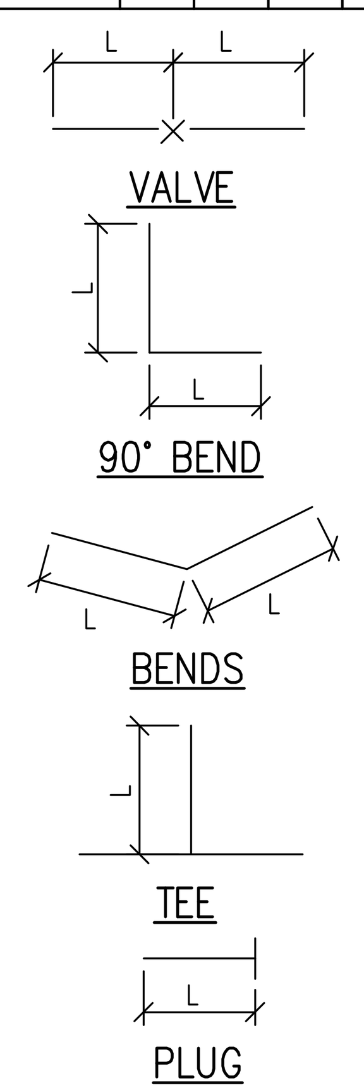
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

CIVIL DETAILS

SHEET NO.
CD1.0

ROD DIAMETER, GRADE & LENGTH OF RESTRAINED PIPE

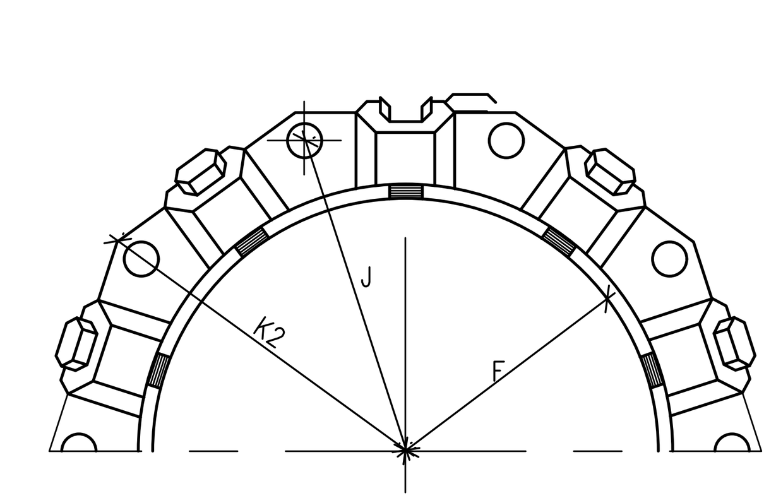
PIPE SIZE	4"			6"			8"			12"			16"			20"			24"		
FITTING	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G
90° BEND, TEE, OR PLUG	3/4"	30'	MS	3/4"	45'	MS	3/4"	60'	MS	3/4"	86'	HS	1"	108'	MS	1-1/4"	132'	HS	—	155'	—
VALVE	—	—	—	—	—	—	—	—	—	—	—	—	1"	108'	MS	1-1/4"	132'	HS	—	155'	—
45° BEND	3/4"	9'	MS	3/4"	13'	MS	3/4"	18'	MS	3/4"	25'	MS	1"	32'	MS	3/4"	39'	HS	—	45'	—
22-1/2° BEND	3/4"	1'	MS	3/4"	4'	MS	3/4"	5'	MS	3/4"	7'	MS	3/4"	8'	MS	3/4"	10'	MS	—	12'	—
11-1/4° BEND	—	—	—	—	—	—	3/4"	1'	MS	3/4"	2'	MS	3/4"	2'	MS	3/4"	3'	MS	—	3'	—



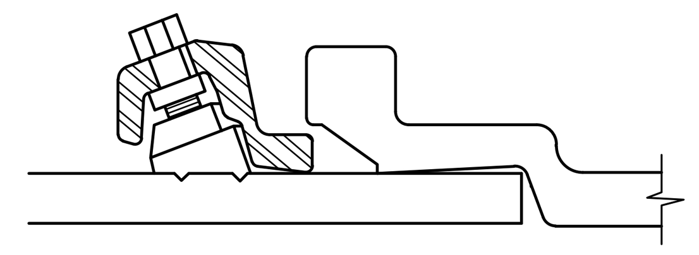
NOTES:

1. LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM VALVES AND BENDS
2. CLAMPS, RODS & MEGALUGS NOT ALLOWED FOR 24" & LARGER PIPES
3. D=DIAMETER, L=LENGTH, G=GRADE, MS=MILD STEEL, HS=HIGH STRENGTH
4. MINIMUM 4.5' GROUND COVER REQUIRED
5. MS MEANS MILD STEEL ROD ASTM STANDARD DESIGNATION A-36
6. HS MEANS HIGH STRENGTH ROD ASTM STANDARD DESIGNATION A-193 GRADE B-7
7. NUTS SHALL BE ASTM STANDARD DESIGNATION A-307 GRADE A OR B HEXAGON HEAVY SERIES. HIGH STRENGTH NUTS SHALL CONFORM TO MS-22
8. MEGALUG MECHANICAL JOINT RESTRAINT CAN BE USED IN LIEU OF TIE RODS FOR DIP OR PVC MAINS
9. LENGTH REFERS TO THE AMOUNT OF PIPE WHICH MUST BE RESTRAINED TOGETHER AND IS NOT NECESSARILY THE LENGTH OF THE RODS
10. LENGTH OF RESTRAINED PIPE CHART IS ALSO FOR THE LENGTH OF JOINT RESTRAINT FOR MEGALUGS
11. CROSSES MUST BE RESTRAINED IN ALL APPLICABLE DIRECTIONS
12. 12" AND SMALLER IN LINE VALVES AND TEES SHALL HAVE A MECHANICAL JOINT RESTRAINT DEVICES ON EACH SIDE OF THE FITTING OR VALVE. MECHANICAL JOINT RESTRAINT DEVICES SHALL BE PER MS-2 OF THE ENGINEERING STANDARDS.
13. A SECOND VALVE WILL BE REQUIRED TO BE CLOSED WHEN EXCAVATING NEXT TO AN EXISTING VALVE

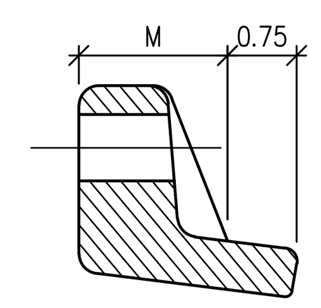
LENGTH OF RESTRAINED PIPE DETAIL (1)
NTS



MECHANICAL JOINT RESTRAINT



WEDGE DETAIL



BOLT HOLE DETAIL

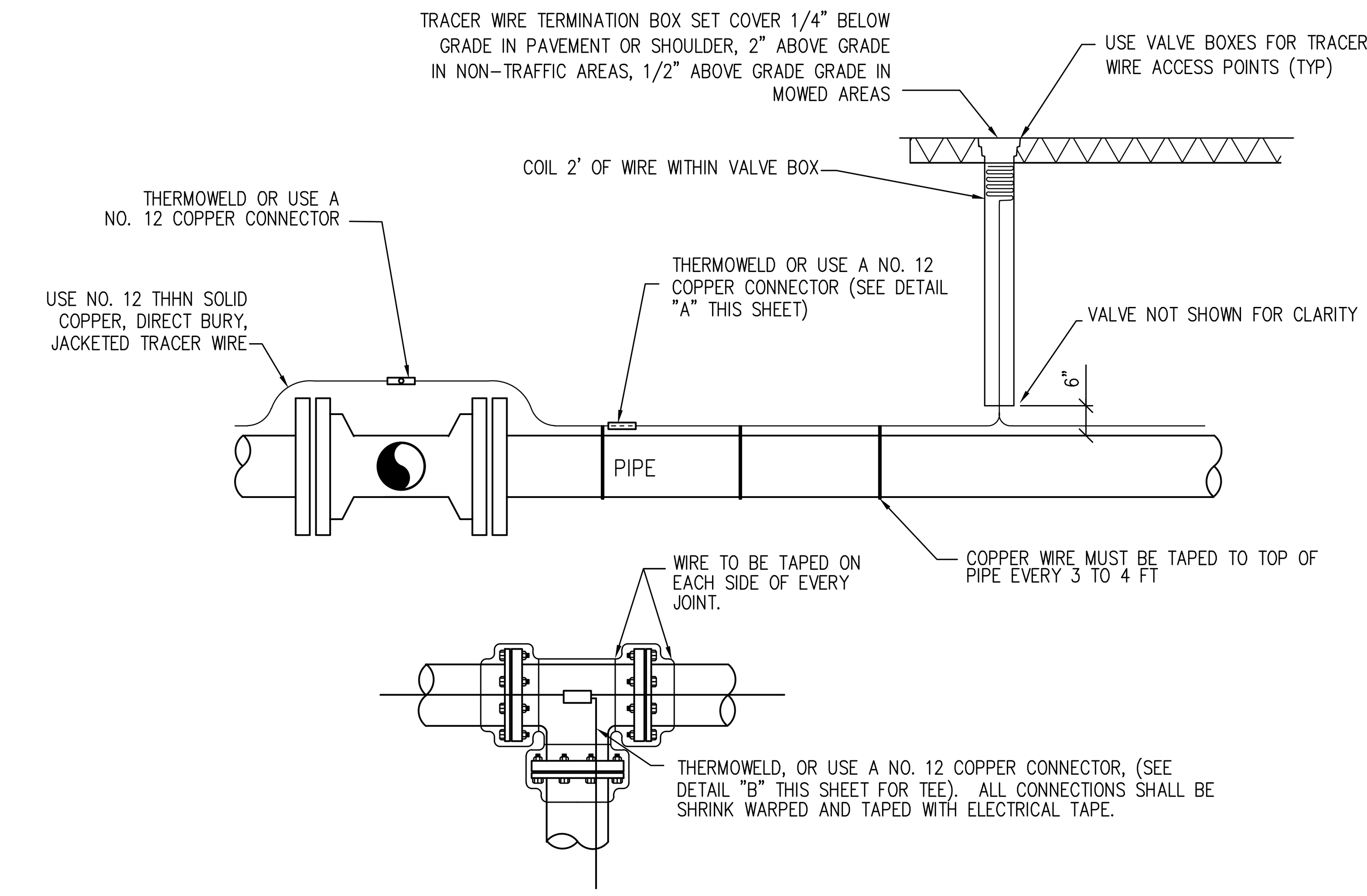
DIMENSIONS

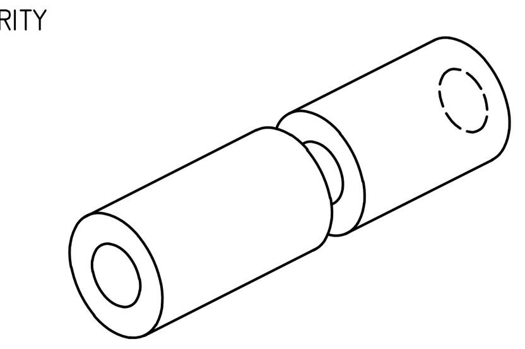
	NOMINAL PIPE SIZE	NO. OF BOLTS	NO. OF WEDGES	K2 INCHES	J INCHES	F INCHES	M INCHES	
PVC	4"	2	2					PVC
	6"	6	3	11.12	9.50	7.00	0.88	
	8"	6	4	13.37	11.75	9.15	1.00	
	10"	8	6	15.62	14.00	11.20	1.00	
	12"	8	8	17.88	16.25	13.30	1.25	
DI	4"	4	2					DI
	6"	6	3	11.12	9.50	7.00	0.88	
	8"	6	4	13.37	11.75	9.15	1.00	
	10"	8	6	15.62	14.00	11.20	1.00	
	12"	8	8	17.88	16.25	13.30	1.25	
	16"	12	12	22.50	21.00	17.54	1.56	
	20"	14	14	27.00	25.50	21.74	1.69	

NOTE:

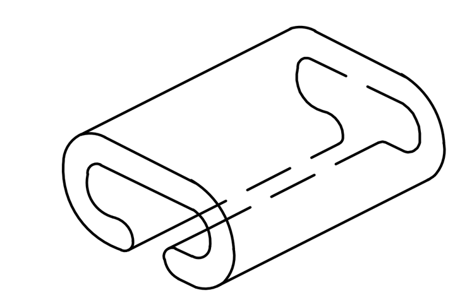
1. BASED ON "MEGA LUG" PIPE RESTRAINT SYSTEM BY EBAA IRON
2. OTHER MECHANICAL JOINT RESTRAINT DEVICES MUST BE APPROVED BEFORE INSTALLATION.

MECHANICAL JOINT RESTRAINT DETAIL (2)
NTS



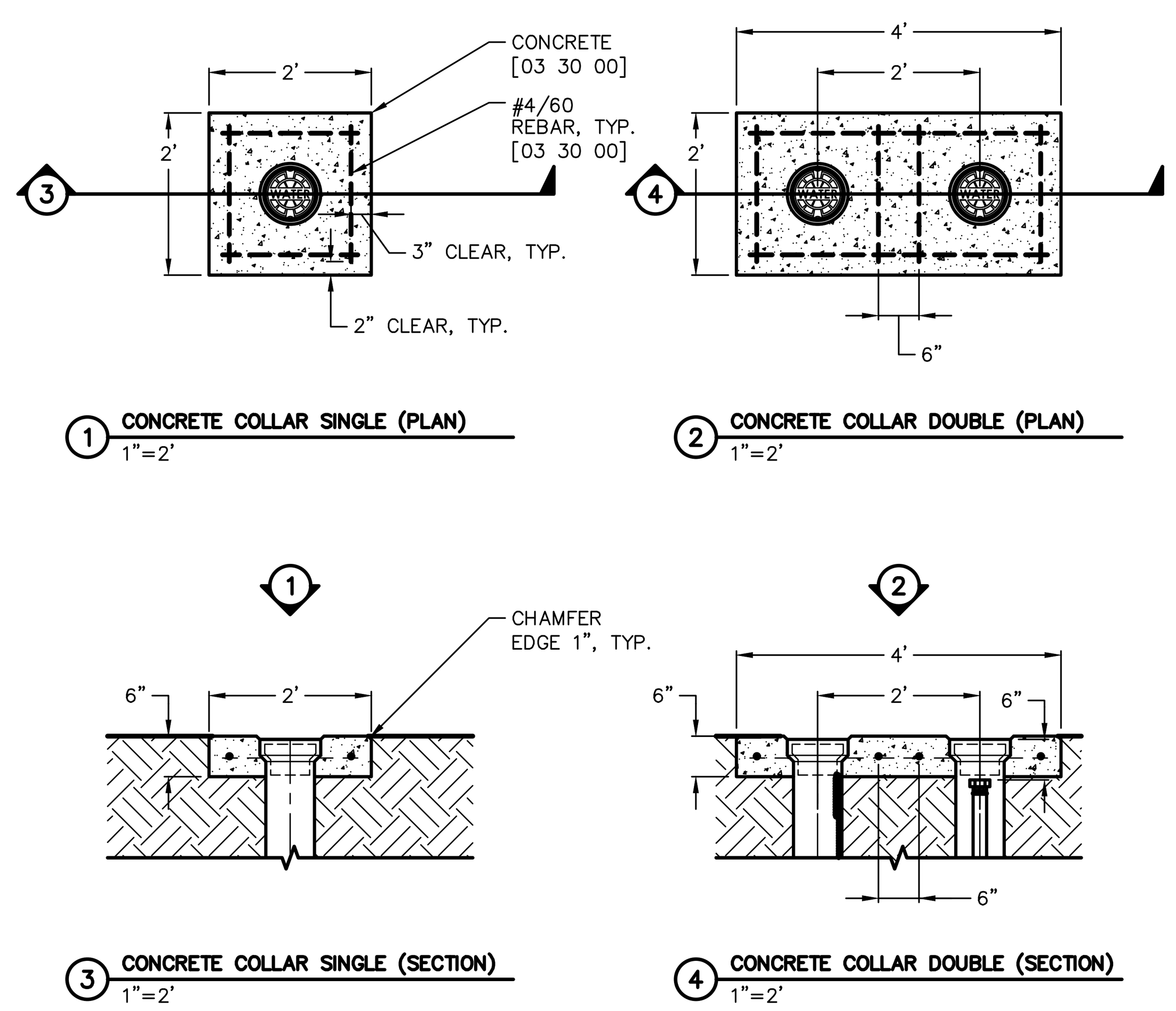


DETAIL "A"



DETAIL "B"

COPPER TRACER WIRE DETAIL (OPEN CUT METHOD) (3 / CD1.0)
NTS

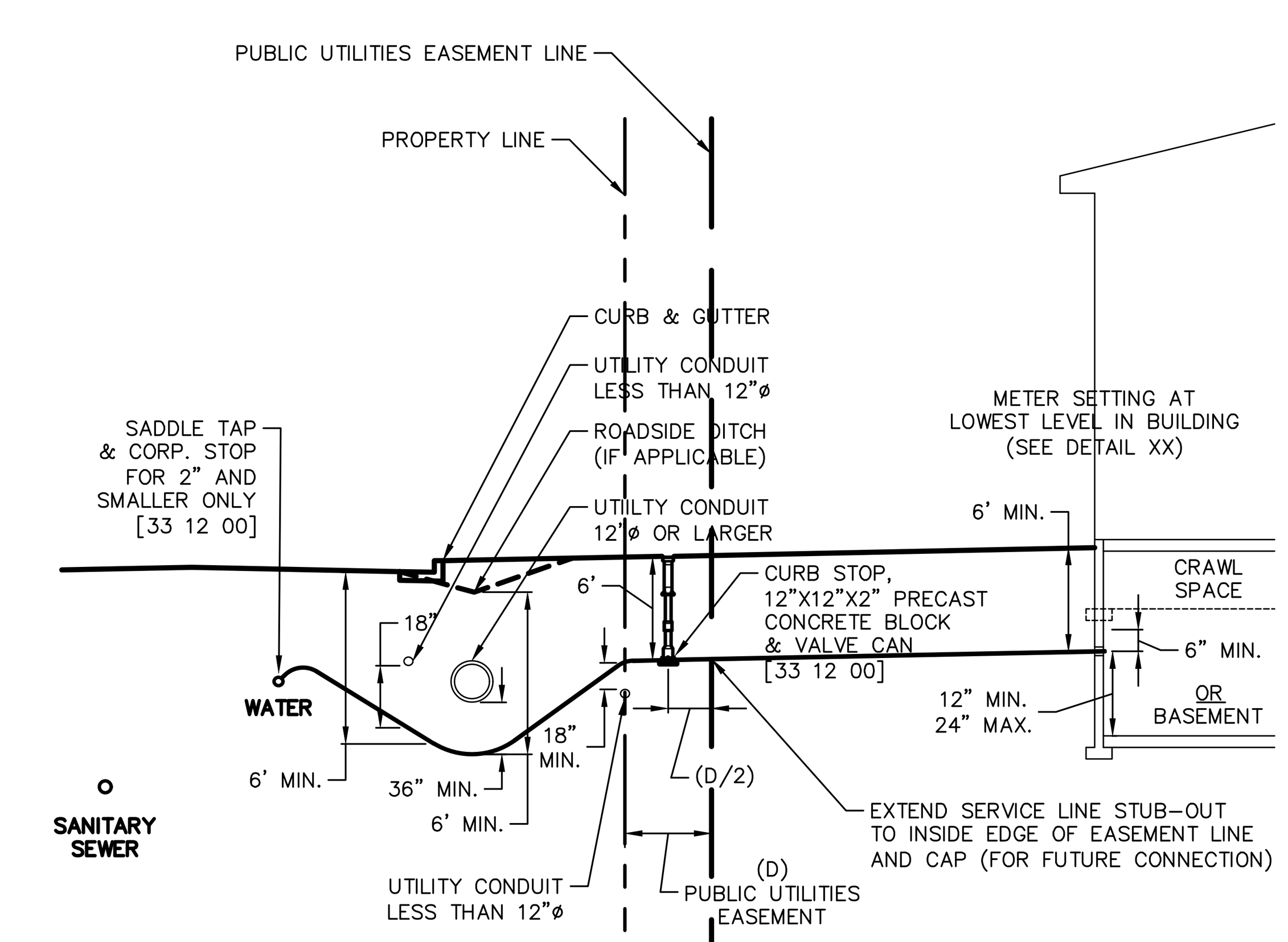


WOODMOOR WATER & SANITATION DISTRICT NO. 1 STANDARD DETAIL W-6

VALVE CANS IN UNPAVED AREAS (4)
NTS

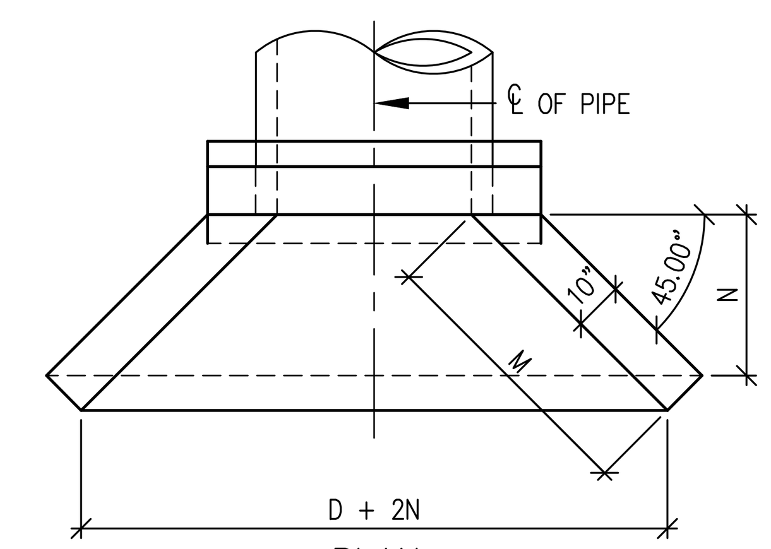
REFER TO WATER & SEWER SERVICE LINE EQUIPMENT SPECIFICATIONS FOR SUPPLEMENTAL INFORMATION (APP C OF THE SYSTEM SPECIFICATIONS)

GENERAL NOTES:
- PROVIDE METAL T-POST AT CURB STOP WHEN CONSTRUCTION OF STUB-OUT TO LOT IS COMPLETE. T-POST MAY BE REMOVED AFTER CONNECTION TO SERVICE STUB.

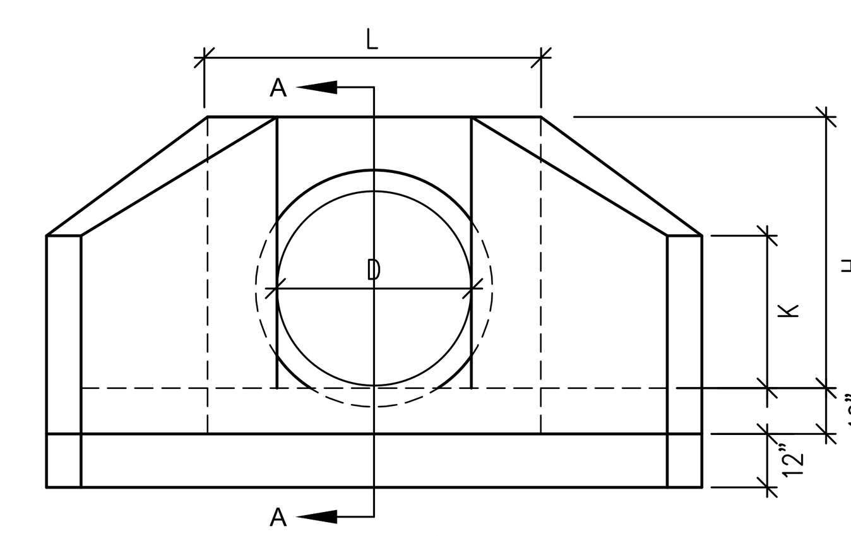


WOODMOOR WATER & SANITATION DISTRICT NO. 1 STANDARD DETAIL G-6

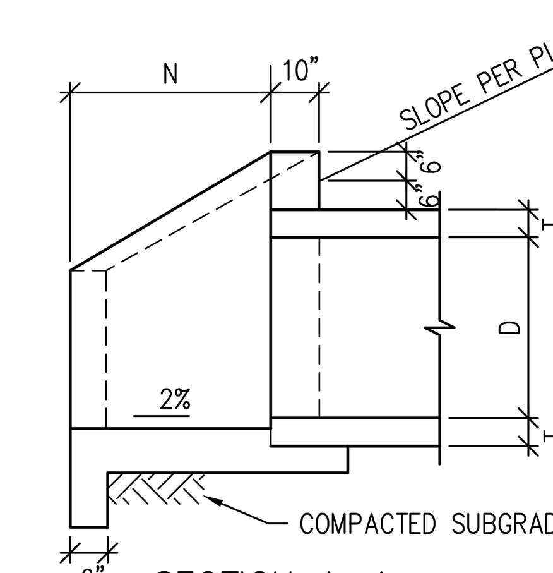
WATER SERVICE (3/4" TO 2") (5 / C1.1)
NTS



PLAN



ELEVATION



SECTION A-A

DIMENSIONS

D	AREA SQ FT	T	H	K	L	M	N
15"	1.23	2 1/4"	2'-5 1/4"	1'-5"	3'-7"	1'-9"	1'-3"
18"	1.77	2 1/2"	2'-8 1/2"	1'-7"	3'-10"	2'-1 1/2"	1'-6"
24"	3.14	3"	3'-3"	1'-10 1/2"	4'-4"	2'-10"	2'-0"
30"	4.91	3 1/2"	3'-9 1/2"	2'-2"	4'-10"	3'-6 1/2"	2'-6"
36"	7.07	4"	4'-4"	2'-5 1/2"	5'-4"	4'-3"	3'-0"
42"	9.62	4 1/2"	4'-10 1/2"	2'-9"	5'-10"	4'-1 1/2"	3'-6"

NOTES:

1. CONCRETE SHALL BE CLASS B. CAST-IN-PLACE CONCRETE SHALL CONFORM TO ASTM C478
2. CAST-IN-PLACE CONCRETE WALL EDGES SHALL BE CHAMFERED 3/4".
3. ALL WALLS AND BASE SHALL BE REINFORCED WITH #4'S @ 12" OC EACH WAY. REINFORCING BARS SHALL BE DEFORMED AND SHALL HAVE 3" MINIMUM CLEARANCE FROM FACE OF CONCRETE.
4. DIMENSIONS AND MATERIAL REQUIREMENTS VARY DEPENDING ON APPLICATION. FOR COMPLETE DETAILS, MEASUREMENTS, MATERIALS LIST, AND OTHER FACTORS REFER TO THE CURRENT CDOT M7S STANDARDS.
5. TRASH RACK SHALL BE RFP, OR ENGINEER ACCEPTED CORROSION RESISTANT MATERIAL, WITH 1" OPENINGS. TRASH RACK SHALL BE SECURED TO THE CONCRETE HEADWALL WITH STAINLESS STEEL HARDWARE.

HEADWALL WITH CIRCULAR PIPE DETAIL (6 / C1.1)
NTS

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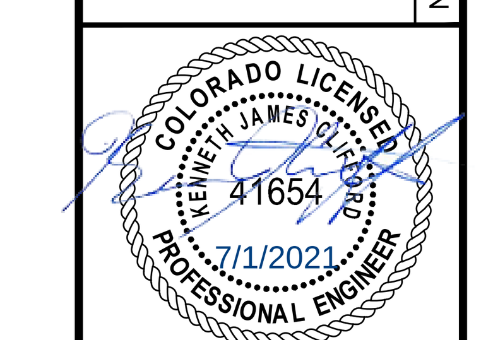

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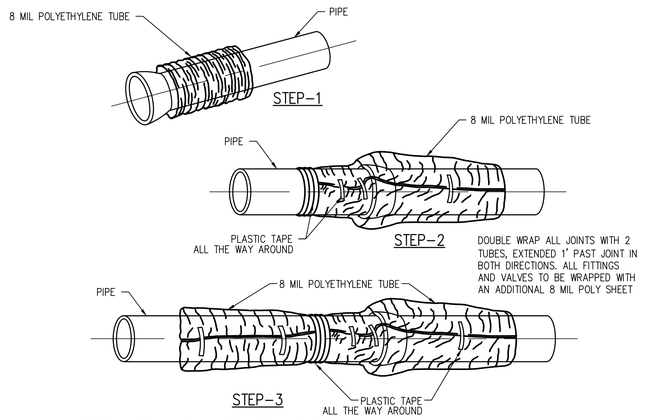


DOUBLE WRAP ALL JOINTS WITH 2 TUBES, EXTENDED 1' PAST JOINT IN BOTH DIRECTIONS. ALL FITTINGS AND VALVES TO BE WRAPPED WITH AN ADDITIONAL 8 MIL POLY SHEET

FIELD INSTALLATION–POLYETHYLENE WRAP

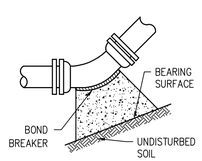
STEP–1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH

STEP–2 PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH THREE CIRCUMFERENTIAL TURNS OF TWO–INCH WIDE PLASTIC TAPE TO HOLD PLASTIC TUBE AROUND SPIGOT END

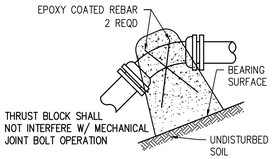
STEP–3 ADJACENT TUBE OVERLAPS FIRST TUBE AND IS SECURED WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE WILL BE LOOSE. EXCESS MATERIAL AND SHOULD BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED INTO AN OVERLAP ON TOP OF THE PIPE AND HELD IN PLACE BY MEANS OF PIECES OF THE PLASTIC TAPE AT APPROXIMATELY THREE TO FIVE FOOT INTERVALS

NOTE:
ALL RODDING TO BE ENCASED IN POLYETHYLENE SEPARATED FROM THE PIPE

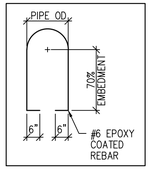
POLYETHLENE WRAP DETAIL (1)
NTS

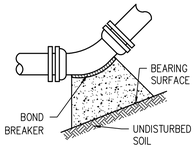


UPWARD BEND

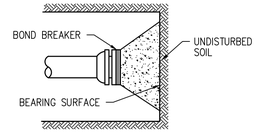


DOWNWARD BEND

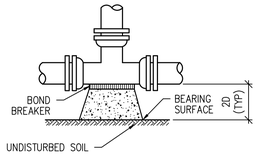




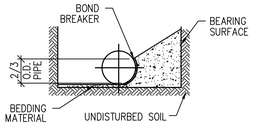
11–1/4", 22–1/2", 45° & 90° BENDS



DEAD END



TEE



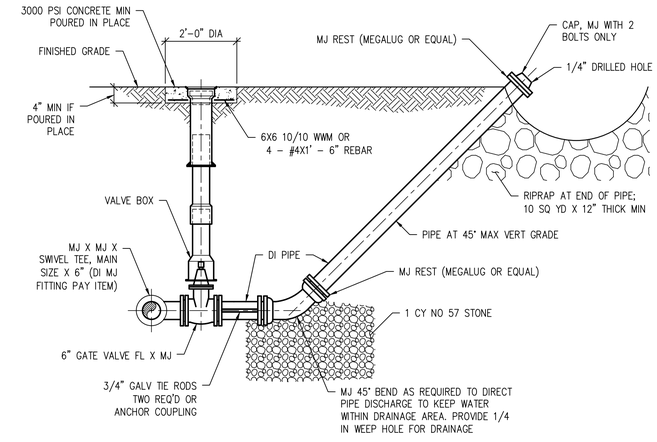
TYPICAL CROSS SECTION

NOTES:
1. BEARING SURFACES SHOWN IN CHART ARE MINIMUM SQUARE FEET
2. BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER. 4", 6", 8", & 12" WATER HAMMER = 110 PSI 16", 20" AND 24" WATER HAMMER = 70 PSI
3. BASED ON 3000 PSF SOIL BEARING CAPACITY
4. USE TYPE II PORTLAND CEMENT 3000 PSI CONCRETE
5. ALL VALVES, TEES, BENDS AND PLUGS SHALL BE RESTRAINED AND KICKBLOCKED

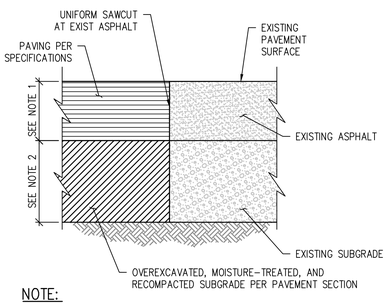
SIZE OF PIPE	SURFACE AREA (SQ FT) TEE OR DEAD END	BENDS 11–1/4°	22–1/2°	45°	90°	CONC VOL (CU YD) VERT 45°
2"	1.50	1.00	1.00	1.00	2.0	0.34
4"	1.50	1.00	1.00	1.00	2.0	0.34
6"	3.00	1.00	1.25	2.25	4.5	0.71
8"	5.25	1.00	2.00	4.00	8.0	1.22
12"	11.25	2.25	4.50	8.75	17.0	1.83
16"	19.00	3.50	7.50	14.50	27.00	2.59
20"	25.00	5.00	10.00	19.50	35.50	6.93
24"	36.00	6.50	14.00	27.75	51.00	9.88

MINIMUM BEARING SURFACE AREA (IN SQUARE FEET)

CONCRETE THRUST BLOCK DETAIL (2)
NTS C2.0

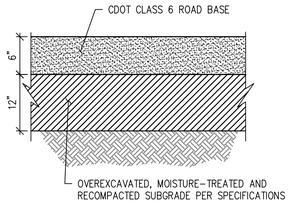


6" BLOW–OFF ASSEMBLY DETAIL (3 C2.3)
NTS

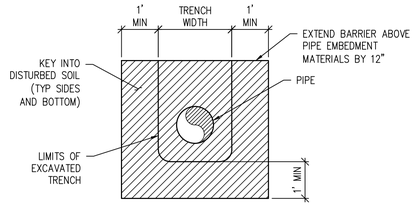


NOTE:
1. MATCH EXISTING DEPTH +1" OR 3" MINIMUM, WHICHEVER IS GREATER
2. MATCH EXIST SUBGRADE DEPTH UNLESS OTHERWISE SPECIFIED
3. APPLY TACKIFIER AT SAWCUT PRIOR TO PAVING.

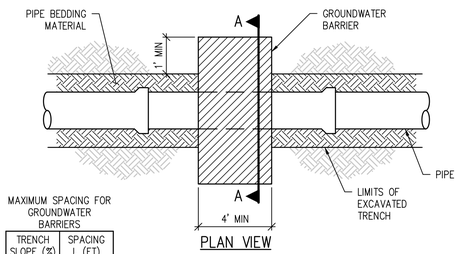
ASPHALT PATCH DETAIL (5 C2.0)
NTS



GRAVEL SECTION DETAIL (4 C1.0)
NTS



SECTION A



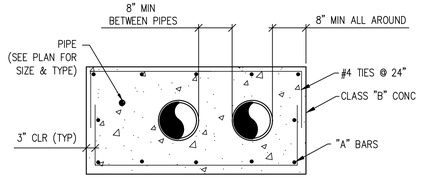
PLAN VIEW

MAXIMUM SPACING FOR GROUNDWATER BARRIERS

TRENCH SLOPE (%)	SPACING L (FT)
< 5	1,000
5 – 15	500
15 – 25	300
25 – 35	200
35 – 100	100
> 100	50

NOTES:
1. LOCATE GROUNDWATER BARRIERS PER ACCEPTED CONSTRUCTION DRAWINGS AND WATER AND SEWER DEPARTMENT CONSTRUCTION STANDARDS.
2. GROUNDWATER BARRIER TO BE CLAY OR OTHER DISTRICT APPROVED MATERIAL.

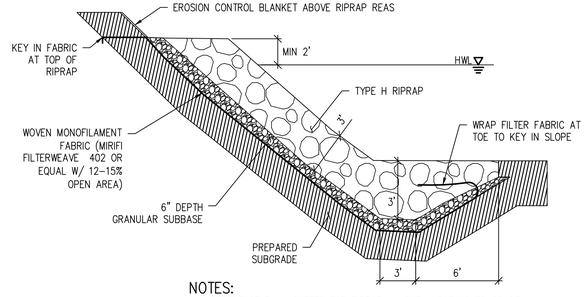
GROUNDWATER BARRIER DETAIL (7 C2.3)
NTS



PIPE SIZE	"A" BARS
4" AND SMALLER PIPE	6–#4
5" TO 12" PIPE	12–#4
14" TO 36" PIPE	12–#5
42" AND LARGER PIPE	16–#5

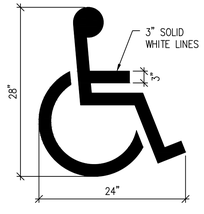
NOTE:
EXTEND HORIZONTAL REINF. A MINIMUM OF 12" INTO STRUCTURE.

CONCRETE ENCASEMENT DETAIL (8 C2.5)
NTS



NOTES:
1. REFERENCE PLAN SHEETS FOR RIPRAP LAYOUT AND FINISHED GRADE ELEVATIONS
2. RIPRAP SHALL BE HAND OR MACHINE PLACED. DUMPING ALONG SLOPE IS NOT ACCEPTABLE

TYPE H RIPRAP SLOPE PROTECTION (9 C1.0)
NTS



ACCESSIBLE SYMBOL DETAIL (6 C2.0)
NTS

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CD1.2

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WOODMOOR
Water & Sanitation District No. 1
P. O. Box 1407 • Monument, Colorado 80132
Phone (719) 488-2525 • Fax (719) 488-2530

Jennifer Irvine
El Paso County Department of Transportation
3275 Akers Drive
Colorado Springs, CO 80922

Re: Payment of Permit Fees & Restoration of Usefulness

Dear Ms. Irvine:

The Woodmoor Water and Sanitation District is in receipt of comments from El Paso County Planning and community development regarding a planned road cut for the establishment of a raw water transmission line in Woodmoor Drive.

General counsel for the District has advised us that under Colorado law, the District has express legislative authority to perform road cuts. §32-1-1006(1)(c)(I), C.R.S. Where the District restores a location to its former state of usefulness, the District is not required to pay any fees to the County. §32-1-1006(1)(c)(II), C.R.S.

Based on this advice, the District has taken the position that the District has no legal obligation to pay permit fees nor perform restoration beyond that which is necessary to restore the location to its former state of usefulness.

Very truly yours,

WOODMOOR WATER & SANITATION DISTRICT

Jessie J. Shaffer
District Manager

cc: El Paso County Planning & Community Development
Members of the District Board of Directors