STERLING RANCH FILING NO. 1

COUNTY OF EL PASO, STATE OF COLORADO

STORM SEWER PLANS

JANUARY 2018

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
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STERLING RANCH FILING NO. 1
STORM SEWER PLANS
PROJECT NO. 09-002 | FILE: (dwg)\Const Dwg\Storm - District\ST01.dwg | SCALE | DATE: 01/02/2018 | ST01
DESIGNED BY: ET | HORIZ: N/A | SHEET 1 OF 28
DRAWN BY: ELY | VERT: N/A
CHECKED BY: VAS

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.
VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

AGENCIES

OWNER/DEVELOPER:	SR LAND, LLC 20 BOULDER CRESCENT, SUITE 201 COLORADO SPRINGS, CO 80903 JIM MORLEY (719) 471-1742
CIVIL ENGINEER:	M & S CIVIL CONSULTANTS, INC. 20 BOULDER CRESCENT, SUITE 110 COLORADO SPRINGS, CO 80903 VIRGIL A. SANCHEZ P.E. (719) 955-5485
COUNTY ENGINEERING:	EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT 2880 INTERNATIONAL CIRCLE, SUITE 110 COLORADO SPRINGS, CO 80910 JEFF RICE, P.E. (719) 520-6300
TRAFFIC ENGINEERING:	EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS 3275 AKERS DRIVE COLORADO SPRINGS, CO 80922 JENNIFER IRVINE, P.E. (719) 520-6460
WATER RESOURCES:	STERLING RANCH METRO DISTRICT ENGINEERS JDS-HYDRO CONSULTANTS 545 E. PIKES PEAK AVE., SUITE 300 COLORADO SPRINGS, CO 80903 JOHN MCGINN (719) 668-8769
FIRE DISTRICT:	BLACK FOREST FIRE PROTECTION DISTRICT 11445 TEACHOUT ROAD COLORADO SPRINGS, CO 80908 CHIEF BRYAN JACK (719) 495-4300
GAS DEPARTMENT:	COLORADO SPRINGS UTILITIES 7710 DURANT DR. COLORADO SPRINGS, CO 80947 TIM WENDT (719) 668-3556
ELECTRIC DEPARTMENT:	MOUNTAIN VIEW ELECTRIC 11140 E. WOODMEN ROAD FALCON, CO 80831 (719) 495-2283
COMMUNICATIONS:	QWEST COMMUNICATIONS (U.N.C.C. LOCATORS) (800) 922-1987 AT&T (LOCATORS) (719) 635-3674

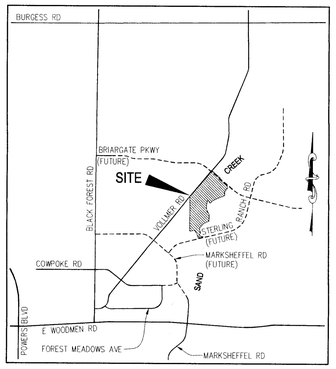
BENCHMARKS:

1. THE TOP OF AN ALUMINUM SURVEYORS CAP, STAMPED "9853", AT THE SOUTHEAST BOUNDARY CORNER OF BARBARICK SUBDIVISION
   NORTHING = 411416.273
   EASTING = 235167.071
   ELEVATION = 7023.42
2. THE TOP OF A RED PLASTIC SURVEYORS CAP, ILLEGIBLE, AT THE NORTHWEST BOUNDARY CORNER OF PAWNEE RANCHEROS SUBDIVISION
   NORTHING = 410095.404
   EASTING = 235052.131
   ELEVATION = 7000.40
3. THE TOP OF A RED PLASTIC SURVEYORS CAP, STAMPED "38141", AT THE SOUTHWEST BOUNDARY CORNER OF BARBARICK SUBDISION
   NORTHING = 411399.962
   EASTING = 233849.817
   ELEVATION = 7030.82

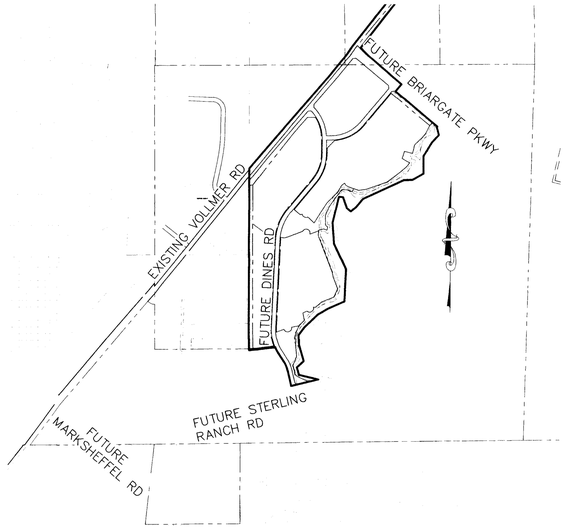
BASIS OF BEARINGS:

THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW1/4) OF SECTION 34, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AS MONUMENTED AT THE SOUTHWEST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BY A 2-1/2" ALUMINUM CAP STAMPED "LS 11624" AND AT THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BY A 2-1/2" ALUMINUM CAP STAMPED "LS 11624", SAID LINE BEARS N 89°14'14" E, A DISTANCE OF 2,722.56 FEET.

SHEET INDEX



VICINITY MAP
N.T.S.



SITE MAP
N.T.S.

APPROVALS:

ENGINEER'S STATEMENT:

DETAILED DRAINAGE CONSTRUCTION PLANS AND SPECIFICATIONS ENGINEER'S STATEMENT:
THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID DETAILED PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED DRAINAGE PLANS AND SPECIFICATIONS, AND SAID DETAILED PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH THE MASTER PLAN OF THE DRAINAGE BASIN. SAID DETAILED DRAINAGE PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR DRAINAGE FACILITY(S) IS DESIGNED. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS, OR OMISSIONS ON MY PART IN PREPARATION OF THE DETAILED IMPROVEMENT PLANS AND SPECIFICATIONS.

VIRGIL A SANCHEZ, COLORADO P.E. NO. 37160 — DATE
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

OWNER/DEVELOPER STATEMENT:

THE OWNER WILL COMPLY WITH THE REQUIREMENTS OF THE DRAINAGE REPORT AND PLAN AND THIS SET OF CONSTRUCTION DOCUMENTS. THE OWNER WILL COMPLY WITH THE REQUIREMENTS OF THE EROSION AND STORMWATER QUALITY CONTROL PLAN INCLUDING TEMPORARY BMP INSPECTION REQUIREMENTS AND FINAL STABILIZATION REQUIREMENTS. I ACKNOWLEDGE THE RESPONSIBILITY TO DETERMINE WHETHER THE CONSTRUCTION ACTIVITIES ON THESE PLANS REQUIRE COLORADO DISCHARGE PERMIT SYSTEM (CDPS) PERMITTING FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY.

JIM MORLEY, SR LAND, LLC — DATE
DIRECTOR OF PLANNING AND ENGINEERING

EL PASO COUNTY:

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH 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, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

JENNIFER IRVINE, P.E. — DATE 30 JAN 18
COUNTY ENGINEER / ECM ADMINISTRATOR

STERLING RANCH METROPOLITAN DISTRICT:

THESE DOCUMENTS HAVE BEEN REVIEWED AND APPROVED FOR STORM DRAIN AND ASSOCIATED UTILITY SERVICE CONSTRUCTION.

FOR AND ON BEHALF OF THE STERLING RANCH METRO. DISTRICT — DATE

ABBREVIATIONS

ACT	ACTUAL
BCR	BACK OF CURB RETURN
BOV	BLOWOFF VALVE ASSEMBLY
BRK	BREAK
BT	BEGINNING OF TRANSITION
CATV	CABLE TV
CL	CLASS, CENTERLINE
CLR	CLEARANCE
CONST	CONSTRUCT
CSU	COLORADO SPRINGS UTILITIES
ECC	ECCENTRIC
ECR	END CURB RETURN
EL	ELEVATION
EOA	EDGE OF ASPHALT
EOP	END OF PAVEMENT
EPC	EL PASO COUNTY
ESMT	EASMENT
ET	END TRANSITION
EX/EXIST	EXISTING
Ⓖ	GAS
GB	GRADE BREAK
FL	FLOW LINE
FT	FEET, FOOT
FUT	FUTURE
GRD	GRADE
HORZ	HORIZONTAL
HP	HIGH POINT ELEVATION
INT	INTERSECTION
LP	LOW POINT ELEVATION
LT	LEFT
LOC	LOCATION
MIN	MINIMUM
N,S,E,W	NORTH,SOUTH,EAST,WEST
NTS	NOT TO SCALE
PC	POINT OF VERTICAL CURVATURE
PCC	POINT OF COMPOUND CURVE
PCR	POINT OF CURB RETURN
PL	PROPERTY LINE
PRC	POINT OF REVERSE CURVE
PUB	PUBLIC
PVI	POINT OF VERTICAL INTERSECTION
PVC	POINT OF VERTICAL CURVE
PVT	POINT OF VERTICAL TANGENT
PT	POINT OF TANGENCY
PROP	PROPOSED
REM	REMOVE
ROW	RIGHT OF WAY
RSNTS	RESTRAINTS
RT	RIGHT
SAN	SANITARY SEWER
SD	STANDARD DETAIL
STA	STATION
STM	STORM
COB	TOP CORNER OF BOX
TELE	TELEPHONE
TYP	TYPICAL
UNK	UNKNOWN
Ⓤ	UNDERGROUND POWER
UTL	UTILITY
VERT	VERTICAL
WTR	WATER LINE
XING	CROSSING
YD	YARD (CUBIC)

LEGEND

AIR & VACUUM VALVE STA
ANCHOR, CONC. REVERSE
ANODE
CENTERLINE
EXISTING FENCE
PROPOSED GAS
PROPOSED SANITARY SEWER
PROPOSED WATER
RIGHT-OF-WAY
PROPERTY LINE
FIRE HYDRANT (EXISTING)
FIRE HYDRANT (PROPOSED)
EXISTING STORM DRAIN
FUTURE STORM DRAIN
VALVE (PROPOSED)
VALVE (EXISTING)

BLOWOFF ASSY. (PROPOSED)
BLOWOFF ASSY. (EXISTING)
PLUG (PROPOSED)
PLUG (EXISTING)
PLUG (EXISTING)
CENTERLINE (W/ STATION) 1+00
FLOODPLAIN OR 100 YR WSE 100 YR
EURV WSE EURV
EXISTING GROUND ℄ CENTERLINE
PROPOSED GRADE ℄ CENTERLINE
EDGE OF ASPHALT & GRAVEL SHOULDER
PERCENT GRADE 0.70%
FINISHED GRADE SPOT ELEVATION 7082.15

PROPOSED RIPRAP
WETLANDS

REVISIONS:	NO.	DATE:	BY:	DESCRIPTION:	APPVD. BY:	DATE:

THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

CAUTION

File: O:\09002A\Sterling Ranch District\(dwg)\Const Dwg\Storm - District\ST01.dwg Plotstamp: 1/4/2018 8:14 AM

SF-16-013

STANDARD CONSTRUCTION NOTES:

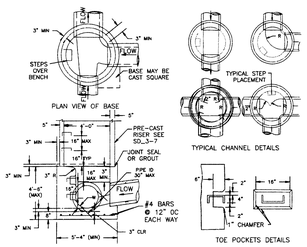
1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD LOCATION 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 TIME INCLUDING THE FOLLOWING:
   3.1 EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   3.2 CITY OF COLORADO SPRINGS/EL PASO COUNTY ENGINEERING CRITERIA MANUAL VOLUMES 1 AND 2.
   3.3 COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARDS SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION.
   3.4 CDOT M&S STANDARDS.
4. IT IS THE DESIGN ENGINEERS RESPONSIBILITY TO ACCURACY SHOW EXISTING CONDITION BOTH ONSITE AND OFFSITE ON THE CONSTRUCTION PLANS. ANY MODIFICATION NECESSARY DUE TO CONFLICT OMISSIONS OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPERS RESPONSIBILITY TO RECTIFY.
5. IT IS THE CONTRACTORS 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 STORM WATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, US ARMY CORPS OF ENGINEER ISSUED 401 AND/OR 404 PERMITS AND COUNTY AND STATE FUGITIVE DUST PERMITS.
6. ANY TEMPORARY SIGNAGE AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOW AND MUTCD CRITERIA.
7. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
8. 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 OFFSITE DISTURBANCE GRADING, OR CONSTRUCTION.

STORM SEWER GENERAL NOTES

1. ALL STATIONING IS ALONG STORM SEWER CENTERLINE UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE INVERT UNLESS OTHERWISE INDICATED.
2. ALL STORM SEWER BENDS AND WYES SHOWN ON THE PLAN SHALL BE PREFABRICATED.
3. HORIZONTAL AND VERTICAL BENDS ARE INDICATED ON THE PLANS.
4. JOINTS SHALL BE IN ACCORDANCE WITH ASTM C443 "STANDARD SPECIFICATIONS FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKET," IN NO CASE SHALL THE MAXIMUM JOINT OPENING FOR STRAIGHT ALIGNMENT EXCEED 1 INCH OR ONE AND ONE-HALF INCH ON CURVED ALIGNMENT.
5. INLET DIMENSIONS SHOWN ON PLANS REFER TO DISTANCES FROM INSIDE FACES OF BOX BETWEEN THE WIDTHS AND LENGTHS.
6. MANHOLE WIDTHS AND LENGTHS SHOWN ON PLAN REFER TO THE EXTERIOR WALL DIMENSIONS.
7. ALL STORM SEWER SHALL BE A MINIMUM OF CLASS III REINFORCED CONCRETE PIPE. SPECIFIC SEGMENTS OF STORM SEWER SHALL BE REQUIRED TO BE CONSTRUCTED OF A MINIMUM OF 5000 PSI CONCRETE DUE TO EXCESSIVE VELOCITIES. REFER TO ADDITIONAL NOTES WITHIN CONSTRUCTION PLANS.
8. SINCE ALL PIPE ENTRIES INTO THE BASE ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL. ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK.
9. THE MH RING (FRAME) SHALL BE SET IN A BED OF GROUT. THE FRAME SHALL BE SURROUNDED WITH A GROUT IN UNPAVED AREA, OR A CONCRETE COLLAR IN PAVED AREA.
10. PRECAST MANHOLES AND REINFORCEMENT SHALL CONFORM TO ASTM C 478 (AASHTO M 199).
11. CAST IN PLACE MANHOLES SHALL BE CLASS B CONCRETE.
12. STEPS SHALL BE REQUIRED WHEN THE MANHOLE DEPTH EXCEEDS 3'-6" AND SHALL BE IN ACCORDANCE WITH AASHTO M 199.
13. ALL REINFORCING STEEL SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI. VERTICAL STEEL SHALL BE PLACED AT ℄ OF WALL. ALL BARS SHALL HAVE A 2" MINIMUM CLEARANCE.
14. FLOW CHANNELS AND INVERTS SHALL BE FORMED BY SHAPING WITH CLASS B CONCRETE OR APPROVED GROUT.
15. STUB-OUTS SHALL EXTEND 4 FT MINIMUM BEYOND OUTSIDE WALL SURFACE OF MANHOLE AND BE SATISFACTORILY PLUGGED.
16. CHECK WITH THE LOCAL GOVERNMENT AUTHORITY FOR ANY ADDITIONAL STORM SEWER SPECIFICATIONS, DETAILS, OR REGULATIONS.
17. THE SLOPE OF THE MANHOLE COVER SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
18. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ALL PREFABRICATED STRUCTURES TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION.

ADDITIONAL NOTES:

1. RIPRAP CHANNEL: THE SIZE OF RIPRAP AND BOULDERS SHALL BE AS INDICATED ON THE PLANS. BOULDERS FOR GROUTED BOULDER FOREBAY SHALL MEET THE SAME REQUIREMENTS FOR DURIBILITY AND SPECIFIC GRAVITY AS RIPRAP. BOULDERS USED IN GROUTED BOULDER FOREBAY SHALL BE CLEAN AND FREE OF SOIL TO PROVIDE A PROPER BOND WITH THE GROUT.

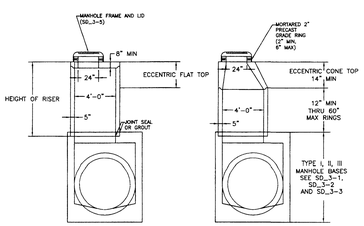


NOTES

1. TYPE II MANHOLES SHALL BE USED WHEN APPROPRIATE AND TYPICALLY WHEN THE PIPE SIZES ARE 30" OR LESS INSIDE DIAMETER.
2. VIEW AND DETAILS ARE TYPICAL. DESIGN ENGINEER SHALL DETERMINE MANHOLE BASE CONFIGURATION AND DIMENSIONS FOR PARTICULAR PIPE SIZES AND ALIGNMENT.
3. EITHER LADDER OR STEPS SHALL BE INSTALLED WHEN MANHOLE DEPTH EXCEEDS 30". STEPS IN BASE SHALL BE INSTALLED IN "TOE POCKETS" (SEE DETAIL THIS SHEET). LOWEST STEP SHALL BE A MAXIMUM OF 16" ABOVE THE FLOOR.
4. PIPES SHALL BE TRIMMED TO FINAL SHAPE AND SET BEFORE MANHOLE IS POURED.
5. BENCH SHALL BE SLOPED TOWARD CENTER OF MANHOLE BASE (4:1 MAX., ½" PER FOOT. MIN.).
6. FLOOR OF MANHOLE SHALL BE TROWELLED TO A SMOOTH, HARD SURFACE AND SHALL SLOPE TOWARDS THE OUTLET (0:1, ½" PER FT. MIN.) . FLOOR SHALL BE SHAPED AND CHANNELED; SEE DETAILS THIS SHEET.

SCALE: NOT TO SCALE

STORM SEWER MANHOLE DETAIL
TYPE II SD 3-2



NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SUPPLEMENTAL SPECIFICATIONS APPLICABLE TO THE PROJECT.
2. PRECAST RISERS SHALL CONFORM TO ASTM C478.
3. STEPS SHALL BE REQUIRED WHEN MANHOLE DEPTH EXCEEDS 30". STEPS SHALL BE CAST IRON OR EXTRUDED ALUMINUM, 1000 LB CAPACITY, 12" WIDE WITH NON-SKID GROOVES AND DROP FRONT. OSHA SAFETY NOTICE, IN ACCORDANCE WITH APPROVED OSHA REQUIREMENTS.

STORM SEWER MANHOLE
RISER AND COVER DETAIL
TYPE SD 3-7

SOIL RIPRAP NOTES:

1. THE SOIL MATERIAL SHALL BE NATIVE OR TOPSOIL AND MIXED WITH SIXTY FIVE PERCENT (65%) RIPRAP AND THIRTY FIVE PERCENT (35%) SOIL BY VOLUME.
2. SOIL RIPRAP SHALL CONSIST OF A UNIFORM MIXTURE OF SOIL AND RIPRAP WITHOUT VOIDS.
3. CONTRACTOR SHALL COOPERATE WITH ENGINEER IN OBTAINING AND PROVIDED SAMPLES OF ALL SPECIFIED MATERIALS.
4. CONTRACTOR SHALL SUBMIT CERTIFIED LABORATORY TEST CERTIFICATES FOR ALL ITEMS REQUIRED FOR SOIL RIPRAP.
5. RIPRAP USED SHALL BE THE TYPE DESIGNATED ON THE DRAWINGS AND SHALL CONFORM TO TABLE SHOWN TO THE RIGHT.
6. THE RIPRAP DESIGNATION AND TOTAL THICKNESS OF RIPRAP SHALL BE AS SHOWN ON THE DRAWINGS. THE MAXIMUM STONE SIZE SHALL NOT LARGER THAN THE THICKNESS OF THE RIPRAP.
7. NEITHER WIDTH NOR THICKNESS OF A SINGLE STONE OF RIPRAP SHALL BE LESS THAN ONE-THIRD (⅓) OF ITS LENGTH.
8. THE SPECIFIC GRAVITY OF THE RIPRAP SHALL BE TWO AND ONE-HALF (2.5) OR GREATER.
9. MINIMUM DENSITY FOR ACCEPTABLE RIPRAP SHALL BE ONE HUNDRED AND SIXTY FIVE (165) POUNDS PER CUBIC FOOT.
10. RIPRAP SPECIFIC GRAVITY SHALL BE ACCORDING TO THE BULK-SATURATED, SURFACE-DRY BASIS, IN ACCORDANCE WITH AASHTO T85.
11. BROKEN CONCRETE OR ASPHALT PAVEMENT SHALL NOT BE ACCEPTABLE FOR USE IN THE WORK.
12. ROUNDED RIPRAP (RIVER ROCK) IS NOT ACCEPTABLE, UNLESS SPECIFICALLY DESIGNATED ON THE DRAWINGS.

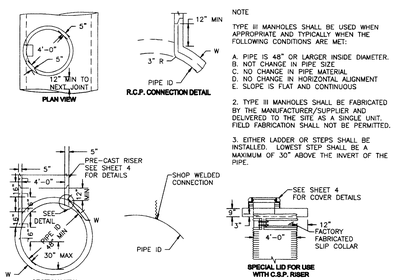
STRUCTURAL CONCRETE NOTES:

1. ALL CONSTRUCTION INVOLVING THE PLACEMENT OF STRUCTURAL CONCRETE SHALL BE COMPLETED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, AND AS SUPPLEMENTED BY THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION.
2. STEEL REINFORCING SHALL BE GRADE 60 FOR ALL REINFORCING STEEL GREATER THAN #4. SPLICING, LAP SPLICING SHALL BE MINIMUM IN THE FOLLOWING TABLE UNLESS OTHERWISE SPECIFIED:

BAR SIZE	#4	#5	#6	#7	#8
SPLICE LENGTH	1'-9"	2'-2"	2'-7"	3'-4"	4'-3"

   ALL REINFORCING SHALL HAVE A 2-INCH MINIMUM COVER UNLESS OTHERWISE SPECIFIED. ALL REINFORCED STEEL TO BE EPOXY COATED.
3. CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'_c) OF 4,000 PSI AT 28 DAYS. ALL CONCRETE PLACED AGAINST SOIL SHALL BE TYPE II PORTLAND CEMENT. ALL EXPOSED CORNERS SHALL BE FORMED WITH A 3/4" CHAMFER UNLESS OTHERWISE SPECIFIED.
4. EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-213.
5. BACKFILL AGAINST STRUCTURES SHALL NOT COMMENCE UNTIL ALL SUPPORTING DIAPHRAGMS ARE IN PLACE AND CONCRETE HAS OBTAINED ITS FULL SEVEN DAY STRENGTH. BACKFILL SHALL BE PLACED EQUALLY ON EACH SIDE OF RETAINING WALL STRUCTURES AND CUTOFF WALLS UNTIL THE FINAL GRADE IS REACHED.
6. FOOTING EXCAVATIONS SHALL BE EXAMINED BY THE GEOTECHNICAL ENGINEER WITH A 24-HOUR MINIMUM NOTIFICATION FOR SOIL AND/OR CONCRETE TESTING. PLACEMENT OF CONCRETE IN THE ABSENCE OF TESTING SHALL BE COMPLETED AT THE SOLE RISK OF THE CONTRACTOR.
7. PRIOR TO THE PLACEMENT OF CONCRETE IN AREAS WHERE SOIL IS PRESENT, THE SOIL SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 6-INCHES. THE MOISTURE CONTENT SHALL BE ADJUSTED TO WITHIN PLUS OR MINUS 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AND RECOMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION (AASHTO-T-180).

ABBREVIATIONS
EC -- EPOXY COATED O.F. -- OUTSIDE FACE E.F. -- EACH FACE E.W. -- EACH WAY I.F. -- INSIDE FACE N.F. -- NEAR FACE
T.O.C. -- TOP OF CONCRETE B.O.C. -- BOTTOM OF CONCRETE CONT. -- CONTINUOUS



NOTE

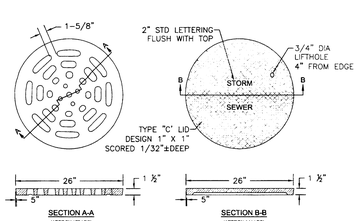
TYPE III MANHOLES SHALL BE USED WHEN APPROPRIATE AND TYPICALLY WHEN THE FOLLOWING CONDITIONS ARE MET:

A. PIPE IS 48" OR LARGER INSIDE DIAMETER.
B. NOT CHANGE IN PIPE SIZE
C. NO CHANGE IN PIPE MATERIAL
D. NO CHANGE IN HORIZONTAL ALIGNMENT
E. SLOPE IS FLAT AND CONTINUOUS

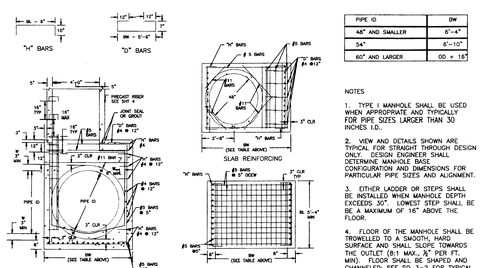
2. TYPE III MANHOLES SHALL BE FABRICATED BY THE MANUFACTURER/SUPPLIER AND DELIVERED TO THE SITE AS A SINGLE UNIT. FIELD FABRICATION SHALL NOT BE PERMITTED.

3. EITHER LADDER OR STEPS SHALL BE INSTALLED. LOWEST STEP SHALL BE A MAXIMUM OF 30" ABOVE THE INVERT OF THE PIPE.

STORM SEWER MANHOLE DETAIL
TYPE III SD 3-3



STORM SEWER MANHOLE L
LID DETAILS SD 3-2



PIPE ID	BW
48" AND SMALLER	6'-4"
54"	8'-10"
60" AND LARGER	OD + 16"

NOTES

1. TYPE I MANHOLE SHALL BE USED WHEN APPROPRIATE AND TYPICALLY FOR PIPE SIZES LARGER THAN 30 INCHES I.D..
2. VIEW AND DETAILS SHOWN ARE TYPICAL FOR STRAIGHT THROUGH DESIGN ONLY. DESIGN ENGINEER SHALL DETERMINE MANHOLE BASE CONFIGURATION AND DIMENSIONS FOR PARTICULAR PIPE SIZES AND ALIGNMENT.
3. EITHER LADDER OR STEPS SHALL BE INSTALLED WHEN MANHOLE DEPTH EXCEEDS 30". LOWEST STEP SHALL BE A MAXIMUM OF 16" ABOVE THE FLOOR.
4. FLOOR OF THE MANHOLE SHALL BE TROWELLED TO A SMOOTH, HARD SURFACE AND SHALL SLOPE TOWARDS THE OUTLET (8:1 MAX., ½" PER FT. MIN). FLOOR SHALL BE SHAPED AND CHANNELED; SEE SD_3-2 FOR TYPICAL CHANNEL DETAILS.

SCALE: NOT TO SCALE

STORM SEWER MANHOLE DETAIL
TYPE I SD 3-1

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

STERLING RANCH FILING NO. 1
GENERAL NOTES AND DETAILS

PROJECT NO: 09-002	FILE: \Eng\Const Dwg\Storm - Details\ST02.dwg	SCALE:	SHEET 2 OF 28	ST02
DESIGNED BY: ET	DATE: 01/02/2018	HORIZ: N/A		
DRAWN BY: ET		VERT: N/A		
CHECKED BY: VAS				

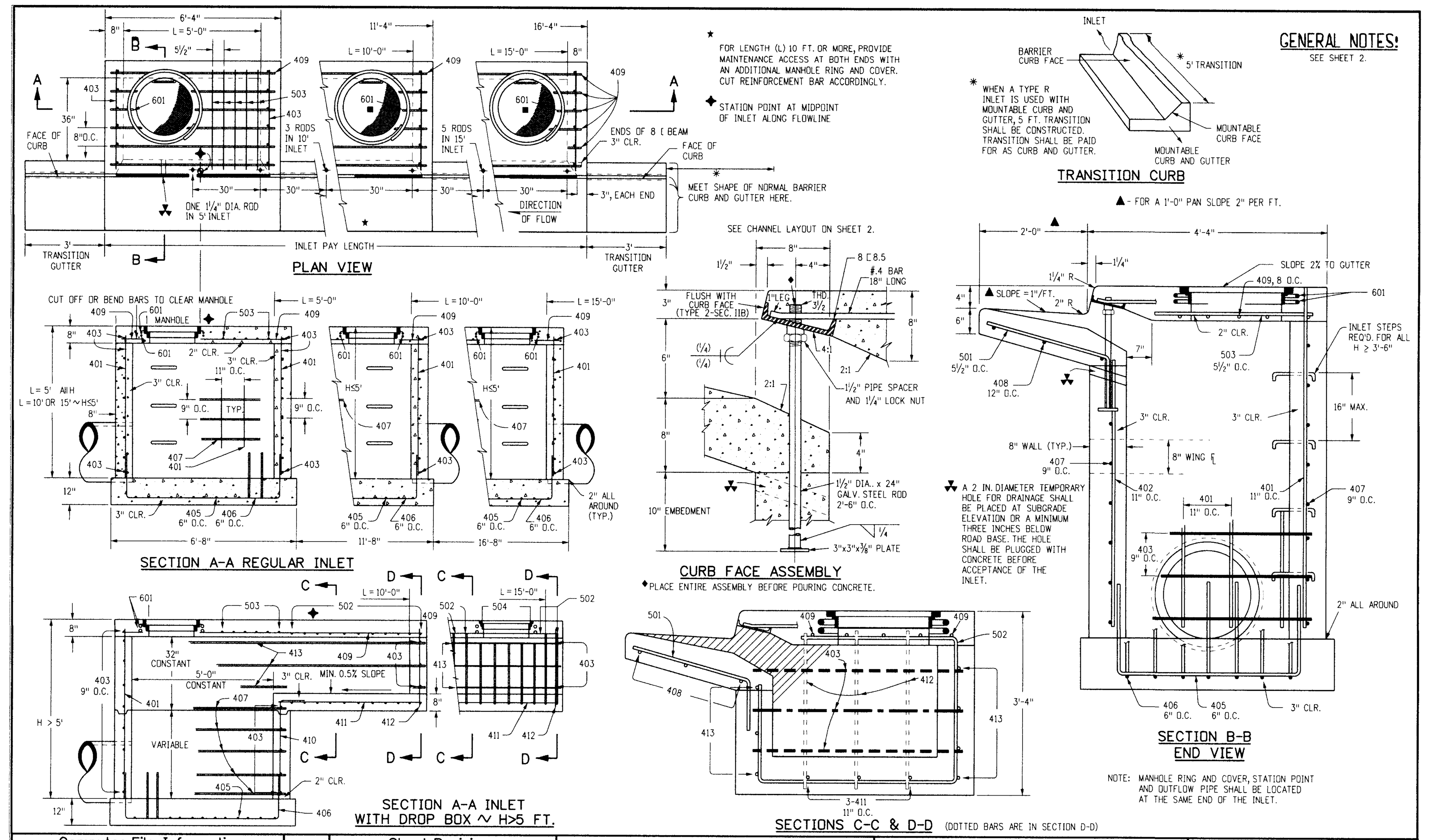
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO. 80903
PHONE: 719.955.5485

FOR AND ON BEHALF OF M.V.E., INC. VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

REVISIONS:				
NO.	DATE	BY	DESCRIPTION	APPVD

THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THE PLANS.

CAUTION



CURB INLET TYPE R — STANDARD PLAN NO. M-604-12 — Sheet No. 1 of 2

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: DD	Date:	Comments
Last Modification Date: 07/04/12	Initials: LTA		
Full Path: www.coloradodot.info/business/designsupport			
Drawing File Name: 6040120101.dgn			
CAD Ver.: MicroStation V8 Scale: Not to Scale	Units: English		

Colorado Department of Transportation
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Denver, Colorado 80222
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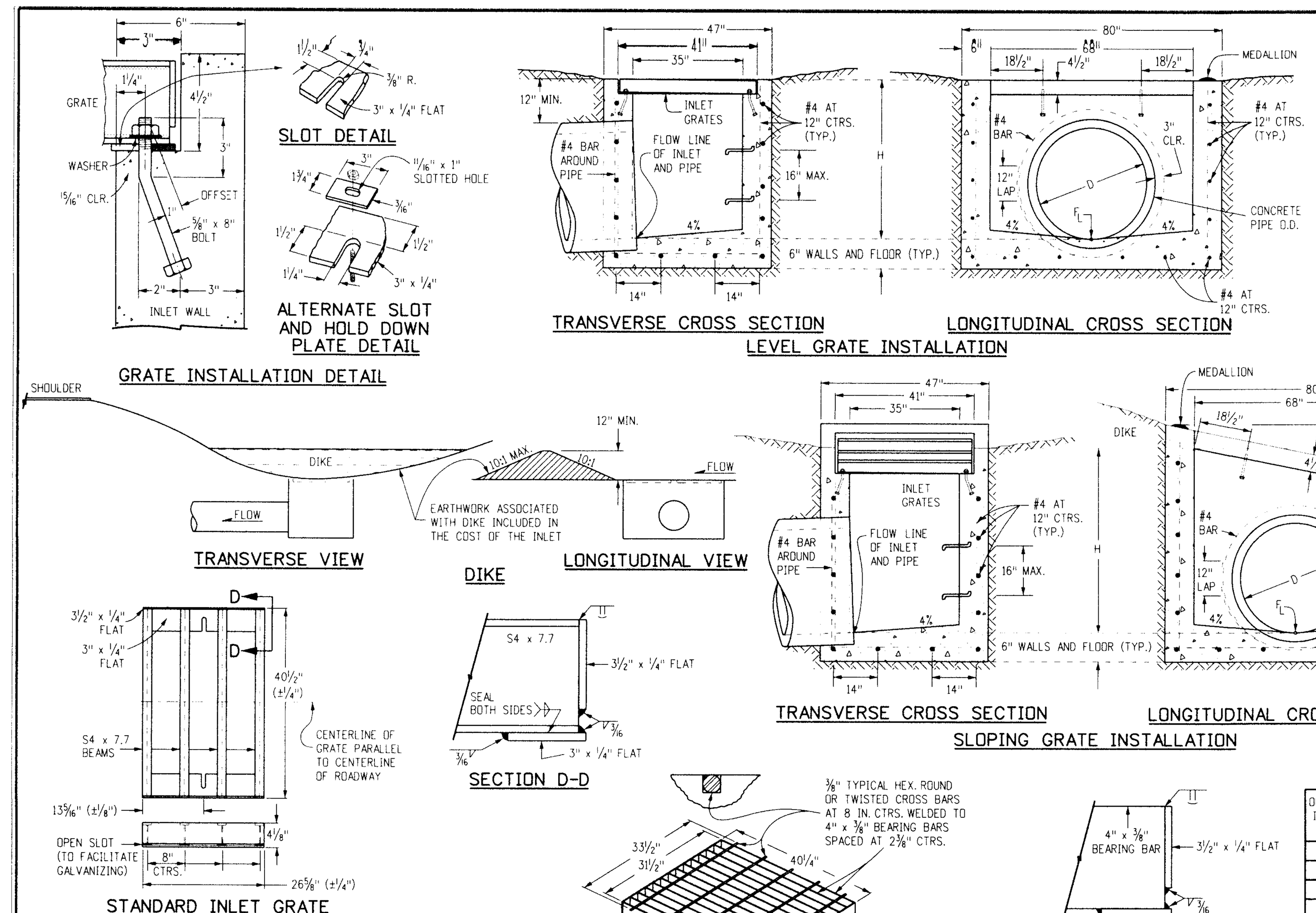
CURB INLET TYPE R
Issued By: Project Development Branch July 4, 2012
STANDARD PLAN NO. M-604-12
Sheet No. 1 of 2



GENERAL NOTES

1. INLET TYPE D IS NOT HS-20 RATED AND SHALL NOT BE PLACED IN PAVED ROADWAYS. THIS INLET SHALL BE USED ONLY OUTSIDE PAVED ROADWAYS.
2. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
3. SEE PLANS FOR SIZE AND LOCATION OF PIPE.
4. STRUCTURAL STEEL FOR GRATES AND GRATE INSTALLATION HARDWARE SHALL BE GALVANIZED AND SHALL BE IN ACCORDANCE WITH SUBSECTION 712.06.
5. STANDARD INLET GRATES SHALL BE USED ON ALL TYPE D INLETS UNLESS CLOSE MESH GRATES ARE SPECIFIED ON THE PLANS.
6. CLOSE MESH GRATES ARE RECOMMENDED WHERE FOOT TRAFFIC OR BICYCLE ROUTES ARE IN CLOSE PROXIMITY TO GRATE. THIS GRATE IS NOT ADA COMPLIANT OR BICYCLE FRIENDLY AND SHALL NOT BE PLACED DIRECTLY IN SIDEWALKS, CROSSWALKS OR BIKE PATHS.
7. STEPS SHALL BE PROVIDED WHEN INLET DIMENSION "H" IS EQUAL TO OR GREATER THAN 3 FT.-6 IN. AND SHALL CONFORM WITH AASHTO M 199.
8. REINFORCING BARS SHALL BE EPOXY COATED AND DEFORMED #4, AND SHALL HAVE A 2 IN. MINIMUM CLEARANCE. CUT OR BEND BARS AROUND PIPE AS REQUIRED.
9. ALL INLETS SHALL HAVE A 4 IN. DIA. METAL MEDALLION WITH A "NO DUMPING DRAINS TO STREAM" MESSAGE ON IT. THE MEDALLION SHALL HAVE A FISH SYMBOL WITH A BLUE BACKGROUND. IT SHALL BE FIRMLY ATTACHED TO THE INLET'S SURFACE WITH A PERMANENT FASTENER.

TWO STEEL GRATE PER INLET QUANTITIES

NO. PIECES	DESCRIPTION	LENGTH	LBS PER FT.	WEIGHT (LBS.)
8	S4 x 7.7 BEAM	40"	7.70	206
4	3½" x ¼" FLAT	26⅝"	2.98	26
4	3" x ¼" FLAT	26⅝"	2.55	24

TOTAL LBS. - 256

OUTLET PIPE INSIDE DIA. FT. - "D"	MIN. "H" FT.
1.5	3.0
2.0	3.5
2.5	4.0
3.0	4.5
3.5	5.0

"H" FT.	CONCRETE CU. YDS. ▼	STEEL LBS. ▼	CIRCULAR PIPE RANGE INSIDE DIA., IN. - "D"
3.0	1.5	127	18
3.5	1.7	149	18-24
4.0	1.9	157	18-30
4.5	2.0	179	18-36
5.0	2.2	187	18-42
5.5	2.4	208	18-42
6.0	2.6	215	18-42
6.5	2.8	236	18-42
7.0	2.9	243	18-42
7.5	3.1	264	18-42
8.0	3.3	271	18-42
8.5	3.5	292	18-42
9.0	3.6	299	18-42
9.5	3.8	320	18-42
10.0	4.0	327	18-42

▼ CONCRETE AND STEEL QUANTITIES ARE FOR ONE ENTIRE INLET BEFORE DEDUCTION FOR VOLUME OCCUPIED BY PIPE. WEIGHT OF STEEL INCLUDES A RING FOR THE MAXIMUM PIPE DIAMETER.

QUANTITIES FOR ONE INLET

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: DD	Date:	Comments
Last Modification Date: 07/04/12	Initials: LTA		
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Drawing File Name: 6040110101.dgn			
CAD Ver.: MicroStation V8 Scale: Not to Scale	Units: English		

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INLET, TYPE D
Issued By: Project Development Branch July 4, 2012
STANDARD PLAN NO. M-604-11
Sheet No. 1 of 1

TABLE ONE ~ BAR LIST FOR CURB INLETS, TYPE "R"

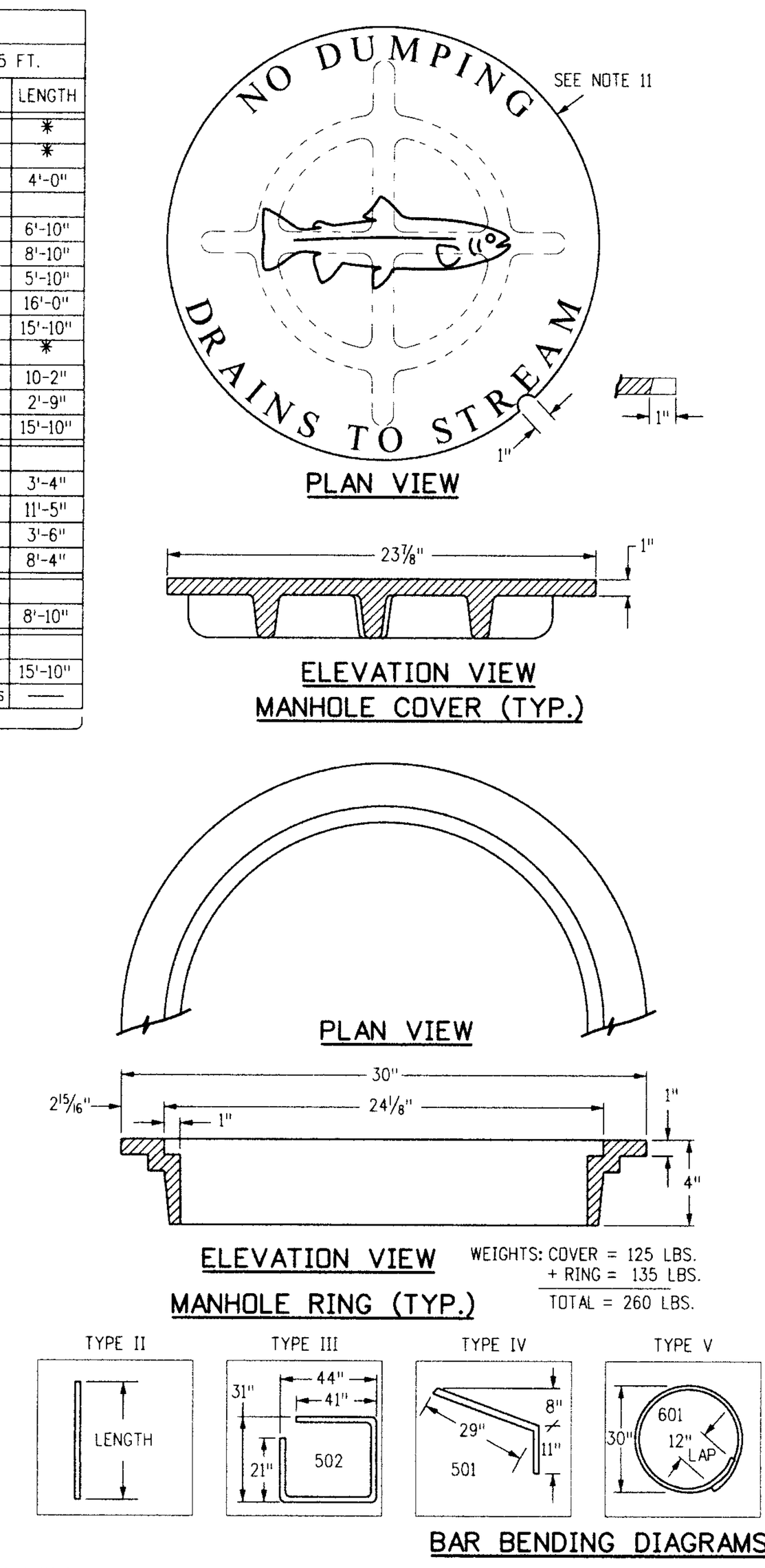
MARK	BAR # OR SIZE	O.C. SPACING	TYPE	ALL INLETS L = 5 FT. NO. REQ'D.	L = 5 FT. LENGTH	REGULAR INLETS: H ≤ 5 FT. L = 10 FT. NO. REQ'D.	L = 10 FT. LENGTH	L = 15 FT. NO. REQ'D.	L = 15 FT. LENGTH	DROP BOX INLETS: H > 5 FT. L = 10 FT. NO. REQ'D.	L = 10 FT. LENGTH	L = 15 FT. NO. REQ'D.	L = 15 FT. LENGTH
401	4	11"	II	15	*	21	*	26	*	11	*	11	*
402	4	11"	II	7	*	13	*	18	*	7	*	7	*
403	4	9"	II	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-0"
405	4	6"	VI	11	6'-10"	21	6'-10"	31	6'-10"	11	6'-10"	11	6'-10"
406	4	6"	VIII	7	8'-10"	7	13'-10"	7	18'-10"	7	8'-10"	7	8'-10"
407	4	9"	II	*	5'-10"	*	10'-10"	*	15'-10"	*	5'-10"	*	5'-10"
408	4	12"	II	3	6'-10"	3	11'-10"	3	16'-0"	3	11'-10"	3	16'-0"
409	4	8"	II	6	5'-10"	6	10'-10"	6	15'-10"	6	10'-10"	6	15'-10"
410	4	11"	VII							3		3	*
411	4	11"	II							3	5'-2"	3	10-2"
412	4	11"	II							3	2'-9"	3	2'-9"
413	4	9"	II							7	10'-10"	7	15'-10"
501	5	5½"	IV	11	3'-4"	22	3'-4"	33	3'-4"	22	3'-4"	33	3'-4"
502	5	5½"	III							11	11'-5"	17	11'-5"
503	5	5½"	II	5	3'-6"	16	3'-6"	27	3'-6"	6	3'-6"	6	3'-6"
504	5	5½"	IX									5	8'-4"
601	6	2½"	V	2	8'-10"	2	8'-10"	2	8'-10"	2	8'-10"	4	8'-10"
■8[8.5				1	5'-10"	1	10'-10"	1	15'-10"	1	10'-10"	1	15'-10"
				2 BARS, 1 RODS	——	4 BARS, 3 RODS	——	8 BARS, 5 RODS	——	4 BARS, 3 RODS	——	8 BARS, 5 RODS	——

* VARIABLE REFER TO TABLE TWO.
■ INCLUDE #4, 18 IN. BARS (SEE CHANNEL LAYOUT).

TABLE TWO ~ BARS AND QUANTITIES VARIABLE WITH "H"

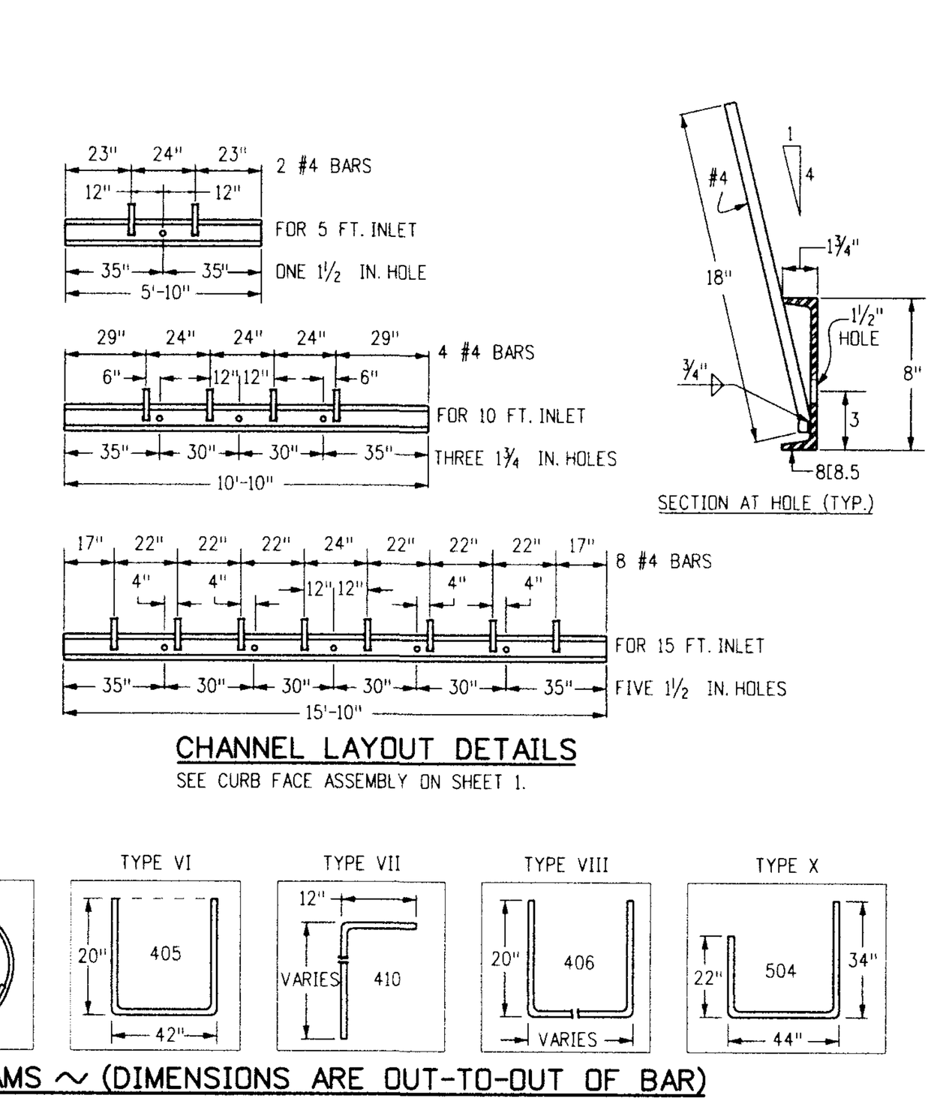
"H"	LENGTH 401	LENGTH 402	LENGTH 410	NO. REQ'D. REGULAR 403	REGULAR 407	NO. REQ'D. DROP BOX 403	DROP BOX 407	L = 5 FT. CONC. CU. YDS.	L = 5 FT. STEEL LBS.	L = 10 FT. CONC. CU. YDS.	L = 10 FT. STEEL LBS.	L = 15 FT. CONC. CU. YDS.	L = 15 FT. STEEL LBS.
3'-0"	2'-8"	1'-8"		10	7			3.2	285	5.3	497	7.4	706
3'-6"	3'-2"	2'-2"		10	7			3.4	305	5.7	528	7.9	747
4'-0"	3'-8"	2'-8"		12	9			3.7	326	6.0	559	8.4	786
4'-6"	4'-2"	3'-2"		12	9			3.9	334	6.4	571	8.8	803
5'-0"	4'-8"	3'-8"		14	11			4.1	354	6.7	602	9.3	844
5'-6"	5'-2"	4'-2"	3'-5"	16	13	15	6	4.4	375	6.0	607	7.4	850
6'-0"	5'-8"	4'-8"	3'-11"	16	13	16	6	4.6	382	6.2	616	7.6	860
6'-6"	6'-2"	5'-2"	4'-5"	18	15	18	8	4.8	402	6.4	637	7.8	880
7'-0"	6'-8"	5'-8"	4'-11"	20	17	19	10	5.0	423	6.6	654	8.0	897
7'-6"	7'-2"	6-2"	5'-5"	20	17	20	10	5.3	430	6.9	664	8.3	907
8'-0"	7'-8"	6'-8"	5'-11"	22	19	22	12	5.5	451	7.1	684	8.5	927
8'-6"	8'-2"	7'-2"	6'-5"	24	21	23	14	5.7	471	7.3	702	8.7	944
9'-0"	8'-8"	7'-8"	6'-11"	24	21	24	14	6.0	479	7.6	711	9.0	954
9'-6"	9'-2"	8'-2"	7'-5"	26	23	26	16	6.2	499	7.8	732	9.2	974
10'-0"	9'-8"	8'-8"	7'-11"	28	25	27	18	6.4	520	8.0	749	9.4	992
10'-6"	10'-2"	9'-2"	8'-5"	28	25	28	18	6.7	527	8.3	759	9.7	1001
11'-0"	10'-8"	9'-8"	8'-11"	30	27	30	20	6.9	547	8.5	779	9.9	1022

NOTES: FOR L = 5 FT., L = 10 FT., AND L = 15 FT.
REGULAR INLETS: TOTAL QUANTITIES NEEDED ARE OUTSIDE THE HEAVY BLACK LINE.
DROP BOX INLETS: TOTAL QUANTITIES NEEDED ARE INSIDE THE HEAVY BLACK LINE.
STEEL WEIGHTS DO NOT INCLUDE STRUCTURAL STEEL CHANNEL.



GENERAL NOTES

1. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
2. CONCRETE WALLS SHALL BE FORMED ON BOTH SIDES AND SHALL BE 8 IN. THICK.
3. INLET STEPS SHALL BE IN CONFORMANCE WITH AASHTO M 199.
4. CURB FACE ASSEMBLY SHALL BE GALVANIZED AFTER WELDING.
5. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN. CURB AND GUTTER CORNERS SHALL BE FINISHED TO MATCH THE EXISTING CURB AND GUTTER BEYOND THE TRANSITION GUTTER.
6. REINFORCING BARS SHALL BE DEFORMED AND SHALL HAVE A 2 IN. MINIMUM CLEARANCE. ALL REINFORCING BARS SHALL BE EPOXY COATED.
7. DIMENSIONS AND WEIGHTS OF TYPICAL MANHOLE RING AND COVER ARE NOMINAL.
8. MATERIAL FOR MANHOLE RINGS AND COVERS SHALL BE GRAY OR DUCTILE CAST IRON IN ACCORDANCE WITH SUBSECTION 712.06.
9. SINCE PIPE ENTRIES INTO THE INLET ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL. ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK. QUANTITIES INCLUDE VOLUMES OCCUPIED BY PIPES.
10. STRUCTURAL STEEL SHALL BE GALVANIZED AND SHALL BE IN ACCORDANCE WITH SUBSECTION 712.06.
11. ALL MANHOLE COVERS SHALL BE CAST WITH A "NO DUMPING DRAINS TO STREAM" MESSAGE AND A FISH SYMBOL. THE SURFACE OF THE MANHOLE COVER SHALL HAVE A NON-SLIP PATTERN.



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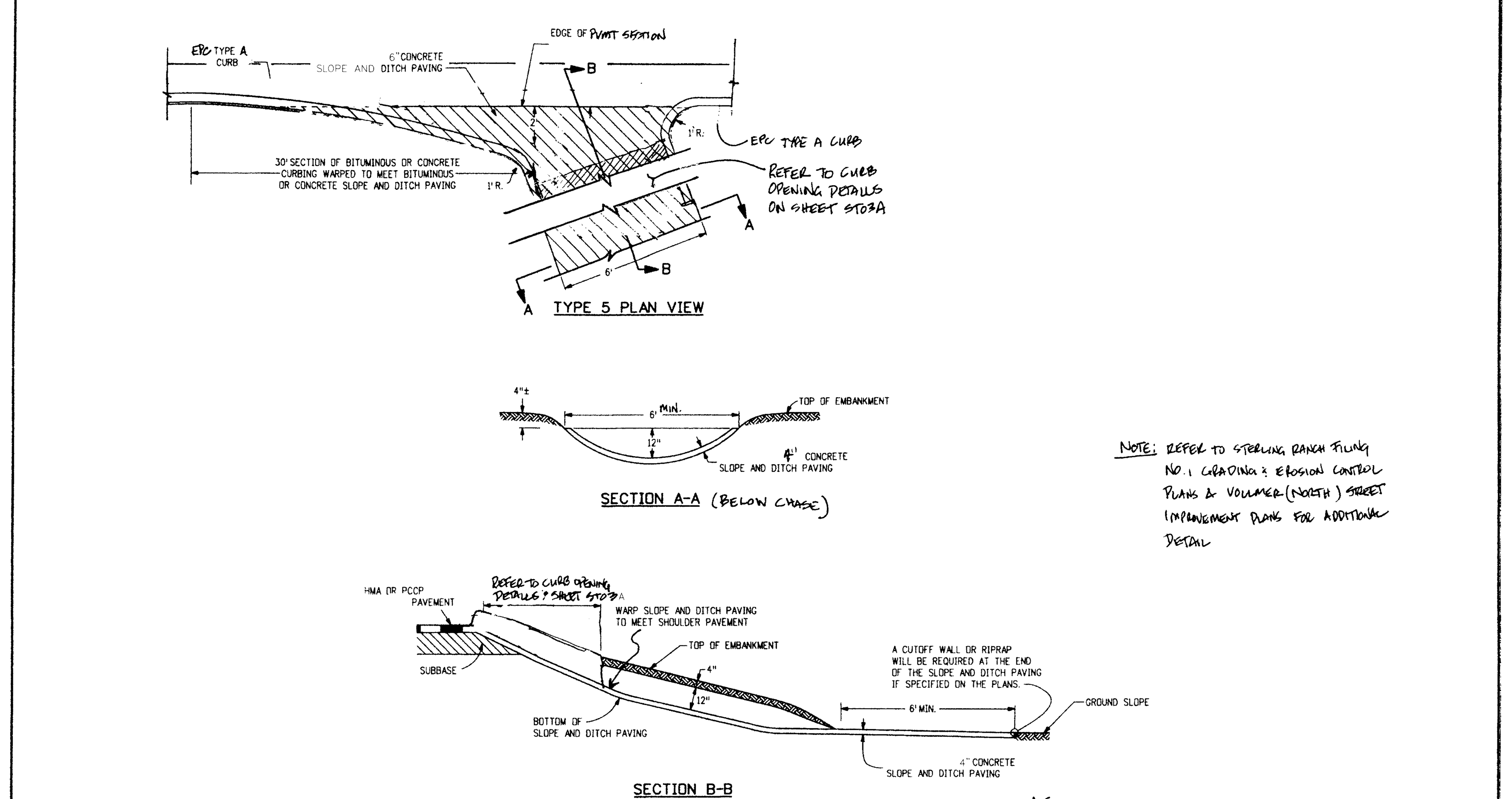
CURB INLET TYPE R
Issued By: Project Development Branch July 4, 2012
STANDARD PLAN NO. M-604-12
Sheet No. 2 of 2



NOTE: REFER TO STERLING RANCH FILING NO. 1 GRADING & EROSION CONTROL PLANS & VOLLMER (NORTH) STREET IMPROVEMENT PLANS FOR ADDITIONAL DETAIL

SECTION B-B
(WITH 4 IN. BITUMINOUS OR CONCRETE SLOPE AND DITCH PAVING)

AS (MODIFIED BY M&S CIVIL)

Computer File Information		Sheet Revisions	
Creation Date: 07/04/06	Initials: SJR	Date:	Comments
Last Modification Date: 07/04/06	Initials: LTA		
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Drawing File Name: 615020101.dgn			
CAD Ver.: MicroStation V8 Scale: Not to Scale	Units: English		

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EMBANKMENT PROTECTOR TYPE 5
Issued By: Project Development Branch July 04, 2006
~~STANDARD~~ PLAN NO. M-615-2
Sheet No. 1 of 1

STERLING RANCH FILING NO. 1
GENERAL NOTES AND DETAILS
09-002
\dwg\Const Dwg\Storm - District\ST03.dwg
01/02/2018
ET
ELY
VAS
N/A
N/A
SHEET 3 OF 28
ST03

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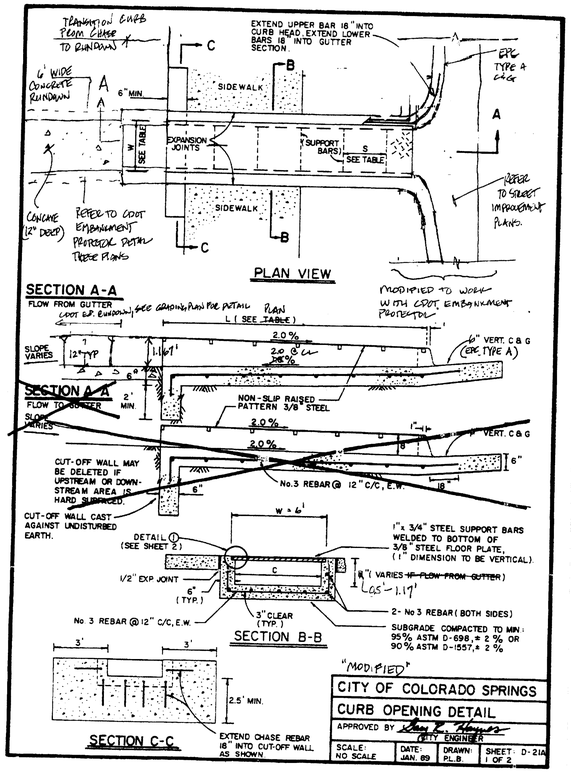
PHONE: 719.955.5485

REVISIONS:
CAUTION

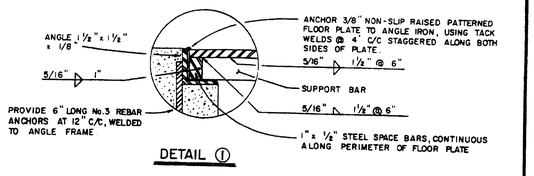


CITY OF COLORADO SPRINGS

CURB OPENING DETAIL

APPROVED BY _____ CITY ENGINEER

SCALE: NO SCALE	DATE: JAN. 89	DRAWN: PL.B	SHEET: D-21A 1 OF 2



DETAIL 1

TYPE OF WALK	MIN. TOTAL LENGTH (L) OF PLATE
ATTACHED	WALK WIDTH + 10 1/2"
DETACHED OR ROADWAYS WITHOUT WALKS	VARIES, HOWEVER ENTIRE CHASE SECTION SHALL BE COVERED WITHIN PUBLIC R.O.W. (SEE NOTE 5)

1" x 3/4" SUPPORT BAR REQUIREMENTS	
FLOOR PLATE WIDTH(W)	SUPPORT SPACING(S)
1'	NONE REQUIRED
2'	60" C/C
3'	27" C/C
4'	15" C/C
5'	10" C/C
6'	7" C/C

NOTE: EACH END OF FLOOR PLATE SHALL BE SUPPORTED BY SUPPORT BARS, WHEN SUPPORT BARS ARE SPECIFIED.
CHASE OPENING (C) = W - 2 3/8"

NOTES:

1. ALL EXPOSED METAL TO BE HOT DIPPED ZINC COATED. FIELD WELDS TO BE TOUCH-UP WITH COLD ZINC COATING.
2. WHEN OTHER THAN TYPE I (8") CURB EXISTS, THE CONTRACTOR SHALL REMOVE THE EXISTING CURB TO ALLOW FOR THE REQUIRED TRANSITIONS AS FOLLOWS: BEGINNING AT THE EDGE OF THE CHASE SECTION, THERE SHALL BE A MINIMUM OF 5 FEET OF TYPE I CURB PLUS 10 FEET OF TRANSITION TO EXISTING CURB TYPE.
3. ALL REMOVAL OF EXISTING CURB SHALL BE BY SAW CUT, OR BY REMOVAL TO AN EXISTING EXPANSION OR COLD JOINT REMAINING SECTION AFTER SAW CUTTING TO BE MINIMUM 5' IN LENGTH.
4. CHASE SECTION TO BE POURED MONOLITHICALLY WITH CURB & GUTTER SECTION AND CUT-OFF WALL.
5. WHEN CHASE SECTION LENGTH(L) EXCEEDS 15' PROVIDE TOOL JOINT IN CONCRETE AT MAXIMUM OF 10' SPACING. FABRICATE FLOOR PLATES IN MULTIPLE SECTION NOT TO EXCEED 10' IN LENGTH.

CITY OF COLORADO SPRINGS

CURB OPENING DETAIL

APPROVED BY _____ CITY ENGINEER

SCALE: NO SCALE	DATE: JAN. 89	DRAWN: PL.B	SHEET: D-21B 2 OF 2

STERLING RANCH FILING NO. 1

GENERAL NOTES AND DETAILS

PROJECT NO. 09-002 | FILE: \dwg\Const Dwg\Street & Storm Plans\ST03A.dwg | SCALE: | DATE: 01/02/2018 | SHEET 4 OF 28 | ST03A

DESIGNED BY: GT | HORIZ: NA
DRAWN BY: JP | VERT: NA
CHECKED BY: VAS

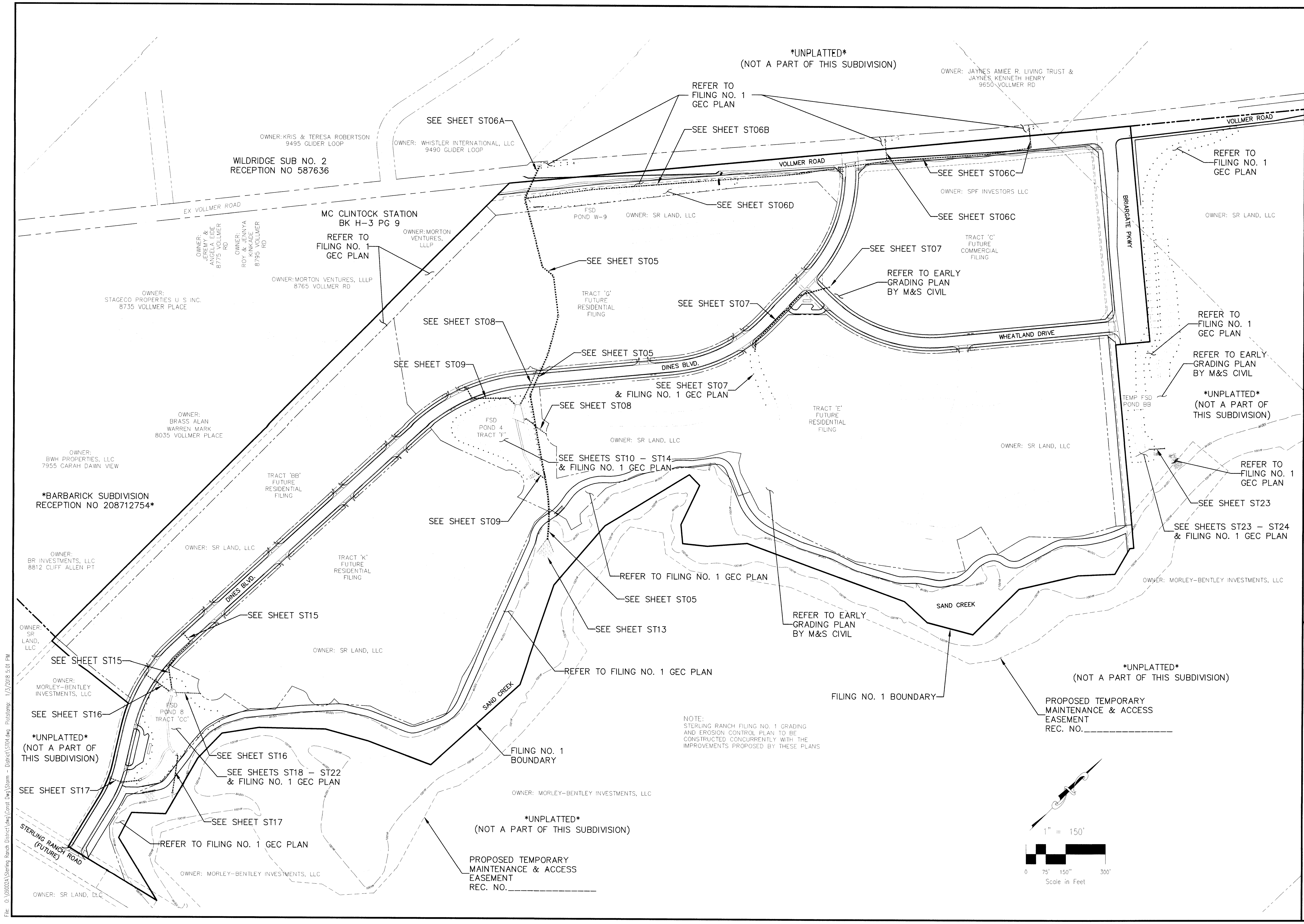
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APPVD. BY	DATE



STERLING RANCH FILING NO. 1
STORM SEWER SHEET KEY

PROJECT NO. 09-002
DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS
SCALE HORIZ: 1"=150' VERT: N/A
DATE: 01/02/2018
SHEET 5 OF 28

ST04

20 BOULDER CRESCENT, SUITE 110
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PHONE: 719.955.5485

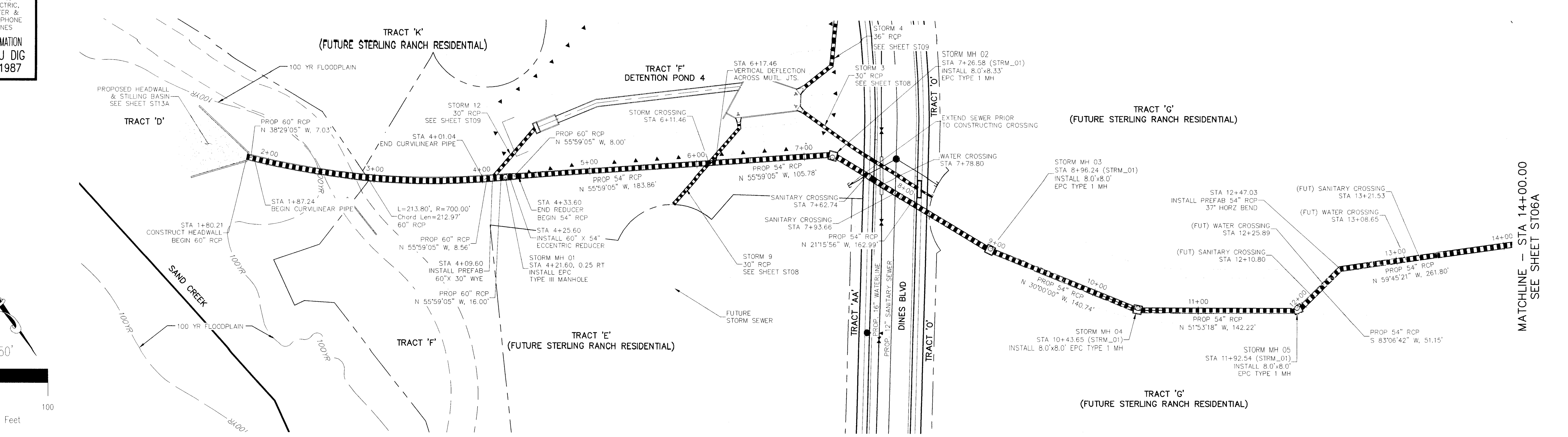
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

REVISIONS

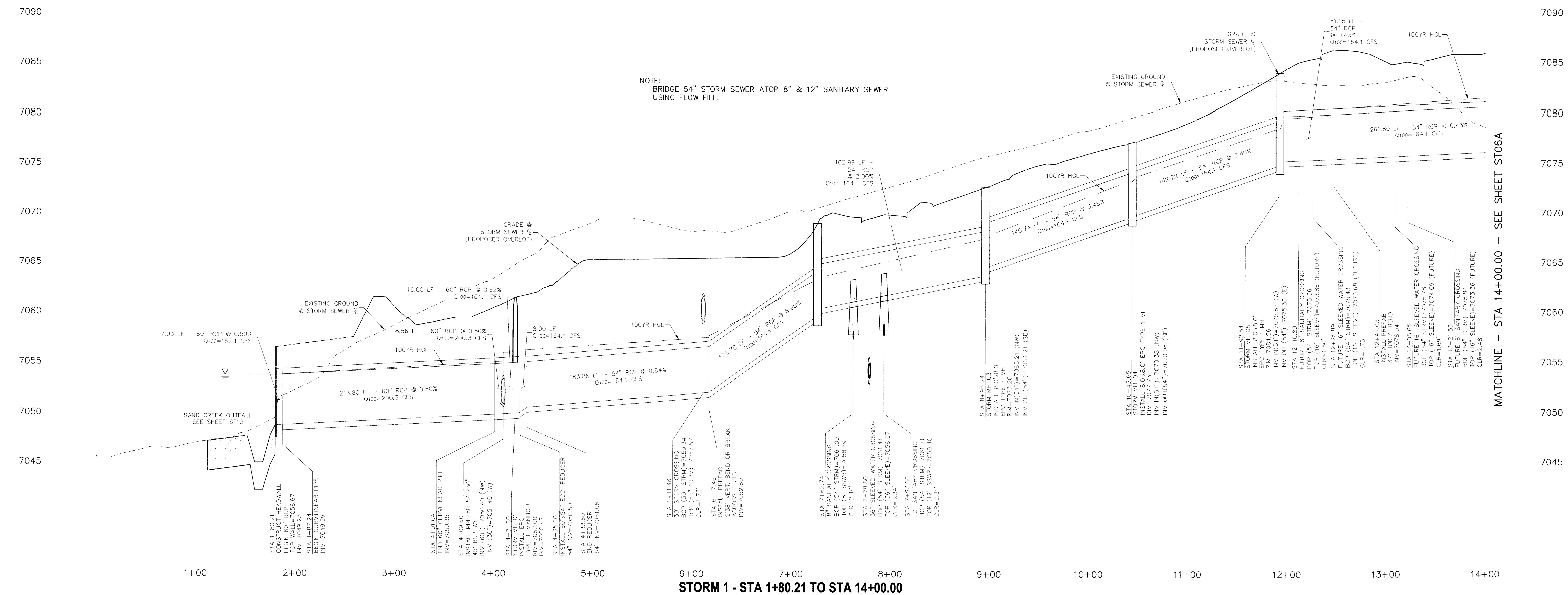
CAUTION

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987



STORM 1
STA 1+80.21 TO STA 14+00.00

NOTES:
1) ALL MANHOLE LIDS ON STORM 1 SHALL LOCKABLE AND SHALL BE SECURED.
2) RCP STORM SEWER BETWEEN STATIONS 5+67.46 (NEAREST FULL JOINT) AND 7+26.58, 8+50.00 (NEAREST FULL JOINT) AND 11+92.54 (NEAREST FULL JOINT) SHALL BE MANUFACTURED WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.



STORM 1 - STA 1+80.21 TO STA 14+00.00

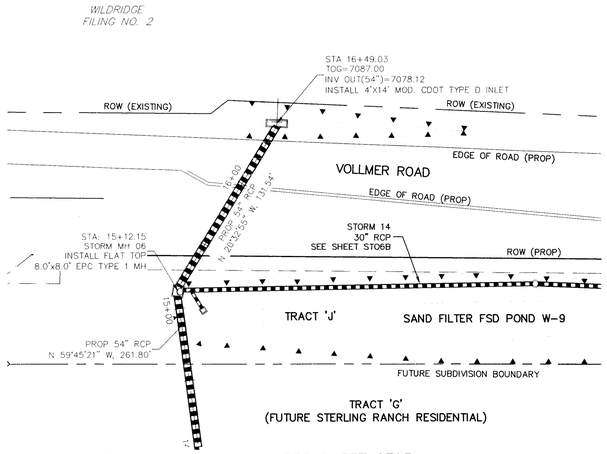
STERLING RANCH FILING NO. 1
STORM SEWER PLANS
PROJECT NO. 09-002
DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS
SCALE HORIZ: 1"=50' VERT: 1"=5'
DATE: 01/02/2018
SHEET 6 OF 28
ST05

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS
NO.	DATE	BY	DESCRIPTION	APPR'D BY	DATE

THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.
CAUTION



MATCHLINE – STA 14+00.00 – SEE SHEET ST05

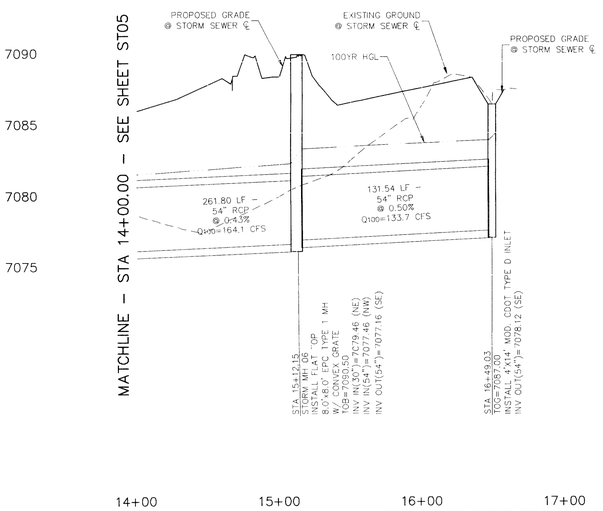
1" = 50'

0 25 50 100

Scale in Feet

STORM 1 - STA 14+00.00 TO STA 16+47.03

NOTE:
ALL MANHOLE LIDS ON STORM 1 SHALL LOCKABLE AND SHALL BE SECURED.



STORM 1 - STA 14+00.00 TO STA 16+49.03

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STERLING RANCH FILING NO. 1
STORM SEWER PLANS
PROJECT NO. 09-002 | FILE: V:\09\Const Dwg\Storm - District\ST06A.dwg | SCALE HORIZ: 1"=50' VERT: 1"=5' | DATE: 01/02/2018 | SHEET 7 OF 28 | ST06A
DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS

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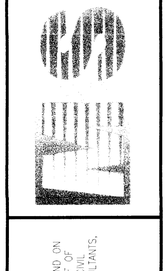
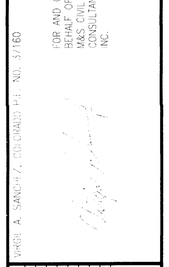
PHONE: 719.955.5485





KAREN A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

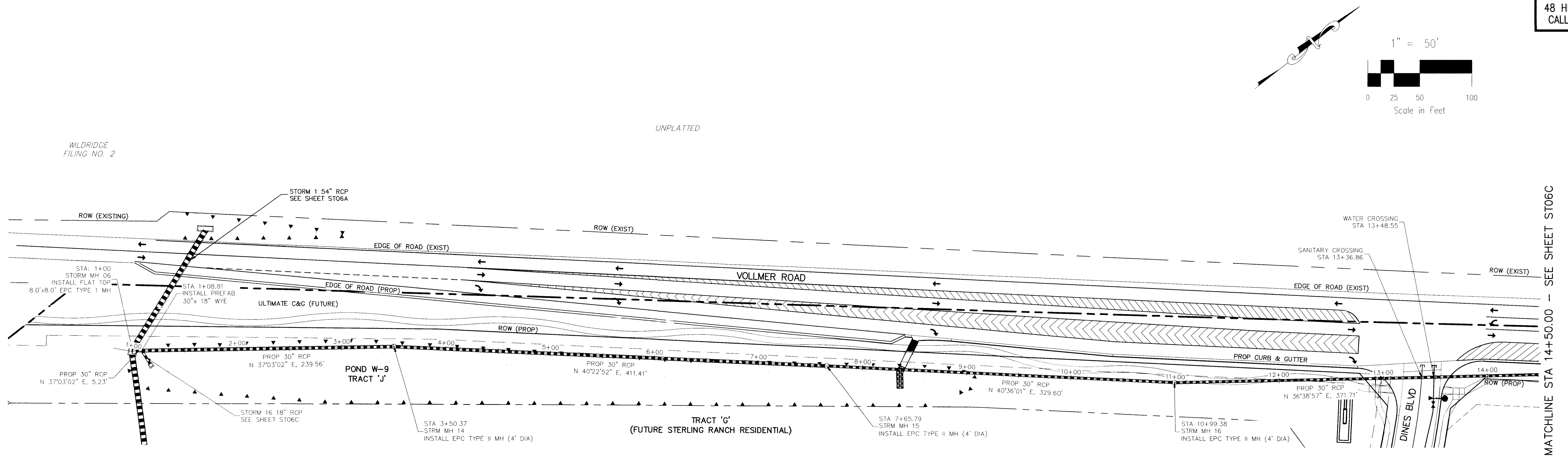
REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APP'D BY:	DATE

File: Q:\09002A\Sterling Ranch District\Dwg\Const Dwg\Storm - District\ST06A.dwg Plotstamp: 1/3/2018 6:57 PM

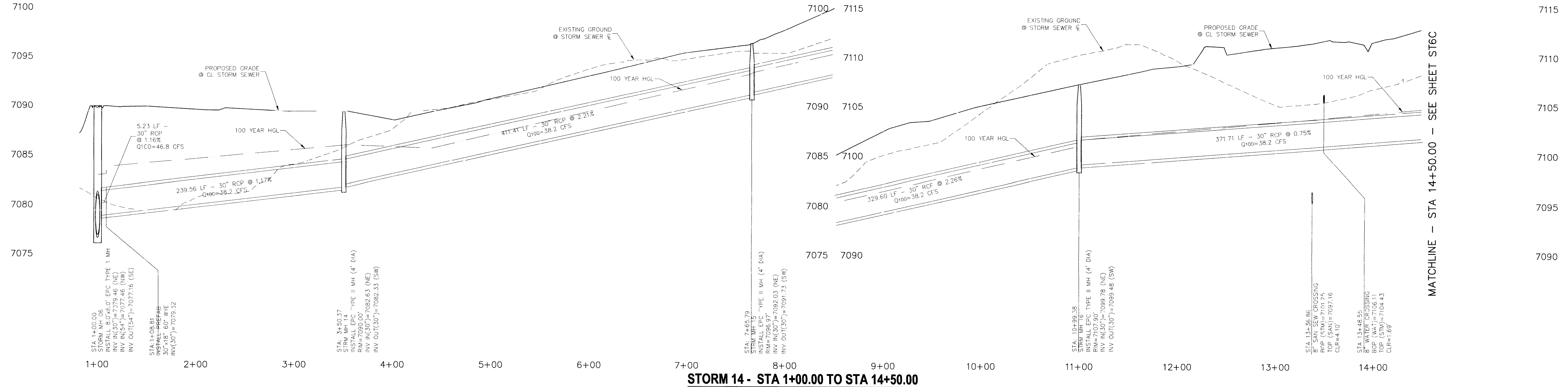
FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987



STORM 14 - STA 1+00.00 TO STA 14+50.00

NOTE:
ALL MANHOLE LIDS ON STORM 14 SHALL LOCKABLE AND SHALL BE SECURED.



STORM 14 - STA 1+00.00 TO STA 14+50.00

STERLING RANCH FILING NO. 1

STORM SEWER PLANS

PROJECT NO. 09-002 | FILE: \dwg\Const Dwg\Storm - District\ST06B.dwg

DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS

SCALE
HORIZ: 1"=50'
VERT: 1"=5'

DATE: 01/02/2018

SHEET 8 OF 28

ST06B

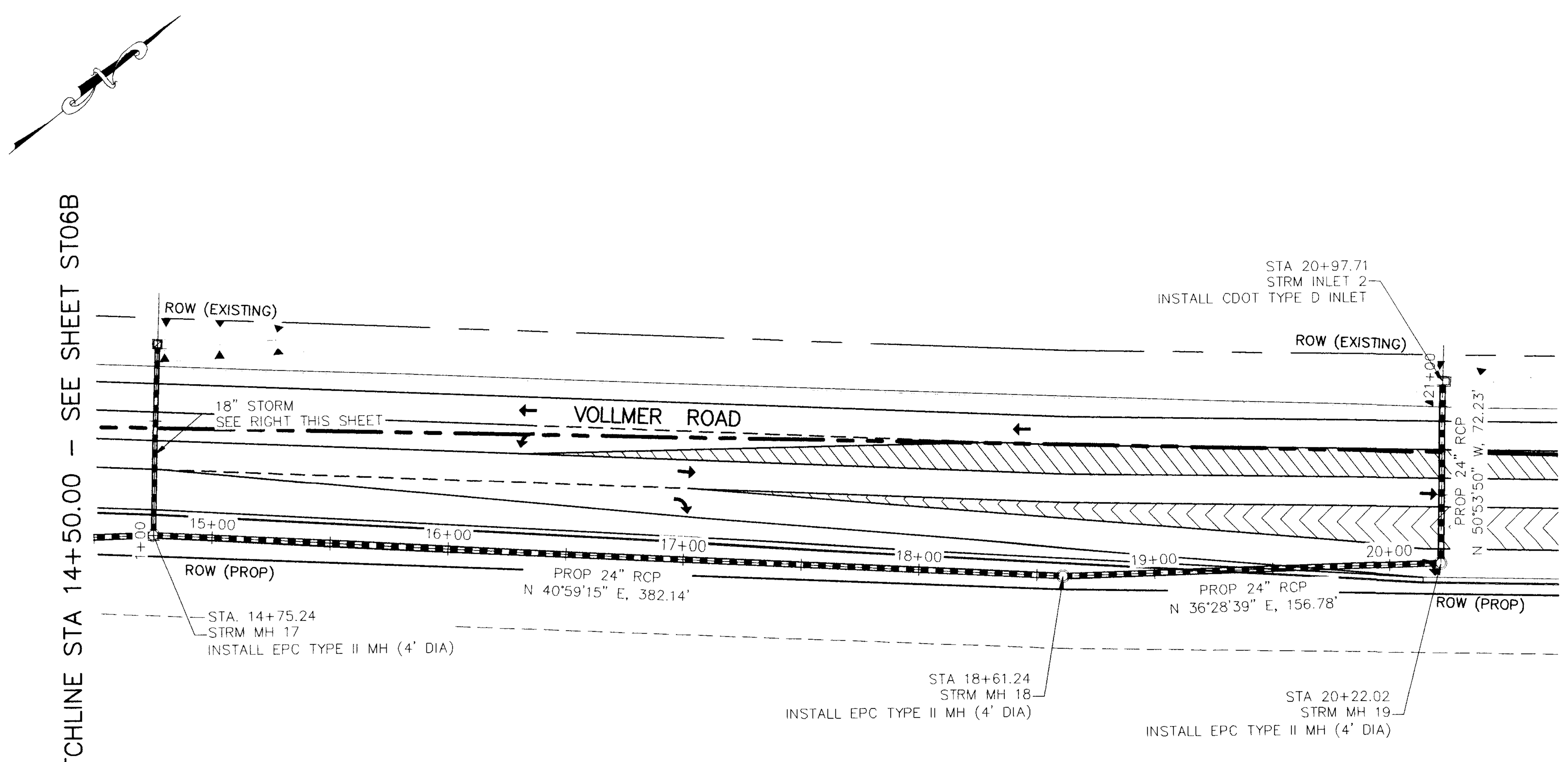
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

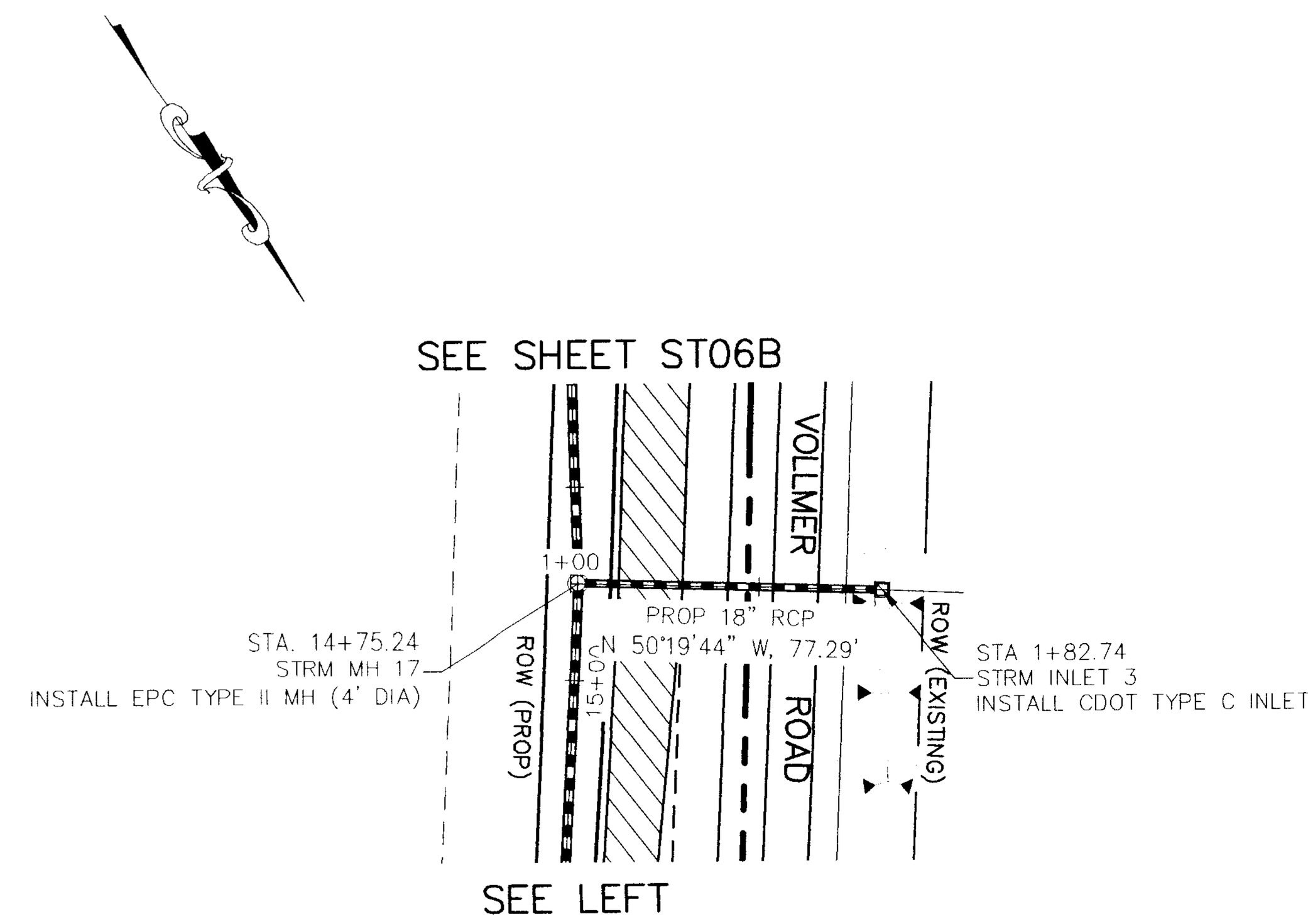
REVISIONS:
NO	DATE	BY	DESCRIPTION	APPR'D BY	DATE

THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

CAUTION



STORM 14 - STA 14+50.00 TO STA 20+97.71

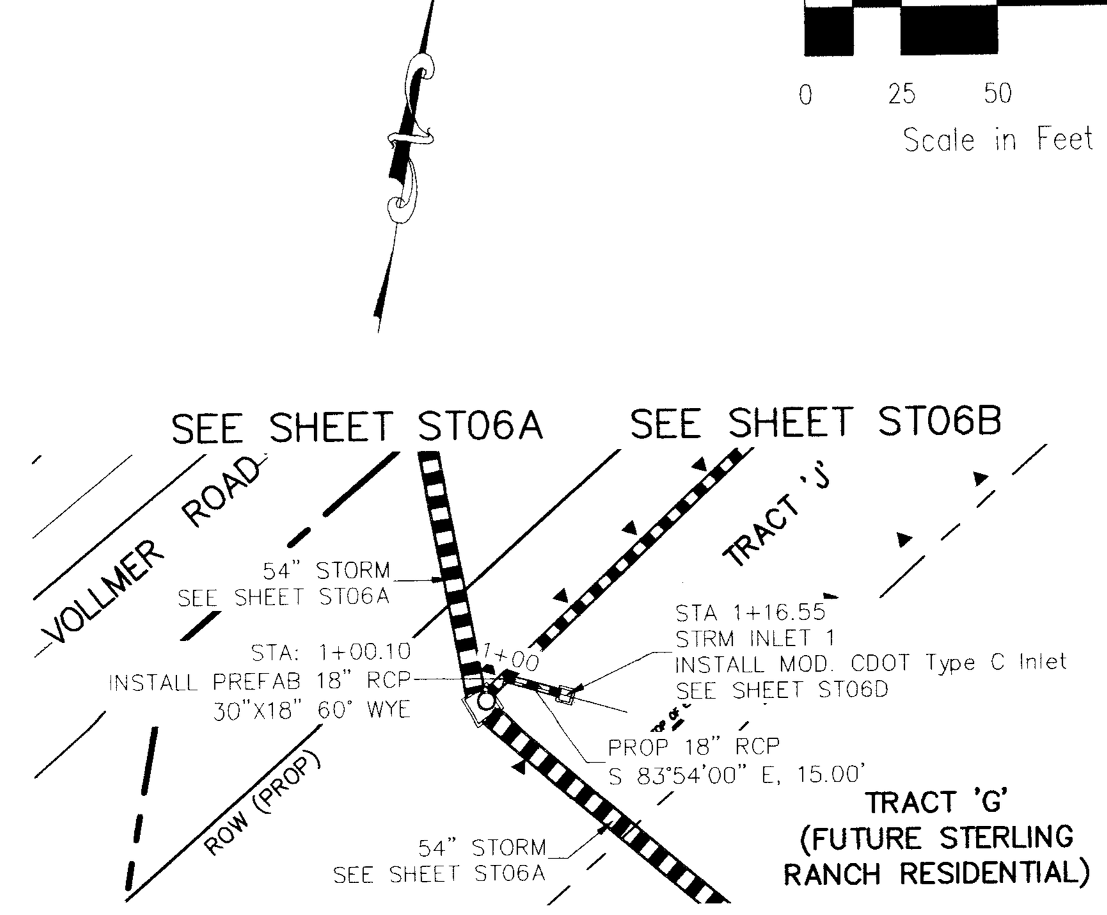


STORM 15 - STA 1+01.99 TO STA 1+82.74

1" = 50'

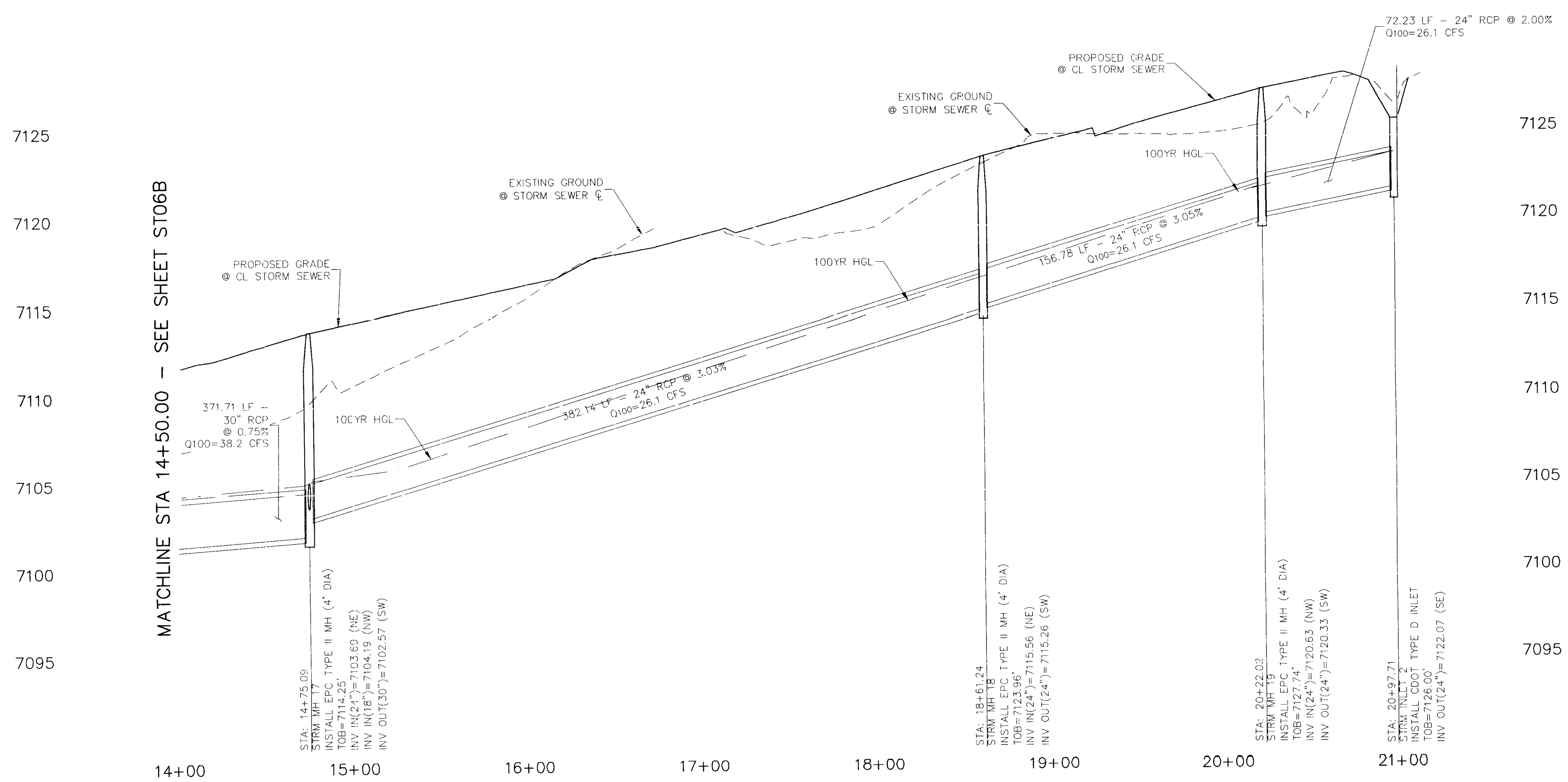
0 25 50 100

Scale in Feet

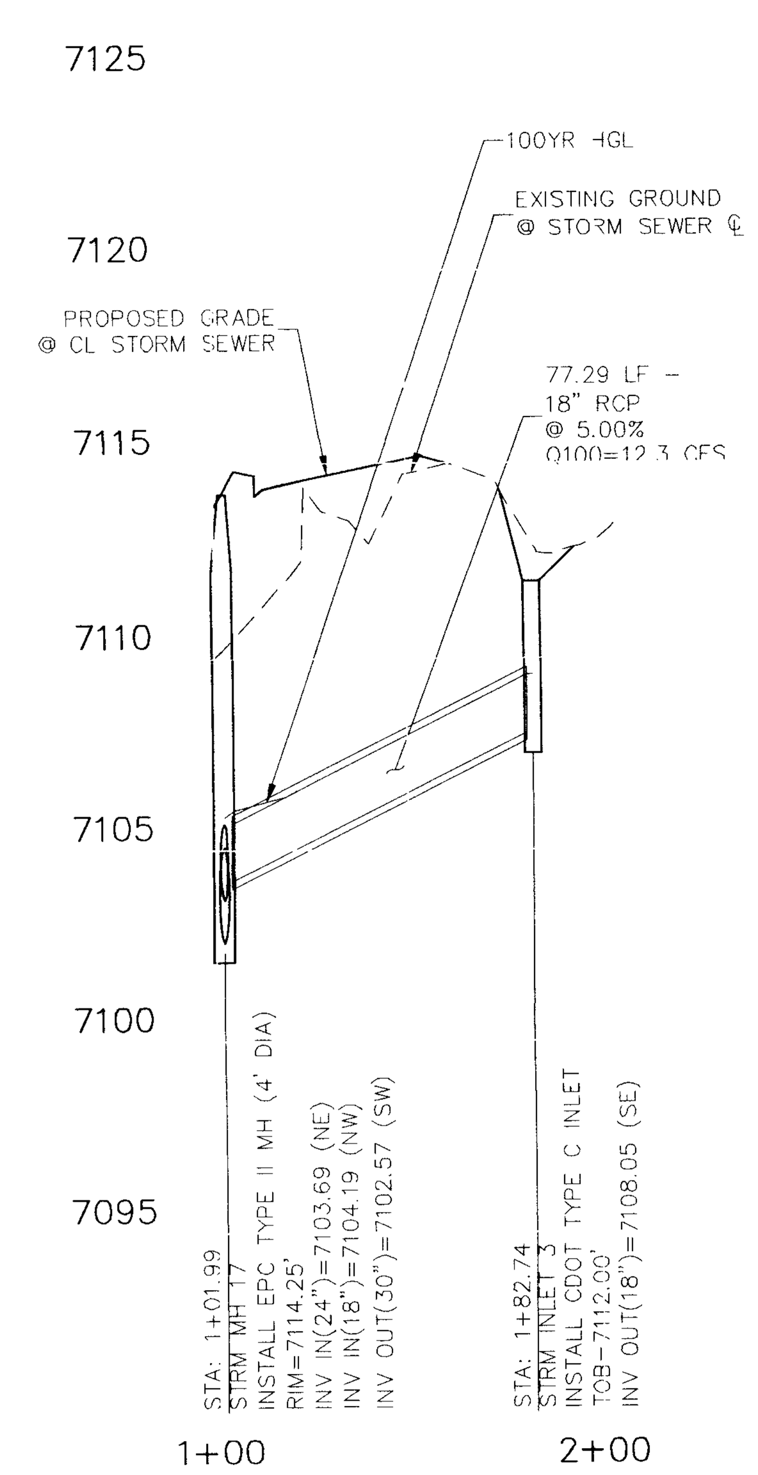


STORM 16 - STA 1+00.10 TO STA 1+16.55

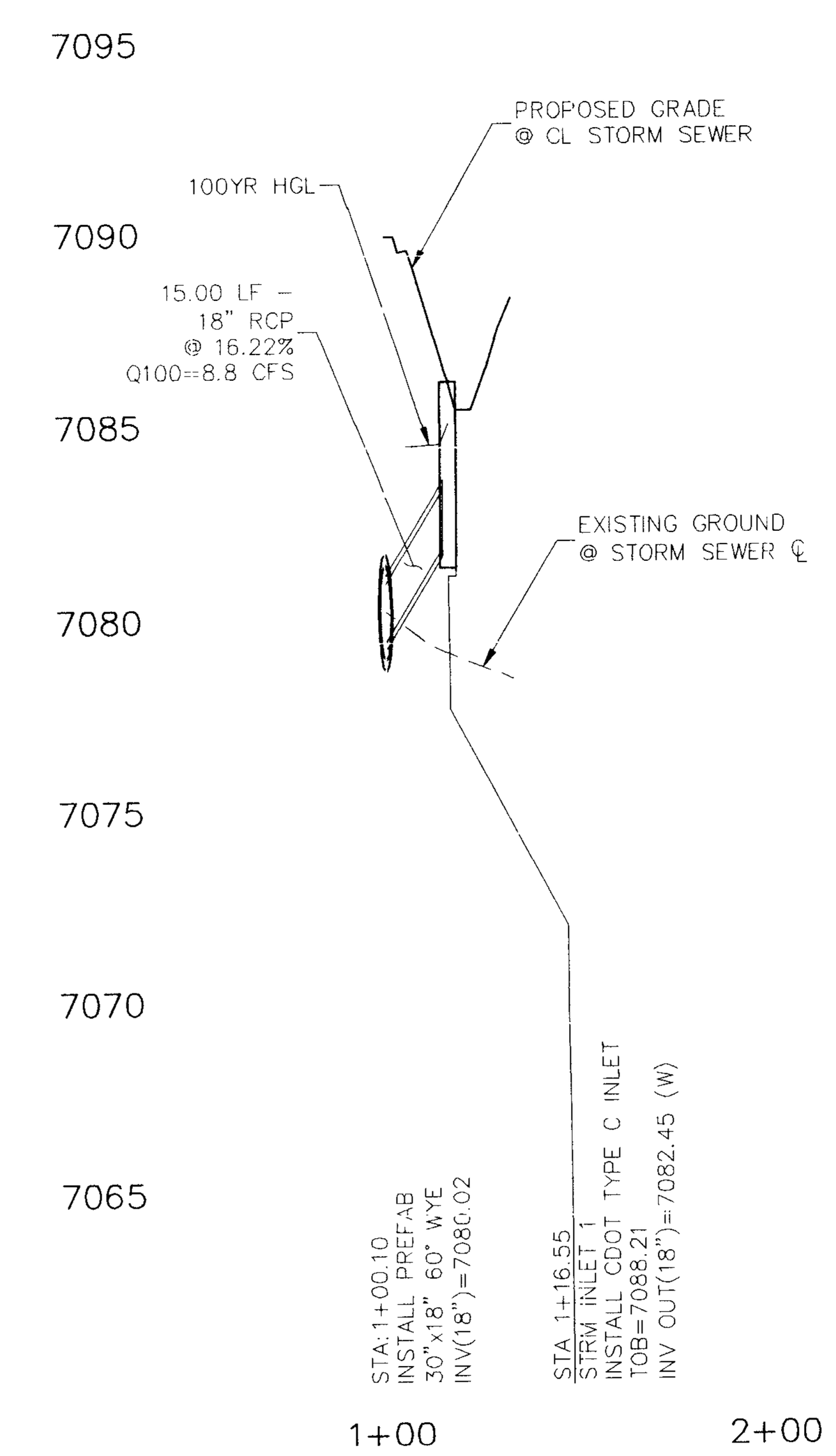
NOTE:
ALL MANHOLE LIDS ON STORM 14 SHALL LOCKABLE AND SHALL BE SECURED.



STORM 14 - STA 14+50.00 TO STA 20+97.71



STORM 15 - STA 1+01.99 TO STA 1+82.74



STORM 16 - STA 1+00.10 TO STA 1+16.55

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

STERLING RANCH FILING NO. 1

STORM SEWER PLANS

PROJECT NO. 09-002	FILE: \dwg\Const Dwg\Storm - District\ST06C.dwg	
DESIGNED BY: ET	SCALE:	DATE: 01/02/2018
DRAWN BY: ELY	HORIZ: 1"=50'	SHEET 9 OF 28
CHECKED BY: VAS	VERT: 1"=5'	

ST06C

20 BOULDER CRESCENT SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

NO.	DATE	BY	DESCRIPTION	APRV'D BY	DATE

REVISIONS

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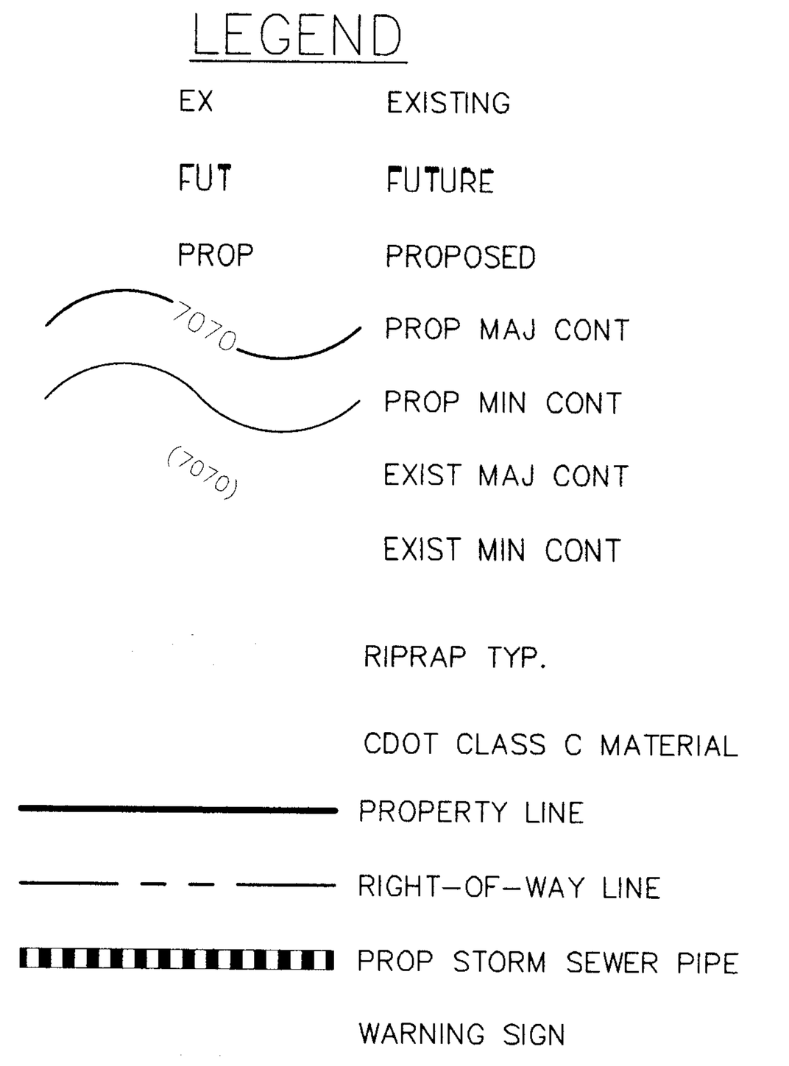
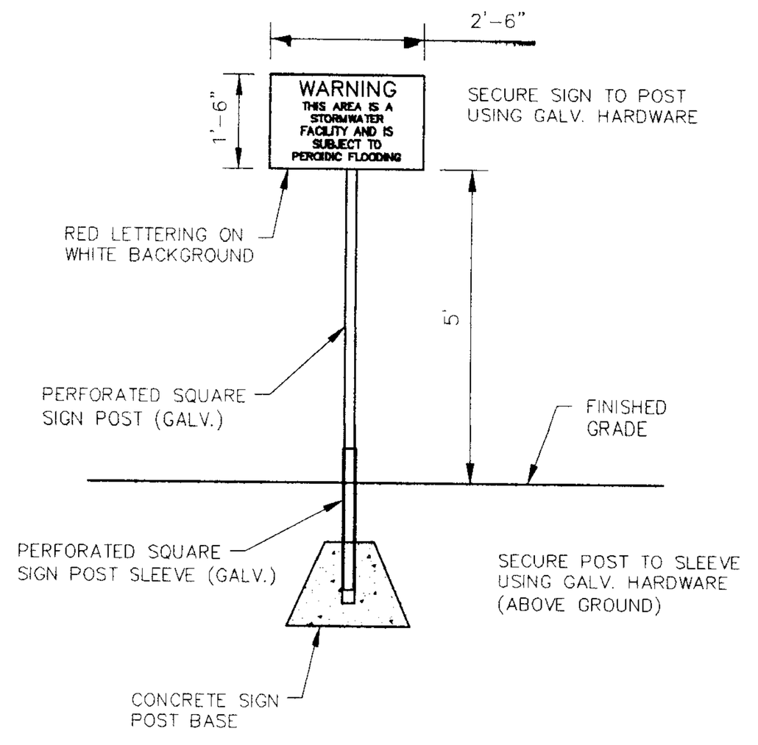
CAUTION

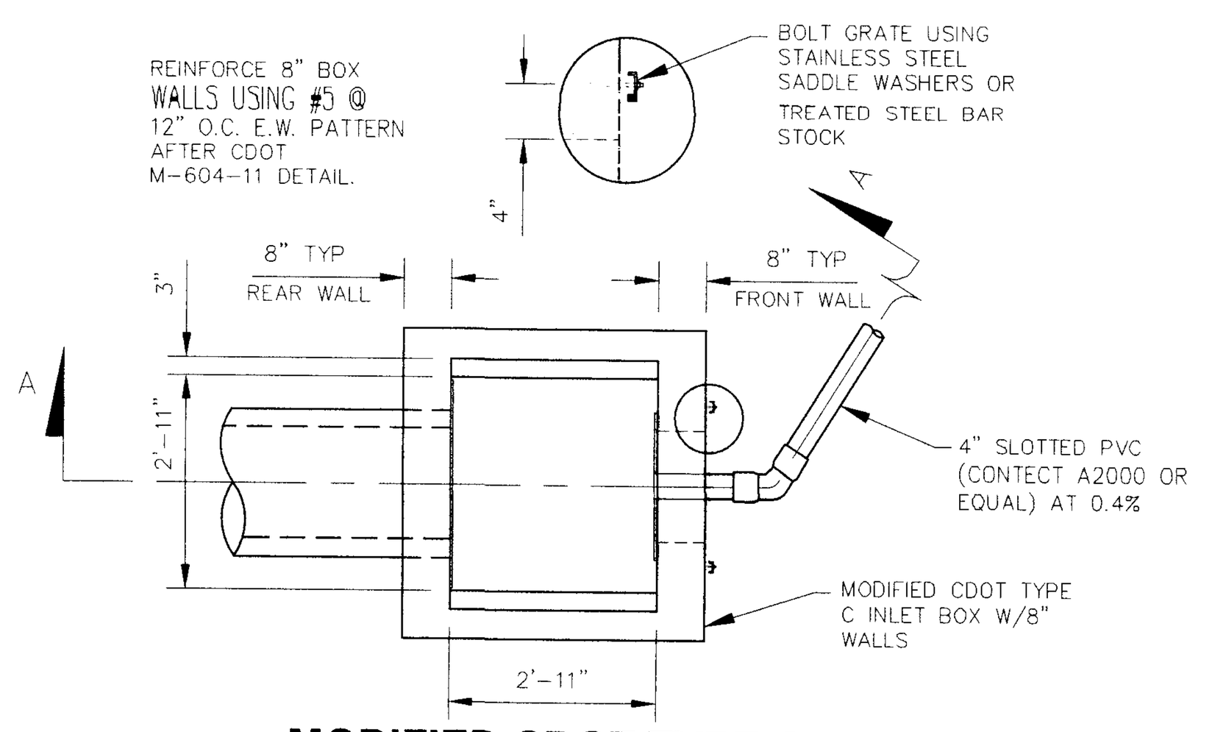
File: O:\09002A\Sterling Ranch District\dwg\Const Dwg\Storm - District\ST06C.dwg Plotstamp: 1/3/2018 7:01 PM





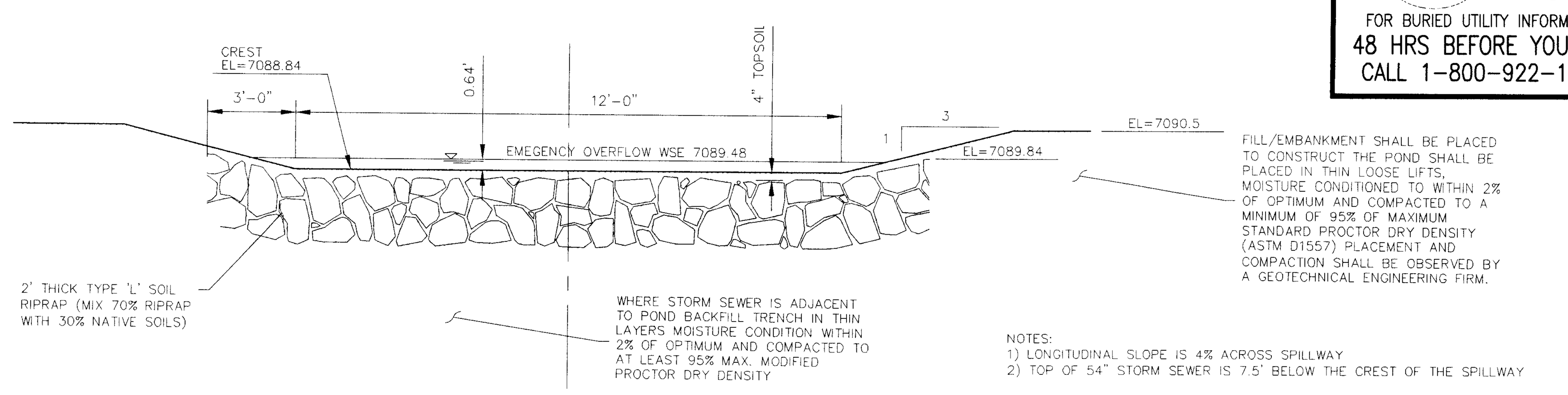
POND WARNING SIGN

NOT TO SCALE

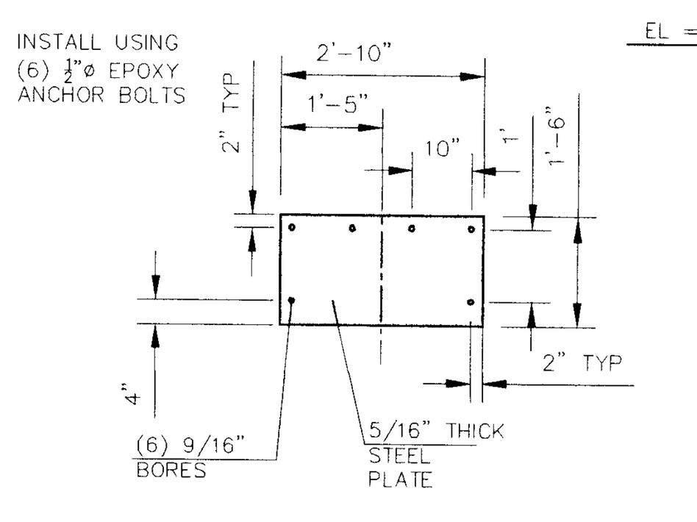


MODIFIED CDOT TYPE C PLAN

NOT TO SCALE

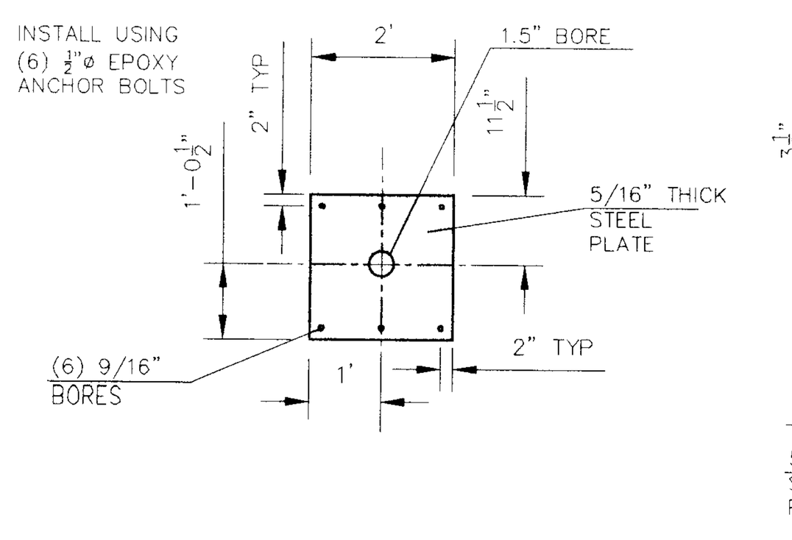


SPILLWAY CROSS SECTION



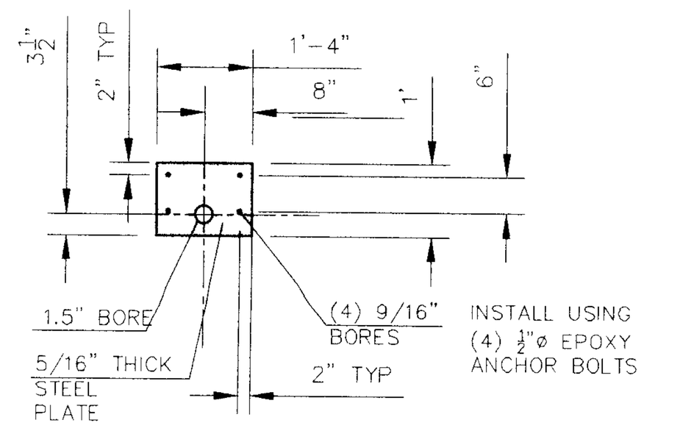
RESTRICTOR PLATE FOR 18" RCP OUTLET

NOT TO SCALE



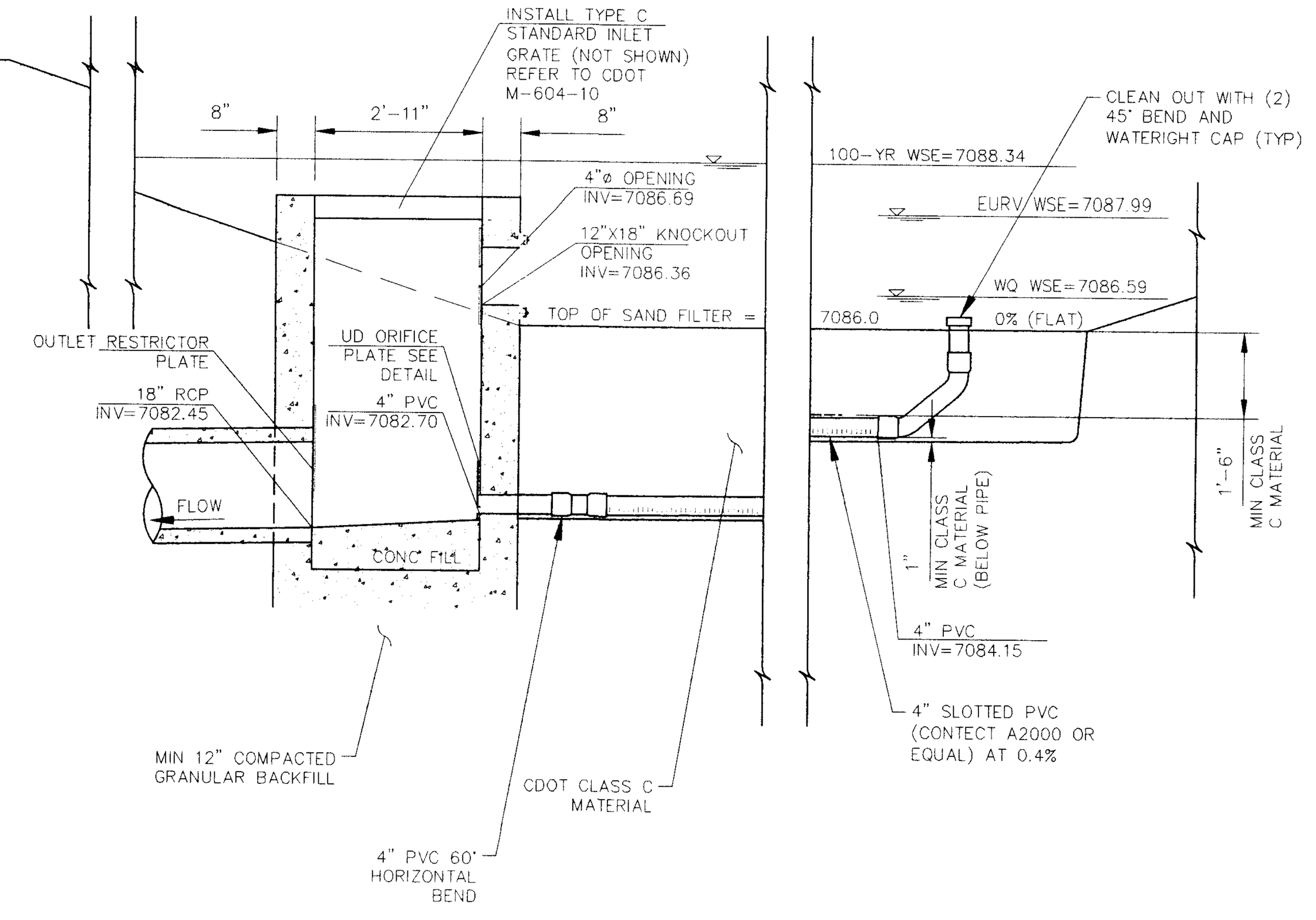
ORIFICE PLATE FOR 12"x18" OPENING

NOT TO SCALE



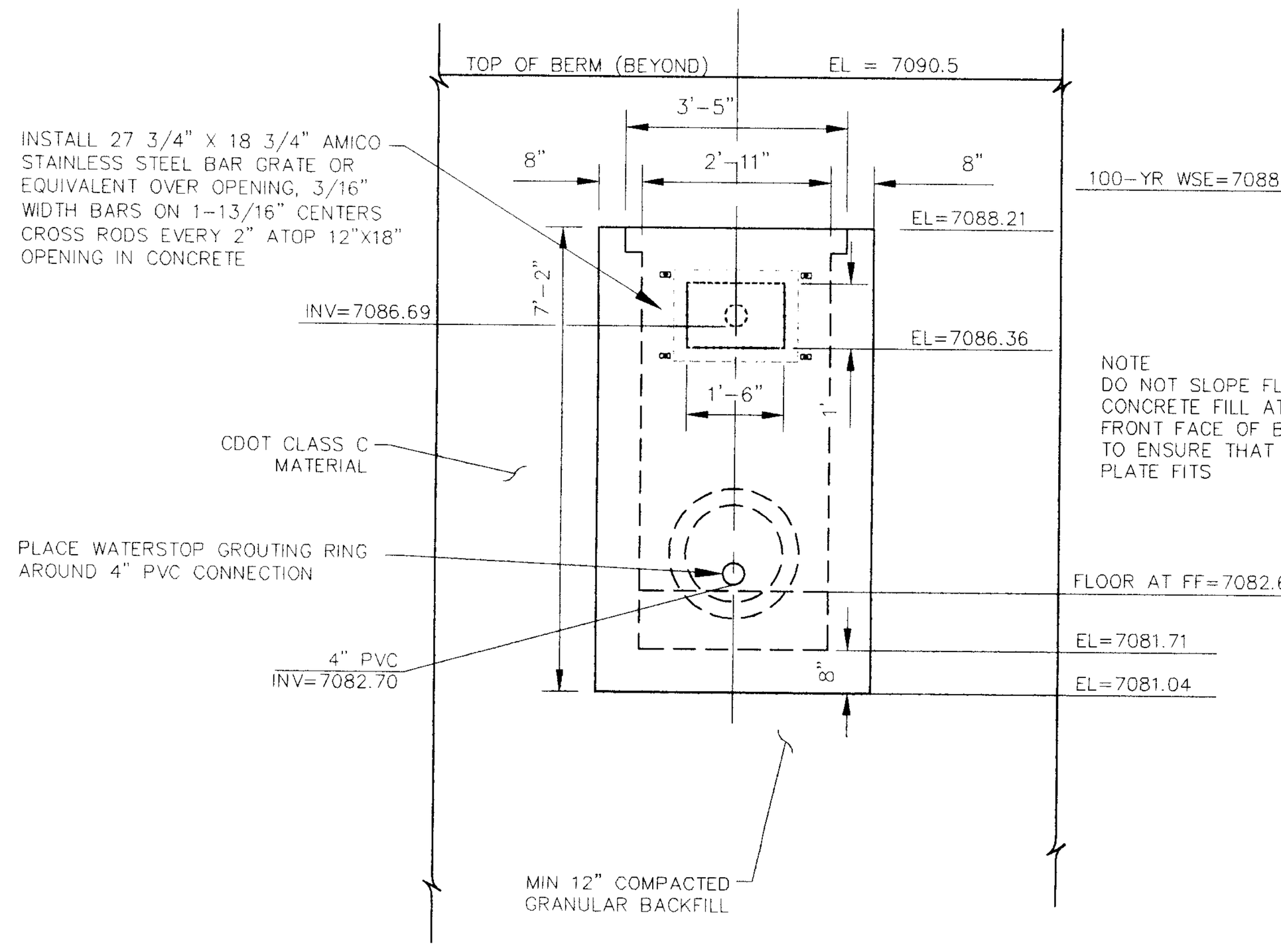
UNDERDRAIN ORIFICE PLATE

NOT TO SCALE



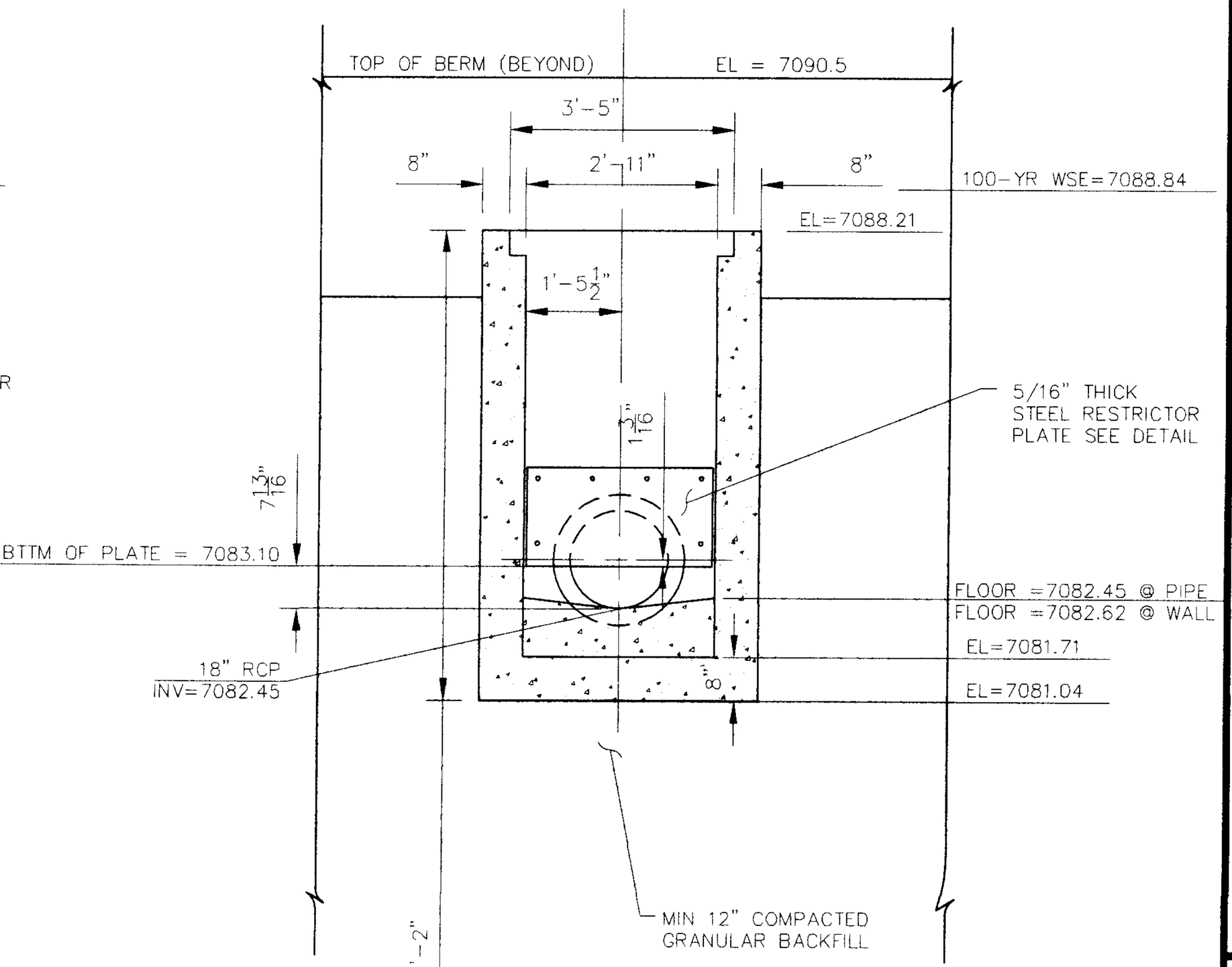
MODIFIED CDOT TYPE C FULL SPECTRUM OUTLET BOX AND SAND FILTER SECTION A-A

NOT TO SCALE



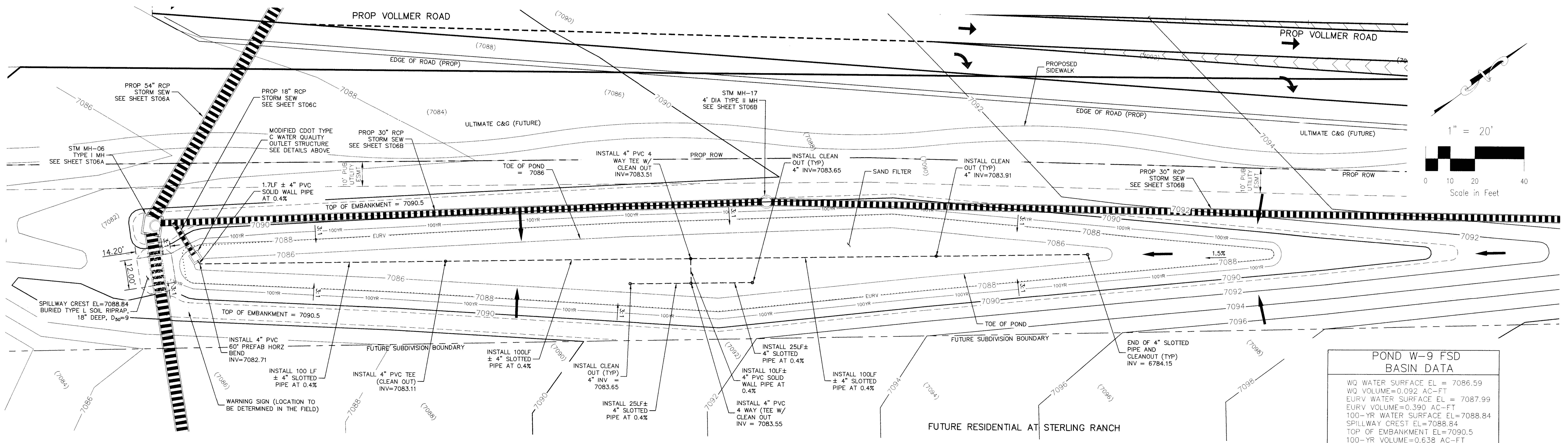
OUTLET BOX FRONT WALL

NOT TO SCALE



OUTLET BOX REAR WALL

NOT TO SCALE



POND W-9 FSD BASIN DATA
WQ WATER SURFACE EL = 7086.59
WQ VOLUME=0.092 AC-FT
EURV WATER SURFACE EL = 7087.99
EURV VOLUME=0.390 AC-FT
100-YR WATER SURFACE EL=7088.84
SPILLWAY CREST EL=7088.84
TOP OF EMBANKMENT EL=7090.5
100-YR VOLUME=0.638 AC-FT
100-YR INFLOW = 21.0 CFS
100-YR RELEASE = 8.7 CFS

FULL SPECTRUM DETENTION SAND FILTER POND W-9 SITE PLAN

SCALE 1"=20'

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

STERLING RANCH FILING NO. 1

STORM SEWER PLANS

PROJECT NO. 09-002
DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS
SCALE: HORIZ: 1"=20' VERT: N/A
DATE: 01/02/2018
SHEET 10 OF 28

ST06D

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APPR'D. BY:	DATE:

CAUTION

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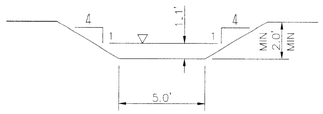
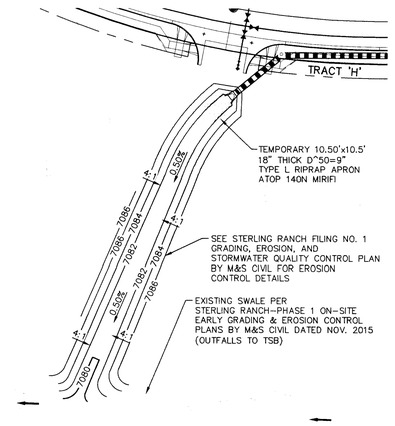
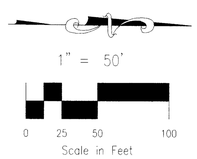
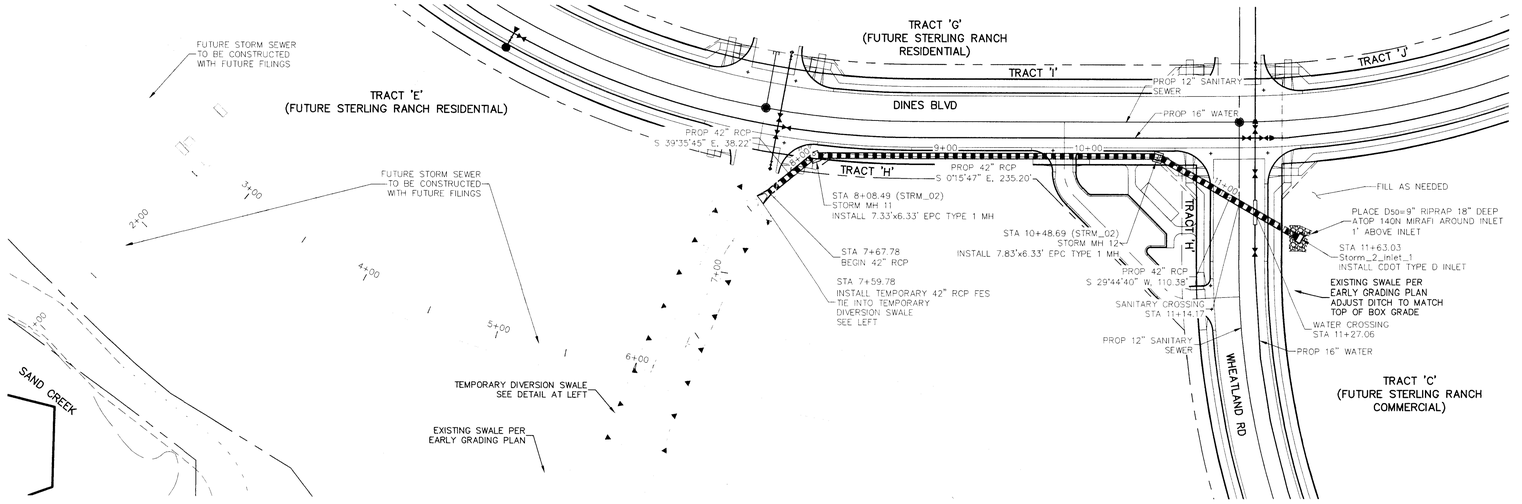


TEMPORARY DIVERSION SWALE
NTS



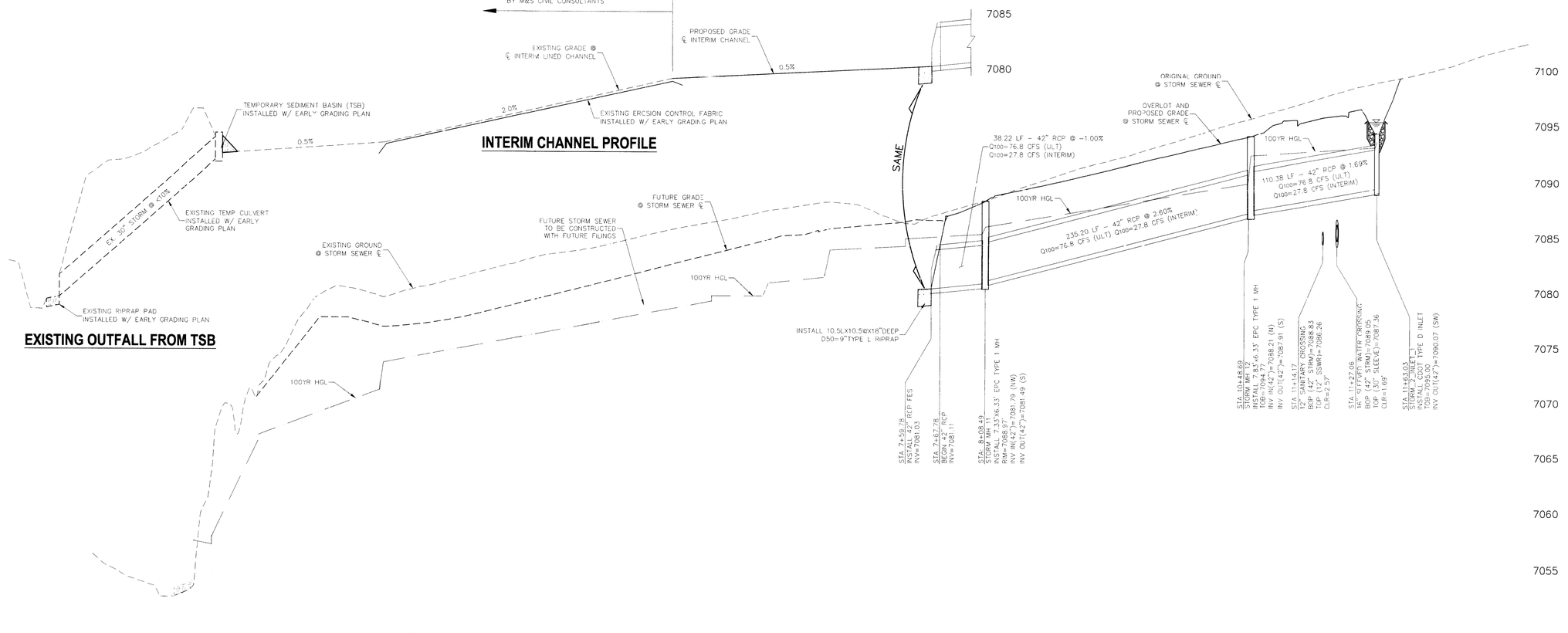
TEMPORARY DIVERSION SWALE DETAIL





STORM 2
STA 7+59.78 TO STA 11+63.03

NOTE:
REFER TO STERLING RANCH PHASE 1 ONSITE EARLY GRADING AND EROSION CONTROL PLAN BY M&S CIVIL CONSULTANTS



STORM 2 - STA 7+59.78 TO STA 11+63.03

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
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STERLING RANCH FILING NO. 1
STORM SEWER PLANS
PROJECT NO: 09-002 | FILE: \Dwg\Const Dwg\Storm - District\ST07.dwg | SCALE | DATE: 01/02/2018 | SHEET 11 OF 28 | ST07
DESIGNED BY: ET | HORIZ: 1"=50'
DRAWN BY: ELY | VERT: 1"=5'
CHECKED BY: VAS

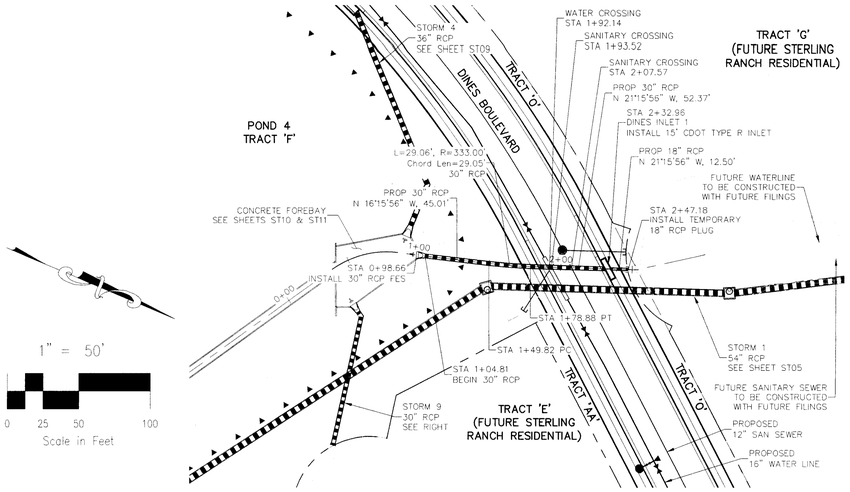
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

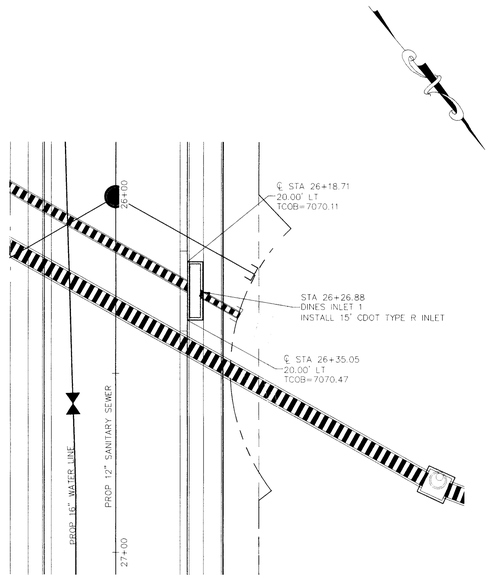
REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APPVD. BY:	DATE:

File: O:\09002A\Sterling Ranch District\Dwg\Const Dwg\Storm - District\ST07.dwg, Plotstamp: 12/5/2016 9:47 AM

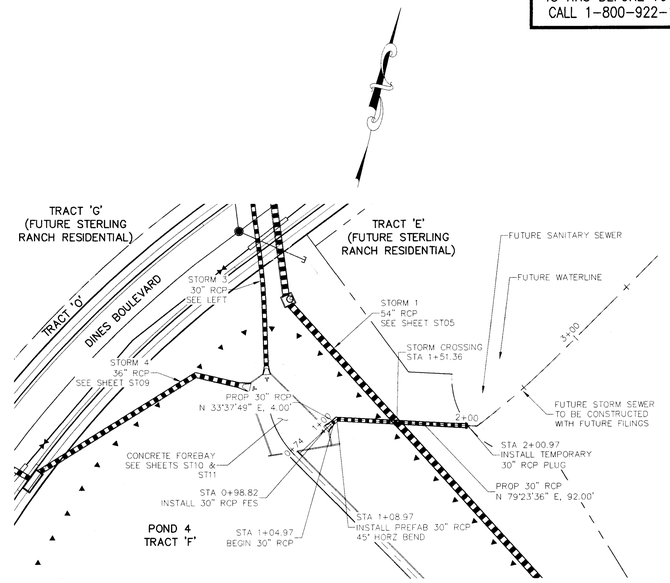


STORM 3 - STA 0+98.66 TO STA 2+47.18



DINES BOULEVARD INLET DETAILS

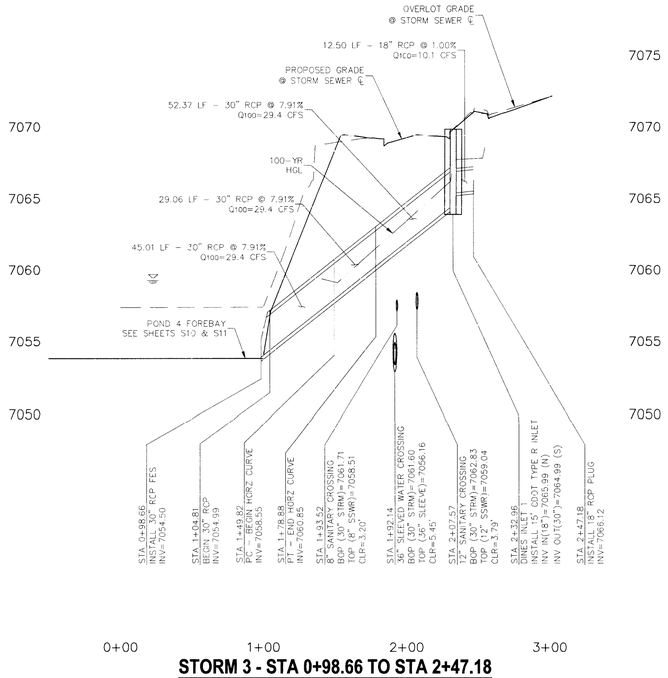
SCALE: 1"=20'



STORM 9 - STA 0+98.82 TO STA 2+00.97

NOTES:

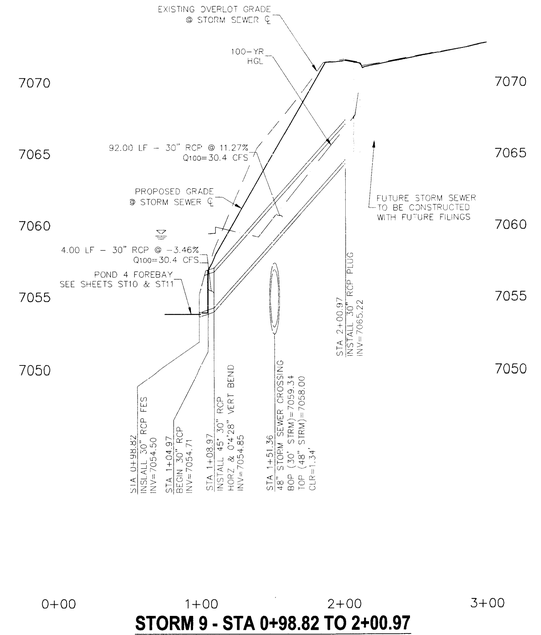
1. STA 1+00.00 TO STA 1+24.00 (NEXT FULL JOINT) TIE PIPE SEGMENT TOGETHER W/4–$\frac{3}{4}$" CANOPY TYPE ROD LUG JOINT FASTENERS.
2. RCP STORM SEWER BETWEEN STATIONS 1+00 TO 2+32.96 SHALL BE MANUFACTURED WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.



STORM 3 - STA 0+98.66 TO STA 2+47.18

NOTE:

1. STA 1+00.00 TO STA 1+24.00 (NEXT FULL JOINT) TIE PIPE SEGMENTS TOGETHER W/4–$\frac{3}{4}$" CANOPY TYPE ROD LUG JOINT FASTENERS.
2. RCP STORM SEWER BETWEEN STATIONS 1+00.00 TO 2+00.97 SHALL BE MANUFACTURED WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.



STORM 9 - STA 0+98.82 TO 2+00.97

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

STERLING RANCH FILING NO. 1

STORM SEWER PLANS

PROJECT NO. 09-002 | FILE: \Eng\Const Dwg\Storm - District\ST08.dwg | SCALE: HORIZ. 1"=50' VERT. 1"=5' | DATE: 01/02/2018 | SHEET 12 OF 28 | ST08

DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS

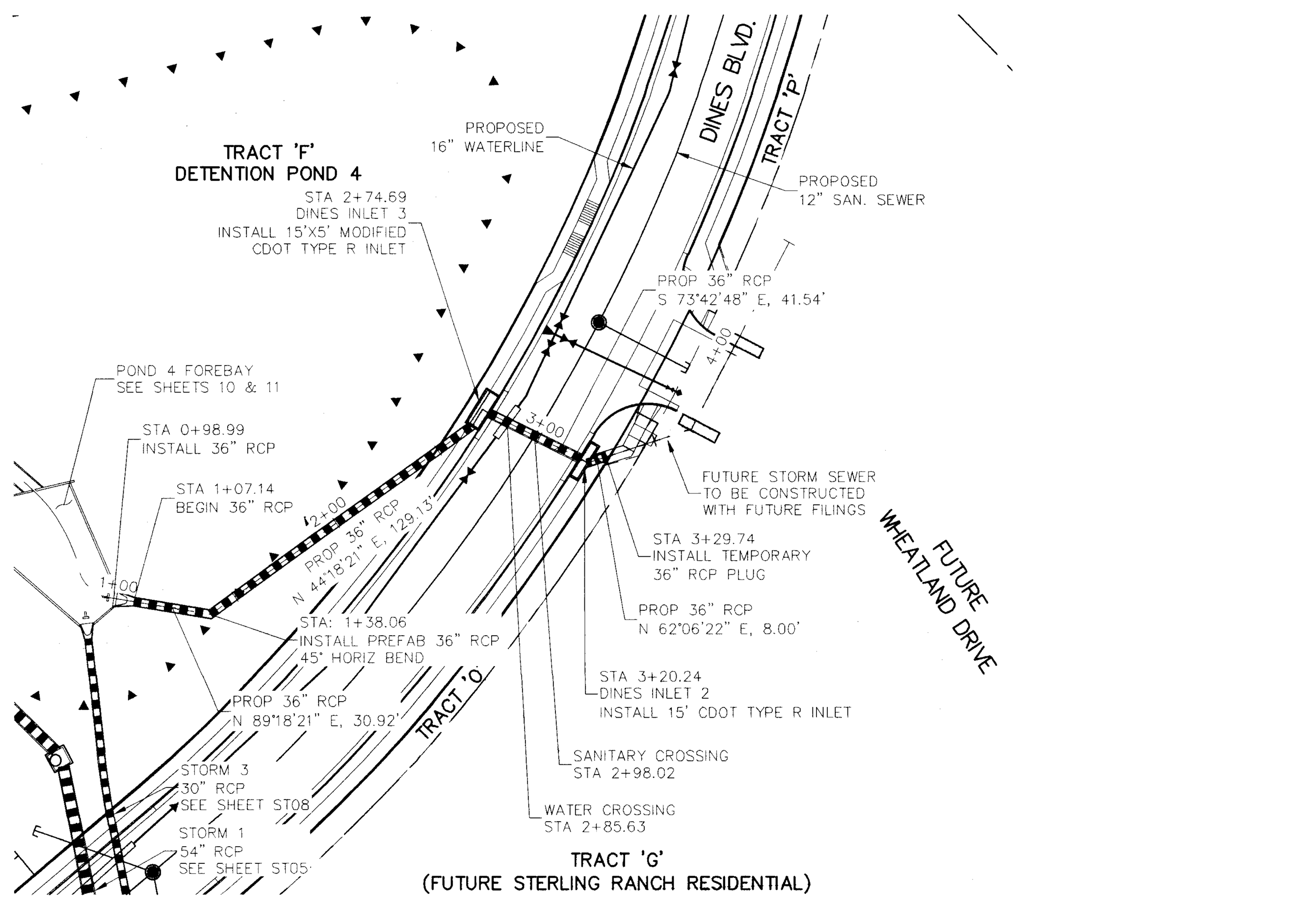
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO. 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

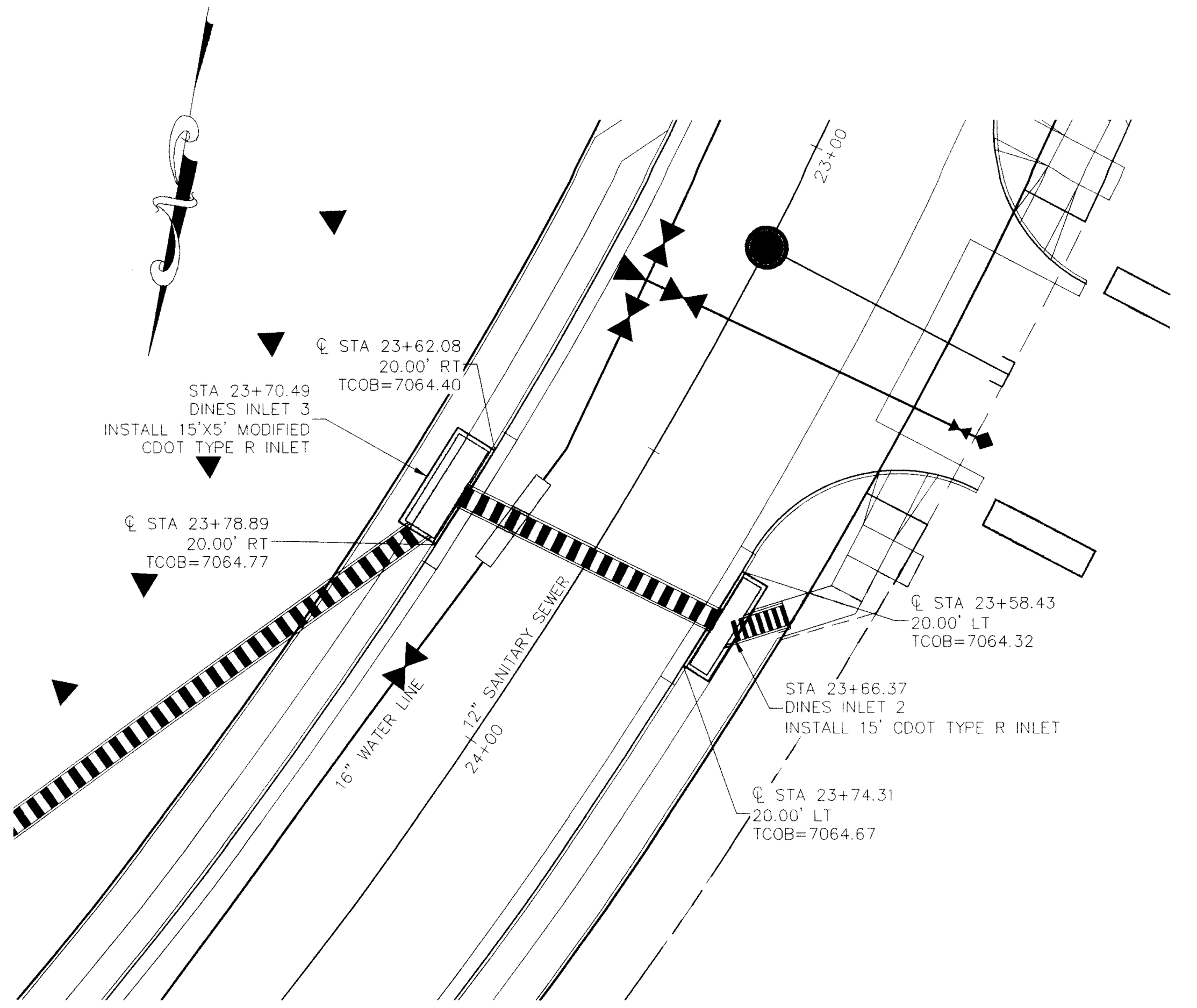
REVISIONS:

NO.	DATE	BY	DESCRIPTION:

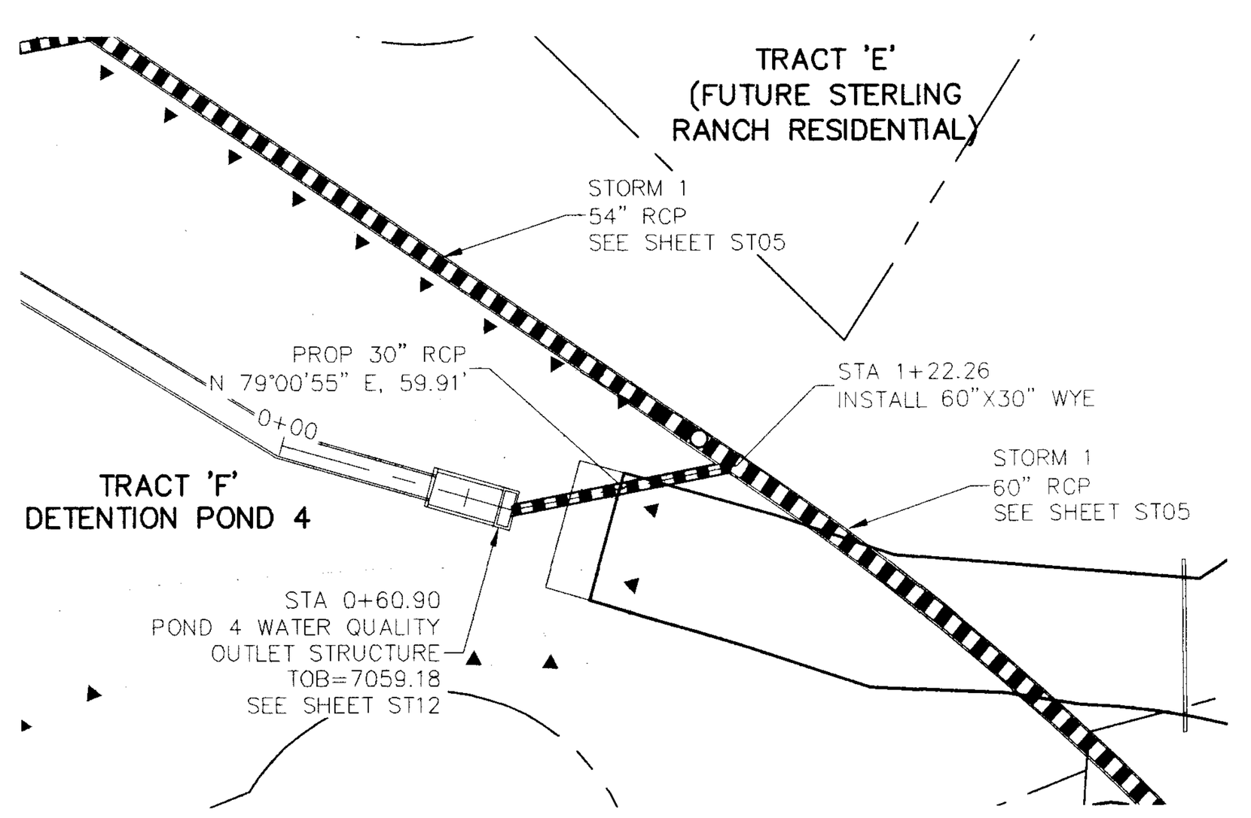
APRV'D BY:	DATE:



STORM 4
STA 0+98.99 TO 3+29.74



DINES BOULEVARD
INLET DETAILS
SCALE: 1"=20'



STORM 12

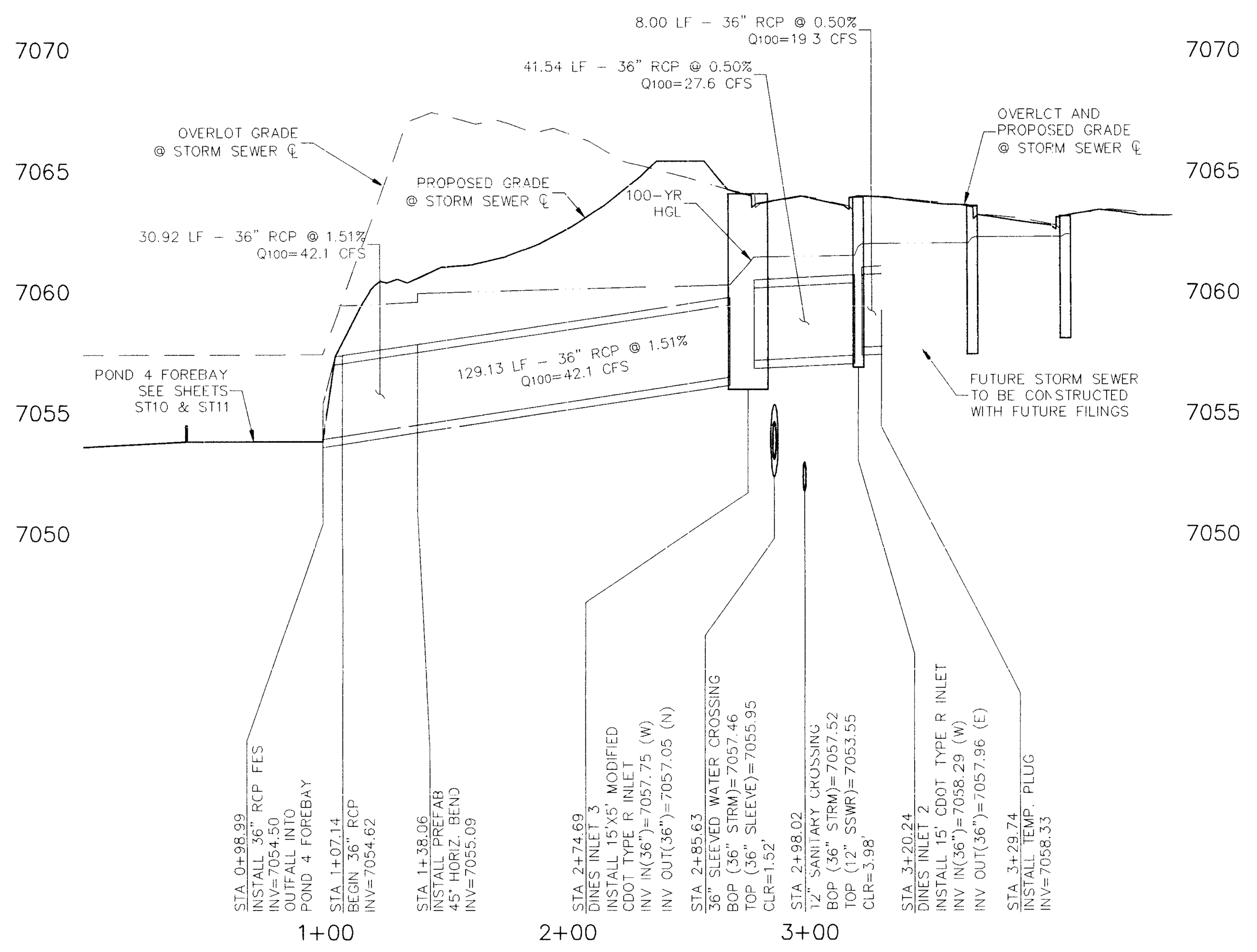
FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

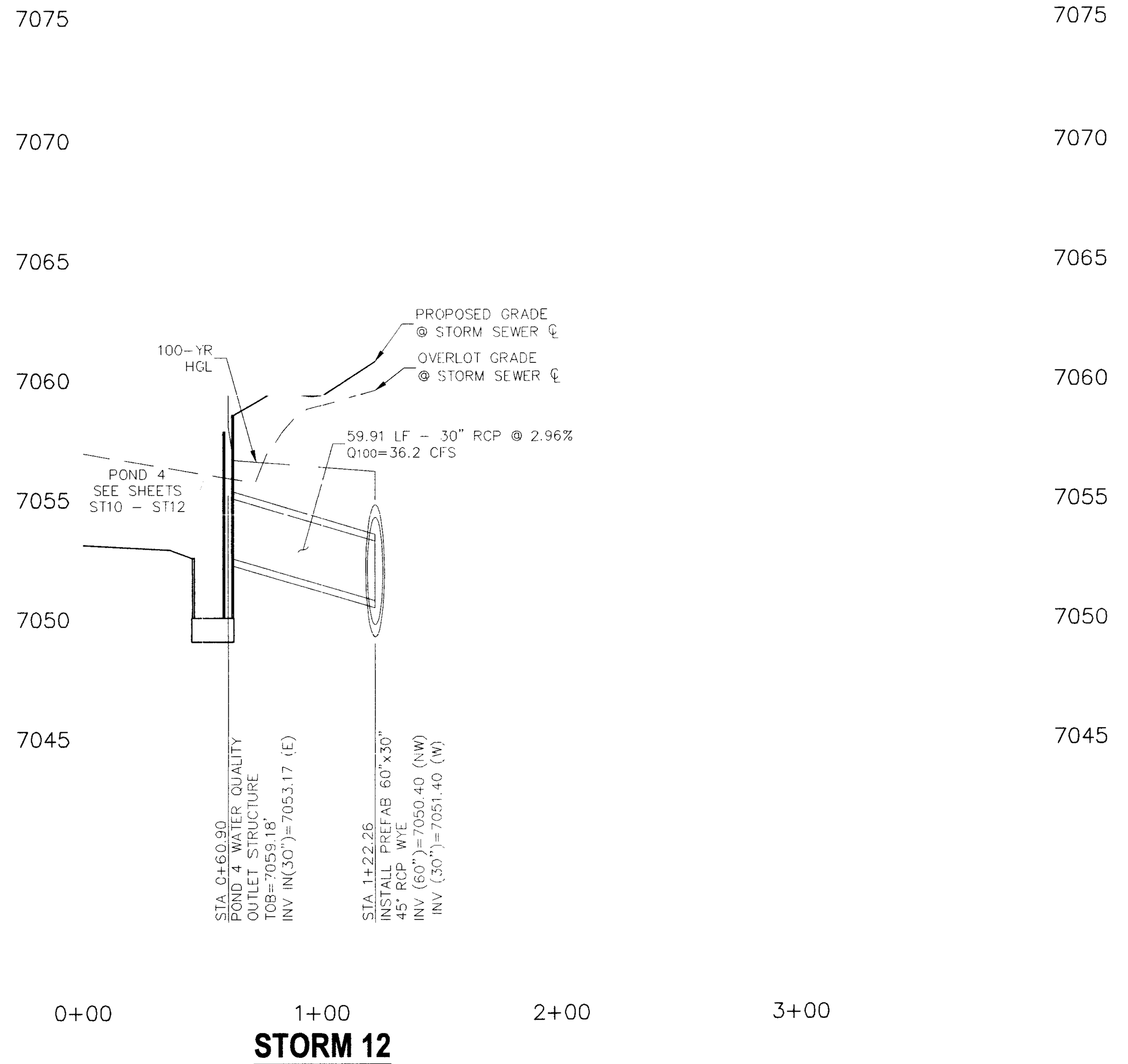
1" = 50'

0 25 50 100

Scale in Feet



STORM 4 STA 0+98.99 TO 3+29.74



STORM 12

STERLING RANCH FILING NO. 1

STORM SEWER PLANS

PROJECT NO. 09-002 | DESIGNED BY: ET | DRAWN BY: ELY | CHECKED BY: VAS | SCALE HORIZ: 1"=50' VERT: 1"=5' | DATE 01/02/2018 | SHEET 13 OF 28

ST09

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE	BY	DESCRIPTION	APPR'D	BY	DATE

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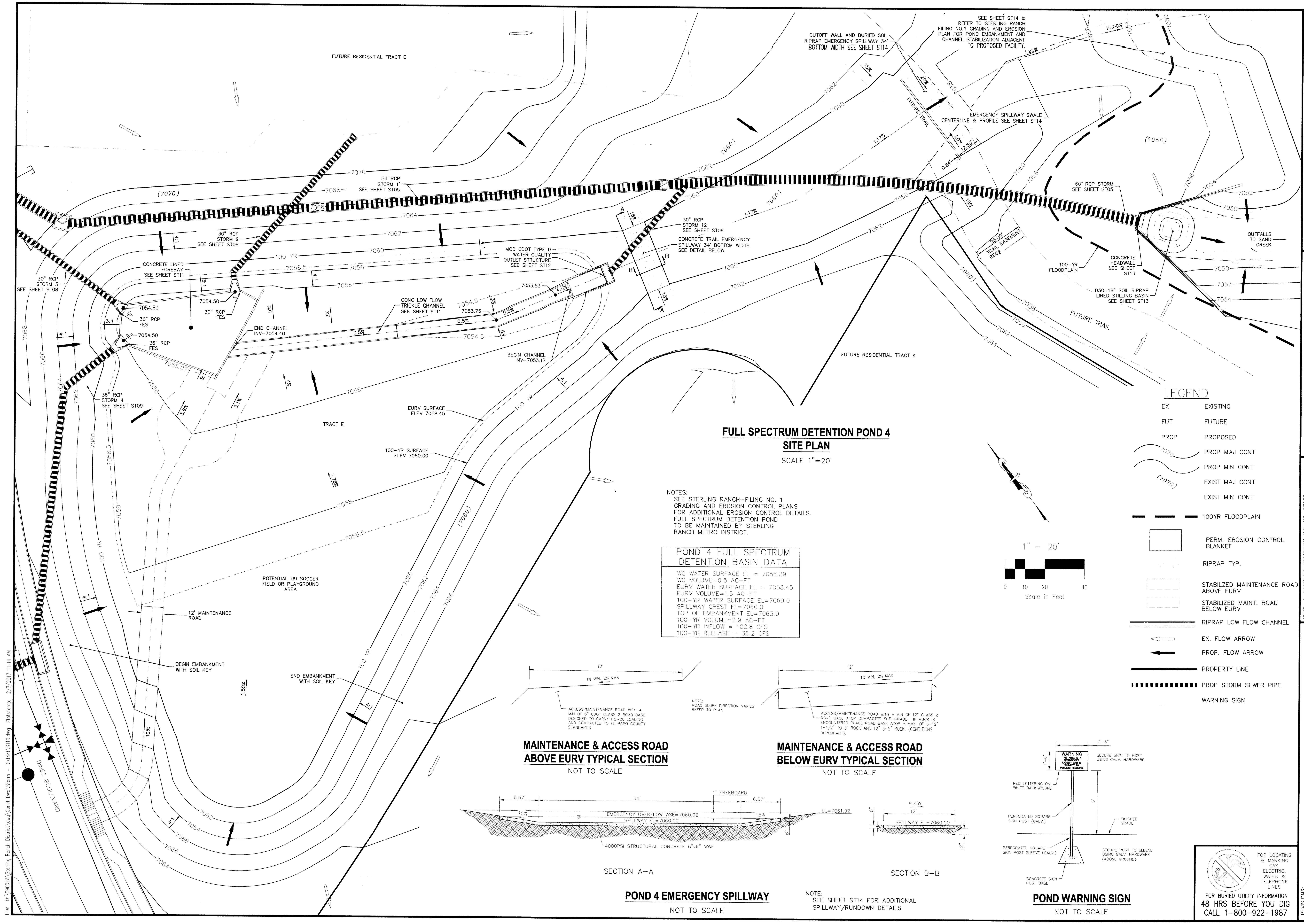
CAUTION



FULL SPECTRUM DETENTION POND 4 SITE PLAN

SCALE 1"=20'

NOTES:
SEE STERLING RANCH-FILING NO. 1 GRADING AND EROSION CONTROL PLANS FOR ADDITIONAL EROSION CONTROL DETAILS. FULL SPECTRUM DETENTION POND TO BE MAINTAINED BY STERLING RANCH METRO DISTRICT.

POND 4 FULL SPECTRUM DETENTION BASIN DATA
WQ WATER SURFACE EL = 7056.39
WQ VOLUME=0.5 AC-FT
EURV WATER SURFACE EL = 7058.45
EURV VOLUME=1.5 AC-FT
100-YR WATER SURFACE EL=7060.0
SPILLWAY CREST EL=7060.0
TOP OF EMBANKMENT EL=7063.0
100-YR VOLUME=2.9 AC-FT
100-YR INFLOW = 102.8 CFS
100-YR RELEASE = 36.2 CFS

NOTE:
SEE SHEET ST14 FOR ADDITIONAL SPILLWAY/RUNDOWN DETAILS

LEGEND

EX	EXISTING
FUT	FUTURE
PROP	PROPOSED
	PROP MAJ CONT
	PROP MIN CONT
	EXIST MAJ CONT
	EXIST MIN CONT
	100YR FLOODPLAIN
	PERM. EROSION CONTROL BLANKET
	RIPRAP TYP.
	STABILIZED MAINTENANCE ROAD ABOVE EURV
	STABILIZED MAINT. ROAD BELOW EURV
	RIPRAP LOW FLOW CHANNEL
	EX. FLOW ARROW
	PROP. FLOW ARROW
	PROPERTY LINE
	PROP STORM SEWER PIPE
	WARNING SIGN

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

STERLING RANCH FILING NO. 1
FULL SPECTRUM DETENTION POND 4

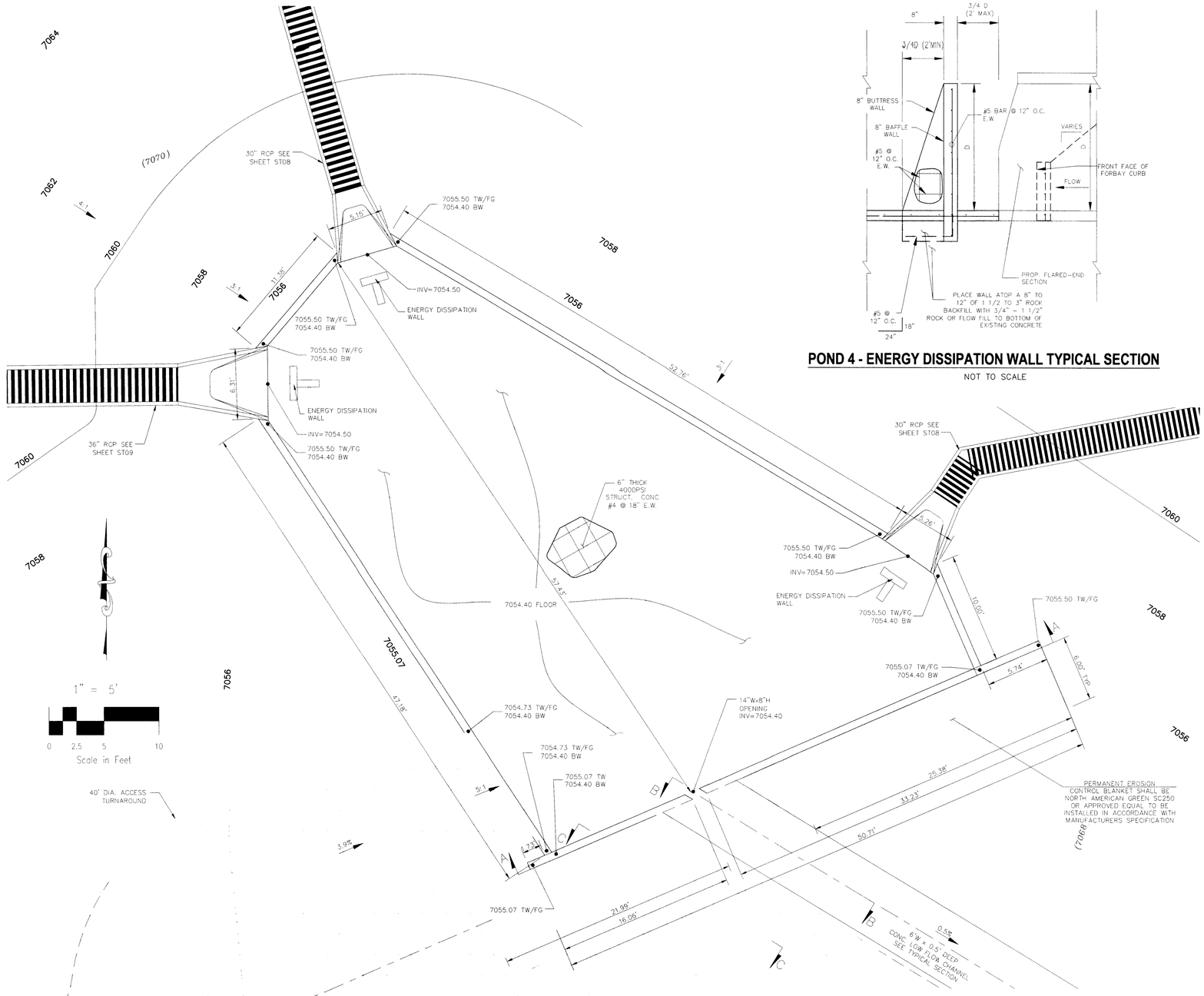
PROJECT NO. 09-002 | FILE: \dwg\Const Dwg\Storm - District\ST10.dwg | DATE: 01/02/2018
DESIGNED BY: ET | DRAWN BY: ELY | CHECKED BY: VAS
SCALE HORIZ: 1"=20' VERT: N/A
SHEET 14 OF 28
ST10

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APRV'D. BY:	DATE:

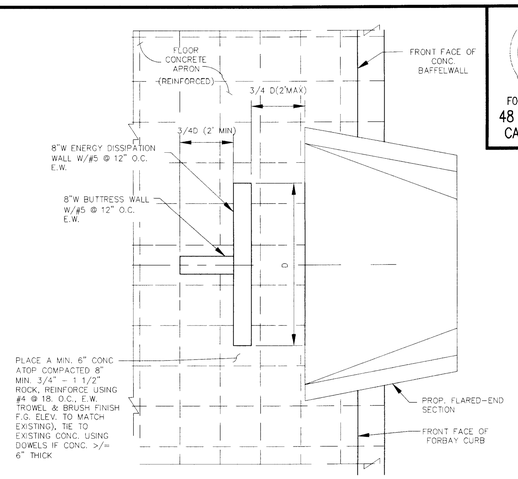


FULL SPECTRUM DETENTION POND 4 FOREBAY PLAN

NOT TO SCALE

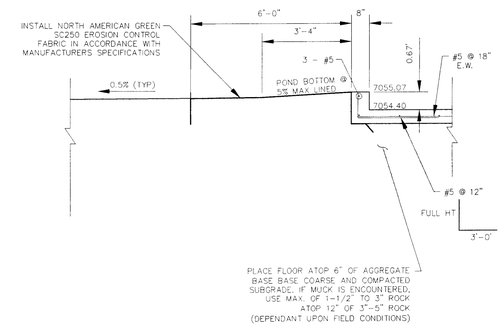
POND 4 - ENERGY DISSIPATION WALL TYPICAL SECTION

NOT TO SCALE



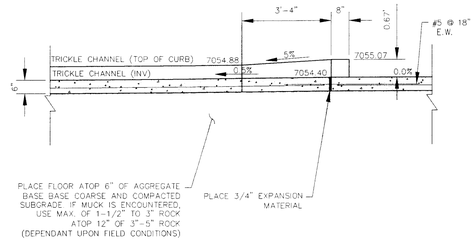
POND 4 - ENERGY DISSIPATION WALL TYPICAL PLAN

NOT TO SCALE



SLOPE GRADING BELOW FOREBAY SECTION C-C

NOT TO SCALE

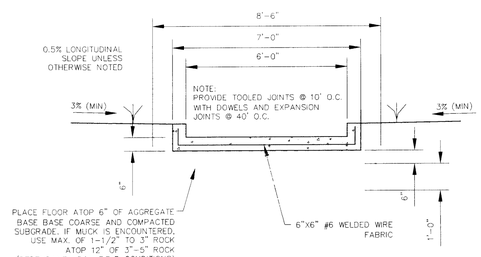


LOW FLOW CHANNEL AT FOREBAY SECTION B-B

NOT TO SCALE

FOREBAY FRONT WALL W/NOTCH SECTION A-A

NOT TO SCALE



LOW FLOW CHANNEL TYPICAL SECTION

NOT TO SCALE

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

STERLING RANCH FILING NO. 1

FULL SPECTRUM DET. POND 4 DETAILS

PROJECT NO. 09-002	FILE: \Dwg\Const Dwg\Storm - District\ST11.dwg	DATE: 01/02/2018	SHEET 15 OF 28
DESIGNED BY: ET	SCALE:	HORIZ: 1"=20'	ST11
DRAWN BY: ELY		VERT: N/A	
CHECKED BY: VAS			

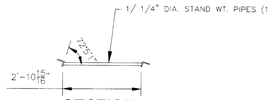
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE 719.955.5485

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

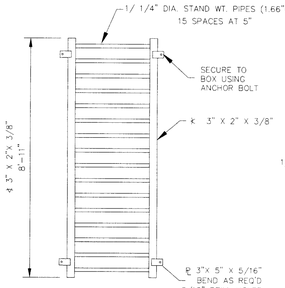
VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

REVISIONS:				
NO	DATE	BY	DESCRIPTION	APPVD

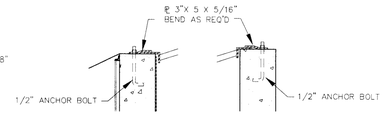
File: O:\09002A\Sterling Ranch District\Dwg\Const Dwg\Storm - District\ST11.dwg Plotstamp: 4/13/2017 3:37 PM



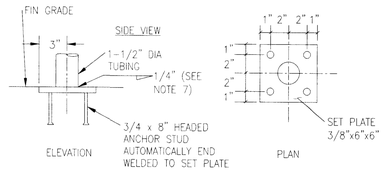
SECTION
NOT TO SCALE



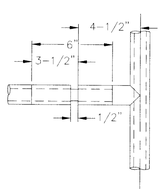
GRATE PLAN
NOT TO SCALE



GRATE DETAIL "A" **GRATE DETAIL "B"**



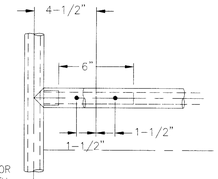
SET PLATE ANCHOR DETAILS
(NTS)



EXPANSION JOINT DETAIL
(NTS)

MECHANICAL TUBING, 1/4" MIN. WALL THICKNESS, 1/16" CHAMFER BOTH ENDS. REAM PIPE FOR SLIP FIT 0.03" MAX. CLEARANCE.

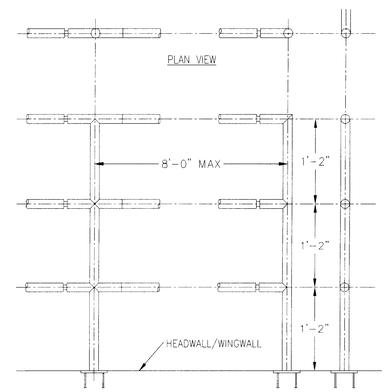
13/32" DRILL AND CSK. PIPE 1/16" DEEP BOTH SIDES. PROVIDE 3/8" DIA SOFT STEEL ROD SUITABLE FOR FIELD RIVETING, GRIND SMOOTH.

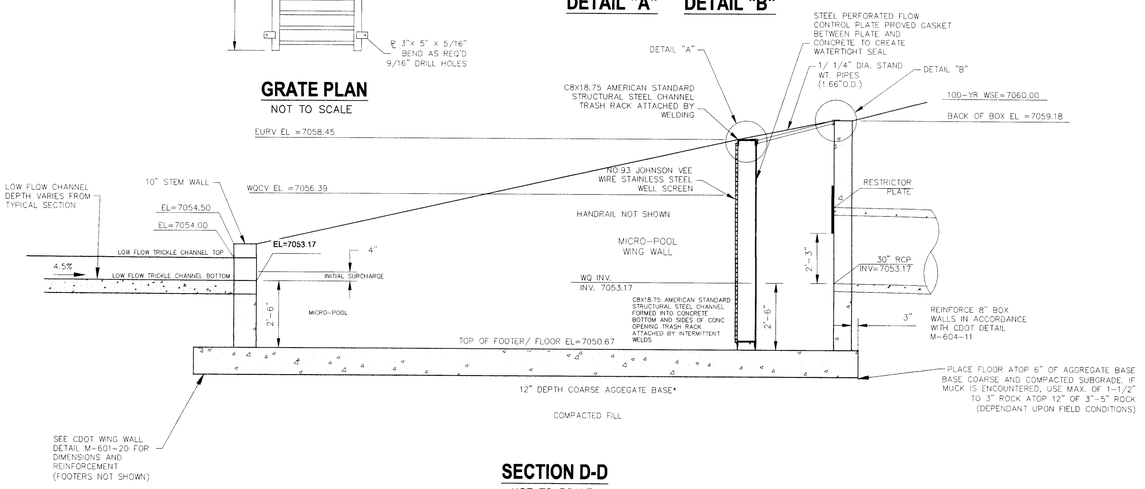


FIXED JOINT DETAIL
(NTS)

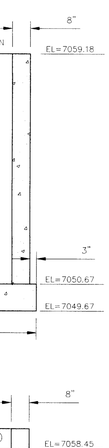
1) WELD PLATES MAY BE SUBSTITUTED FOR PIPE EMBEDMENT.
2) CONTRACTOR TO SUBMIT SHOP DRAWINGS TO ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION.
3) DESIGN CRITERIA SHALL BE IN ACCORDANCE WITH AASHTO STANDARDS.
4) HANDRAIL DESIGN SHALL BE COMPATIBLE WITH THE DESIGN OF THE WINGWALLS AND HEADWALLS.
5) RAILING POSTS SHALL BE SET TO NORMAL TO GRADE. RAILS SHALL RUN PARALLEL TO THE SLOPES OF THREE TOP OF WALLS.
6) ALL RAILS SHALL BE FREE OF ANY SHARP EDGES OR CORNERS.

HANDRAIL ASSEMBLY DETAILS
NOT TO SCALE

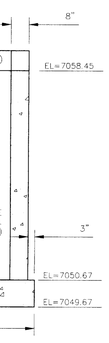




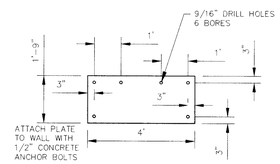
SECTION D-D
NOT TO SCALE



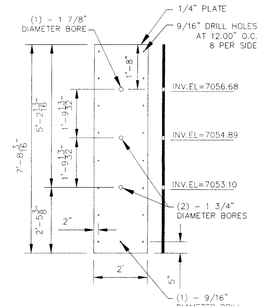
REAR WALL
NOT TO SCALE



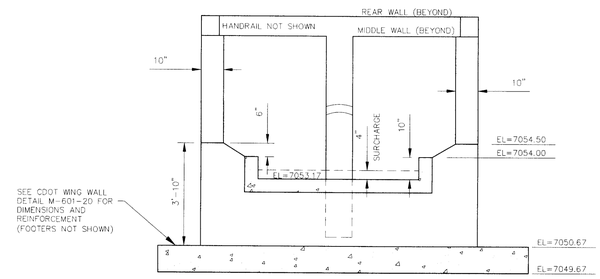
MIDDLE WALL
NOT TO SCALE



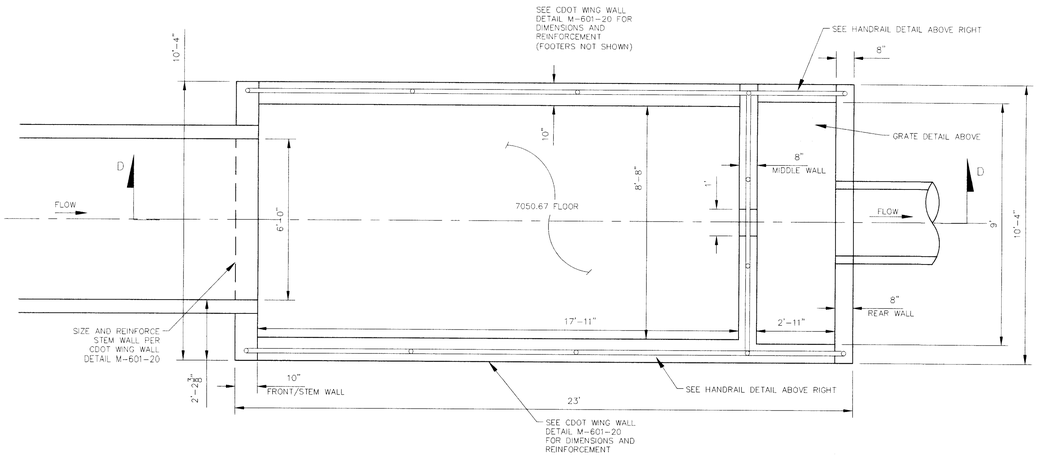
RESTRICTOR PLATE
NOT TO SCALE



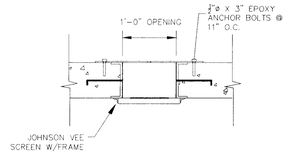
ORIFICE PLATE
NOT TO SCALE



FRONT/STEM WALL
NOT TO SCALE



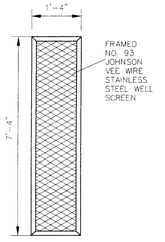
POND 4 WATER QUALITY OUTLET STRUCTURE
NOT TO SCALE



SECTION E-E
NOT TO SCALE

NOTE:
ALL GRATES, IMBEDS, AND FASTENERS SHALL BE FABRICATED USING GALVANIZED STEEL, UNLESS OTHERWISE NOTED.

ALL GRATE DIMENSIONS TO BE FIELD VERIFIED PRIOR TO FABRICATION. ALL GRATE MATERIAL SHALL BE GALVANIZED.



TRASH SCREEN DETAIL
NOT TO SCALE

NOTE:
CENTER ORIFICE PLATE AND TRASH SCREEN HORIZONTALLY ACROSS 1'-0" OPENING IN STRUCTURE

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
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File: O:\V8002A\Sterling Ranch District\dwg\Const Dwg\Storm - District\ST12.dwg Plotstamp: 2/7/2017 12:12 PM

STERLING RANCH FILING NO. 1
OUTLET STRUCTURE & MISC. POND DETAILS
PROJECT NO 09-002 | FILE: V:\dwg\Const Dwg\Storm - District\ST12.dwg | SCALE HORIZ: 1"=20' VERT: N/A | DATE: 01/02/2018 | SHEET 16 OF 28 | ST12
DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

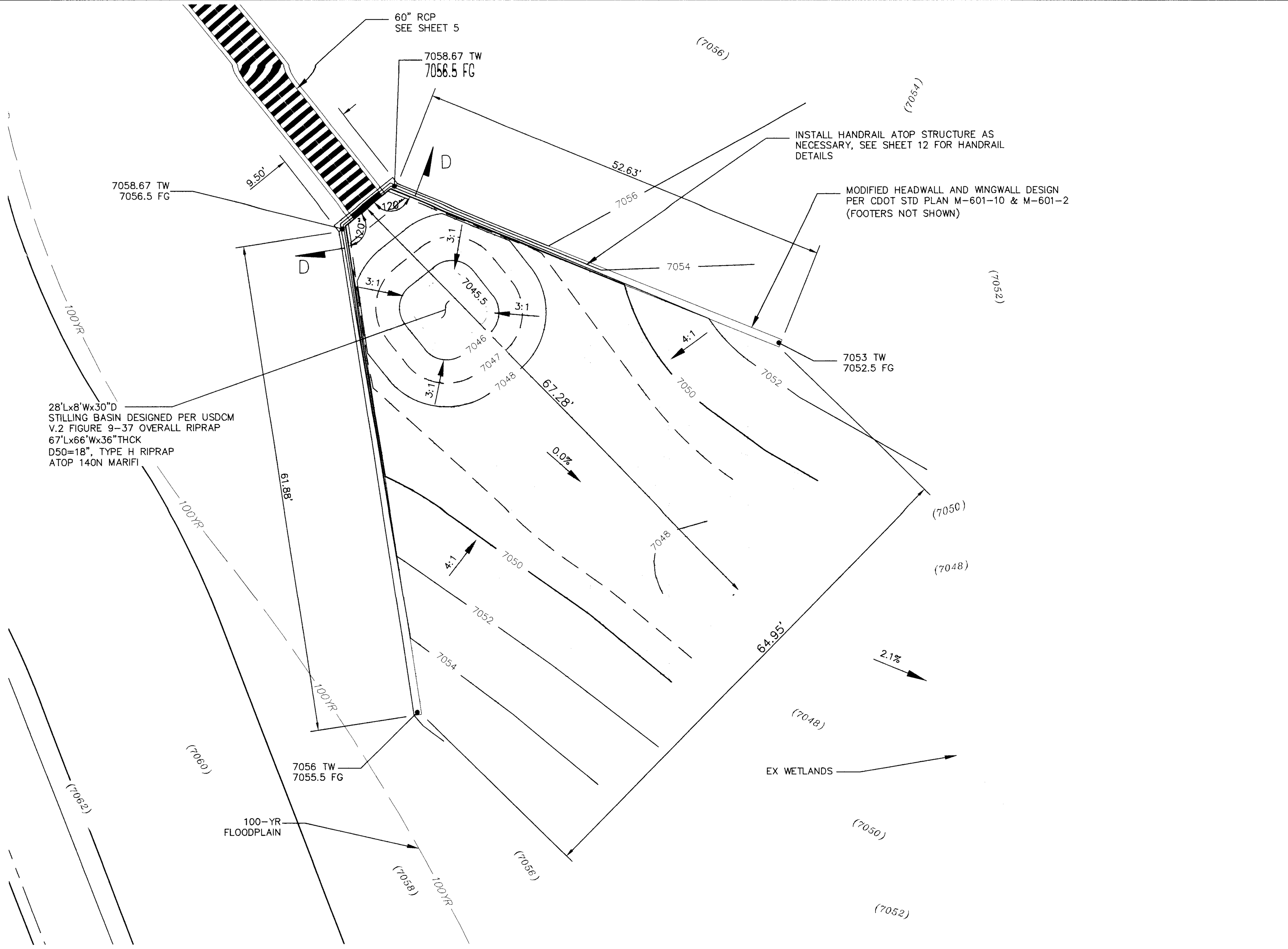
REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:

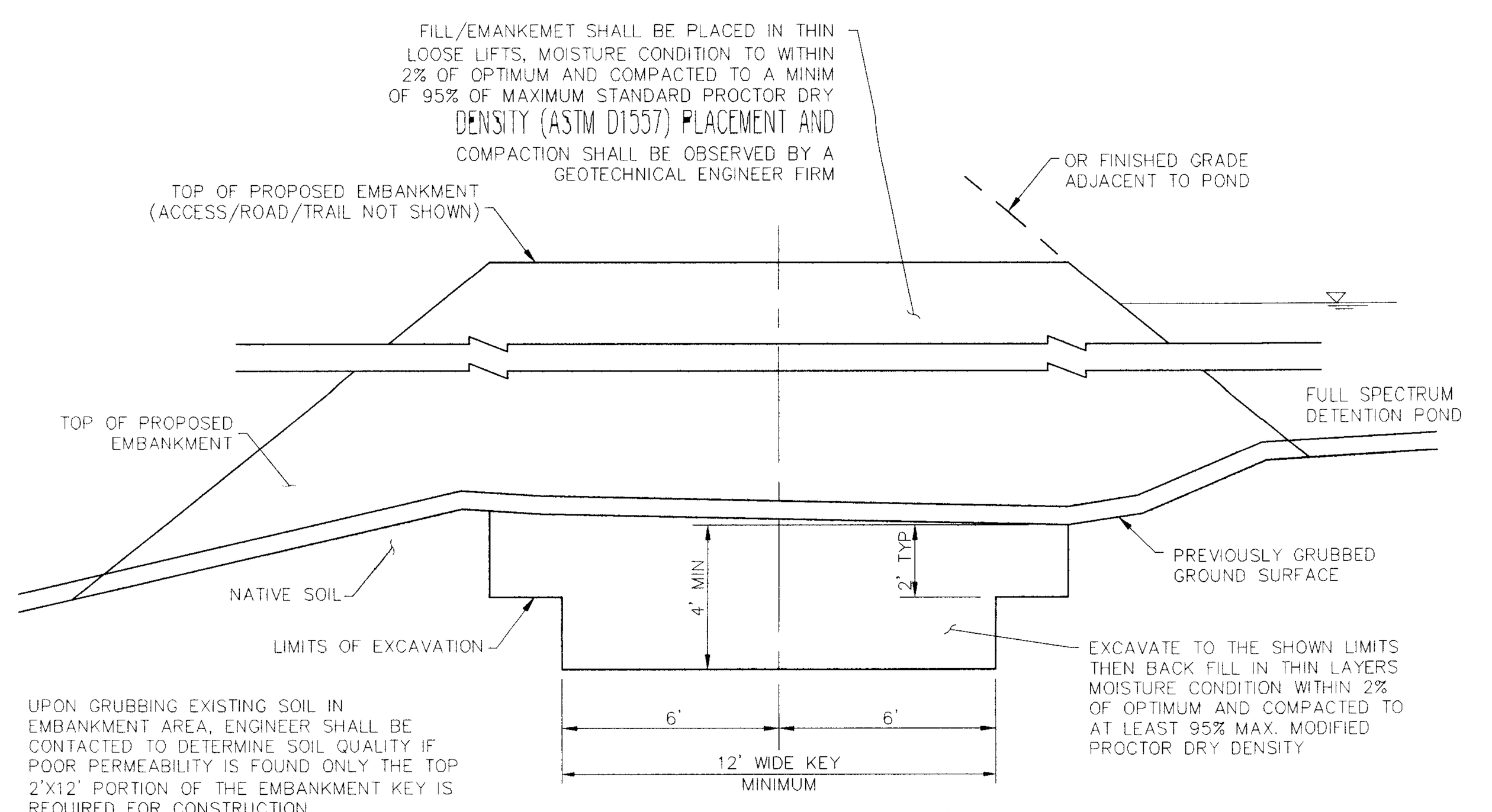
APPVD. BY: DATE:

THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

CAUTION

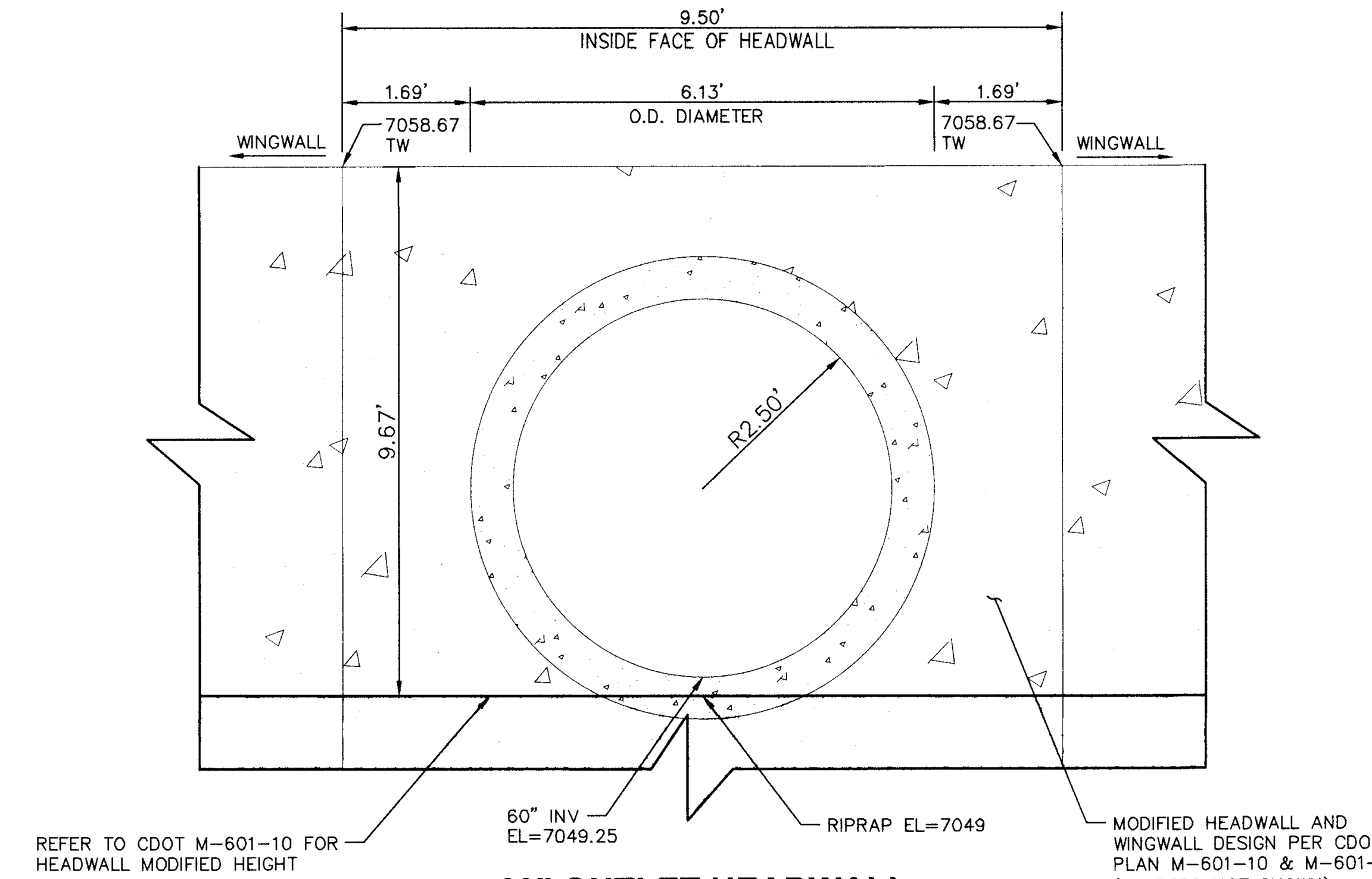


STORM 1 - 60" OUTFALL STILLING BASIN W/ HEADWALL & WINDWALLS



EMBANKMENT DETAIL

NOT TO SCALE



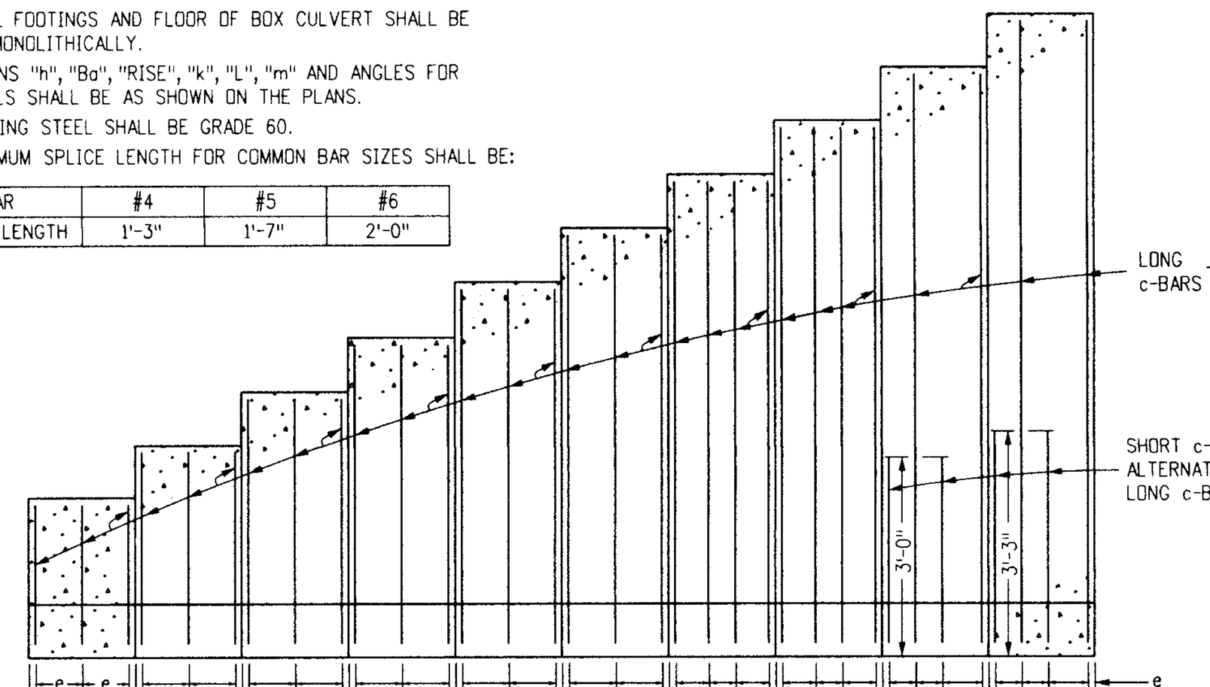
60" OUTLET HEADWALL
SECTION D-D

NOT TO SCALE

GENERAL NOTES

1. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN.
2. WINGWALL FOOTINGS AND FLOOR OF BOX CULVERT SHALL BE PLACED MONOLITHICALLY.
3. DIMENSIONS "h", "Ba", "RISE", "k", "L", "m" AND ANGLES FOR WINGWALLS SHALL BE AS SHOWN ON THE PLANS.
4. REINFORCING STEEL SHALL BE GRADE 60.
5. THE MINIMUM SPLICE LENGTH FOR COMMON BAR SIZES SHALL BE:

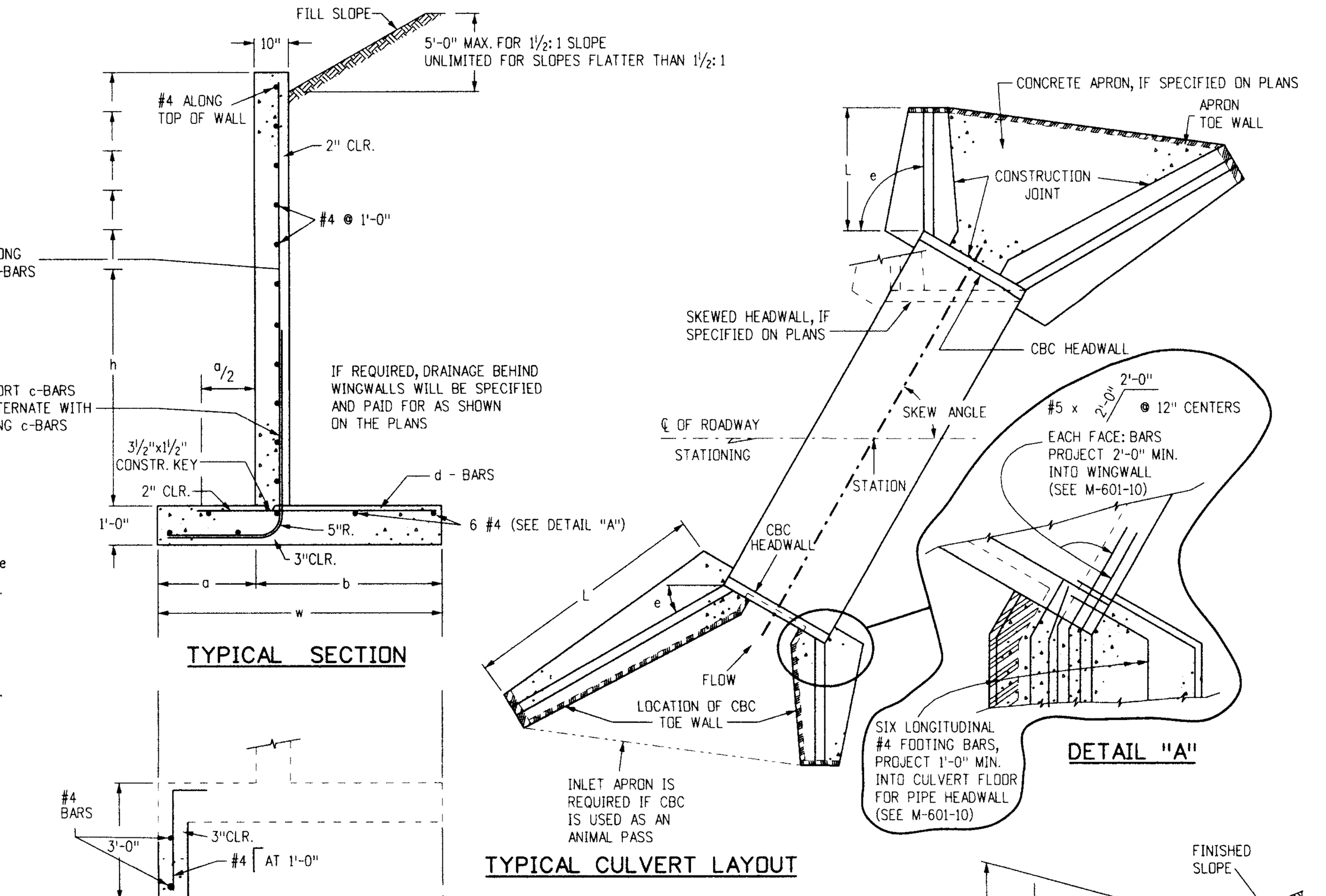
BAR	#4	#5	#6
SPLICE LENGTH	1'-3"	1'-7"	2'-0"

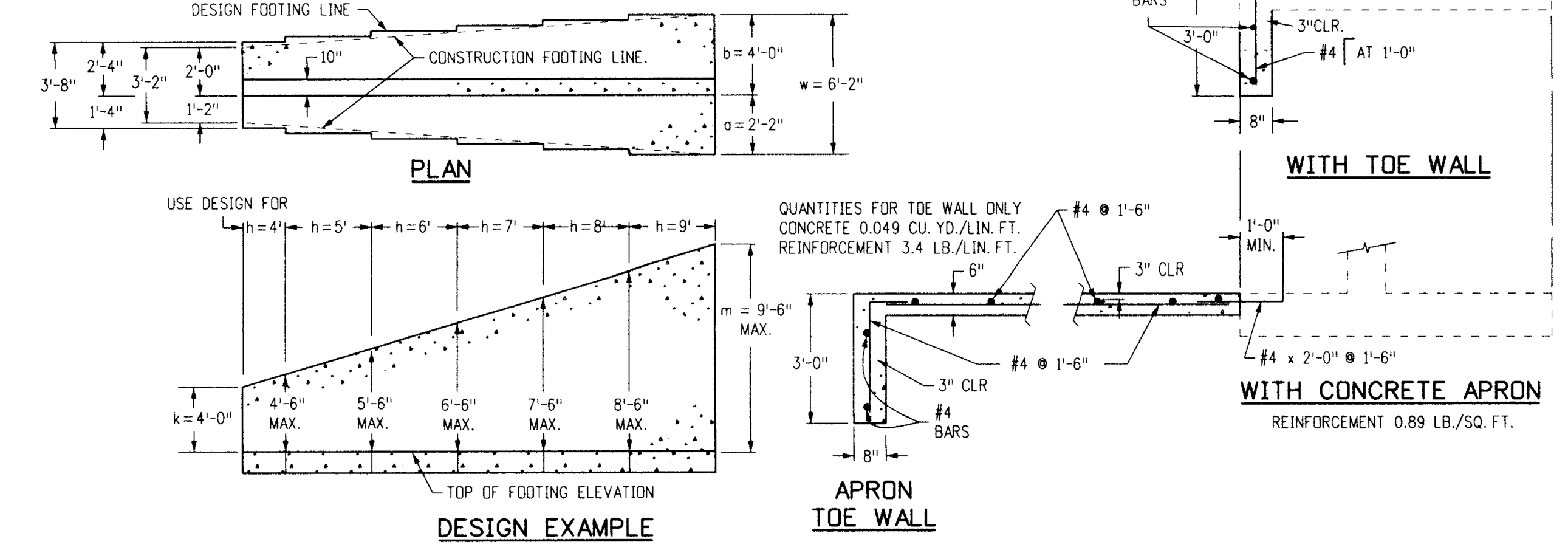


e =	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-4"	1'-3"	11'	9"	7"	CTRS.
h =	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	
a =	1'-0"	1'-2'	1'-4"	1'-6'	1'-8"	1'-10"	2'-0"	2'-2"	2'-4"	2'-6"	
b =	1'-8"	2'-0"	2'-4'	2'-8'	3'-0"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	
w =	2'-8"	3'-2"	3'-8"	4'-2"	4'-8"	5'-2"	5'-8"	6'-2"	6'-8"	7'-2"	
c & d BARS	#4@1'-6"	#4@1'-6"	#4@1'-6"	#4@1'-6"	#4@1'-6"	#4@1'-4"	#5@1'-3"	#5@11"	#6@9"	#6@7"	CTRS.
* CONC.CU.YD./L.F.	0.161	0.210	0.259	0.308	0.358	0.407	0.457	0.506	0.556	0.604	
* REINF. LB./L.F.	8.0	9.3	10.7	12.1	14.3	16.4	23.0	28.6	41.8	54.6	

* DOES NOT INCLUDE TOE WALL QUANTITIES

DESIGN TABLE





DESIGN DATA:

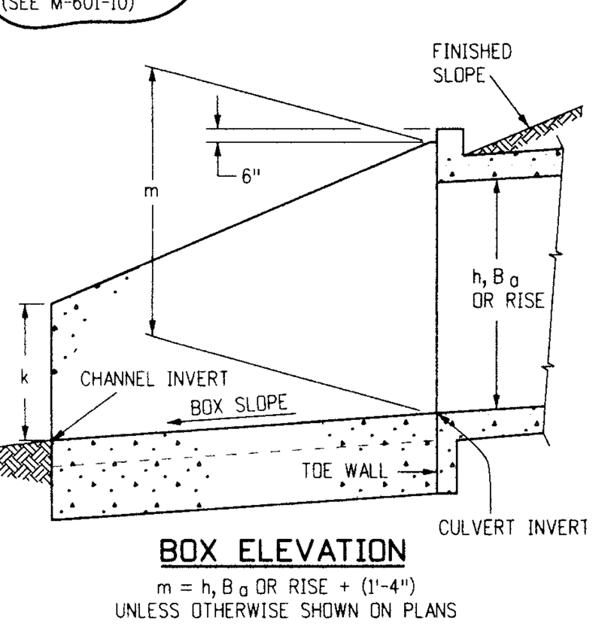
UNIT STRESSES: $f_s = 24{,}000$ PSI
$f_c = 1{,}200$ PSI
$n = 9$

EQUIVALENT FLUID PRESSURE = 36 LBS./CU. FT.
MAXIMUM TOE PRESSURE = 1 TON/SQ. FT.

ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE CONCRETE IS POURED.

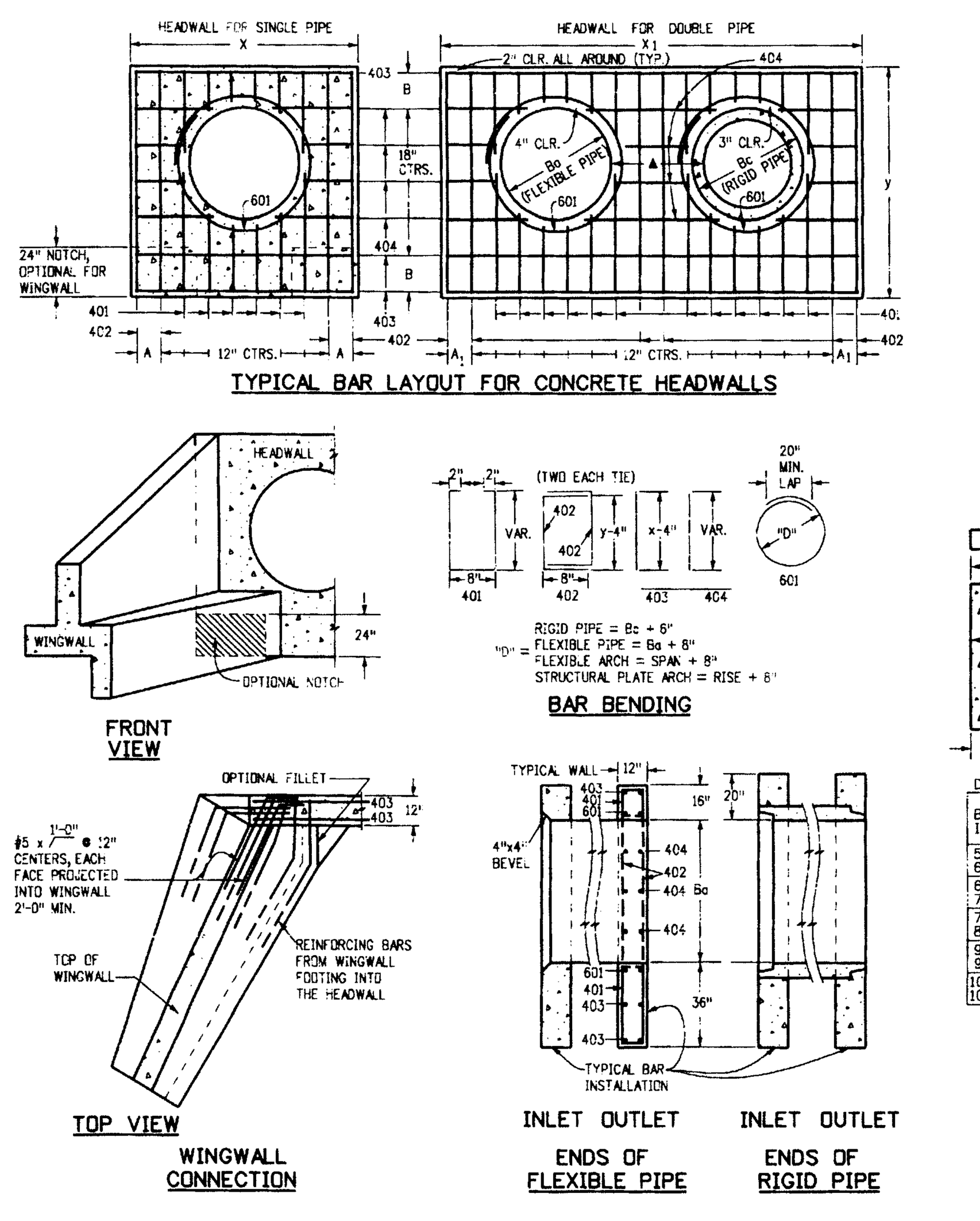
WINGWALL AND APRON CONCRETE SHALL BE:
CONCRETE CLASS B, OR D (BOX CULVERT) FOR CBC's.
CONCRETE CLASS B, OR D (WALL) FOR PIPES.

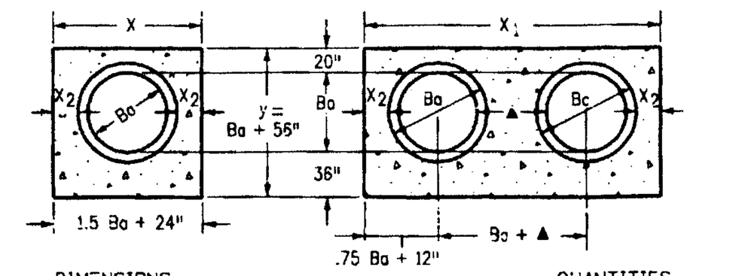
LIVE LOAD SURCHARGE HAS NOT BEEN CONSIDERED. WALLS WITHIN h/2 OF THE EDGE OF THE ROADWAY SHOULDER WILL REQUIRE A SPECIAL DESIGN IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.



OUTLET STRUCTURE WINGWALL REINFORCING DETAILS
CDOT M-601-20

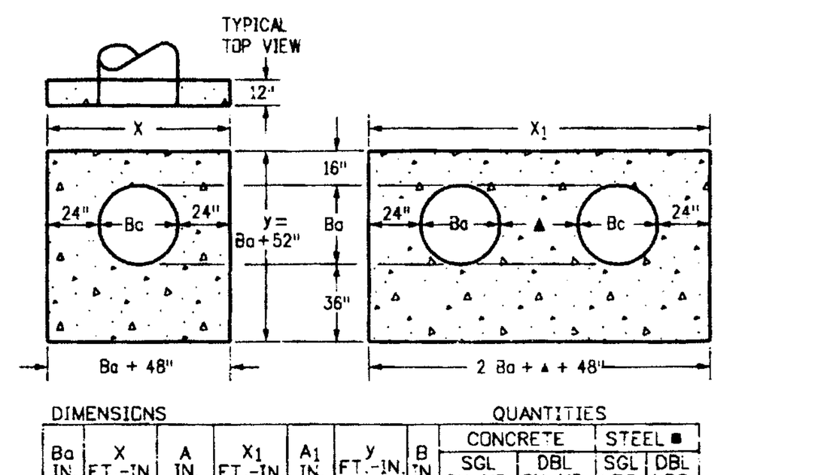
NOT TO SCALE





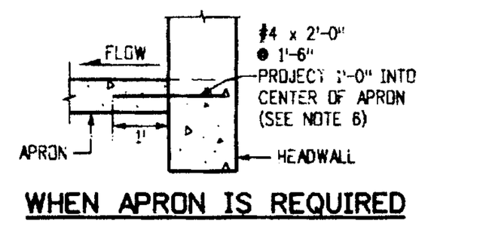
Ba IN.	Bc IN.	X FT.-IN.	A IN.	X_1 FT.-IN.	A_1 IN.	y FT.-IN.	B IN.	X_2 IN.	CONCRETE SGL CU.YD.	CONCRETE DBL CU.YD.	STEEL ■ SGL LBS.	STEEL ■ DBL LBS.
54	65	8-9	8½	15-6	7	9-2	17	20	2.12	3.55	209	364
60	72	9-6	7	17-0	10	9-8	11	21	2.35	3.99	236	414
66	79	10-3	11½	18-6	7	10-2	14	22	2.60	4.44	249	453
72	86	11-0	10	20-0	10	10-8	17	23	2.85	4.91	270	476
78	93	11-9	8½	21-3	11	11-2	11	24	3.11	5.29	306	527
84	100	12-6	7	22-6	7	11-8	14	25	3.38	5.68	333	572
90	107	13-3	11½	23-9	8½	12-2	17	26	3.66	6.08	335	593
96	114	14-0	10	25-0	10	12-8	11	27	3.94	6.48	379	649
102	121	14-9	8½	26-3	11½	13-2	14	28	4.24	6.89	400	664
108	128	15-6	7	27-6	7	13-8	17	29	4.54	7.30	424	707

HEADWALL FOR RIGID ROUND PIPE



Ba IN.	X FT.-IN.	A IN.	X_1 FT.-IN.	A_1 IN.	y FT.-IN.	B IN.	CONCRETE SGL CU. YD.	CONCRETE DBL CU. YD.	STEEL ■ SGL LBS.	STEEL ■ DBL LBS.
54	8-6	7	15-3	11½	8-10	15	2.19	3.81	211	358
60	9-0	10	16-6	7	9-4	18	2.38	4.25	217	396
66	9-6	7	17-9	8½	9-10	12	2.58	4.70	252	454
72	10-0	10	19-0	10	10-4	15	2.78	5.17	255	472
78	10-6	7	20-0	10	10-10	18	2.98	5.56	276	499
84	11-0	10	21-0	10	11-4	12	3.19	5.95	297	553
90	11-6	7	22-0	10	11-10	15	3.40	6.36	317	517
96	12-0	10	23-0	10	12-4	18	3.62	6.79	321	597
102	12-6	7	24-0	10	12-10	12	3.84	7.21	364	663
108	13-0	10	25-0	10	13-4	15	4.06	7.63	362	678

HEADWALL FOR FLEXIBLE ROUND PIPE



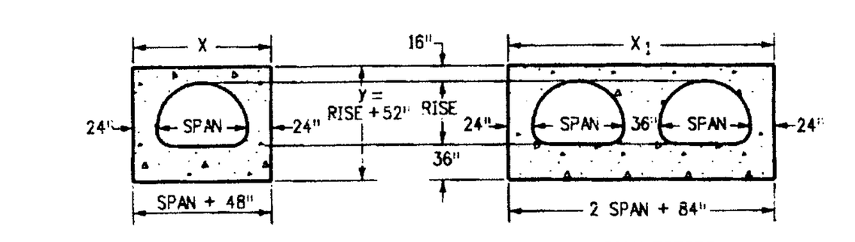
WHEN APRON IS REQUIRED

GENERAL NOTES

1. CONCRETE SHALL BE CLASS B.
2. HEADWALL SHALL BE PERPENDICULAR TO THE PIPE ℄ UNLESS OTHERWISE SHOWN ON THE PLANS. TABULATED DIMENSIONS AND QUANTITIES MUST BE ADJUSTED FOR SKEWED INSTALLATIONS.
3. FOR WINGWALL DETAILS, SEE STANDARD PLAN M-601-20.
4. VOLUME OCCUPIED BY PIPE HAS BEEN DEDUCTED FROM STEEL AND CONCRETE QUANTITIES.
5. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN.
6. ALL REINFORCING BARS SHALL HAVE A 2 IN. MINIMUM CLEARANCE.

▲ WHEN TWO OR MORE PIPES ARE LAID SIDE BY SIDE, THEY SHALL BE PLACED SO THAT THE ADJACENT PIPES WILL BE ½ INSIDE DIAMETER APART, OR ½ INSIDE SPAN APART, OR 3 FT. APART (INCLUDING WALL THICKNESS), WHICHEVER IS LESS.

■ ADD 0.89 x (X OR X_1) (LB.) WHEN APRON IS REQUIRED.



EQUIV. Ba IN.	SPAN IN.	RISE IN.	X FT.-IN.	A IN.	X_1 FT.-IN.	A_1 IN.	y FT.-IN.	B IN.	CONCRETE SGL CU. YD.	CONCRETE DBL CU. YD.	STEEL ■ SGL LBS.	STEEL ■ DBL LBS.
72	81	59	10-9	8½	20-6	7	9-3	17½	2.72	5.10	250	467
78	87	63	11-3	11½	21-6	7	9-7	10½	2.85	5.34	275	531
84	95	67	11-9	8½	22-10	9	9-11	12½	3.08	5.79	290	547
90	103	71	12-7	7½	24-2	11	10-3	15	3.30	6.21	321	591
96	112	75	13-4	12	25-8	8	10-7	16½	3.52	6.65	314	606
102	117	79	13-9	8½	26-6	7	10-11	9½	3.63	6.86	356	672
108	128	83	14-8	8	28-4	12	11-3	11½	3.96	7.51	376	699

HEADWALL FOR FLEXIBLE PIPE ARCH

EQUIV. Ba IN.	SPAN FT.-IN.	RISE FT.-IN.	X FT.-IN.	A IN.	X_1 FT.-IN.	A_1 IN.	y FT.-IN.	B IN.	CONCRETE SGL CU. YD.	CONCRETE DBL CU. YD.	STEEL ■ SGL LBS.	STEEL ■ DBL LBS.
66	6-1	4-7	10-1	10½	19-2	11	8-11	15½	2.52	4.70	232	424
75	7-0	5-1	11-0	10	21-0	10	9-5	9½	2.80	5.25	282	509
84	7-11	5-7	11-11	9½	22-10	9	9-11	12½	3.08	5.79	291	540
93	8-10	6-1	12-10	9	24-8	8	10-5	15½	3.36	6.33	309	622
102	9-9	6-7	13-9	8½	26-6	7	10-11	9½	3.63	6.86	379	673
111	10-11	7-1	14-11	9½	28-10	9	11-5	12½	4.05	7.67	377	711
120	11-10	7-7	15-10	9	30-8	8	11-11	15½	4.36	8.28	395	731
132	12-10	8-4	16-10	9	32-8	8	12-8	11	4.75	9.03	441	839
141	14-1	8-9	18-1	10½	35-2	11	13-1	13½	5.17	9.86	448	931
150	15-4	9-3	19-4	12	37-8	8	13-7	16½	5.69	10.88	490	953
159	15-10	9-10	19-10	9	38-8	8	14-2	11	5.89	11.25	534	1019

HEADWALL FOR STRUCTURAL PLATE ARCH

SKEW ANGLE A°	90	85	80	75	70	65	60	55	50	45	40	35	30
FACTOR (cosecA°)	1.000	1.004	1.015	1.035	1.064	1.103	1.155	1.221	1.305	1.414	1.556	1.743	2.000

SKEW FACTOR TABLE

OUTLET STRUCTURE HEADWALL FOR PIPES REINFORCING DETAILS
CDOT M-601-10

NOT TO SCALE

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

STERLING RANCH FILING NO. 1
OUTLET STRUCTURE & MISC. POND DETAILS

PROJECT NO.	09-002
FILE:	\dwg\Const Dwg\Storm - District\ST13A.dwg
DESIGNED BY:	ET
DRAWN BY:	ELY
CHECKED BY:	VAS
SCALE HORIZ:	1"=20'
VERT:	N/A
DATE:	01/02/2018
SHEET	17 OF 28

ST13

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS: NO.	DATE:	BY:	DESCRIPTION:	APRV'D. BY:	DATE:

CAUTION
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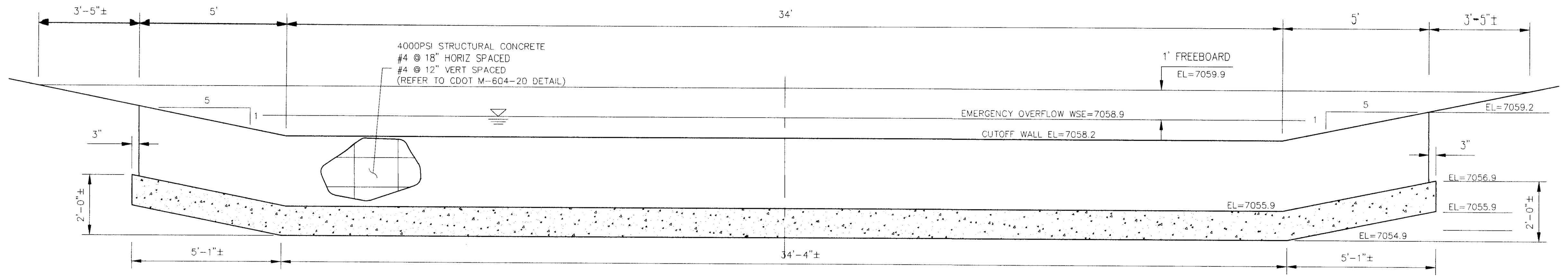
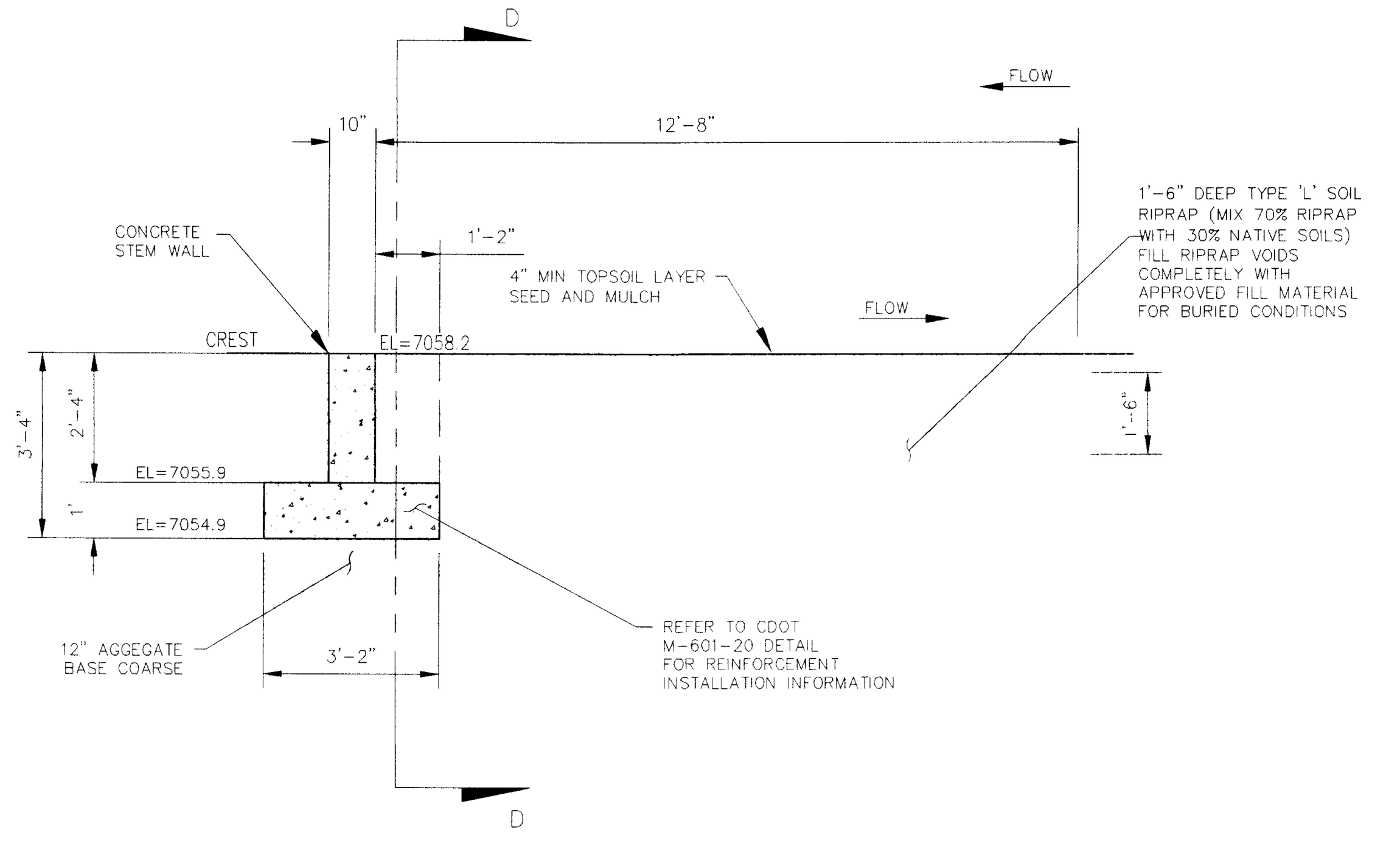
File: 0:\09002\Sterling Ranch District\dwg\Const Dwg\Storm - District\ST13A.dwg Plotstamp: 1/2/2018 11:33 AM



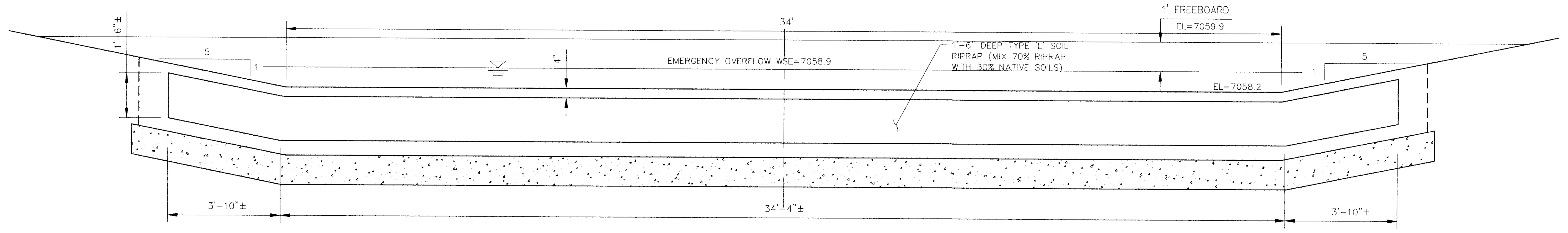
CONCRETE STEM WALL - ELEVATION

NOT TO SCALE



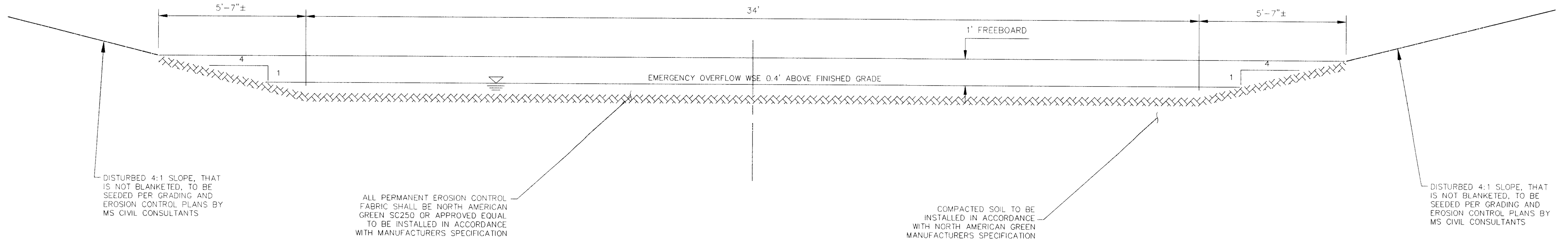
SECTION F-F

NOT TO SCALE



SECTION C-C

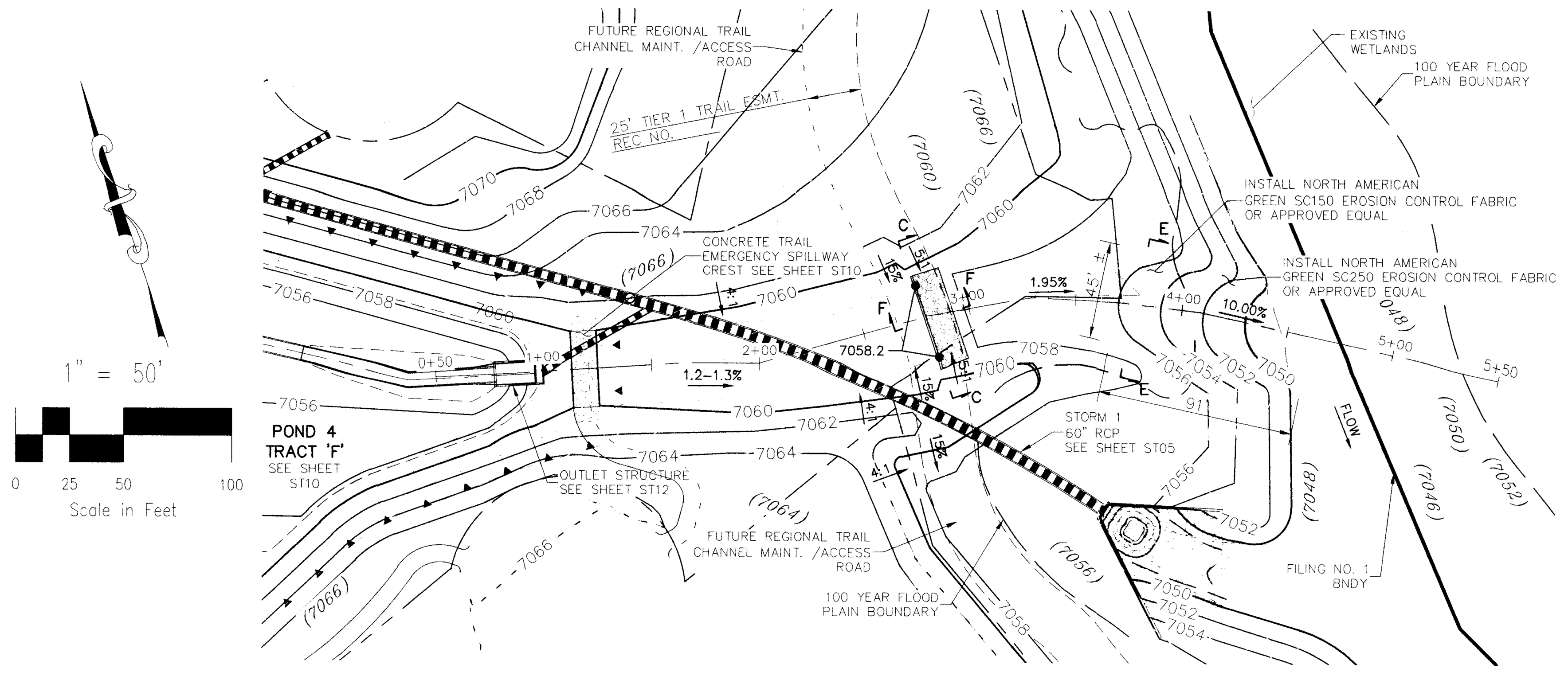
NOT TO SCALE



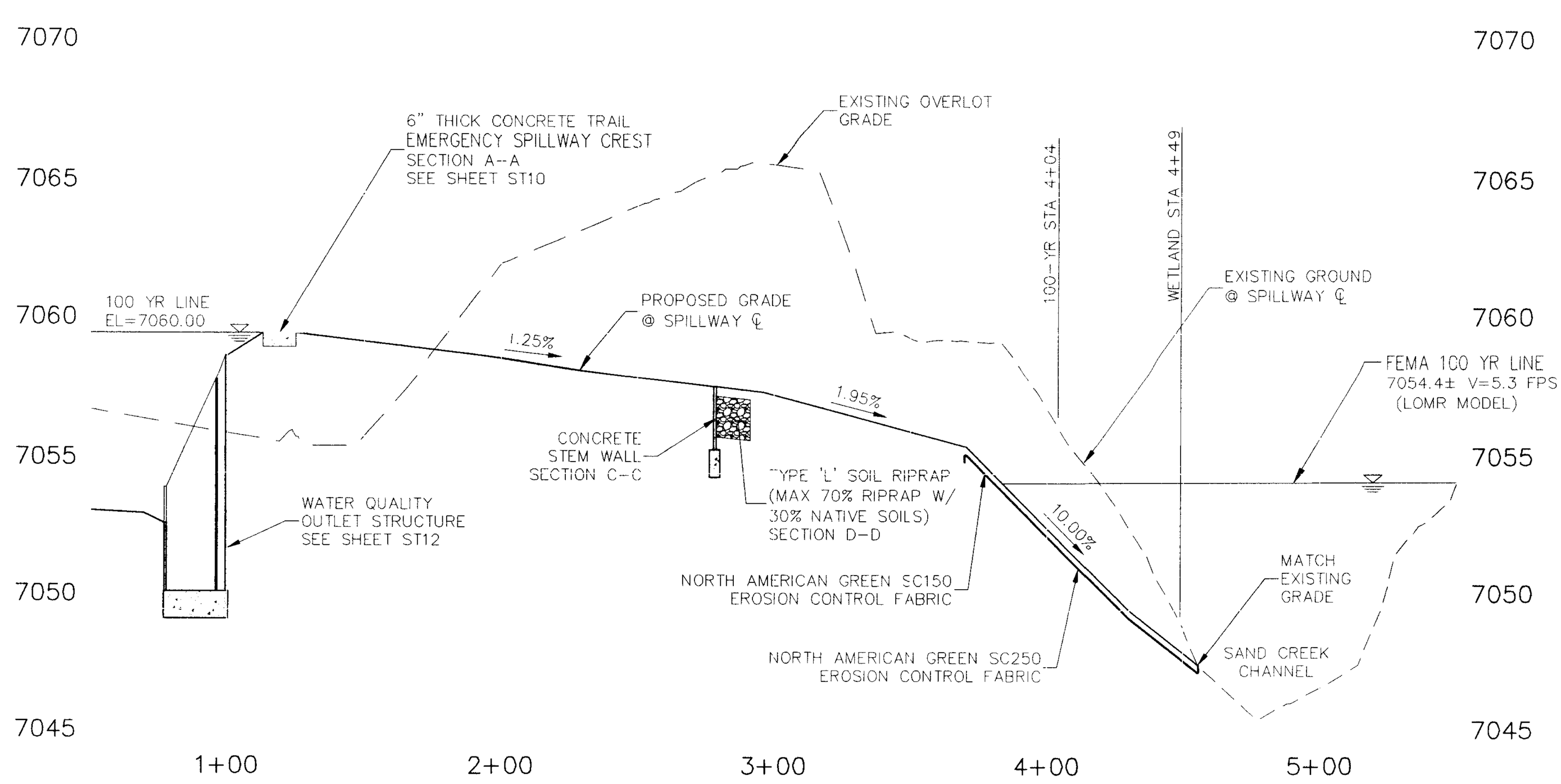
SWALE RUNDOWN INTO SAND CREEK - SECTION E-E

NOT TO SCALE

NOTE:
REFER TO STERLING RANCH FILING NO.1 GRADING AND EROSION PLAN FOR POND EMBANKMENT AND CHANNEL STABILIZATION ADJACENT TO PROPOSED FACILITY.



EMERGENCY SPILLWAY ALIGNMENT



EMERGENCY SPILLWAY PROFILE

HORZ. SCALE: 1"=50'
VERT. SCALE: 1"=5'

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

REVISIONS: NO. | DATE | BY | DESCRIPTION | APPR'D. BY | DATE

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CAUTION

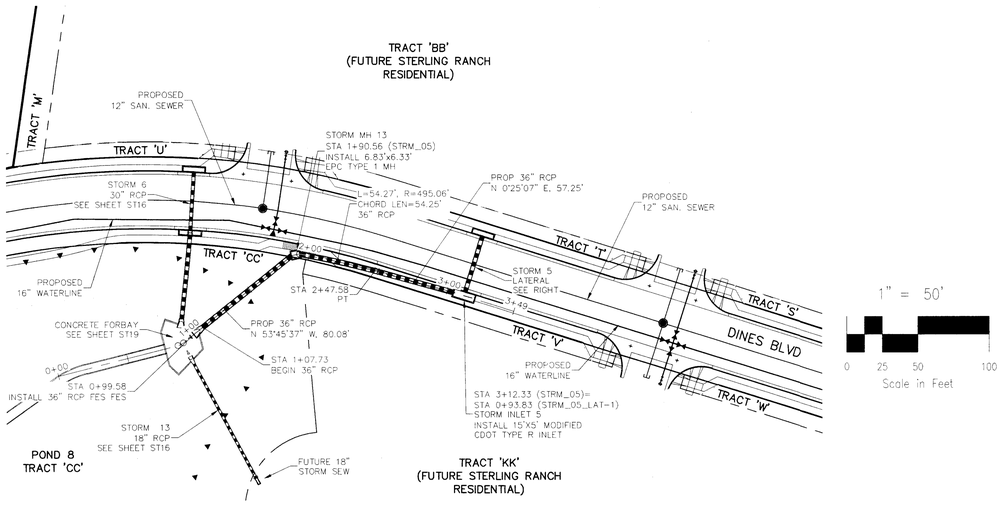
VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

M&S
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

STERLING RANCH FILING NO. 1
FULL SPECTRUM DET. POND 4 DETAILS

PROJECT NO. 09-002
DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS
SCALE: HORIZ: NOTED VERT: N/A
DATE: 01/02/2018
SHEET 18 OF 28

ST14

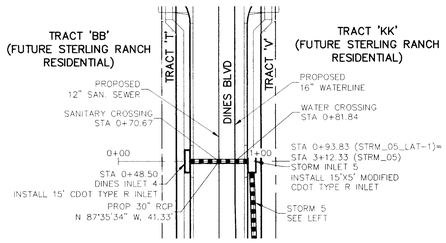


1" = 50'

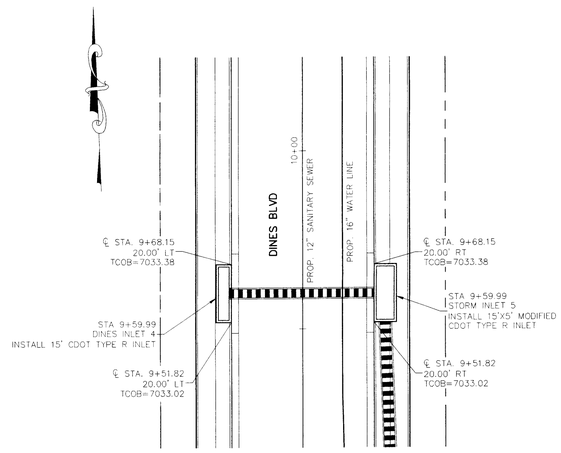
0 25 50 100

Scale in Feet

STORM 5



STORM 5 LATERAL

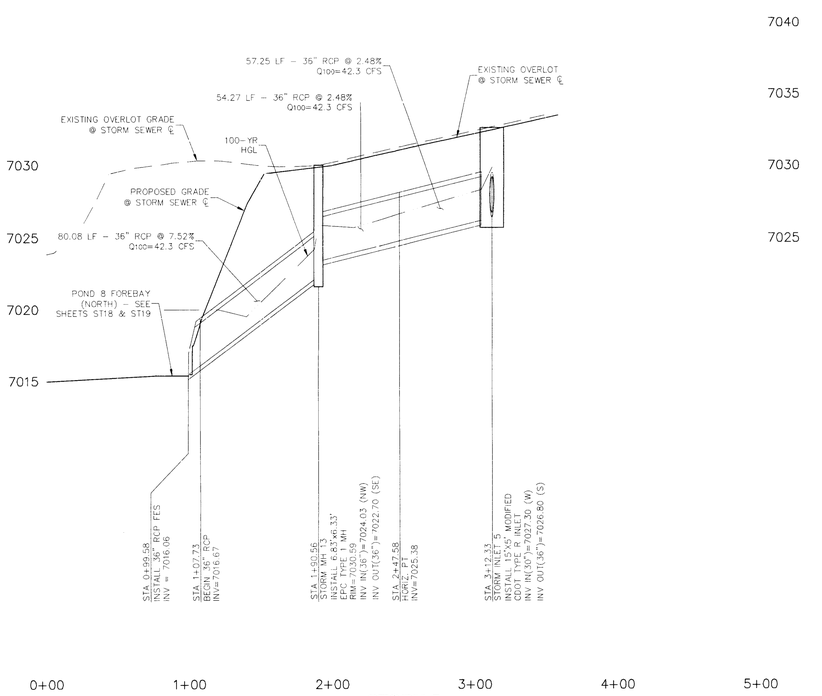


STORM 5 LATERAL INLET DETAILS

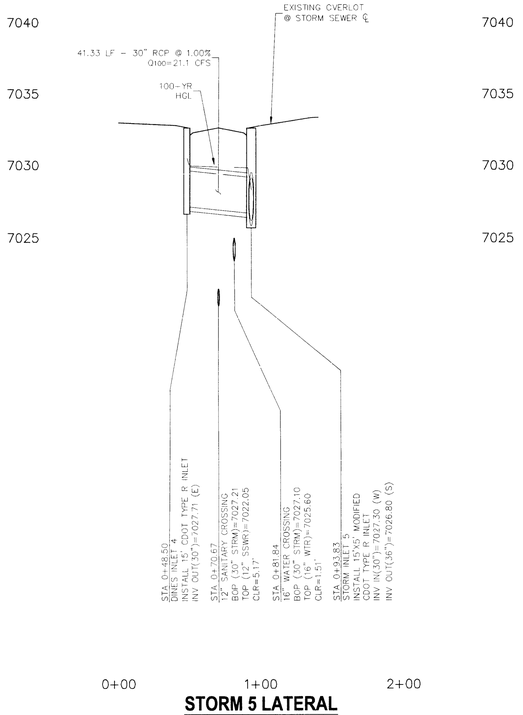
SCALE: 1"=20'

NOTES:
STA 1+00.00 TO STA 1+24.00 (NEXT FULL JOINT) TIE PIPE SEGMENTS TOGETHER W/4-$\frac{3}{4}$" CANOPY TYPE ROD LUG JOINT FASTENERS.

REINFORCED CONCRETE PIPE INSTALLED BETWEEN STA 0+99.56 AND STA 1+90.56 SHALL BE FABRICATED USING A CONCRETE MIX DESIGN THAT RESULTS IN A MIN. 5000 PSI COMPRESSIVE STRENGTH.



STORM 5



STORM 5 LATERAL

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
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CALL 1-800-922-1987

STERLING RANCH FILING NO. 1
STORM SEWER PLANS
PROJECT NO. 09-002 | FILE: V:\eng\Const Dwg\Storm - District\ST15.dwg | DATE: 01/02/2018 | SHEET 19 OF 28 | ST15
DESIGNED BY: ET | DRAWN BY: ELY | CHECKED BY: VAS | SCALE HORIZ: 1"=50' VERT: 1"=5'

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.
VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

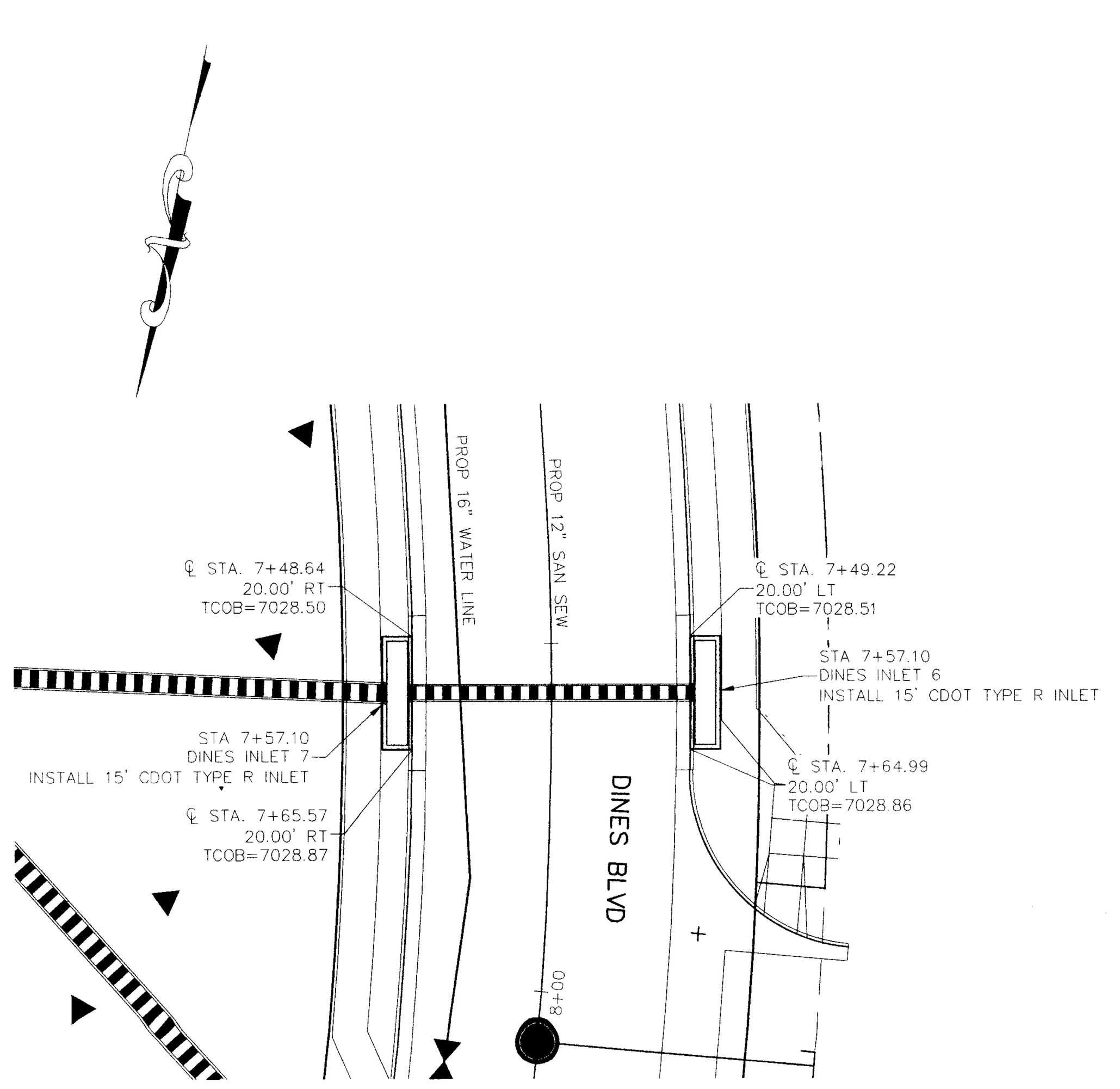
REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APP'D. BY:	DATE:

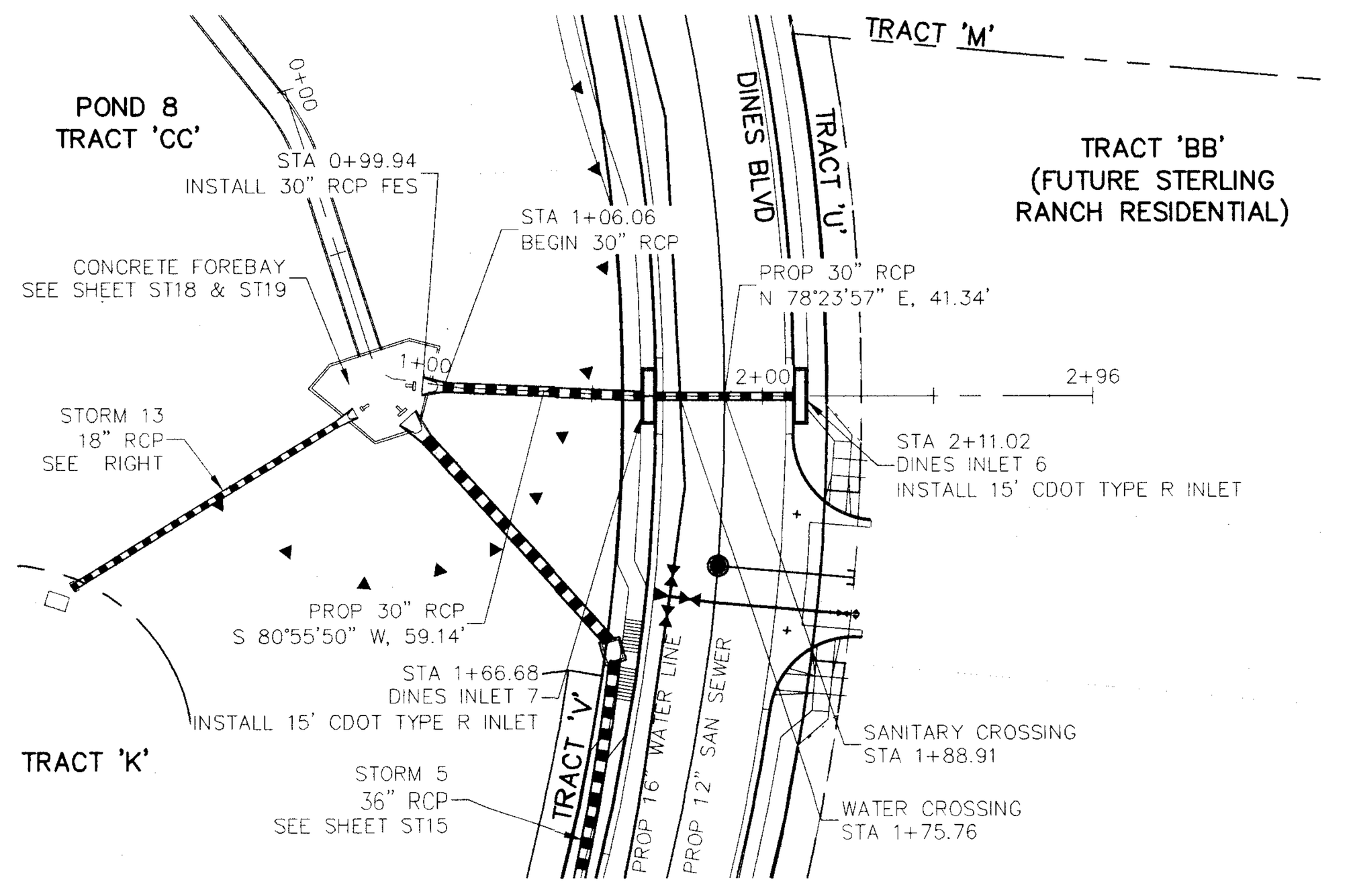
THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

CAUTION

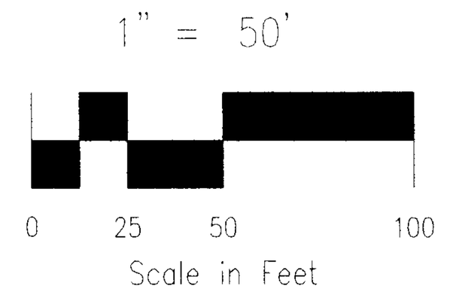
File: O:\090002A\Sterling Ranch (District1)\Const Dwg\Storm - District\ST15.dwg Plotstamp: 2/7/2017 2:26 PM

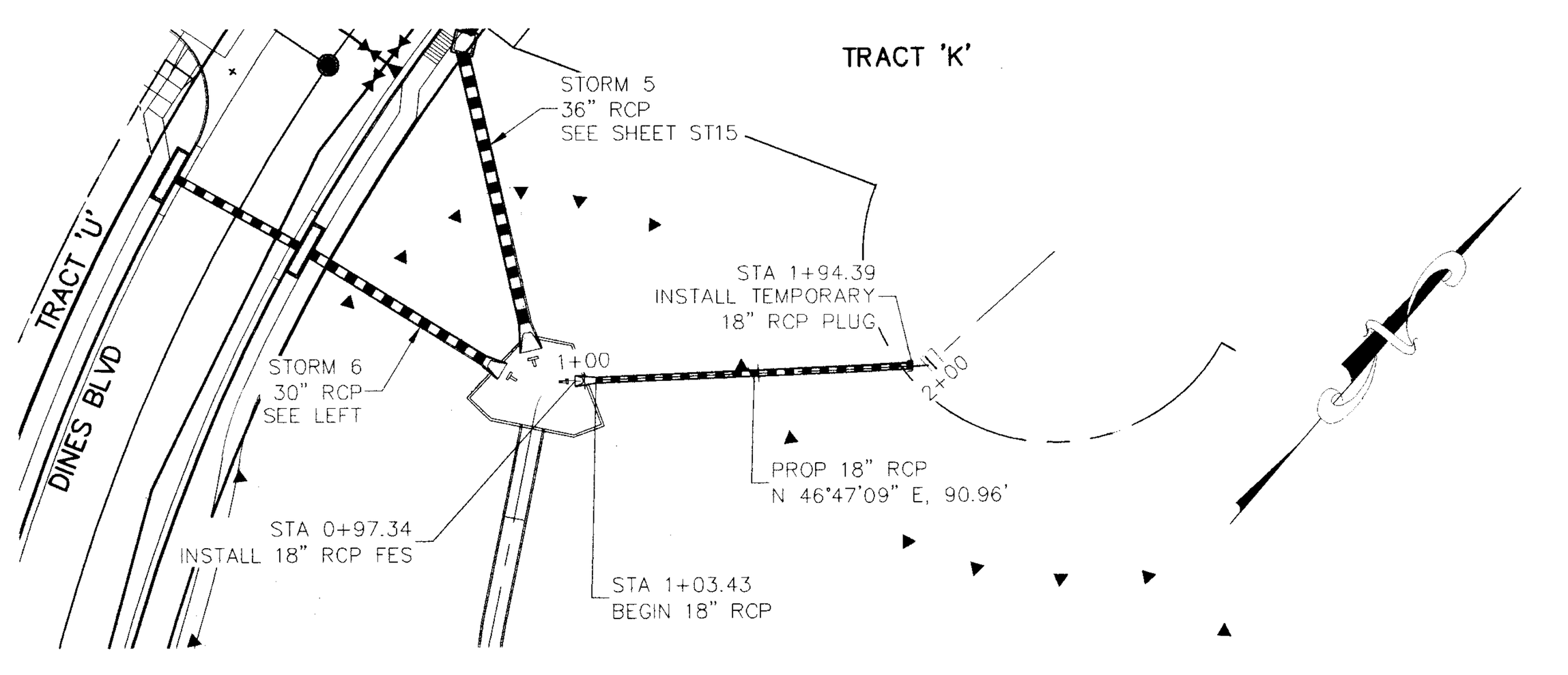


STORM 6
INLET DETAILS
SCALE: 1"=20'



STORM 6



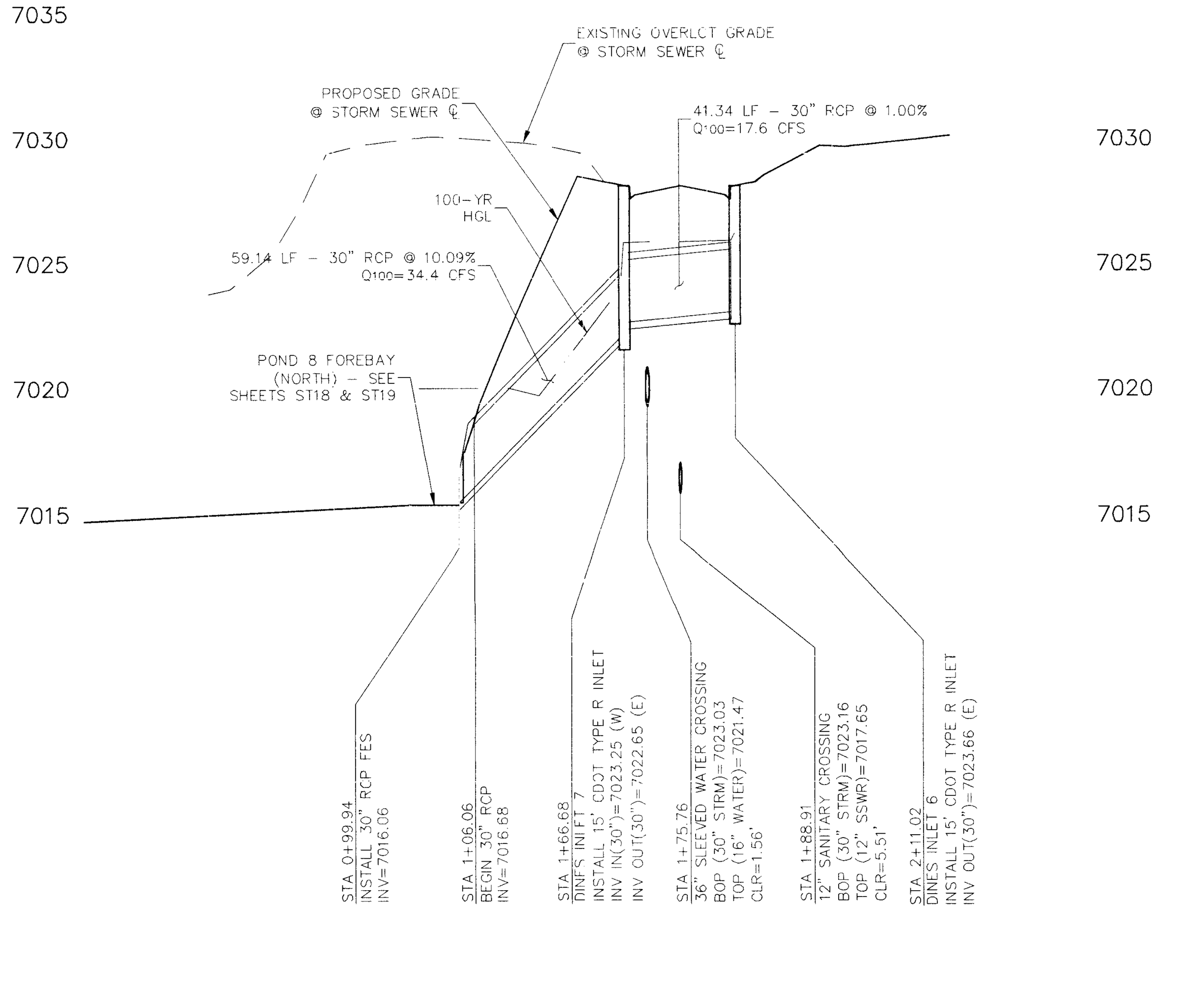


STORM 13 STA 0+97.34 TO 1+94.39

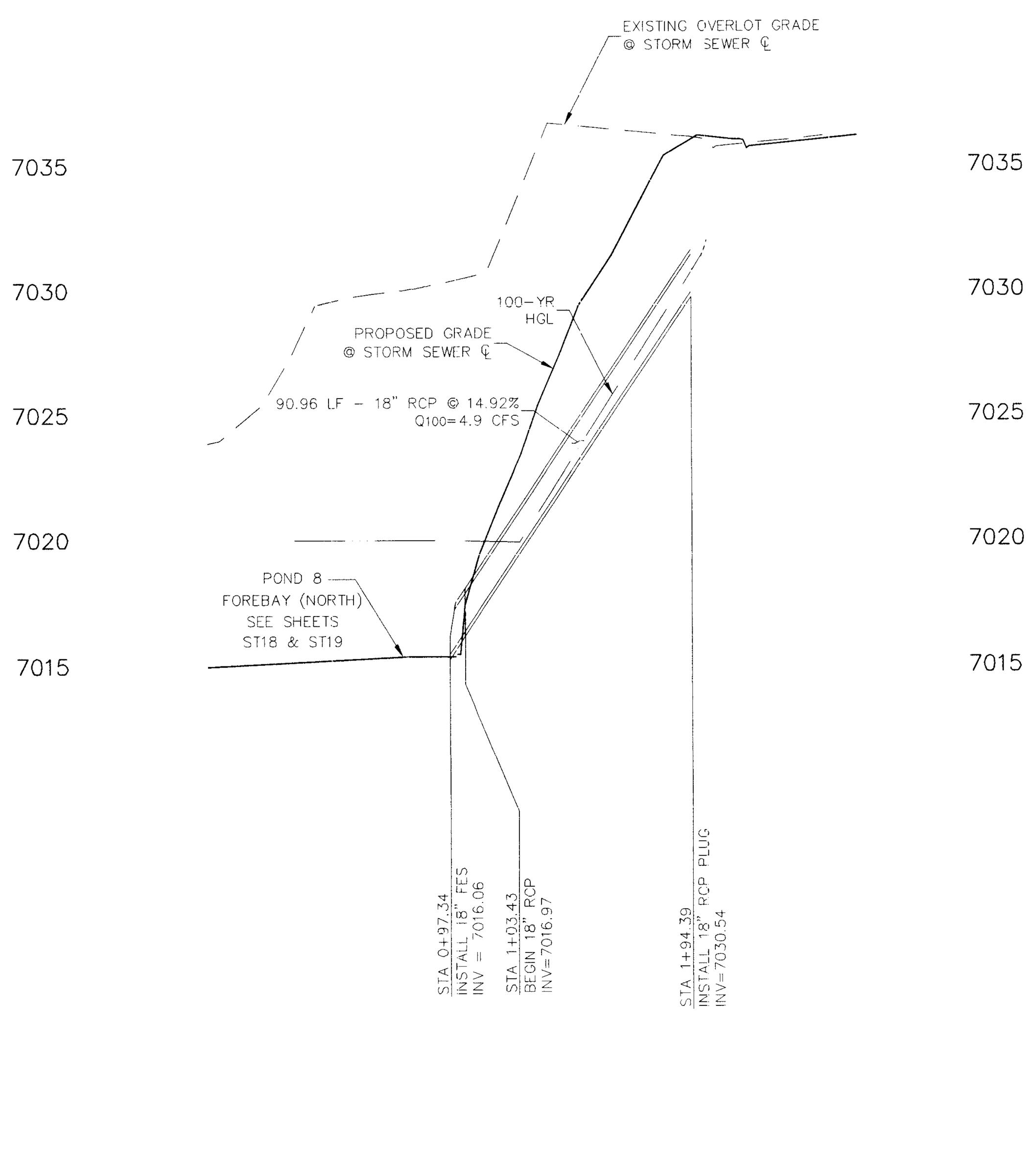
NOTES:
STA 0+99.94 TO STA 1+24.00 (NEXT FULL JOINT) TIE PIPE SEGMENTS TOGETHER W/4-$\frac{3}{4}$" CANOPY TYPE ROD LUG JOINT FASTENERS.

REINFORCED CONCRETE PIPE INSTALLED BETWEEN STA 0+99.94 AND STA 1+66.68 SHALL BE FABRICATED USING A CONCRETE MIX DESIGN THAT RESULTS IN A MIN. 5000 PSI COMPRESSIVE STRENGTH.

NOTE:
STA 1+00.00 TO STA 1+24.00 (NEXT FULL JOINT) TIE PIPE SEGMENTS TOGETHER W/4-$\frac{3}{4}$" CANOPY TYPE ROD LUG JOINT FASTENERS.



STORM 6



STORM 13 STA 0+97.34 TO 1+94.39

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

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STERLING RANCH FILING NO. 1

STORM SEWER PLANS

PROJECT NO. 09-002	FILE: \dwg\Const Dwg\Storm - District\ST16.dwg
DESIGNED BY: ET	SCALE
DRAWN BY: ELY	HORIZ: 1"=50'
CHECKED BY: VAS	VERT: 1"=5'
DATE: 01/02/2018	SHEET 20 OF 28

ST16

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APRV'D. BY:	DATE:

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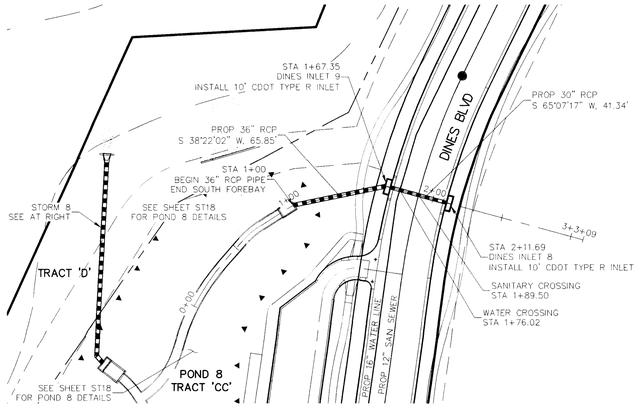
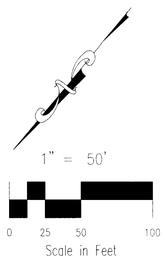
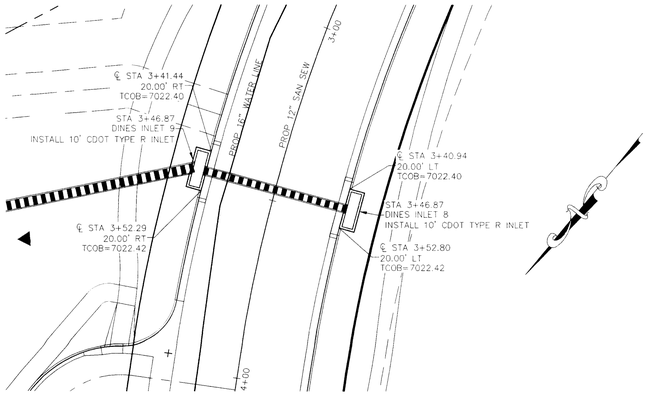
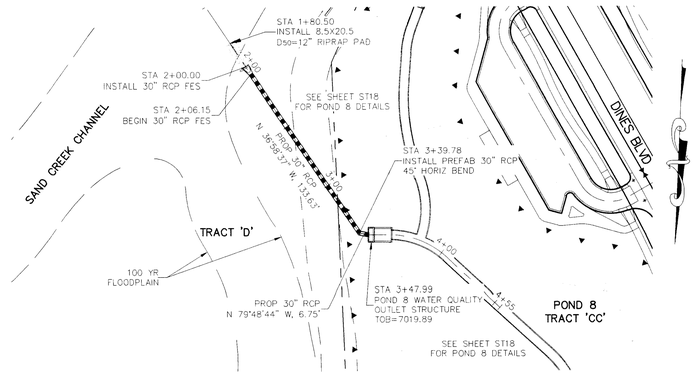


STORM 7

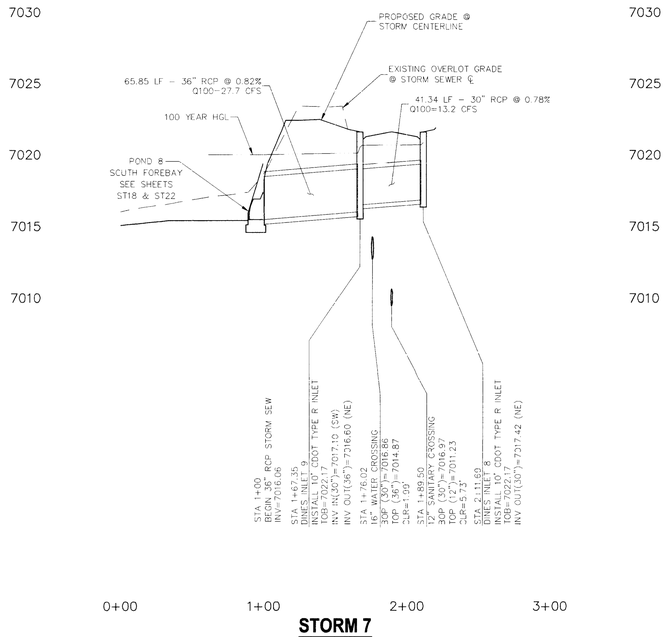




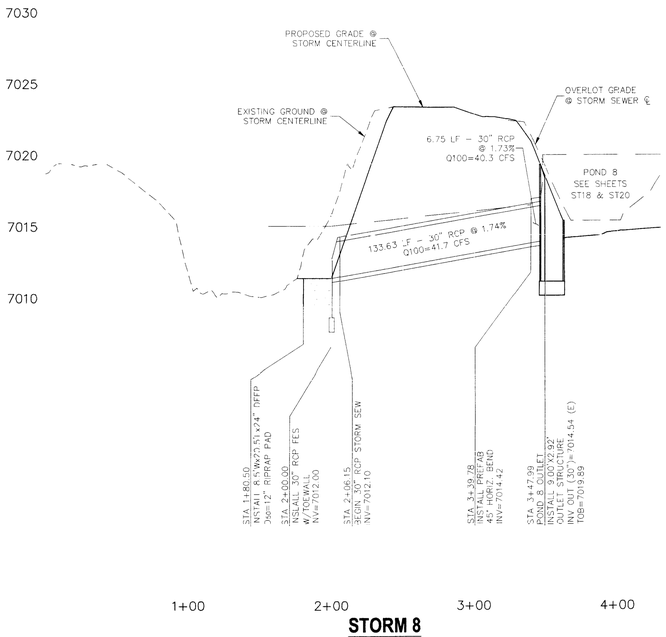
DINES BOULEVARD
SUMP INLETS LATERAL
INLET DETAILS
SCALE: 1"=20'



STORM 8



STORM 7



STORM 8

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
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STERLING RANCH FILING NO. 1
STORM SEWER PLANS

PROJECT NO. 09-002 | DESIGNED BY: ET | DRAWN BY: ELY | CHECKED BY: VAS
FILE: \Dwg\Const Dwg\Street & Storm Plans\ST17.dwg | SCALE | DATE: 01/02/2018 | HORIZ: 1"=50' | VERT: 1"=5' | SHEET 21 OF 28 | ST17

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.
VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

REVISIONS:	NO	DATE	BY	DESCRIPTION	APPVD BY	DATE

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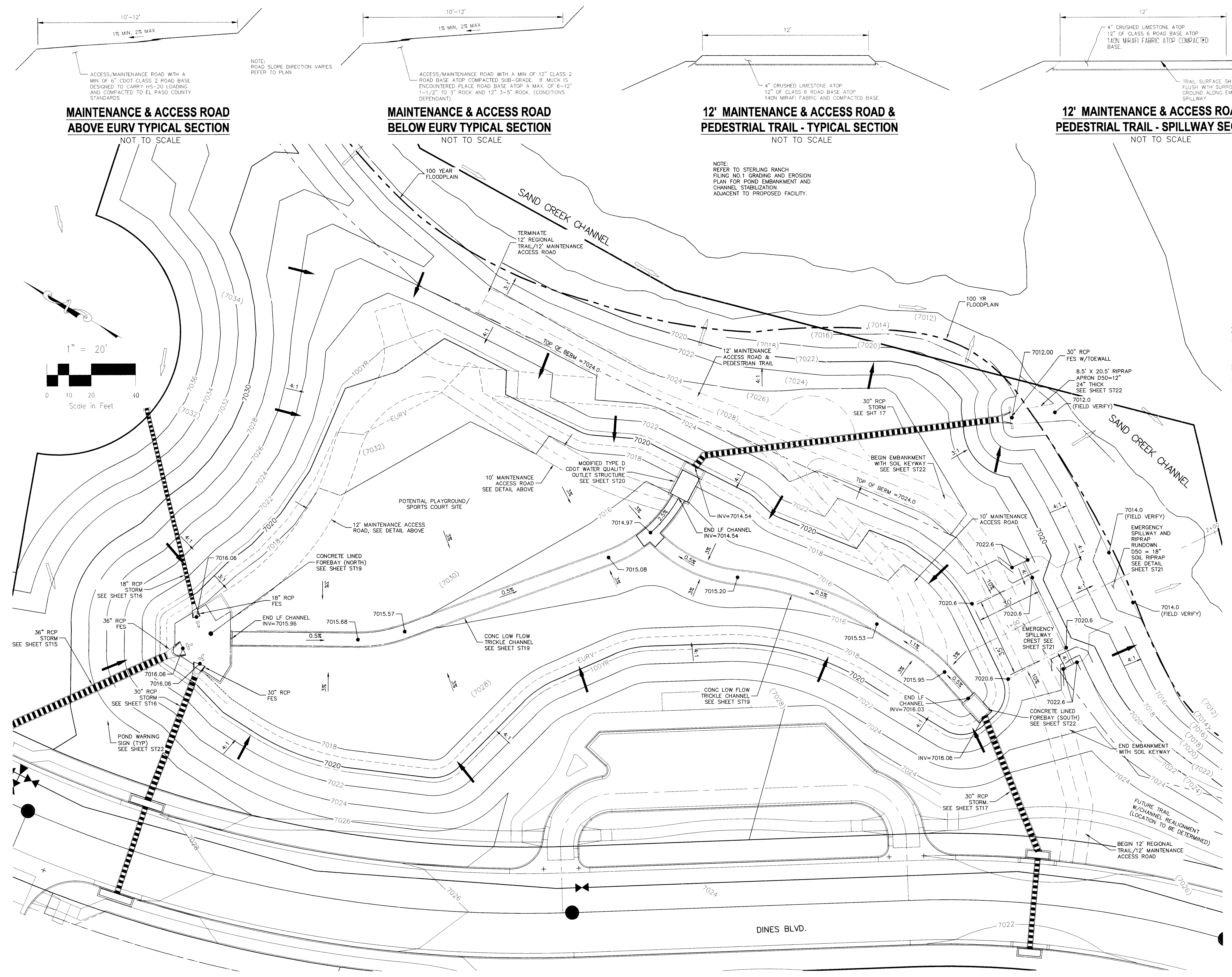
CAUTION

File: O:\09002A\Sterling Ranch District\Dwg\Const Dwg\Storm - District\ST17.dwg Plotstamp: 2/7/2017 2:07 PM



FULL SPECTRUM DETENTION POND 8 SITE PLAN

SCALE 1"=20'

TRAIL NOTES:

1. TRAIL SURFACING SHALL BE CURSHED LIMESTON 3/8" MINUS WITH FINES. CASTLE CONCRETE "COLORADO WHITE FINES" OR EQUIVALENT.
2. TRAIL SURFACING SHALL BE COMPACTED WITH A ROLLER
3. LANDSCAPE FABRIC SHALL BE MIRAFI 140N WITH A RUNNING WITH OF 8' MIN.

POND 8 FULL SPECTRUM DETENTION BASIN DATA
WQ WATER SURFACE EL=7017.20
WQ VOLUME=0.48 AC-FT
EURV WATER SURFACE EL=7018.91
EURV VOLUME=1.58 AC-FT
100-YR WATER SURFACE EL=7020.60
SPILLWAY CREST EL=7020.6
TOP OF EMBANKMENT EL=7024.0
100-YR VOLUME=2.99 AC-FT
100-YR INFLOW=112.8
100-YR RELEASE=41.7 CFS

LEGEND

FUT	EXISTING
FUT	FUTURE
PROP	PROPOSED
	PROP MAJ CONT
	PROP MIN CONT
	EXIST MAJ CONT
	EXIST MIN CONT
	PERM. EROSION CONTROL BLANKET
	RIPRAP
	REGIONAL TRAIL/MAINT. ROAD
	STABILIZED MAINTENANCE ROAD ABOVE EURV
	STABILIZED MAINT. ROAD BELOW EURV
	CONC LOW FLOW CHANNEL
	EX. FLOW ARROW
	PROP. FLOW ARROW
	CONSTRUCTION LIMITS
	PROPERTY LINE
	PROP STORM SEWER PIPE
	EASEMENT LINE
	WARNING SIGN

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
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STERLING RANCH FILING NO. 1
FULL SPECTRUM DET. POND 8 SITE PLAN

PROJECT NO. 09-002
DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS
SCALE HORIZ: 1"=20' VERT: N/A
DATE: 01/02/2018
SHEET 22 OF 28
ST18

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS: NO. | DATE | BY | DESCRIPTION | APRV'D. BY | DATE

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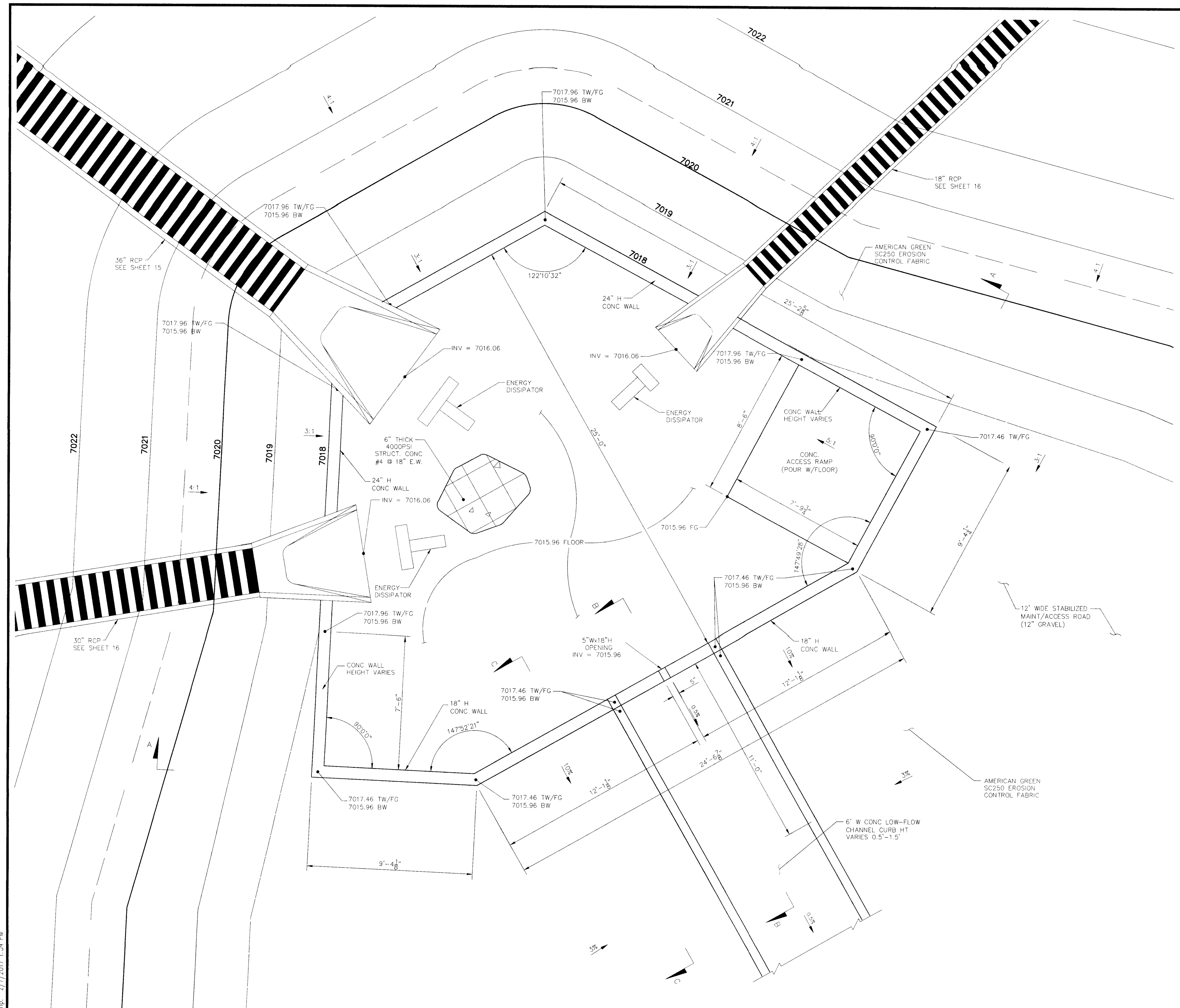
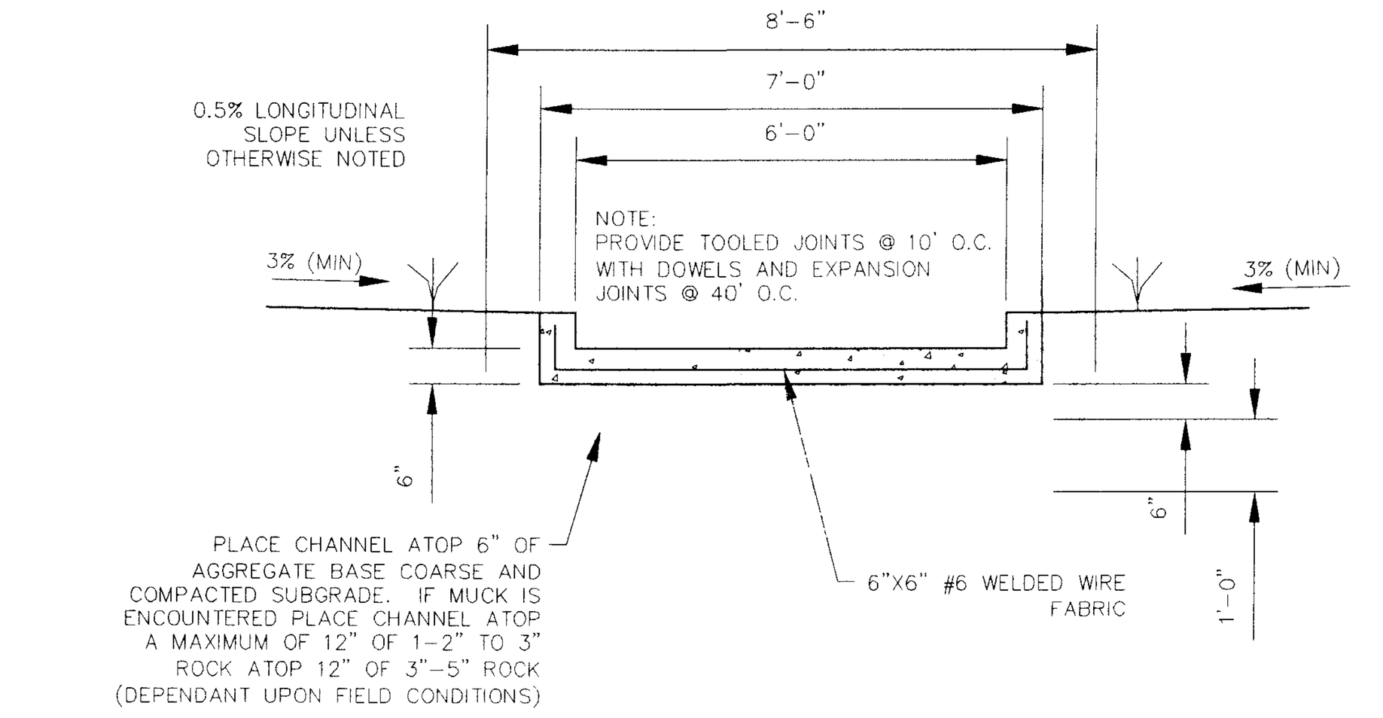
CAUTION



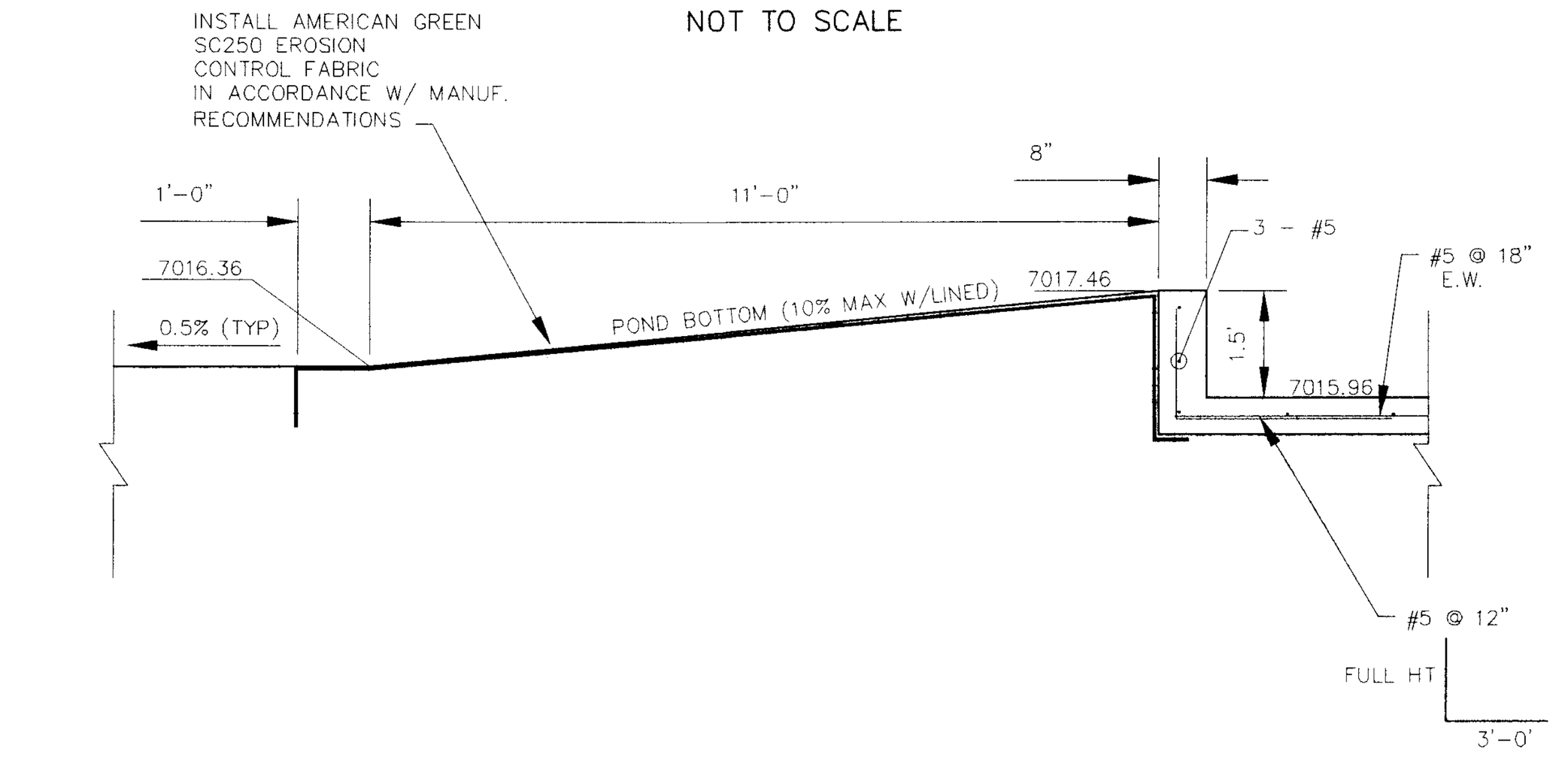
FULL SPECTRUM DETENTION POND 8 NORTHERN FOREBAY PLAN

NOT TO SCALE



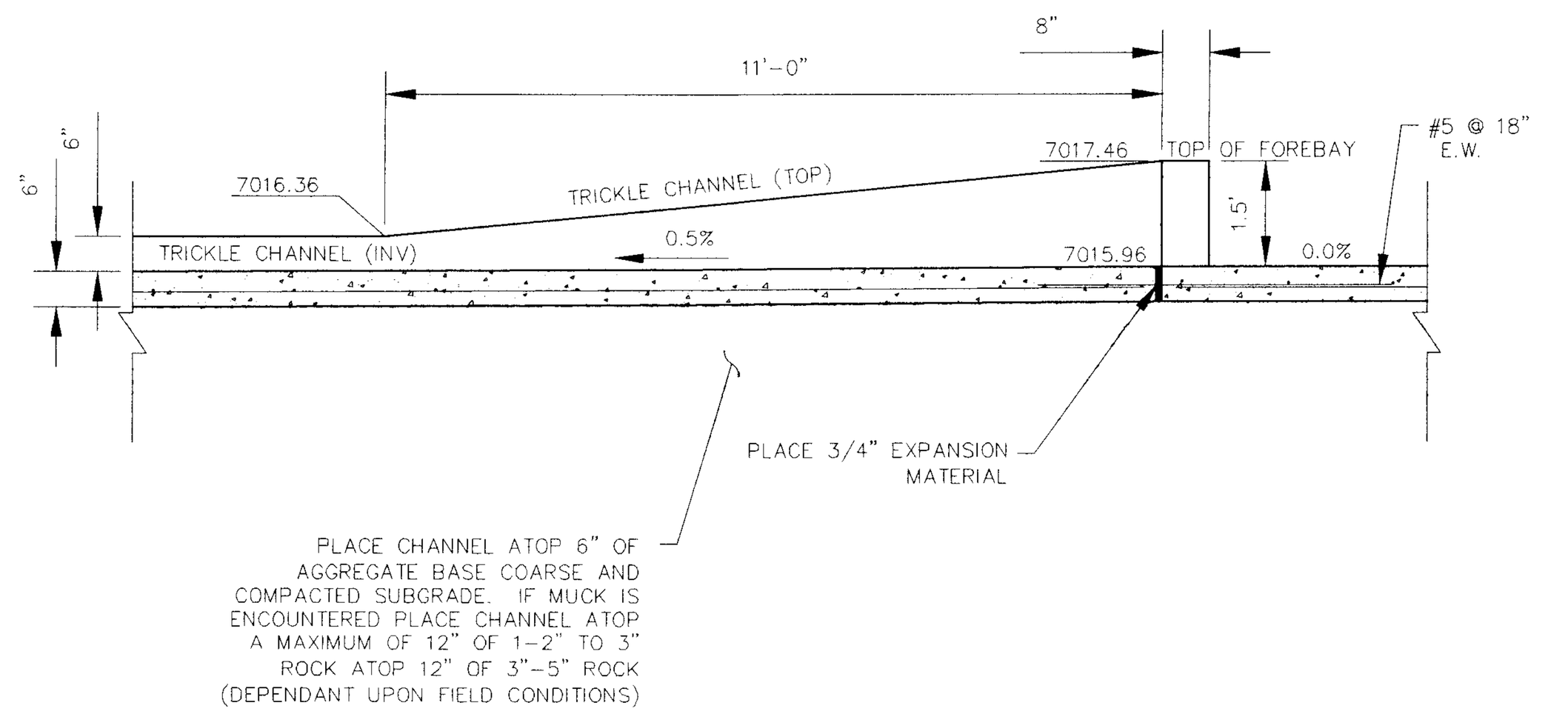
LOW FLOW CHANNEL TYPICAL SECTION

NOT TO SCALE



SLOPE GRADING BELOW NORTHERN FOREBAY SECTION C-C

NOT TO SCALE

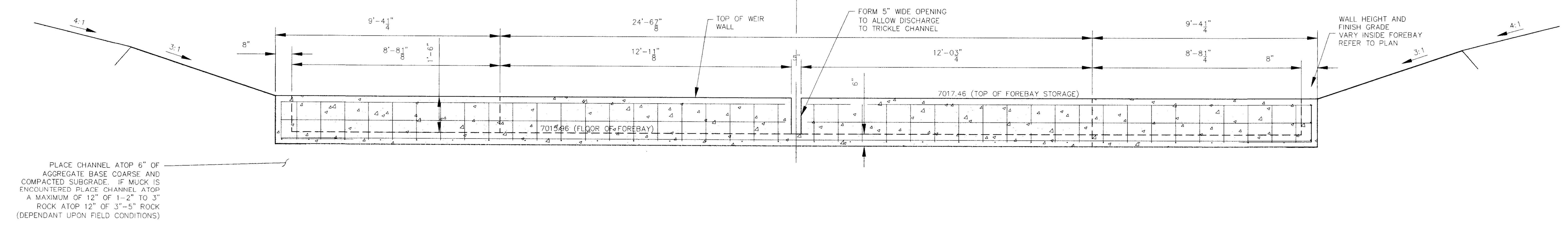


LOW FLOW CHANNEL AT NORTH FOREBAY SECTION B-B

NOT TO SCALE

NORTH FOREBAY FRONT WALL W/NOTCH SECTION A-A

NOT TO SCALE



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STERLING RANCH FILING NO. 1

FULL SPECTRUM DET. POND 8 DETAILS

PROJECT NO. 09-002 | FILE: \dwg\Const Dwg\Street & Storm Plans\ST19.dwg | DATE: 01/02/2018

DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS

SCALE HORIZ: 1"=50' VERT: 1"=5'

SHEET 23 OF 28

ST19

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS: NO.	DATE:	BY:	DESCRIPTION:	APRV'D. BY:	DATE:

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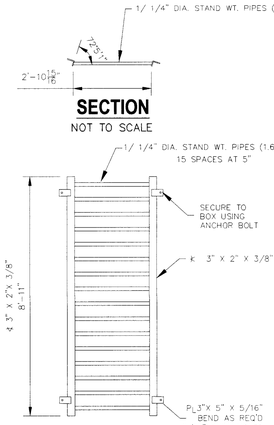
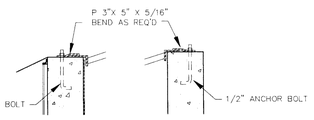
File: O:\09002A\Sterling Ranch District\dwg\Const Dwg\Storm - District\ST19.dwg Plotstamp: 2/7/2017 1:34 PM



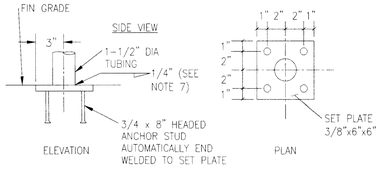
SECTION
NOT TO SCALE

GRATE PLAN
NOT TO SCALE

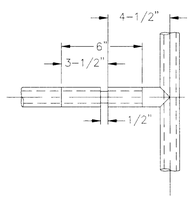


GRATE DETAIL "A"

GRATE DETAIL "B"



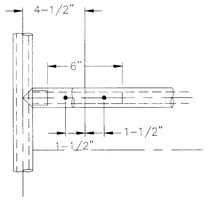
SET PLATE ANCHOR DETAILS
(NTS)



EXPANSION JOINT DETAIL
(NTS)

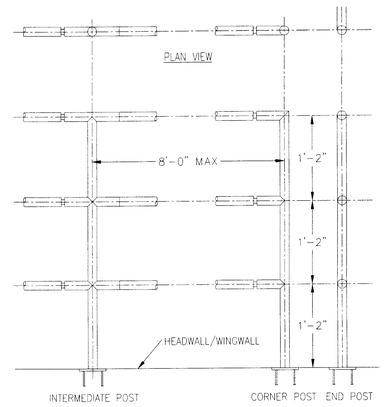
MECHANICAL TUBING, 1/4" MIN. WALL THICKNESS, 1/16" CHAMFER BOTH ENDS. REAM PIPE FOR SLIP FIT 0.03" MAX. CLEARANCE

13/32" DRILL AND CSK. PIPE 1/16" DEEP BOTH SIDES. PROVIDE 3/8" DIA SOFT STEEL ROD SUITABLE FOR FIELD RIVETING, GRIND SMOOTH.

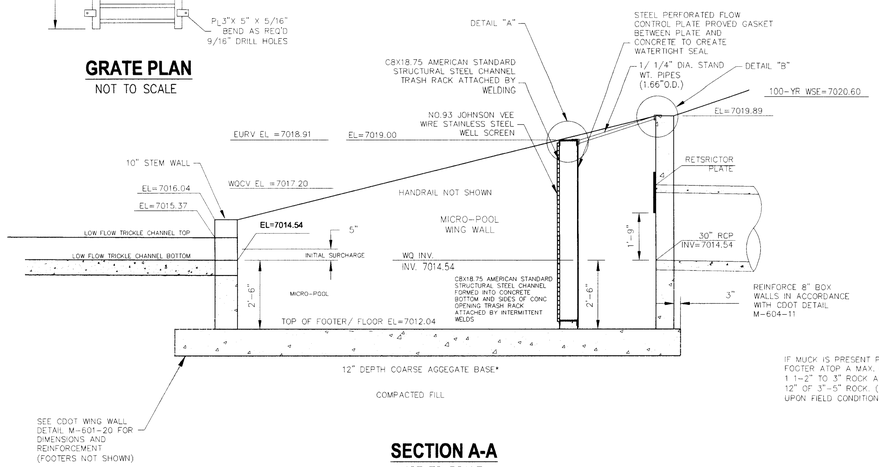


FIXED JOINT DETAIL
(NTS)

1) WELD PLATES MAY BE SUBSTITUTED FOR PIPE EMBEDMENT.
2) CONTRACTOR TO SUBMIT SHOP DRAWINGS TO ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION.
3) DESIGN CRITERIA SHALL BE IN ACCORDANCE WITH AASHTO STANDARDS.
4) HANDRAIL DESIGN SHALL BE COMPATIBLE WITH THE DESIGN OF THE WINGWALLS AND HEADWALLS.
5) RAILING POSTS SHALL BE SET TO NORMAL TO GRADE. RAILS SHALL RUN PARALLEL TO THE SLOPES OF THEE TOP OF WALLS.
6) ALL RAILS SHALL BE FREE OF ANY SHARP EDGES OR CORNERS.

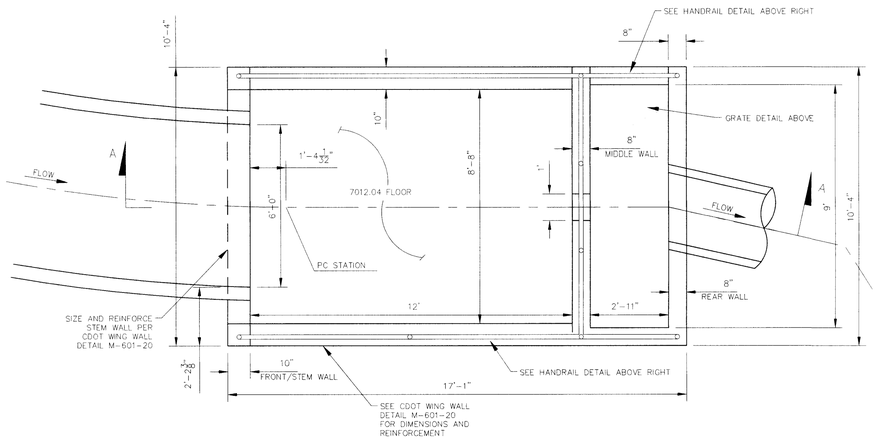


HANDRAIL ASSEMBLY DETAILS
NOT TO SCALE

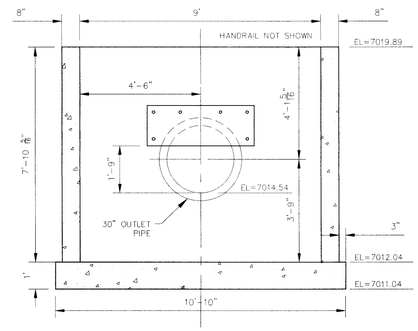


SECTION A-A
NOT TO SCALE

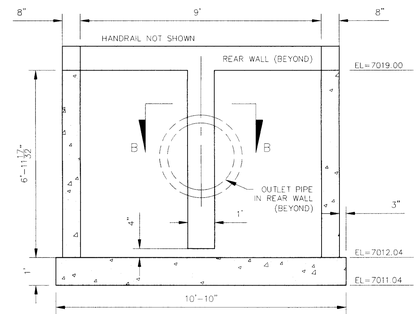
IF MUCK IS PRESENT PLACE FOOTER ATOP A MAX. OF 12" OF 1 1-2" TO 3" ROCK ATOP 12" OF 3"-5" ROCK. (DEPENDANT UPON FIELD CONDITIONS)



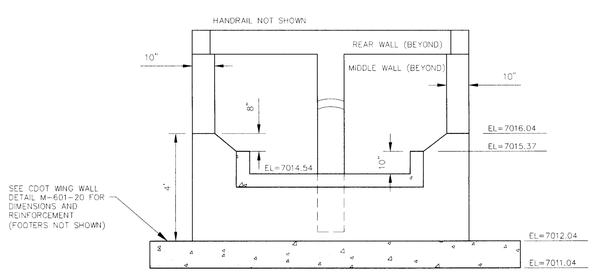
POND 8 WATER QUALITY OUTLET STRUCTURE
NOT TO SCALE



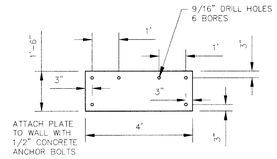
REAR WALL
NOT TO SCALE



MIDDLE WALL
NOT TO SCALE



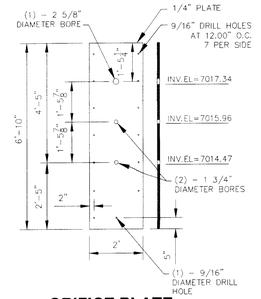
FRONT/STEM WALL
NOT TO SCALE



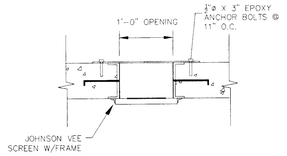
RESTRICTOR PLATE
NOT TO SCALE

NOTE:
ALL GRATES, IMBEDS, AND FASTENERS SHALL BE FABRICATED USING GALVANIZED STEEL, UNLESS OTHERWISE NOTED.

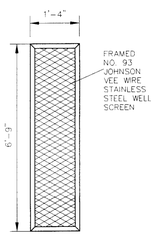
ALL GRATE DIMENSIONS TO BE FIELD VERIFIED PRIOR TO FABRICATION. ALL GRATE MATERIAL SHALL BE GALVANIZED.



ORIFICE PLATE
NOT TO SCALE



SECTION B-B
NOT TO SCALE



TRASH SCREEN DETAIL
NOT TO SCALE

NOTE:
CENTER ORIFICE PLATE AND TRASH SCREEN HORIZONTALLY ACROSS 1'-0" OPENING IN STRUCTURE

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

STERLING RANCH FILING NO. 1
FULL SPECTRUM DET. POND 8 DETAILS

PROJECT NO: 09-002
DESIGNED BY: ET
DRAWN BY: ELY
CHECKED BY: VAS
FILE: I:\dwg\Const Dwg\Storm - District\ST20.dwg
SCALE HORIZ: N/A VERT: N/A
DATE: 01/02/2018
SHEET 24 OF 28
ST20

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.
VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37760

REVISIONS:
NO. | DATE | BY | DESCRIPTION

APRVD BY: | DATE:

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CAUTION

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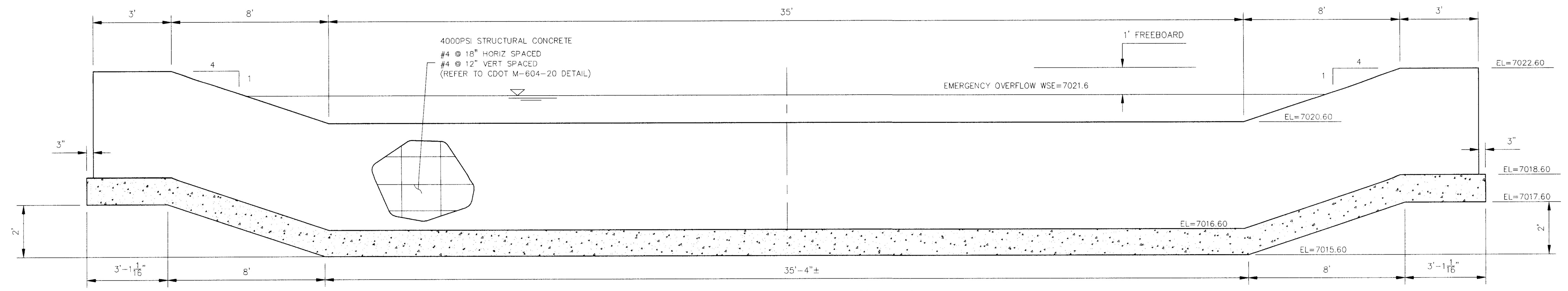
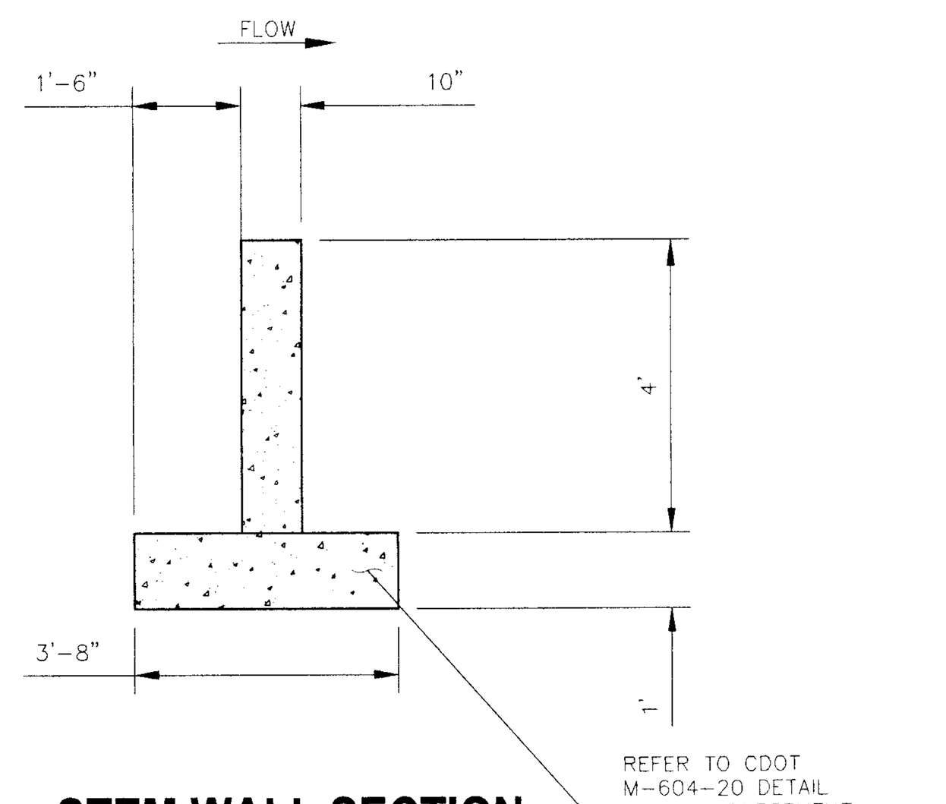


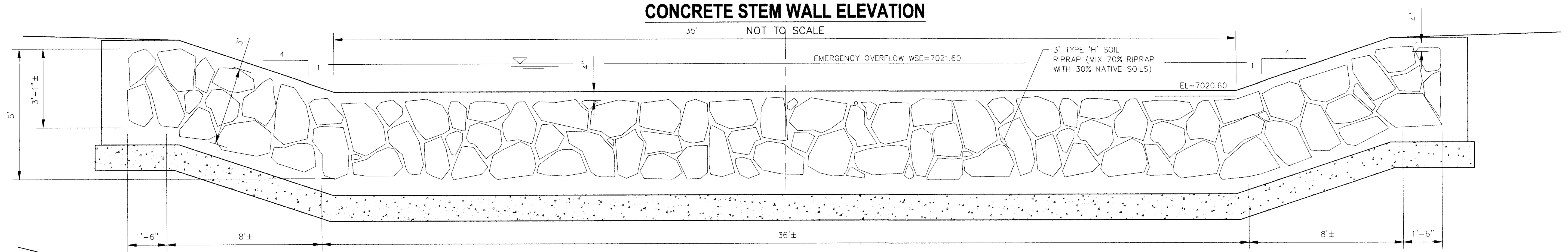
CONCRETE STEM WALL ELEVATION

NOT TO SCALE



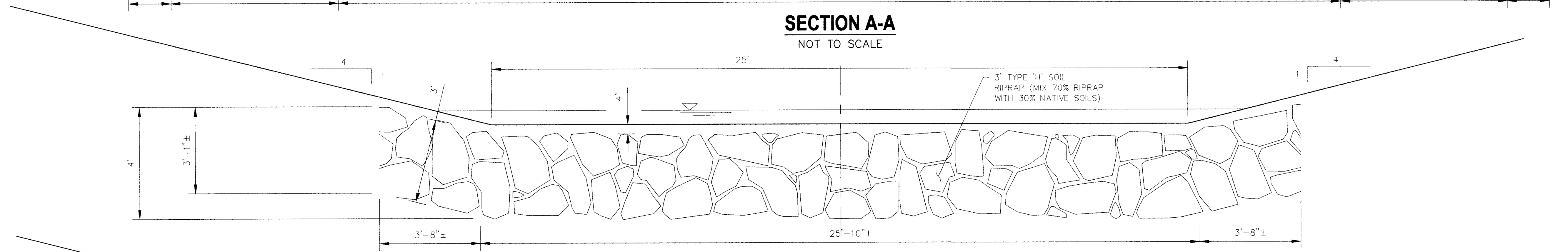
STEM WALL SECTION

NOT TO SCALE



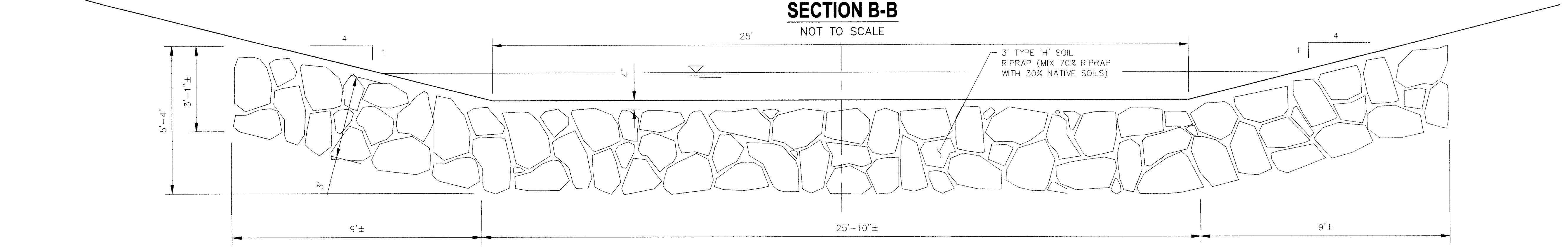
SECTION A-A

NOT TO SCALE



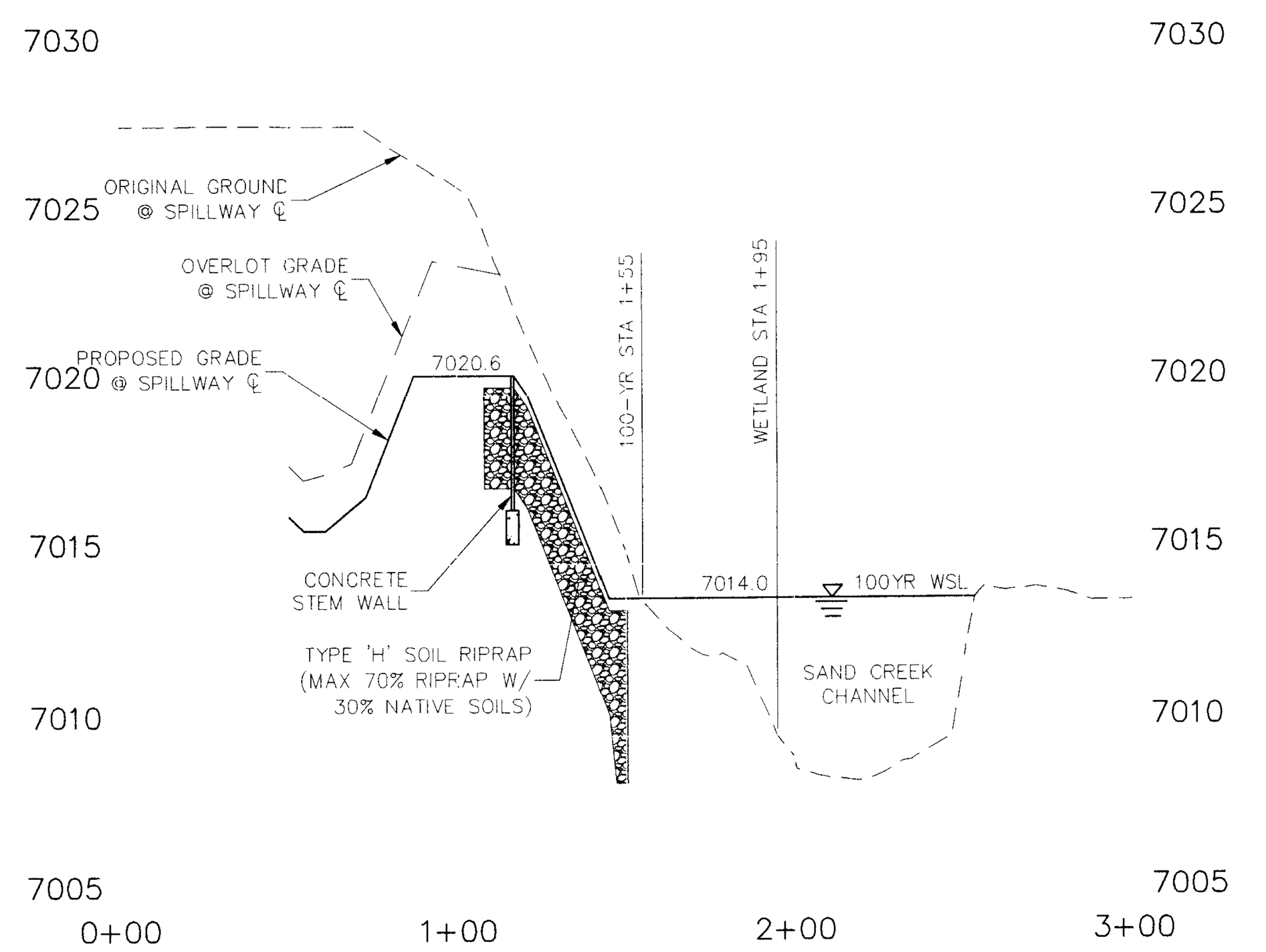
SECTION B-B

NOT TO SCALE



SECTION C-C

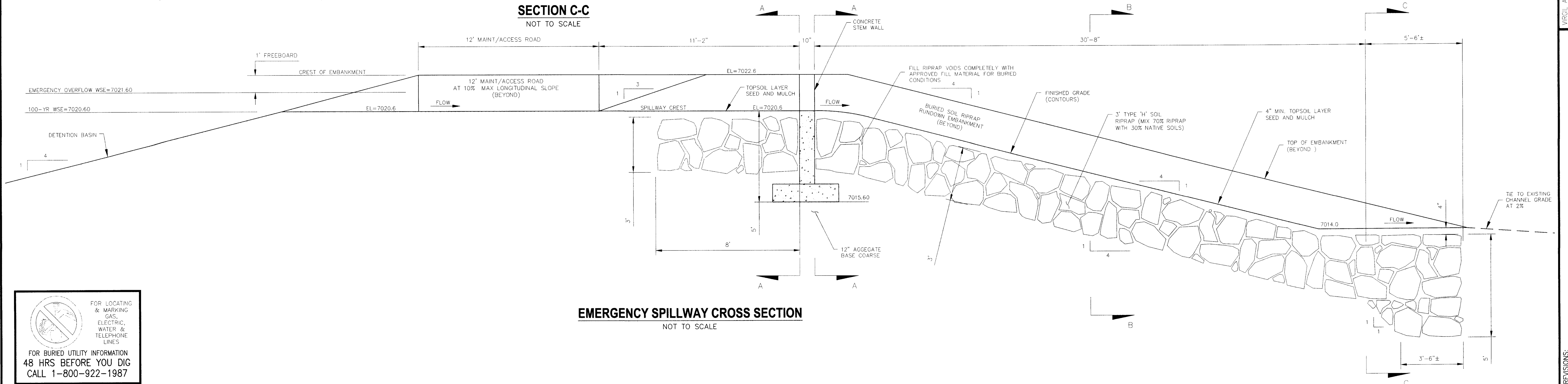
NOT TO SCALE



EMERGENCY SPILLWAY PROFILE

HORZ. SCALE: 1"=50'

VERT. SCALE: 1"=5'



EMERGENCY SPILLWAY CROSS SECTION

NOT TO SCALE

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STERLING RANCH FILING NO. 1

FULL SPECTRUM DET. POND 8 DETAILS

PROJECT NO. 09-002 | DATE: 01/02/2018

DESIGNED BY: ET | DRAWN BY: ELY | CHECKED BY: VAS

SCALE HORIZ: AS NOTED | VERT: AS NOTED

SHEET 25 OF 28

ST21

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE	BY	DESCRIPTION	APPR'D. BY	DATE

CAUTION

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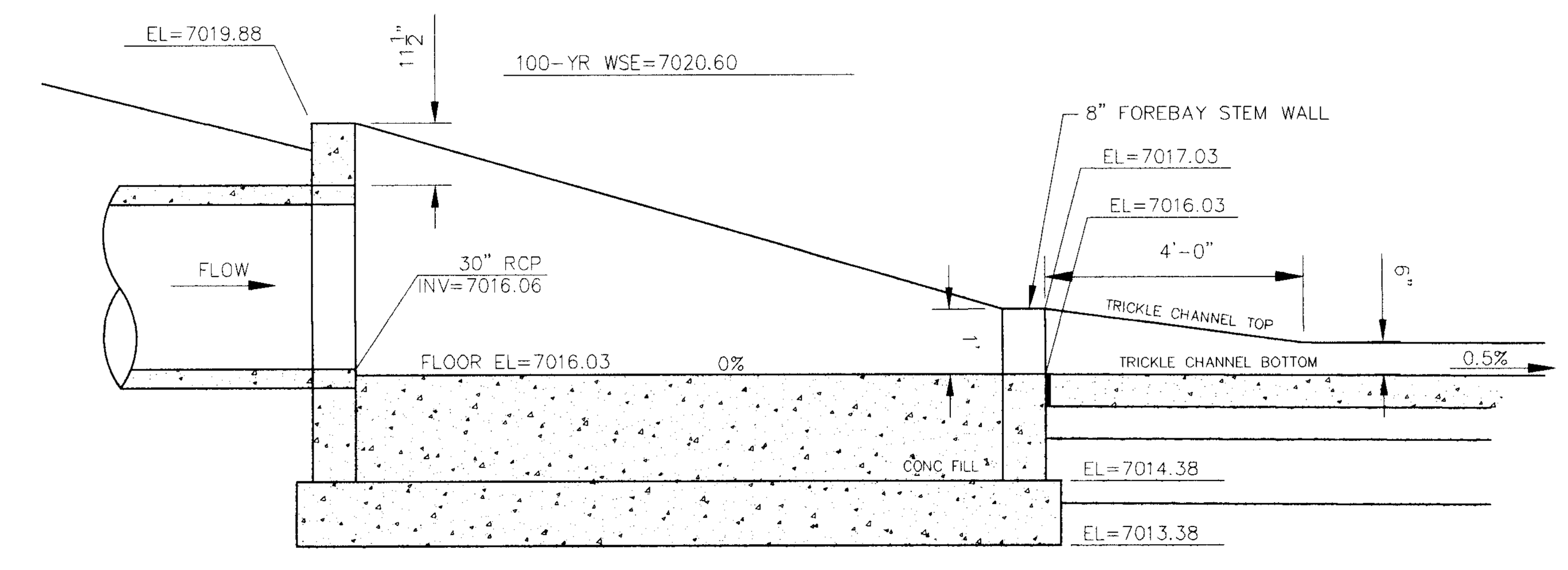

NOTE:
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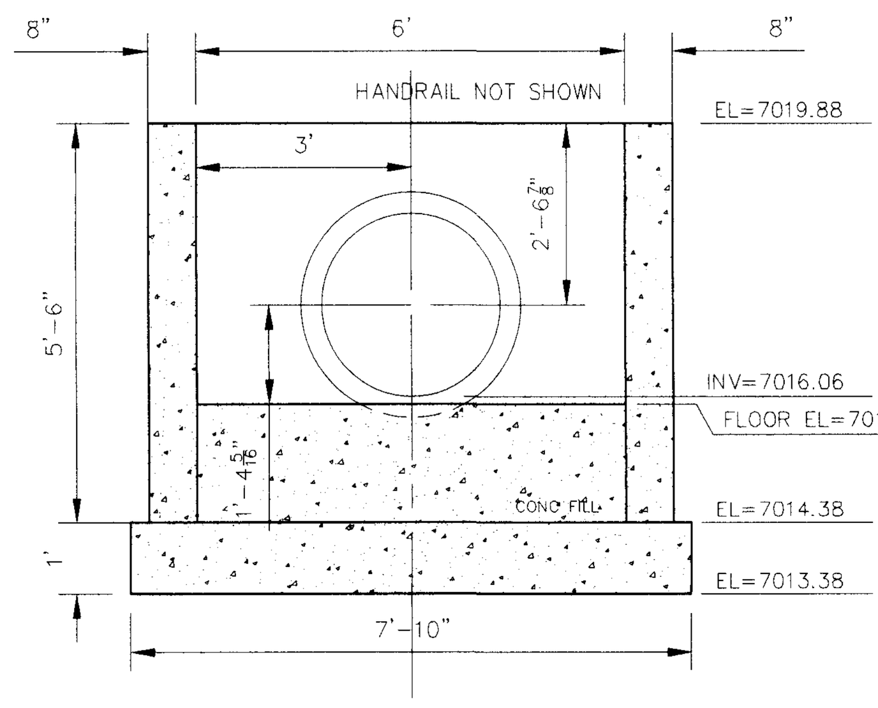
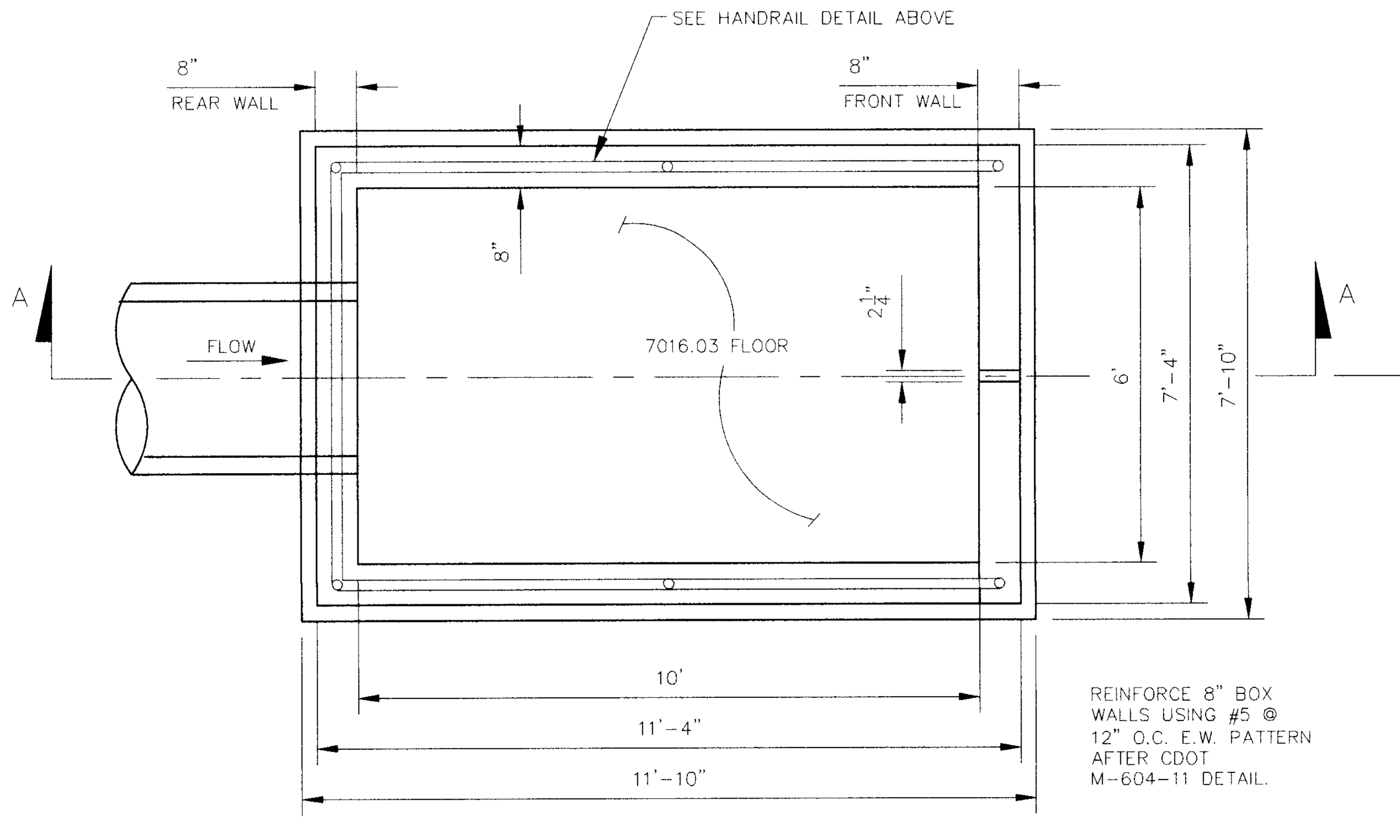
SECTION A-A
NOT TO SCALE

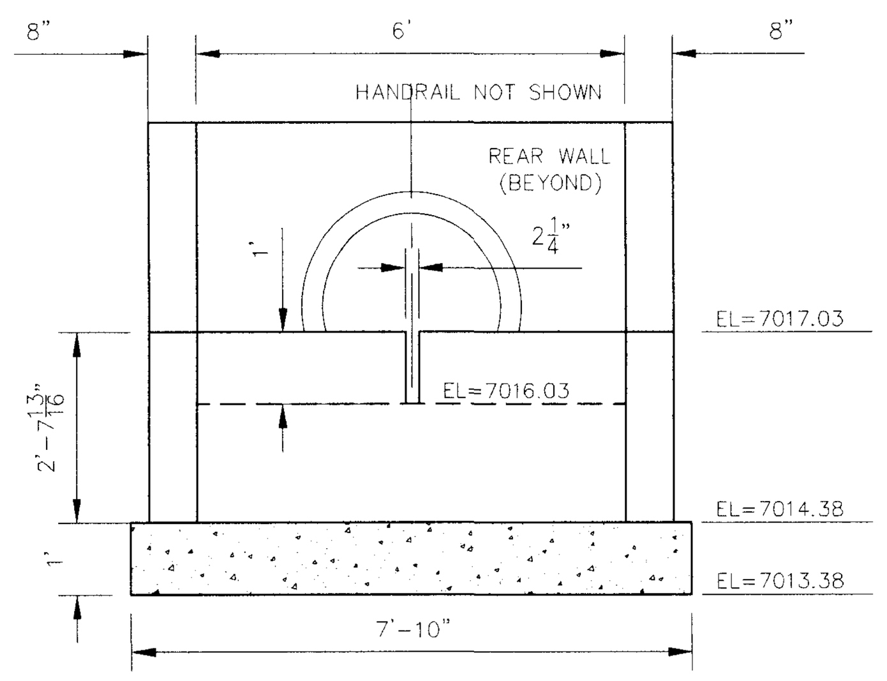
HANDRAIL NOT SHOWN



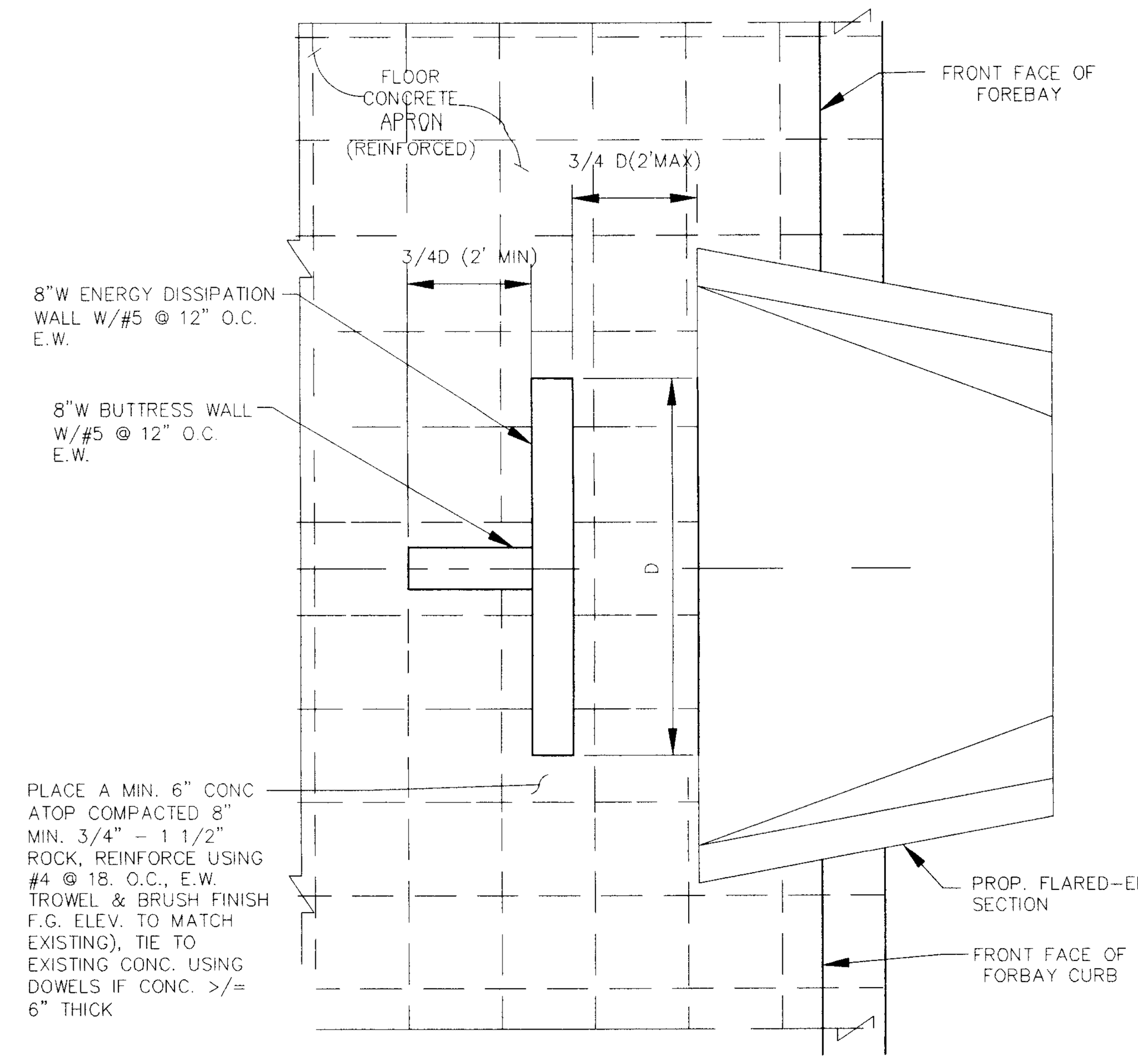
REAR WALL
NOT TO SCALE



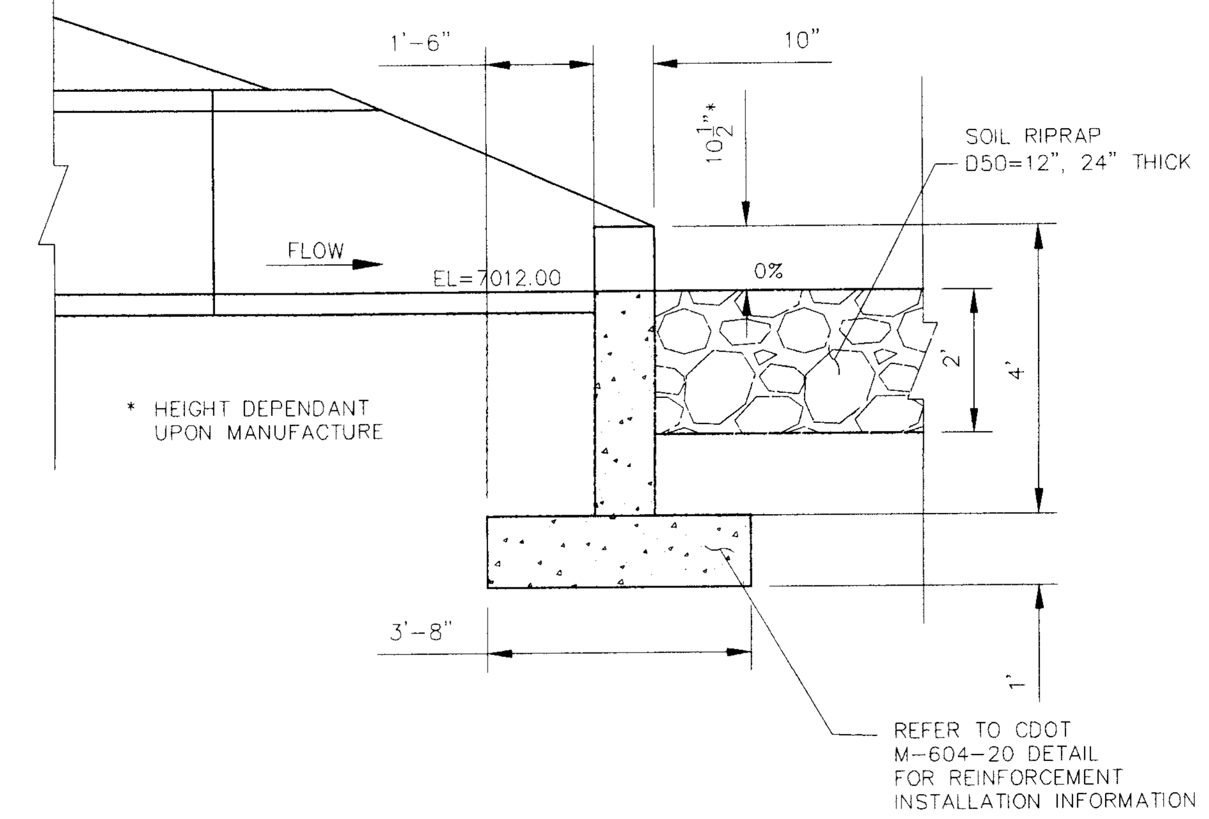
POND 8 - SOUTH FOREBAY PLAN
NOT TO SCALE



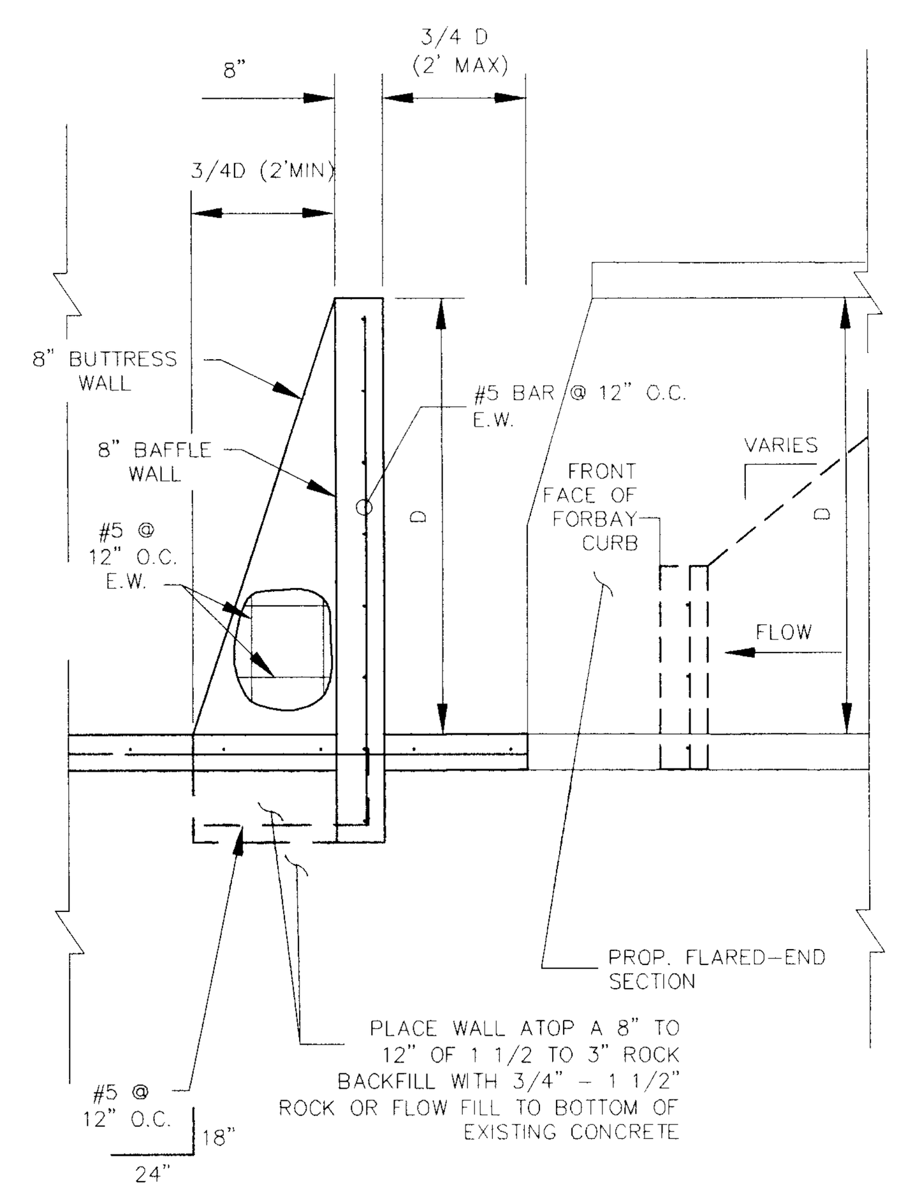
FRONT WALL
NOT TO SCALE



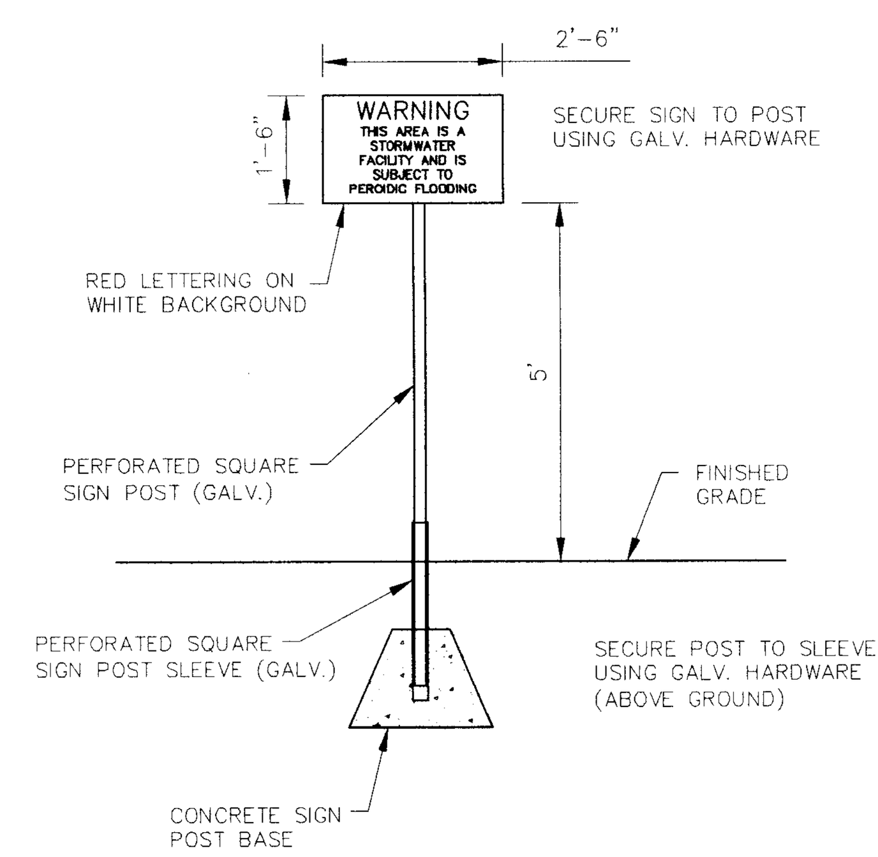
POND 8- ENERGY DISSIPATION WALL TYPICAL PLAN
NOT TO SCALE



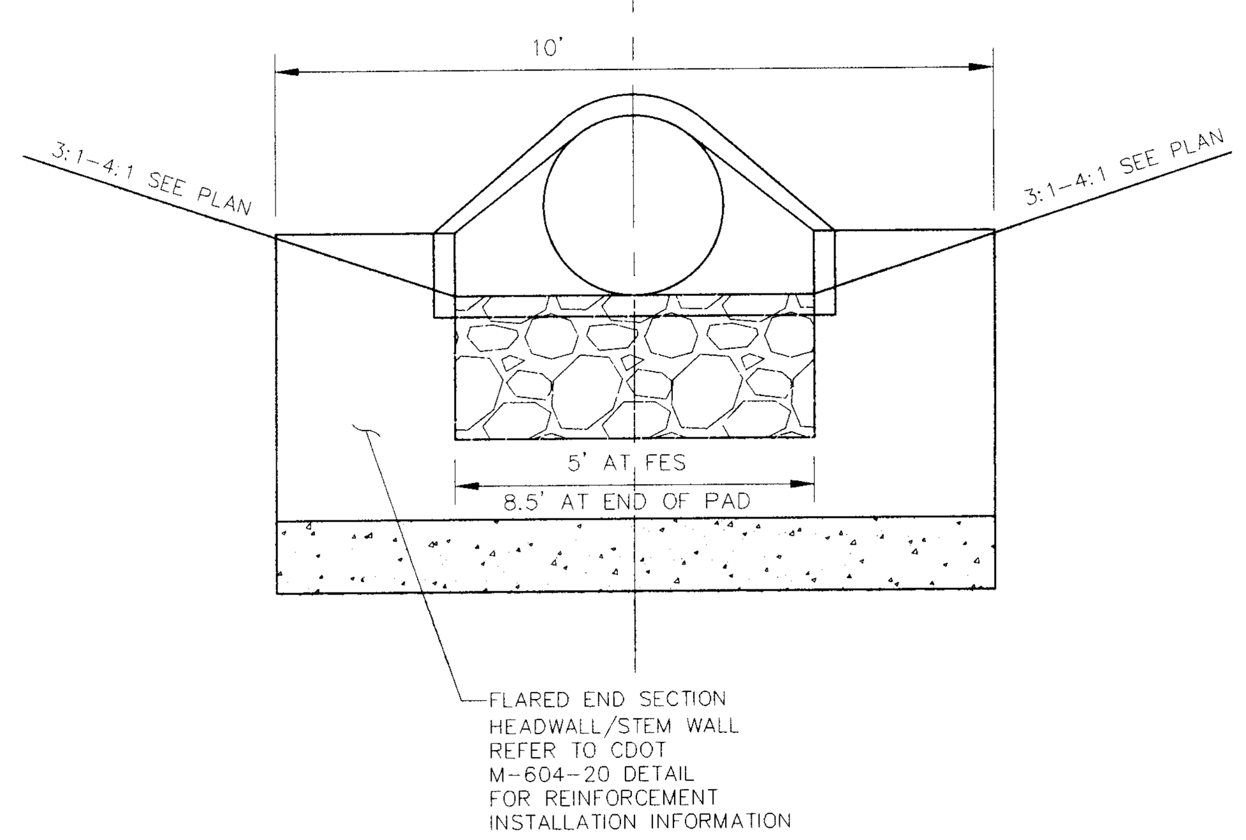
POND 8 - STORM 8 OUTFALL RIPRAP APRON W/HEADWALL SECTION (TYP.)
NOT TO SCALE



POND 8- ENERGY DISSIPATION WALL TYPICAL SECTION
NOT TO SCALE



POND WARNING SIGN
NOT TO SCALE

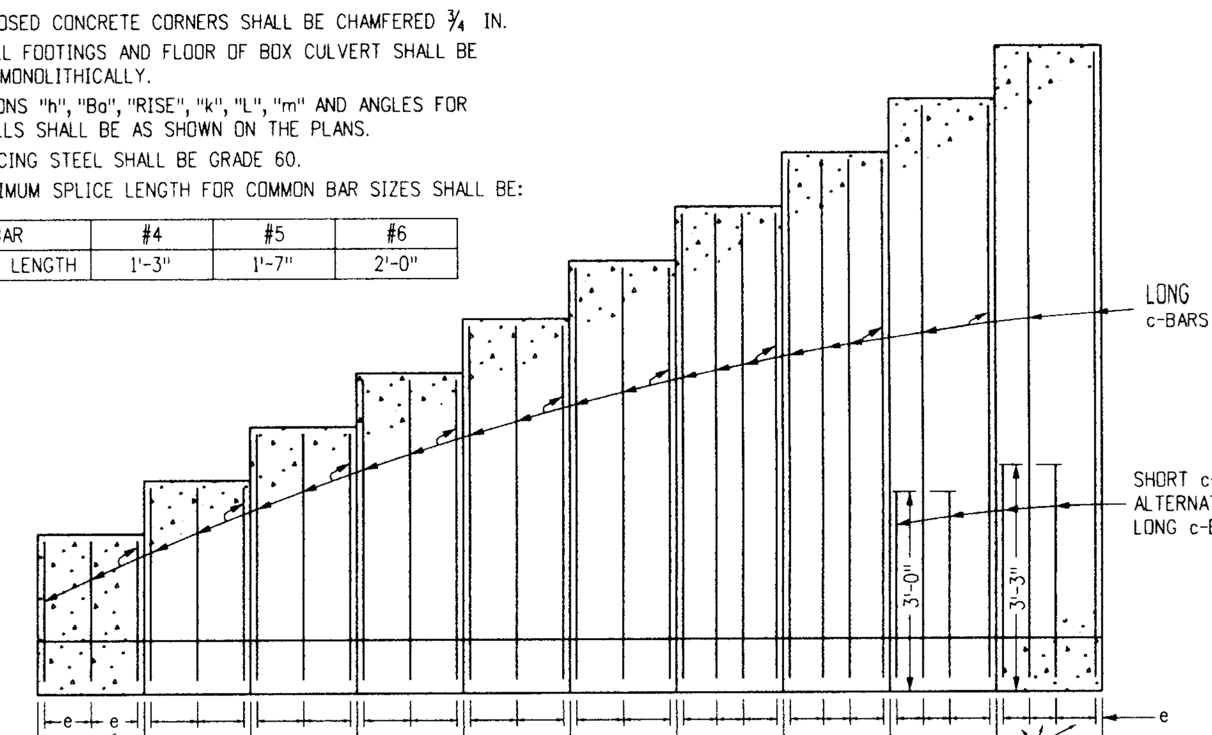


POND 8 - STORM 8 OUTFALL RIPRAP APRON W/HEADWALL ELEVATION (TYP.)
NOT TO SCALE

GENERAL NOTES

1. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN.
2. WINGWALL FOOTINGS AND FLOOR OF BOX CULVERT SHALL BE PLACED MONOLITHICALLY.
3. DIMENSIONS "h", "Ba", "RISE", "k", "L", "m" AND ANGLES FOR WINGWALLS SHALL BE AS SHOWN ON THE PLANS.
4. REINFORCING STEEL SHALL BE GRADE 60.
5. THE MINIMUM SPLICE LENGTH FOR COMMON BAR SIZES SHALL BE:

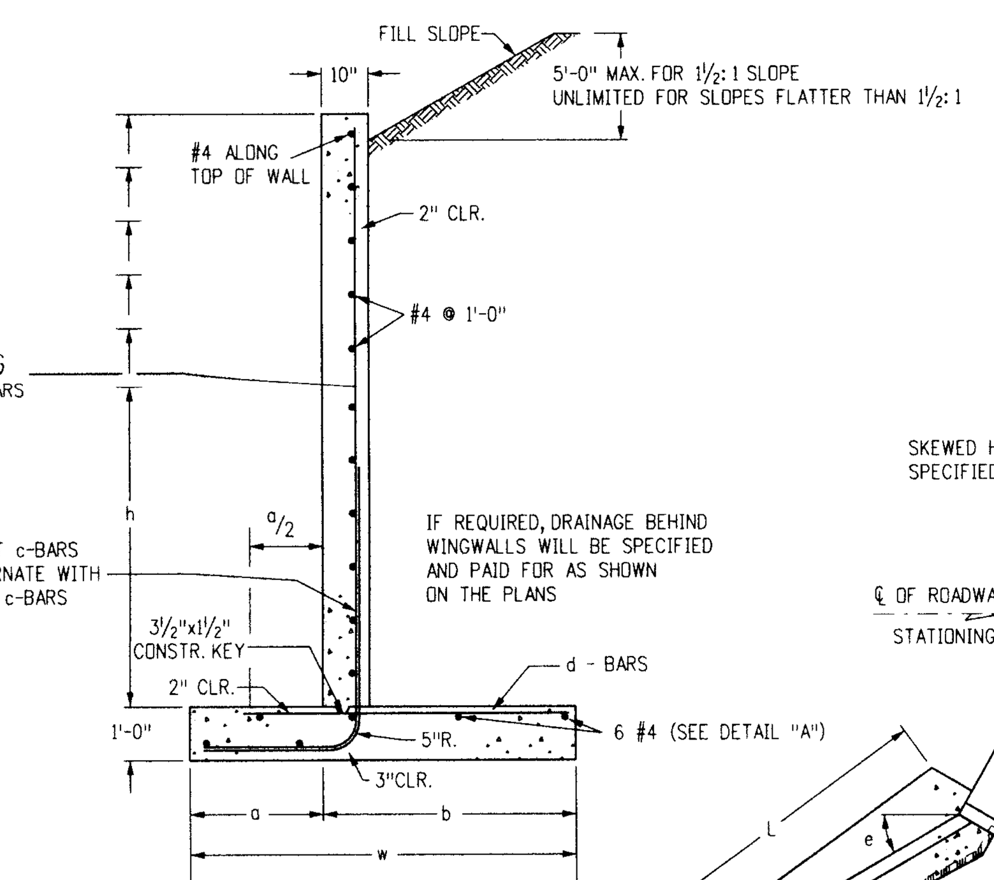
BAR	#4	#5	#6
SPLICE LENGTH	1'-3"	1'-7"	2'-0"



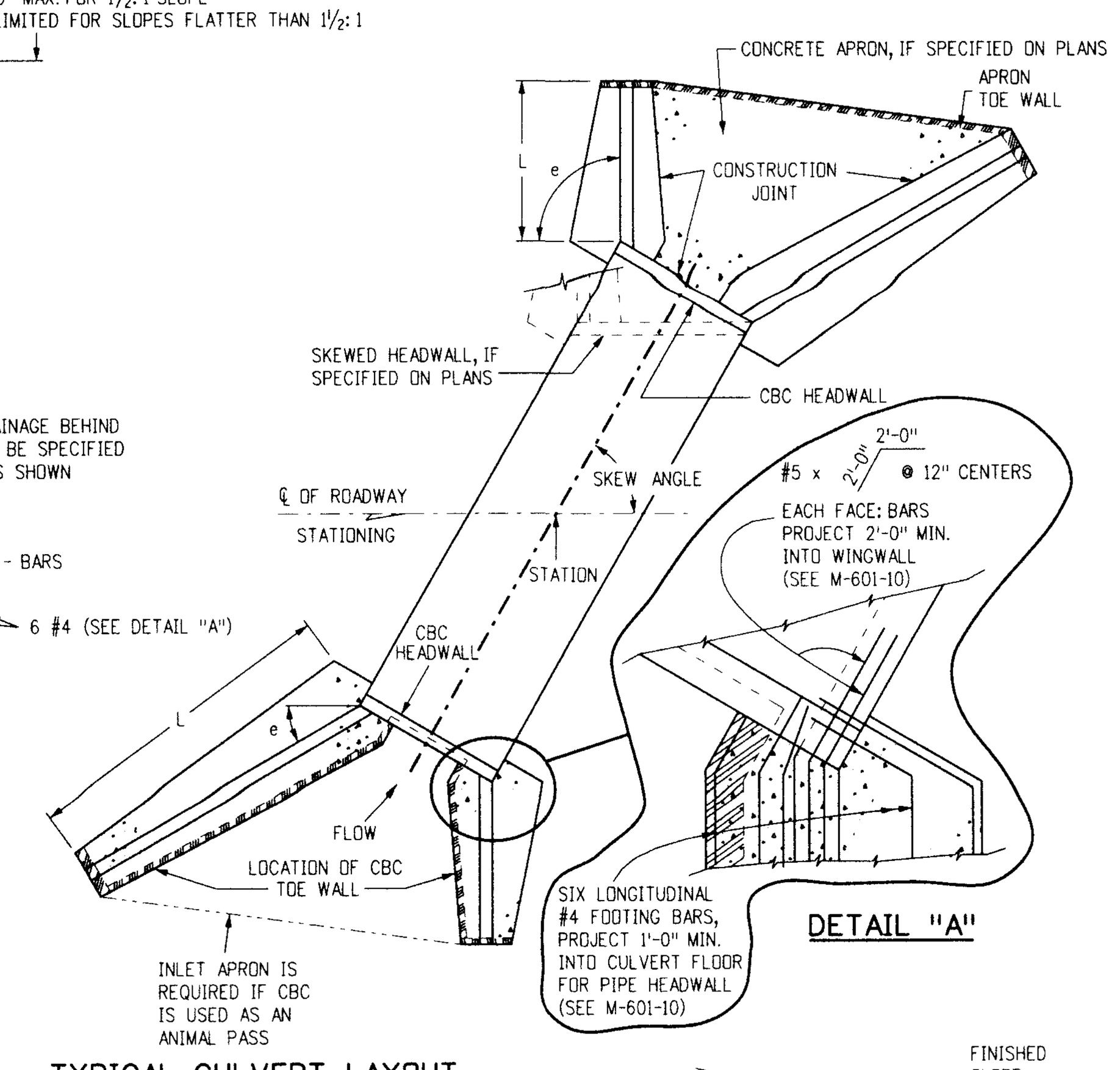
e =	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-4"	1'-3"	11'	9"	7"	CTRS.
h =	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	
a =	1'-0"	1'-2'	1'-4"	1'-6'	1'-8"	1'-10"	2'-0"	2'-2"	2'-4"	2'-6"	
b =	1'-8"	2'-0"	2'-4'	2'-8'	3'-0"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	
w =	2'-8"	3'-2"	3'-8"	4'-2"	4'-8"	5'-2"	5'-8"	6'-2"	6'-8"	7'-2"	
c & d BARS	#4@1'-6"	#4@1'-6"	#4@1'-6"	#4@1'-6"	#4@1'-6"	#4@1'-4"	#5@1'-3"	#5@11"	#6@9"	#6@7"	CTRS.
*CONC.CU.YD./L.F.	0.161	0.210	0.259	0.308	0.358	0.407	0.457	0.506	0.556	0.604	
*REINF. LB./L.F.	8.0	9.3	10.7	12.1	14.3	16.4	23.0	28.6	41.8	54.6	

*DOES NOT INCLUDE TOE WALL QUANTITIES

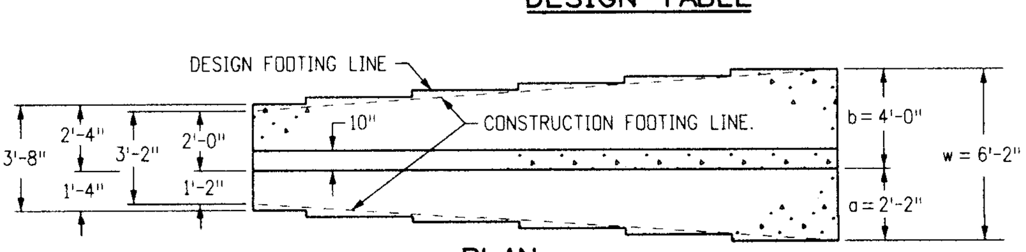
DESIGN TABLE



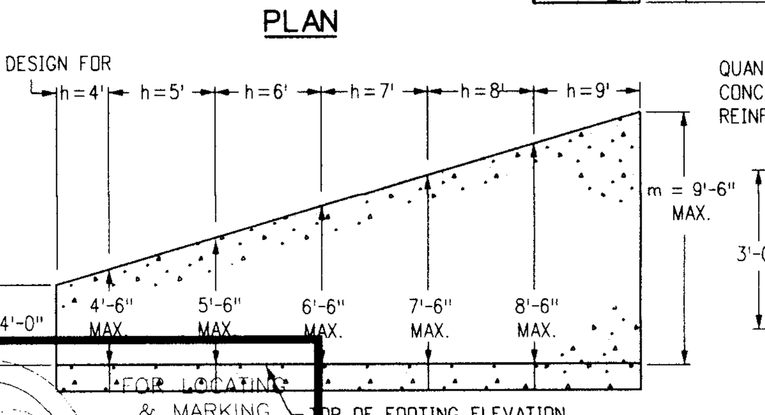
TYPICAL SECTION



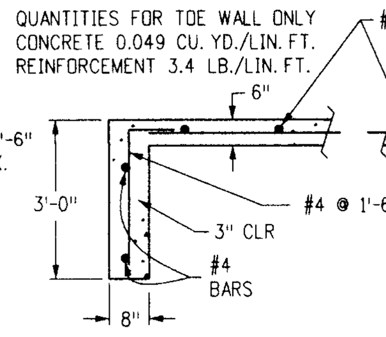
TYPICAL CULVERT LAYOUT



PLAN

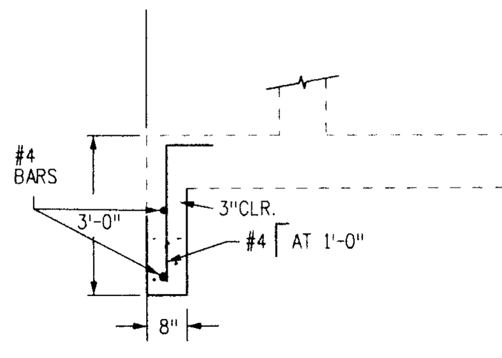


DESIGN EXAMPLE

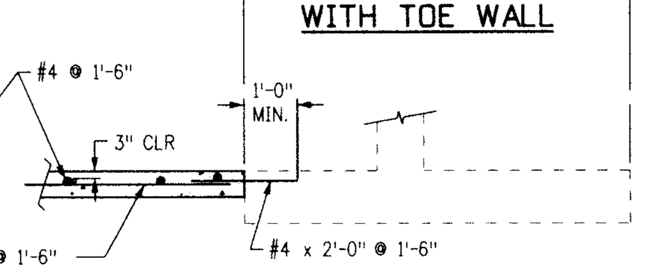


APRON TOE WALL

QUANTITIES FOR TOE WALL ONLY
CONCRETE 0.049 CU. YD./LIN. FT.
REINFORCEMENT 3.4 LB./LIN. FT.



WITH TOE WALL



WITH CONCRETE APRON
REINFORCEMENT 0.89 LB./SQ. FT.

DESIGN DATA:

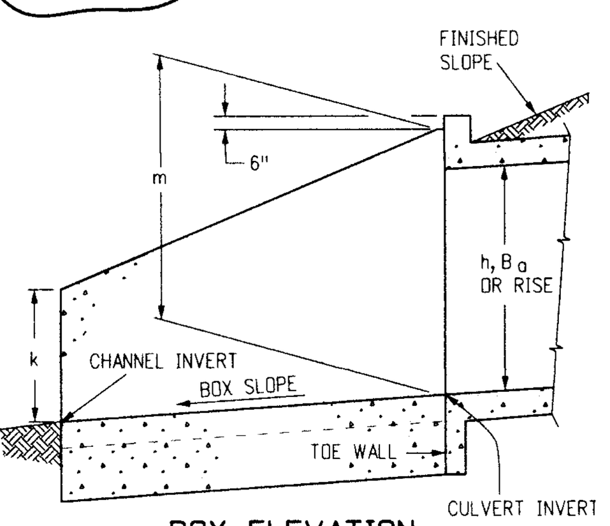
UNIT STRESSES: f_s = 24,000 PSI
f_c = 1,200 PSI
n = 9

EQUIVALENT FLUID PRESSURE = 36 LBS./CU. FT.
MAXIMUM TOE PRESSURE = 1 TON/SQ. FT.

ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE CONCRETE IS POURED.

WINGWALL AND APRON CONCRETE SHALL BE:
CONCRETE CLASS B, OR D (BOX CULVERT) FOR CBC's.
CONCRETE CLASS B, OR D (WALL) FOR PIPES.

LIVE LOAD SURCHARGE HAS NOT BEEN CONSIDERED. WALLS WITHIN h/2 OF THE EDGE OF THE ROADWAY SHOULDER WILL REQUIRE A SPECIAL DESIGN IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.



BOX ELEVATION
m = h, B a OR RISE + (1'-4")
UNLESS OTHERWISE SHOWN ON PLANS

OUTLET STRUCTURE WINGWALL REINFORCING DETAILS
CDOT M-601-20
NOT TO SCALE

FOR UTILITY LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
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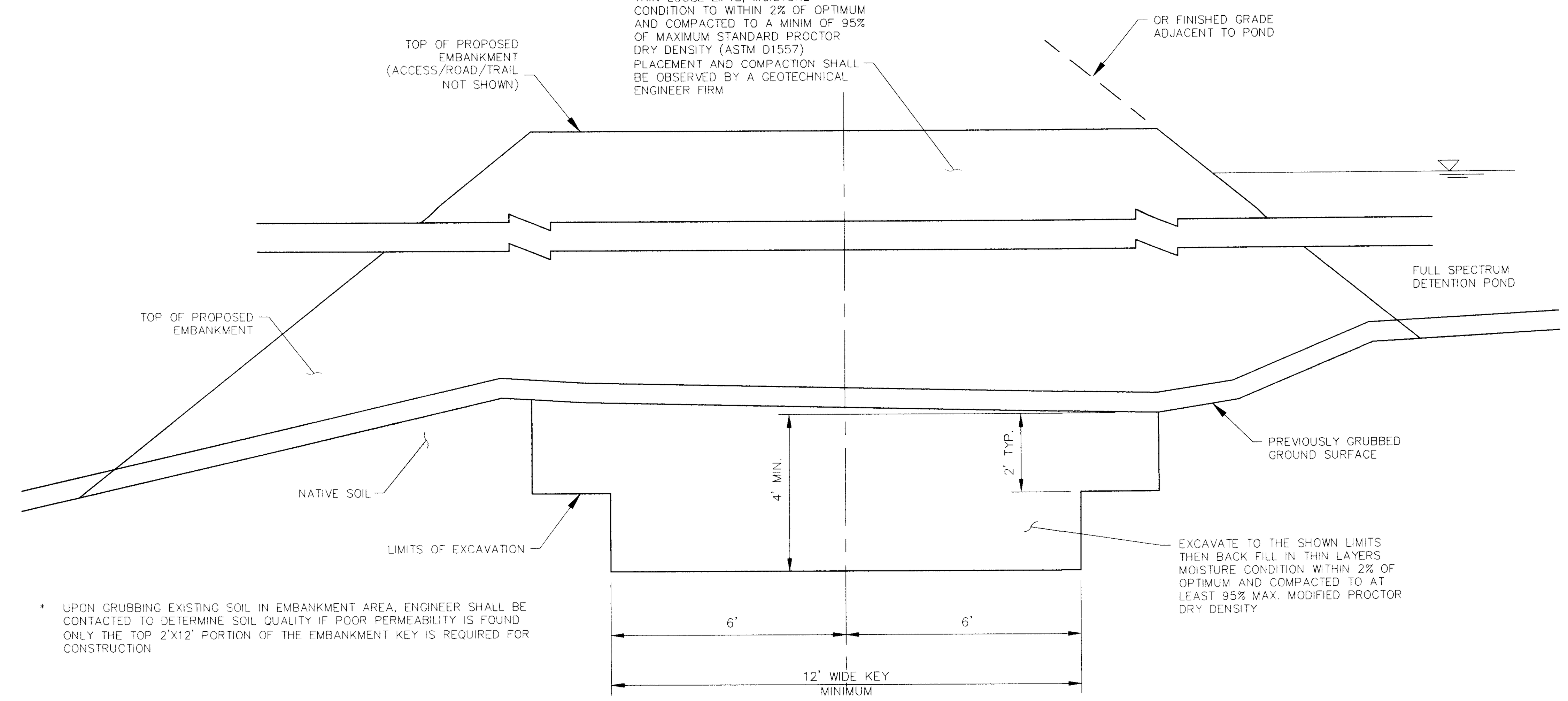


* UPON GRUBBING EXISTING SOIL IN EMBANKMENT AREA, ENGINEER SHALL BE CONTACTED TO DETERMINE SOIL QUALITY IF POOR PERMEABILITY IS FOUND ONLY THE TOP 2'X12' PORTION OF THE EMBANKMENT KEY IS REQUIRED FOR CONSTRUCTION

TYPICAL EMBANKMENT WITH SOIL KEYWAY
NOT TO SCALE

STERLING RANCH FILING NO. 1
FULL SPECTRUM DET. POND 8 DETAILS

PROJECT NO. 09-002	FILE: \dwg\Const Dwg\Storm - District\ST22.dwg		DATE: 01/02/2018
DESIGNED BY: ET	SCALE		SHEET 26 OF 28
DRAWN BY: ELY	HORIZ: N/A		
CHECKED BY: VAS	VERT: N/A		

ST22

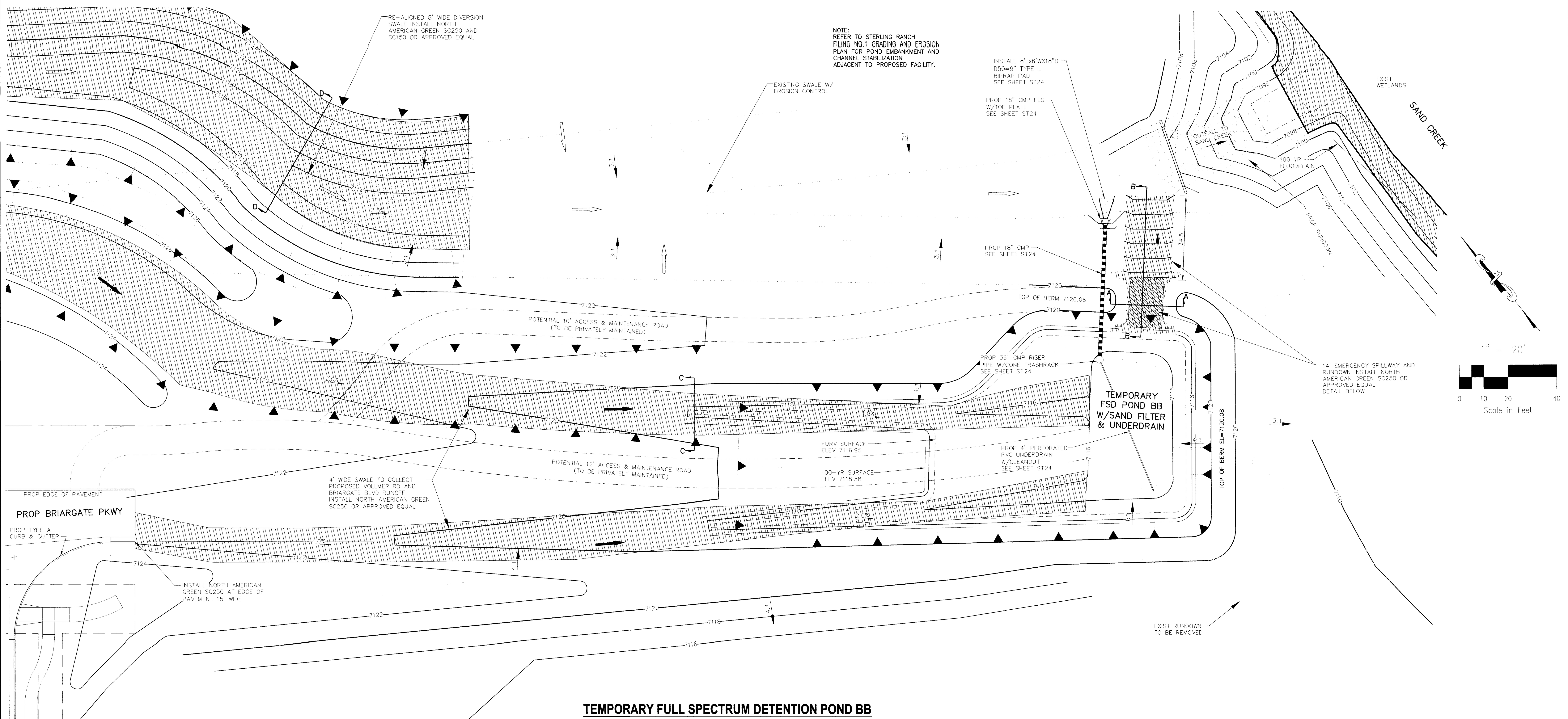
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

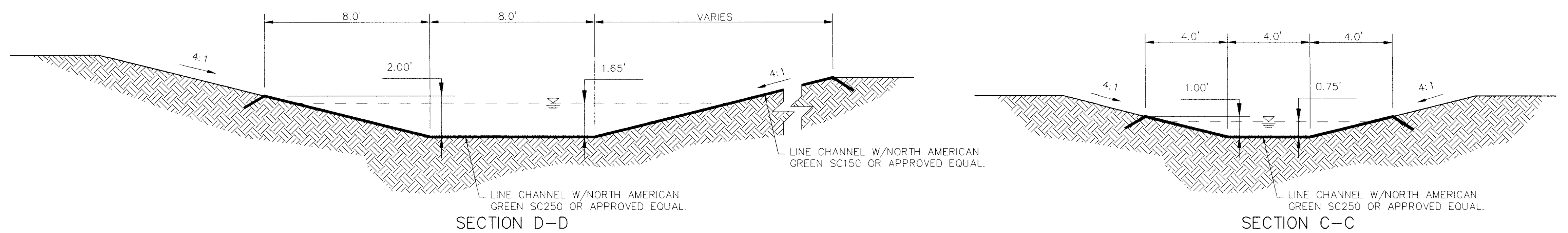
REVISIONS:

NO.	DATE:	BY:	DESCRIPTION:	APRV'D. BY:	DATE:

File: O:\09002A\Sterling Ranch District\dwg\Const Dwg\Storm - District\ST22.dwg Plotstamp: 12/5/2016 11:19 AM

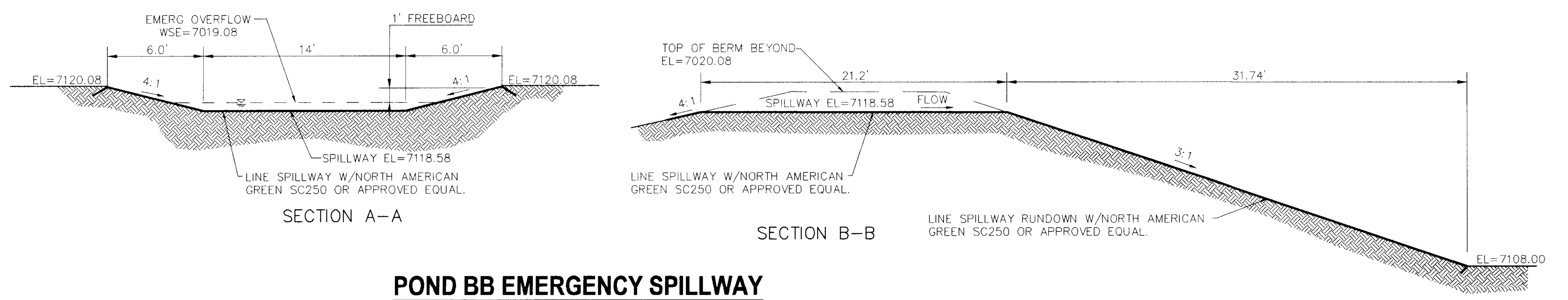


TEMPORARY FULL SPECTRUM DETENTION POND BB
SITE PLAN
SCALE 1"=20'



DIVERSION SWALE 8' WIDTH TYPICAL SECTION
NOT TO SCALE

BRIARGATE/VOLLMER 4' WIDTH TYPICAL SECTION
NOT TO SCALE



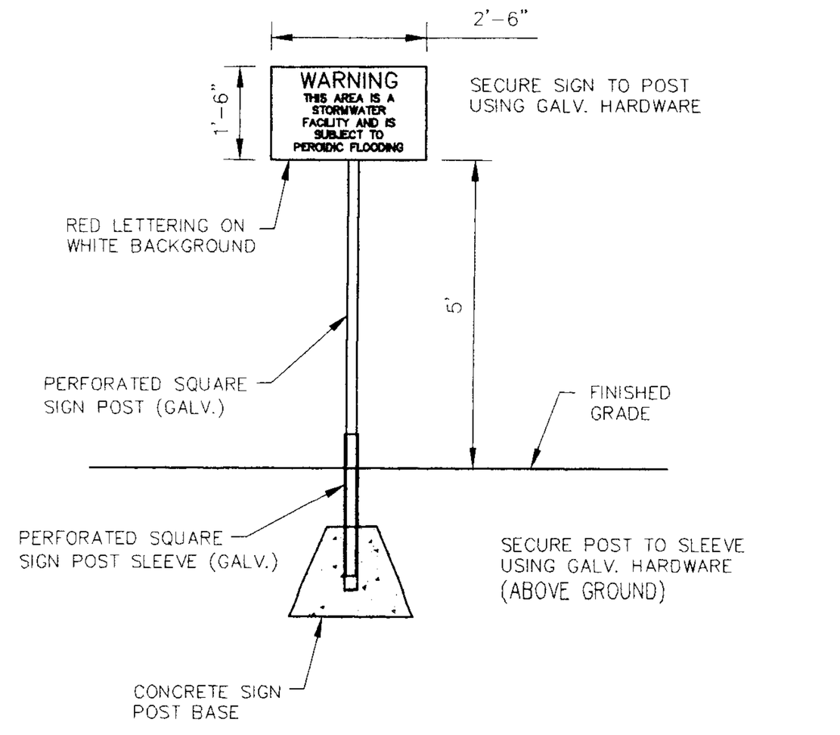
POND BB EMERGENCY SPILLWAY
NOT TO SCALE

POND BB FULL SPECTRUM DETENTION BASIN DATA
WQ WATER SURFACE EL = 7116.51
WQ VOLUME=0.04 AC-FT
EURV WATER SURFACE EL = 7116.95
EURV VOLUME=0.094 AC-FT
100-YR WATER SURFACE EL=7118.58
SPILLWAY CREST EL=7118.58
TOP OF EMBANKMENT EL=7120.08
100-YR VOLUME= 0.48 AC-FT
100-YR INFLOW = 15.50 CFS
100-YR RELEASE = 4.9 CFS

NOTES:
SEE STERLING RANCH-FILING NO. 1 GRADING AND EROSION CONTROL PLANS FOR EROSION CONTROL DETAILS.
TEMPORARY FULL SPECTRUM DETENTION POND TO BE MAINTAINED BY STERLING RANCH METRO DISTRICT.

LEGEND

EX	EXISTING
FUT	FUTURE
PROP	PROPOSED
	PROP MAJ CONT
	PROP MIN CONT
	EXIST MAJ CONT
	EXIST MIN CONT
	EXIST TURF REINFORCEMENT MAT (NORTH AMERICAN GREEN SC-250 OR APPROVED EQUAL)
	RIPRAP TYP.
	EX. FLOW ARROW
	PROP. FLOW ARROW
	PROP STORM SEWER PIPE
	WARNING SIGN
TRM	TURF REINFORCEMENT MAT (NORTH AMERICAN GREEN SC-250 OR APPROVED EQUAL. SEE MANUFACTURER SPECIFICATIONS FOR INSTALLATION DETAILS)



POND WARNING SIGN
NOT TO SCALE

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

REVISIONS: NO. DATE BY DESCRIPTION APPR'D BY DATE

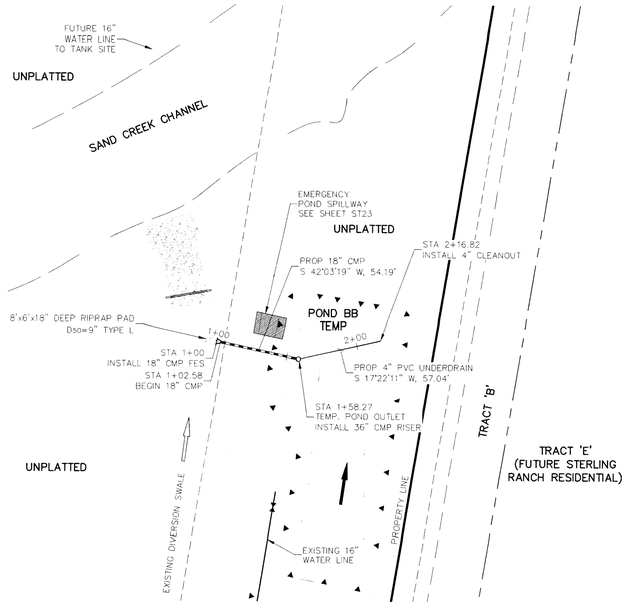
CAUTION
THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

STERLING RANCH FILING NO. 1
TEMP. FULL SPECTRUM DET. POND BB PLANS

PROJECT NO. 09-002	FILE: \dwg\Const Dwg\Street & Storm Plans\ST28.dwg		
DESIGNED BY: ET	SCALE	DATE: 01/02/2018	
DRAWN BY: ELY	HORIZ: AS NOTED	SHEET 27 OF 28	ST23
CHECKED BY: VAS	VERT: AS NOTED		



BRIARGATE PARKWAY
TEMPORARY POND BB OUTFALL

1" = 50'

0 25 50 100

Scale in Feet

BRIARGATE PARKWAY TEMPORARY POND BB OUTFALL

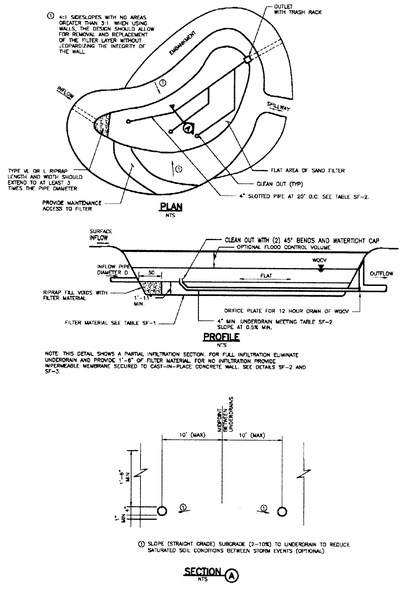
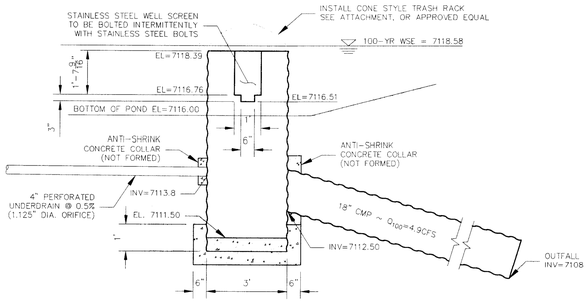


Figure SF-1. Sand Filter Plan and Sections



36" CMP RISER OUTLET STRUCTURE DETAIL

NOT TO SCALE

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

STERLING RANCH FILING NO. 1

STORM SEWER PLANS

PROJECT NO. 09-002 | FILE: \Dwg\Const Dwg\Storm - District\ST29.dwg | DATE: 01/02/2018 | SHEET 28 OF 28 | ST24

DESIGNED BY: ET | SCALE HORIZ: 1"=50' | APPROVED BY: | DATE:
DRAWN BY: ELY | VERT: 1"=5'
CHECKED BY: VAS | DESCRIPTION:

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE:	BY:	DESCRIPTION: