STERLING RANCH
LIFT STATION AND FORCE MAIN
EL PASO COUNTY, COLORADO

APRIL 24, 2017

CONTACTS

OWNER:	SR SEWER, LLC 20 BOULDER CRESCENT, STUIE 201 COLORADO SPRINGS, CO 80903 JIM MORLEY 719-471-1742
CIVIL ENGINEER:	LAMP RYNEARSON COMPANIES TZA WATER 12596 W. BAYUAD AVE. SUITE 330 LAKEWOOD, CO 80228 BRAD SIMONS, 303-971-0077 LARKIN LAMP RYNEARSON 9001 STATE LINE ROAD, SUITE 200 KANSAS CITY, MO 64114 ISAAC CRABTREE, 816-361-0440 LAMP RYNEARSON & ASSOCIATES, INC. 4715 INNOVATION DR., SUITE 100 FORT COLLINS, CO 80525 SHAR SHADOWEN, 970-226-0342 LAMP RYNEARSON & ASSOCIATES, INC. 14710 W. DODGE ROAD, #100 OMAHA, NE 68154 JOHN HILL, 402-498-2498
PROJECT MANAGER:	MMI WATER ENGINEERS, LLC 7262 S. GARRISON COURT LITTLETON, CO 80128 BRADLEY A. SIMONS, P.E., 720-234-8398
TRAFFIC ENGINEERING:	EL PASO COUNTY PUBLIC SERVICES & TRANSPORTATION DEPARTMENT 3275 AKERS DRIVE COLORADO SPRINGS, CO 80922 ANDRE BRACKIN, P.E. 719-668-8769
GAS:	CITY OF COLORADO SPRINGS
GAS:	COLORADO INTERSTATE GAS
GAS:	MAGELLAN MIDSTREAM
FORCE MAIN & SEWER	STERLING RANCH METROPOLITAN DISTRICT NO. 1
ELECTRIC:	MOUNTAIN VIEW ELECTRIC
SANITARY SEWER SERVICE PROVIDER:	MERIDIAN SERVICE METROPOLITAN DISTRICT 11886 STAPLETON DRIVE FALCON, CO 80831 BRADEN McCRORY 719-495-6567

EROSION CONTROL STATEMENT:

ENGINEER'S STATEMENT:

THIS EROSION AND STORMWATER QUALITY CONTROL/GRADING PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. IF SUCH WORK IS PERFORMED IN ACCORDANCE WITH THE GRADING AND EROSION CONTROL PLAN, THE WORK WILL NOT BECOME A HAZARD TO LIFE AND LIMB, ENDANGER PROPERTY, OR ADVERSELY AFFECT THE SAFETY, USE OR STABILITY OF A PUBLIC WAY, DRAINAGE CHANNEL OR OTHER PROPERTY.

ENGINEER, COLORADO P.E. #_____

12/9/19

PROJECT CONTROL

HORIZONTAL CONTROL:

N ¼ CORNER, SEC 3, T13S, R65W
NORTHING: 410191.1110
EASTING: 241732.9390
ELEVATION: 7010.07
DESCRIPTION: 2 ½" ALUM CAP W/ 2" ALUM PIPE, LS 11624

NW CORNER, SEC 3, T13S, R65W
NORTHING: 410154.8270
EASTING : 239010.5240
ELEVATION: 7028.15
DESCRIPTION: 2 ½" ALUM CAP W/ ½" REBAR, LS 11624

VERTICAL DATUM:

STERLING RANCH DEVELOPMENT BENCHMARK
NORTHING: 413533.64
EASTING: 235994.01
ELEVATION: 7076.93
DESCRIPTION: ½" REBAR WITH 1" PLASTIC CAP

FORCE MAIN & SEWER MAIN EXTENSIONS

ANY CHANGE OR ALTERATIONS AFFECTING THE GRADING, ALIGNMENT, ELEVATION AND/OR DEPTH OF COVER OF ANY FORCE MAIN, SEWER MAINS OR OTHER APPURTENANCES SHOWN ON THIS DRAWING SHALL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ALL OPERATION DAMAGE AND DEFECTS IN INSTALLATION AND MATERIAL FOR MAINS AND SERVICES FROM THE DATE OF APPROVAL UNTIL FINAL ACCEPTANCE IS ISSUED.

SIGNED: _____ OWNER/DEVELOPER DATE: 12/9/19

PRINT NAME: JAMES F. MORLEY

DBA: SR SEWER LLC

ADDRESS: 20 BOULDER CRESCENT #200

COLORADO SPRINGS, COLORADO 80903

DISTRICT APPROVAL

THE STERLING RANCH METROPOLITAN DISTRICT RECOGNIZED THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN AND HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

STERLING RANCH METROPOLITAN DISTRICT
WASTEWATER DESIGN APPROVAL

SIGNED: _____ DISTRICT ENGINEER DATE: 12/09/19

PROJECT NO. _____

DEVELOPER'S STATEMENT – EROSION CONTROL

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 THIS PLAN REQUIRE COLORADO DISCHARGE PERMIT SYSTEM (CDPS) PERMITTING FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY.

BY: _____ JAMES F. MORLEY

DBA: SR SEWER LLC

TITLE: PRESIDENT

ADDRESS: 20 BOULDER CRESCENT #200

COLORADO SPRINGS, COLORADO 80903

MERIDIAN SERVICE METROPOLITAN DISTRICT APPROVAL

THE MERIDIAN SERVICE METROPOLITAN DISTRICT HAS REVIEWED THESE PLANS PREPARED BY LAMP RYNEARSON & ASSOCIATES AND AMENDED BY MMI WATER ENGINEERS, LLC.

SIGNED: _____ THOMAS A. KERBY, P.E. – DISTRICT ENGINEER DATE: 12-9-19

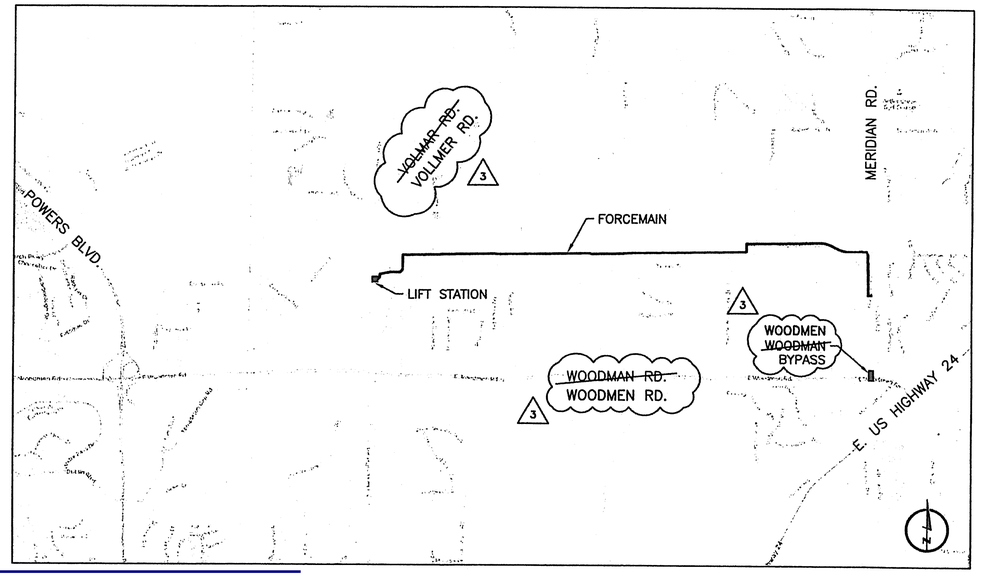
EL PASO COUNTY STANDARD CD SIGNATURE BLOCK:

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 THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

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

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

Engineering accepts this document (SDP) with the addition/change of the Grading and Erosion Control and SWMP Plan approved by separate document and in PCD file # CDR 17-002



LOCATION MAP
N.T.S.

Approved
By:Craig Dossey, Executive Director
Date: 03/06/2020
El Paso County Planning & Community Development

INDEX OF SHEETS

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GENERAL	
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G0.3	GENERAL NOTES
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LIFT STATION	
C1.1	LIFT STATION SITE PLAN
C1.2	LIFT STATION SITE DETAILS
T1.1	LIFT STATION PLAN SECTIONS
T1.2	LIFT STATION PLAN SECTIONS
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E1.1	ELECTRICAL SITE PLAN
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SHEET NUMBER	SHEET TITLE
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FM2.1	CONSTRUCTION DETAILS
FM2.2	CONSTRUCTION DETAILS
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FM2.4	EROSION CONTROL DETAILS

ACCEPTED for FILE
Engineering Review
03/05/2020 11:46:49 AM
dsdrijkamp
EPC Planning & Community Development Department

LAMP RYNEARSON & ASSOCIATES
12596 West Bayaud Avenue, Suite 330
Lakewood, Colorado 80228
LRA-Inc.com / tza4water.com
303.971.0030 | P
303.971.0077 | F

MMI water engineers

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

STANDARD NOTES:

1. CONSTRUCTION MAY NOT COMMENCE UNTIL A CONSTRUCTION PERMIT IS OBTAINED FROM PLANNING AND COMMUNITY DEVELOPMENT (PCD) AND A PRECONSTRUCTION CONFERENCE IS HELD WITH PCD INSPECTIONS.
2. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFF SITE WATERS, INCLUDING WETLANDS.
3. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
4. A SEPARATE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED STORMWATER MANAGER, SHALL BE LOCATED ON SITE AT ALL TIMES AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
5. ONCE THE ESQCP HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL BMPS AS INDICATED ON THE GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY PCD INSPECTIONS STAFF.
6. SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 21 CALENDAR DAYS AFTER FINAL GRADING, OR FINAL EARTH DISTURBANCE, HAS BEEN COMPLETED. DISTURBED AREAS AND STOCKPILES WHICH ARE NOT AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS SHALL ALSO BE MULCHED WITHIN 21 DAYS AFTER INTERIM GRADING. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE SEEDED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND BMPS SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED.
7. TEMPORARY SOIL EROSION CONTROL FACILITIES SHALL BE REMOVED AND EARTH DISTURBANCE AREAS GRADED AND STABILIZED WITH PERMANENT SOIL EROSION CONTROL MEASURES PURSUANT TO STANDARDS AND SPECIFICATION PRESCRIBED IN THE DCM VOLUME II AND THE ENGINEERING CRITERIA MANUAL (ECM) APPENDIX I.
8. ALL PERSONS ENGAGED IN EARTH DISTURBANCE SHALL IMPLEMENT AND MAINTAIN ACCEPTABLE SOIL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING BMPS IN CONFORMANCE WITH THE EROSION CONTROL TECHNICAL STANDARDS OF THE DRAINAGE CRITERIA MANUAL (DCM) VOLUME II AND IN ACCORDANCE WITH THE STORMWATER MANAGEMENT PLAN (SWMP).
9. ALL TEMPORARY EROSION CONTROL FACILITIES INCLUDING BMPS AND ALL PERMANENT FACILITIES INTENDED TO CONTROL EROSION OF ANY EARTH DISTURBANCE OPERATIONS SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS, THE SWMP AND THE DCM VOLUME II AND MAINTAINED THROUGHOUT THE DURATION OF THE EARTH DISTURBANCE OPERATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY REDUCE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME.
11. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE DESIGNED TO LIMIT THE DISCHARGE TO A NON-EROSIVE VELOCITY.
12. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE SWMP. NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
13. EROSION CONTROL BLANKETING SHALL BE USED ON SLOPES STEEPER THAN 3:1.
14. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMP'S MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
15. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
17. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
18. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
19. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
20. BULK STORAGE STRUCTURES FOR PETROLEUM PRODUCTS AND OTHER CHEMICALS SHALL HAVE ADEQUATE PROTECTION SO AS TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
21. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCH LINE.
22. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
23. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
24. PRIOR TO ACTUAL CONSTRUCTION THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
25. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
26. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ____________ AND SHALL BE CONSIDERED A PART OF THESE PLANS.
27. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

   COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
   WATER QUALITY CONTROL DIVISION
   WQCD – PERMITS
   4300 CHERRY CREEK DRIVE SOUTH
   DENVER, CO 80246–1530
   ATTN: PERMITS UNIT

3

EROSION CONTROL NOTES:

1. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFF SITE WATERS, INCLUDING WETLANDS.
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3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED STORMWATER MANAGER, SHALL BE LOCATED ON SITE AT ALL TIMES AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
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18. BULK STORAGE STRUCTURES FOR PETROLEUM PRODUCTS AND OTHER CHEMICALS SHALL HAVE ADEQUATE PROTECTION SO AS TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
19. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCHLINE.
20. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
21. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
22. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
23. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
24. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ENTECH ENGINEERING, INC. AND SHALL BE CONSIDERED A PART OF THESE PLANS.
25. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

   COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
   WATER QUALITY CONTROL DIVISION
   WQCD – PERMITS
   4300 CHERRY CREEK DRIVE SOUTH
   DENVER, CO 80246–1530
   ATTN: PERMITS UNIT

GENERAL NOTES:

1. ALL STATIONING IS CENTER LINE UNLESS OTHERWISE NOTED. ALL ELEVATIONS ARE CENTER LINE UNLESS OTHERWISE NOTED.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE DISTRICT. THE DISTRICT RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
3. COMPACTION TESTS SHALL BE 95% STANDARD PROCTOR AS DETERMINED BY ASTM D698, UNLESS OTHERWISE APPROVED BY THE DISTRICT OR HIGHER STANDARD AS IMPOSED BY OTHER AGENCIES HAVING RIGHT-OF-WAY JURISDICTION. THIS SHALL INCLUDE ALL VALVES, FIRE HYDRANT RUNS, WATER & SEWER SERVICE LINES AND MANHOLES. ALL REPORTS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL. MOISTURE CONTENT SHALL BE AS OUTLINED IN THE GEOTECHNICAL REPORT.
4. THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE LOCATION OF ALL UTILITIES SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE DISTRICT SHALL BE NOTIFIED OF ANY DEVIATIONS TO THE LINE AND/OR GRADE AS DEPICTED ON THE PLANS. CONTRACTOR SHALL SUBMIT TO THE DISTRICT AND THE ENGINEER OF RECORD A REPORT OF THE FIELD VERIFIED INFORMATION PRIOR TO THE START OF CONSTRUCTION.
5. ALL PIPELINES, BENDS, AIR RELEASES, MANHOLES, TEST STATIONS, STRUCTURES, FENCES AND OTHER PERTINENT DESIGN COMPONENTS SHALL BE FIELD STAKED PRIOR TO THE START OF CONSTRUCTION.
6. BENDS, DEFLECTION & CUT PIPE LENGTHS SHALL BE USED TO HOLD HORIZONTAL ALIGNMENT OF SEWER AND WATER LINES TO NO MORE THAN 0.5' FROM THE DESIGNED ALIGNMENT. CONSTRUCTION STAKES TO BE AT 25' INTERVALS ALONG CURVES TO ASSURE LOCATION OF PIPE LINE CONSTRUCTION.
7. ALL UNUSED SALVAGED UTILITY MATERIAL SHALL BE RETURNED TO THE TOWN OF KEENESBURG AS REQUESTED.
8. AT THE CONTRACTOR'S EXPENSE, ALL UTILITY MAINS SHALL BE SUPPORTED AND PROTECTED SUCH THAT THEY SHALL FUNCTION CONTINUOUSLY DURING CONSTRUCTION OPERATIONS. SHOULD A UTILITY MAIN FAIL AS A RESULT OF THE CONTRACTOR'S OPERATION, IT SHALL BE REPLACED IMMEDIATELY BY THE CONTRACTOR OR BY THE DISTRICT AT FULL COST OF LABOR AND MATERIALS TO THE CONTRACTOR.
9. PUMPING OR BYPASS OPERATIONS SHALL BE REVIEWED AND APPROVED BY BOTH THE DISTRICT AND THE DISTRICT ENGINEER PRIOR TO EXECUTION.
10. THE CONTRACTOR SHALL REPLACE OR REPAIR DAMAGE TO ALL SURFACE IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO FENCES, LANDSCAPING, CURB AND GUTTER AND/OR ASPHALT THAT MAY BE CAUSED DURING CONSTRUCTION.
11. ALL CONTRACTORS WORKING ON OR NEAR A WATER OR SEWER FACILITY (TO INCLUDE SERVICE LINES) SHALL HAVE LIABILITY INSURANCE NAMING THE DISTRICT AS AN ADDITIONAL INSURED AND SHALL PROVIDE A CURRENT COPY OF WORKERS COMPENSATION INSURANCE ON FILE WITH THE DISTRICT. NO WORK CAN PROCEED WITHOUT CURRENT CERTIFICATES ON FILE AT THE DISTRICT'S OFFICE.
12. THE CONTRACTOR SHALL NOTIFY THE DISTRICT AND ALL AFFECTED UTILITY COMPANIES ADJACENT TO THE PROPOSED UTILITY CONSTRUCTION A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF CONSTRUCTION. A WEEKLY CONSTRUCTION MEETING SHALL BE REQUIRED WITH THE CONTRACTOR, DISTRICT ENGINEER AND ALL OTHER PARTIES AS DEEMED NECESSARY BY THE DISTRICT.
13. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS FROM ALL JURISDICTIONS REQUIRED FOR THIS PROJECT.

TESTING OF FACILITIES:

14. THE CONTRACTOR SHALL NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF ANY TESTING.
15. ALL SECTIONS OF FORCE MAIN ARE TO MEET THE FOLLOWING PRESSURE TESTING REQUIREMENTS:
    - TEST 100% OF ALL LINES
    - MUST PASS PRESSURE TEST TO 200 PSI FOR TWO HOURS (UNLESS OTHERWISE APPROVED ON THE PLANS).
19. ALL SANITARY SEWER FACILITIES ARE TO MEET THE FOLLOWING TESTING REQUIREMENTS:
    - ALL LINES SHALL BE JET CLEANED PRIOR TO VACUUM OR PRESSURE TESTING.
    - ALL MANHOLES SHALL BE VACUUM TESTED WITH DISTRICT STAFF PRESENT PRIOR TO CCTV INSPECTION.
    - SEWER MAINS TO BE PRESSURE TEST PRIOR TO CCTV INSPECTION.
    - ALL LINES SHALL BE CCTV INSPECTED AND VIDEO SHALL TO BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.

ACCEPTANCE:

25. PRELIMINARY ACCEPTANCE SHALL BE DEFINED AS THE POINT IN TIME THAT THE DISTRICT ACCEPTS THE FACILITY FOR USE. ALL SURFACE IMPROVEMENTS AND RESTORATION SHALL BE COMPLETED WITHIN 30 DAYS OF COMMENCEMENT. SHOULD THE CONTRACTOR FAIL TO COMPLETE ALL SURFACE IMPROVEMENTS AND RESTORATION WITHIN 30 DAYS OF COMMENCEMENT OF SERVICE, THE DISTRICT, AT THEIR DISCRETION, MAY ELECT TO COMPLETE THE IMPROVEMENTS AT THE CONTRACTORS COST.
26. ALL FORCE MAINS AND SEWER MAINS, INCLUDING SERVICE LINES, SHALL HAVE "AS-BUILT" DRAWINGS PREPARED AND APPROVED PRIOR TO PRELIMINARY ACCEPTANCE BY THE DISTRICT.

FORCE MAIN SYSTEM INSTALLATION NOTES:

1. ALL TEST STATIONS AND ASSOCIATED APPURTENCES WITH THE FORCE MAIN SYSTEM SHALL BE MARKED WITH CARSONITE MARKERS AS APPLICABLE.
2. ANY REQUIRED REALIGNMENT (HORIZONTAL OR VERTICAL) SHALL BE REVIEWED AND APPROVED BY THE DISTRICT.
3. ALL MAIN LINES (PVC, HDPE & DUCTILE IRON) SHALL BE INSTALLED WITH COATED #12 TRACER WIRE WITH TEST STATIONS AT INTERVALS NO GREATER THAN 1,000 FEET OR AS SHOWN (VALVE BOXES CAN BE USED AT INTERSECTIONS AND SERVICE STUBS).

COMMENCEMENT OF USE OF WATER LINES AND/OR SYSTEMS:

4. NO WATER OR FORCE MAIN FACILITY SHALL BE PLACED IN SERVICE UNTIL AFTER THE COMPLETION OF ALL PRESSURE TESTING, FLUSHING, BAC-T TESTING, COMPACTION TESTING, AND AS-BUILT DRAWINGS ARE SUBMITTED AND APPROVED BY THE DISTRICT.
5. NO FORCE MAIN FACILITY SHALL BE PLACED IN SERVICE UNTIL ALL SURFACE IMPROVEMENTS ARE COMPLETED.
6. ALL EASEMENTS (PLATTED OR DEEDED) ARE DEDICATED, EXECUTED BY THE DISTRICT, AND RECORDED.

SANITARY SEWER SYSTEM INSTALLATION NOTES:

1. SANITARY SEWER LENGTHS ARE MH CENTER-MH CENTER. ALL SANITARY SEWER PIPES SHALL BE SDR 35 PVC OR EQUAL. SEWER LINES MAY NOT EXCEED 7% GRADE FOR ANY SIZE WITHOUT PRIOR APPROVAL OF THE TOWN OF KEENESBURG.
2. ALL SANITARY SEWER MANHOLES SHALL BE WRAPPED WITH RU116 RUBR-NEK JOINT WRAP OR EQUIVALENT AND COATED.

COMMENCEMENT OF USE OF SEWER LINES AND/OR SYSTEMS:

3. NO SANITARY SEWER FACILITY SHALL BE PLACED IN SERVICE UNTIL THE COMPLETION OF ALL JET CLEANING, PRESSURE TESTING, VACUUM TESTING, CCTV INSPECTION, COMPACTION TESTING, AND AS-BUILT DRAWINGS ARE SUBMITTED AND APPROVED BY THE DISTRICT.
4. NO SANITARY SEWER FACILITY SHALL BE PLACED IN SERVICE UNTIL ALL SURFACE IMPROVEMENTS ARE COMPLETED.
5. ALL NECESSARY EASEMENTS (PLATTED OR DEEDED) ARE DEDICATED, EXECUTED BY THE DISTRICT, AND RECORDED.

DRAWN BY JPM
DESIGNED BY JPM
DATE APRIL 24, 2017
JOB NUMBER-TASKS 0416011
BOOK AND PAGE

REVISIONS
3 – PER EPC COMMENTS – 05/31/2019

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN
GENERAL NOTES

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

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EXISTING LINE LEGEND

ADJACENT LOT LINE	EXISTING ELECTRIC	EXISTING STORM SEWER
EDGE PAVEMENT OR GRAVEL	EXISTING FIBER OPTIC	EXISTING TELEPHONE
PROPERTY LINE	EXISTING FLOWLINE	EXISTING WATER
SECTION LINE	EXISTING GAS	EXISTING WIRE FENCE
EXISTING CABLE TELEVISION	EXISTING OVERHEAD POWER	
EXISTING EASEMENT	EXISTING SANITARY SEWER	

EXISTING SYMBOL LEGEND & CODE ABBREVIATIONS

SYMBOL	DESCRIPTION	CODE ABBREVIATIONS
	BUILDING, A/C	BAC
	BUILDING, ROOF DRAIN	BRD
	BRIDGE, LOW CHORD	BRLC
	DRAINAGE, AREA INLET, ROUND	DAIR
	DRAINAGE, AREA INLET, SQUARE	DAIS
	DRAINAGE, MANHOLE	DMH
	DRAINAGE, STORM, FES	DSF
	DRAINAGE, STORM, PIPE	DSP
	GROUND, BORE HOLE	GBH
	LANDSCAPE, BENCH	LBE
	LANDSCAPE, BOLLARD	LB
	LANDSCAPE, BOULDER	LBR
	LANDSCAPE, BUSH	LBU
	LANDSCAPE, FLAGPOLE	LFP
	LANDSCAPE, GROUND LIGHT	LGL
	LANDSCAPE, MAILBOX	LMB
	LANDSCAPE, MISCELLANEOUS POINT	LMP
	LANDSCAPE, TREE, CONIFEROUS	LTC
	LANDSCAPE, TREE, DECIDUOUS	LTD
MB	MONUMENT, BENCHMARK	MB
	MONUMENT, CONTROL	MC
	MONUMENT, FOUND	MF
	MONUMENT, FOUND, OFFSET	MFO
	MONUMENT, SET	MS
	MONUMENT, RIGHT-OF-WAY	MROW
	MONUMENT, SECTION CORNER	MSC
	MONUMENT, SECTION CORNER, CALCULATED	MSCC
	MONUMENT, SECTION CORNER, REFERENCE	MSCR
	MONUMENT, SECTION CORNER, TIE	MSCT
	MONUMENT, SECTION CORNER, WITNESS	MSCW
	RAILROAD, CROSSBUCK	RRCB
	RAILROAD, SIGN, CROSSING	RRSC
	SIGNS, BILLBOARD	SBLB
	SIGNS, DELINEATOR	SD
	SIGNS, INFORMATION	SI
	SIGNS, MONUMENT	SM
	SIGNS, REGULATORY	SR
	STRIPING, ARROW, LEFT	STAL
	STRIPING, ARROW, RIGHT	STAR
	STRIPING, ARROW, STRAIGHT	STAS
	STRIPING, BICYCLE	STBC

SYMBOL	DESCRIPTION	CODE ABBREVIATIONS
	STRIPING, HANDICAP	STHC
	STRIPING, ONLY	STO
	TRAFFIC CONTROL, CABINET	TCC
	TRAFFIC CONTROL, PEDESTRIAN CROSSING	TCPC
	TRAFFIC CONTROL, POLE WITH MAST	TCPM
	TRAFFIC CONTROL, PULLBOX	TCPB
	UTILITY, CABLE, PEDESTAL	UCP
	UTILITY, CABLE, PULLBOX	UCPB
	UTILITY, CABLE, WARNING SIGN	UCWS
	UTILITY, ELECTRIC, MANHOLE	UEMH
	UTILITY, ELECTRIC, METER	UEM
	UTILITY, ELECTRIC, POLE	UEP
	UTILITY, ELECTRIC, PULLBOX	UEPB
	UTILITY, ELECTRIC, TRANSFORMER	UET
	UTILITY, ELECTRIC, VAULT	UEV
	UTILITY, ELECTRIC, WARNING SIGN	UEWS
	UTILITY, FIBER OPTIC, PEDESTAL	UFP
	UTILITY, FIBER OPTIC, PULLBOX	UFPB
	UTILITY, FIBER OPTIC, VAULT	UFV
	UTILITY, FIBER OPTIC, WARNING SIGN	UFWS
	UTILITY, GAS, MANHOLE	UGMH
	UTILITY, GAS, METER	UGM
	UTILITY, GAS, VALVE	UGV
	UTILITY, GAS, WARNING SIGN	UGWS
	UTILITY, IRRIGATION, CONTROL VALVE	UICV
	UTILITY, IRRIGATION, SPRINKLER HEAD	UISH
	UTILITY, POLE, H-STRUCTURE	UPH
	UTILITY, POLE, PEDESTRIAN LIGHT	UPPL
	UTILITY, POLE, STEEL	UPS
	UTILITY, POLE, STREET LIGHT	UPSL
	UTILITY, POLE, WOOD	UPW
	UTILITY, POLE, WOOD WITH LIGHT	UPWL
	UTILITY, SEWER, CLEANOUT	USCO
	UTILITY, SEWER, MANHOLE	USMH
	UTILITY, SEWER, WARNING SIGN	USWS
	UTILITY, TELEPHONE, MANHOLE	UTMH
	UTILITY, TELEPHONE, POLE	UTP
	UTILITY, TELEPHONE, PULLBOX	UTPB
	UTILITY, TELEPHONE, WARNING SIGN	UTWS
	UTILITY, UNIDENTIFIED, MANHOLE	UUMH
	UTILITY, UNIDENTIFIED, PEDESTAL	UUP

SYMBOL	DESCRIPTION	CODE ABBREVIATIONS
	UTILITY, UNIDENTIFIED, PULLBOX	UUPB
	UTILITY, WATER, CURB STOP	UWCS
	UTILITY, WATER, FIRE HYDRANT	UWFH
	UTILITY, WATER, MANHOLE	UWMH
	UTILITY, WATER, METER	UWM
	UTILITY, WATER, POST INDICATOR VALVE	UWPIV
	UTILITY, WATER, VALVE	UWV
	UTILITY, WATER, WARNING SIGN	UWWS
	UTILITY, WATER, YARD HYDRANT	UWYH

REMOVALS

- BUILDING TO BE REMOVED
- SIDEWALK TO BE REMOVED
- REMOVAL UTILITY
- REMOVE OBJECT

EROSION & SEDIMENT CONTROL (EC) LEGEND

- SILT FENCE
- WATTLE
- VEHICLE TRACKING CONTROL
- TEMPORARY SEEDING
- STRAW HAY BALE
- SLOPE PROTECTION
- PERMANENT SEEDING
- INLET PROTECTION
- CONCRETE WASHOUT PIT
- CHECK DAM
- CONSTRUCTION ROAD STABILIZATION
- CURB SOCK INLET PROTECTION
- DIVERSION DITCH AND DIKE, TEMPORARY
- DIVERSION CHANNEL, TEMPORARY
- EROSION CONTROL BLANKET
- MULCHING
- RIPRAP
- SEDIMENT BASIN
- SEDIMENT CONTROL LOG
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
- TERRACING
- TEMPORARY STREAM CROSSING
- (COMPACTED) EARTH BERM

GRADING

- PROPOSED CONTOUR
- FUTURE CONTOUR
- EXISTING CONTOUR
- PROPOSED SWALE
- GRADE BREAK
- WETLANDS AREA NOT TO BE DISTURBED
- ×4638.00 SPOT ELEVATION
- ×HP=4637.94 SPOT ELEVATION WITH DESCRIPTION SEE ABBREVIATIONS THIS SHEET

UTILITIES

- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SEWER SERVICE
- PROPOSED SLOTTED UNDER DRAIN
- PROPOSED UNDERGROUND POWER
- PROPOSED WATER LINE
- PROPOSED GAS
- PROPOSED TELEPHONE
- PROPOSED AIR TAP
- PROPOSED WATER SERVICE
- PROPOSED MANHOLE
- PROPOSED F.E.S.
- PROPOSED F.E.S. WITH ROCK APRON
- PROPOSED CURB INLET
- PROPOSED AREA INLET
- PROPOSED PIPE PLUG
- PROPOSED CLEANOUT
- PROPOSED VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED REDUCER
- PROPOSED TEE WITH THRUST BLOCK
- PROPOSED BEND WITH THRUST BLOCK
- PROPOSED CROSS
- PROPOSED METER PIT AND METER VAULT

PAVING

- PROPOSED CURB AND GUTTER
- PROPOSED FLOWLINE
- PROPOSED RETAINING WALL
- PROPOSED X" CONCRETE SIDEWALK
- PROPOSED X" CONCRETE DECORATIVE
- PROPOSED ASPHALT PAVEMENT
- PROPOSED BARRICADE
- PROPOSED SIGN
- PROPOSED BUILDING
- PROPOSED FENCE
- PROPOSED PARKING STALL COUNT
- PROPOSED PAVEMENT MARKINGS
- SAWED TRANSVERSE CONTRACTION JOINT
- SAWED LONGITUDINAL JOINT
- KEYED LONGITUDINAL
- EXPANSION JOINT
- PROPOSED HANDY CAP PARKING

DRAINAGE (DR) LEGEND

- DRAINAGE BASIN ID
- DRAINAGE AREA (AC)
- MINOR STORM RUNOFF COEFFICIENT
- MAJOR STORM RUNOFF COEFFICIENT
- PROPOSED DRAINAGE BASIN BOUNDARY
- PROPOSED DRAINAGE SUB BASIN BOUNDARY
- EXISTING DRAINAGE BASIN BOUNDARY
- EXISTING DRAINAGE SUB BASIN BOUNDARY
- DRAINAGE FLOW PATH
- DESIGN POINT
- CHANNEL FLOW ARROW
- OVERLAND FLOW ARROW

GENERAL ABBREVIATIONS

AC	ACRES
A.D.	GRADE CHANGE
ADA	AMERICANS WITH DISABILITIES ACT
BLDG	BUILDING
BOC	BACK OF CURB
BOSW	BOTTOM OF WALL AT FINISHED GRADE
BOP	BOTTOM OF PIPE
BOW	BOTTOM OF WALL AT FINISHED GRADE
CATV	CABLE TELEVISION
CF	CUBIC FOOT
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CP	CONTROL POINT
CY	CUBIC YARD
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
E	EAST
EOA	EDGE OF ASPHALT
EOB	EDGE OF BOX
ELEV.	ELEVATION
EOG	EDGE OF GRAVEL
FES	FLARED END SECTION
FFE	FINISH FLOOR ELEVATION
FH	FIRE HYDRANT
FL	FLOWLINE
G	GAS
G.B.	GRADE BREAK
HP	HIGH POINT
HORIZ	HORIZONTAL
I.E.	INVERT ELEVATION
L	LEGAL DIMENSIONS
LF	LINEAR FEET
LP	LOW POINT
M	MEASURED
MH	MANHOLE
ME	MATCH EXISTING
MOE	MINIMUM OPENING ELEVATION
N	NORTH
N.T.S.	NOT TO SCALE
P	PLAT DIMENSIONS
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
P.V.C.	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
R	RECORD DIMENSIONS
RAD	RADIUS
RB	REBAR
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
S	SOUTH
SF	SQUARE FEET
SS	SANITARY SEWER
ST	STORM
STA	STATION
STD	STANDARD
T	TELEPHONE
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOG	TOP OF GRADE
TOI	TOP OF ISLAND
TOP	TOP OF PAVEMENT
TOW	TOP OF WALL
TYP.	TYPICAL
VERT	VERTICAL
W/	WITH
W	WEST
WQCV	WATER QUALITY CAPTURE VOLUME

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	0416011
BOOK AND PAGE	

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN LEGEND

LAMP RYNEARSON - ENGINEERS

COLORADO LICENSED PROFESSIONAL ENGINEER 34705 BRADLEY A. SIMONS 4/24/17

BRADLEY A. SIMONS
34705

COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG!

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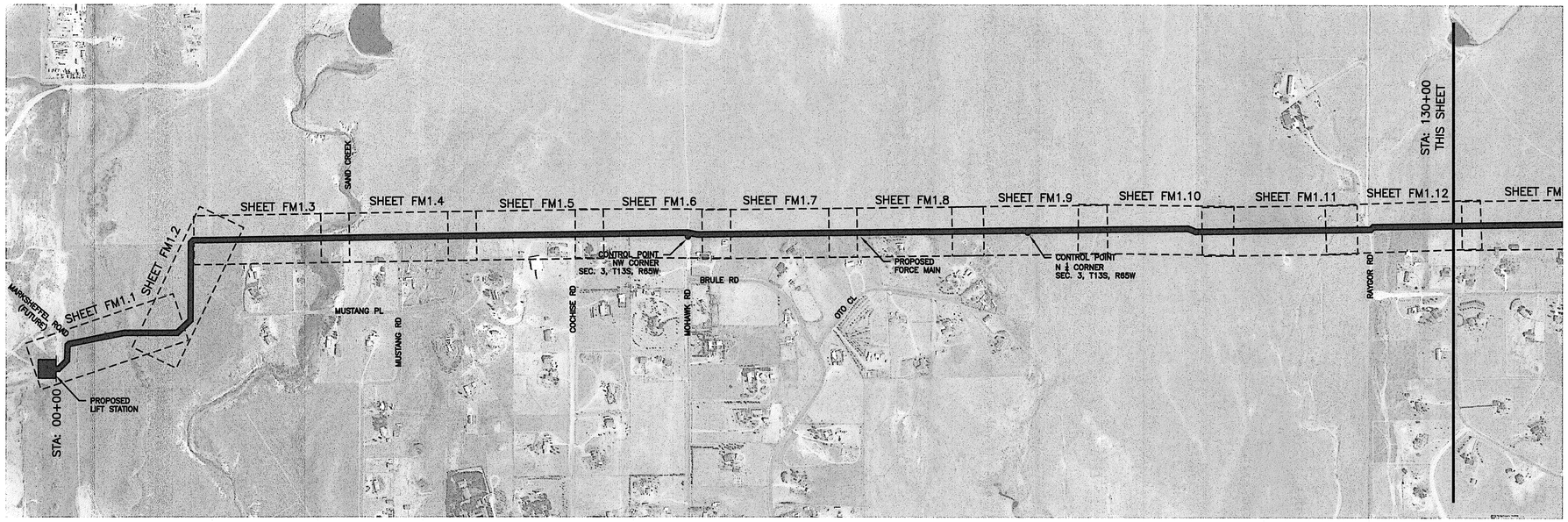
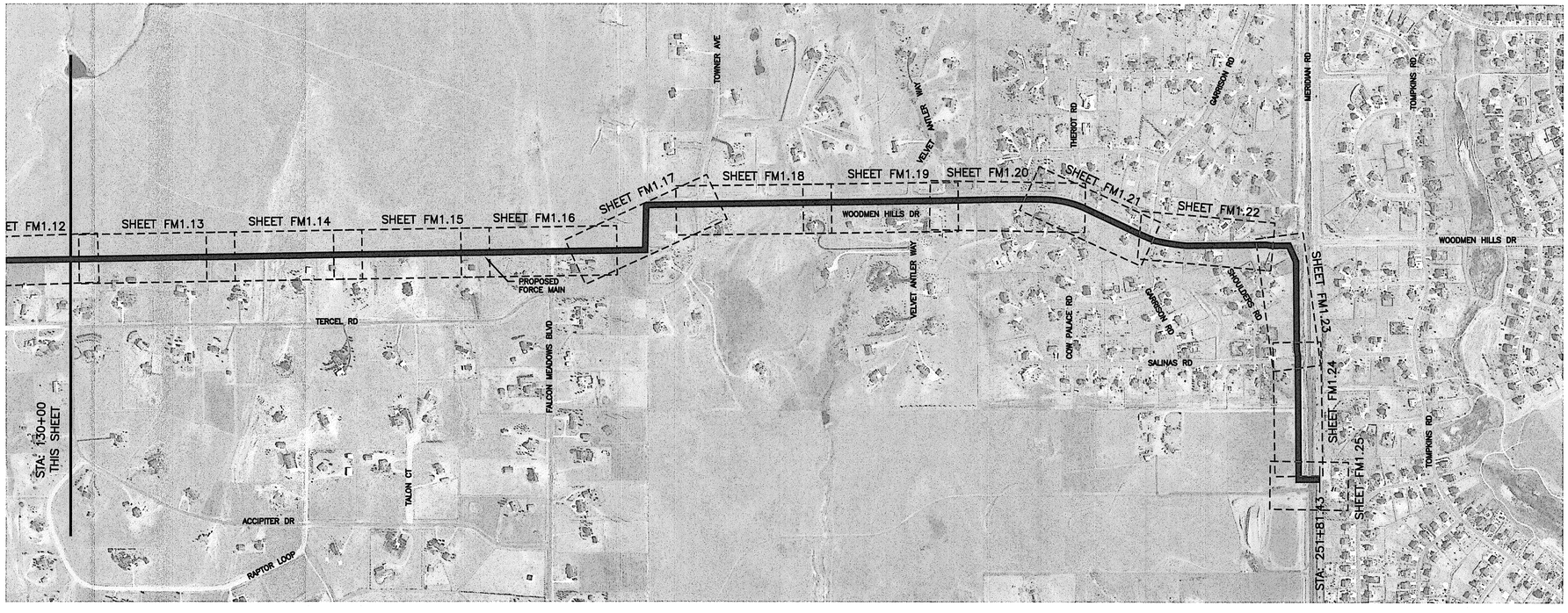
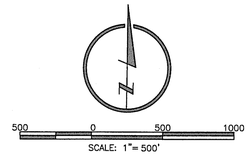
P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-CPR.dwg, 4/21/2017 2:33:18 PM, JASON MCNEELL, LAMP RYNEARSON & ASSOCIATES







PROJECT CONTROL

HORIZONTAL CONTROL:

N ¼ CORNER, SEC 3, T13S, R65W
NORTHING: 410191.1110
EASTING: 241732.9390
ELEVATION: 7010.07
DESCRIPTION: 2 ½" ALUM CAP W/ 2" ALUM PIPE, LS 11624

NW CORNER, SEC 3, T13S, R65W
NORTHING: 410154.8270
EASTING : 239010.5240
ELEVATION: 7028.15
DESCRIPTION: 2 ½" ALUM CAP W/ ¾" REBAR, LS 11624

VERTICAL DATUM:

STERLING RANCH DEVELOPMENT BENCHMARK
NORTHING: 413533.64
EASTING: 235994.01
ELEVATION: 7076.93
DESCRIPTION: ½" REBAR WITH 1" PLASTIC CAP

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG!

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER/TASKS	0416011/TASK3
SHEET/TOTAL	BOOK AND PAGE

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN OVERALL PLAN & PROJECT CONTROL

LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER
BRADLEY A. SIMONS
34705
4-24-17

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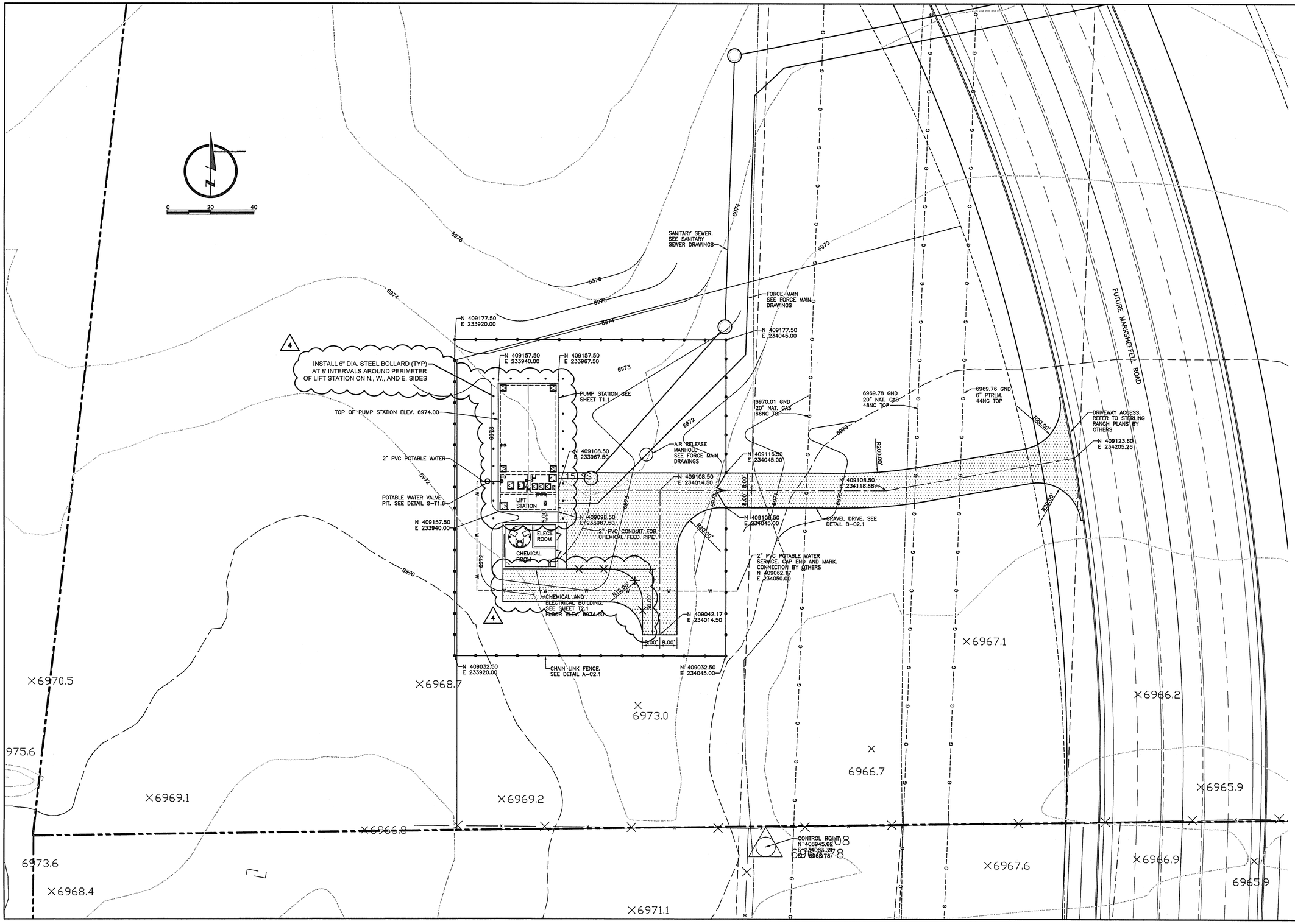
P:_Engineering\0416011 - Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-HC-001.dwg, 4/21/2017 3:33:39 PM, JASON MCNEILL (LAMP RYNEARSON & ASSOCIATES



REVISIONS	
1	REVISED PER COMMENTS - 06/07/19

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DESIGNED BY	ITC
DATE	04-20-2017
JOB NUMBER-TASK3	0416011.01
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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION SITE PLAN

LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER 34705

BRADLEY A. SIMONS
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SHEET
C1.1

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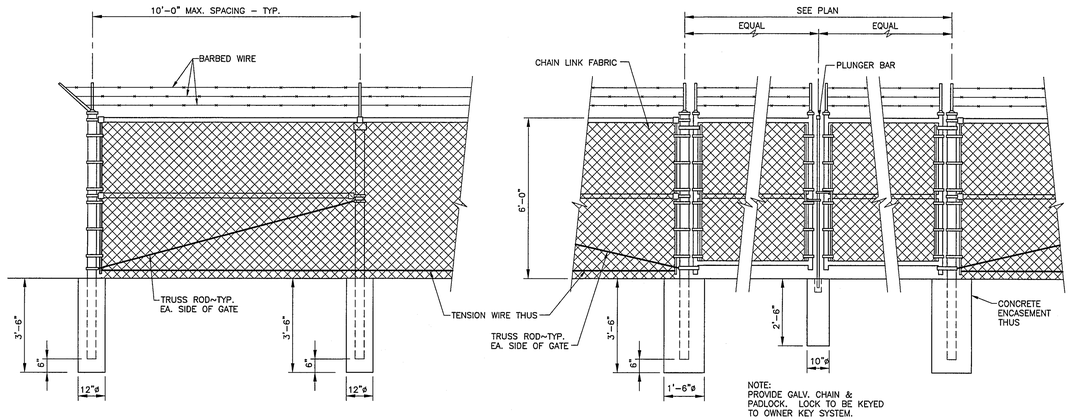

(A) CHAIN LINK FENCE AND GATE DETAIL
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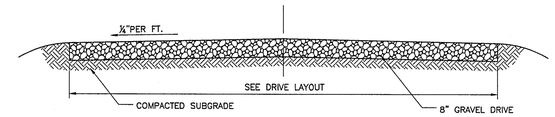

(B) GRAVEL DRIVE DETAIL
SCALE: 3/8"=1'-0"

DRAWN BY	TWG
DESIGNED BY	RTC
DATE	04-20-2017
JOB NUMBER-TASKS	0416011.01
BOOK AND PAGE	

REVISIONS

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
SITE DETAILS

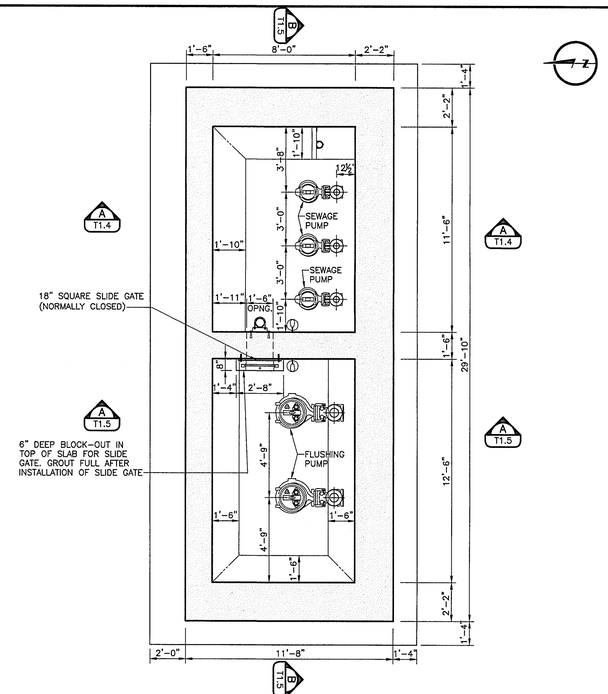
LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER 34705 4/24/17

BRADLEY A. SIMONS
34705

SHEET
C2.1

L:\Sterling Ranch (0416011) - Twig\DRAWINGS\CONSTRUCTION DRAWINGS\0416011 Site Details.dwg, 4/20/2017 2:18:49 PM, "BSIMS" BIDGART, LAMP RYNEARSON & ASSOCIATES



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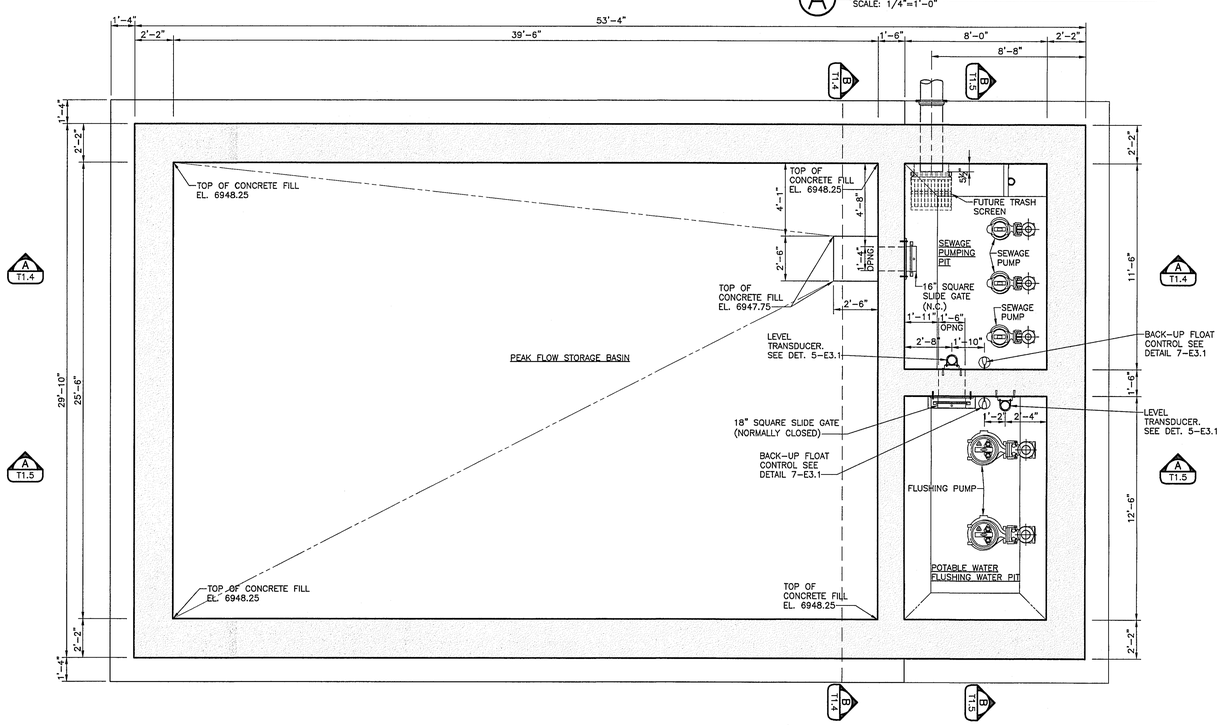

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SCALE: 1/4"=1'-0"

ABBREVIATIONS

ALUM	ALUMINUM
B	BOTTOM
BC	BOLT CIRCLE
BLDG.	BUILDING
B&S	BOTTOM AND SIDES
BV	BALL VALVE
C-C	CENTER TO CENTER
CJ	CONSTRUCTION JOINT
CL.	CLEAR
CLR.	CLEARANCE
CSP	CORRUGATED STEEL PIPE
CV	CHECK VALVE
DET.	DETAIL
DIA.	DIAMETER
DIP	DUCTILE IRON PIPE
EF	EACH FACE
EJ	EXPANSION JOINT
EL.	ELEVATION
EW	EACH WAY
EXP.	EXPANDABLE
F.D.	FLOOR DRAIN
FF	FAR FACE
FM	FORCE MAIN
FV	FIELD VERIFY
FT.	FEET
GPM	GALLONS PER MINUTE
GV	GATE VALVE
H	HORIZONTAL OR HEIGHT
HDG	HOT DIP GALVANIZED
HSS	HOLLOW STRUCTURAL SECTION
ID	INSIDE DIAMETER
IF	INSIDE FACE
INV.	INVERT
JT	JOINT
L	LONG
LONG	LONGITUDINAL
MID	MIDDLE OR MID POINT
N.C.	NORMALLY CLOSED
NF	NEAR FACE
N.O.	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OVERALL
OC	ON CENTERS
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
PE	POLYETHYLENE
PV	PLUG VALVE
PVC	POLY VINYL CHLORIDE
REQ'D	REQUIRED
SAN.	SANITARY
SPA.	SPACE OR SPACES
SQ.	SQUARE
S.S.	STAINLESS STEEL
STR	STRAIGHT
T	TOP
TBD	TO BE DETERMINED
TOF	TOP OF FOOTING ELEVATION
TOG	TOP OF GROUT
TOS	TOP OF SLAB ELEVATION
TRANS	TRANSVERSE
TYP.	TYPICAL
UNO	UNLESS NOTED OTHERWISE
V	VERTICAL
W	WIDTH
WS	WATERSTOP
WWR	WELDED WIRE REINFORCING

DRAWN BY TWB
DESIGNED BY ITC
DATE 04-20-2017
JOB NUMBER: TA5/63 04160111.01
BOOK AND PAGE

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

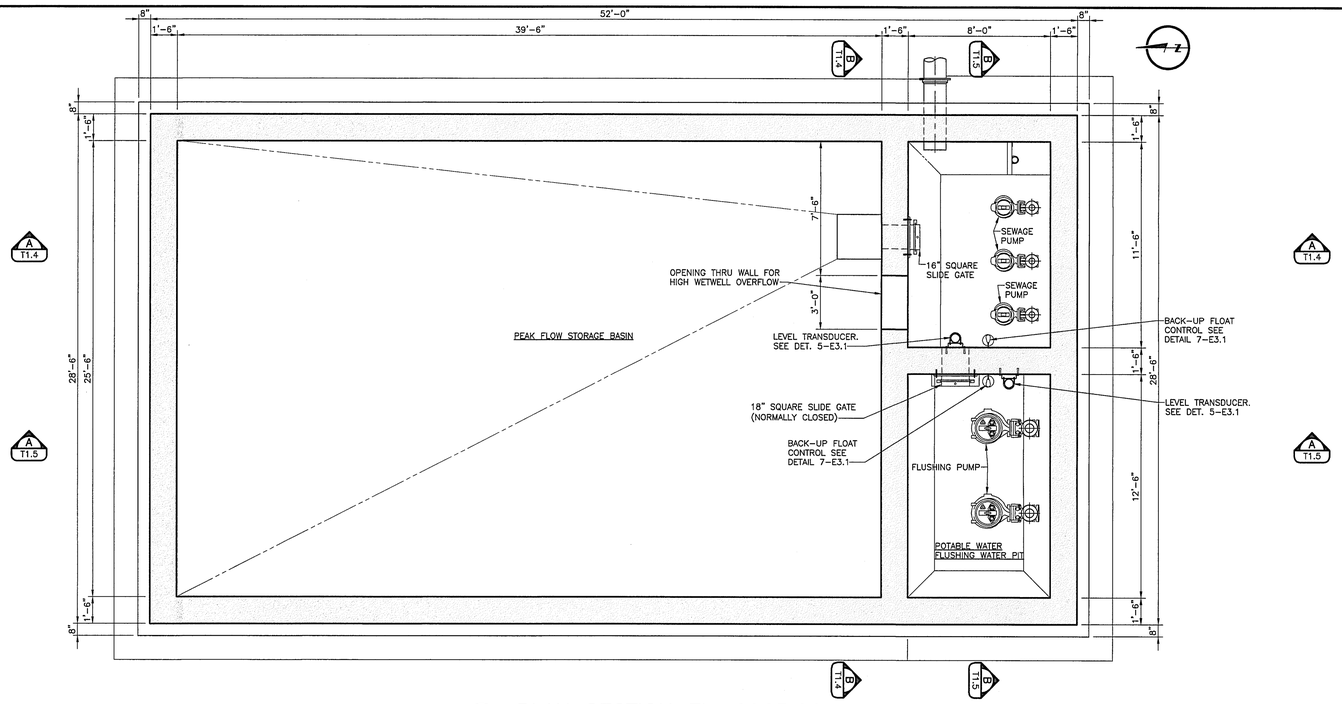
LIFT STATION
PLAN SECTIONS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
T1.1

L:\Sterling Ranch (04160111) - Temp\DRAWINGS\CONSTRUCTION DRAWINGS\04160111 LIFT Station.dwg, 4/20/2017 2:20:23 PM, TERRY BOGARE, LAMP RYNEARSON & ASSOCIATES



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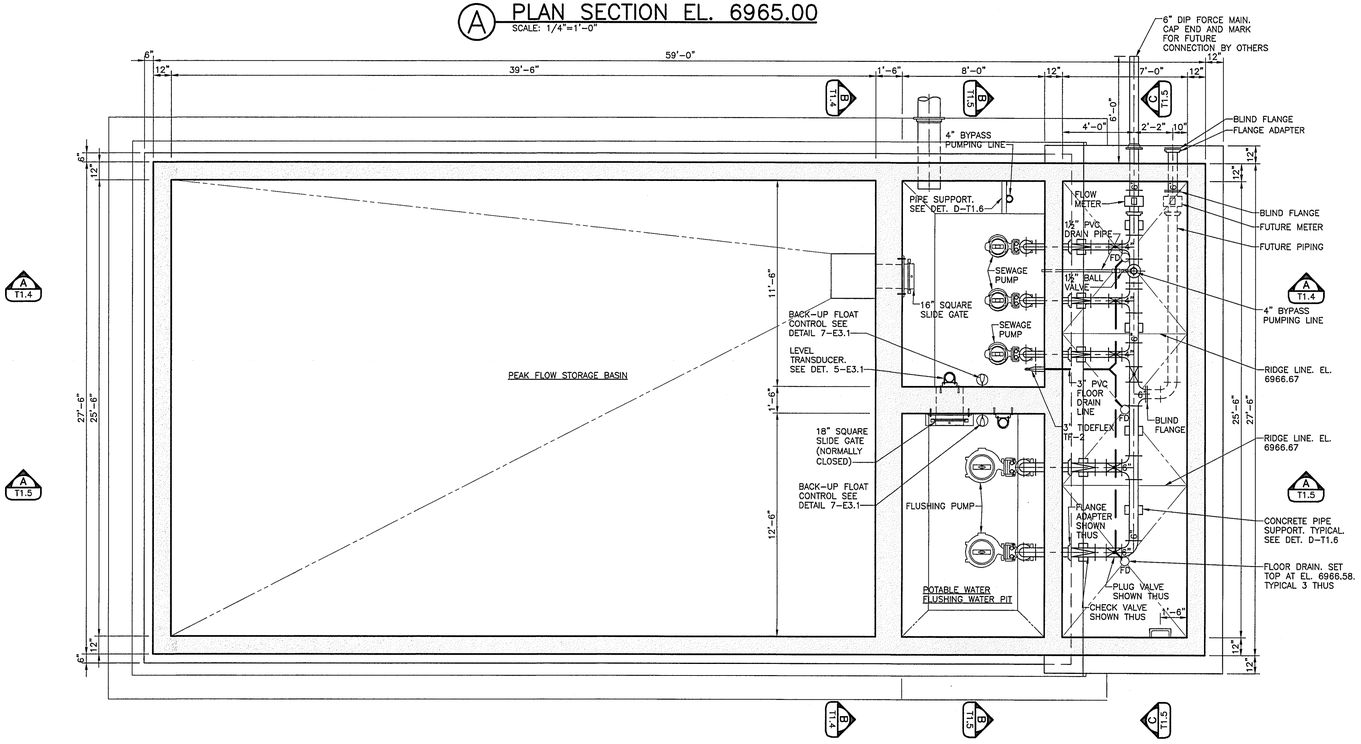

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REVISIONS

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DESIGNED BY JTC
DATE 04-20-2017
JOB NUMBER-TASKS 0416011.01
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STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
PLAN SECTIONS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
T1.2

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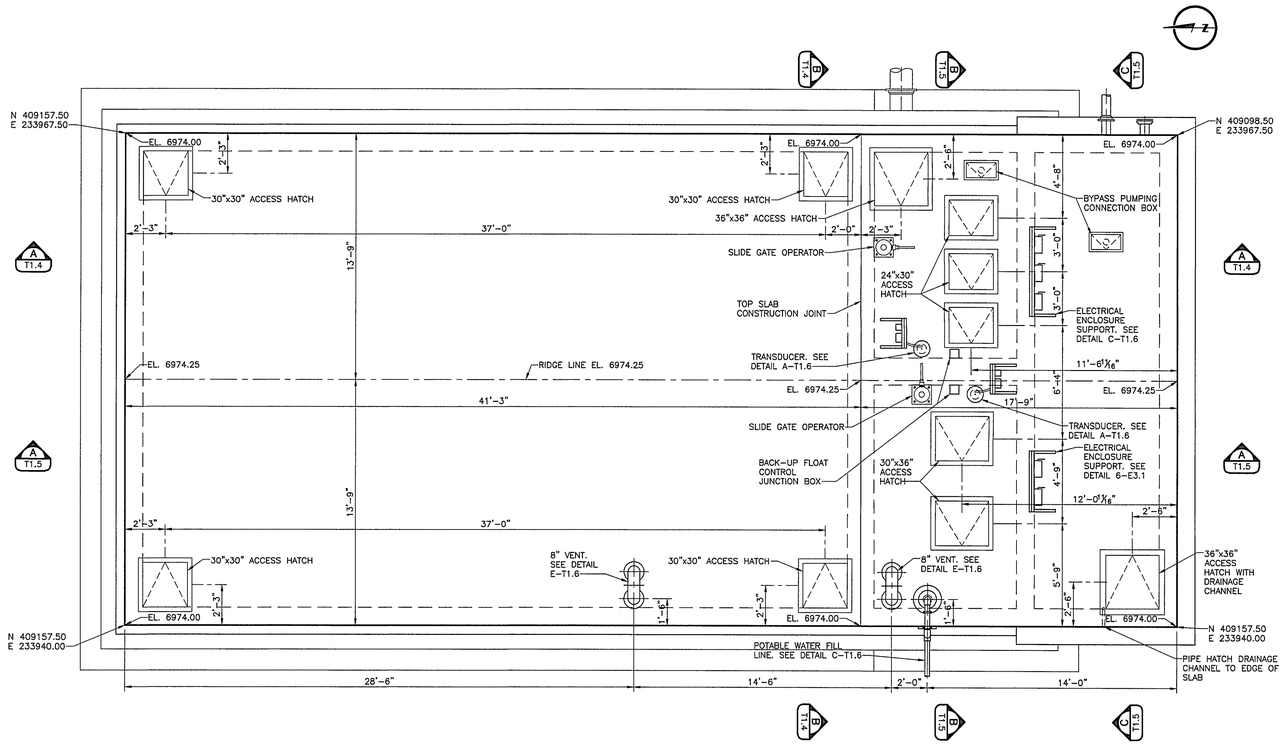

A PLAN
SCALE: 1/4"=1'-0"

DRAWN BY	TWG
DESIGNED BY	ITC
DATE	04-20-2017
JOB NUMBER-TASKS	0416011.01
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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION PLAN

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
T1.3

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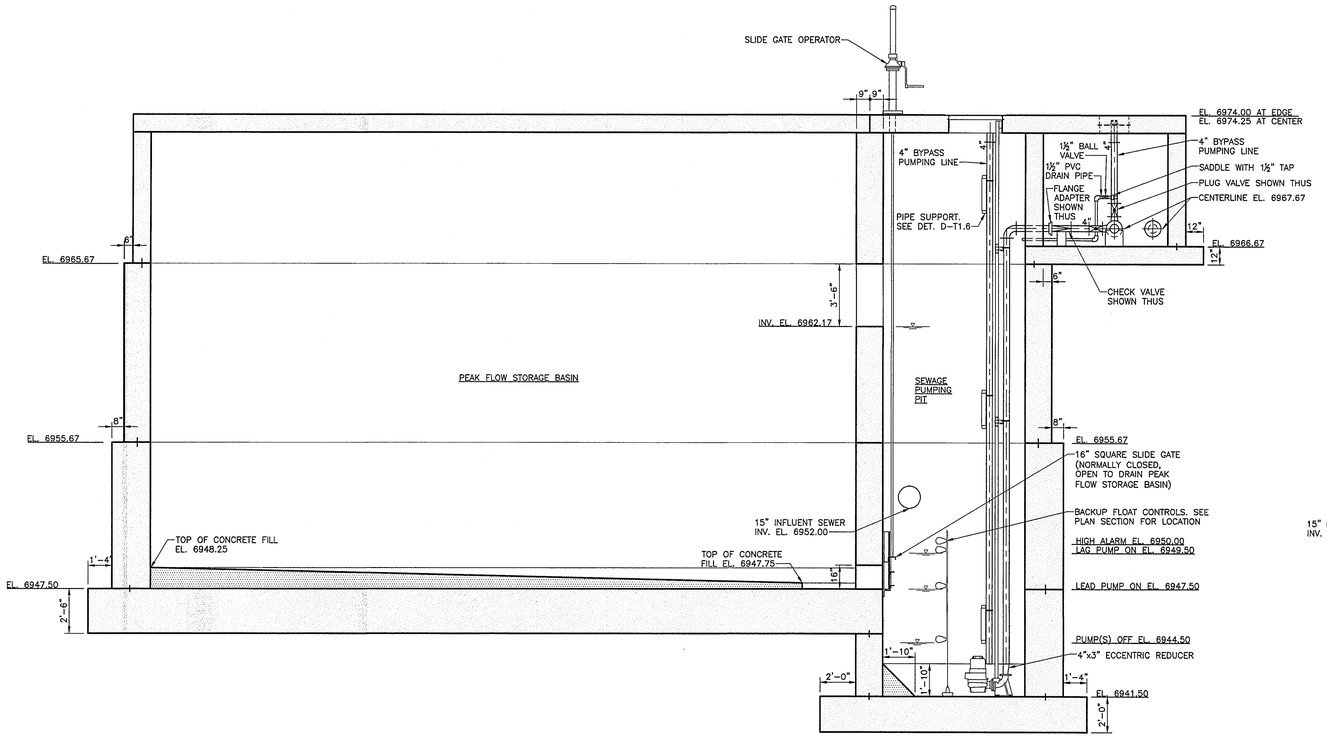

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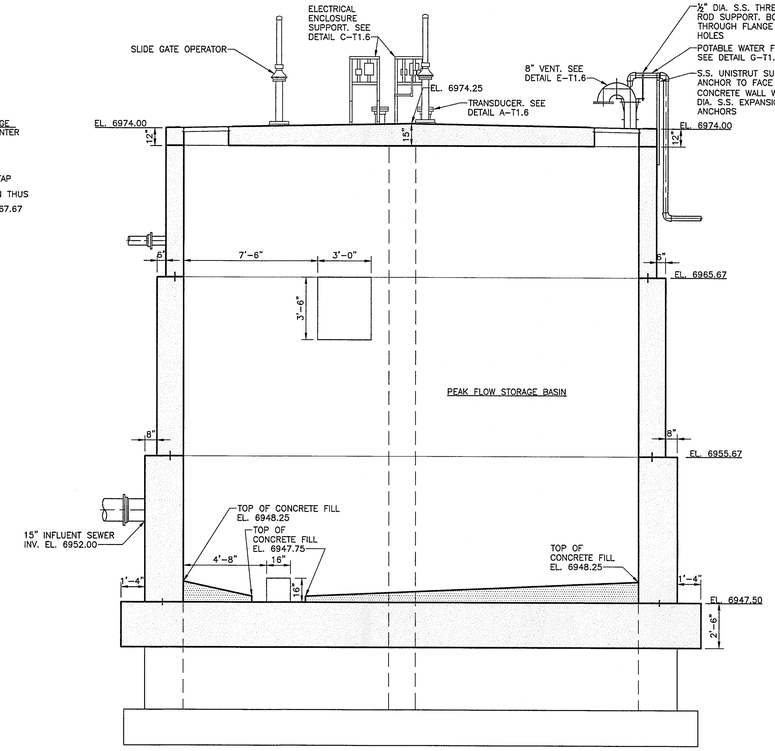

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DRAWN BY: WG
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DATE: 04-20-2017
JOB NUMBER-TASKS: 0416011.01
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REVISIONS

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STERLING RANCH LIFT STATION & FORCE MAIN
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LIFT STATION SECTIONS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
T1.4

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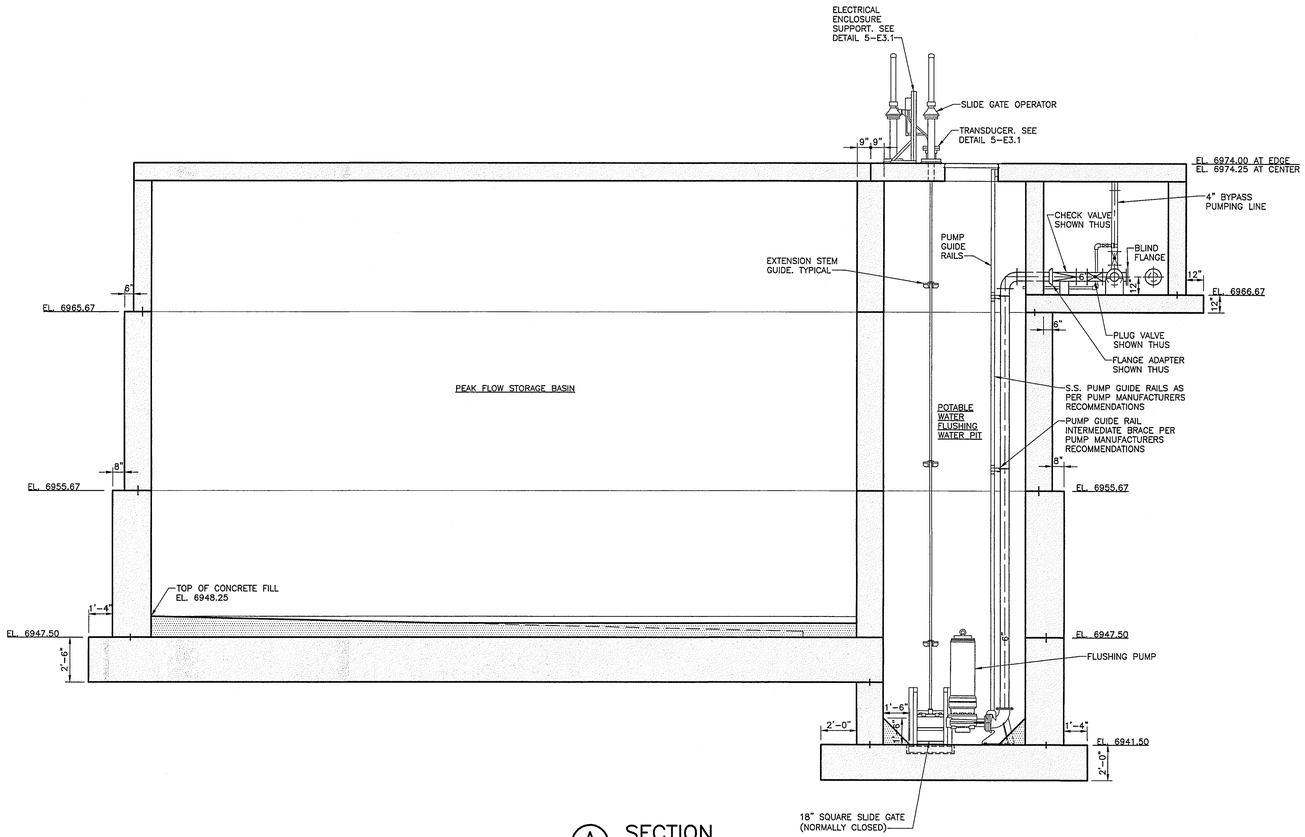

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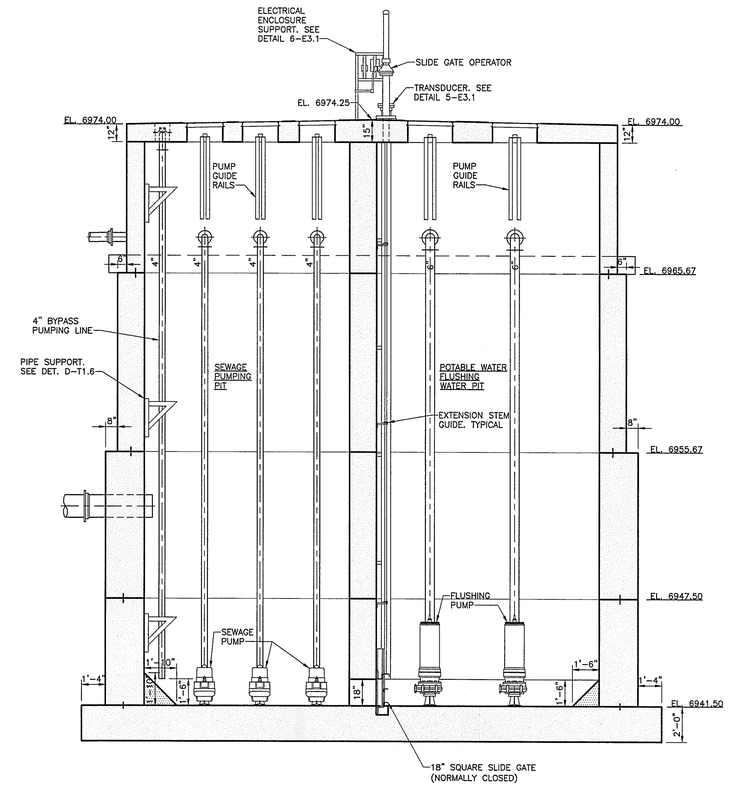

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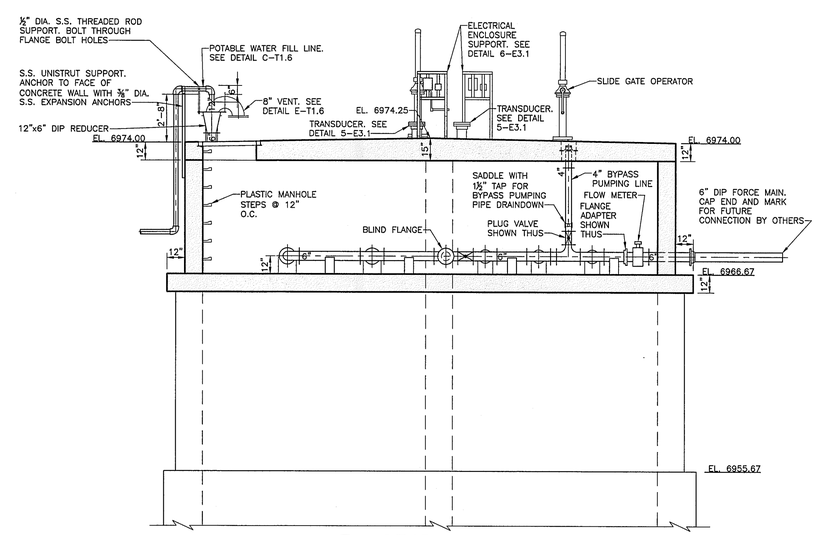

C SECTION
SCALE: 1/4"=1'-0"

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DATE	04-20-2017
JOB NUMBER-TASKS	0416011.01
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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION SECTIONS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
T1.5

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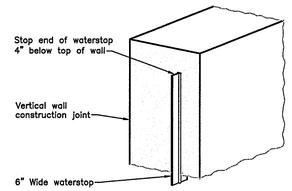

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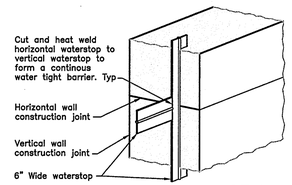
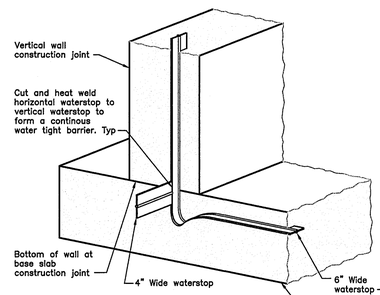
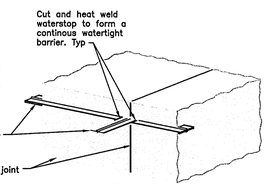


WALL CONSTRUCTION JOINT

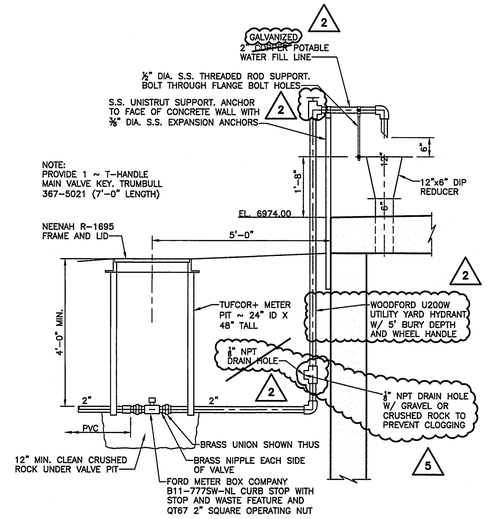


WALL AT BASE SLAB CONSTRUCTION JOINT



BASE SLAB CONSTRUCTION JOINT

B WATERSTOP DETAILS
SCALE: NTS



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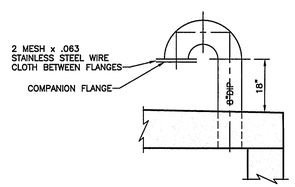

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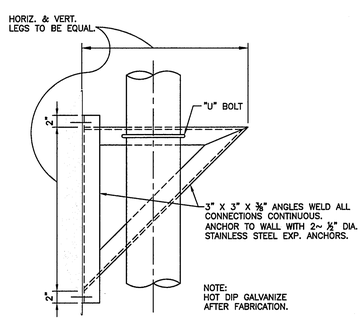
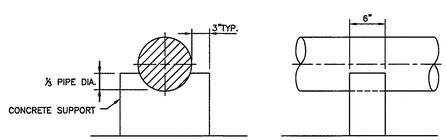


VERTICAL PIPE SUPPORT



CONCRETE PIPE SUPPORT

D PIPE SUPPORT DETAILS
SCALE: 1"=1'-0"

REVISIONS		
1	REV PER MSMD COMMENTS	04/23/19
2	REV PER MSMD COMMENTS	07/30/19

DRAWN BY	TWS
DESIGNED BY	ITC
DATE	6-20-2017
JOB NUMBER-TASK#	0416011.01
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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

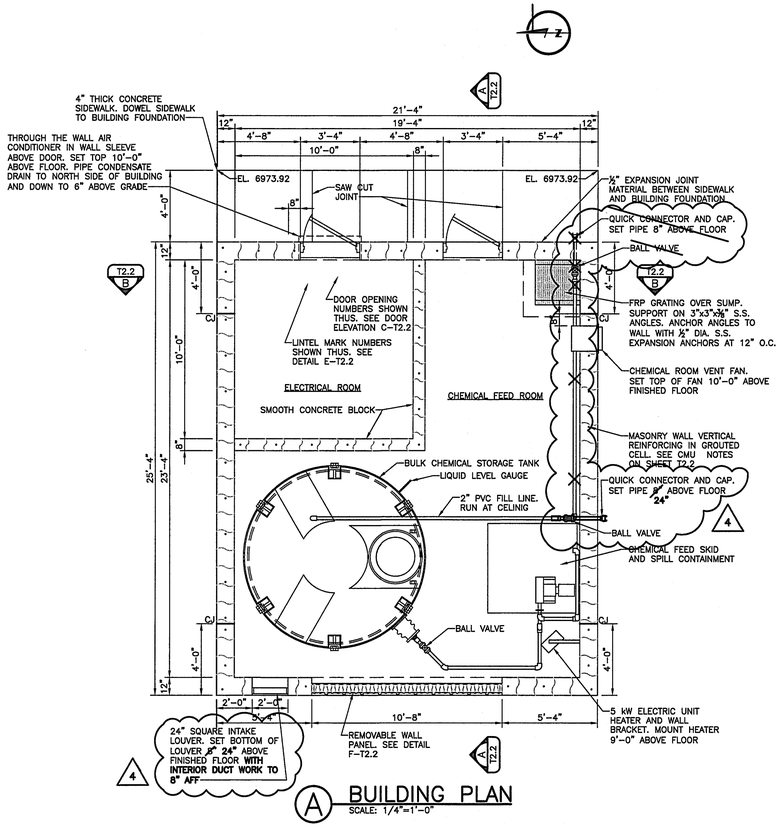
LIFT STATION
MISCELLANEOUS DETAILS

LAMP RYNEARSON - ENGINEERS

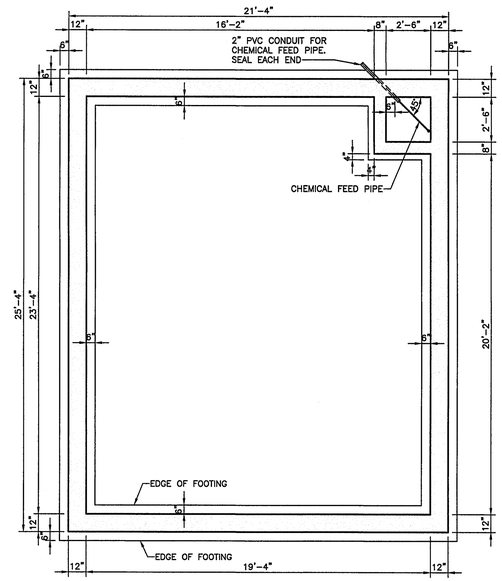
BRADLEY A. SIMONS
34709

SHEET
T1.6

H:\Projects\AM - Sterling Ranch\CAD\Engineering\Sheet Sets\CD's\0416011 LIFT Station-MSMdwg, 7/30/2019 12:11:10 PM, SAM WONG, LAMP RYNEARSON & ASSOCIATES



A BUILDING PLAN
SCALE: 1/4"=1'-0"



B BUILDING FOUNDATION PLAN
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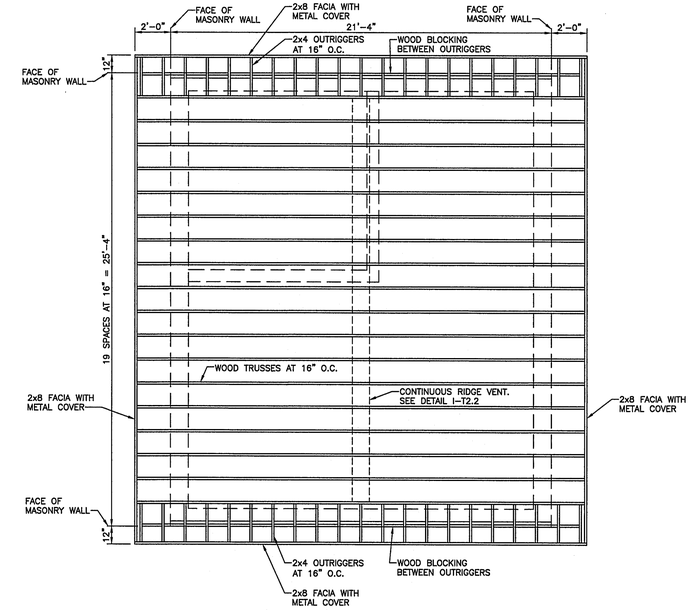

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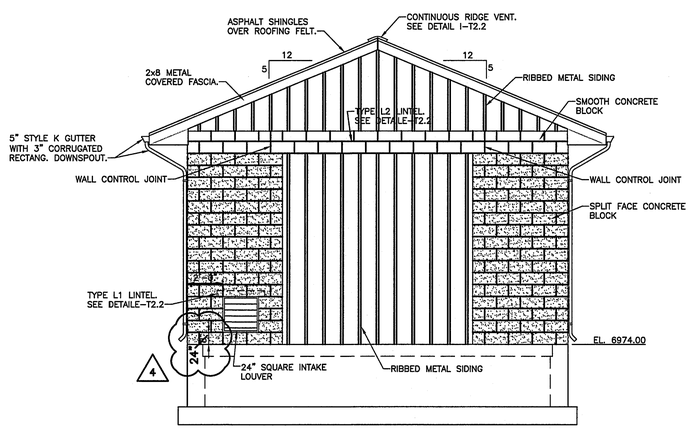

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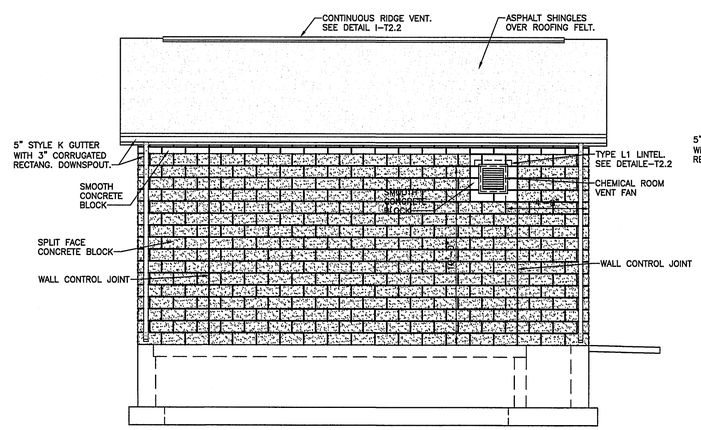

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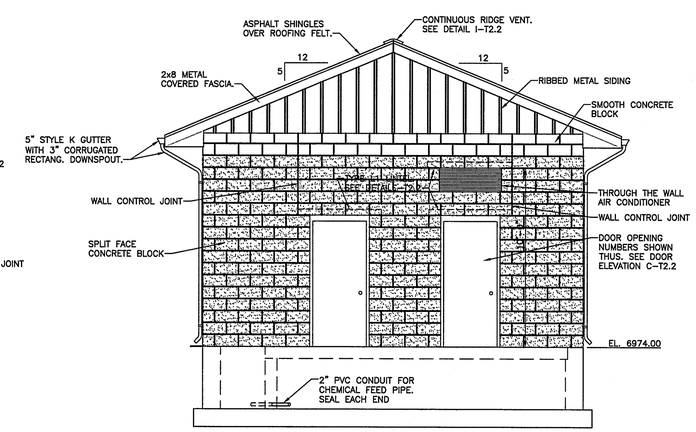

F EAST BUILDING ELEVATION
SCALE: 1/4"=1'-0"

DRAWN BY	TWB
DESIGNED BY	ITC
DATE	04-20-2017
JOB NUMBER	74363
SHEET	01 OF 01
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REVISIONS
1 REVISED PER COMMENTS - 06/07/19

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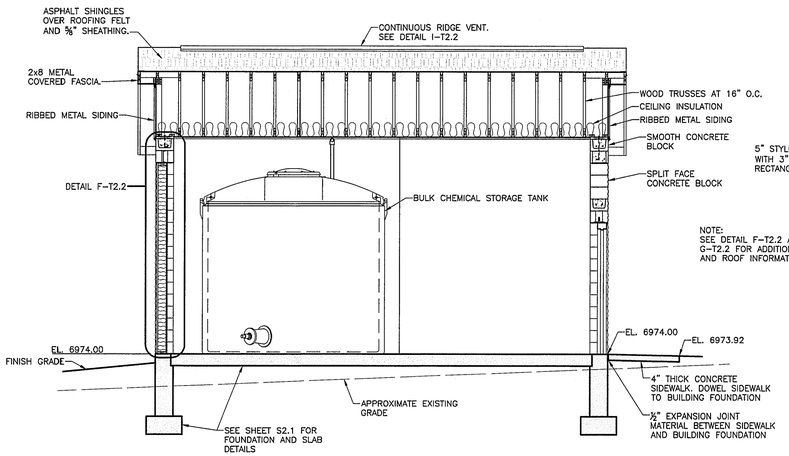
STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

CHEMICAL AND ELECTRICAL BUILDING PLAN AND ELEVATIONS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
T2.1



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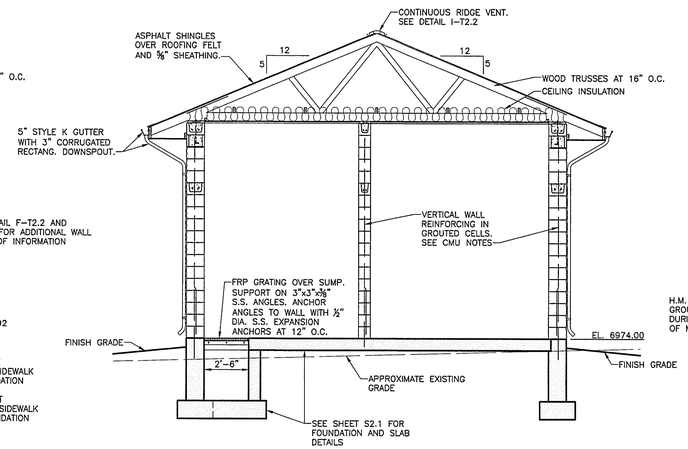

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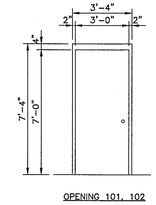

C DOOR ELEVATION
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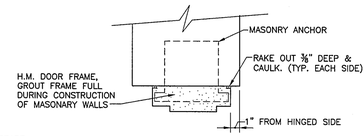

D DOOR FRAME DETAIL
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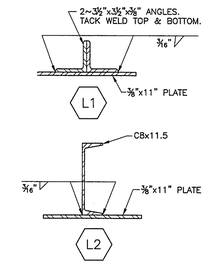
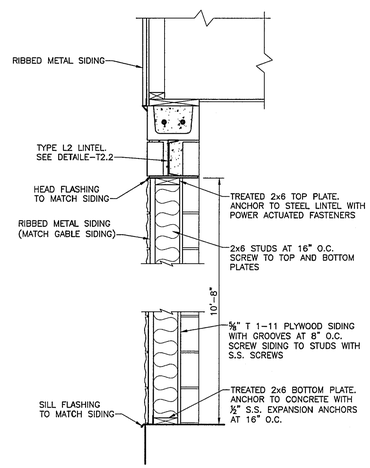
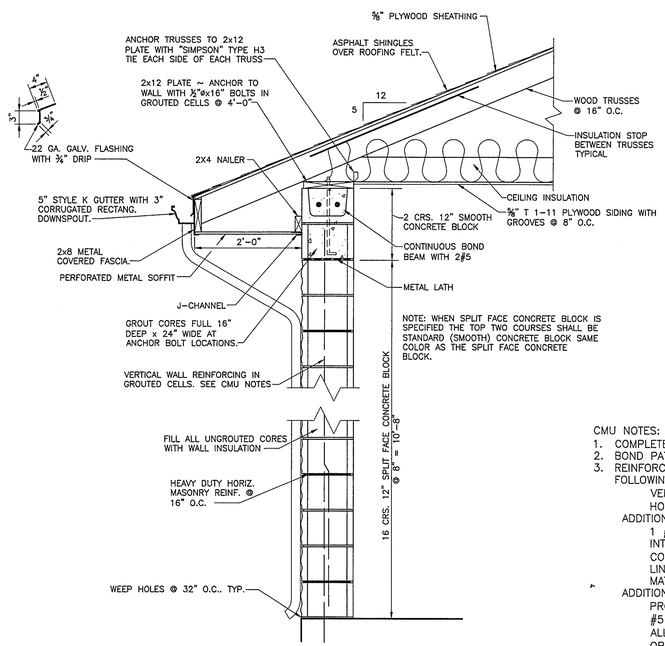


NOTE:
1. 8" MIN. END BEARING REQ'D ON ALL TYPE L1 AND L2 LINTELS.
2. HOT DIP GALVANIZE AFTER FABRICATION

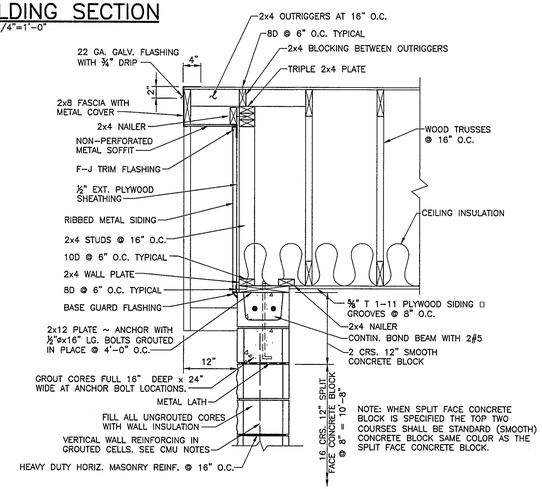
E LINTEL DETAILS
SCALE: 1 1/2"=1'-0"



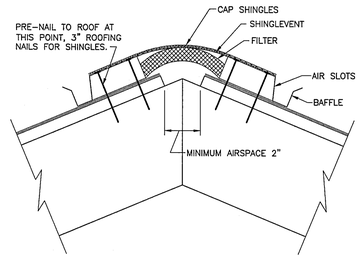
F REMOVABLE WALL PANEL
SCALE: 3/4"=1'-0"



G SIDEWALL ROOF FRAMING DETAIL
SCALE: 3/4"=1'-0"



H GABLE WALL ROOF FRAMING DETAIL
SCALE: 3/4"=1'-0"



I CONTINUOUS RIDGE VENT
SCALE: 3"=1'-0"

CMU NOTES:
1. COMPLETED UNIT MASONRY: f'm=1500 PSI
2. BOND PATTERN: RUNNING BOND
3. REINFORCE WALLS AS NOTED ON PLANS BUT NOT LESS THAN THE FOLLOWING MINIMUMS:
   VERT 1 #5 AT 2'-0" OC
   HORZ 1 #5 AT 8'-0" OC (8" TALL BOND BEAM)
   ADDITIONAL VERT:
   1 #5 VERT IN CELL AT EACH WALL CORNER, WALL INTERSECTIONS, JAMB OF OPENINGS AND EACH SIDE OF CONTROL OR EXPANSION JOINTS. 1 #5 VERT BELOW ALL STEEL LINTEL OR BEAM BEARINGS.PROVIDE DOWELS IN CONCRETE TO MATCH ALL VERT BARS.
   ADDITIONAL HORZ:
   PROVIDE 1 #5 HORZ. BOND BEAM AT TOP OF WALL. PROVIDE 1 #5 HORZ REINF (8" BOND BEAM) AT TOP AND BOTTOM OF ALL OPENINGS UON. EXTEND ALL BARS 24" MIN BEYOND OPENINGS (HOOK BARS IF WALL TERMINATES AMID EXTENSION). PROVIDE HORZ CORNER BARS, SIZE TO MATCH HORZ REINF, L SHAPED, 48 DB EACH LEG. LAP SPLICE REBAR 48 BAR DIAMETERS.
4. SHORE AND BRACE WALLS AS NECESSARY UNTIL ALL STRUCTURAL CONSTRUCTION IS COMPLETE.
5. GROUT ALL CELLS WITH REINFORCING STEEL, HORZ. AND VERT.
6. CONTROL JOINTS: NOTED ON PLANS AS "CJ", OR OTHERWISE PLACE AT 24' MAX SPACING AND 12' MAX AND 4' MIN FROM ENDS OR INTERSECTIONS OF WALLS; USE PREMOLDED, KEY SHAPED, HARD RUBBER OR PVC, WITH SEALANT, DISCONTINUE HORIZONAL REINFORCING (BOND BEAM AND WIRE JOINT REINF) AT VERTICAL CONTROL JOINTS EXCEPT AT FLOOR OR ROOF LEVELS.
7. CONSTRUCT IN ACCORDANCE WITH ACI 530.1

DRAWN BY	TWG
DESIGNED BY	ITC
DATE	04-20-2017
JOB NUMBER	7XXXS
SHEET NO. BOOK AND PAGE	01

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

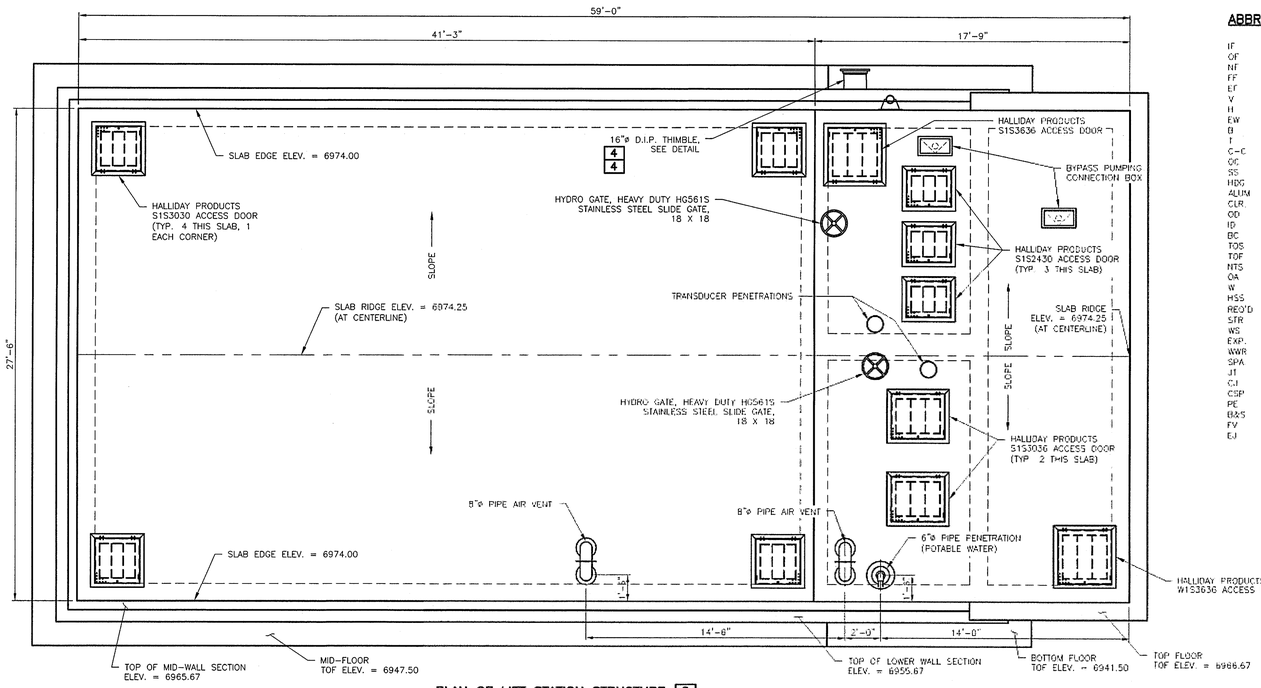
CHEMICAL AND ELECTRICAL BUILDING SECTIONS AND DETAILS

LAMP RYNEARSON - ENGINEERS

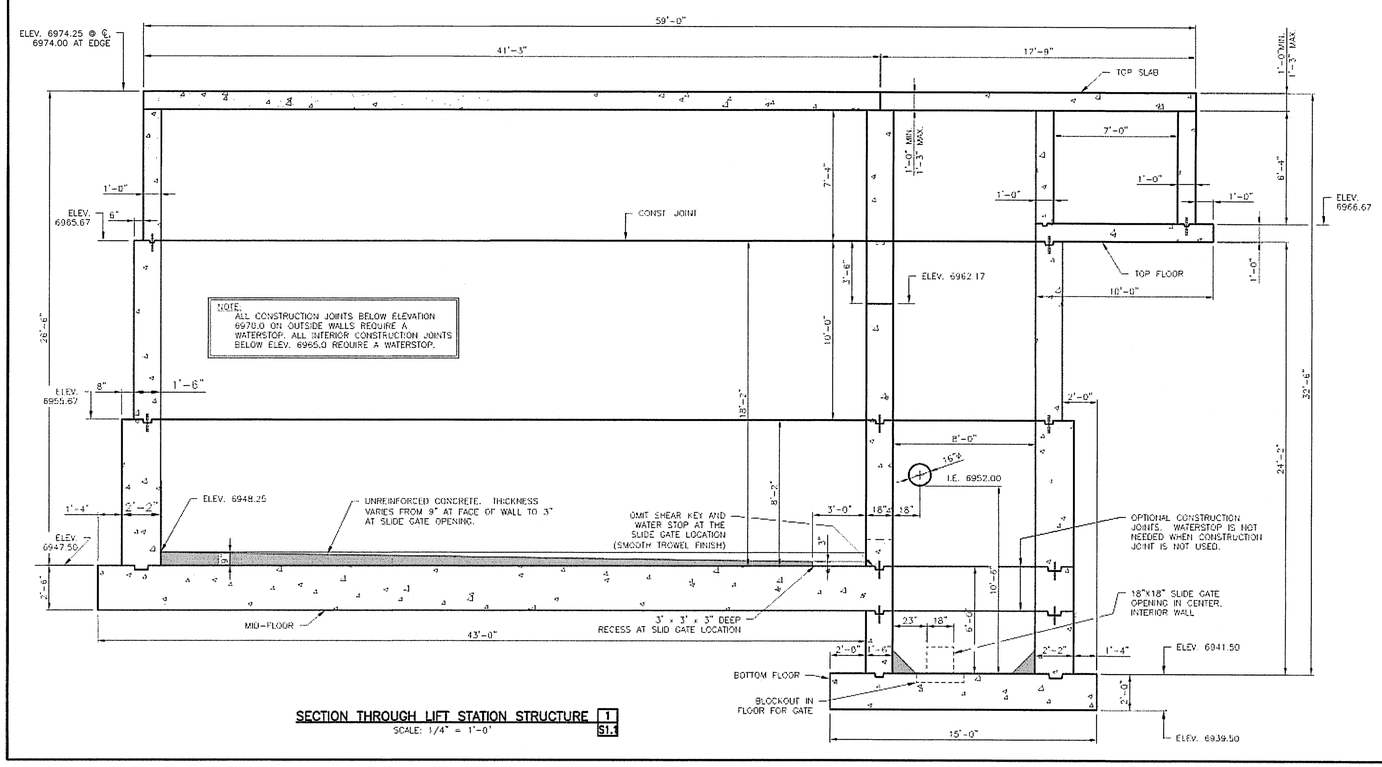
BRADLEY A. SIMONS
34705

SHEET
T2.2

L:\Sterling Ranch (941601) - Temp\DRAWINGS\CONSTRUCTION DRAWINGS\941601 LIFT Station.dwg, 4/20/2017 2:27:51 PM, TODD BOGAN, LAMP RYNEARSON & ASSOCIATES



PLAN OF LIFT STATION STRUCTURE 2 / S1.1
SCALE: 1/4" = 1'-0"



SECTION THROUGH LIFT STATION STRUCTURE 1 / S1.1
SCALE: 1/4" = 1'-0"

ABBREVIATIONS

IF	INSIDE FACE
OF	OUTSIDE FACE
NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
V	VERTICAL
H	HORIZONTAL OR HEIGHT
EW	EACH WAY
B	BOTTOM
T	TOP
C-C	CENTER TO CENTER
OC	ON CENTERS
SS	STAINLESS STEEL
HDG	HOT DIP GALVANIZED
ALUM	ALUMINUM
CLR	CLEARANCE
OD	OUTSIDE DIAMETER
ID	INSIDE DIAMETER
BC	BOLT CIRCLE
TOS	TOP OF SLAB ELEVATION
TOF	TOP OF FOOTING ELEVATION
NTS	NOT TO SCALE
OA	OVERALL
W	WIDTH
HSS	HOLLOW STRUCTURAL SECTION
REQ'D	REQUIRED
STR	STRAIGHT
WS	WATERSTOP
EXP.	EXPANDABLE
WWR	WELDED WIRE REINFORCING
SPA	SPACE OR SPACES
JT	JOINT
CJ	CONSTRUCTION JOINT
CSP	CORRUGATED STEEL PIPE
PE	POLYETHYLENE
B&S	BOTTOM AND SIDES
FV	FIELD VERIFY
EJ	EXPANSION JOINT

CONCRETE STRUCTURE NOTES

1. CONCRETE FOR ALL CAST-IN-PLACE ELEMENTS SHALL BE AIR-ENTRAINED CONCRETE AND SHALL ACHIEVE A 28 DAY COMPRESSIVE STRENGTH NOT LESS THAN 4000 PSI PER ASTM C39. CONCRETE SHALL BE OBTAINED FROM AN APPROVED READY-MIX SUPPLIER UNLESS OTHERWISE APPROVED BY THE ENGINEER. TEST CYLINDERS USED FOR FORM REMOVAL AND BACKFILL TIMING SHALL BE FIELD CURED PER ASTM C31. PORTLAND CEMENT FOR THIS APPLICATIONS SHALL CONFORM TO THE REQUIREMENTS FOR TYPE II CEMENT IN ACCORDANCE WITH ASTM C150, STANDARD SPECIFICATION FOR PORTLAND CEMENT, INCLUDING TABLE 2 (MAXIMUM EQUIVALENT ALKALIES REQUIREMENTS ONLY) AND TABLE 3.
2. THE BASE SLAB OF CONCRETE STRUCTURES SHALL BE GIVEN A ROUGH FLOAT FINISH. THE TOP SLAB OF FLOORS AND STRUCTURES SHALL BE GIVEN A FINISH AS SHOWN IN THE DETAILS. ALL SLABS SHALL BE CURED WITH BURLAP OR A WHITE PIGMENTED CURING COMPOUND.
3. REINFORCING STEEL SHALL BE GRADE 60 PER ASTM A615.
4. ALL BAR SUPPORTS AND ADDITIONAL REINFORCING STEEL REQUIRED BY THE CONTRACTOR TO SUPPORT THE REINFORCING AS DETAILED SHALL BE INCIDENTAL TO THE COST OF THE STRUCTURE.
5. ALL REINFORCING SHALL BE PLACED WITH A 3" CLEARANCE TO CONCRETE SURFACE UNLESS NOTED OTHERWISE. REINFORCING SHALL BE PLACED WITH A TOLERANCE OF -1/4", +1/2" ON CLEARANCE AND ± 1" BETWEEN ADJACENT BARS. REINFORCING SHALL BE HELD IN PLACE BY MANUFACTURED SUPPORTS. BOTTOM REINFORCING OF SLABS ON GRADE MAY BE SUPPORTED BY PRECAST CONCRETE BLOCKS.
6. CONCRETE WALLS AND TOP SLABS SHALL BE BUILT TO THE THICKNESS SHOWN ON THE DRAWING WITH A TOLERANCE OF -0", +1". FORM TIE HOLES ON EXPOSED AND INTERIOR SURFACES SHALL BE PATCHED.
7. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
8. BAR SUPPORTS AGAINST TEXTURED SURFACES SHALL BE STAINLESS STEEL, GALVANIZED OR PLASTIC COATED WITHIN 1/2" FROM THE SURFACE. FORM TIES ON EXPOSED SURFACES SHALL BE STAINLESS STEEL OR PLASTIC.
9. THESE STRUCTURES ARE DESIGNED FOR LATERAL LOADS OF 45 PCF EQUIVALENT FLUID PRESSURE FOR DRAINED SOIL AND 120 PCF SATURATED SOIL CONDITION WITH WATER TABLE DEPTH OF 4 FEET FROM GROUND SURFACE. SOIL LOADS ARE APPLIED WITH AND WITHOUT THE TOP SLAB IN PLACE. THE TOP SLAB IS DESIGNED FOR 120 PSF UNIFORM LOAD AND 2,000 LBS. POINT LOAD
10. ALL CONCRETE INSERTS SHALL BE STRUCTURAL STEEL CONFORMING TO ASTM A36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123, UNLESS NOTED OTHERWISE.
11. EXPANSION JOINT MATERIAL (FIBER TYPE) SHALL CONFORM TO ASTM D1751.
12. WATERSTOP SHALL BE RIBBED CENTER BULB PVC WATERSTOPS HAVING A WIDTH NOT LESS THAN 2/3 OF THE WALL THICKNESS OR 12" MAXIMUM WIDTH UNLESS NOTED OTHERWISE.
13. THE ENGINEER MAY REQUIRE ADDITIONAL EXPANDABLE WATERSTOP AT LOCATIONS DURING CONSTRUCTION THAT COULD REQUIRE PROTECTION FROM SEEPAGE DUE TO CONSTRUCTION METHODS AND FORMING THAT MAY NOT BE DEEMED WATER TIGHT. EXPANDABLE WATERSTOP SHALL BE 1" X 1/2" BENTONITE IMPREGNATED ROPE (TREMCO SUPERSTOP OR APPROVED SUBSTITUTE). WATERSTOP SHALL BE PLACED IN A CONTINUOUS RIBBON AND SECURED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS
14. ANCHOR BOLTS AND DOWELS SHALL BE SECURED IN DRILLED HOLES BY A TWO-COMPONENT EPOXY ADHESIVE (SIMPSON EPOXY TIE OR APPROVED SUBSTITUTE). ADHESIVE SHALL BE MIXED AND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHEN WEATHER CONDITIONS ARE BEYOND THOSE PERMITTED BY THE ADHESIVE MANUFACTURER'S THE CONTRACTOR SHALL PROPOSE ALTERNATE MATERIALS OR METHODS AT NO ADDITIONAL COST TO THE OWNER.
15. EXPANSION ANCHORS SHALL BE OF THE THREE SECTION WEDGE DESIGN (HILTI 304 OR 316 STAINLESS STEEL KWIK BOLT II OR APPROVED SUBSTITUTE) OF THE SIZE SPECIFIED. HOLES SHALL BE DRILLED FULL DEPTH AND CLEANED AND INSPECTED BY THE ENGINEER'S REPRESENTATIVE PRIOR TO INSTALLING THE ANCHORS.
16. PLACEMENT OF CONCRETE WHEN THE TEMPERATURE IS BELOW 40°F SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 306.1. THE PROCEDURES TO OBTAIN SUITABLE CONDITIONS IN THE FORMWORK AND TO PROTECT THE CONCRETE DURING CURING SHALL BE REVIEWED WITH THE ENGINEER 48 HOURS BEFORE THE PLACEMENT.

EXCAVATION AND GRADING FOR CONCRETE STRUCTURES

1. THE CONTRACTOR SHALL EXPOSE EXISTING SEWERS AND CONFLICTS AND VERIFY ALL LOCATIONS AND ELEVATIONS PRIOR TO COMMENCING WORK. DIMENSIONS TO EXISTING STRUCTURES SHALL GOVERN OVER ELEVATIONS AND DIMENSIONS MARKED FV OR THOSE STAKED IN THE FIELD.
2. THE CONTRACTOR SHALL SHORE AND DEWATER THE EXCAVATION AS NECESSARY TO MEET SAFETY REQUIREMENTS AND TO OBTAIN QUALITY CONCRETE WORK.
3. ALL STRUCTURE FOUNDATIONS AND FOOTINGS SHALL BE PLACED ON UNDISTURBED SOIL OR SANDSTONE, OR SHALL BE COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.

STRUCTURAL STEEL AND METAL EMBEDMENTS FOR CONCRETE STRUCTURES

1. ALL HSS ROUND OR RECTANGULAR SECTIONS SHALL CONFORM TO ASTM A500, GRADE B OR C STRUCTURAL TUBING. STRUCTURAL STEEL, STEEL PLATES AND OTHER MISCELLANEOUS STEEL ITEMS IN THE STRUCTURES SHALL BE FABRICATED FROM STRUCTURAL STEEL CONFORMING TO ASTM A36 OR A572. WELDING SHALL MEET REQUIREMENTS OF AWS D1.1.
2. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED AS PER ASTM A153/F2329.
3. ALL STEEL PIPE SHALL BE STANDARD WEIGHT STEEL PIPE CONFORMING TO ASTM A53 OF THE NOMINAL SIZES NOTED (O.D. IS ONE SIZE LARGER). HSS TUBING SHALL CONFORM TO ASTM A500, GRADE B (FY = 42 KSI.)
4. HATCHES SHALL BE HALLIDAY PRODUCTS SERIES W1S OR S1S ACCESS DOOR AS INDICATED ON THE PLANS.
5. ALL ALUMINUM EMBEDMENTS AND HATCHES SHALL BE COATED ON SURFACES IN CONTACT WITH CONCRETE WITH A BITUMINOUS COATING.
6. PAINT SHALL BE THEMEC SERIES 90-97, ZINC PRIMER, THEMEC SERIES 73 ENDURA SHIELD, COLOR TO BE DETERMINED BY ENGINEER. THEMEC SERIES 76 ENDURA-CLEAR COVER, UNLESS OTHERWISE NOTED ON ARCHITECTURAL PLANS OR SPECIFICATIONS. COLOR SAMPLES SHALL BE SUBMITTED TO THE ARCHITECT FOR THE OWNERS REVIEW PRIOR TO ORDERING PAINT.
7. GALVANIZED SURFACES AND STAINLESS STEEL ITEMS SHALL NOT BE PAINTED.

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

ALL UTILITIES ARE SHOWN BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION.

DRAWN BY: R.K.
DESIGNED BY: JMH
DATE: 01/20/2017
COMMUNITY PLANNING BOOK AND PAGE

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

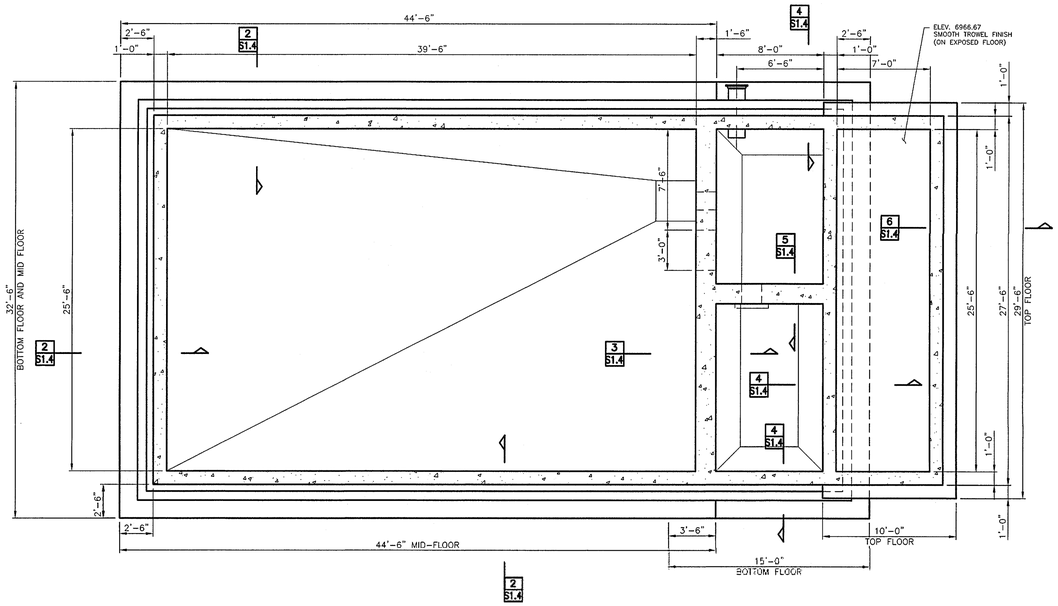
LIFT STATION SECTION AND PLAN

LARKIN LAMP RYNEARSON

COLORADO LICENSED PROFESSIONAL ENGINEER JOHNNY M. HILL 42301
04/20/2017

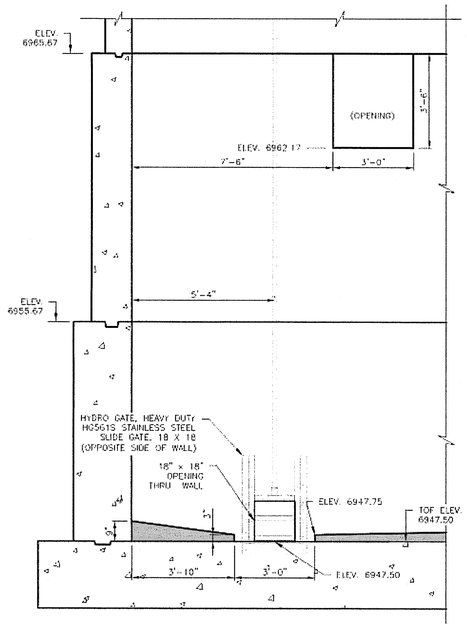
Johnny M. Hill
42301

SHEET
S1.1

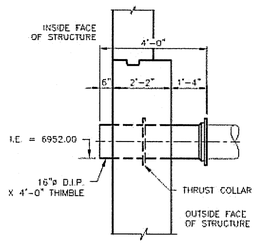


PLAN SECTION THRU UPPER WALL 2/S1.2
SCALE: 3/16" = 1'-0"

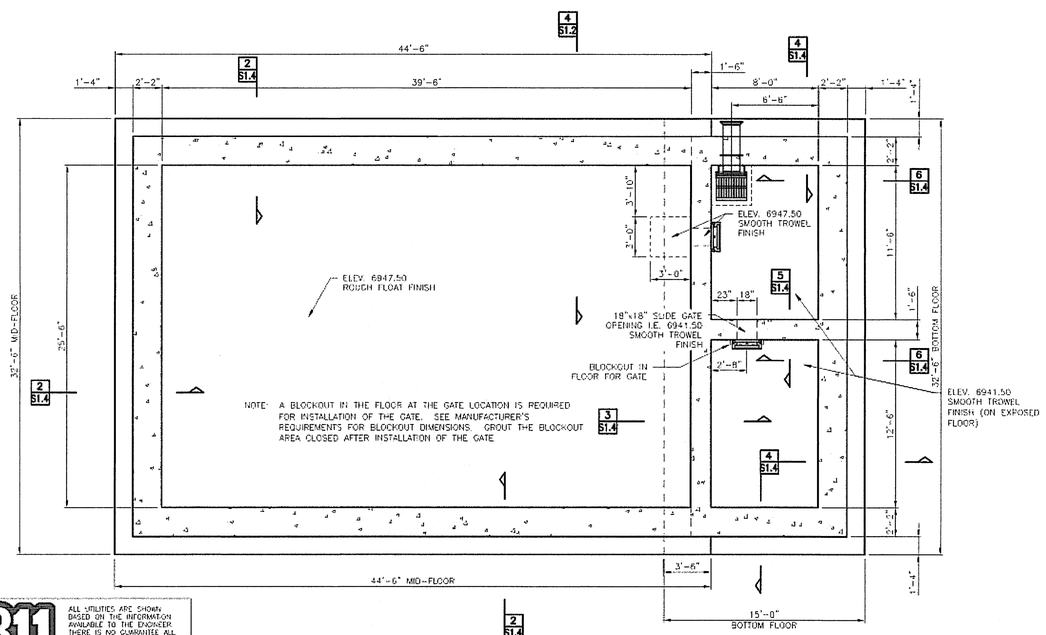
NOTE: SEE SHEETS T1.1 THROUGH T1.5 FOR ALL PENETRATIONS AND BLOCKOUTS FOR SIZE AND LOCATION. NOT ALL MAY BE SHOWN ON THIS SHEET.



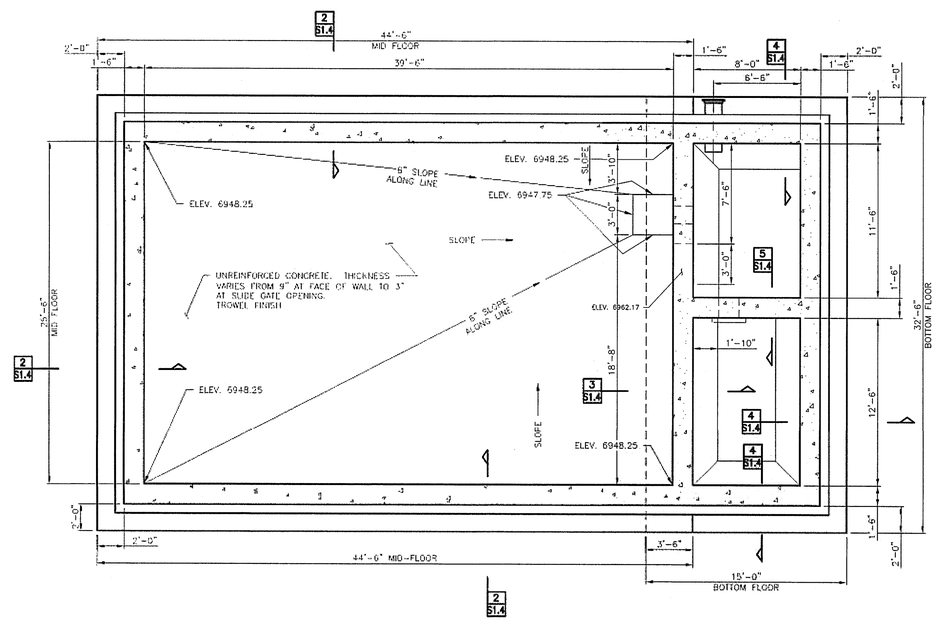
PART ELEVATION NEAR SLIDE GATE SHOWING UNREINFORCED CONCRETE & OPENING 4/S1.2
SCALE: 3/8" = 1'-0"



16"ø THIMBLE DETAIL 5/S1.2
SCALE: 3/8" = 1'-0"



PLAN SECTION THRU LOWER WALL 1/S1.2
SCALE: 3/16" = 1'-0"



PLAN SECTION THRU MID WALL DETAIL 3/S1.2
SCALE: 3/16" = 1'-0"

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DRAWN BY	PJK
DESIGNED BY	JHH
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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
PLAN SECTIONS

LARKIN LAMP RYNEARSON

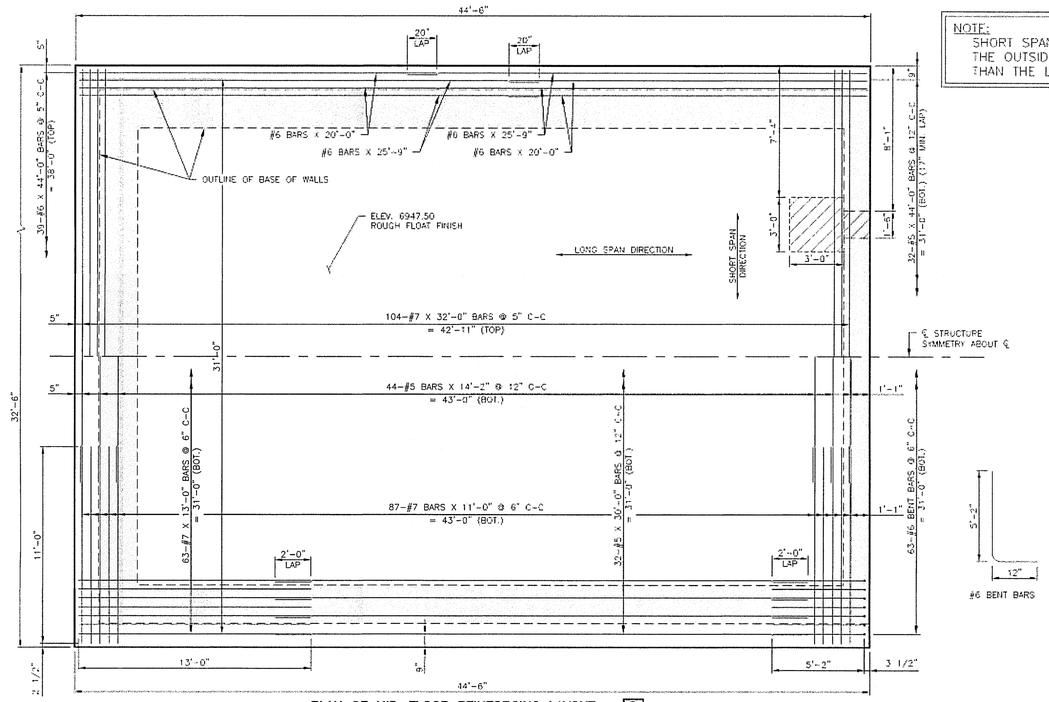
COLORADO LICENSED PROFESSIONAL ENGINEER JOHNNY M. HILL 42301

04/20/2017

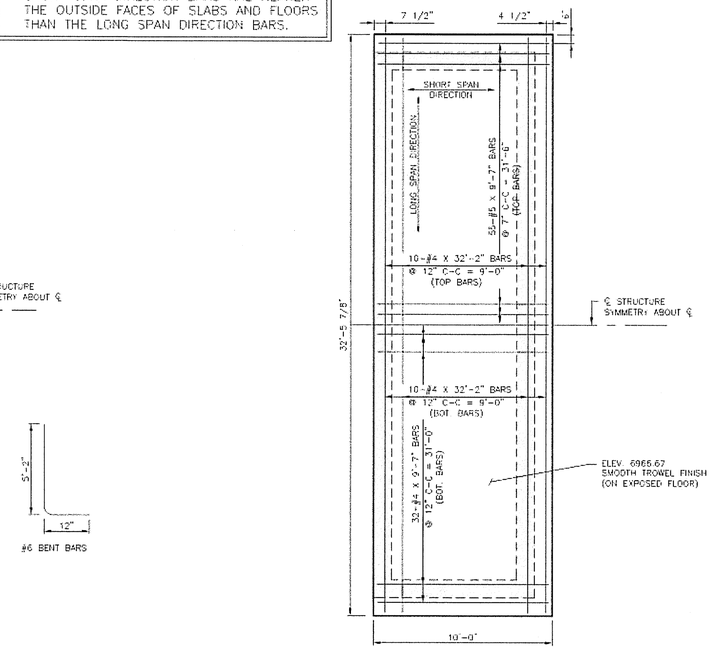
Johnny M. Hill
42301

SHEET
S1.2

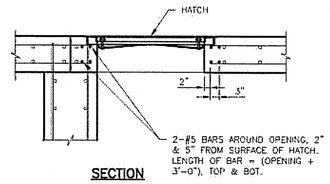
NOTE:
SHORT SPAN DIRECTION BARS ARE NEARER THE OUTSIDE FACES OF SLABS AND FLOORS THAN THE LONG SPAN DIRECTION BARS.



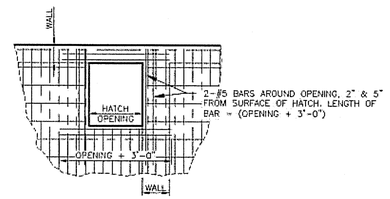
PLAN OF MID-FLOOR REINFORCING LAYOUT 2 S1.3
SCALE: 1/4" = 1'-0"



PLAN OF TOP FLOOR REINFORCING LAYOUT 3 S1.3
SCALE: 1/4" = 1'-0"



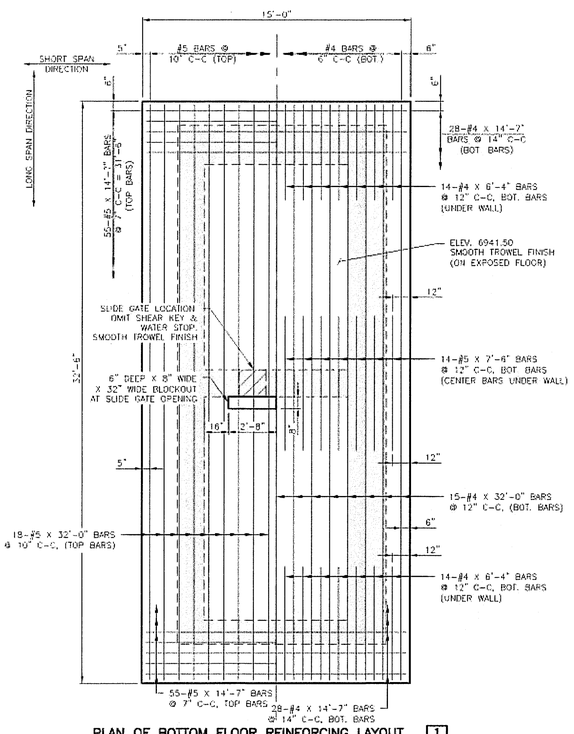
SECTION



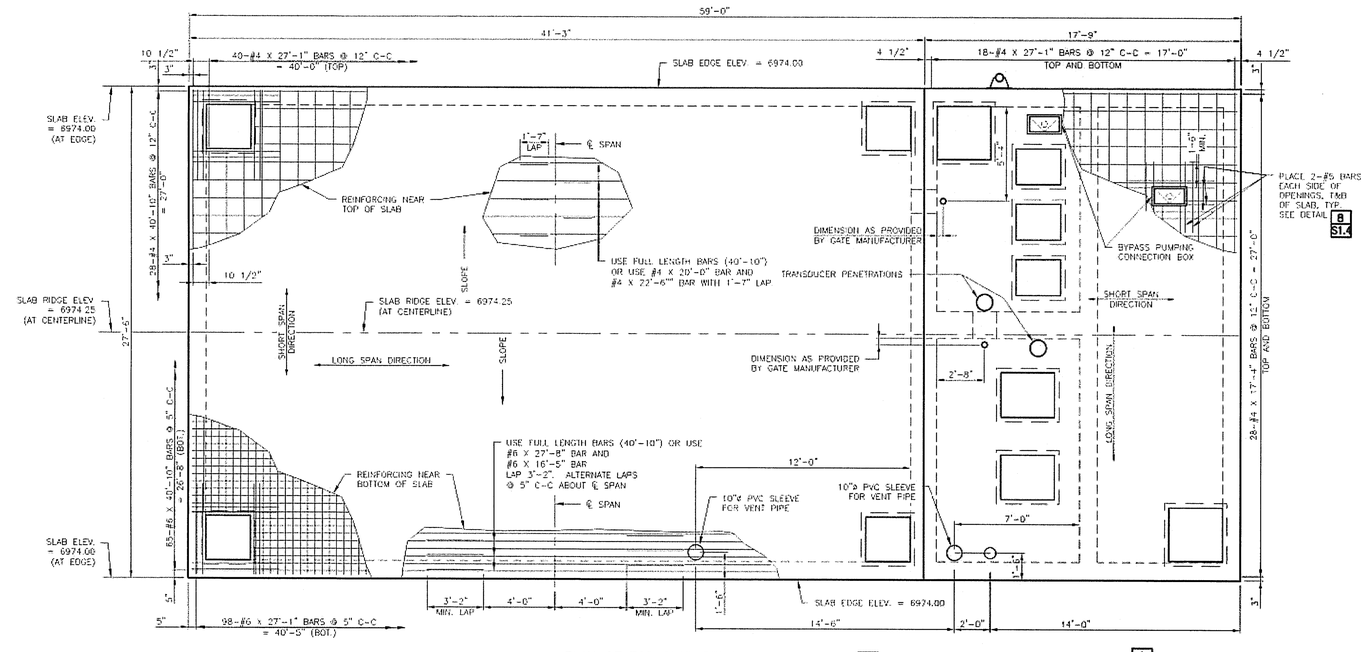
PLAN

TRIM SLAB BARS TO WITHIN 2" OF THE HATCH, TYP. EACH DIRECTION, EACH FACE.

HATCH REINFORCING DETAILS 5 S1.3
SCALE: 1/4" = 1'-0"



PLAN OF BOTTOM FLOOR REINFORCING LAYOUT 1 S1.3
SCALE: 1/4" = 1'-0"



PLAN OF TOP SLAB REINFORCING LAYOUT 4 S1.3
SCALE: 1/4" = 1'-0"

SEE DETAIL 1 S1.4 FOR SECTION THRU TOP SLAB

DRAWN BY	RJK
DESIGNED BY	JMH
DATE	04/20/2017
JOB NUMBER-TASKS	G518011.03-005
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STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
FLOOR & SLAB REINFORCING

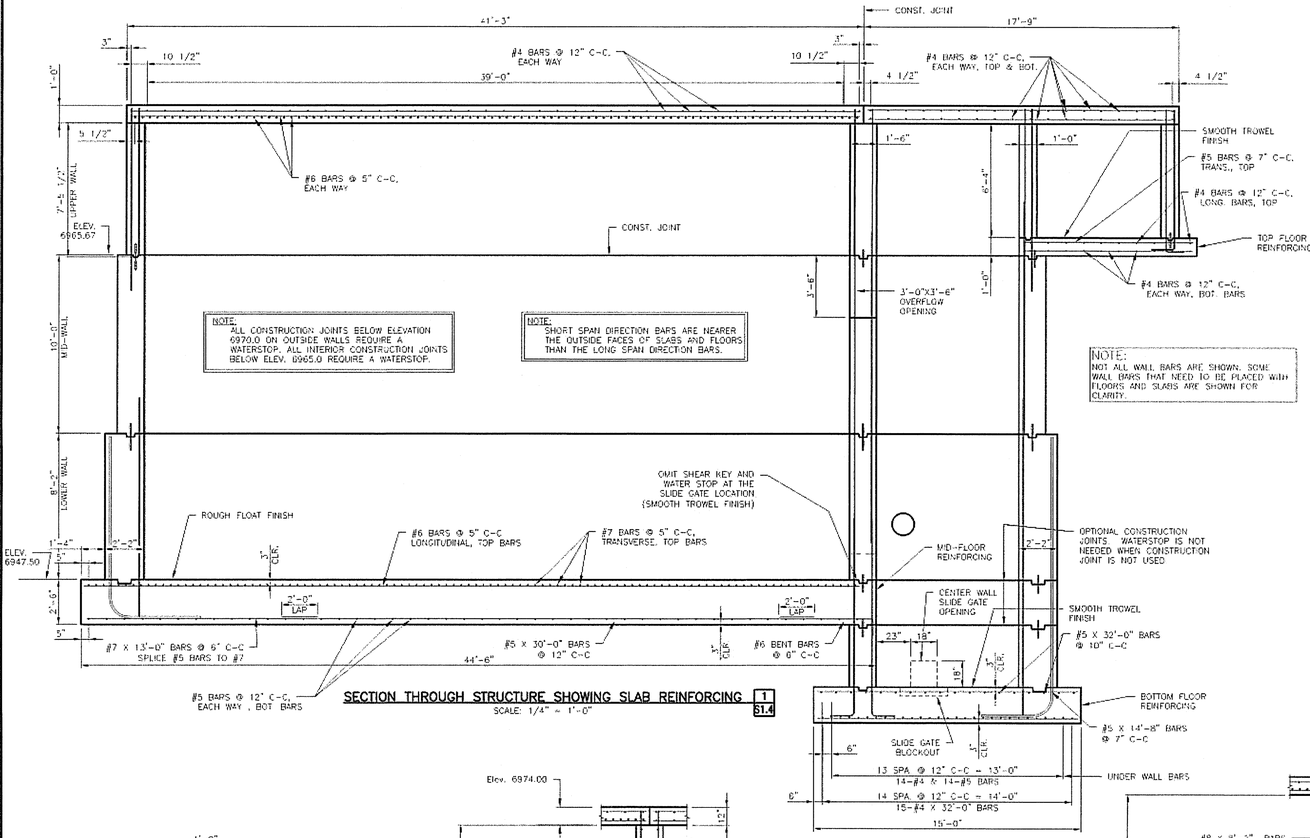
LARKIN LAMP RYNEARSON

COLORADO LICENSED PROFESSIONAL ENGINEER JOHNNY M. HILL

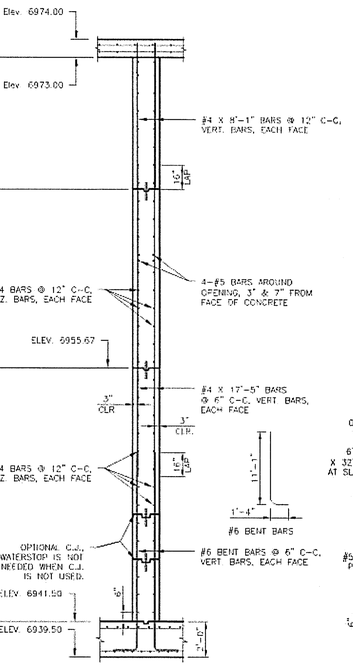
04/20/2017

Johnny M. Hill
42301

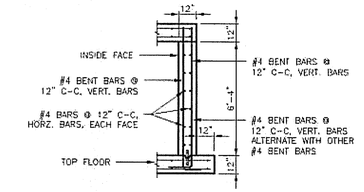
SHEET
S1.3



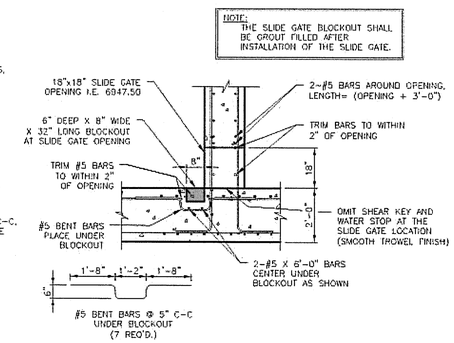
SECTION THROUGH STRUCTURE SHOWING SLAB REINFORCING 1 S1.4
SCALE: 1/4" = 1'-0"



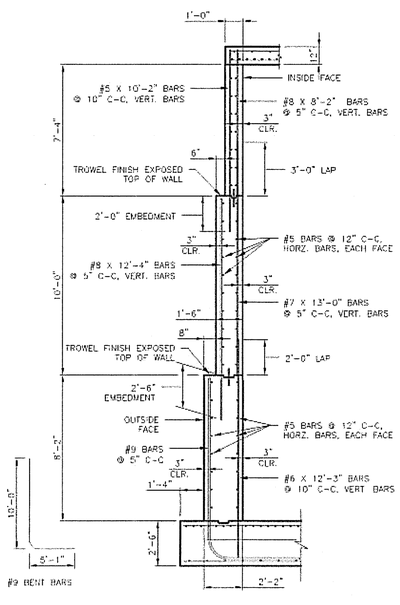
SECTION THRU INTERIOR WALL (SHOWING REINFORCING) 5 S1.4
SCALE: 1/4" = 1'-0"



SECTION THRU OUTSIDE, SHORT HEIGHT WALL 6 S1.4
SCALE: 1/4" = 1'-0"



PARTIAL SECTION THRU INTERIOR WALL (SHOWING SLIDE GATE BLOCKOUT) 7 S1.4
SCALE: 3/8" = 1'-0"



SECTION THRU OUTSIDE, MID-HEIGHT WALL 2 S1.4
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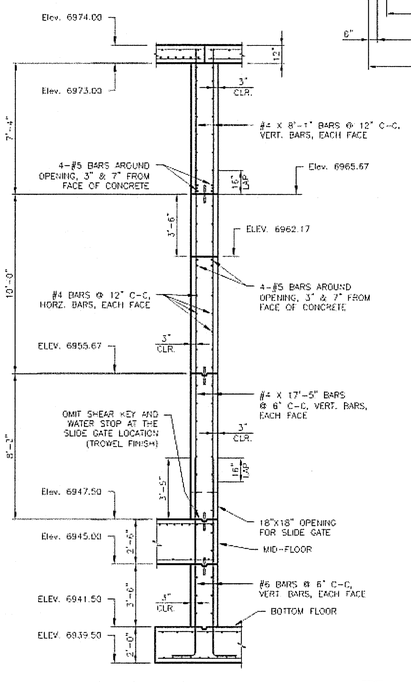
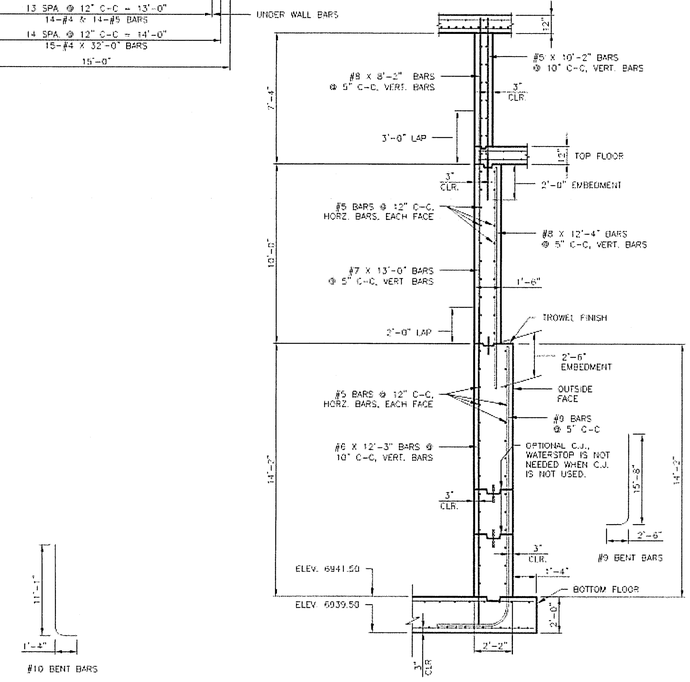
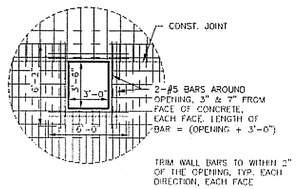


SECTION THRU INSIDE, FULL HEIGHT WALL 3 S1.4
SCALE: 1/4" = 1'-0"



SECTION THRU OUTSIDE, FULL HEIGHT WALL 4 S1.4
SCALE: 1/4" = 1'-0"



PART ELEVATION OF WALL PENETRATION (SHOWING REINFORCING) 8 S1.4
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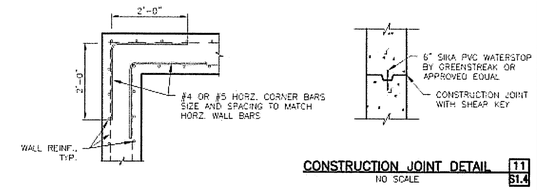
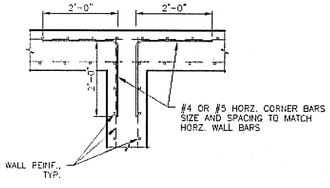
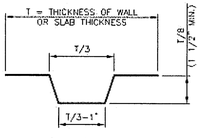


CONSTRUCTION JOINT DETAIL 11 S1.4
NO SCALE



CORNER REINFORCING DETAILS 9 S1.4
NO SCALE



SHEAR KEY DETAIL 10 S1.4
NO SCALE

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LIFT STATION
WALL REINFORCING & DETAILS

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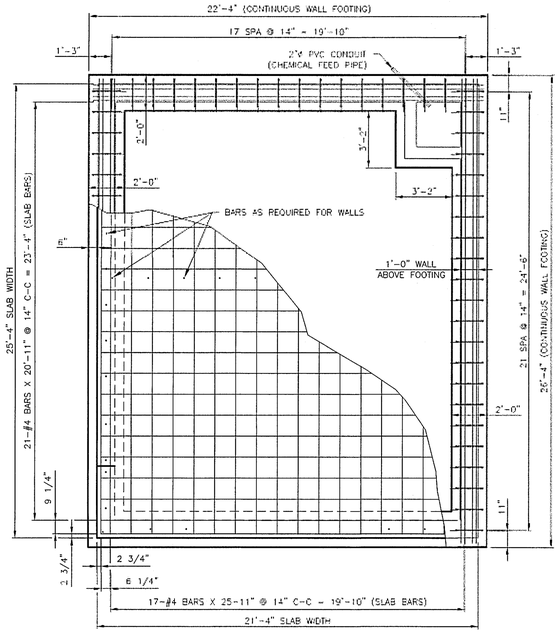
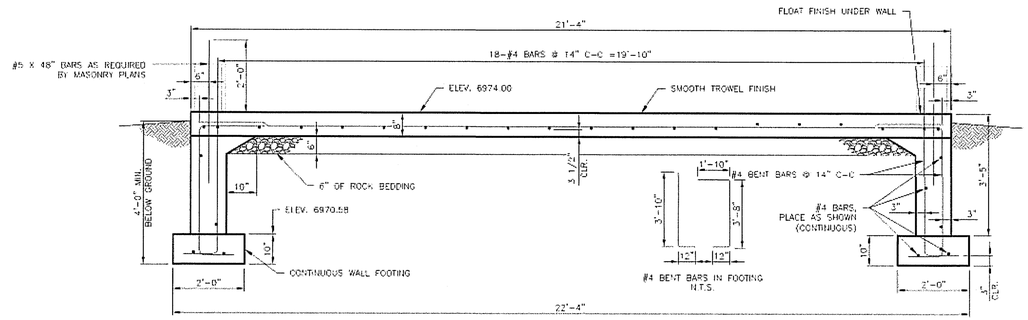
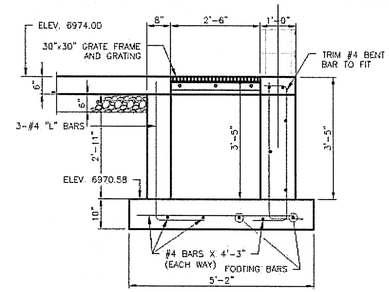


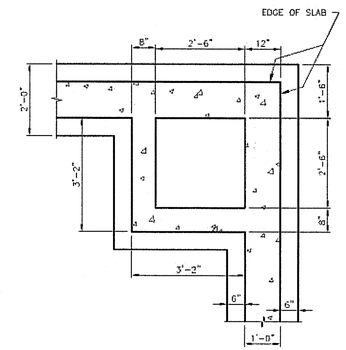
CONTINUOUS FOOTING AND SLAB LAYOUT AND REINFORCING 1 S2.1
Scale: 1/4" = 1'-0"



SECTION THRU CONTINUOUS FOOTING 2 S2.1
Scale: 1/2" = 1'-0"



SUMP FOR CONTINUOUS FOOTING 3 S2.1
Scale: 1/2" = 1'-0"



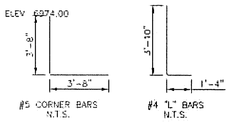
SUMP AREA PLAN VIEW CONTINUOUS WALL 4 S2.1
Scale: 1/2" = 1'-0"

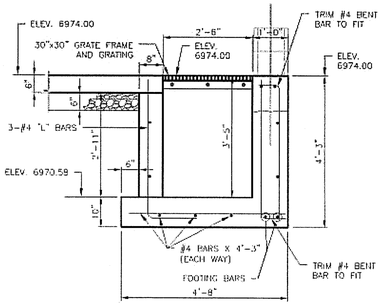
CONCRETE NOTES

1. CONCRETE FOR ALL CAST-IN-PLACE ELEMENTS SHALL BE AIR-ENTRAINED CONCRETE AND SHALL ACHIEVE A 28 DAY COMPRESSIVE STRENGTH NOT LESS THAN 4000 PSI PER ASTM C39. CONCRETE SHALL BE OBTAINED FROM AN APPROVED READY-MIX SUPPLIER UNLESS OTHERWISE APPROVED BY THE ENGINEER. TEST CYLINDERS USED FOR FORM REMOVAL AND BACKFILL TIMING SHALL BE FIELD CURED PER ASTM C31. PORTLAND CEMENT FOR THIS APPLICATIONS SHALL CONFORM TO THE REQUIREMENTS FOR TYPE II CEMENT IN ACCORDANCE WITH ASTM C150, STANDARD SPECIFICATION FOR PORTLAND CEMENT, INCLUDING TABLE 2 (MAXIMUM EQUIVALENT ALKALIES REQUIREMENTS ONLY) AND TABLE 3
2. THE BASE SLAB OF CONCRETE STRUCTURES SHALL BE GIVEN A ROUGH FLOAT FINISH. THE TOP SLAB OF FLOORS AND STRUCTURES SHALL BE GIVEN A FINISH AS SHOWN IN THE DETAILS. ALL SLABS SHALL BE CURED WITH BURLAP OR A WHITE PIGMENTED CURING COMPOUND.
3. REINFORCING STEEL SHALL BE GRADE 60 PER ASTM A615
4. ALL BAR SUPPORTS AND ADDITIONAL REINFORCING STEEL REQUIRED BY THE CONTRACTOR TO SUPPORT THE REINFORCING AS DETAILED SHALL BE INCIDENTAL TO THE COST OF THE STRUCTURE.
5. ALL REINFORCING SHALL BE PLACED WITH A 3" CLEARANCE TO CONCRETE SURFACE UNLESS NOTED OTHERWISE. REINFORCING SHALL BE PLACED WITH A TOLERANCE OF -1/4", +1/2" ON CLEARANCE AND ± 1" BETWEEN ADJACENT BARS. REINFORCING SHALL BE HELD IN PLACE BY MANUFACTURED SUPPORTS. BOTTOM REINFORCING OF SLABS ON GRADE MAY BE SUPPORTED BY PRECAST CONCRETE BLOCKS.
6. CONCRETE WALLS AND TOP SLABS SHALL BE BUILT TO THE THICKNESS SHOWN ON THE DRAWING WITH A TOLERANCE OF -0", +1". FORM TIE HOLES ON EXPOSED AND INTERIOR SURFACES SHALL BE PATCHED.
7. BAR SUPPORTS AGAINST TEXTURED SURFACES SHALL BE STAINLESS STEEL, GALVANIZED OR PLASTIC COATED WITHIN 1/2" FROM THE SURFACE. FORM TIES ON EXPOSED SURFACES SHALL BE STAINLESS STEEL OR PLASTIC.
8. PLACEMENT OF CONCRETE WHEN THE TEMPERATURE IS BELOW 40°F SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 306.1. THE PROCEDURES TO OBTAIN SUITABLE CONDITIONS IN THE FORMWORK AND TO PROTECT THE CONCRETE DURING CURING SHALL BE REVIEWED WITH THE ENGINEER 48 HOURS BEFORE THE PLACEMENT.
9. SOME REINFORCEMENT FOR THE MASONRY WALLS WILL NEED TO BE PLACED WITH THE CONCRETE SLAB AND/OR FOUNDATION. REFER TO THE DETAILS AND NOTES ON SHEETS T2.1 & T2.2 FOR CMU AND REINFORCEMENT PLACEMENT FOR THE WALLS.
10. THE FOUNDATION FOR THE CHEMICAL BUILDING MAY BE CONSTRUCTED AS A CONTINUOUS WALL FOOTING OR, AS AN ALTERNATE, A GRADE BEAM FOOTING. THE SLAB DIMENSIONS AND REINFORCEMENT IN THE SLAB IS THE SAME FOR EITHER ALTERNATE.

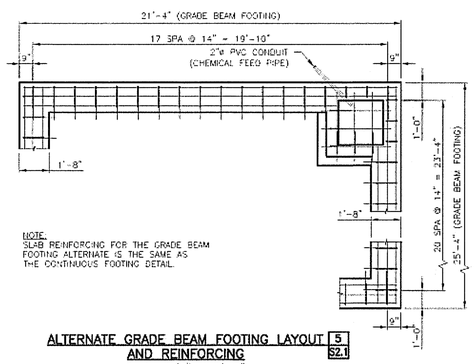
EXCAVATION AND GRADING FOR CONCRETE STRUCTURES

1. THE CONTRACTOR SHALL EXPOSE EXISTING SEWERS AND CONFLICTS AND VERIFY ALL LOCATIONS AND ELEVATIONS PRIOR TO COMMENCING WORK. DIMENSIONS TO EXISTING STRUCTURES SHALL GOVERN OVER ELEVATIONS AND DIMENSIONS MARKED FV OR THOSE STAKED IN THE FIELD.
2. THE CONTRACTOR SHALL SHORE AND DEWATER THE EXCAVATION AS NECESSARY TO MEET SAFETY REQUIREMENTS AND TO OBTAIN QUALITY CONCRETE WORK.
3. ALL STRUCTURE FOUNDATIONS AND FOOTINGS SHALL BE PLACED ON UNDISTURBED SOIL OR SANDSTONE, OR SHALL BE COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.

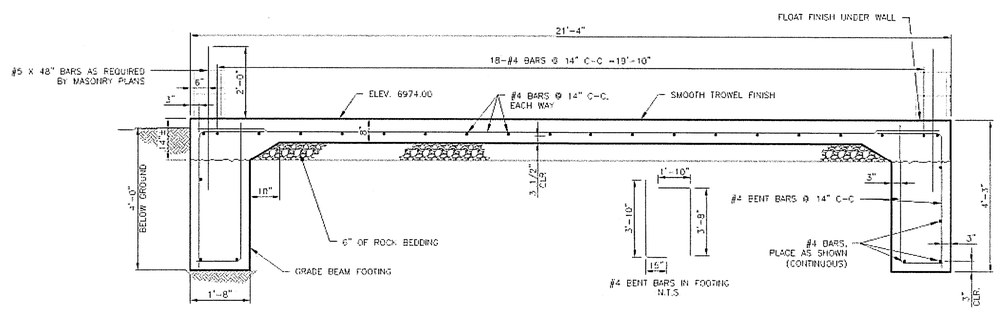




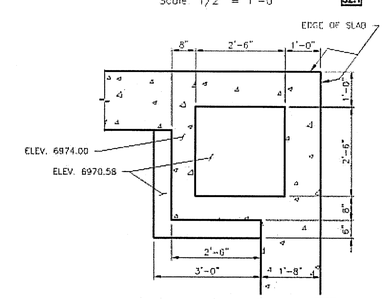
SUMP FOR GRADE BEAM FOOTING 7 S2.1
Scale: 1/2" = 1'-0"



ALTERNATE GRADE BEAM FOOTING LAYOUT AND REINFORCING 5 S2.1
Scale: 1/4" = 1'-0"



SECTION THRU ALTERNATE GRADE BEAM FOOTING 6 S2.1
Scale: 1/2" = 1'-0"



SUMP AREA PLAN VIEW (GRADE BEAM FOOTING) 8 S2.1
Scale: 1/2" = 1'-0"

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

CHEMICAL AND ELECTRICAL BUILDING
SLAB AND FOUNDATION DETAILS

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04/20/2017

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SHEET
S2.1

ELECTRICAL GENERAL NOTES – APPLICABLE TO ALL ELECTRICAL SHEETS

1. PRIOR TO SUBMITTING BIDS THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE TO VERIFY EXISTING ELECTRICAL EQUIPMENT CONDITIONS AND DIFFICULTIES THAT WILL AFFECT EXECUTION OF THE WORK. FIELD VERIFY QUANTITIES OF EXISTING LIGHT FIXTURES, ELECTRICAL DEVICES, COMMUNICATION DEVICES, FIRE ALARM DEVICES, AND ELECTRICAL EQUIPMENT. NOTIFY THE ARCHITECT AND ENGINEER OF ANY EXISTING CONDITIONS WHICH MODIFY THE SCOPE OF WORK AS SHOWN ON THE CONSTRUCTION DOCUMENTS. SUBMISSION OF A BID PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR MOBILIZATION, LABOR, EQUIPMENT, AND/OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WILL NOT BE RECOGNIZED.

2. THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE DRAWINGS OF ALL TRADES WHOSE WORK RELATES TO OR IS DEPENDENT ON ELECTRICAL WORK TO BECOME FULLY INFORMED OF THE EXTENT AND CHARACTER OF THEIR SPECIFIED WORK AND BE ABLE TO COORDINATE IT WHILE AVOIDING POSSIBLE INTERFERENCE WITH THE ELECTRICAL WORK.

3. IT IS THE INTENTION OF THESE SPECIFICATIONS AND DRAWINGS TO CALL FOR FINISHED WORK, TESTED AND READY FOR OPERATION. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN "FURNISH AND INSTALL COMPLETE AND READY FOR USE." "REPLACE" SHALL MEAN TO PUT NEW IN PLACE OF EXISTING. THE ARCHITECTURAL GENERAL AND SPECIAL CONDITIONS FOR THE WORK OF THIS PROJECT AND BASE BUILDING SPECIFICATIONS SHALL BE PART OF THE ELECTRICAL SPECIFICATIONS. THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE GENERAL AND SPECIAL CONDITIONS BEFORE SUBMITTING A BID.

4. ALONGSIDE SUBMISSION OF THE BID, THE ELECTRICAL CONTRACTOR SHALL GIVE WRITTEN NOTICE TO THE ARCHITECT/ENGINEER OF ANY NECESSARY ITEMS OR WORK THAT HAVE BEEN OMITTED FROM THE DRAWINGS OR SPECIFICATIONS. IN THE ABSENCE OF SUCH WRITTEN NOTICE, IT IS MUTUALLY AGREED THAT THE ELECTRICAL CONTRACTOR HAS INCLUDED THE COST OF ALL REQUIRED ITEMS IN HIS BID, AND THAT THE ELECTRICAL CONTRACTOR WILL BE RESPONSIBLE FOR THE APPROVED SATISFACTORY FUNCTIONING OF THE ENTIRE SYSTEM WITHOUT EXTRA COMPENSATION.

5. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE AND SATISFACTORY ELECTRICAL INSTALLATION IN ACCORDANCE WITH THE TRUE INTENT OF THE DRAWINGS AND SPECIFICATIONS. HE SHALL PROVIDE, WITHOUT EXTRA CHARGE, ALL INCIDENTAL ITEMS REQUIRED, AS A PART OF THIS ELECTRICAL INSTALLATION. THE INSTALLATION SHALL BE SO MADE THAT ITS SEVERAL COMPONENT PARTS WILL FUNCTION TOGETHER AS A WORKABLE SYSTEM AND SHALL BE LEFT WITH ALL PARTS ADJUSTED AND IN WORKING ORDER.

6. ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LOCAL FEES, PERMITS, AND SERVICES OF INSPECTION AUTHORITIES REQUIRED BY ELECTRICAL WORK FOR THIS ELECTRICAL CONSTRUCTION. FILE ALL NECESSARY PLANS, PREPARE ALL DOCUMENTS, AND OBTAIN ALL NECESSARY APPROVALS REQUIRED BY ALL GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION. ALL WORK PERFORMED UNDER THIS CONTRACT SHALL REMAIN EXPOSED TO VIEW UNTIL APPROVED BY THE INSPECTION AUTHORITY.

7. ELECTRICAL CONTRACTOR SHALL FULLY COORDINATE WITH OWNER REPRESENTATIVES. ALL ELECTRICAL WORK PERFORMED UNDER THIS CONTRACT SHALL CONFORM WITH LATEST EDITIONS OF THE NATIONAL ELECTRICAL CODE, INTERNATIONAL BUILDING CODE, LOCAL BUILDING AND FIRE DEPARTMENT REQUIREMENTS. PERFORM WORK IN ACCORDANCE WITH REQUIREMENTS OF OWNER REPRESENTATIVE.

8. ELECTRICAL CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER OF ANY CHANGES REQUIRED BY THE BUILDING MANAGEMENT AND TENANT REPRESENTATIVES.

9. BEFORE STARTING WORK, ELECTRICAL CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ARCHITECT/ENGINEER FIVE (5) SETS OF SHOP DRAWINGS, BROCHURES, INSTALLATION INSTRUCTIONS, AND DESCRIPTIVE EQUIPMENT DATA RELATED TO SPECIFIED EQUIPMENT, WIRING DEVICES, AND ACCESSORIES FOR APPROVAL. ELECTRONIC SUBMITTALS (PDF OR SIMILAR) ARE ACCEPTABLE WITH PRIOR APPROVAL FROM THE ARCHITECT. THE CONTRACTOR SHALL IDENTIFY ANY "LONG LEAD TIME" ITEMS WHICH MAY IMPACT THE OVERALL PROJECT SCHEDULE. ALL BIDS SHALL INCLUDE COSTS ASSOCIATED WITH THE PURCHASE AND DELIVERY OF EQUIPMENT TO MEET THE PROJECT SCHEDULE. NO EQUIPMENT SHALL BE ORDERED, PURCHASED, OR INSTALLED PRIOR TO THE APPROVAL OF SHOP DRAWINGS, BROCHURES, INSTALLATION INSTRUCTIONS, AND SCHEDULES. APPROVAL BY THE ARCHITECT/ENGINEER IS INTENDED TO ESTABLISH CONFORMANCE WITH THE PROJECT DESIGN CONCEPT AND THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.

10. THE NAMING OF THE MANUFACTURER OR BRAND WITH CATALOG NUMBER OR OTHER PRODUCT IDENTIFICATION WITHOUT THE WORDS "OR EQUAL" IN THE SPECIFICATIONS OR NOTES SHALL INDICATE THAT IT IS THE ONLY PRODUCT APPROVED FOR PURCHASE. IF THE WORDS "OR EQUAL" ARE USED THEY SHALL BE INTERPRETED AS ESTABLISHING A QUALITY OR PERFORMANCE STANDARD FOR THE MATERIAL OR PRODUCT TO BE PURCHASED. THIS SHALL INDICATE THAT THE ELECTRICAL CONTRACTOR IS NOT RESTRICTED TO THE USE OF THE NAMED AND IDENTIFIED PRODUCT IF A SUBSTITUTE APPROVED BY THE ARCHITECT/ENGINEER IS AVAILABLE. HOWEVER, WHERE A SUBSTITUTION IS REQUESTED, IT WILL BE PERMITTED ONLY WITH THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER. NO SUBSTITUTE MATERIAL OR PRODUCT SHALL BE ORDERED, FABRICATED, SHIPPED OR PROCESSED IN ANY MATTER PRIOR TO THE APPROVAL OF THE ARCHITECT/ENGINEER. THE ELECTRICAL CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR ADDITIONAL EXPENSES AS REQUIRED MAKING CHANGES FROM THE ORIGINAL MATERIAL OR PRODUCT SPECIFIED.

11. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF ELECTRICAL WORK. LOCATIONS ARE APPROXIMATE AND SHALL BE SUBJECT TO MINOR MODIFICATIONS AS DIRECTED BY THE GENERAL CONTRACTOR AND OWNER REPRESENTATIVES. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXACT FITTING OF ALL MATERIALS, EQUIPMENT, ETC., IN THE BUILDING AND TENANT SPACE. ALL DIMENSIONS SHALL BE VERIFIED ON THE JOB.

12. DRAWINGS SHALL NOT BE SCALED FOR ROUGH-IN MEASUREMENTS OR USED AS SHOP DRAWINGS, WHERE DIMENSIONS ARE SHOWN ON PLANS OR DETAILS, THESE DIMENSIONS ARE TO BE FIELD-VERIFIED BY THE ELECTRICAL CONTRACTOR AGAINST EXISTING FIELD CONDITIONS, INSTALLATION REQUIREMENTS OF OTHER TRADES, AND THE MANUFACTURER'S SUBMITTALS FOR EQUIPMENT TO BE INSTALLED. SHOULD ANY CONFLICTS ARISE WHICH CANNOT BE EASILY RESOLVED IN THE FIELD WITHOUT CHANGING THE DESIGN INTENT, THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

13. WHILE ALL WORK IS IN PROGRESS, EXCEPT FOR SHORT DESIGNATED INTERVALS DURING WHICH CONNECTIONS ARE TO BE MADE, CONTINUITY OF SERVICE TO ALL EXISTING SYSTEMS SERVING OCCUPIED SPACES SHALL BE MAINTAINED. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH OWNER AT ALL TIMES FOR ALL NEW-TO-EXISTING CONNECTIONS, SYSTEM SHUTDOWNS, AND RESTART-UP.

14. REPORT ANY EXISTING DAMAGED EQUIPMENT OR SYSTEMS TO THE OWNER PRIOR TO BEGINNING THE PROJECT.

15. BEFORE ANY EQUIPMENT IS INSTALLED, DETERMINE THAT SAID EQUIPMENT WILL PROPERLY FIT WITHIN THE SPACE ALLOCATED. INSTALL ALL EQUIPMENT AND MATERIALS IN SUCH A MANNER AS TO PROVIDE REQUIRED ACCESS FOR SERVICING AND MAINTENANCE. ALLOW AMPLE SPACE FOR REMOVAL OF ALL PARTS THAT REQUIRE REPLACEMENT OR SERVICING.

16. MINIMUM WORKING CLEARANCES PER THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE SHALL BE PROVIDED AROUND AND IN FRONT OF ALL ELECTRICAL EQUIPMENT.

17. ALL CIRCUIT BREAKER LUGS SHALL BE RATED FOR A MINIMUM OF 75 DEGREES CELSIUS.

18. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, UNDAMAGED, BEAR THE UL LABEL WHERE APPLICABLE, AND BE AS SPECIFIED FOR USE IN EACH SPECIFIC LOCATION. ANY INCIDENTAL ACCESSORIES NECESSARY TO COMPLETE THE WORK IN ALL RESPECTS AND MAKE IT READY FOR OPERATION, EVEN IF NOT SPECIFICALLY SPECIFIED, SHALL BE FURNISHED, DELIVERED, AND INSTALLED BY THE ELECTRICAL CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE CLIENT.

19. MINOR DETAILS NOT USUALLY SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF A SYSTEM OR EQUIPMENT, SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S ESTIMATE, AS IF SPECIFIED HEREIN OR SHOWN.

20. NEUTRALS, RACEWAYS, AND NON-CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT AND ASSOCIATED ENCLOSURES SHALL BE GROUNDED IN FULL ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. PROVIDE HARD WIRE GROUND CONNECTIONS TO ALL DEVICES AND SEPARATE, CONTINUOUS, INSULATED GROUND WIRE IN EACH CIRCUIT (#12 CU MINIMUM "GREEN" TRACER GROUND). COORDINATE EQUIPMENT GROUNDING CONDUCTOR WIRE SIZE WITH MANUFACTURER REQUIREMENTS.

21. CONDUIT JOINTS SHALL BE CUT SQUARE, THREADED, REAMED SMOOTH, AND DRAWN UP TIGHT. BENDS OR OFFSETS SHALL BE MADE WITH AN APPROVED BENDER OR HICKEY, OR HUB-TYPE CONDUIT FITTINGS. THE NUMBER OF BENDS PER RUN SHALL CONFORM TO THOSE STATED IN CURRENT NEC.

22. ALL ROOF PENETRATIONS SHALL BE SEALED WATER TIGHT, PROVIDE FLASHING AND COUNTER FLASHING AS REQUIRED. COORDINATE ROOFING WORK WITH THE GENERAL CONTRACTOR.

23. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL JUNCTION AND PULL BOXES TO PROVIDE ACCESS POINTS FOR PULLING AND FEEDING CONDUCTORS INTO A RACEWAY SYSTEM. JUNCTION AND PULL BOXES AND THEIR COVERS SHALL BE FORMED FROM SHEET STEEL AND SHALL BE FINISHED IN GRAY ENAMEL PAINT. BOXES SHALL BE IN INDUSTRY STANDARD SIZES. OUTLET BOXES WITH THE CORRECT FITTING FOR THE APPLICATION SHALL BE LOCATED AT EACH CONDUCTOR SPLICE POINT, AT EACH OUTLET, SWITCH POINT, OR JUNCTION POINT, AND AT EACH PULL POINT FOR THE CONNECTION OF CONDUIT AND OTHER RACEWAYS. OUTLET BOXES FOR CONCEALED WIRING SHALL BE MADE FROM GALVANIZED OR CADMIUM-PLATED SHEET STEEL, AND THEY SHALL HAVE A DEPTH OF AT LEAST 1.5 INCHES, WHETHER SINGLE OR GANGED. THE BOXES SHALL BE LARGE ENOUGH SIZE TO ACCOMMODATE THE NUMBER OF WIRING DEVICES AND CONDUCTORS AS SPECIFIED IN THE FILL SCHEDULE OF THE CURRENT NEC. SECURE BOXES WITH MOUNTING BRACKET, BRACES, HANGER OR BOX MOUNTING SUPPORT.

24. WIRING DEVICES SHALL BE SPECIFICATION GRADE. MINIMUM DEVICE RATING SHALL BE 20 AMPS FOR ALL WIRING DEVICES UNLESS SPECIFICALLY NOTED OTHERWISE. DEVICES WITH DEDICATED CIRCUITS SHALL BE RATED AS REQUIRED BY CIRCUIT LOAD. ISOLATED GROUND RECEPTACLES SHALL BE ORANGE. MATCH COLOR AND TYPE TO EXISTING BUILDING STANDARD. PROVIDE MATCHING NYLON COVER PLATES FOR ALL OUTLETS. ELECTRICAL CONTRACTOR SHALL VERIFY ALL OUTLETS WITH ARCHITECTURAL PLANS AND TENANT BEFORE ORDERING AND PURCHASING OF MATERIALS.

25. ALL JUNCTION BOX COVERS SHALL BE INDELIBLY LABELED WITH PANEL DESIGNATION AND BRANCH CIRCUIT NUMBER OF EACH WIRE WITHIN THE JUNCTION BOX. ALSO LABEL CONDUITS RISING FROM PANEL WITH BRANCH CIRCUIT NUMBERS.

26. ALL WIRING SHALL BE COPPER, TYPE THHN OR THWN INSULATION, UNLESS SPECIFICALLY NOTED OTHERWISE. MINIMUM SIZE SHALL BE #12 AWG. CONDUCTORS SHALL BE FACTORY COLOR-CODED WITH WIRE COLOR CODING AS REQUIRED BY THE NATIONAL ELECTRICAL CODE AND USING STANDARD CONDUCTOR COLOR CODES:

120/208 VOLTS:		277/480 VOLTS:	
A:	BLACK	A:	BROWN
B:	RED	B:	ORANGE
C:	BLUE	C:	YELLOW
NEU:	WHITE	NEU:	GRAY
GND:	GREEN	GND:	GREEN
ISO. G:	GREEN W/YELLOW STRIPE		

27. ALL JOINTS OR SPLICES FOR 10 AWG. CONDUCTORS OR SMALLER SHALL BE MADE WITH UL-APPROVED WIRE NUTS, OR COMPRESSION-TYPE CONNECTORS.

28. ALL JOINTS OR SPLICES FOR CONDUCTORS 8 AWG AND LARGER SHALL BE MADE WITH A MECHANICAL COMPRESSION OR BOLTED CONNECTOR. AFTER THE CONDUCTORS HAVE BEEN MADE MECHANICALLY AND ELECTRICALLY SECURE, THE ENTIRE JOINT OR SPLICE SHALL BE COVERED WITH 3M SCOTCH BRAND NO. 33 TAPE OR APPROVED EQUAL, TO MAKE THE INSULATION VALUE AT THE JOINT OR SPLICE EQUAL TO THE VALUE OF THE CONDUCTOR INSULATION. ALL CONNECTORS SHALL BE UL APPROVED.

29. ALL NEW MULTI-WIRE BRANCH CIRCUITS SHALL INCLUDE SEPARATE NEUTRAL CONDUCTORS OR BREAKER TIES AS REQUIRED BY CURRENT NEC SECTION 210.4 (B).

30. VOLTAGE DROP: THE ELECTRICAL CONTRACTOR SHALL ENSURE THAT VOLTAGE DROP FOR FEEDERS TO DISTRIBUTION EQUIPMENT DOES NOT EXCEED 2% AND VOLTAGE DROP IN BRANCH CIRCUITING DOES NOT EXCEED 3% FOR OVERALL VOLTAGE DROP OF 5% (MAXIMUM). FEEDERS LISTED ON SCHEDULES AND THE ELECTRICAL ONE-LINE DIAGRAM ARE A BASE FEEDER/BRANCH CIRCUIT SIZE AND SHALL BE ADJUSTED AS NEEDED BASED ON ACTUAL LENGTHS OF CONDUCTORS.

31. FOR ALUMINUM CONDUCTOR TERMINATIONS, ALUMINUM BI-METALLIC PIN CONNECTORS ARE REQUIRED UNLESS COMPACT CONDUCTORS ARE USED. THESE CONNECTORS SHALL BE UL LISTED PER UL 486B AND RATED FOR USE UP TO 600V AND TEMPERATURE UP TO 90°C. CONNECTORS SHALL BE INSTALLED WITH MANUFACTURER'S SPECIFIED CRIMPING TOOLS AND DIES.

32. WALL AND CEILING ROUGH-IN INSTALLATIONS FOR LOW-VOLTAGE CONTROL WIRING OF ANY TYPE SUCH AS DATA/TELECOMMUNICATIONS WIRING, FIRE ALARM WIRING, HVAC CONTROL WIRING, SECURITY SYSTEMS WIRING, TV CABLING, OPTICAL FIBER CABLING, ETC., SHALL BE COMPLETE AND READY FOR INSPECTION AT THE TIME ELECTRICAL ROUGH-IN INSPECTIONS ARE REQUESTED. ALL SHARP EDGES, CONDUIT ENDS AND METAL STUDS, ETC. FOR LOW-VOLTAGE CABLING SHALL BE PROTECTED BY INSULATED BUSHINGS OR GROMMETS AND SECURELY FASTENED IN THE OPENINGS FOR THE WALL ROUGHT-IN INSPECTIONS. WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER (GROUPED CABLES ROUTED WITH SQUARE CORNERS AND PARALLEL TO BUILDING LINES.) CABLES SHALL BE INSTALLED PER NEC REQUIRED SEPARATIONS AND SUPPORTED FROM THE BUILDING STRUCTURE.

33. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF LIGHTING FIXTURES IN MECHANICAL ROOMS/SPACES WITH MECHANICAL DUCT WORK INSTALLER PRIOR TO ROUGH IN. LOCATE BELOW DUCT WORK (8'-0" A.F.F. MIN.) CENTERED IN ROOM AS MUCH AS POSSIBLE.

34. ELECTRICAL CONTRACTOR SHALL COMPLY WITH NEC AND LOCAL CODES FOR CONDUIT FILL REQUIREMENTS DEPENDING ON WIRE SIZES, QUANTITY, AND CORRECTION FACTORS. COORDINATE WITH LOCAL AUTHORITY HAVING JURISDICTION IF UPGRADE OF THE EXISTING ELECTRICAL INSTALLATION IS REQUIRED. THIS UPGRADE MAY INCLUDE REPLACEMENT OF THE EXISTING CONDUITS AND WIRING AFFECTED BY SCOPE OF THIS PROJECT TO ACCOMMODATE CURRENT CODE CONDUIT FILL AND CORRECTION REQUIREMENTS. INCLUDE COST ASSOCIATED WITH THIS UPGRADE IN THE BID.

35. ELECTRICAL CABINETS AND ENCLOSURES LOCATED IN PUBLIC AREAS SHALL BE LOCKABLE TYPE.

36. PENETRATIONS THROUGH STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT SPECIFIC WRITTEN PERMISSION FROM STRUCTURAL ENGINEER AND ARCHITECT. SUBMIT REQUESTS FOR PENETRATIONS TO ARCHITECT FOR REVIEW AND DISPOSITION. PRIOR TO CORE, DRILLING THROUGH FLOORS, VERIFY CLEARANCE OF BEAMS, DUCTWORK, ETC IN CEILING SPACE BELOW, AND X-RAY FOR CONDUIT AND/OR REBAR IN SLAB. COORDINATE WITH BUILDING MANAGEMENT/OWNER TO INFORM TENANT BELOW FOR SCHEDULING OF CORE DRILLING AND TO ADVICE CONCERNING PROTECTION FOR ANY SENSITIVE EQUIPMENT PRIOR TO COMMENCEMENT OF WORK. ALL X-RAYS AND CORE DRILLS MUST BE SCHEDULED FOR AFTER HOURS UNLESS BUILDING MANAGEMENT/OWNER AUTHORIZES OTHERWISE.

37. RACEWAYS SHALL BE PROVIDED WITH EXPANSION FITTINGS WHERE NECESSARY TO COMPENSATE FOR THERMAL EXPANSION AND CONTRACTION, AND TO ALLOW FOR MINOR MOVEMENT OF THE STRUCTURAL ELEMENTS OF THE BUILDING EXPANSION FITTINGS FOR METAL RACEWAYS SHALL BE MADE ELECTRICALLY CONTINUOUS BY EQUIPMENT BONDING JUMPERS OR OTHER MEANS.

38. PROVIDE TYPEWRITTEN, UPDATED PANELBOARD DOOR DIRECTORIES FOR ALL AFFECTED PANELS PER NEC 408.4, REFLECTING ACCURATE BRANCH CIRCUIT DESTINATIONS. CLEARLY MARK JUNCTION BOXES IN CEILING SPACE WITH PANEL DESIGNATIONS AND CIRCUIT NUMBERS. PROVIDE NEW ENGRAVED PLASTIC LABELS TO REPLACE ANY DAMAGED MISLABELED, TEMPORARY OR OTHERWISE ILLEGIBLE EXISTING IDENTIFICATION LABELS FOR DISTRIBUTION EQUIPMENT AFFECTED BY THIS CONTRACT. ATTACH THESE LABELS PERMANENTLY TO EQUIPMENT WITH RIVETS OR SCREWS. ALL PANEL SCHEDULES SHALL INDICATE THE NAME OF THE UPSTREAM PANEL OR SWITCHBOARD PROVIDING POWER.

39. CLEAN EXPOSED PANEL BOARD SURFACES AND CHECK TIGHTNESS OF ELECTRICAL CONNECTIONS. REPLACE DAMAGED CIRCUIT BREAKERS AS REQUIRED AND PROVIDE CLOSURE PLATES FOR VACANT SPACES. ALL NEW PANELS PROVIDED UNDER THIS CONTRACT SHALL BE DOOR-IN-DOOR CONSTRUCTION TYPE, WITH BOLT-ON CIRCUIT BREAKERS AND COPPER BUSSING, UNLESS SPECIFICALLY NOTED OTHERWISE.

40. PROVIDE FIRE STOPPING MATERIAL AND SYSTEMS AS LISTED IN THE UL FIRE RESISTANCE DIRECTORY EQUAL TO THE FIRE RESISTANCE RATING OF THE RESPECTIVE WALL OR FLOOR ASSEMBLY FOR ALL PENETRATIONS OF CONDUIT, SLEEVES, WIRING, CABLES AND OTHER ELECTRICAL ITEMS THROUGH FIRE-RATED CORRIDOR WALLS, FIRE RESISTIVE WALLS, FIRE RESISTIVE SHAFTS, AND FLOOR PENETRATIONS.

41. PRIOR TO ROUGH-IN AND PURCHASE OF MATERIALS, THE CONTRACTOR SHALL COORDINATE WITH EACH TRADE AND EQUIPMENT PROVIDER IN TERMS OF THE FINAL WIRING REQUIREMENTS, VOLTAGE AND PHASE, LOADS, WIRING REQUIREMENTS, OVERCURRENT PROTECTION, DISCONNECTS, CONNECTION POINTS, ETC. FOR ALL EQUIPMENT (MECHANICAL, PLUMBING, CABINETRY AND FURNITURE, FIRE ALARM, SECURITY, SPECIAL EQUIPMENT, ETC.). MATCH PLUG CONFIGURATIONS AND CORD AND PLUG SETS.

42. THE CONTRACTOR SHALL REVIEW ALL MAJOR EQUIPMENT SUBMITTALS TO VERIFY LOCATION, SIZE AND TYPE OF CONNECTIONS.

43. FOR ALL EQUIPMENT PROVIDED BY OTHER TRADES REQUIRING ELECTRICAL POWER OR CONTROL, THE CONTRACTOR SHALL PROVIDE THE REQUIRED CONDUIT, WIRING, OUTLETS, RECEPTACLES, DISCONNECT SWITCHES, ETC., AND MAKE UP ALL FINAL ELECTRICAL CONNECTIONS TO PROVIDE COMPLETE AND OPERATING SYSTEMS IN ACCORDANCE WITH EQUIPMENT SHOP DRAWINGS AND MANUFACTURER'S RECOMMENDATIONS. ALL ELECTRICAL CONNECTIONS SHALL BE IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S INSTRUCTIONS. USE WIRE AND CABLE WITH INSULATION SUITABLE FOR TEMPERATURES ENCOUNTERED.

44. MAKE CONDUIT CONNECTIONS TO MOTOR EQUIPMENT USING LIQUID TIGHT FLEXIBLE CONDUIT.

45. MAKE WIRING CONNECTIONS IN CONTROL PANEL OR IN WIRING COMPARTMENT OF PRE-WIRED EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. PROVIDE INTERCONNECTING WIRING WHERE INDICATED.

46. INSTALL TERMINAL BLOCK JUMPERS AS REQUIRED TO COMPLETE EQUIPMENT WIRING REQUIREMENTS.

47. INSTALL DISCONNECT SWITCHES, CONTROLLERS, CONTROL STATIONS, AND CONTROL DEVICES SUCH AS LIMIT SWITCHES AND TEMPERATURE SWITCHES AS INDICATED. CONNECT WITH CONDUIT AND WIRING AS INDICATED.

48. GROUNDING: AS SPECIFIED IN THESE PLANS AND PER EQUIPMENT MANUFACTURER.

49. RACEWAYS AND BOXES: PROVIDE CONDUIT, BOXES, WIRE, CABLE, AND CONNECTIONS AS REQUIRED.

50. PROVIDE SUBMITTALS FOR VFDS, MOTORS, SOFT STARTER, AND VFD CABLE. EACH SHEET OF DESCRIPTIVE LITERATURE SHALL BE CLEARLY MARKED TO IDENTIFY THE MATERIAL OR EQUIPMENT FOR WHICH IT PERTAINS. CROSS OUT EQUIPMENT ON SUBMITTED SHEETS THAT IS NOT FOR THIS PROJECT. AS A MINIMUM THE FOLLOWING INFORMATION SHALL BE SUBMITTED:
    50.a. EQUIPMENT SHEETS SHALL IDENTIFY WHAT THE EQUIPMENT REFERS TO BY CALLING OUT THE NAME OF THE EQUIPMENT ON THE SHEET.
    50.b. SCHEMATICS AND CONNECTION DIAGRAMS FOR ALL ELECTRICAL EQUIPMENT.

51. COORDINATE VFDS WITH VARIABLE TORQUE RANGES FOR MOTOR, OR WHERE ABSENT, MATCH EXISTING VFD RANGES FOR EXISTING MOTORS.

52. INCLUDE THE FOLLOWING IN MOTOR SUBMITTALS:
    52.a. NAME OF MANUFACTURER
    52.b. TYPE OF MOTOR
    52.c. TYPE OF BEARING AND METHOD OF LUBRICATION
    52.d. TYPE OF MODEL OF BEARING INSULATION
    52.e. RATED SIZE OF MOTOR, HP, AND SERVICE FACTOR
    52.f. TEMPERATURE RISE AND INSULATION RATING
    52.g. FULL LOAD ROTATIVE SPEED
    52.h. NET WEIGHT
    52.i. EFFICIENCY AT FULL, 3/4 AND 1/2 LOAD
    52.j. FULL LOAD CURRENT
    52.k. LOCKED ROTOR CURRENT
    52.l. SPACE HEATER VOLTAGE AND WATTAGE, WHERE APPLICABLE
    52.m. MOTOR TEMPERATURE SWITCH DATA, WHERE APPLICABLE
    52.n. INVERTER RATING (E.G. YES, NO)
    52.o. STANDARDS COMPLIANCE (E.G. IEEE 841, NEMA MG1 PART 31)

53. PROVIDE OPERATION AND MAINTENANCE MANUALS, INCLUDING:
    53.1. ASSEMBLY, INSTALLATION, ALIGNMENT, ADJUSTMENT, AND CHECKING INSTRUCTIONS
    53.2. LUBRICATION AND MAINTENANCE INSTRUCTIONS
    53.3. GUIDE TO TROUBLESHOOTING
    53.4. PARTS LIST AND PREDICTED LIFE OF PARTS SUBJECT TO WEAR
    53.5. ASSEMBLY DRAWINGS, ENGINEERING DATA, AND WIRING DIAGRAMS
    53.6. TEST DATA AND PERFORMANCE CURVES, WHERE APPLICABLE

54. PROVIDE MOTORS WITH 1.15 SERVICE FACTOR, MINIMUM.

55. PROVIDE MOTORS THAT ARE SELF-VENTILATED. THE FAN COVERS OF TOTALLY ENCLOSED FAN COOLED MOTORS SHALL MEET NEMA MG 1 REQUIREMENTS FOR A FULLY GUARDED MACHINE.

56. MOTORS SHALL BE DESIGNED FOR SATISFACTORY OPERATION AT ANY VOLTAGE WITHIN PLUS OR MINUS 10 PERCENT OF RATED VOLTAGE.

57. ENSURE ALL MOTORS PROVIDED ARE PREMIUM EFFICIENCY TYPE.

58. HANDLE, INSTALL, CONNECT, CLEAN, CONDITION, AND ADJUST PRODUCTS IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND IN CONFORMITY WITH SPECIFIED REQUIREMENTS.

59. PERFORM WORK IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. SHOULD JOB CONDITIONS OR SPECIFIED REQUIREMENTS CONFLICT WITH MANUFACTURER'S INSTRUCTIONS, CONSULT WITH ENGINEER FOR FURTHER INSTRUCTIONS. INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS UNLESS OTHERWISE SPECIFIED IN INDIVIDUAL EQUIPMENT SPECIFICATION SECTIONS.

60. ENSURE THE ENTIRE SYSTEM IS DESIGNED, COORDINATED, AND SUPPLIED BY A QUALIFIED ELECTRICAL CONTRACTOR WHO IS REGULARLY ENGAGED IN THE BUSINESS OF BUILDING ELECTRICAL SYSTEMS FOR WATER AND WASTEWATER PROJECTS. THE ELECTRICAL CONTRACTOR SHALL PROVIDE A "STATEMENT OF QUALIFICATIONS" INDICATING THAT THEY HAVE SUCCESSFULLY PROVIDED SIMILAR WORK FOR AT LEAST 5 YEARS.

61. IN ADDITIONAL TO NEC COMPLIANCE, ALSO COMPLY WITH ALL LOCAL CODES AND DIRECTION FROM THE AUTHORITY HAVING JURISDICTION (AHJ). LOCAL CODES PREVAIL WHERE IN CONFLICT WITH NEC. AHJ DIRECTION OVERRIDES ALL OTHER CODES. PROVIDE ELECTRONIC AND WRITTEN NOTICE TO OWNER AND OWNER'S ENGINEER OF ANY OVERRIDING DIRECTION FROM THE AHJ AND PROVIDE TIME FOR COORDINATION IF PRACTICABLE.

62. PULL AND JUNCTION BOXES TO BE APPROPRIATE FOR WET LOCATIONS.

63. INSPECT MATERIALS AND EQUIPMENT FOR SIGNS OF DAMAGE, DETERIORATION OR OTHER DELETERIOUS EFFECTS OF STORAGE, TRANSPORTATION, HANDLING, OR DEFECTS IN MANUFACTURE OR ASSEMBLY. REPLACE WITH IDENTICAL NEW MATERIALS OR EQUIPMENT OR REPAIR TO LIKE NEW CONDITION ANY MATERIALS OR EQUIPMENT SHOWING SUCH EFFECTS TO THE SATISFACTION OF THE ENGINEER AND OWNER.

64. PROTECT THE WIRE AND CABLE AND AVOID KINKING CONDUCTORS, CUTTING OR PUNCTURING JACKETS, CONTAMINATING BY OIL OR GREASE OR DAMAGING IN ANY MANNER. TERMINATE STRANDED CABLE WITH LUGS, CUP WASHERS, OR PRESSURE TYPE CONNECTORS; DO NOT WRAP STRANDED CABLE AROUND SCREW TYPE TERMINALS. SPLICE STRANDED CABLE WITH PRESSURE TYPE CONNECTORS; DO NOT USE WIRE NUT TYPE CONNECTORS ON STRANDED CABLE. SPLICE CABLES ONLY AT READILY ACCESSIBLE LOCATIONS. DO NOT PULL CABLE TIGHT AGAINST BUSHINGS OR PRESS HEAVILY AGAINST ENCLOSURES.

65. USE CABLE PULLING LUBRICANTS AS RECOMMENDED BY THE CABLE MANUFACTURER. USE SWAB TO CLEAN CONDUITS AND DUCTS BEFORE PULLING CABLES. INSTALL CABLE AND ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. WHERE NECESSARY TO PREVENT HEAVY LOADING OF CABLE CONNECTORS DUE TO CABLE WEIGHT, SUPPORT CABLES IN VERTICAL RISERS WITH WOVEN CABLE GRIPS. COIL AND TAPE SPARE CABLE ENDS.

66. USE CONDUCTOR NOT SMALLER THAN 12 AWG FOR POWER AND LIGHTING CIRCUITS. PULL ALL CONDUCTORS INTO RACEWAY AT SAME TIME. USE SUITABLE WIRE PULLING LUBRICANT FOR BUILDING WIRE 8 AWG AND LARGER. PROTECT EXPOSED CABLE FROM DAMAGE. NEATLY TRAIN AND LACE WIRING INSIDE BOXES, EQUIPMENT, AND PANEL BOARDS. CLEAN CONDUCTOR SURFACES BEFORE INSTALLING LUGS AND CONNECTORS. MAKE SPLICES, TAPS, AND TERMINATIONS TO CARRY FULL AMPACITY OF CONDUCTORS.

67. ENSURE ALL RECEPTACLES IDENTIFIED AS "WP"/WATERPROOF ARE TAMPER-PROOF GFI-TYPE RECEPTACLES WITH WEATHERPROOF-WHILE-IN-USE COVERS.

68. PROVIDE ALL MOTORS RATED FOR COMPATIBILITY WITH VFD. MOTORS TO BE IDENTIFIED FOR INVERTER-DUTY, COMPLIANT WITH NEMA MG1, INCLUDING PART 31, AND INCLUDE ANY FEATURE REQUIRED TO PREVENT SHAFT CURRENT ACROSS MOTOR AND PUMP BEARINGS.

69. UTILITY CONNECTIONS SHOWN ARE REPRESENTATIVE. PROVIDE UTILITY SERVICE CONNECTIONS IN THE SEQUENCE AND FORMAT REQUIRED BY THE LOCAL UTILITY.

RECORD DOCUMENTS

1. RECORD DOCUMENTS: THE ELECTRICAL CONTRACTOR SHALL MAINTAIN ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS OR IN THE SPECIFICATIONS AND IDENTIFY ORIGIN OF CHANGE.

2. KEEP A COMPLETE SET OF RECORD DOCUMENT PRINTS IN CUSTODY DURING ENTIRE PERIOD OF CONSTRUCTION AT THE CONSTRUCTION SITE. ON COMPLETION OF THE PROJECT, TWO COMPLETE SETS OF MARKED-UP PRINTS SHOWING THESE DEVIATIONS SHALL BE DELIVERED TO GENERAL CONTRACTOR AND ARCHITECT/ENGINEER. THIS CONTRACT WILL NOT BE CONSIDERED COMPLETED UNTIL THESE RECORD DRAWINGS HAVE BEEN RECEIVED AND REVIEWED BY THE ENGINEER.

COMMUNICATIONS SYSTEMS

1. ELECTRICAL CONTRACTOR SHALL FULLY FIELD COORDINATE COMMUNICATIONS SYSTEM INSTALLATION (DEVICES AND CABLING) WITH OWNER'S REPRESENTATIVE PRIOR TO ROUGH IN AND PURCHASING OF MATERIALS.

2. ALL DATA AND TELECOMMUNICATIONS CABLING SHALL BE INSTALLED BY ELECTRICAL CONTRACTOR AND TERMINATED BY CONTROLS VENDOR.

3. VERIFY ALL SPECIFIC EQUIPMENT REQUIREMENTS WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH IN. COORDINATION SHALL INCLUDE MOUNTING HEIGHTS, CONNECTION TYPE AND POWER REQUIREMENTS. ALL CONNECTIONS FOR EQUIPMENT SHALL BE IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S AND SUPPLIER'S RECOMMENDATIONS

WARRANTY

1. PROVIDE COMPLETE WARRANTY INFORMATION FOR EACH ITEM, WHICH SHALL INCLUDE NAME OF PRODUCT OR EQUIPMENT: DATE OF BEGINNING OF WARRANTY OR BOND; DURATION OF WARRANTY OR BOND; AND NAMES, ADDRESSES, AND TELEPHONE NUMBERS OF MANUFACTURING/SERVICING PERSONNEL AS WELL AS PROCEDURES FOR FILING A CLAIM AND OBTAINING WARRANTY SERVICES.

2. THE CONTRACTOR SHALL WARRANT ALL MATERIALS, WORKMANSHIP AND THE SUCCESSFUL OPERATION OF ALL EQUIPMENT AND APPARATUS INSTALLED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE ENTIRE WORK AS IDENTIFIED IN THE GENERAL CONDITIONS.

MECHANICAL SYSTEM

1. ELECTRICAL CONTRACTOR SHALL REVIEW MECHANICAL AND PLUMBING DRAWINGS AND SCHEDULES FOR VERIFICATION OF THE EQUIPMENT USED, WIRING AND ADDITIONAL INSTALLATION REQUIREMENTS PRIOR TO PROVIDING REQUIRED ROUGH-INS STARTERS/DISCONNECT SWITCHES, WHEN EQUIPMENT DELIVERED TO JOB SITE. ELECTRICAL CONTRACTOR SHALL VERIFY THIS DATA WITH EQUIPMENT NAMEPLATES OR MANUALS IF SIGNIFICANT DISCREPANCIES OCCUR CONTACT ELECTRICAL ENGINEER FOR REVISION OF THE CONSTRUCTION DOCUMENTS.

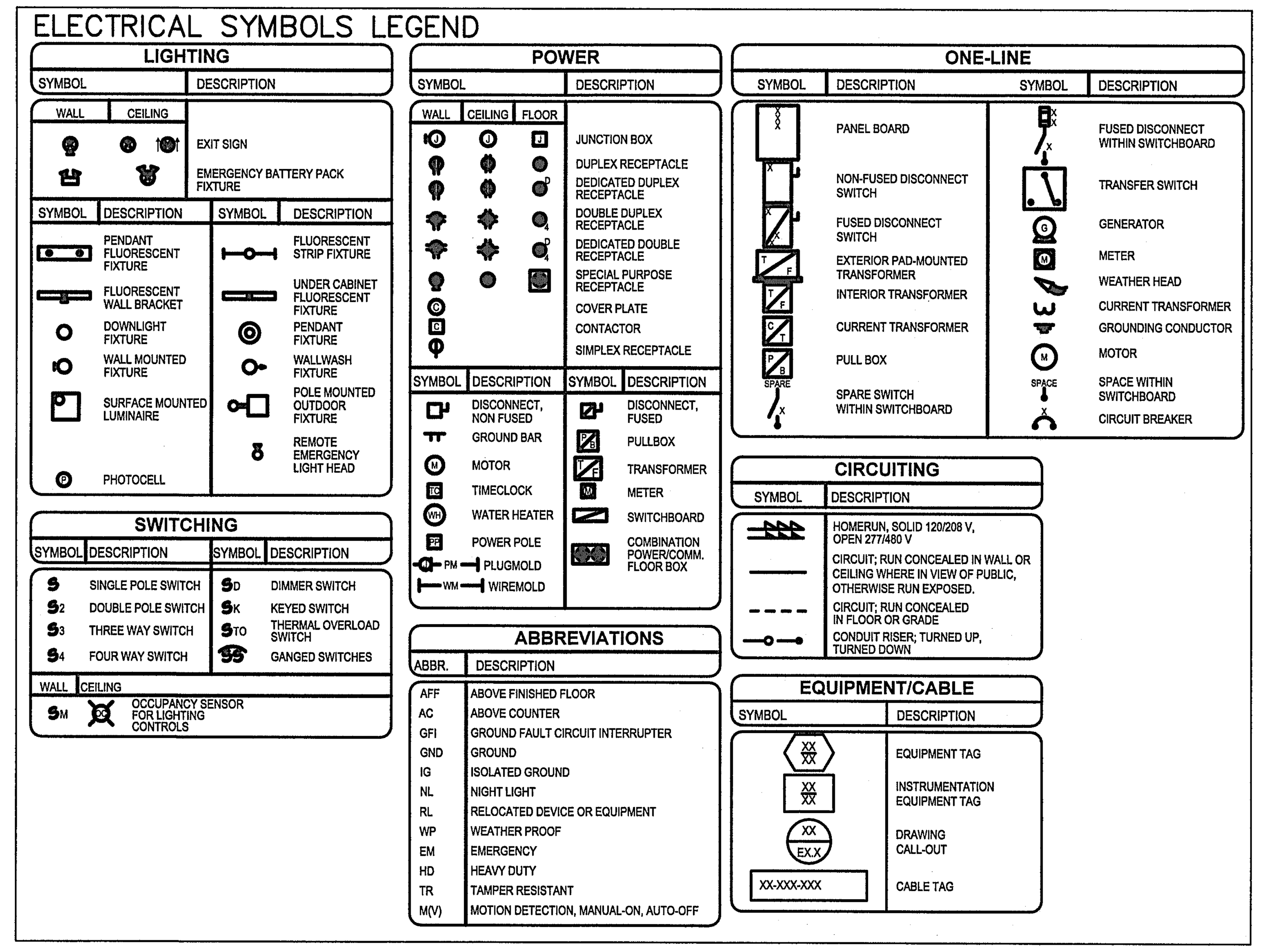
2. PROVIDE ALL REQUIRED OUTLETS; HEAVY-DUTY SAFETY DISCONNECT SWITCHES, FUSES AND CONNECTIONS FOR ALL MECHANICAL EQUIPMENT UNLESS PROVIDED BY MECHANICAL CONTRACTOR AS SPECIFICALLY DIRECTED ON MECHANICAL DRAWING OR SPECIFICATION REQUIREMENTS.

3. ELECTRICAL POWER WIRING IN CONNECTION WITH THE AUTOMATIC TEMPERATURE CONTROL SYSTEM, WHERE SHOWN ON THE ELECTRICAL DIVISION DRAWINGS, SHALL BE PERFORMED BY THE ELECTRICAL CONTRACTOR. ALL OTHER WIRING, INCLUDING LOW VOLTAGE REQUIRED FOR PROPER OPERATION OF THE AUTOMATIC TEMPERATURE CONTROL SYSTEM, SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR.

NO CHANGES THIS SHEET

1

ELECTRICAL SYMBOLS LEGEND



COREY Electrical Engineering, Inc.
Commercial and Transportation Design
COREY PROJECT #16481

COLORADO LICENSED STEVEN L STRETCH 32200 CEE # 16481 PROFESSIONAL ENGINEER

DRAWN BY	GGR
DESIGNED BY	GGR
DATE	04/21/2017
JOB NUMBER-TASKS	0416011.01
BOOK AND PAGE	
REVISIONS	REV 1, SAMPLER VAULT, 10/05/19

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
LEGEND AND GENERAL NOTES

SHEET
E0.1

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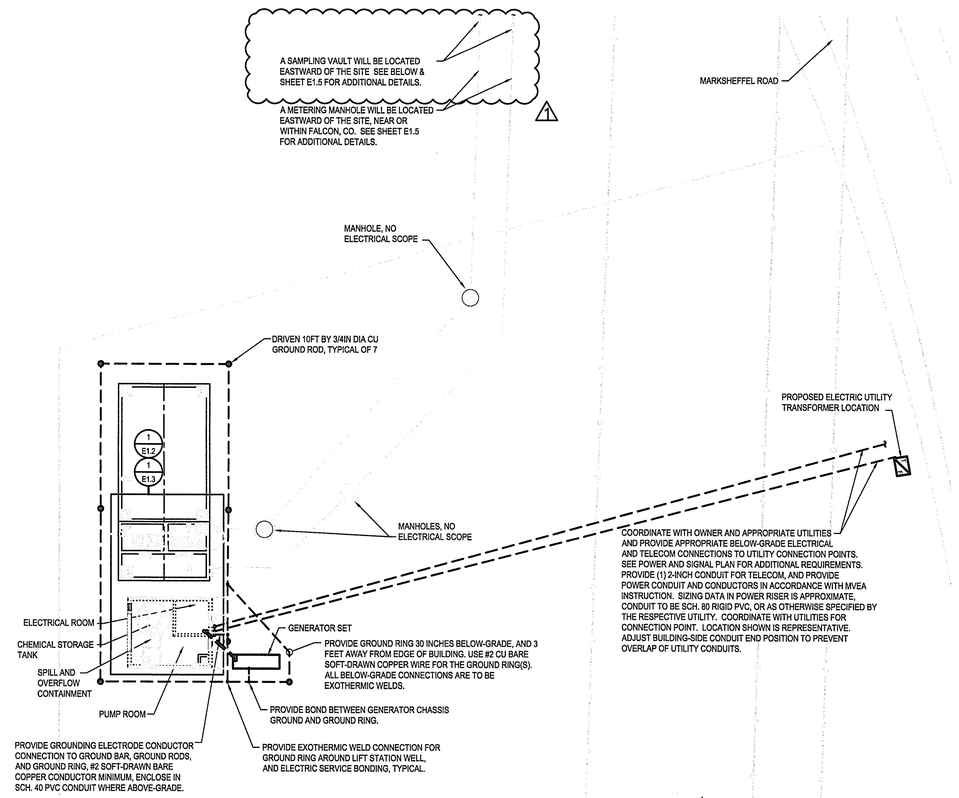


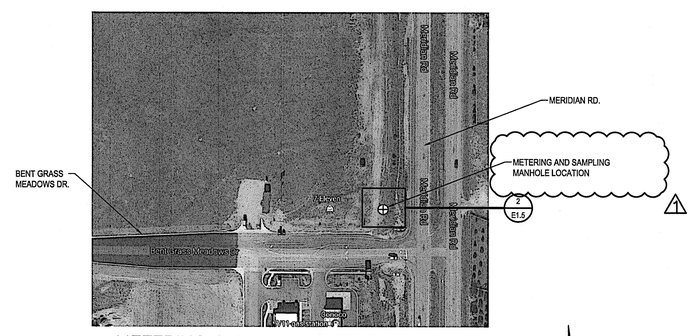
1 / E1.1 LIFT STATION SITE PLAN

SCALE: 1"=20'-0"

GENERAL NOTES:

A. NEW AND RELOCATED ITEMS SHOWN AS BOLD ———
ITEMS ROUTED BELOW-FLOOR, BELOW-GRADE OR CONCEALED SHOWN AS DASHED – – –
EXISTING ITEMS SHOWN AS LIGHT ———

0 20 40



1 / E1.1 METERING MANHOLE SITE PLAN

NOT TO SCALE

REVISIONS	
REV 1, SAMPLER VAULT, 10/05/19	

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DESIGNED BY	GGR
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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
ELECTRICAL SITE PLAN

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COREY PROJECT #16481

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⟨#⟩ DETAIL NOTES

1. PROVIDE INHERENTLY-SAFE DEVICES OR OTHER METHODS TO ENSURE INSTRUMENTATION IS RATED FOR CLASS I / DIVISION 1 SPACE. WHERE INTRINSICALLY-SAFE METHODS ARE SELECTED, ENSURE INTRINSICALLY-SAFE BARRIER IS INSTALLED AHEAD OF INSTRUMENT. PROVIDE INSTRUMENTS THAT HAVE SEPARATE (OR REMOTE) TRANSMITTER MODULES IF REQUIRED TO REMOVE TRANSMITTER FROM CLASSIFIED AREA FOR 4-20mA FEEDBACK.
2. COORDINATE AND PROVIDE UTILITY DISCONNECT IN ACCORDANCE WITH NEC AND UTILITY GUIDELINES. ACTUAL METER LOCATION IS ANTICIPATED TO BE AT UTILITY TRANSFORMER.
3. PROVIDE CONNECTION TO EACH CHEMICAL PUMP IN PUMP ROOM. COORDINATE WITH OWNER FOR ACTUAL REQUIREMENTS. PROVIDE LOCAL WEATHERPROOF DISCONNECT SWITCH AT EACH EQUIPMENT LOCATION.
4. PROVIDE RIGID GALVANIZED STEEL CONDUIT FOR ALL CONNECTIONS BETWEEN THE VAULT SPACES AND THE SEAL-OFFS. SEE MECHANICAL EQUIPMENT SCHEDULE FOR CABLE AND CONDUIT REQUIREMENTS.
5. THE BELOW-GRADE SPACES ARE A CLASSIFIED AREA, AND ALL INSTRUMENT AND DATA CABLES ARE TO BE SEALED AT THE CLASSIFIED AREA BOUNDARY IN ACCORDANCE WITH NEC ARTICLES 500-501. DO NOT BURY SEALS. PROVIDE ALL WORK IN ACCORDANCE WITH NEC ART. 501.
   - 5.1. SPACES IDENTIFIED BY THIS NOTE ARE CLASS I / DIVISION 1 SPACES.
   - 5.2. LOCATIONS IDENTIFIED BY THIS NOTE ARE CLASS I / DIVISION 2 SPACES.
6. PROVIDE LINK-SEAL SYSTEM WHERE CONDUIT PASSES THROUGH BASIN AND VAULT WALLS, TYPICAL.
7. ONE CABLE SHOWN FOR CLARITY. PROVIDE ADDITIONAL CABLES, LINK SEALS, SEAL-OFFS, AND OTHER ASSOCIATED HARDWARE IF MOTOR PROVIDED UTILIZES MORE THAN ONE (1) CABLE PER SUBMERSIBLE MOTOR. ENSURE MOISTURE AND TEMPERATURE SWITCH CONDUCTORS ARE SHIELDED SEPARATELY FROM THE POWER CONDUCTORS, OR PROVIDE OTHER MEANS TO PREVENT PLC FROM RECEIVING NOISE FROM FROM VFD-RELATED CROSS-TALK/LINE NOISE.
8. ADJUST VFD SPACING TO ACCOUNT FOR ACTUAL VFD SIZE AND VFD MANUFACTURER'S RECOMMENDED AIR-SPACE ENVELOPE AROUND EACH VFD. TYPICAL FOR EACH VFD IN ELEC. ROOM.
9. PROVIDE INTERLOCK SWITCHES IN MOTOR DISCONNECTS. SWITCHES TO BREAK CONTROL CIRCUIT BEFORE POWER CIRCUIT. PROGRAM PLC AND VFDS AS REQUIRED TO DISCONTINUE MOTOR POWER BEFORE POWER SWITCH IS COMPLETELY OPENED.
10. IF TRANSDUCER REQUIRES POWER BEYOND STANDARD 4-20mA LOOP POWER THEN PROVIDE POWER CONNECTIONS THAT MEET NEC REQUIREMENTS AND USE LINK SEALS WHERE PENETRATING CONCRETE WALLS.
11. PROVIDE PLACARDS AT POWER SOURCES FOR BUILDING:

    "POWER SUPPLIED IN (2) TWO PLACES. TO SHUT OFF POWER, TURN OFF UTILITY DISCONNECT AND GENERATOR CIRCUIT BREAKER. THERE IS ALSO A MAIN CIRCUIT BREAKER WITHIN THE BUILDING."
12. PROVIDE CONDUIT WITH 3#12CU AND #12 GND. WIRE-NUT SPARE CONDUCTOR AT CONTROL CABINET AND AT J-BOX ADJACENT TO FUTURE FLOW METER LOCATION. MECHANICALLY RESTRAIN BREAKER FOR FUTURE METER IN "OFF" POSITION.
13. PROVIDE CABLE SUPPORT GRIP AT TOP OF WALL FOR EACH MOTOR CABLE, INCLUDING PORTION OF FLOAT GUIDE CABLE DETAIL AS REQUIRED TO SUPPORT CABLE. PROVIDE LINK-SEAL SEAL WHERE CABLE PENETRATES TOP OF VAULT. PROVIDE SEAL-OFF AND FLEXIBLE CONNECTION TO ENCLOSURE SHOWN ON PLANS WITH LFMC-TYPE CONDUIT. ALL HARDWARE IN VAULT TO BE STAINLESS STEEL OR NON-METAL. HARDWARE TO ALSO BE RATED FOR LOADING AND IDENTIFIED FOR THE APPLICATION(S) USED.
14. PROVIDE CONNECTION FROM PUMP CONTROL PANEL USING CONDUIT SIZED FOR CONTROL CABLES, 1"C. MINIMUM CONDUIT FOR EACH VFD. THIS CONDUIT IS NOT SHOWN ON PLANS FOR CLARITY. PROVIDE CABLES AS REQUIRED TO FACILITATE CONTROL. PROGRAM VFD SHUT DOWN FOR WHEN DISCONNECT INTERLOCK SWITCH INDICATES MOTOR DISCONNECT IS ABOUT TO OPEN. CONTRACTOR IS RESPONSIBLE FOR ASSURING A WORKING PUMP/VFD SOLUTION. ENSURE VFD-TYPE SHIELDED SYMMETRICAL CABLES, SHAFT GROUNDING FEATURES, AND INSULATED BUSHINGS ARE PROVIDED AS REQUIRED TO ENSURE NO CURRENT ACROSS BEARING, AND TO AVOID DAMAGE TO MOTOR OR WIRE INSULATION.
15. ENSURE CONTROL CABINET HAS INHERENTLY SAFE BARRIERS TO PROTECT VOLTAGE AND CURRENT MAGNITUDES WITHIN CABLE IF INHERENTLY-SAFE DEVICES ARE USED TO MEET AREA CLASSIFICATION.
16. PROVIDE 3/4" PLYWOOD BACKPLANE AT THIS LOCATION, SIZED AS REQUIRED FOR TELECOM PROVIDER EQUIPMENT.
17. DISCONNECT SWITCHES ARE LOCATED ABOVE VAULT, OUTSIDE OF CLASSIFIED AREA. SEAL CONDUITS FROM WETWELL BEFORE CONNECTING TO DISCONNECT SWITCHES.
18. INSTRUMENT IS LOCATED IN VALVE VAULT OR WETWELL AND MUST BE RATED AND INSTALLED IN COMPLIANCE WITH NEC REQUIREMENTS FOR THE LOCATION.
19. PROVIDE SEAL-OFF FITTINGS WHERE CONDUITS EMERGE FROM GRADE WITHIN BUILDING. EARTH ALONG CONDUIT IS CONSIDERED BOUNDARY FOR CLASSIFIED AREA IN THIS SITUATION, AS APPROPRIATE TO AVOID BURIED SEAL-OFF FITTINGS. ENCLOSE IN RMC-TYPE CONDUIT UNTIL ON NON-CLASSIFIED SIDE OF SEAL-OFF FITTING.

MECHANICAL EQUIPMENT SCHEDULE (NOTE 3)

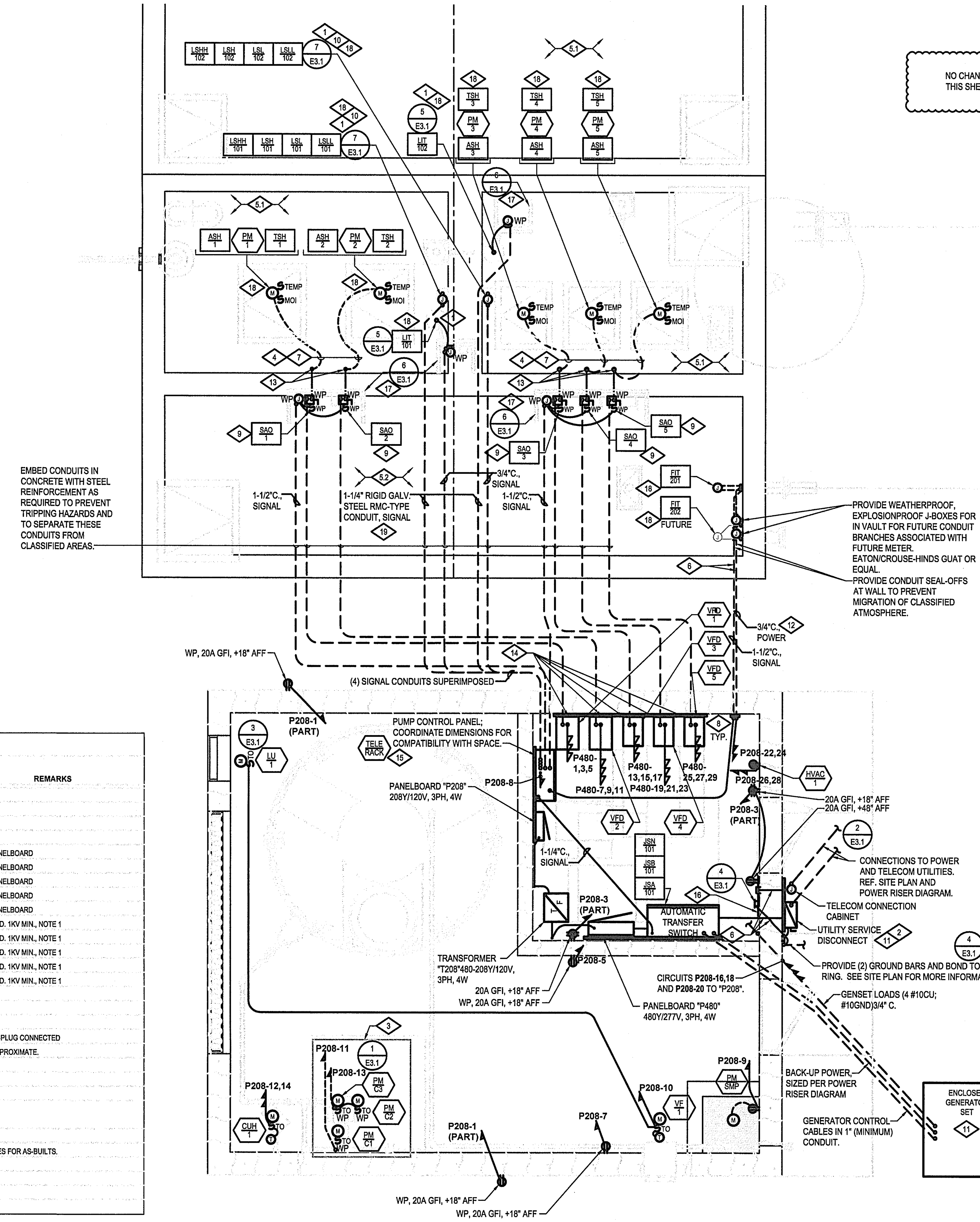
DESIGNATION	DESCRIPTION	MAKE	MODEL NO. (NOTE 3)	VOLT	PH	FLA	HP	KVA	CONDUCTORS	CONDUIT	SW	CB	FUSE SIZE/TYPE	REMARKS
LU-1	MOTORIZED LOUVER	NOTE #2	NOTE #2	120	1	1	FRACT	–	(2#12CU;#12G)	1/2"C.	20/1	15/1	N/A	
VF-1	VENT FAN	NOTE #2	NOTE #2	120	1	4.4	1/4	–	(2#12CU;#12G)	1/2"C.	20/1	15/1	N/A	
HVAC-1	AC UNIT WITHOUT HTR	NOTE #2	NOTE #2	208	1	8.6	–	1.8	(2#12CU;#12G)	1/2"C.	20/2	15/2	N/A	NOTE 4
CUH-1	5,000W UNIT HEATER	NOTE #2	NOTE #2	208	1	24.0	–	5.0	(2#10CU;#10G)	3/4"C.	30/2	30/2	N/A	
VFD-1	VFD FOR A 100 HP MOTOR	ABB	ACS800-U31-0100-5	480	3	132	–	110	(3#2/0CU;#6GND)	2" C.	N/A	175/3	N/A	DISC @ PANELBOARD
VFD-2	VFD FOR A 100 HP MOTOR	ABB	ACS800-U31-0100-5	480	3	132	–	110	(3#2/0CU;#6GND)	2" C.	N/A	175/3	N/A	DISC @ PANELBOARD
VFD-3	VFD FOR A 30HP MOTOR	ABB	ACS800-U31-0030-5	480	3	45	–	37.4	(3#6CU;#10GND)	1-1/2" C.	N/A	60/3	N/A	DISC @ PANELBOARD
VFD-4	VFD FOR A 30HP MOTOR	ABB	ACS800-U31-0030-5	480	3	45	–	37.4	(3#6CU;#10GND)	1-1/2" C.	N/A	60/3	N/A	DISC @ PANELBOARD
VFD-5	VFD FOR A 30HP MOTOR	ABB	ACS800-U31-0030-5	480	3	45	–	37.4	(3#6CU;#10GND)	1-1/2" C.	N/A	60/3	N/A	DISC @ PANELBOARD
PM-1	100 HP PUMP	NOTE #2	NOTE #2	480	3	124	100	–	(3#2/0CU;#2/0GND)	2-1/2" C.	VFD	175/3	VFD	XHHW COND. 1KV MIN., NOTE 1
PM-2	100 HP PUMP	NOTE #2	NOTE #2	480	3	124	100	–	(3#2/0CU;#2/0GND)	2-1/2" C.	VFD	175/3	VFD	XHHW COND. 1KV MIN., NOTE 1
PM-3	30 HP PUMP	NOTE #2	NOTE #2	480	3	40	30	–	(3#6CU;#6GND)	1-1/2" C.	VFD	60/3	VFD	XHHW COND. 1KV MIN., NOTE 1
PM-4	30 HP PUMP	NOTE #2	NOTE #2	480	3	40	30	–	(3#6CU;#6GND)	1-1/2" C.	VFD	60/3	VFD	XHHW COND. 1KV MIN., NOTE 1
PM-5	30 HP PUMP	NOTE #2	NOTE #2	480	3	40	30	–	(3#6CU;#6GND)	1-1/2" C.	VFD	60/3	VFD	XHHW COND. 1KV MIN., NOTE 1
PM-C1	CHEMICAL PUMP, 1HP	<COMMODITY>	<COMMODITY>	120	1	16	1	–	(2#8CU;#8G)	3/4"C.	60/1	40/1	N/A	
PM-C2	CHEMICAL PUMP, 1/6HP MAX	<COMMODITY>	<COMMODITY>	120	1	4.4	1/6	–	(2#12CU;#12G)	3/4"C.	20/1	15/1	N/A	
PM-C3	CHEMICAL PUMP, 1/6HP MAX	<COMMODITY>	<COMMODITY>	120	1	4.4	1/6	–	(2#12CU;#12G)	3/4"C.	20/1	15/1	N/A	
PM-SMP	1/2HP SUMP PUMP	<COMMODITY>	<COMMODITY>	120	1	9.8	1/2	–	CORD/PLUG	N/A	REC	20/1	N/A	CORD-AND-PLUG CONNECTED
TELE-RACK	TELEMETRY RACK	N/A	N/A	120	1	3.5	–	0.43	(2#12CU;#12G)	3/4"C.	N/A	20/1	N/A	LOAD IS APPROXIMATE.

NOTE 1 VERIFY MOTOR IS INVERTER-DUTY AND HAS ADEQUATE COOLING FOR OPERATING RPM RANGE.

NOTE 2 SPECIFIC MAKES AND MODELS WERE NOT REFERENCED FOR THIS EQUIPMENT, SO DATA FOR TYPICAL EQUIPMENT WAS USED FOR DESIGN. PROVIDE WIRE AND CONDUIT SIZED TO MEET ACTUAL EQUIPMENT FLA OR MCA AS APPROPRIATE AND CIRCUIT BREAKER SIZE LIMITED TO EQUIPMENT'S MAXIMUM OVERCURRENT PROTECTION REQUIREMENTS.

NOTE 3 COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE DISCONNECTS, CIRCUIT BREAKERS, AND CONDUCTORS TO MATCH ACTUAL EQUIPMENT PROVIDED. COORDINATE CHANGES WITH OWNER'S ENGINEER, AND DOCUMENT CHANGES FOR AS-BUILTS.

NOTE 4 PROVIDE NEMA RECEPT. TO MATCH EQUIPMENT.



NO CHANGES THIS SHEET

⚠1

⓵/E1.2 LIFT STATION POWER PLAN

SCALE: 1/4"=1'-0"

GENERAL NOTES:

A. NEW AND RELOCATED ITEMS SHOWN AS BOLD ———
   ITEMS ROUTED BELOW-FLOOR, BELOW-GRADE OR CONCEALED SHOWN AS DASHED — — —
B. REFERENCE E2.1 FOR ADDITIONAL INSTRUMENT INFORMATION.
C. ANY AND ALL INSTRUMENT INFORMATION IS FOR CONCEPTUAL REFERENCE ONLY, AND IS TO BE VERIFIED WITH CONTROL SYSTEM INTEGRATOR. PROVIDE CABLE AND CONDUIT IN ACCORDANCE WITH DIRECTION FROM CONTROL SYSTEM INTEGRATOR.

0 4 8

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COREY PROJECT #16481

COLORADO LICENSED STEVEN L STRETCH 32200 CEE # 16481 PROFESSIONAL ENGINEER

DRAWN BY GGR
DESIGNED BY GGR
DATE 04/21/2017
JOB NUMBER-TASKS 0416011.01
BOOK AND PAGE

REVISIONS
REV 1, SAMPLER VAULT, 10/05/19

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
POWER & SIGNAL PLAN

SHEET
E1.2

COMcheck Software Version 4.0.5.1
Interior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: Sterling Ranch Lift Station
Project Type: New Construction

Construction Site:	Owner/Agent:	Designer/Contractor:
MARKSHEFFEL ROAD FALCON, CO 80908		Glenn Ross Corey Electrical Engineering, Inc. 7822 S. Wheeling Ct., Suite B Englewood, CO 80112 303-309-6964 Glenn@CoreyEng.com

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Workshop	440	1.4	616
		Total Allowed Watts =	616

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Workshop (440 sq.ft.)				
LED 1: Other:	1	5	45	225
			Total Proposed Watts =	225

Section 4: Requirements Checklist

Interior Lighting PASSES: Design 63% better than code

Lighting Wattage:

✓ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
616	225	YES

Controls, Switching, and Wiring:

N/A ☐ 2. Daylight zones under skylights more than 15 feet from the perimeter have lighting controls separate from daylight zones adjacent to vertical fenestration.
N/A ☐ 3. Daylight zones have individual lighting controls independent from that of the general area lighting.

Exceptions:

N/A ☐ Contiguous daylight zones spanning no more than two orientations are allowed to be controlled by a single controlling device.
N/A ☐ Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.
✓ 4. Independent controls for each space (switch/occupancy sensor).

Exceptions:

N/A ☐ Areas designated as security or emergency areas that must be continuously illuminated.

N/A ☐ Lighting in stairways or corridors that are elements of the means of egress.
N/A ☐ 5. Master switch at entry to hotel/motel guest room.
N/A ☐ 6. Individual dwelling units separately metered.
N/A ☐ 7. Medical task lighting or art/history display lighting claimed to be exempt from compliance has a control device independent of the control of the nonexempt lighting.
✓ 8. Each space required to have a manual control also allows for reducing the connected lighting load by at least 50 percent by either controlling all luminaires, dual switching of alternate rows of luminaires, alternate luminaires, or alternate lamps, switching the middle lamp luminaires independently of other lamps, or switching each luminaire or each lamp.

Exceptions:

N/A ☐ Only one luminaire in space.
N/A ☐ An occupant-sensing device controls the area.
N/A ☐ The area is a corridor, storeroom, restroom, public lobby or sleeping unit.
✓ Areas that use less than 0.6 Watts/sq.ft.
N/A ☐ 9. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.

Exceptions:

N/A ☐ Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.
N/A ☐ 10. Photocell/astronomical time switch on exterior lights.

Exceptions:

✓ Lighting intended for 24 hour use.
N/A ☐ 11. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

Exceptions:

✓ Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 5: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COM*check* Version 4.0.5.1 and to comply with the mandatory requirements in the Requirements Checklist.

Glenn Ross, Project Engineer (EIT) — [signature] — 03/16/2017
Name - Title — Signature — Date

COMcheck Software Version 4.0.5.1
Exterior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: Sterling Ranch Lift Station
Project Type: New Construction
Exterior Lighting Zone: 2 (Residentially zoned area)

Construction Site:	Owner/Agent:	Designer/Contractor:
MARKSHEFFEL ROAD FALCON, CO 80908		Glenn Ross Corey Electrical Engineering, Inc. 7822 S. Wheeling Ct., Suite B Englewood, CO 80112 303-309-6964 Glenn@CoreyEng.com

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Well Tops (Walkway >= 10 feet wide)	508 ft2	0.14	Yes	71	81
		Total Tradable Watts* =		71	81
		Total Allowed Watts =		71	
		Total Allowed Supplemental Watts** =		600	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.
** A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Well Tops (Walkway >= 10 feet wide 508 ft2): Tradable Wattage				
LED 1: Other:	1	3	27	81
			Total Tradable Proposed Watts =	81

Section 4: Requirements Checklist

Lighting Wattage:

✓ 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.
Compliance: Passes using supplemental allowance watts.

Controls, Switching, and Wiring:

N/A ☐ 2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.
N/A ☐ 3. Lighting not designated for dusk-to-dawn operation is controlled by either a a photosensor (with time switch), or an astronomical time switch.
✓ 4. Lighting designated for dusk-to-dawn operation is controlled by an astronomical time switch or photosensor.
N/A ☐ 5. All time switches are capable of retaining programming and the time setting during loss of power for a period of at least 10 hours.

Exterior Lighting Efficacy:

N/A ☐ 6. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.

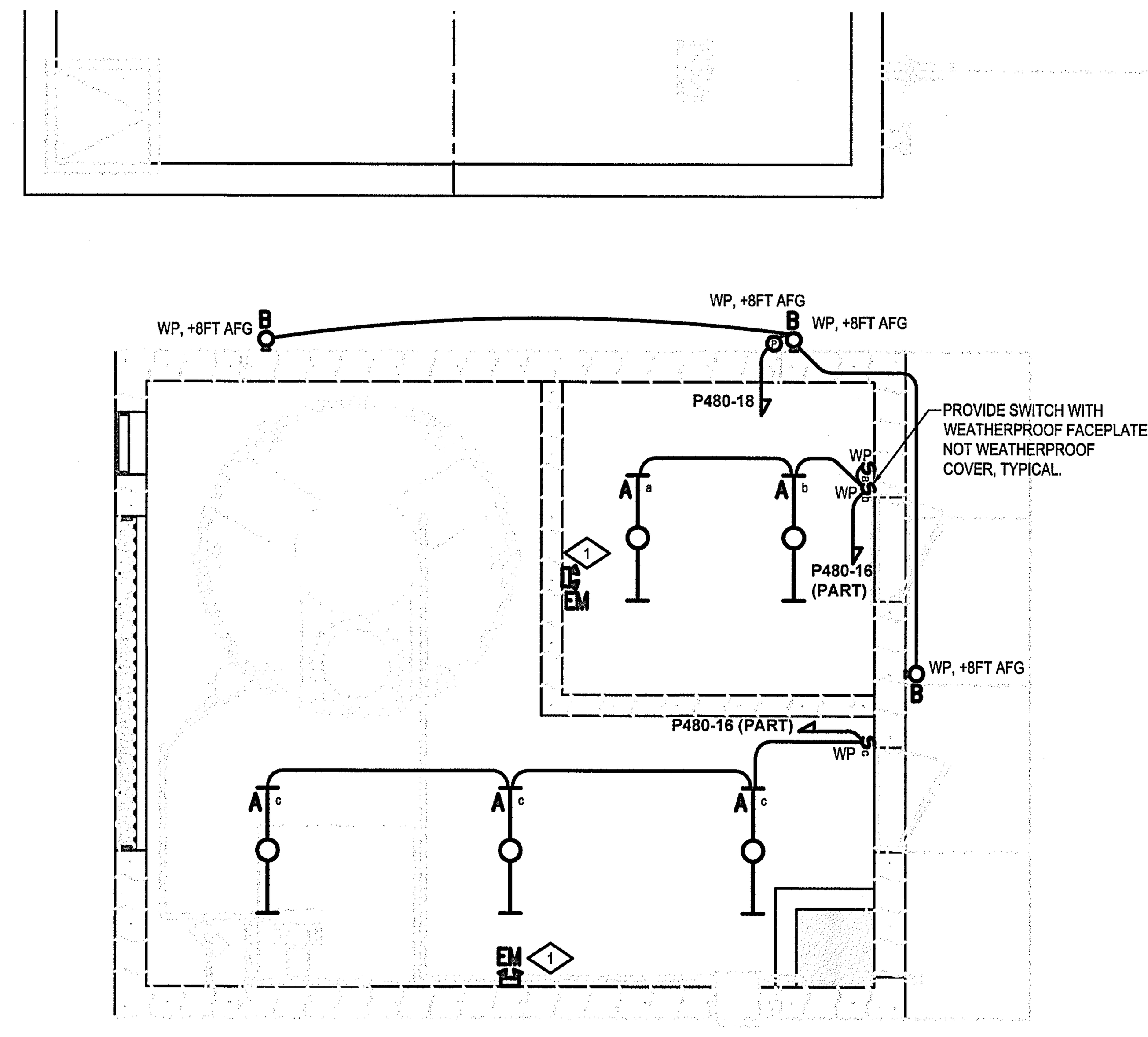
Exceptions:

N/A ☐ Lighting that has been claimed as exempt and is identified as such in Section 3 table above.
N/A ☐ Lighting that is specifically designated as required by a health or life safety statue, ordinance, or regulation.
N/A ☐ Emergency lighting that is automatically off during normal building operation.
✓ Lighting that is controlled by motion sensor.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COM*check* Version 4.0.5.1 and to comply with the mandatory requirements in the Requirements Checklist.

Glenn Ross, Project Engineer (EIT) — [signature] — 03/16/2017
Name - Title — Signature — Date



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DETAIL NOTES

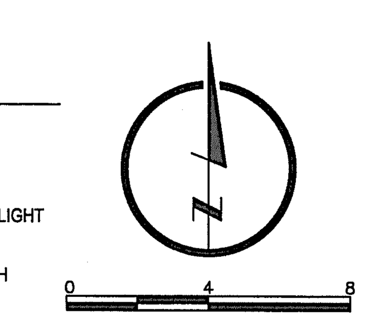
1. PROVIDE NEW LED EMERGENCY LIGHT FIXTURE WITH 90-MINUTE EMERGENCY BATTERY. CONNECT TO UNSWITCHED LEG OF LOCAL LIGHTING CIRCUIT.

1/E1.3 LIFT STATION LIGHTING PLAN

SCALE: 1/4"=1'-0"

GENERAL NOTES:

A. NEW AND RELOCATED ITEMS SHOWN AS BOLD
B. AUTO-OFF CONTROLS HAVE BEEN OMITTED AS A FUNCTION OF WORKER SAFETY. LOSS OF LIGHT WHEN WORKING WITH CHEMICALS OR ELECTRICITY CAN BE CATASTROPHIC.
C. PROVIDE PHOTOCELL CONTROL OF ALL EXTERIOR LIGHTS. PROVIDE EXTERIOR LIGHTS WITH INTEGRAL MOTION DETECTION, WHICH IS TO TURN ON INDIVIDUAL LIGHTS UPON MOTION. OVER-RIDE TO OFF IS ACHIEVED BY SWITCHING CIRCUIT BREAKER AT PANELBOARD "P480".



LIGHTING FIXTURE SCHEDLE

TYPE	MANUFACTURER	CATALOG NUMBER	DESCRIPTION	MOUNTING	VOLTAGE	LAMPS / BALLAST
A	LITHONIA (OR APPROVED EQUAL)	VAP 4000LM FST WD MVOLT GZ10 40K 80CRI (OR APPROVED EQUAL)	WET-LOCATION ENCLOSED LED LUMINAIRE WITH MINUS 20 TO POS 104 DEG-F RATING WITH HIGH-IMPACT FROSTED POLYCARBONATE LENS.	PENDANT 11' AFF	120/277V	LED ARRAY 4,000LM MIN, 45W MAX 4000K CCT
B	LITHONIA (OR APPROVED EQUAL)	DSXW1 LED 10C 700 4000K T3M 277 BBW PIR DDBXD (OR APPROVED EQUAL)	WET-LOCATION WALL SCONCE WITH TYPE 3 DISTRIBUTION, INTEGRAL MOTION DETECTOR, AND SURFACE-MOUNTED BACKBOX FOR CONDUIT, DARK BRONZE FINISH	WALL, 9'AFF	277V	LED ARRAY 2,750LM MIN, 27W MAX 4000K CCT
EM	BEGHELLI (OR APPROVED EQUAL)	LAX-25W-SE-US2-AT (OR APPROVED EQUAL)	WET LOCATION INTEGRAL BUG-EYE LUMINAIRE FOR EGRESS LIGHTING WITH INTEGRAL BATTERY PACK RATED FOR TEMPERATURE CONDITIONS	WALL, 9'AFF	277V	(2) 5W HALOGEN HEADS

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DRAWN BY GGR
DESIGNED BY GGR
DATE 04/21/2017
JOB NUMBER-TASKS 0416011.01
BOOK AND PAGE

REVISIONS
REV 1, SAMPLER VAULT, 10/05/19

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION LIGHTING PLAN

COLORADO LICENSED STEVEN L STRETCH 32200 CEE # 16481 PROFESSIONAL ENGINEER

SHEET
E1.3

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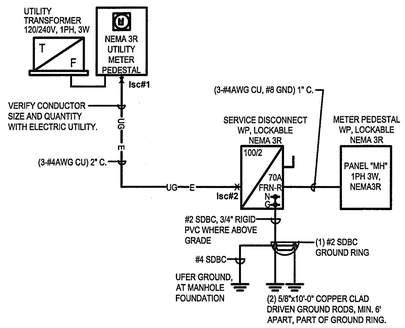
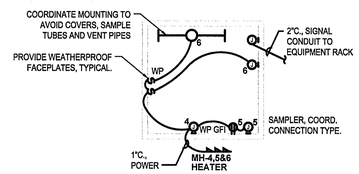


1 POWER ONE-LINE DIAGRAM
E1.5 NO SCALE

GENERAL NOTES:

A. NEW AND RELOCATED ITEMS SHOWN AS BOLD ———



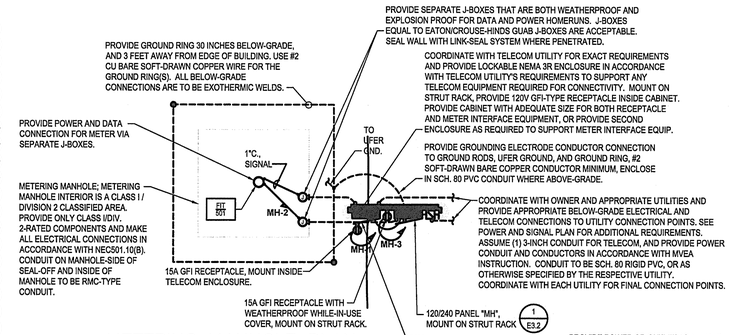
3 SAMPLING VAULT PLAN
E1.5 NO SCALE

GENERAL NOTES:

A. NEW AND RELOCATED ITEMS SHOWN AS BOLD ———
ITEMS ROUTED BELOW-FLOOR, BELOW-GRADE OR CONCEALED SHOWN AS DASHED - - - - -

B. HOMERUNS CONNECT TO PANEL "MH" VIA BELOW-GRADE CONDUIT. UPSIZE CONDUIT AND CONDUCTOR IN ACCORDANCE WITH NEC WHERE COMBINING CIRCUITS INTO A SINGLE CONDUIT. PROVIDE LINK-SEAL SYSTEM AROUND CONDUIT PENETRATIONS WHEREVER VAULT WALL IS PENETRATED. SEAL CONDUIT INTERIOR WHERE CONDUIT PENETRATES THE WALL.

C. AUTO-OFF CONTROLS HAVE BEEN OMITTED AS A FUNCTION OF WORKER SAFETY. LOSS OF LIGHT WHEN WORKING WITH CHEMICALS OR ELECTRICITY CAN BE CATASTROPHIC.



2 METERING MANHOLE PLAN
E1.5 NO SCALE

GENERAL NOTES:

A. NEW AND RELOCATED ITEMS SHOWN AS BOLD ———
ITEMS ROUTED BELOW-FLOOR, BELOW-GRADE OR CONCEALED SHOWN AS DASHED - - - - -

B. SEAL CONDUITS FITTINGS AT BOUNDARY OF CLASS I/DIV. 2 MANHOLE SPACE. PROVIDE SEAL-OFF FITTINGS WHERE CONDUITS FROM MANHOLE EMERGE FROM BELOW-GRADE.

C. HOMERUNS CONNECT TO PANEL "MH" VIA BELOW-GRADE CONDUIT. UPSIZE CONDUIT AND CONDUCTOR IN ACCORDANCE WITH NEC WHERE COMBINING CIRCUITS INTO A SINGLE CONDUIT. PROVIDE LINK-SEAL SYSTEM AROUND CONDUIT PENETRATIONS WHEREVER VAULT WALL IS PENETRATED. SEAL CONDUIT INTERIOR WHERE CONDUIT PENETRATES THE WALL.

D. METERING MANHOLE IS LOCATED ON THE NORTHWEST CORNER OF BENT GRASS MEADOWS DR AND MERIDIAN ROAD IN FALCON, CO. REFERENCE CIVIL PLANS FOR EXACT LOCATION. ORIENT CONSTRUCTION TO MATCH SERVICE SUPPLY DIRECTION AND ALIGNMENT OF MANHOLE. COORDINATE WITH OWNER'S PROJECT MANAGER FOR FINAL RACK LOCATION AND OBTAIN APPROVAL BEFORE ROUGH-IN.

1PH FAULT CALCULATION

POINT #1, AT THE TRANSFORMER;

Isc = 43,400 A L-N
Isc = 29,600 A L-L

POINT #2, AT BOTH SERVICE DISCONNECT & PANEL "MH";

(THIS CALCULATION ASSUMES AT LEAST 35' BETWEEN TRANSFORMER AND PEDESTAL. IF PEDESTAL IS CLOSER TO TRANSFORMER THEN CONTACT OWNER'S ENGINEER FOR REVISED CALCULATION.)

f = 2.0	x	Length	x	Isc (L-N)	/	Volts (L-N)	x	Wire Factor			
f = 2.0	x	35	x	43,400	A /	120	x	3625			
f =		6.62									
M = 1	/	1+ f = 1 /		1 + 6.62		=		0.13			
Isc = M	x	Isc (L-N)		= 0.13		x		43,400	A =	5,696	A L-N
f = 2.0	x	Length	x	Isc (L-L)	/	Volts (L-L)	x	Wire Factor			
f = 2.0	x	35	x	29,600	A /	240	x	3625			
f =		2.26									
M = 1	/	1+ f = 1 /		1 + 2.26		=		0.31			
Isc = M	x	Isc (L-L)		= 0.31		x		29,600	A =	9,088	A L-L

Panel MH

Service: **120/240 Volt, 1 Phase 3 Wire**
Panel Type: **NA**
Poles: **6**
Mounting: **NEMA 3R**
Mains: **MLO**
AIC: **10K**
Comments: **NEW**
Bus: **100**

	Code	Description	Load	Blr	P	Phase Circuit				P	Blr	Load	Description	Code	
1,4	R	RED-TELECOM	900	20	1	1	A	2		1	20	500	METER	L	1,4
1,2	X	RED-COOW ENENCE	500	20	1	3	B	4		1	20	500	SAMPLER VAULT HEATER	L	1
1	X	SAMPLER & TELECOM	500	20	1	5	A	6		1	20	310	S VAULT LGT, OUTLET & FAN	X	1

Code	Description	Conn.	DF	NEC Demand	Load Summary		
L	Lighting	1.00	125%	1.25 KVA			Balance
R	Recpt up to 10 KVA	0.90	100%	0.90 KVA	Leg A	2.39 KVA	67%
	Recpt over 10 KVA	0.00	50%	0.00 KVA	Leg B	1.18 KVA	33%
M	Motor	0.00	100%	0.00 KVA			
	Largest Motor	0.00	125%	0.00 KVA			
C	Computer Recpt	0.00	125%	0.00 KVA	Connected	3.21 KVA	
A	Appliances	0.00	65%	0.00 KVA	Design	16.80 KVA	
X	Misc. Equipment / Mixed Loads	1.31	100%	1.31 KVA	Demand	3.46 KVA	
	Connected Total	3.21 KVA		Demand Total 3.46 KVA	Spare	13.34 KVA	
	Connected Load	13.38 Amps		Demand Load 14.42 Amps			
				Spare Load 55.58 Amps	NEC Demand	3.46 KVA	
				Service Design Load 70 Amps	NEC Demand	14.42 Amps	

1. PROVIDE FEATURES FOR LOCKING IN "OFF" POSITION.
2. TURN OFF RECEPTACLE AT PANELBOARD WHEN NOT IN USE
3. PROVIDE PANELBOARD WITH LOCKABLE COVER TO PREVENT PUBLIC ACCESS.
4. PROVIDE INTERNAL SURGE PROTECTION, AND INCREASE NUMBER OF PANEL SPACES AS REQUIRED TO ACCOMMODATE SURGE PROTECTION DEVICE. ENSURE ANY SURGE PROTECTION DEVICE IS RATED FOR THE ENVIRONMENT WHERE IT IS INSTALLED.
5. PROVIDE NEW BREAKERS AS NEEDED.

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COREY PROJECT #16481

REVISIONS
REV 1, SAMPLER VAULT, 10/05/19

DRAWN BY	GCR
DESIGNED BY	GCR
DATE	04/21/2017
JOB NUMBER-TASKS	041601.01
BOOK AND PAGE	

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
METERING MANHOLE AND POWER RISER

COLORADO LICENSED STEVEN L STRETCHAY 32200 CEE # 16481 PROFESSIONAL ENGINEER

SHEET
E1.5

X:\Corey-Revit\16481 Sterling\16481 Sterling Ranch Lift Station\E1-Series-Rev1.dwg, 10/7/2019 2:50:22 PM, ELECTRICS, LAMP RYNEARSON & ASSOCIATES

3PH FAULT CALCULATION

POINT #1, AT THE UTILITY TRANSFORMER;

Isc = 11,200 A

POINT #2, AT SERVICE DISCONNECT;

(THIS CALCULATION ASSUMES AT LEAST 30' BETWEEN TRANSFORMER AND DISCONNECT. IF PEDESTAL IS CLOSER TO TRANSFORMER THEN CONTACT OWNER'S ENGINEER FOR REVISED CALCULATION.)

f = 1.73 x Length x Isc (source) / L-L Volts x Wire Factor
f = 1.73 x 30 x 11200 A / 480 x 27846
f = 0.04

M = 1 / 1+f = 1 / 1 + 0.04 = 0.96

Isc = M x Isc (source) = 0.96 x 11200 A = 10,733 A

NO FURTHER CALCULTION PERFORMED FOR 480V SYSTEM, AS <14K

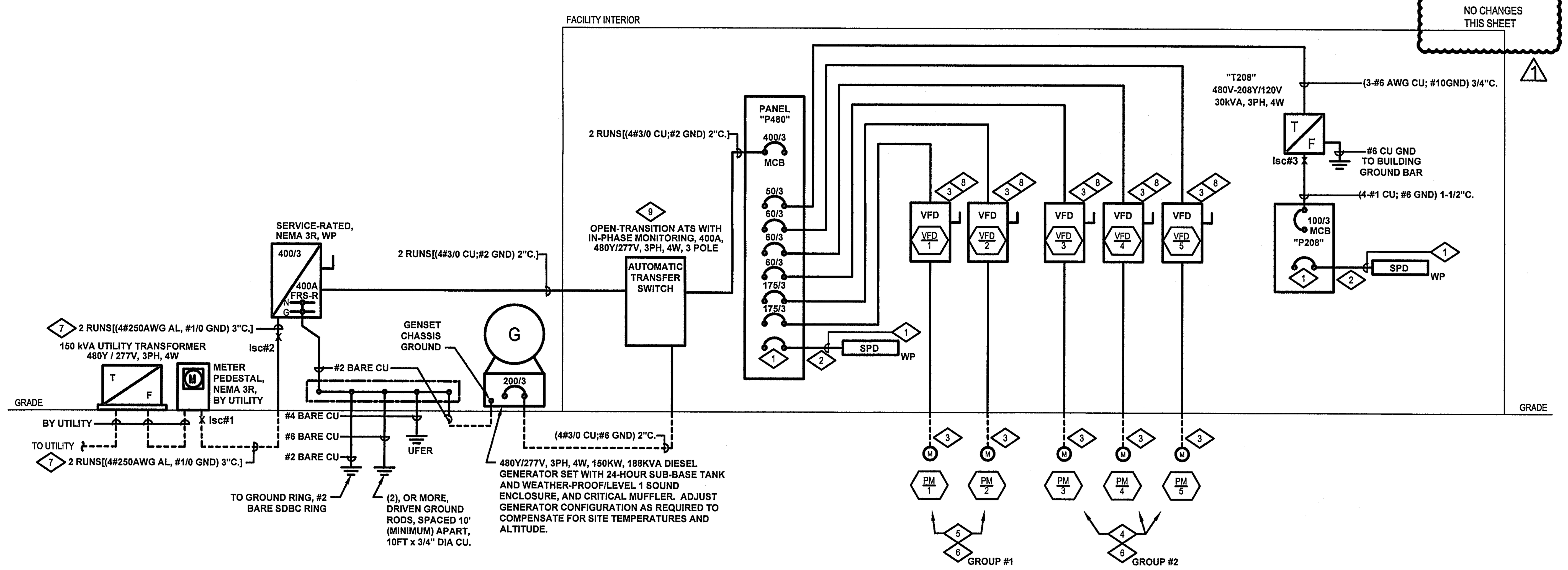
POINT #3, THROUGH THE TRANSFORMER (WORST CASE);

f = [Ip x Vp x 1.73 x %Z] / 100,000 x KVA
f = [10733 A x 480 V x 1.73 x 2.00
/ 100000 x 30 KVA
f = 5.94

M = 1 / 1+f = 1 / 1 + 5.94 = 0.14

Is = (Vp / Vs) x M x Ip = ____ A
Is = (480 V / 208 V) x 0.14 x 10733 A

Is = 3,568 A



POWER RISER DIAGRAM
1 / E2.1
NOT TO SCALE

GENERAL NOTES:
A. NEW AND RELOCATED ITEMS SHOWN AS BOLD
ITEMS BY OTHER TRADES SHOWN AS LIGHT
BELOW-GRADE ITEMS SHOWN AS DASHED

DETAIL NOTES

1. PROVIDE CIRCUIT BREAKER, CONDUCTORS, AND CONDUIT IN ACCORDANCE WITH NEC AND SPD MANUFACTURER'S INSTRUCTIONS.
2. PROVIDE PANELBOARD WITH SURGE PROTECTIVE DEVICE (SPD) TO SUPPRESS TRANSIENT VOLTAGE SURGES.
3. SEE MECHANICAL EQUIPMENT SCHEDULE FOR CONDUCTOR REQUIREMENTS.
4. THESE MOTORS ARE CONTROLLED SO THAT ONLY TWO OF THESE THREE MOTORS WILL BE RUN AT THE SAME TIME.
5. THESE MOTORS ARE CONTROLLED SO THAT ONLY ONE OF THESE TWO MOTORS WILL BE RUN AT THE SAME TIME.
6. THESE MOTOR GROUPS ARE CONTROLLED SO THAT ONLY ONE GROUP OF MOTORS WILL BE RUN AT THE SAME TIME. (100HP VFD MAXIMUM.)
7. OMIT GROUND IF REQUIRED BY UTILITY TO PREVENT BONDING FACILITY TO UTILITY GROUNDING SYSTEM. COORDINATE WITH UTILITY'S ENGINEER FOR APPROVAL TO OMIT GROUND IN THIS CONNECTION.
8. CONSIDER ALTITUDE AND AMBIENT TEMPERATURE WHEN SIZING VFDS. PROVIDE VFDS CAPABLE OF SUPPLYING THE FULL HORSEPOWER OF THE MOTOR AT SITE ALTITUDE AND WORSE-CASE TEMPERATURE. IF VFDS ARE UP-SIZED FOR DE-RATION, THEN PROVIDE PROGRAMMING TO LIMIT CURRENT SUPPLY TO MAXIMUM RATING FOR MOTOR-MATCHED VFD.
9. PROVIDE AUTOMATIC TRANSFER SWITCH RATED TO MEET NEC ARTICLE 701 REQUIREMENTS, ESPECIALLY REQUIREMENTS OF NEC 701.5.

INSTRUMENTATION CABLE SCHEDULE

ROW #	AREA	FROM	TO	INST. CABLE/CONDUIT REQUIREMENTS	DESCRIPTION
1	WATER BASIN	LIT-101	CTL. PNL.	SEE NOTE	PRESSURE TRANSDUCER FOR LEVEL
2	WATER BASIN	LSHH-101	CTL. PNL.	SEE NOTE	HIGH-HIGH-LEVEL SWITCH - SEE SPECS FOR REQUIREMENTS
4	WATER BASIN	LSH-101	CTL. PNL.	SEE NOTE	HIGH-LEVEL SWITCH - SEE SPECS FOR REQUIREMENTS
5	WATER BASIN	LSL-101	CTL. PNL.	SEE NOTE	LOW-LEVEL SWITCH - SEE SPECS FOR REQUIREMENTS
5	WATER BASIN	LSLL-101	CTL. PNL.	SEE NOTE	LOW-LOW-LEVEL SWITCH - SEE SPECS FOR REQUIREMENTS
6	SLUDGE BASIN	LIT-102	CTL. PNL.	SEE NOTE	PRESSURE TRANSDUCER FOR LEVEL
7	SLUDGE BASIN	LSHH-102	CTL. PNL.	SEE NOTE	HIGH-HIGH-LEVEL SWITCH - SEE SPECS FOR REQUIREMENTS
4	SLUDGE BASIN	LSH-102	CTL. PNL.	SEE NOTE	HIGH-LEVEL SWITCH - SEE SPECS FOR REQUIREMENTS
5	SLUDGE BASIN	LSL-102	CTL. PNL.	SEE NOTE	LOW-LEVEL SWITCH - SEE SPECS FOR REQUIREMENTS
10	SLUDGE BASIN	LSLL-102	CTL. PNL.	SEE NOTE	LOW-LOW-LEVEL SWITCH - SEE SPECS FOR REQUIREMENTS
11	VALVE VAULT	FIT-201	CTL. PNL.	SEE NOTE	FLOW METER - CLASS I/DIV. 2-RATED
12	V.VLT. (FUT.)	FIT-202	CTL. PNL.	SEE NOTE	FLOW METER - FUTURE DEVICE, PROVIDE INFRASTRUCTURE.
13	ELEC. ROOM	JSA-101	CTL. PNL.	SEE NOTE	POWER TRANSFER SWITCH FAULT/ALARM
14	ELEC. ROOM	JSN-101	CTL. PNL.	SEE NOTE	POWER TRANSFER SWITCH - UTILITY POWER STATUS
15	ELEC. ROOM	JSB-101	CTL. PNL.	SEE NOTE	POWER TRANSFER SWITCH - GENERATOR POWER STATUS
16	WATER BASIN	TSH-1	CTL. PNL.	SEE NOTE	MOTOR TEMPERATURE SWITCH
17	WATER BASIN	ASH-1	CTL. PNL.	SEE NOTE	MOTOR MOISTURE SWITCH
18	WATER BASIN	TSH-2	CTL. PNL.	SEE NOTE	MOTOR TEMPERATURE SWITCH
19	WATER BASIN	ASH-2	CTL. PNL.	SEE NOTE	MOTOR MOISTURE SWITCH
20	SLUDGE BASIN	TSH-3	CTL. PNL.	SEE NOTE	MOTOR TEMPERATURE SWITCH
21	SLUDGE BASIN	ASH-3	CTL. PNL.	SEE NOTE	MOTOR MOISTURE SWITCH
22	SLUDGE BASIN	TSH-4	CTL. PNL.	SEE NOTE	MOTOR TEMPERATURE SWITCH
23	SLUDGE BASIN	ASH-4	CTL. PNL.	SEE NOTE	MOTOR MOISTURE SWITCH
24	SLUDGE BASIN	TSH-5	CTL. PNL.	SEE NOTE	MOTOR TEMPERATURE SWITCH
25	SLUDGE BASIN	ASH-5	CTL. PNL.	SEE NOTE	MOTOR MOISTURE SWITCH
26	ABOVE W. BSN.	SAO-1	CTL. PNL.	SEE NOTE	SWITCH OPENING ALARM PRE-ACTION SWITCH
27	ABOVE W. BSN.	SAO-2	CTL. PNL.	SEE NOTE	SWITCH OPENING ALARM PRE-ACTION SWITCH
28	ABOVE S. BSN.	SAO-3	CTL. PNL.	SEE NOTE	SWITCH OPENING ALARM PRE-ACTION SWITCH
29	ABOVE S. BSN.	SAO-4	CTL. PNL.	SEE NOTE	SWITCH OPENING ALARM PRE-ACTION SWITCH
30	ABOVE S. BSN.	SAO-5	CTL. PNL.	SEE NOTE	SWITCH OPENING ALARM PRE-ACTION SWITCH
31	METER MANHOLE	FIT-501	CTL. PNL.	SEE NOTE	FLOW METER - CLASS I/DIV. 2-RATED

NOTE: PROVIDE CONDUIT AND CABLE BETWEEN DEVICES SHOWN. CONDUIT SIZE AND CABLE REQUIREMENTS ARE REPRESENTATIVE ONLY. COORDINATE WITH CONTROL SYSTEM PROVIDER FOR FINAL CONDUIT AND CABLE SELECTION. ALL FINAL WIRE TERMINATIONS/CONNECTIONS TO BE PROVIDED BY INSTRUMENTATION CONTRACTOR. CABLE TYPE "TP" INDICATES "TWISTED PAIR CABLE"; CABLE TYPE "STP" INDICATES INSTRUMENTS TO "SHIELDED TWISTED-PAIR CABLE", VERIFY CABLE TYPE IN ALL CASES WITH CONTROL SYSTEM PROVIDER. PROVIDE #12AWG CU GROUND IN EVERY INSTRUMENTATION CONDUIT. BASIS FOR ANALOG - #16AWG CU STP; DISCRETE - #16 STP, POWER - (2#12CU,#12GND)3/4"C. PROVIDE CONDUIT FOR ALL INSTRUMENT CONNECTIONS. REPLACE BASIS CABLES WITH CABLES RECOMMENDED BY MANUFACTURER OF LISTED EQUIPMENT WHERE CONFLICT WITH BASIS CABLES OCCUR.

SUPPLIED FROM: 480Y/277V UTILITY SERVICE VIA FUSED DISCONNECT SWITCH VIA AUTO. XFR. SWITCH

* PANEL "P480" (NEW) — VOLTAGE 277 / 480 V 3 PH 4 W
FLUSH ____ M.C.B. 400/3 MLO X I.G. BAR ____ MANF. ____
SURFACE X BUS 400A CU A.I.C. 14,000 C.B. BOLT ON

	TYPE	DESCRIPTION	BKR	CIR	A	A	B	B	C	C	CIR	BKR	DESCRIPTION	TYPE	
3	M	VFD-1	175	1	36564	0					2	TBD	SURGE PROT. DEVICE		1
3	M	- (PM-1)	/	3			36564	0			4	/	-		1
3	M	- (100HP)	3P	5					36564	0	6	3P	-		1
2,3		VFD-2	175	7	0	0					8	--	SPACE		
2,3		- (PM-2)	/	9			0	0			10	--	SPACE		
2,3		- (100HP)	3P	11					0	0	12	--	SPACE		
2,3		VFD-3	60	13	0	0					14	--	SPACE		
2,3		- (PM-3)	/	15			0	225			16	15	LTG - INTERIOR	L	
2,3		- (30HP)	3P	17					0	81	18	15	LTG - EXTERIOR	L	
2,3		VFD-4	60	19	0	0					20	--	SPACE		
2,3		- (PM-4)	/	21			0	0			22	--	SPACE		
2,3		- (30HP)	3P	23					0	0	24	--	SPACE		
2,3		VFD-5	60	25	0	6386					26	50	P208 VIA XFMR	RMG	
2,3		- (PM-5)	/	27			0	4436			28	/	-	RMG	
2,3		- (30HP)	3P	29					0	5700	30	3P	-	RMG	
					42950		41225		42345						

LOAD TYPE	CONNECTED KVA A	B	C	TOTAL ALL PHASES	FACTOR	DEMAND KVA A	B	C	TOTAL ALL PHASES
LIGHTING	0.0	0.2	0.1	0.3	125%	0.0	0.3	0.1	0.4
RECEPTACLE (10KVA OR LESS)	0.5	0.9	0.2	1.6	100%	0.5	0.9	0.2	1.6
RECEPTACLE (OVER 10KVA)	0.0	0.0	0.0	0.0	50%	0.0	0.0	0.0	0.0
HVAC/MOTOR	2.3	2.4	1.9	6.6	100%	2.3	2.4	1.9	6.6
MOTOR(LARGEST)	36.6	36.6	36.6	109.8	125%	45.8	45.8	45.8	137.3
KITCHEN EQUIPMENT	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0
MISCELLANEOUS	3.5	1.1	3.6	8.2	100%	3.5	1.1	3.6	8.2
TOTAL KVA	43.0	41.2	42.3	126.5	TOTAL KVA	52	50	52	154.0
WITH GROUND BUS					TOTAL AMPS	188	182	186	185.3

LEGEND: L = LIGHTING R = RECEPTACLE M = HVAC / MOTOR K = KITCHEN G = MISCELLANEOUS
MAX PERCENT DIFFERENCE BETWEEN PHASES (A,B,C): 4%

* PROVIDE COMPLETE NEW PANELBOARD.
1 PROVIDE PANELBOARD WITH INTEGRAL SURGE PROTECTIVE DEVICE (SPD). SIZE CONNECTION AND CIRCUIT BREAKER IN ACCORDANCE WITH NEC AND SPD MANUFACTURER'S REQUIREMENTS.
2 LOAD NOT ADDED TO CALCULATED LOAD AS THIS MOTOR IS LOCKED-OUT WHEN THE LARGEST MOTOR/VFD ON THE SYSTEM IS OPERATING.
3 PROVIDE MEANS FOR LOCKING CIRCUIT BREAKER IN THE OFF POSITION, FOR USE AS EQUIPMENT SERVICE DISCONNECT.

SUPPLIED FROM: 50/3 CIRCUIT BREAKER IN PANEL "P480" VIA 30KVA TRANSFORMER

* PANEL "P208" (NEW) — VOLTAGE 120 / 208 V 3 PH 4 W
FLUSH ____ M.C.B. 100/3 MLO X I.G. BAR ____ MANF. ____
SURFACE X BUS 100A CU A.I.C. 10,000 C.B. BOLT ON

	TYPE	DESCRIPTION	BKR	CIR	A	A	B	B	C	C	CIR	BKR	DESCRIPTION	TYPE	
	R	REC - EXTERIOR	20	1	360	0					2	TBD	SURGE PROT. DEVICE	–	1
	R	REC - ELEC RM.	20	3			900	0			4	/	-	–	1
	R	REC - PUMP RM. - N	20	5					180	0	6	3P	-	–	1
	R	REC - PUMP RM. - S	20	7	180	430					8	20	CONTROL PANEL	M	
	M	PUMP - SUMP	20	9			1176	300			10	15	FAN VF-1, LU-1	M	
	M	PUMP - CHEM C1	40	11					1920	2500	12	30	CUH-1 UNIT HEATER	G	
	M	PUMP - CHEM C2, C3	15	13	1056	2500					14	2P	-	G	
2	M	SPARE	15	15			100	1000			16	20	208V GENSET LOADS	G	
	–	SPARE	15	17					0	1000	18	2P	-	G	
	–	SPARE	15	19	0	1000					20	20	120V GENSET LOADS	G	
	–	SPACE	--	21			0	100			22	15	FLOW METER	G	
	–	SPACE	--	23					0	100	24	15	FLOW METER (FUT)	G	3
	–	SPACE	--	25	0	860					26	15	HVAC-1 AIR COND.	M	
	–	SPACE	--	27			0	860			28	2P	-	M	
	–	SPACE	--	29					0	0	30	--	SPACE	–	
					6386		4436		5700						

LOAD TYPE	CONNECTED KVA A	B	C	TOTAL ALL PHASES	FACTOR	DEMAND KVA A	B	C	TOTAL ALL PHASES
LIGHTING	0.0	0.0	0.0	0.0	125%	0.0	0.0	0.0	0.0
RECEPTACLE (10KVA OR LESS)	0.5	0.9	0.2	1.6	100%	0.5	0.9	0.2	1.6
RECEPTACLE (OVER 10KVA)	0.0	0.0	0.0	0.0	50%	0.0	0.0	0.0	0.0
HVAC/MOTOR	1.2	1.2	0.0	2.5	100%	1.2	1.2	0.0	2.5
MOTOR(LARGEST)	1.1	1.2	1.9	4.2	125%	1.4	1.5	2.4	5.3
KITCHEN EQUIPMENT	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0
MISCELLANEOUS	3.5	1.1	3.6	8.2	100%	3.5	1.1	3.6	8.2
TOTAL KVA	6.4	4.4	5.7	16.5	TOTAL KVA	7	5	6	17.6
WITH GROUND BUS					TOTAL AMPS	56	39	51	48.8

LEGEND: L = LIGHTING R = RECEPTACLE M = HVAC / MOTOR K = KITCHEN G = MISCELLANEOUS
MAX PERCENT DIFFERENCE BETWEEN PHASES (A,B,C): 31%

* PROVIDE COMPLETE NEW PANELBOARD.
1 PROVIDE PANELBOARD WITH INTEGRAL SURGE PROTECTIVE DEVICE (SPD). SIZE CONNECTION AND CIRCUIT BREAKER IN ACCORDANCE WITH NEC AND SPD MANUFACTURER'S REQUIREMENTS.
2 CIRCUIT RESERVED FOR ACCESSORIES, PUMPS, INSTRUMENT SYSTEMS, AND SIMILAR IN THE PUMP ROOM. PROVIDE UP TO TWO (2) ADDITIONAL CONNECTIONS WITH LOCAL WEATHERPROOF DISCONNECT SWITCH AT EACH EQUIPMENT LOCATION.
3 PROVIDE MECHANICAL RESTRAINT FOR THIS CIRCUIT BREAKER AND RESTRAIN IN "OFF" POSITION.

COREY Electrical Engineering, Inc.
Commercial and Transportation Design
COREY PROJECT #16481

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
POWER RISER AND SCHEDULES

DRAWN BY GGR
DESIGNED BY GGR
DATE 04/21/2017
JOB NUMBER-TASKS 0416011.01
BOOK AND PAGE

REVISIONS
REV 1, SAMPLER VAULT, 10/05/19

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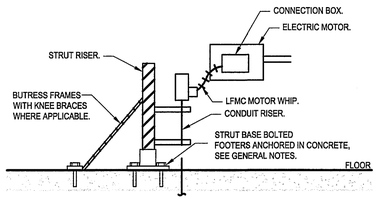
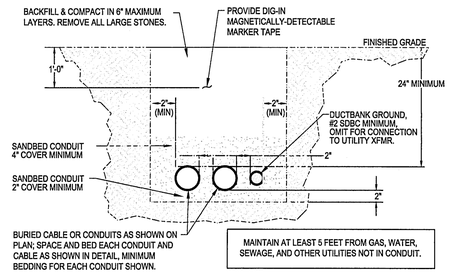


NOTE: BUTTRESS STRUT FRAMES AGAINST NEARBY WALLS OR OTHER STRUCTURES WITH BRACKETS, OR PROVIDE KNEE BRACES TO FLOOR. ENSURE BUTTRESSING PROTECTS STRUT FRAME FROM BOTH FRONT-TO-BACK FORCES AND SIDE-TO-SIDE FORCES AND LOCATE ALL CONNECTIONS TO MINIMIZE TRIP HAZARDS AND OBSTRUCTIONS TO TRAFFIC.

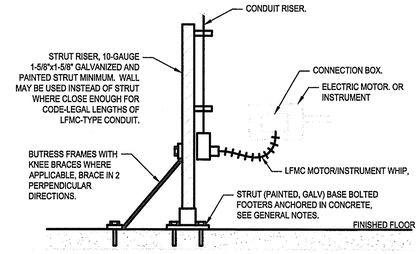
1 / E3.1 MOTOR & INSTRUMENT CONNECTION DIAGRAM – UNDER–SLAB

NOT TO SCALE



2 / E3.1 CONDUIT TRENCHING DETAIL

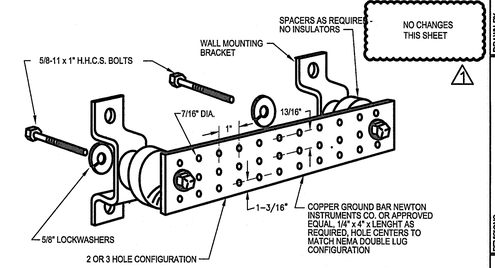
NOT TO SCALE



NOTE: BUTTRESS STRUT FRAMES AGAINST NEARBY WALLS OR OTHER STRUCTURES WITH BRACKETS, OR PROVIDE KNEE BRACES TO FLOOR. ENSURE BUTTRESSING PROTECTS STRUT FRAME FROM BOTH FRONT-TO-BACK FORCES AND SIDE-TO-SIDE FORCES AND LOCATE ALL CONNECTIONS TO MINIMIZE TRIP HAZARDS AND OBSTRUCTIONS TO TRAFFIC.

3 / E3.1 MOTOR & INSTRUMENT CONNECTION DIAGRAM – OVERHEAD

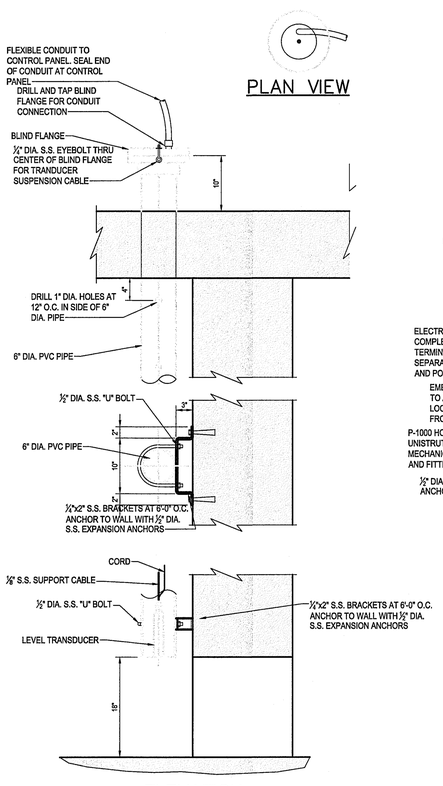
NOT TO SCALE



NOTE: TWO HOLE LUG CONNECTOR BOLTED TO EACH SIDE OF GROUND BAR ACCEPTABLE TO REDUCE GROUND BAR SIZE.

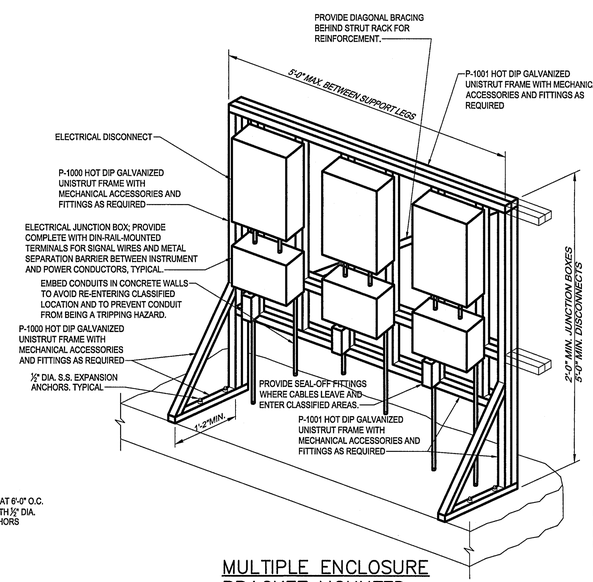
4 / E3.1 GROUND BAR DETAIL

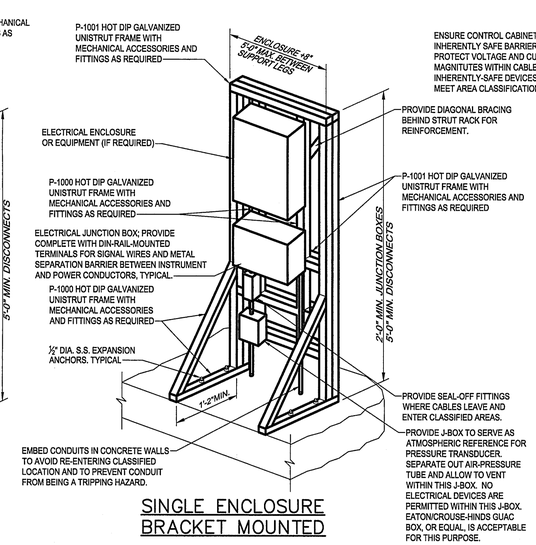
NOT TO SCALE



5 / E3.1 TRANSDUCER DETAIL

NOT TO SCALE

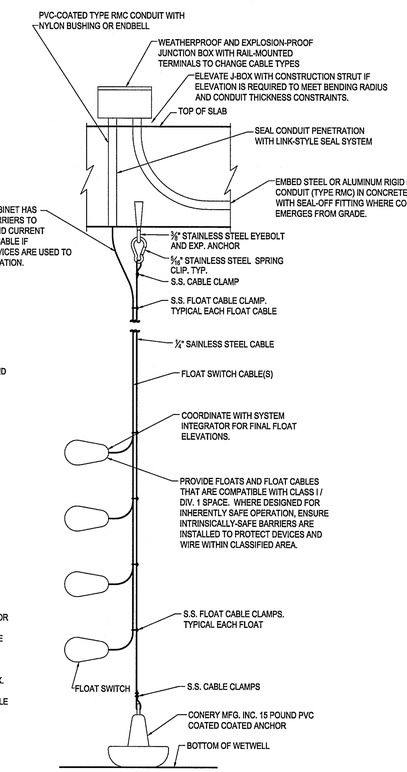




NOTE: CONDUIT CONNECTIONS NOT SHOWN FOR CLARITY. PROVIDE CONDUIT CONNECTIONS PER PLAN DRAWINGS AND AS REQUIRED FOR SYSTEM FUNCTIONALITY.

6 / E3.1 ENCLOSURE SUPPORT

NOT TO SCALE



7 / E3.1 FLOAT GUIDE CABLE DETAIL

NOT TO SCALE

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REV 1. SAMPLER VAULT	10/05/19

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

LIFT STATION
ELECTRICAL DETAILS

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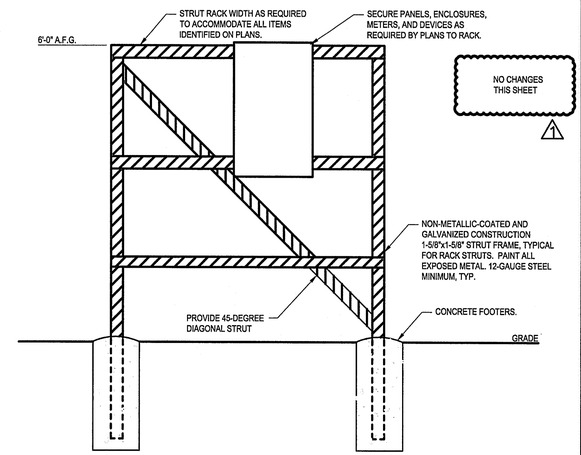

1 E3.2 MANHOLE SERVICE STRUT RACK
NOT TO SCALE

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REV 1, SAMPLIER VAULT, 10/05/19

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

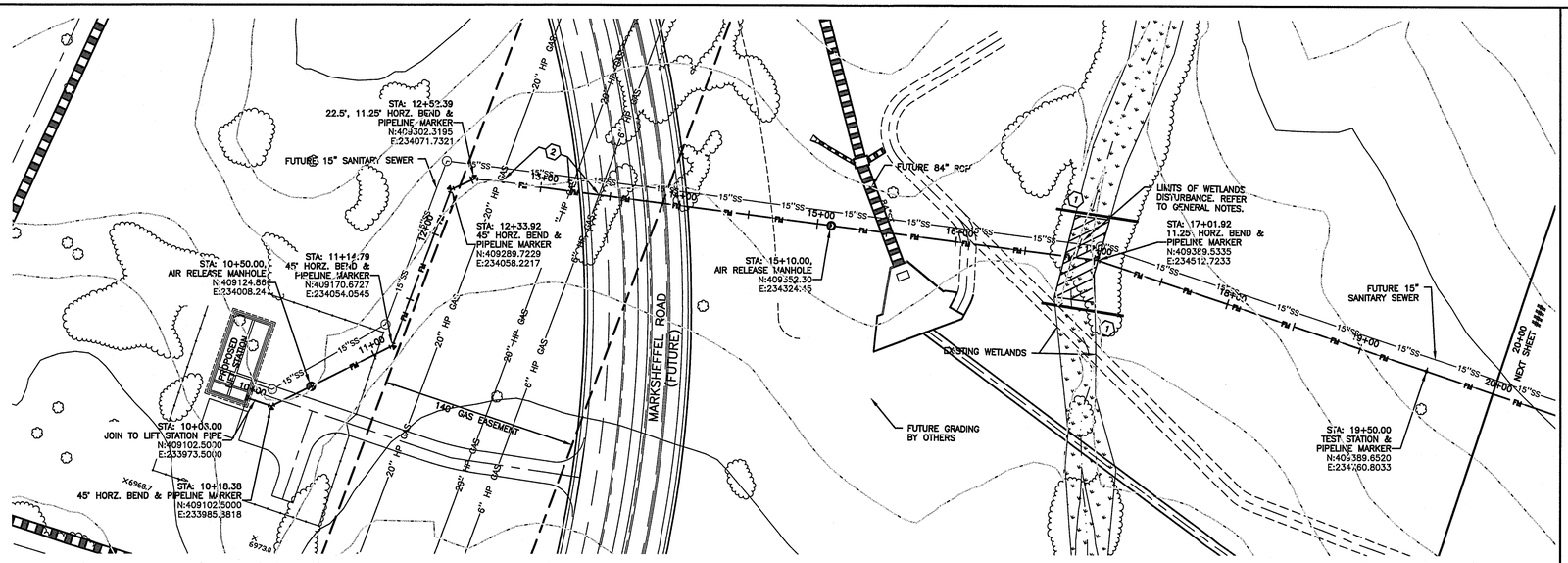
LIFT STATION
ELECTRICAL DETAILS

COLORADO LICENSED
STEVEN L STREICHER
32200
CEE #
16481
PROFESSIONAL ENGINEER

COREY
Electrical Engineering, Inc.
Commercial and Transportation Design
7653 S. Sterling Ct. Suite B, Englewood, CO 80112 | P (720) 66-1287 |
projects@coreygroup.com
COREY PROJECT #16481

SHEET
E3.2

X:\Corey-Revit\16481 Sterling\16481 Sterling Ranch Lift Station\E3.1 -Electrical Details-Rev1.dwg, 10/7/2019 2:53:07 PM, ELECTRICS, LAMP RYNEARSON & ASSOCIATES



NOTES:

1. SEE SHEET G0.2 FOR GENERAL NOTES.
2. STATIONING IS BASED ON THE CENTERLINE BETWEEN THE 8" AND 10" FORCE MAINS.
3. CONTRACTOR SHALL INSTALL THRUST BLOCKS AT ALL HORIZONTAL AND VERTICAL BENDS PER DETAIL.
4. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES WITHIN THE AREA OF WORK 7 DAYS PRIOR TO THE START OF INSTALLATION OF THE PIPELINE. THE CONTRACTOR SHALL NOTIFY OWNER AND ENGINEER OF ANY CONFLICTS THAT ARISE AND REQUIRE REDESIGN OF ANY PORTION OF THE PROJECT. REFER TO GENERAL NOTES FOR FURTHER INFORMATION.
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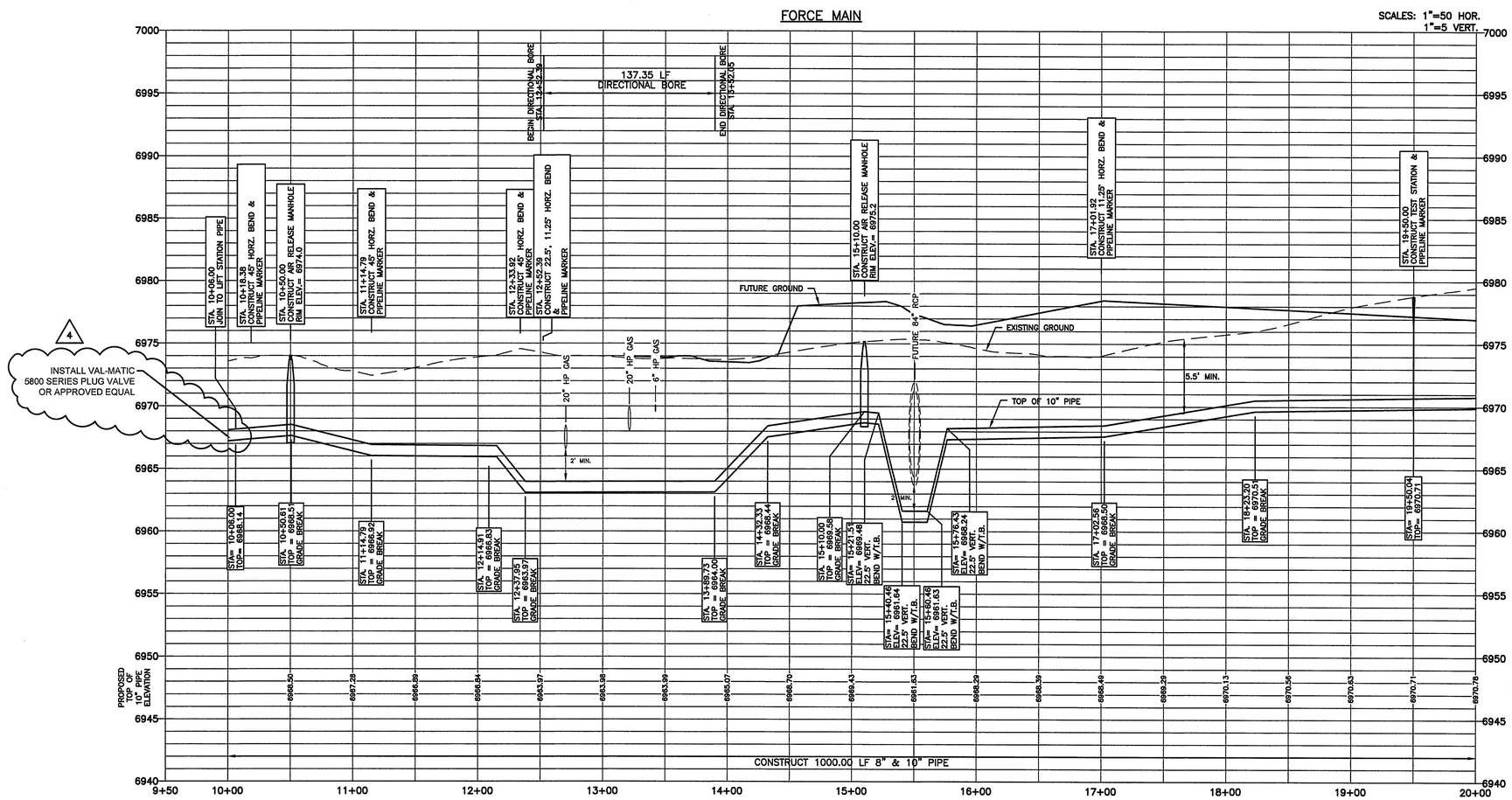
8. CONTRACTOR SHALL BLADE A SMALL 6" HIGH BERM ALONG THE DOWNSTREAM SIDE OF TRENCHING OPERATIONS TO CONTROL STORM DRAINAGE FLOWS AND MINIMIZE TRANSPORTATION SEDIMENT DOWNSTREAM. SEE DETAIL SHEET FM2.4.
9. CONTRACTOR SHALL RESEED ALL AREAS DISTURBED DURING CONSTRUCTION, INCLUDING ANY SOD AND/OR LANDSCAPING.
10. CONTRACTOR SHALL PROTECT IN PLACE OR REMOVE AND REPLACE ANY SIGNS, MAILBOXES, LANDSCAPING, OR OTHER OBSTRUCTIONS DISTURBED DURING CONSTRUCTION.

KEYNOTE:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4
2. CONTRACTOR SHALL COORDINATE AND OBTAIN PERMITS WITH THE UTILITY COMPANIES PRIOR TO CONSTRUCTION AND CROSSING THE EXISTING HIGH PRESSURE GAS MAIN.
   A. COLORADO INTERSTATE GAS (719) 520-4816
   B. MAGELLAN MIDSTREAM GAS (918) 574-7098



REVISIONS	
1	REVISED PER COMMENTS - 06/07/19

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER: 041601.1
BOOK AND PAGE:

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
SHEET – 1

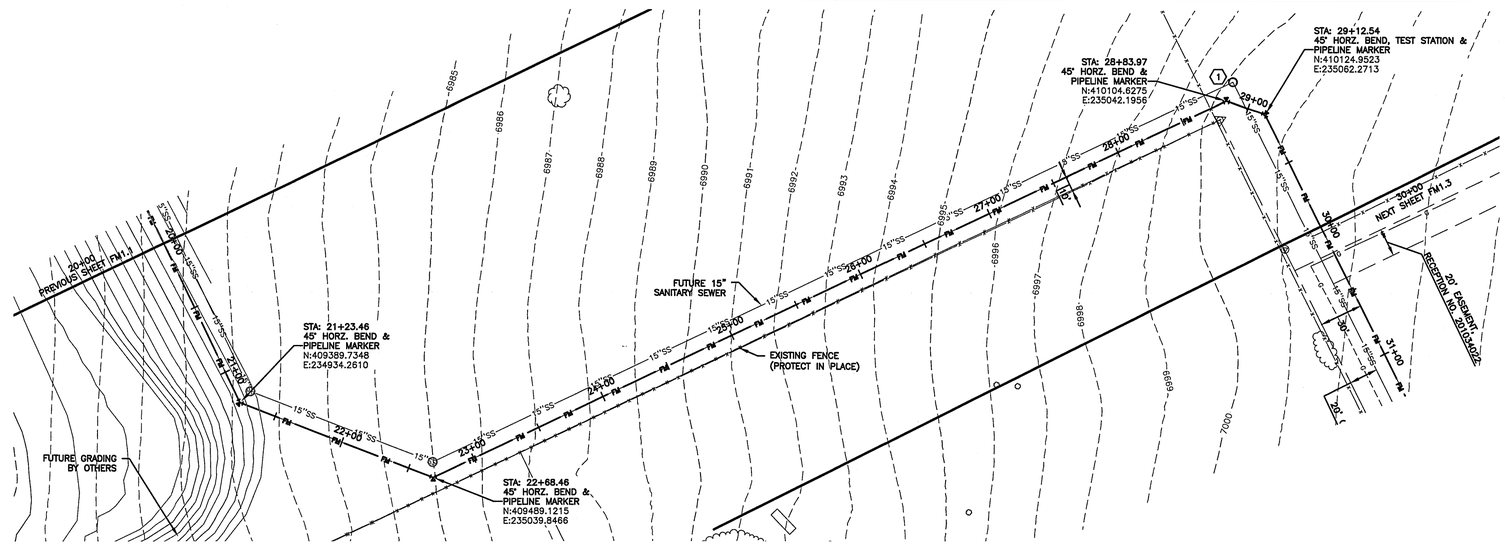
LAMP RYNEARSON - ENGINEERS

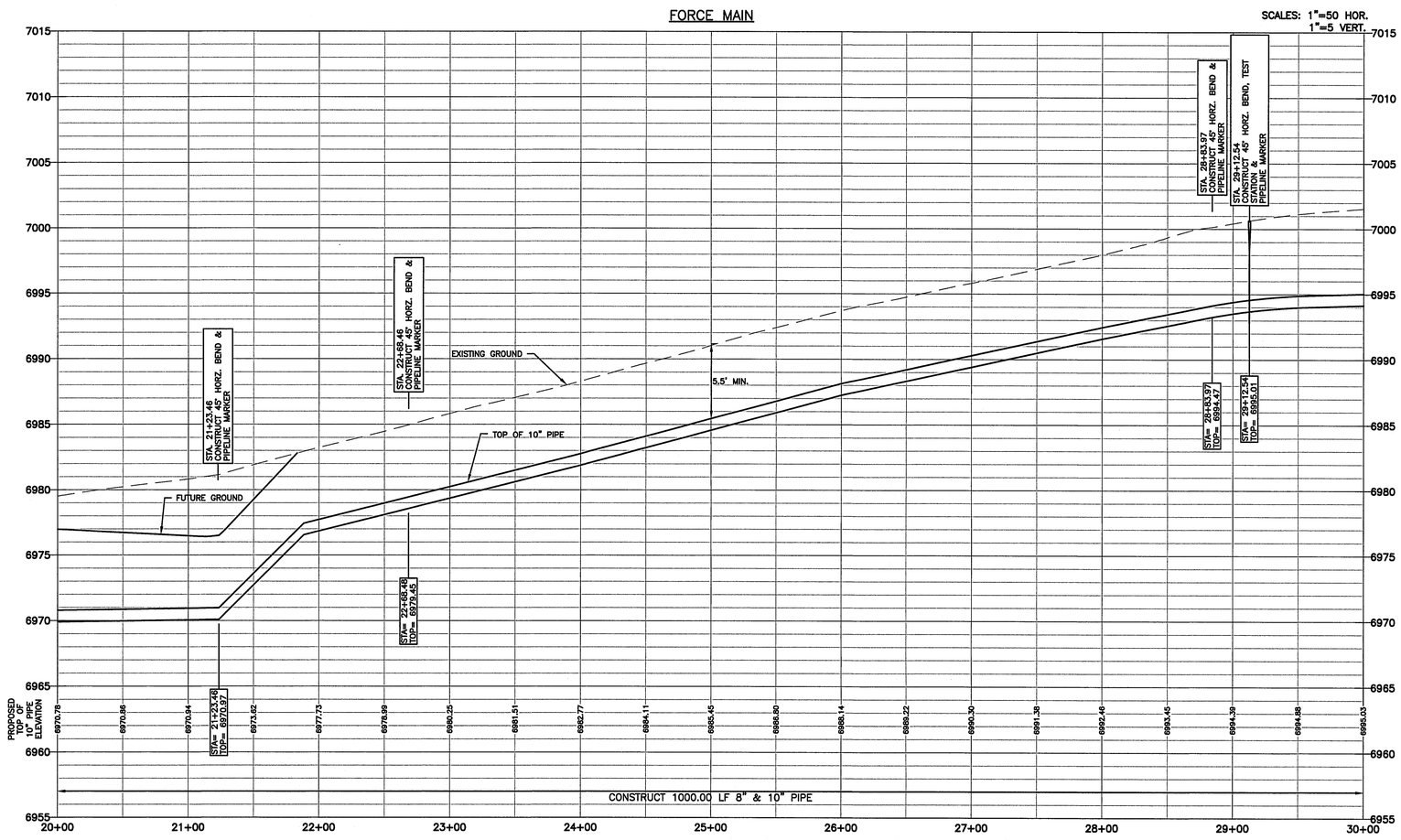
BRADLEY A. SIMONS
34705

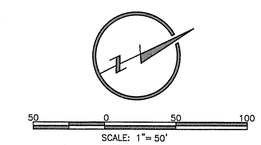
SHEET
FM1.1

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

N:\Projects\Mat – Sterling Ranch\CAD\Engineering\Sheet Sets\G2\A\041601-Sht-001-Mat.dwg, 6/7/2019 10:41:06 AM, DAN POND, LAMP RYNEARSON & ASSOCIATES







NOTES:

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10. CONTRACTOR SHALL PROTECT IN PLACE OR REMOVE AND REPLACE ANY SIGNS, MAILBOXES, LANDSCAPING, OR OTHER OBSTRUCTIONS DISTURBED DURING CONSTRUCTION.

KEYNOTE:

(1) REMOVE AND RE-INSTALL 50 LF OF EXISTING FENCE

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	14011
BOOK AND PAGE	

REVISIONS

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 20+00 TO STA. 30+00

LAMP RYNEARSON - ENGINEERS

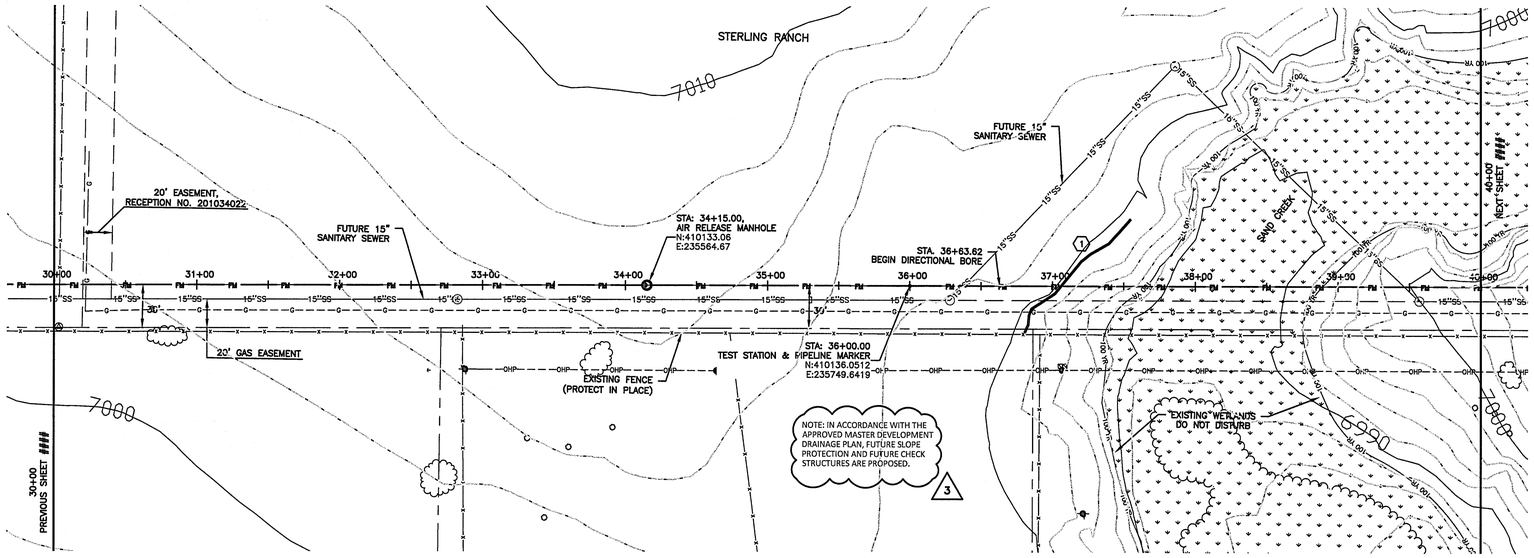
COLORADO LICENSED PROFESSIONAL ENGINEER 34705 4/24/17

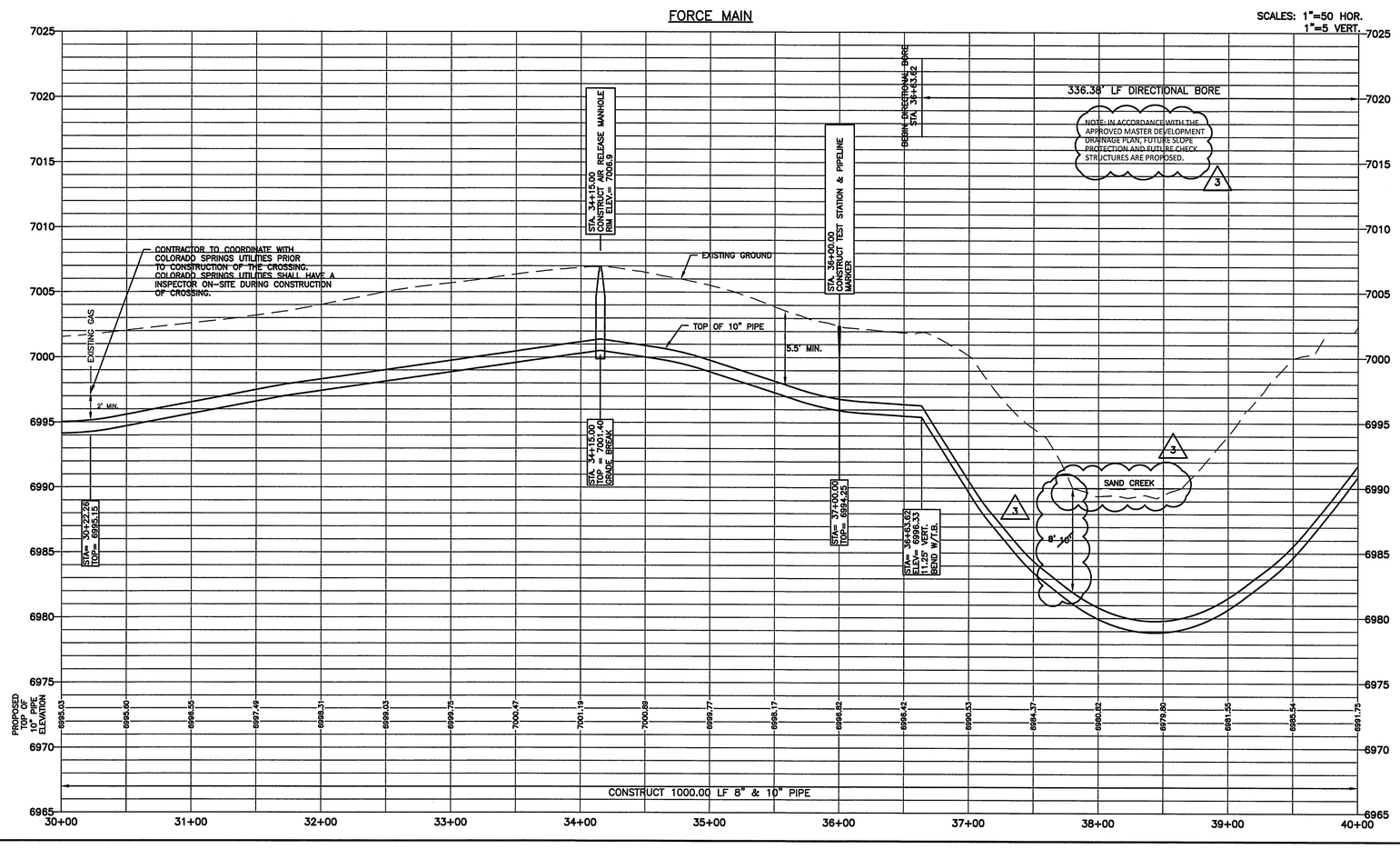
BRADLEY A. SIMONS
34705

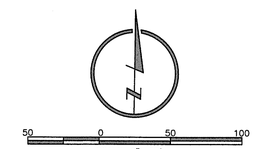
SHEET
FM1.2

COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG.

PL_Engineering\14011 Sterling Ranch LR Station\DRAWINGS\CONSTRUCTION DRAWINGS\14011-SAN-001.dwg, 4/21/2017 2:36:39 PM, JASON MONELL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTE:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER/ FASRS	04180/
BOOK AND PAGE	

REVISIONS
3 – PER EPC COMMENTS – 05/31/2019

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 30+00 TO STA. 40+00

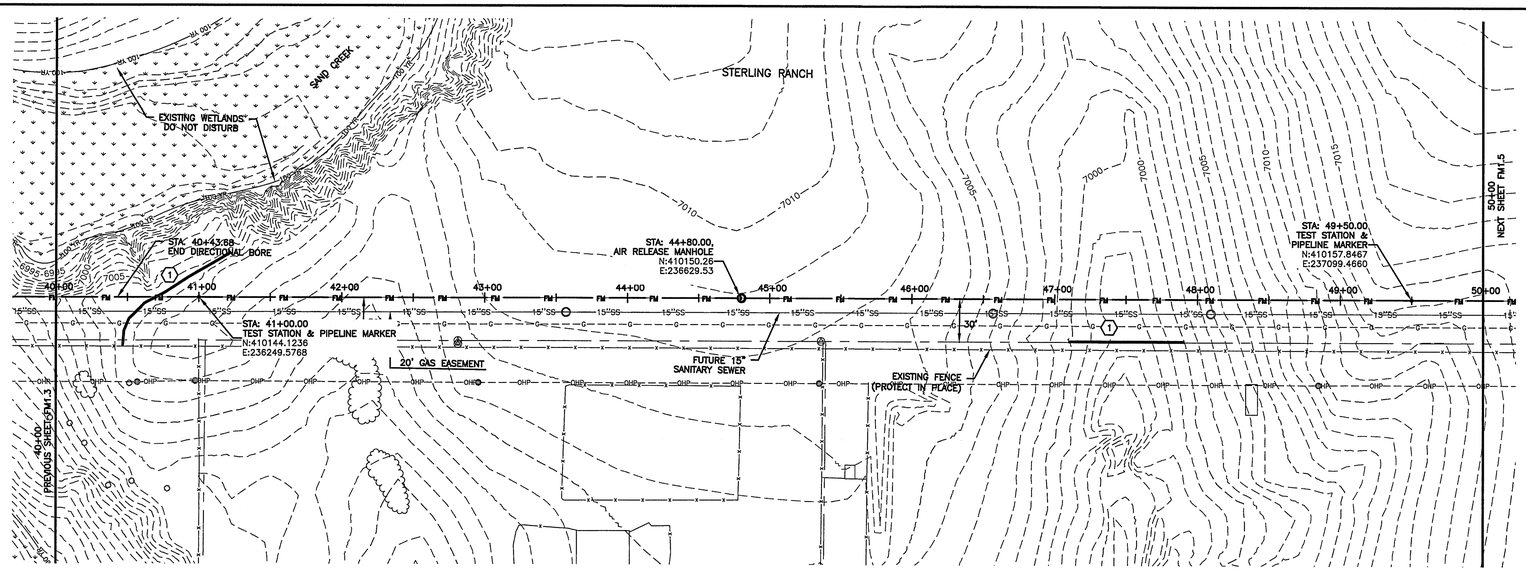
LAMP RYNEARSON - ENGINEERS

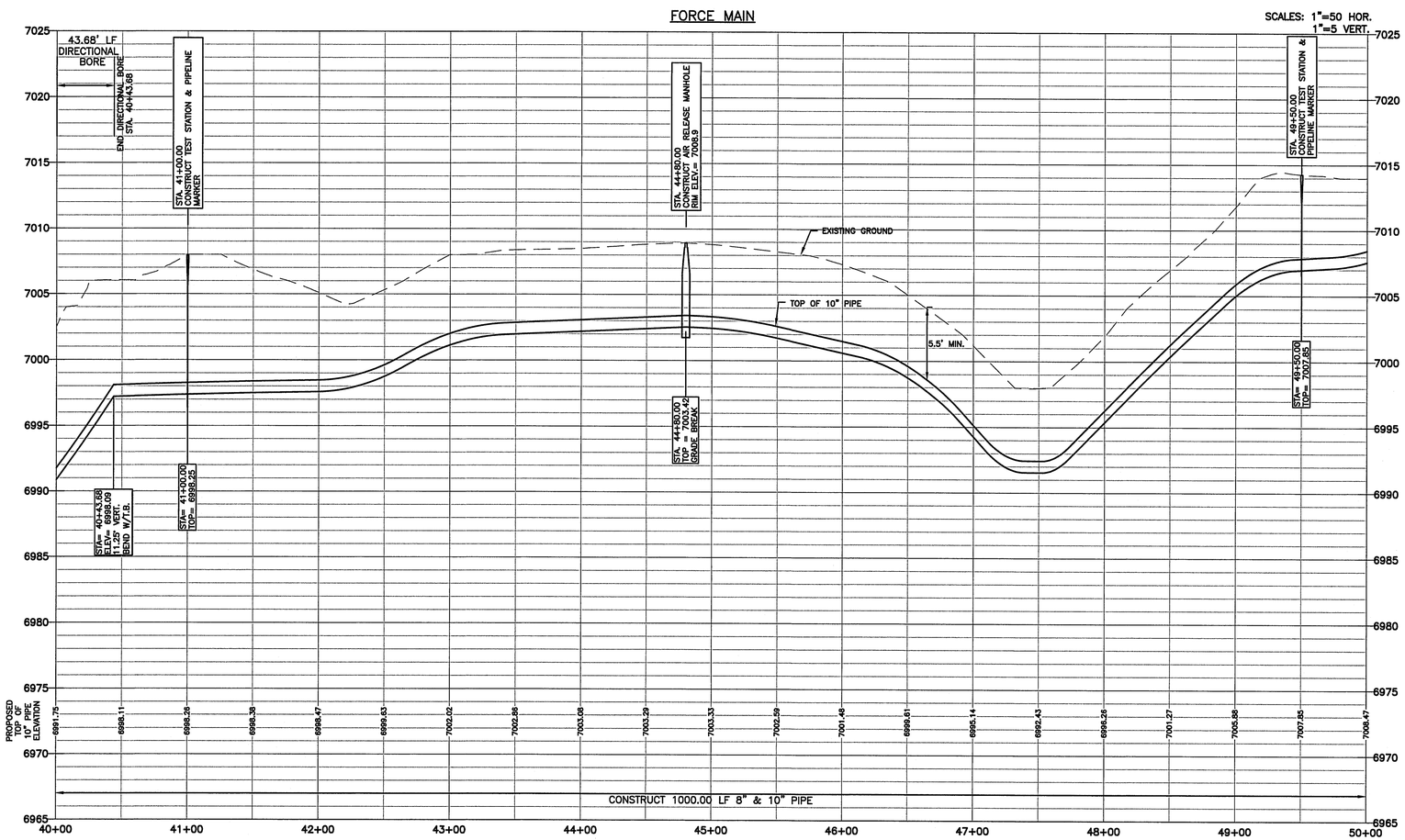
BRADLEY A. SIMONS
34705

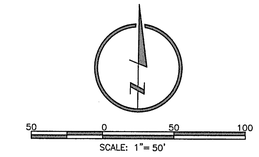
SHEET
FM1.3

COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG.

N:\Projects\AM8 – Sterling Ranch\CAD\Engineering\Const Sets\CDP\LA\16011-04M-001-MM.dwg, 6/7/2019 10:33:43 AM, DWG TO PDF.PC3, LAMP RYNEARSON & ASSOCIATES







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KEYNOTE:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER: FA3K8	
041601	
BOOK AND PAGE	

REVISIONS

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE STA. 40+00 TO STA. 50+00

LAMP RYNEARSON - ENGINEERS

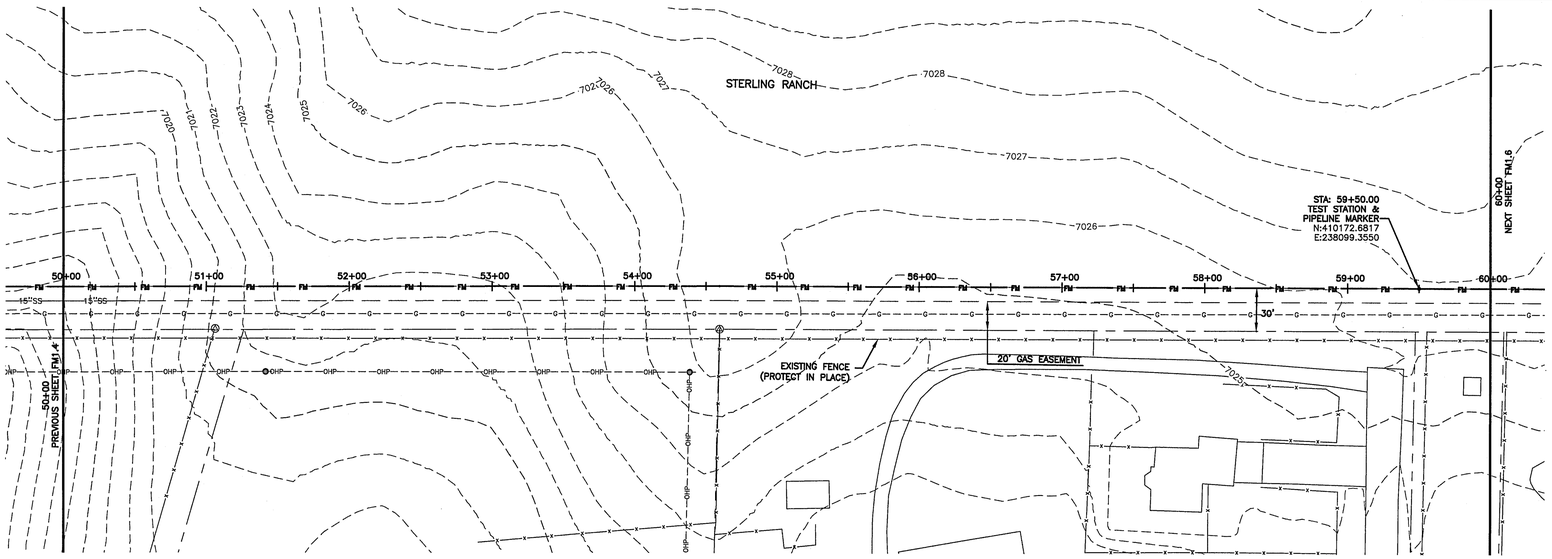
COLORADO PROFESSIONAL ENGINEER 34705 4/24/17

BRADLEY A. SIMONS
34705

SHEET
FM1.4

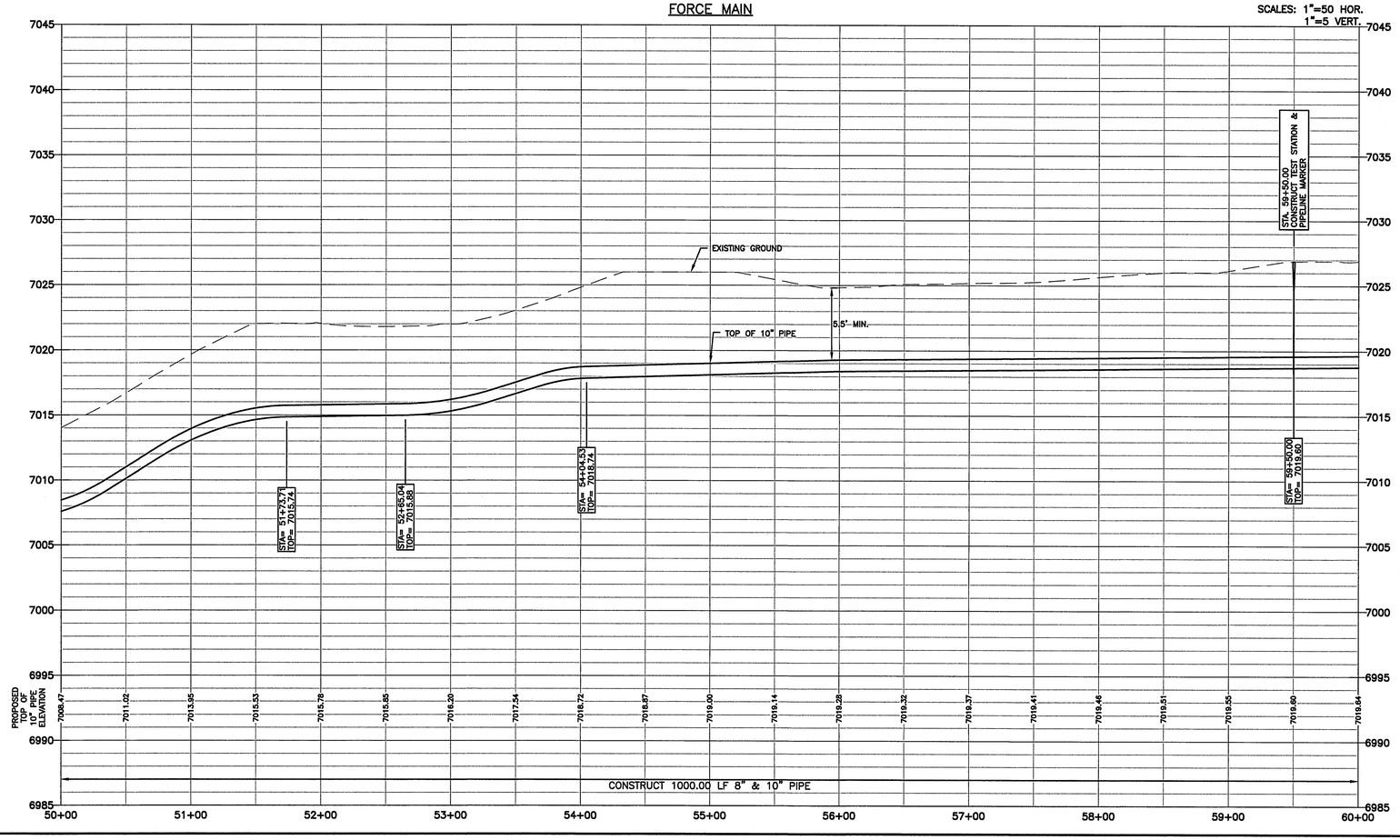
COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG!

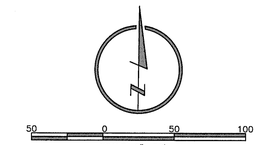
P:_Engineering\041601 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\041601-SAN-001.dwg, 4/21/2017 2:37:14 PM, JASON MORELL, LAMP RYNEARSON & ASSOCIATES



FORCE MAIN

SCALES: 1"=50 HOR.
1"=5 VERT.





NOTES:

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DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	704868
041611	
BOOK AND PAGE	

REVISIONS

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STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 50+00 TO STA. 60+00

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.5

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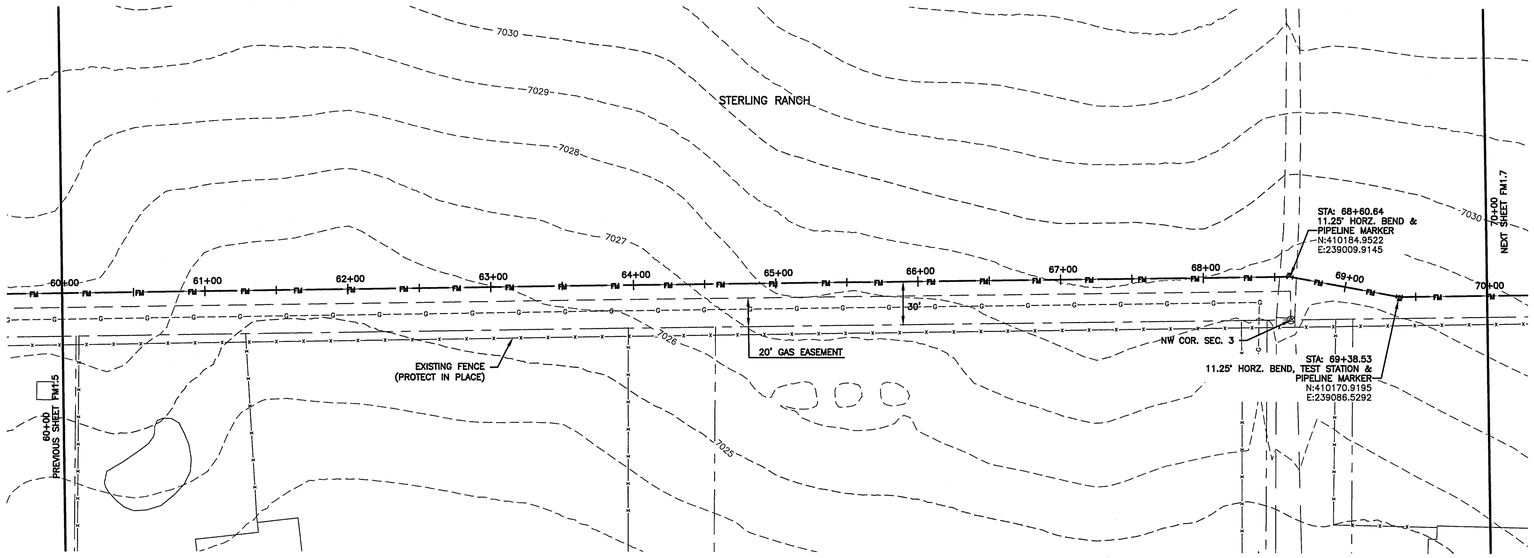
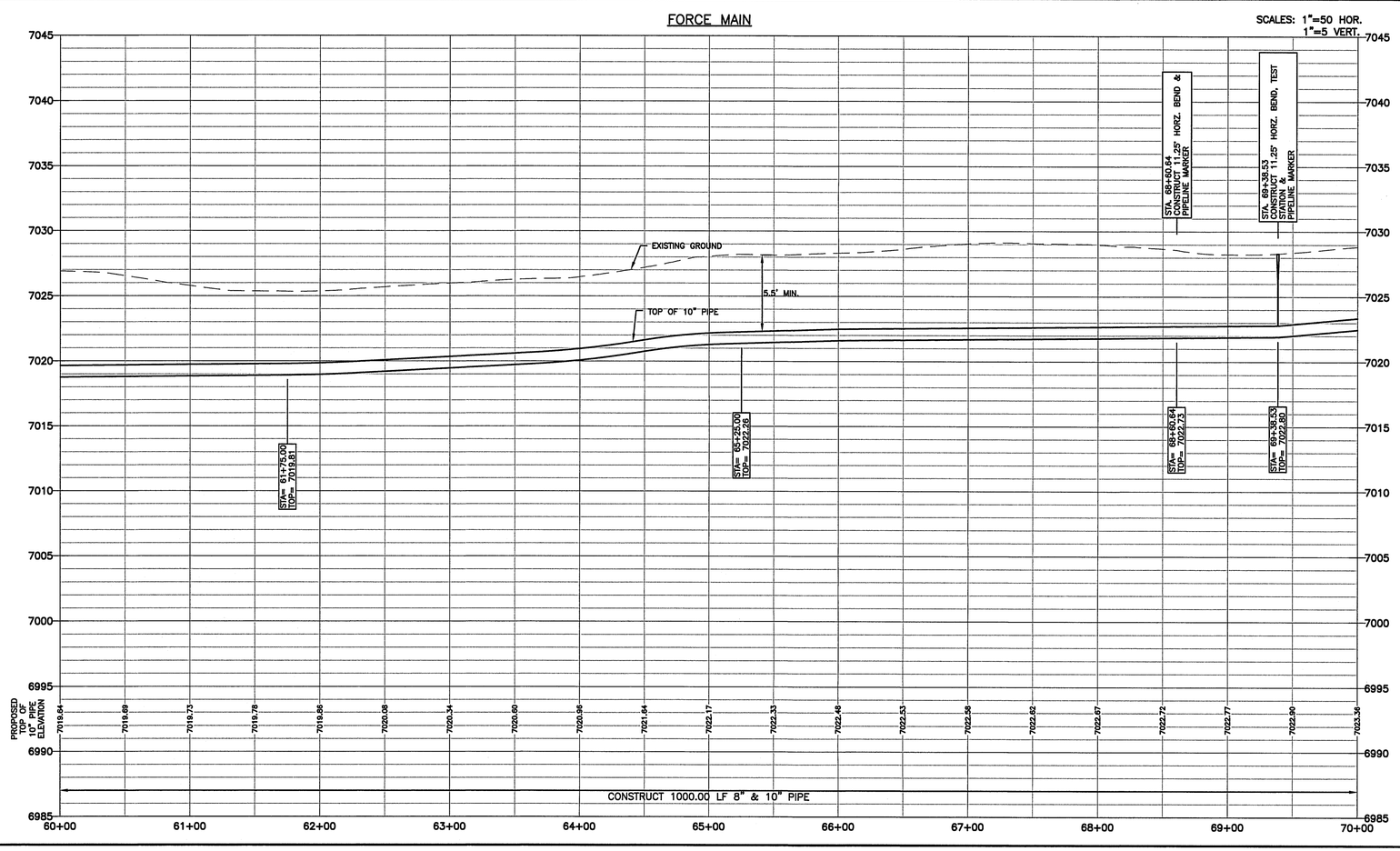
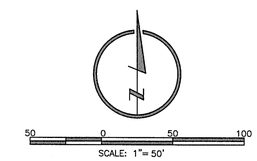
P:_Engineering\041611 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\041611-SAN-001.dwg, 4/21/2017 2:30:34 PM, JASON MORELL, LAMP RYNEARSON & ASSOCIATES







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DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER-TASKS	0416011
BOOK AND PAGE	

REVISIONS

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LAMP RYNEARSON - ENGINEERS

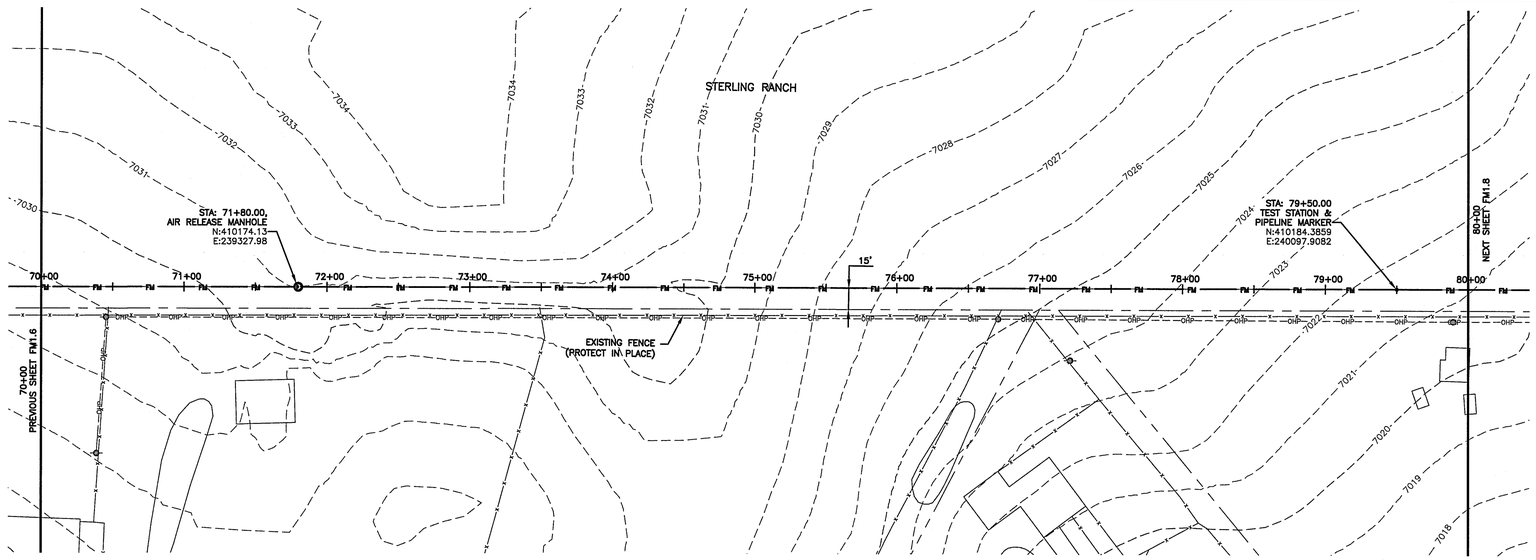
COLORADO REGISTERED PROFESSIONAL ENGINEER 34705 4/24/17

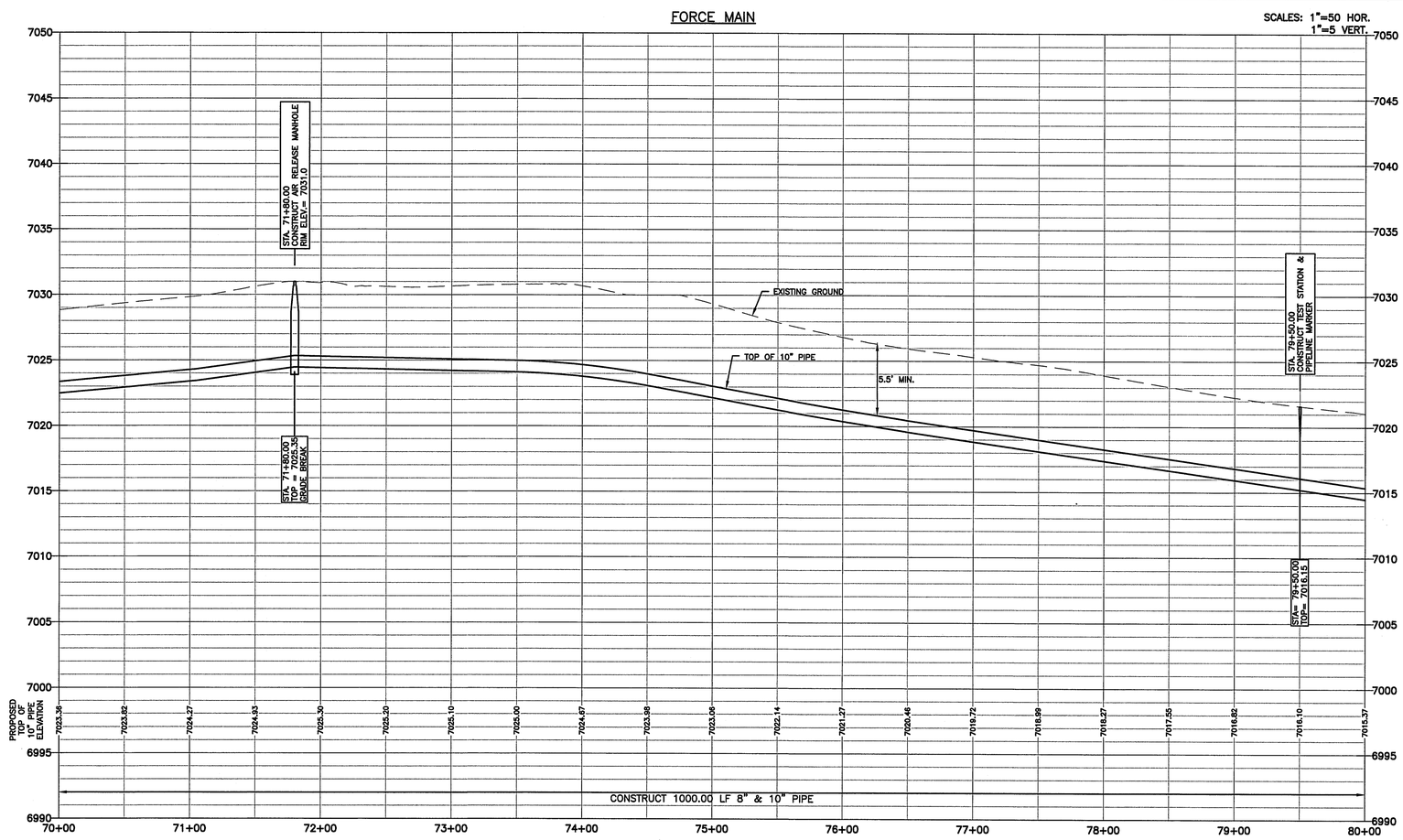
BRADLEY A. SIMONS
34705

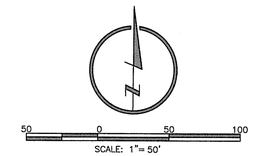
COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG!

SHEET
FM1.6

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-001.dwg, 4/21/2017 2:39:12 PM, JASON MORELL, LAMP RYNEARSON & ASSOCIATES







NOTES:

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DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER/TASKS	041811
BOOK AND PAGE	

REVISIONS

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STERLING RANCH METROPOLITAN DISTRICT NO. 1

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STA. 70+00 TO STA. 80+00

LAMP RYNEARSON - ENGINEERS

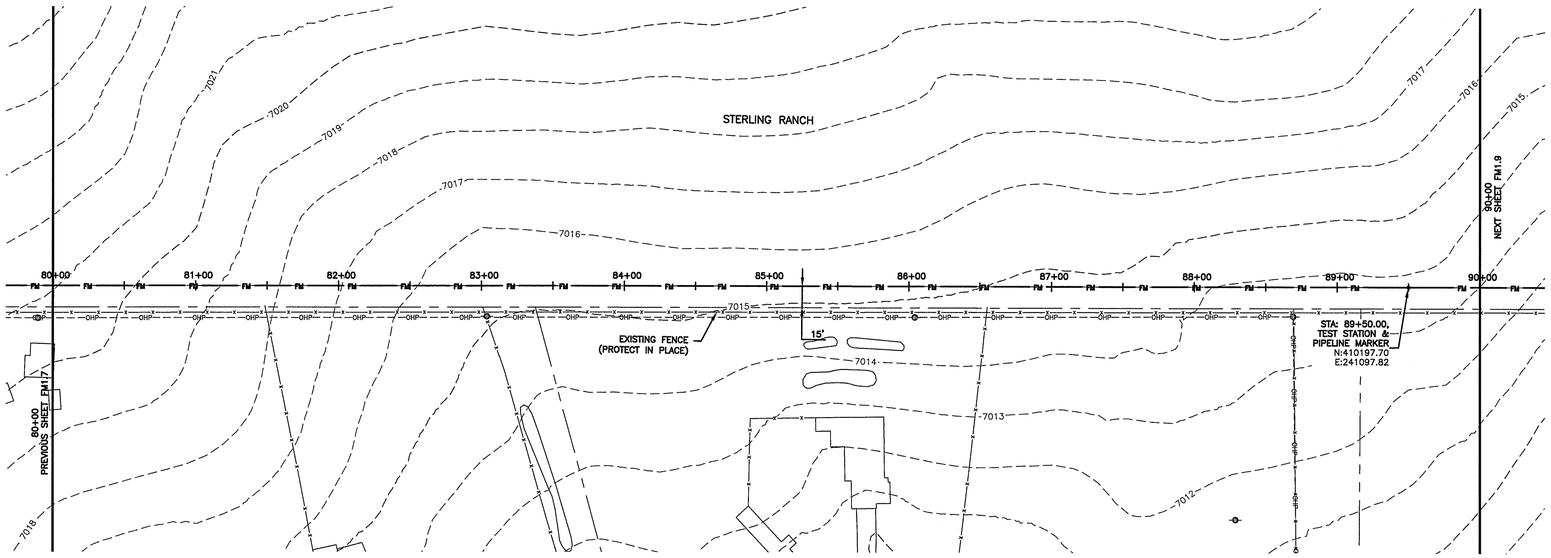
COLORADO LICENSED PROFESSIONAL ENGINEER 34705 4/24/17

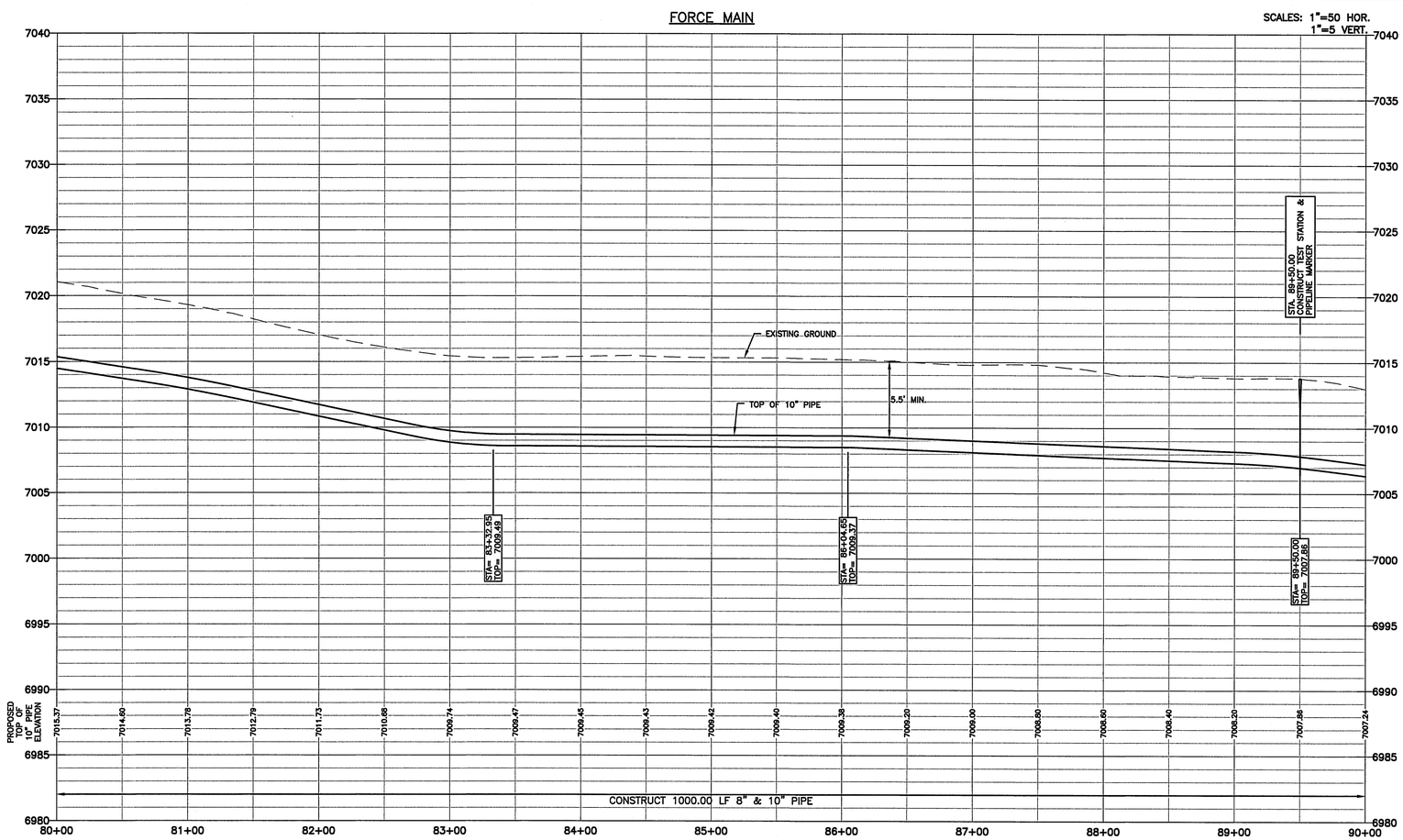
BRADLEY A. SIMONS
34705

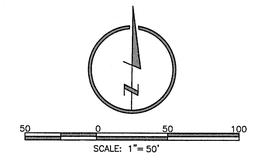
SHEET
FM1.7

COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG

PL_Engineering\041811 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\041811-SHH-001.dwg, 4/21/2017 2:39:50 PM, JASON MCNEILL, LAMP RYNEARSON & ASSOCIATES







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DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	7A3K8
	0416011
BOOK AND PAGE	

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LAMP RYNEARSON - ENGINEERS

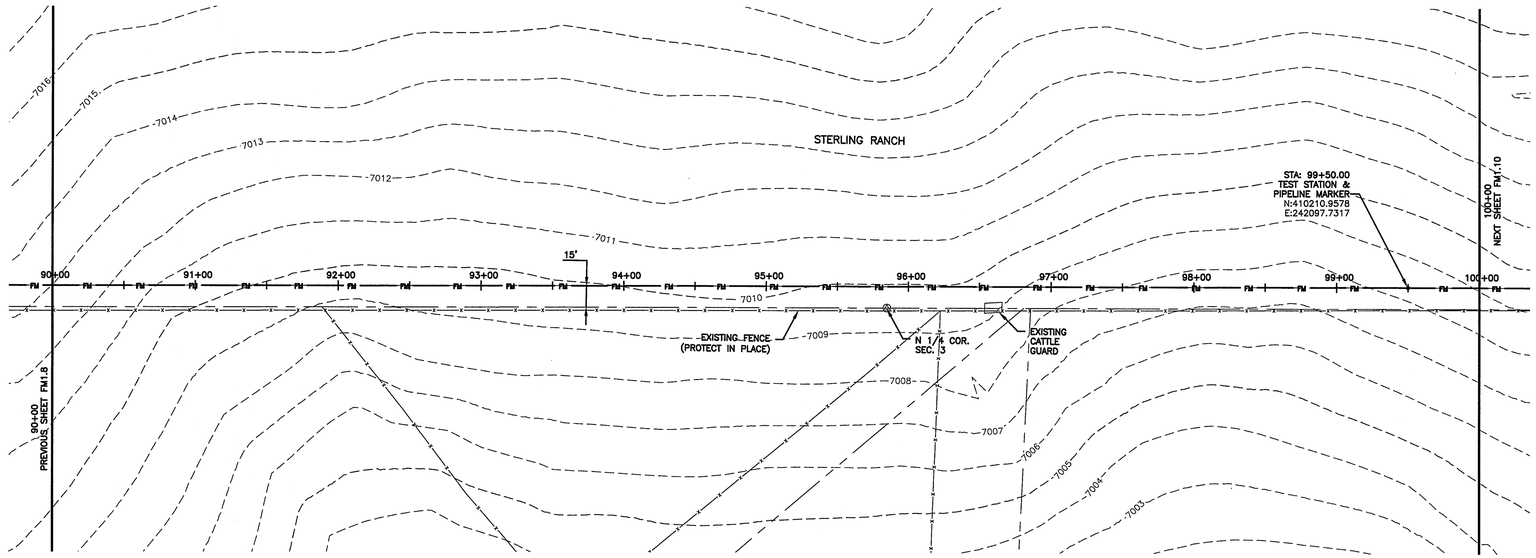
COLORADO LICENSED PROFESSIONAL ENGINEER 34705 4-24-17

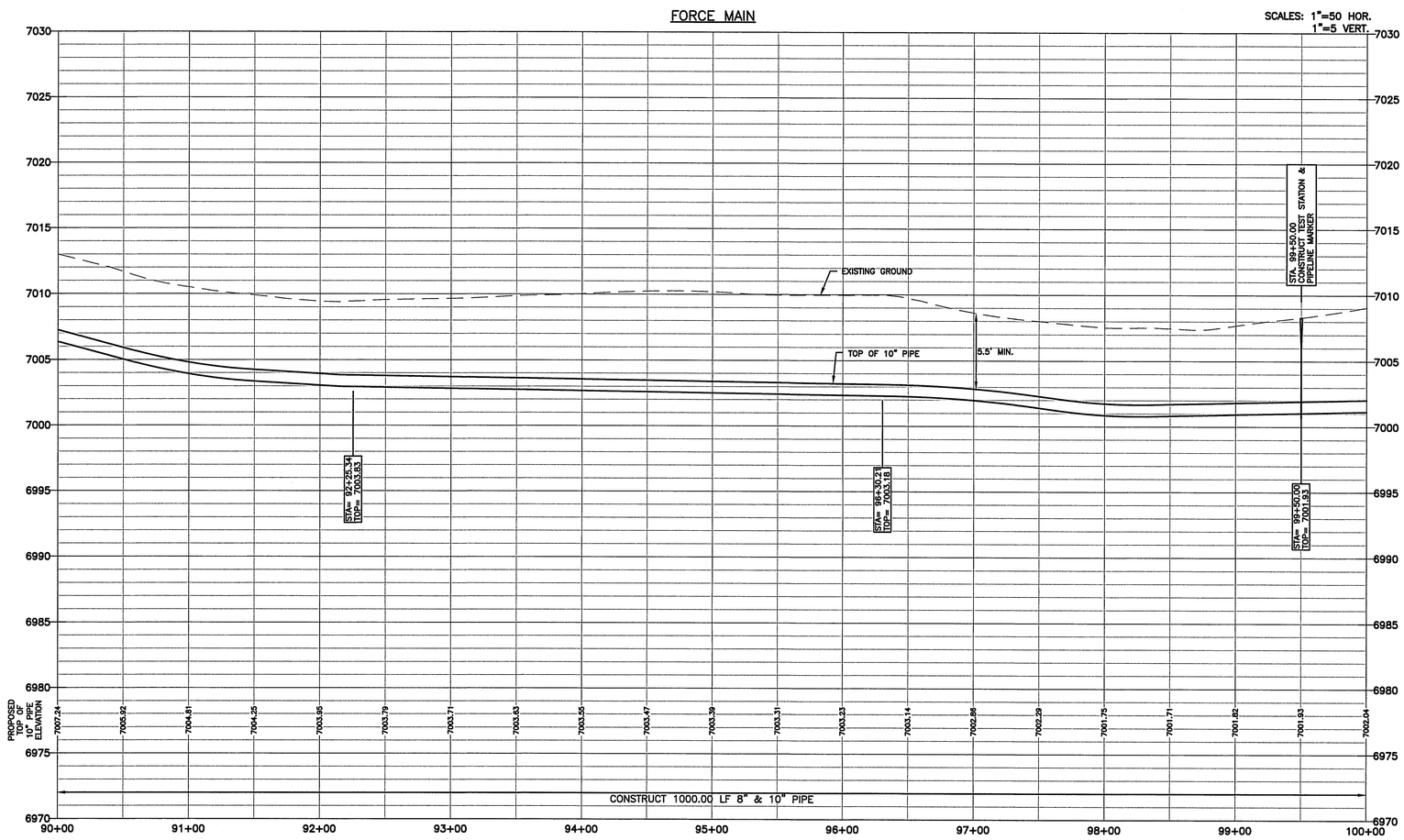
BRADLEY A. SIMONS
34705

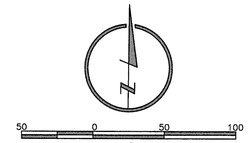
SHEET
FM1.8

COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-CAD-001.dwg, 4/21/2017 2:49:29 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES







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DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	041011
BOOK, AND PAGE	

REVISIONS

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STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 90+00 TO STA. 100+00

LAMP RYNEARSON - ENGINEERS

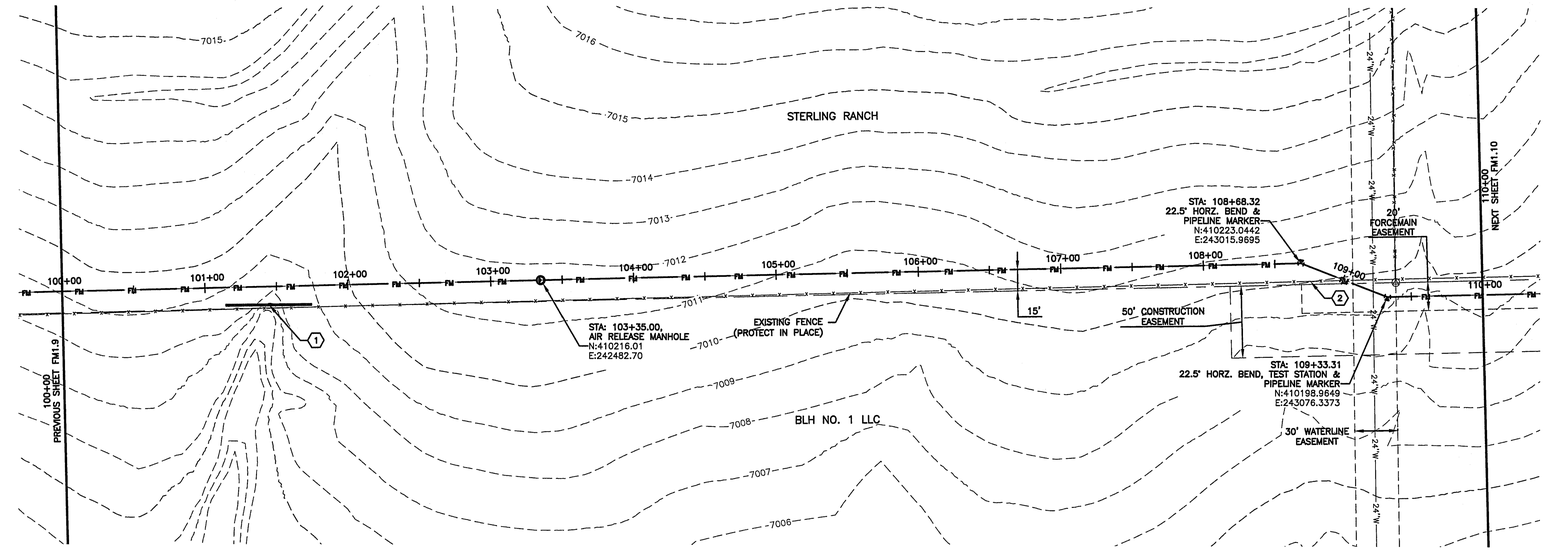
COLORADO LICENSED PROFESSIONAL ENGINEER 34705 BRADLEY A. SIMONS

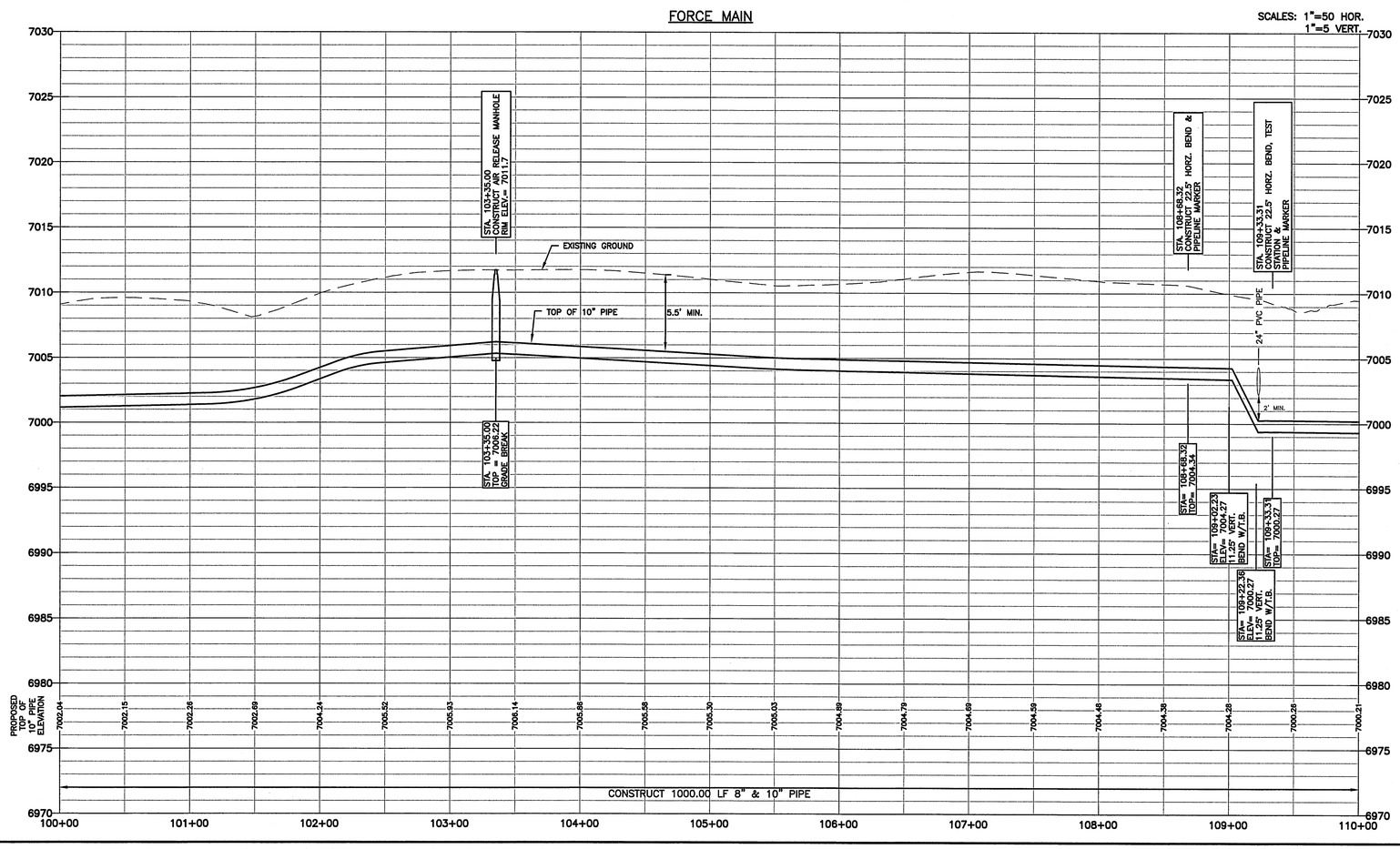
BRADLEY A. SIMONS
34705

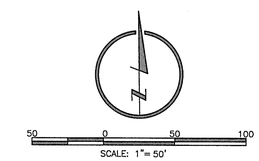
SHEET
FM1.9

COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG

P:_Engineering\041011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\041011-SR-001.dwg, 4/21/2017 2:41:00 PM, JASON MCNEILL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTE:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4
2. REMOVE AND RE-INSTALL 115 LF OF EXISTING FENCE

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	4103/3
BOOK AND PAGE	0416011

REVISIONS

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 100+00 TO STA. 110+00

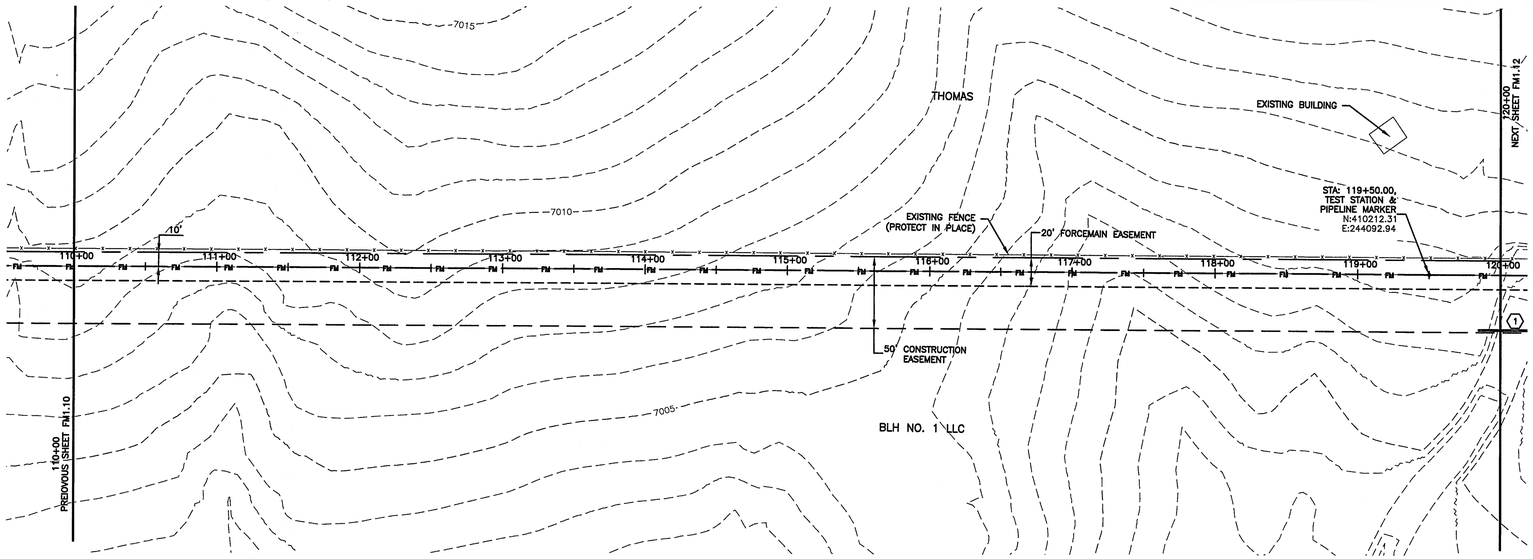
LAMP RYNEARSON - ENGINEERS

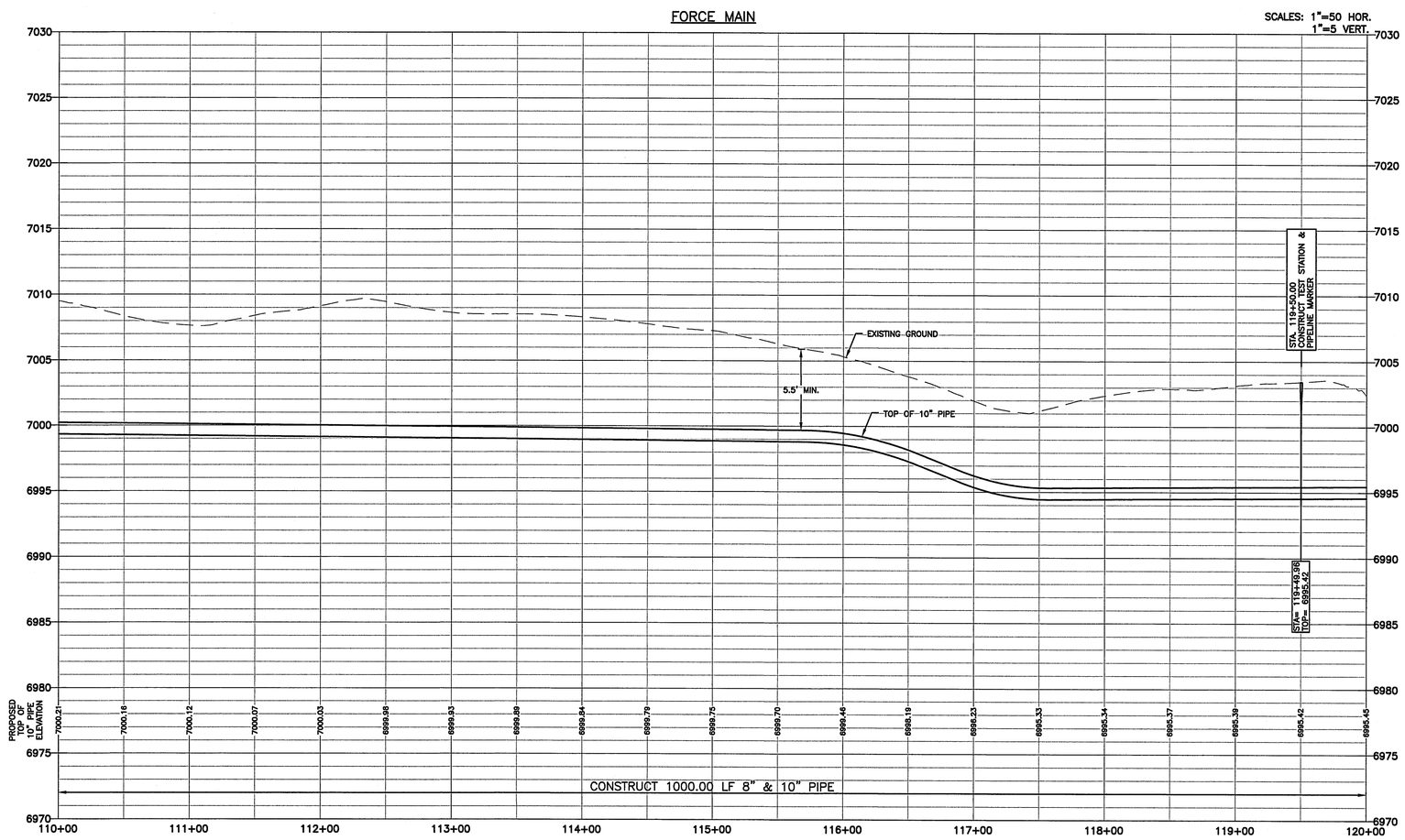
BRADLEY A. SIMONS
34705

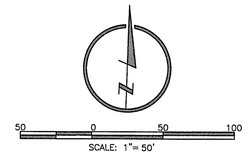
SHEET
FM1.10

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG!

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-C404-001.dwg, 4/21/2017 2:41:37 PM, JASON MCNEILL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER: FA3/K3	041601
BOOK AND PAGE	

REVISIONS

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STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 110+00 TO STA. 120+00

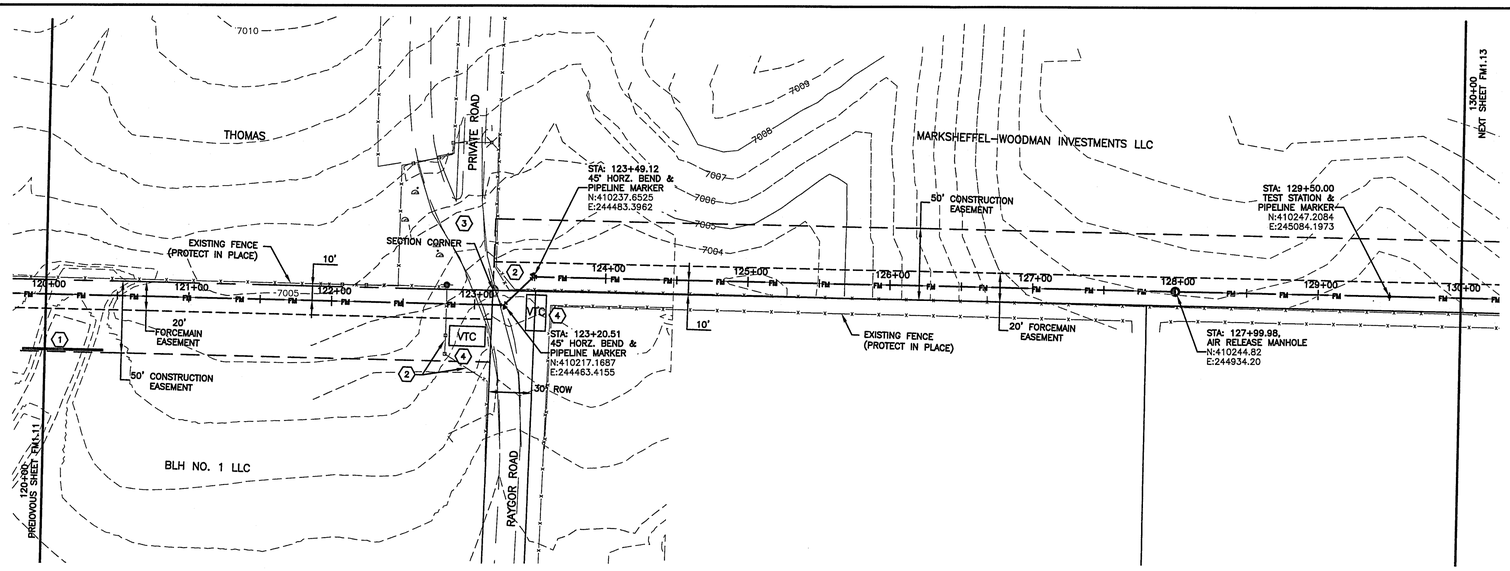
LAMP RYNEARSON - ENGINEERS

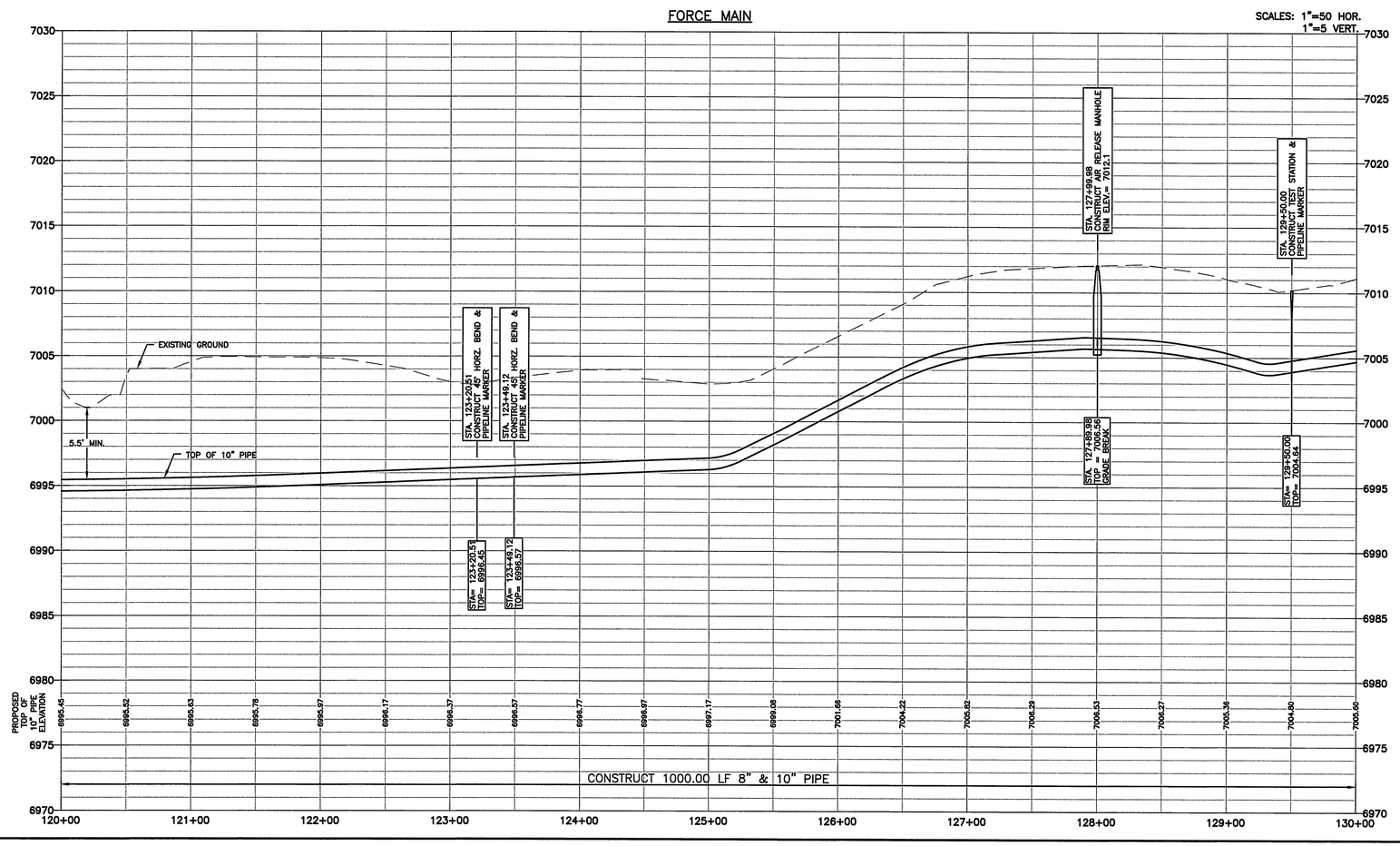
BRADLEY A. SIMONS
34705

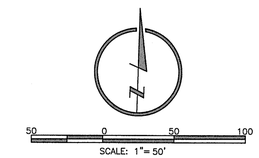
SHEET
FM1.11

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

P:_Engineering\041601 Sterling Ranch LIS Station\DRAWINGS\CONSTRUCTION DRAWINGS\041601-SW-005.dwg, 4/21/2017 2:44:46 PM, JASON MCNEILL LAMP RYNEARSON & ASSOCIATES







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KEYNOTES:

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2. REMOVE AND RE-INSTALL 115 LF OF EXISTING FENCE.
3. CONTRACTOR SHALL KEEP ACCESS OPEN TO ALL RESIDENTIAL LOTS AT ALL TIMES. CONTRACTOR SHALL NOTIFY AND COORDINATE ACCESS WITH ALL PROPERTY OWNERS.
4. VEHICLE TRACKING CONTROL PER SHEET FM2.4

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	74363
0416011	
BOOK AND PAGE	

REVISIONS

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STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 120+00 TO STA. 130+00

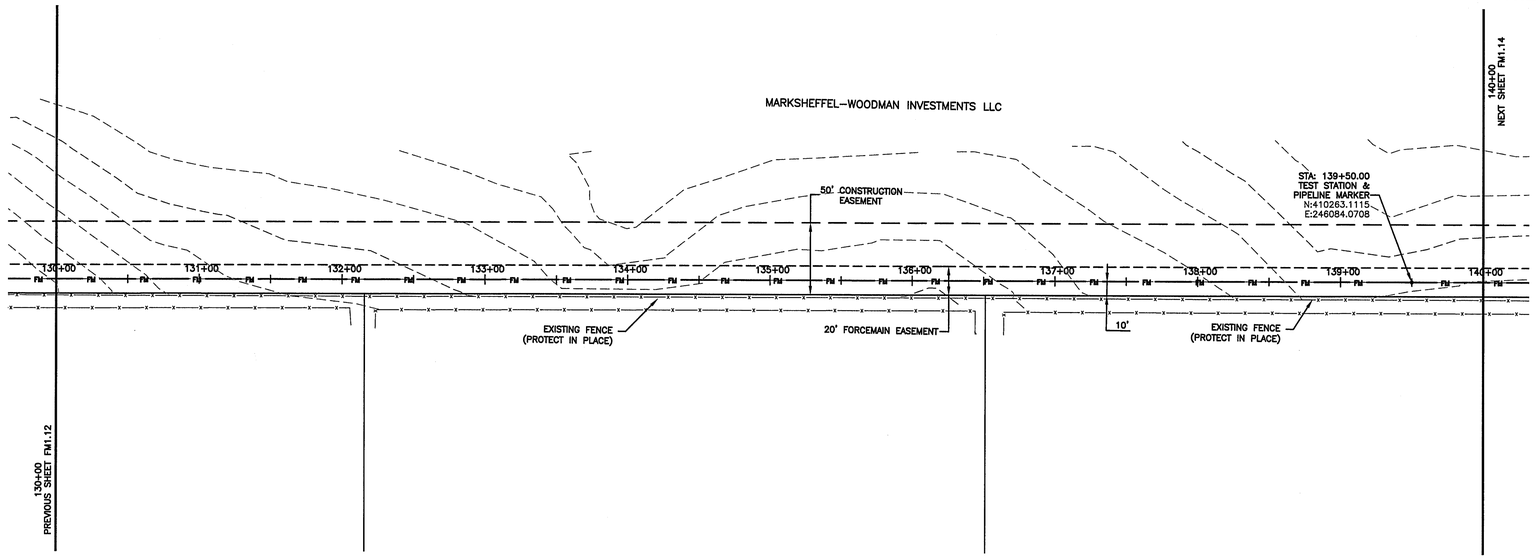
LAMP RYNEARSON - ENGINEERS

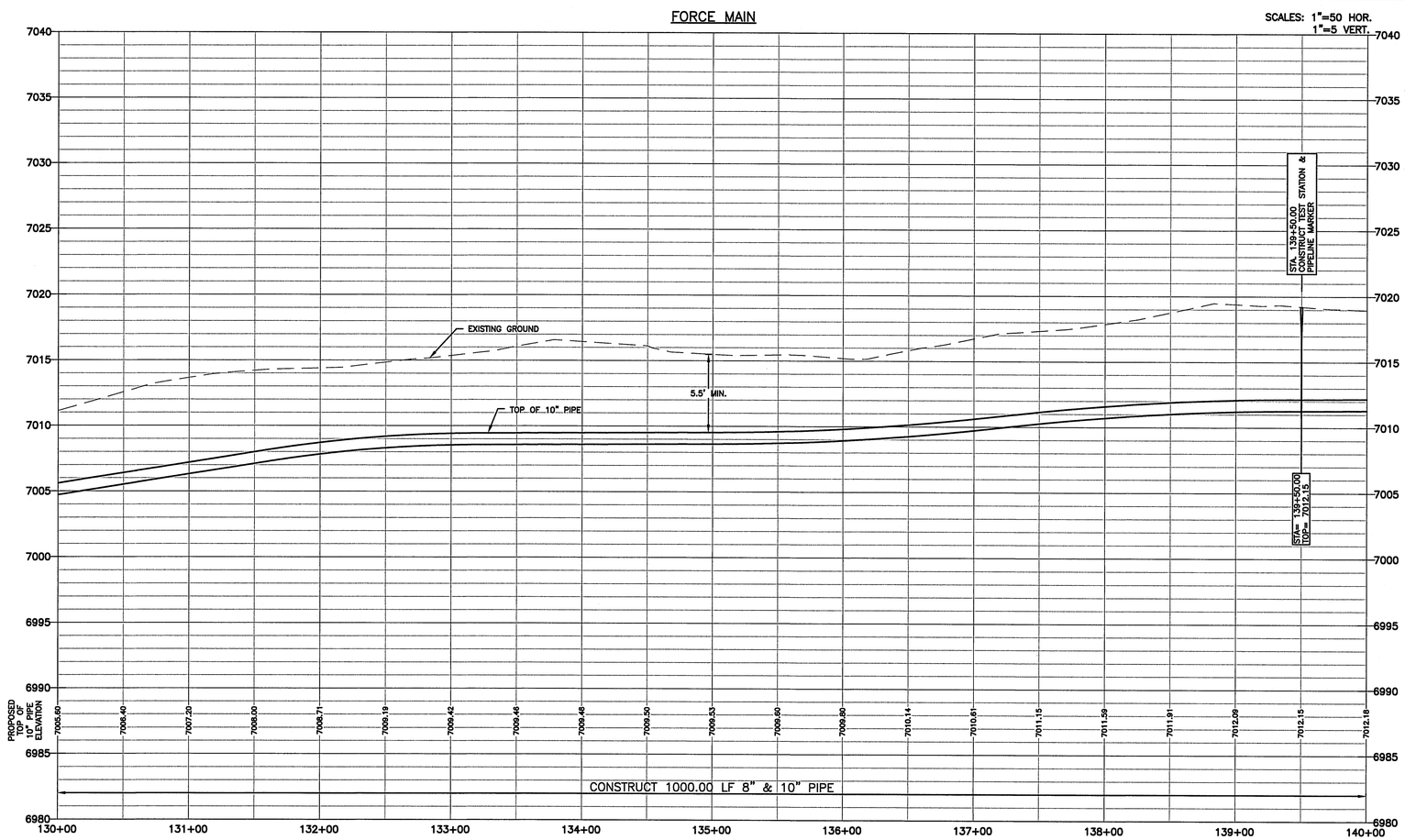
BRADLEY A. SIMONS
34705

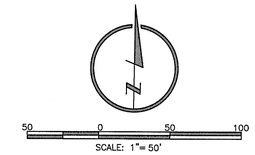
SHEET
FM1.12

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG!

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-002.dwg, 4/21/2017 2:45:39 PM, JASON MCNEILL LAMP RYNEARSON & ASSOCIATES







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10. CONTRACTOR SHALL PROTECT IN PLACE OR REMOVE AND REPLACE ANY SIGNS, MAILBOXES, LANDSCAPING, OR OTHER OBSTRUCTIONS DISTURBED DURING CONSTRUCTION.

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER/TASKS	
A141011	
BOOK, AND PAGE	

REVISIONS

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 130+00 TO STA. 140+00

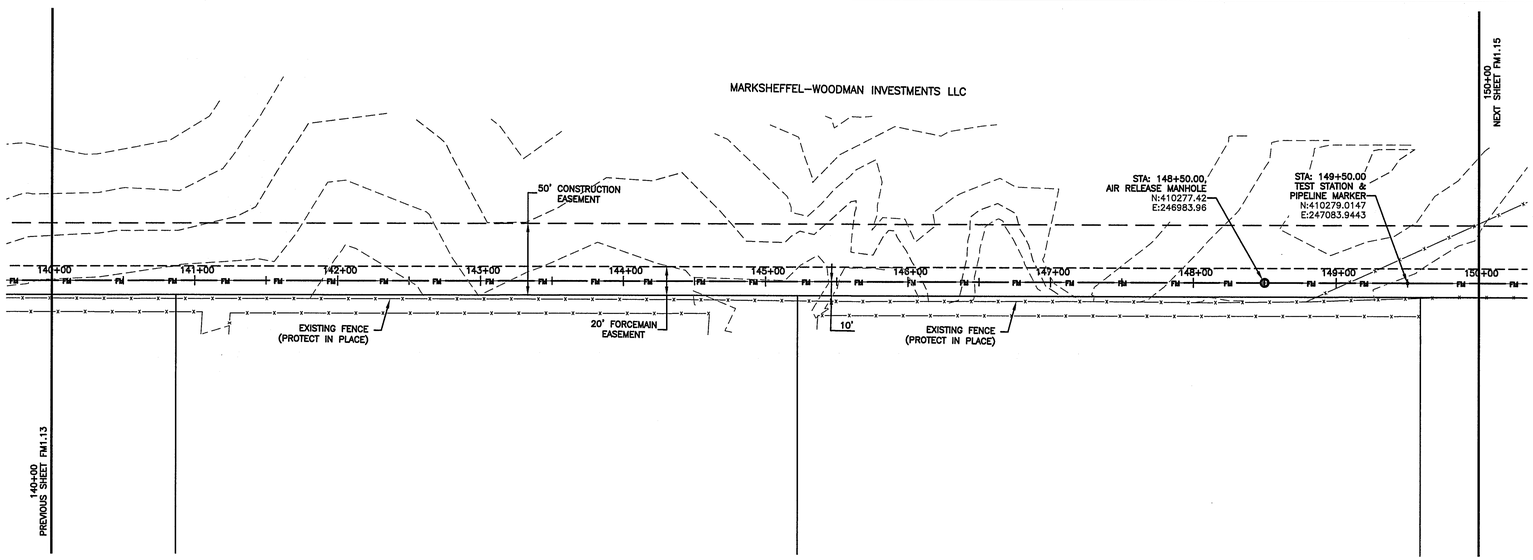
LAMP RYNEARSON - ENGINEERS

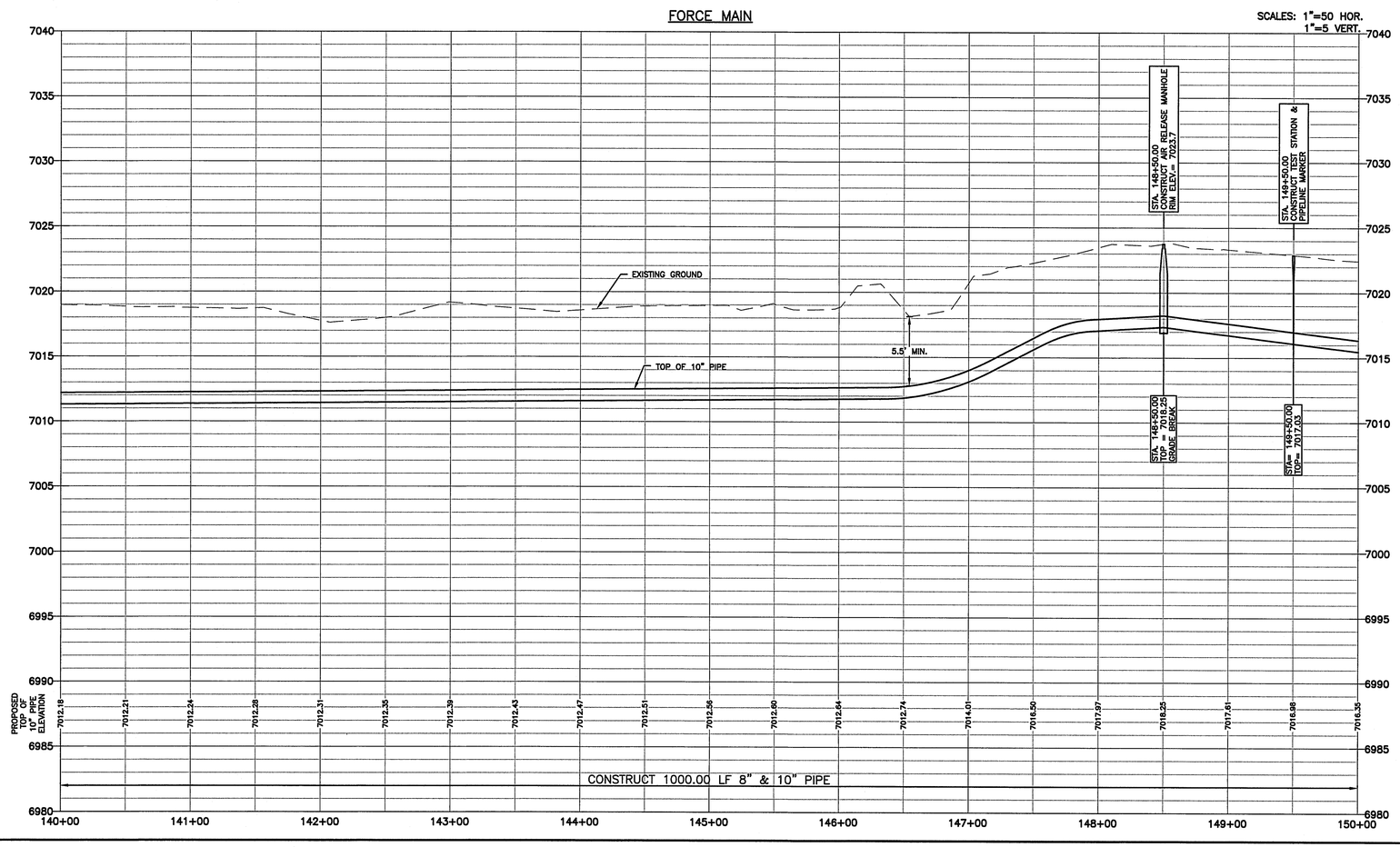
BRADLEY A. SIMONS
34705

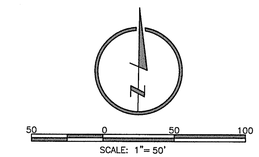
SHEET
FM1.13

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG!

P:_Engineering\A141011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\A141011-SRH-002.dwg, 4/21/2017 2:46:33 PM, JASON MICHELL LAMP RYNEARSON & ASSOCIATES







NOTES:

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DATE	APRIL 24, 2017
JOB NUMBER	7438/3
	0416011
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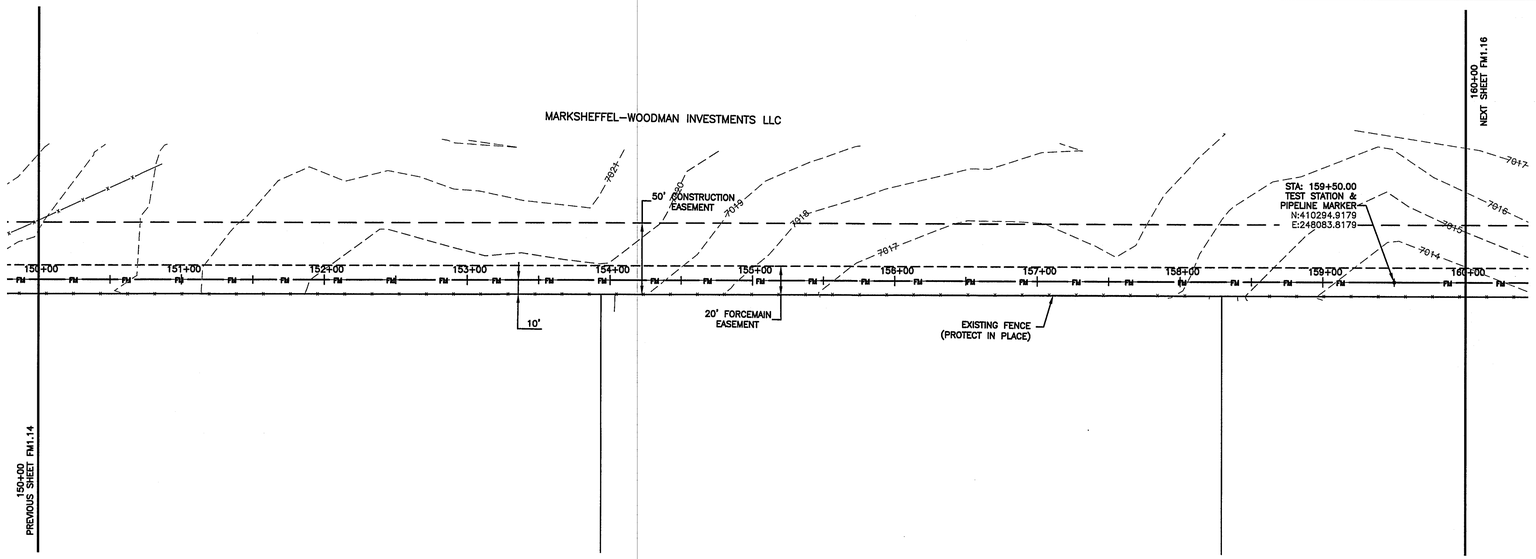
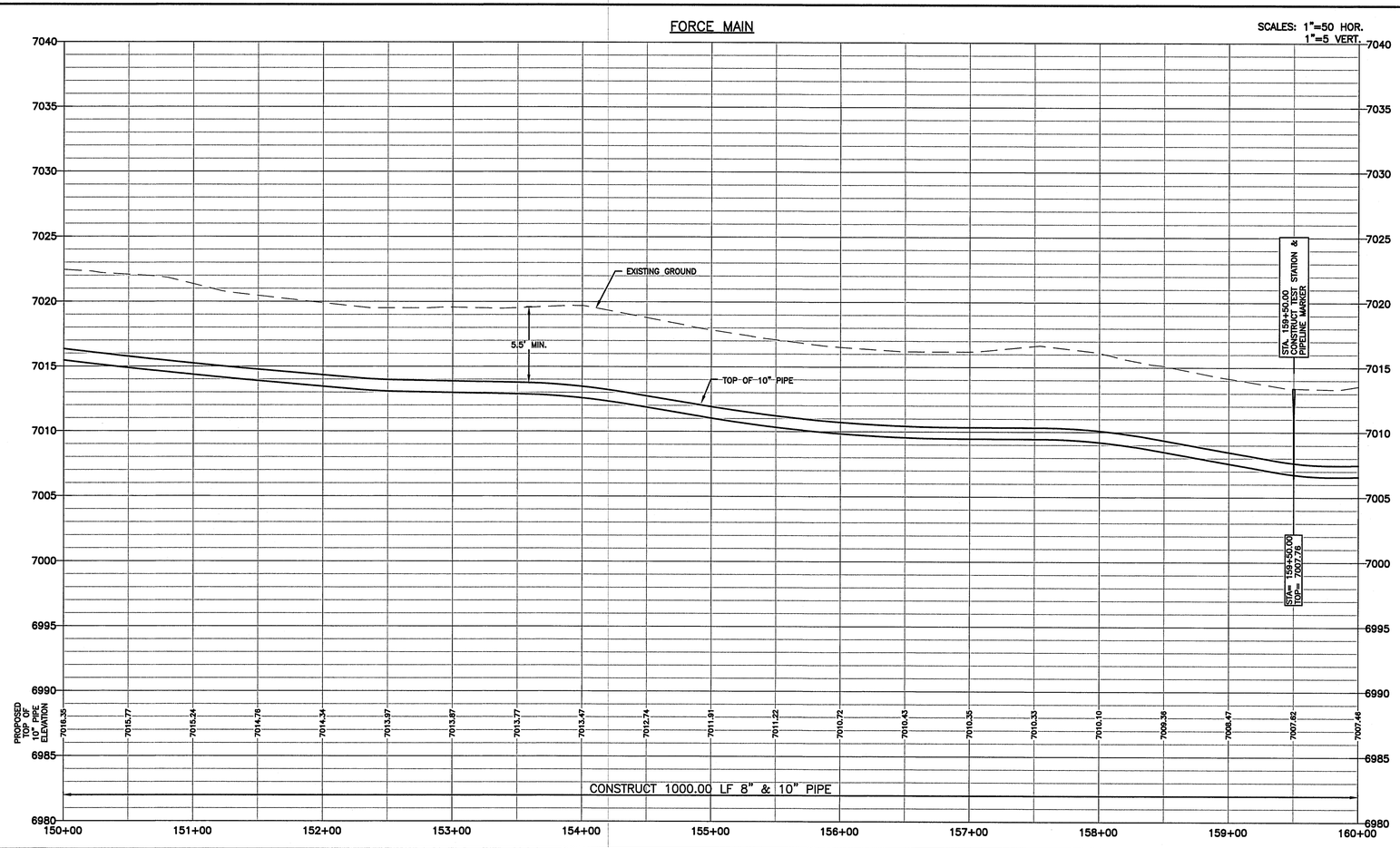
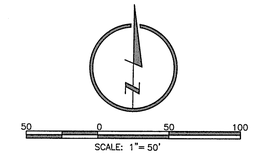
BRADLEY A. SIMONS
34705

SHEET
FM1.14

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-002.dwg, 4/21/2017 2:47:22 PM, JASON MCNEILL LAMP RYNEARSON & ASSOCIATES







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DESIGNED BY	JPM
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JOB NUMBER	241011
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LAMP RYNEARSON - ENGINEERS

COLORADO LICENSED PROFESSIONAL ENGINEER 34705 4/24/17

BRADLEY A. SIMONS
34705

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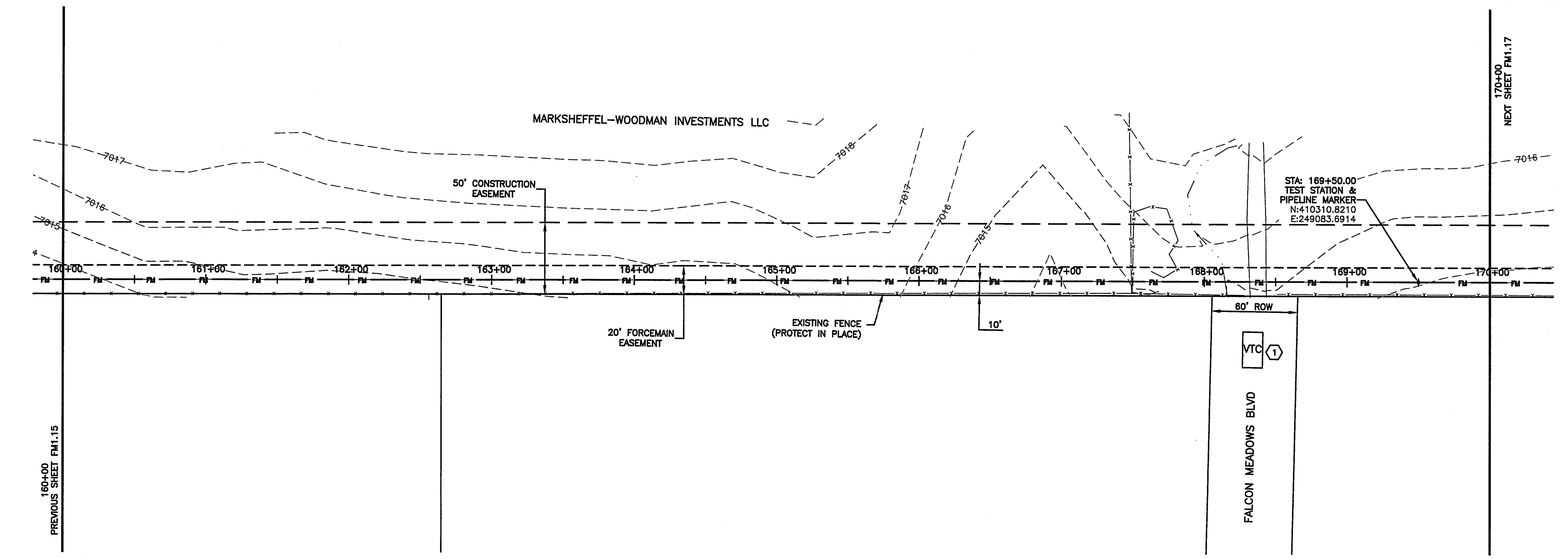
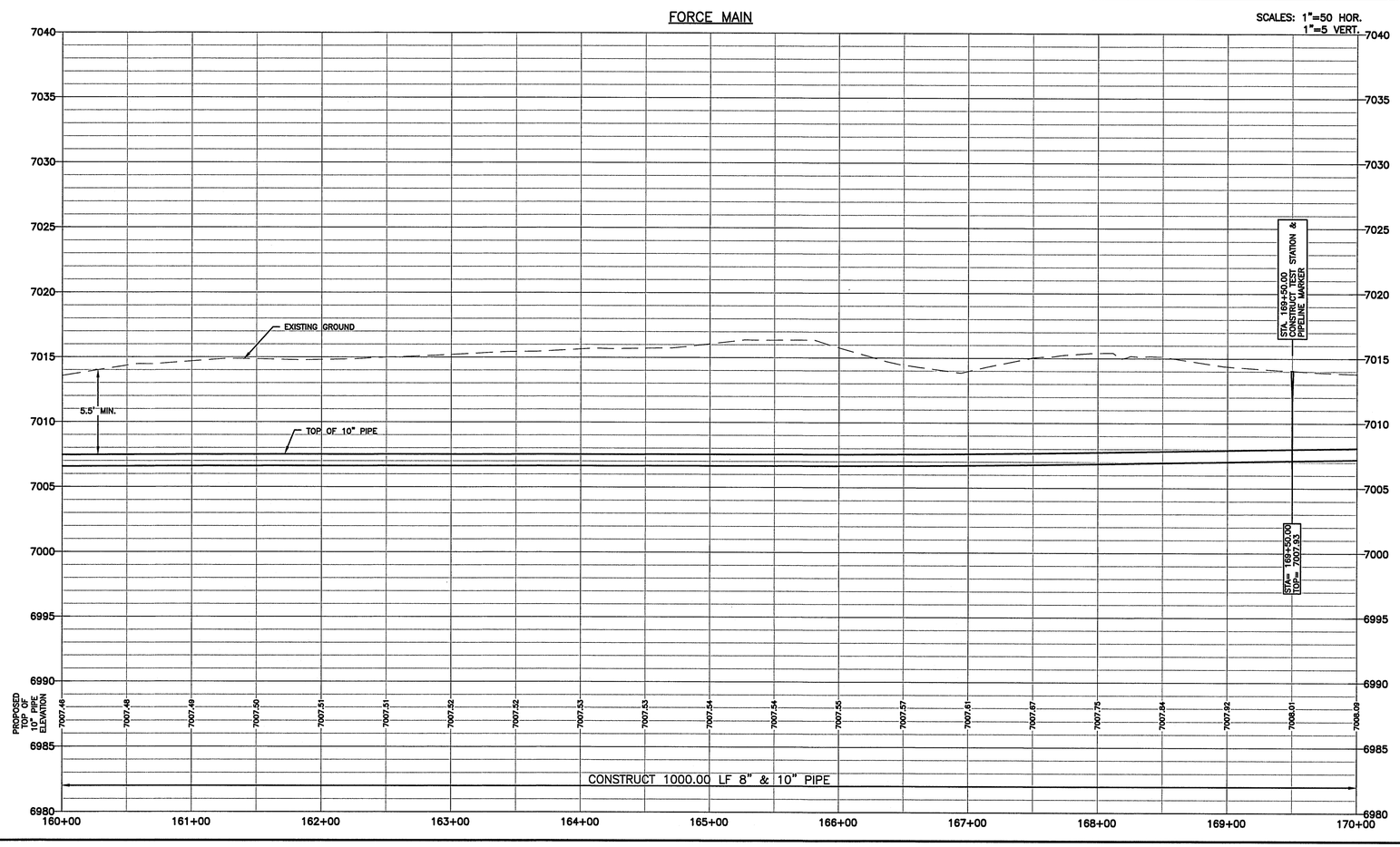
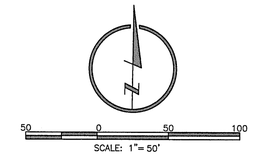
SHEET
FM1.15

P:_Engineering\241011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\241011-GA4-002.dwg, 4/21/2017 2:46:11 PM, JASON MORELL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTES:

1. VEHICLE TRACKING CONTROL PER SHEET FM2.4

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER: FA5K5	
0416011	
BOOK AND PAGE	

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FORCE MAIN PLAN & PROFILE
STA. 160+00 TO STA. 170+00

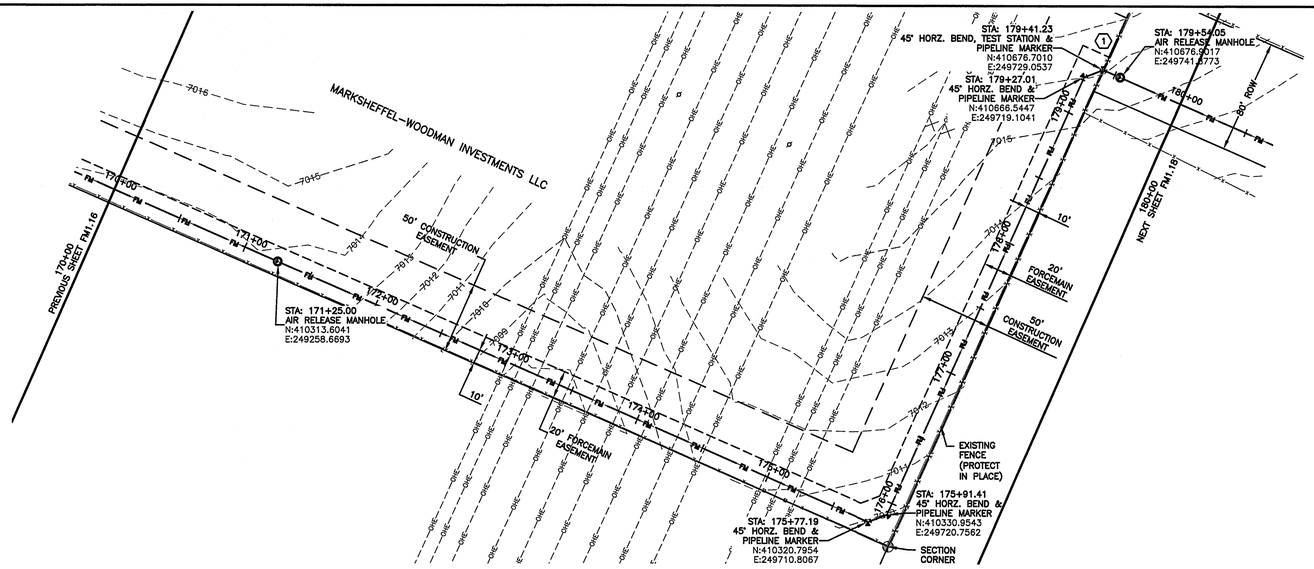
LAMP RYNEARSON - ENGINEERS

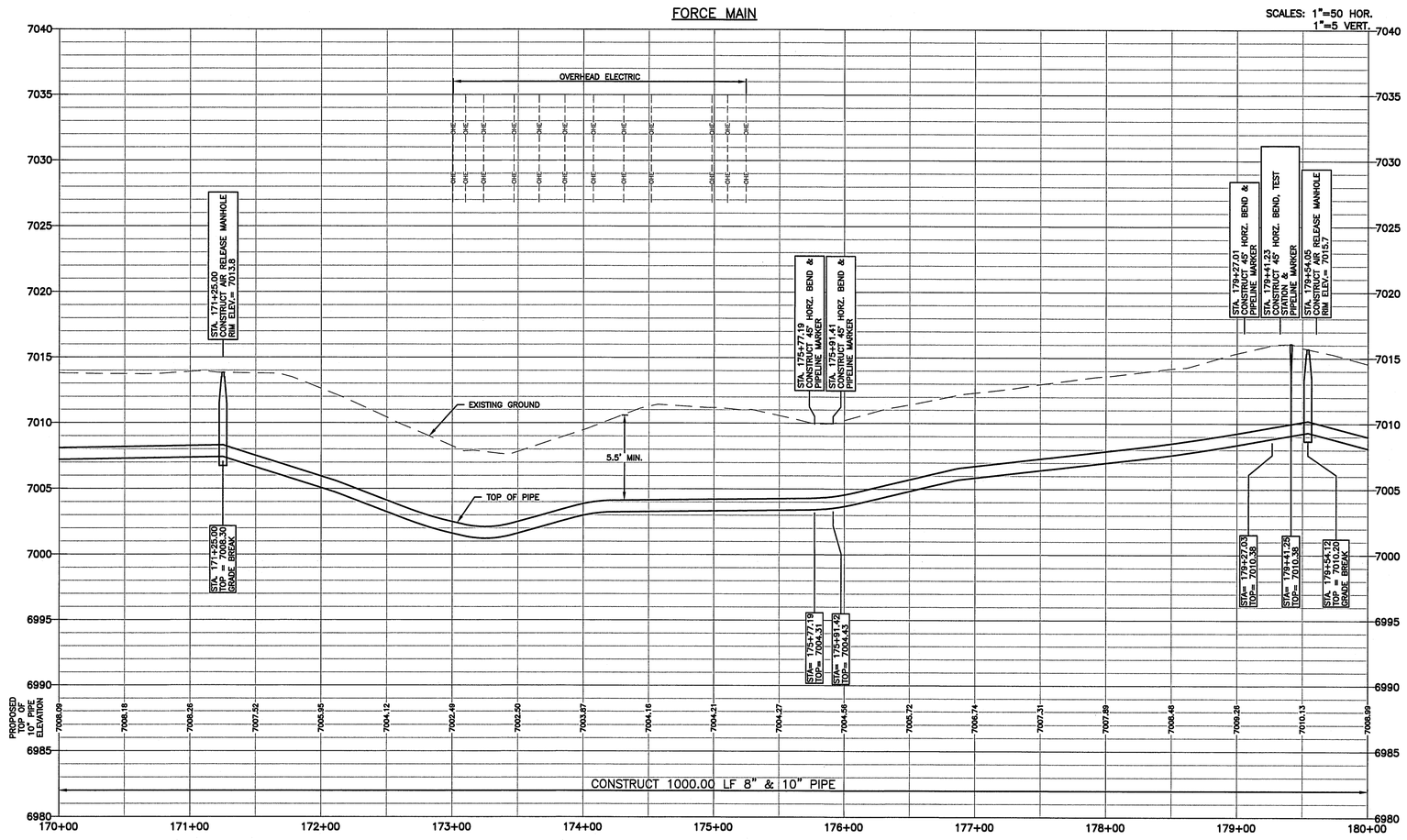
BRADLEY A. SIMONS
34705

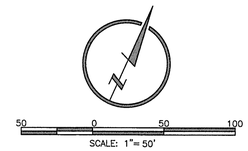
SHEET
FM1.16

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG!

P:_Projects\fy\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-CAN-002.dwg, 4/21/2017 2:49:01 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTES:

(1) REMOVE & RE-INSTALL 50 LF OF EXISTING FENCING.

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DATE	APRIL 24, 2017
JOB NUMBER	041011
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LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.17

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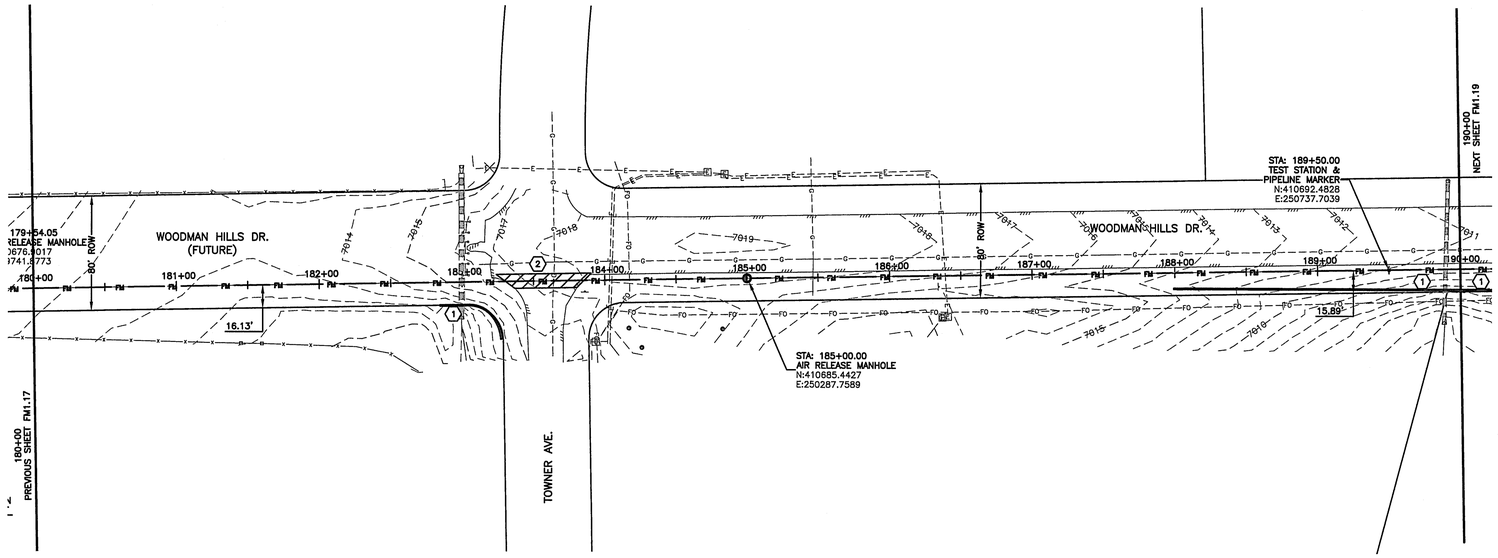
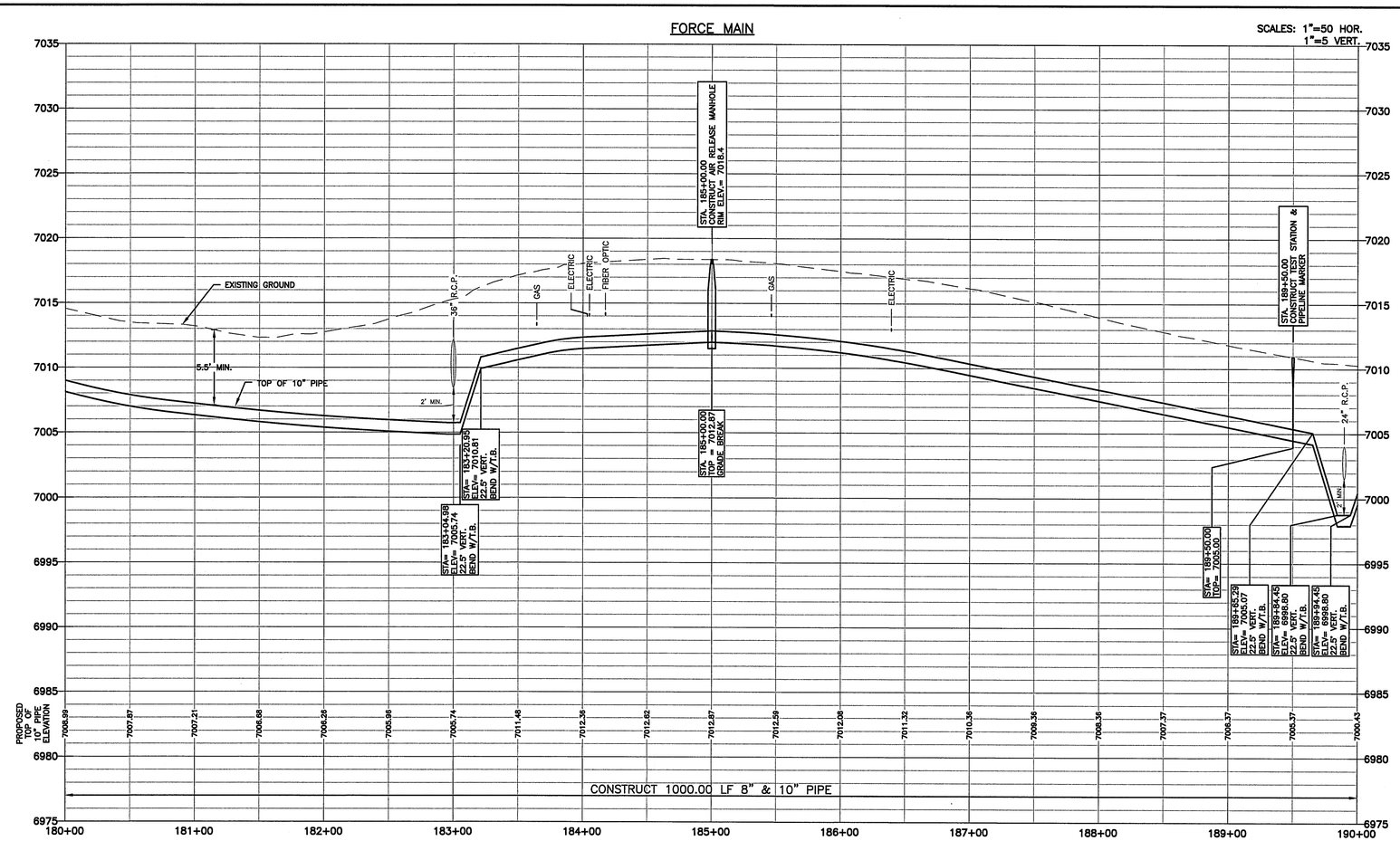
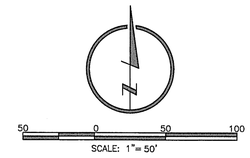
P:_Engineering\041011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\041011-SR-02.dwg, 4/21/2017 3:45:24 PM, JASON MCNEILL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTES:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4
2. CONTRACTOR SHALL SAW CUT, REMOVE & REPLACE EXISTING PAVEMENT PER EL PASO COUNTY SPECIFICATIONS.

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER/TASKS	041601
BOOK AND PAGE	

REVISIONS

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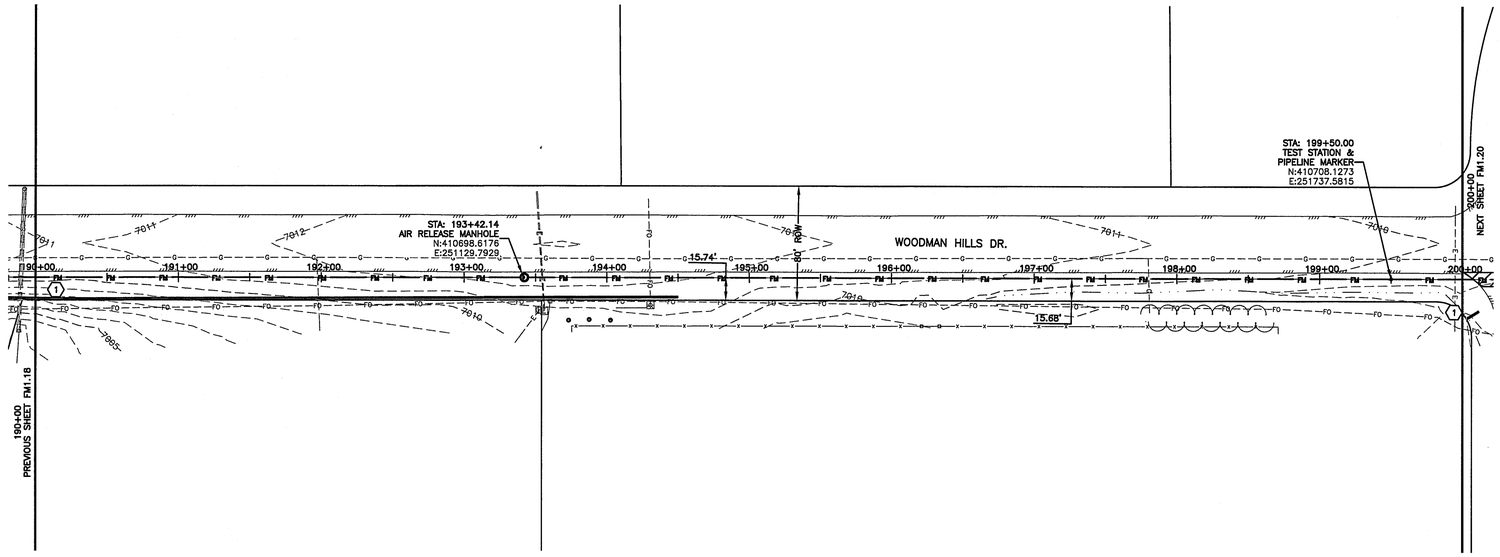
LAMP RYNEARSON - ENGINEERS

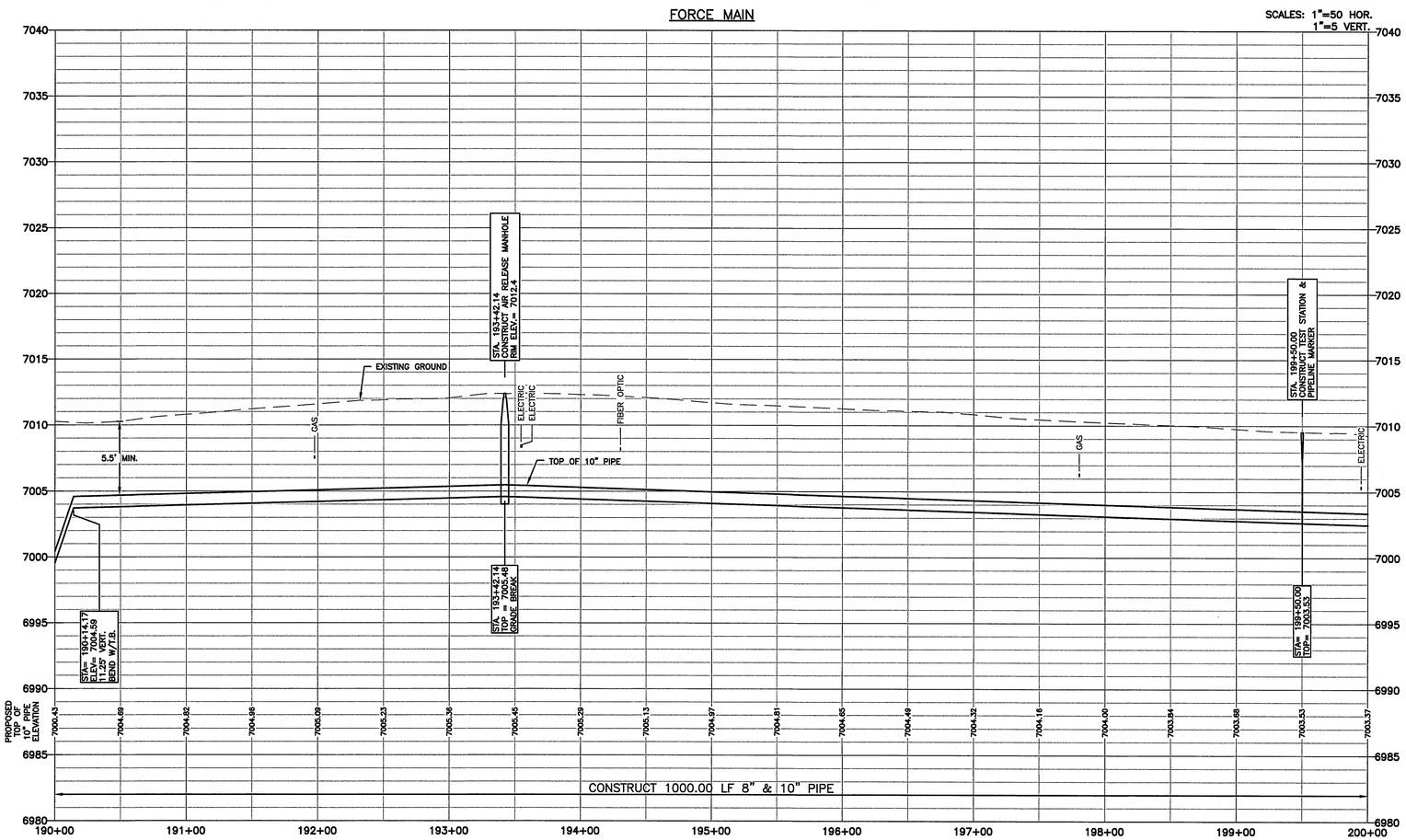
BRADLEY A. SIMONS
34705

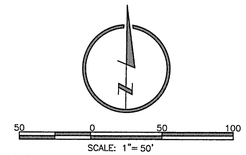
SHEET
FM1.18

COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG

P:_Engineering\041601 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\041601-GAA-002.dwg, 4/21/2017 2:50:56 PM, JASON MCNOLL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

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DATE	APRIL 24, 2017
JOB NUMBER-TASK#	0416011
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LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.19

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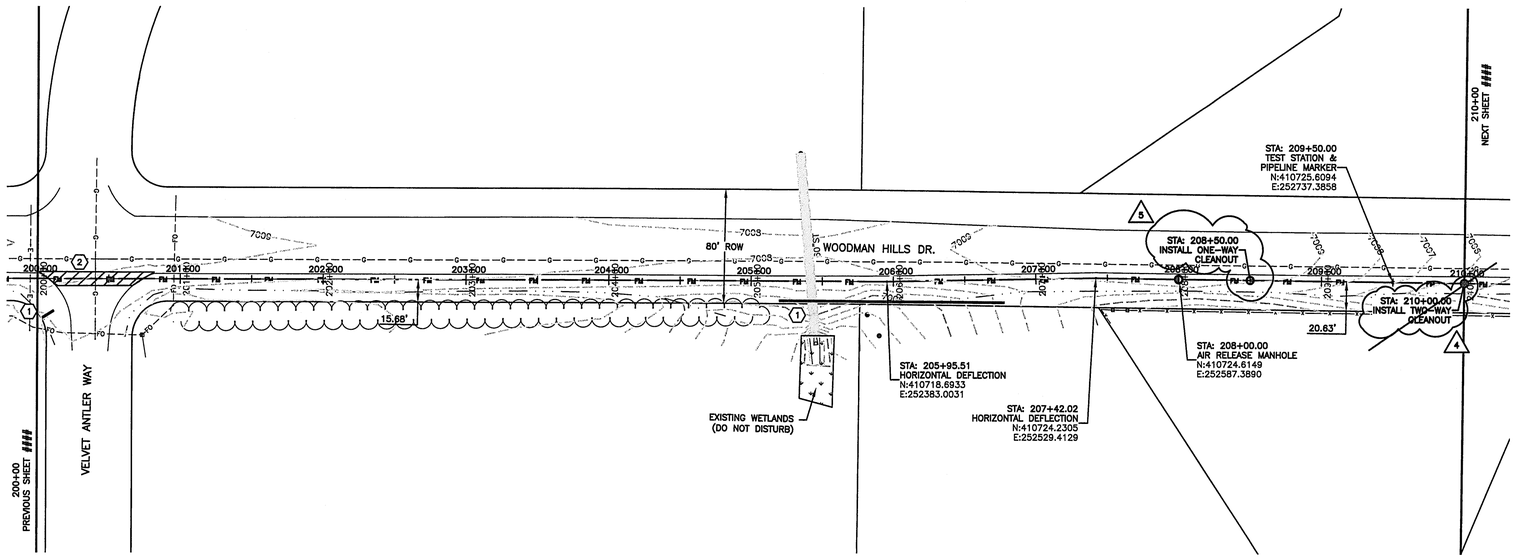
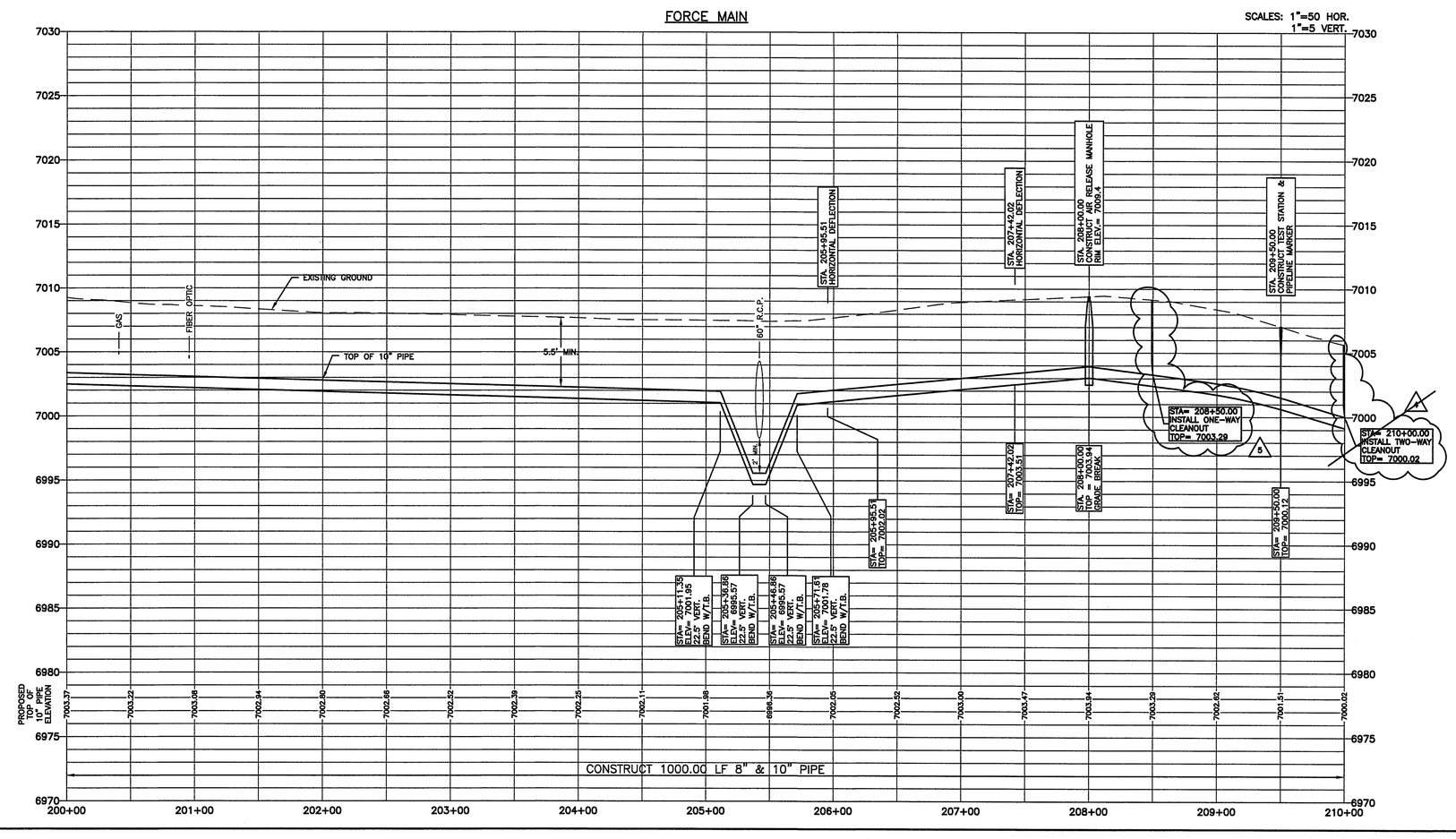
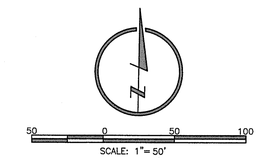
P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-002.dwg, 4/21/2017 2:31:32 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES







NOTES:

1. SEE SHEET G0.2 FOR GENERAL NOTES.
2. STATIONING IS BASED ON THE CENTERLINE BETWEEN THE 8" AND 10" FORCE MAINS.
3. CONTRACTOR SHALL INSTALL THRUST BLOCKS AT ALL HORIZONTAL AND VERTICAL BENDS PER DETAIL.
4. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES WITHIN THE AREA OF WORK 7 DAYS PRIOR TO THE START OF INSTALLATION OF THE PIPELINE. THE CONTRACTOR SHALL NOTIFY OWNER AND ENGINEER OF ANY CONFLICTS THAT ARISE AND REQUIRE REDESIGN OF ANY PORTION OF THE PROJECT. REFER TO GENERAL NOTES FOR FURTHER INFORMATION.
5. CONTRACTOR SHALL BE REQUIRED TO STAY WITHIN THE CONSTRUCTION EASEMENTS AND/OR ROAD RIGHT OF WAY WHEN CONSTRUCTING THE PIPELINE. TRAFFIC CONTROL MEASURES SHALL BE IN PLACE DURING CONSTRUCTION PER EL PASO COUNTY REQUIREMENTS.
6. CONTRACTOR SHALL PROVIDE A MINIMUM 1' OF CLEARANCE BETWEEN ALL UTILITIES UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL PLACE SEDIMENT CONTROL LOGS UPSTREAM OF ALL STORM DRAIN PIPES WITHIN THE PROJECT AREA.
8. CONTRACTOR SHALL BLADE A SMALL 6" HIGH BERM ALONG THE DOWNSTREAM SIDE OF TRENCHING OPERATIONS TO CONTROL STORM DRAINAGE FLOWS AND MINIMIZE TRANSPORTATION SEDIMENT DOWNSTREAM. SEE DETAIL SHEET FM2.4.
9. CONTRACTOR SHALL RESEED ALL AREAS DISTURBED DURING CONSTRUCTION, INCLUDING ANY SOD AND/OR LANDSCAPING.
10. CONTRACTOR SHALL PROTECT IN PLACE OR REMOVE AND REPLACE ANY SIGNS, MAILBOXES, LANDSCAPING, OR OTHER OBSTRUCTIONS DISTURBED DURING CONSTRUCTION.

KEYNOTES:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4
2. CONTRACTOR SHALL SAW CUT, REMOVE & REPLACE EXISTING PAVEMENT PER EL PASO COUNTY SPECIFICATIONS.

REVISIONS	
1	REVISED PER COMMENTS - 06/07/19
2	REVISED PER COMMENTS - 07/02/19

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	7A3&3
	0416011
BOOK AND PAGE	

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 200+00 TO STA. 210+00

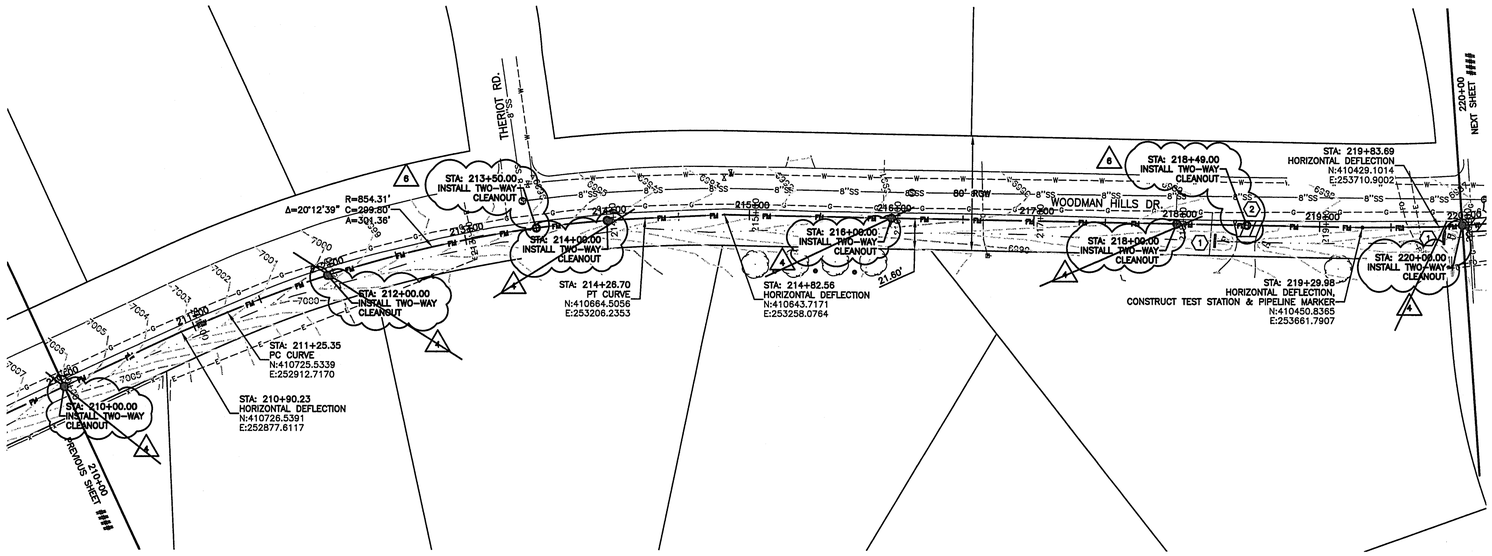
LAMP RYNEARSON - ENGINEERS

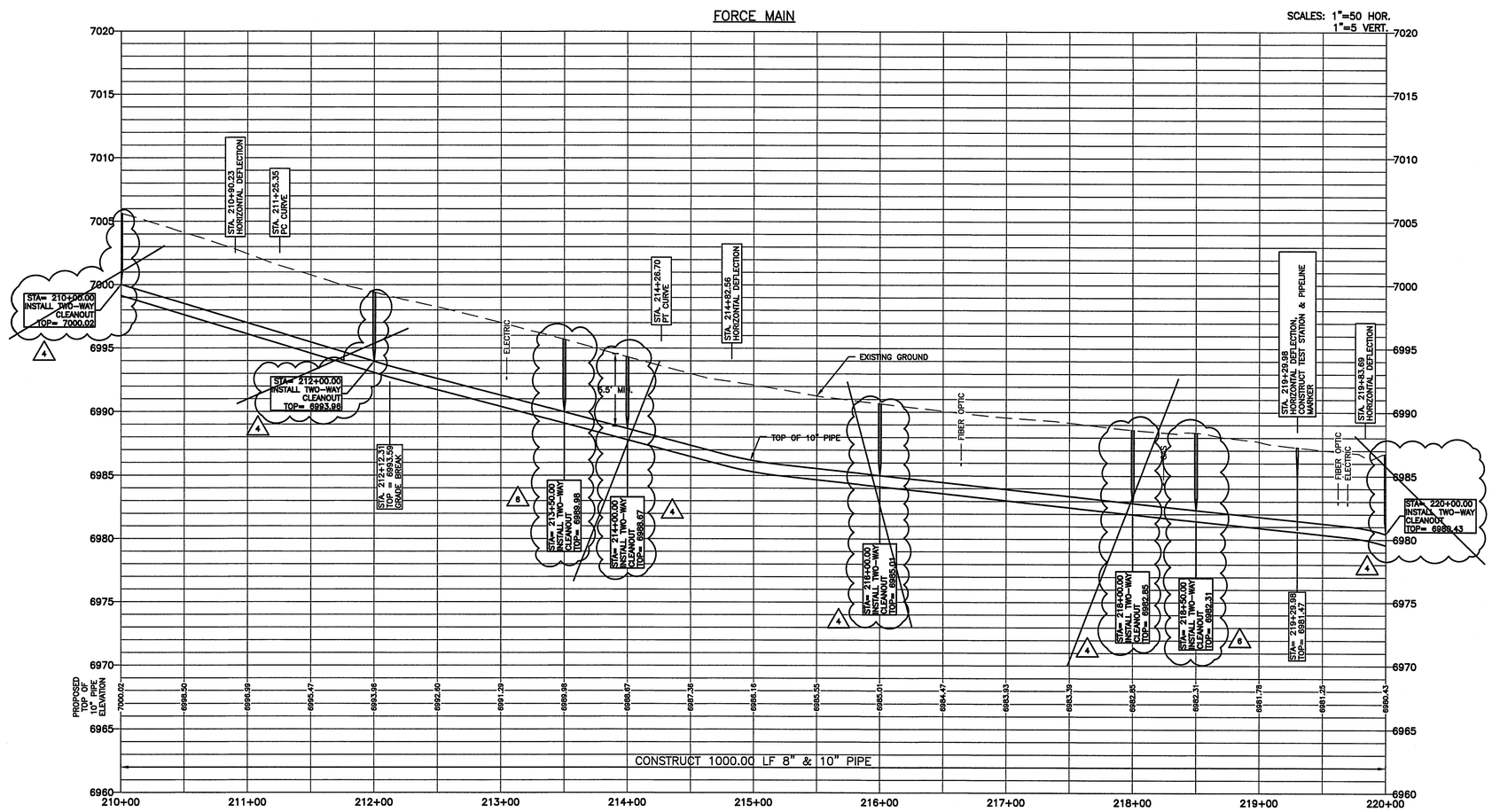
COLORADO REGISTERED PROFESSIONAL ENGINEER
BRADLEY A. SIMONS
34705

COLORADO 811
KNOW WHAT'S BELOW. CALL BEFORE YOU DIG!

SHEET
FM1.20

N:\Projects\AM8 - Sterling Ranch\CAD\Engineering\Cover Sheet\20FD\H41011-sAM-H20-MB.dwg, 7/2/2019 1:05:53 PM, DAN PONS, LAMP RYNEARSON & ASSOCIATES





50 0 50 100
SCALE: 1"= 50'

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KEYNOTES:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4
2. CONTRACTOR SHALL SAW CUT, REMOVE AND REPLACE EXISTING CONCRETE DRIVEWAY.

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER-FASKS	0416011
BOOK AND PAGE	

REVISIONS
1 REVISED PER COMMENTS - 06/07/19
2 REVISED PER COMMENTS - 07/02/19
3 REVISED PER COMMENTS - 08/28/19

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LAMP RYNEARSON - ENGINEERS

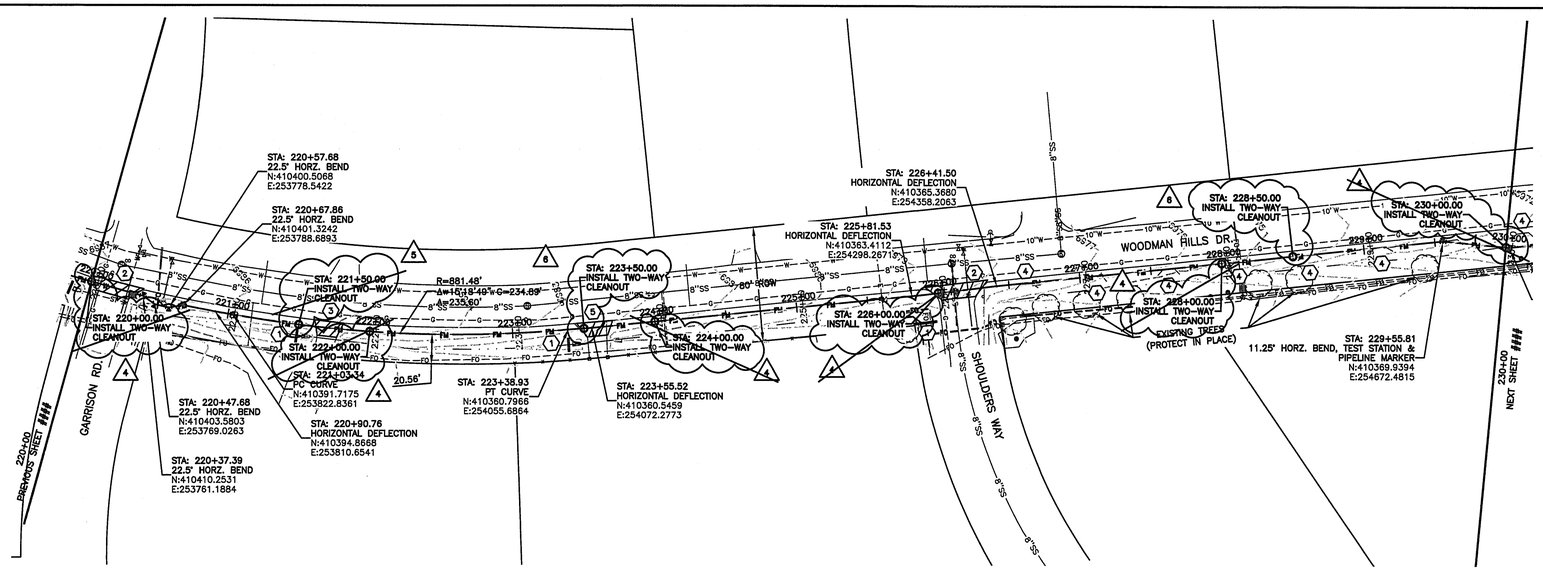
COLORADO REGISTERED PROFESSIONAL ENGINEER BRADLEY A. SIMONS 34705 8/28/19

BRADLEY A. SIMONS
34705

SHEET
FM1.21

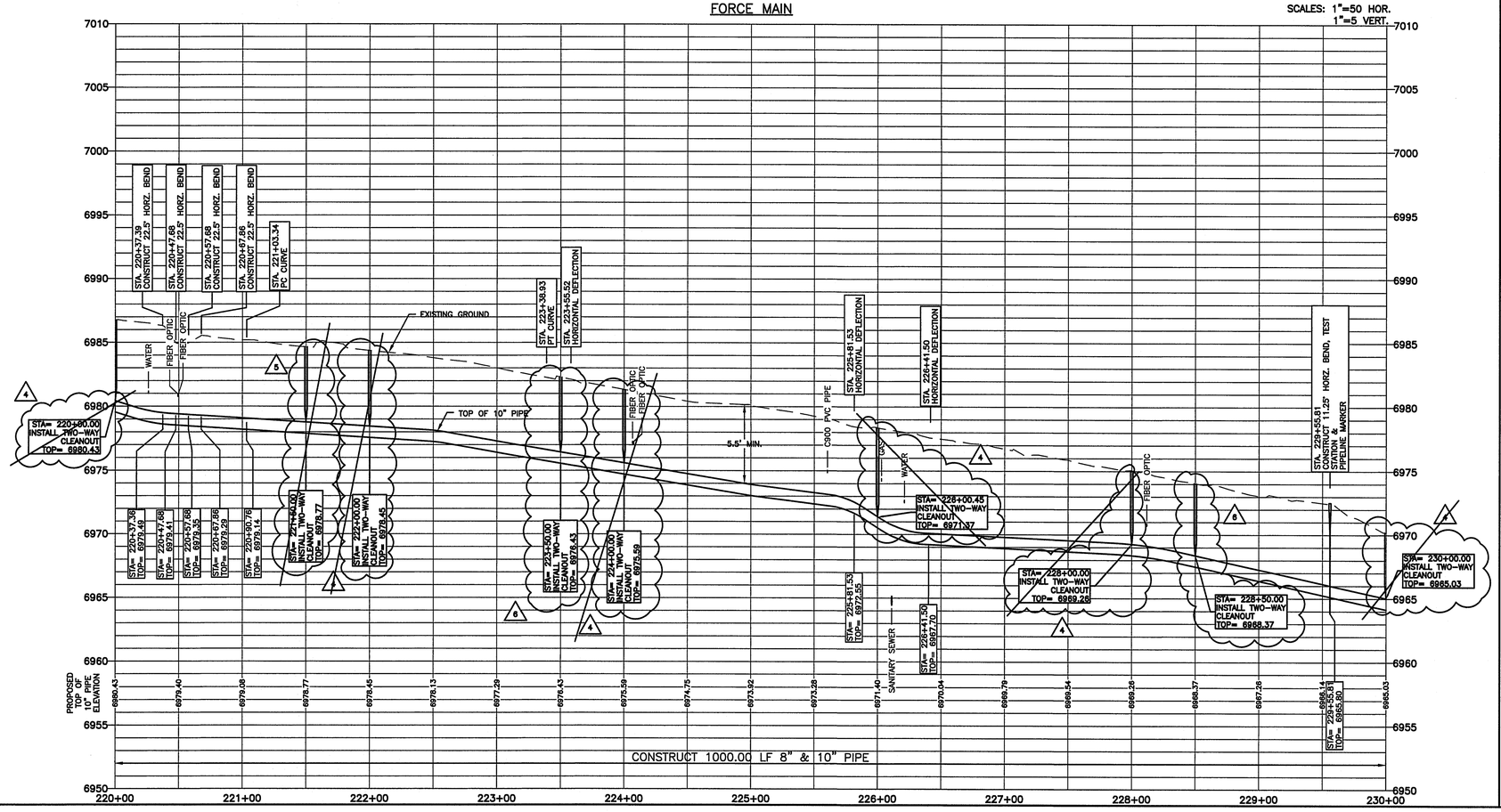
COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG!

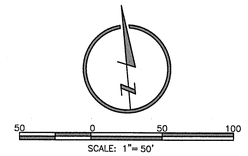
N:\Projects\AM8 - Sterling Ranch\CAD\Engineering\Sheet Sets\CDT\0416011-02H-02C-MS.dwg, 8/28/2019 12:19:42 PM, DAN POND, LAMP RYNEARSON & ASSOCIATES



FORCE MAIN

SCALES: 1"=50 HOR.
1"=5 VERT.





NOTES:

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3. CONTRACTOR SHALL SAW CUT, REMOVE AND REPLACE EXISTING CONCRETE DRIVEWAY.
4. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING DECORATIVE FENCE.
5. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING GRAVEL DRIVEWAY.

DRAWN BY	JDM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER-TASK#	0416011
BOOK AND PAGE	

REVISIONS		
1	REVISED PER COMMENTS	06/07/19
2	REVISED PER COMMENTS	07/09/19
3	REVISED PER COMMENTS	08/28/19

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LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER
BRADLEY A. SIMONS
34705

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SHEET
FM1.22

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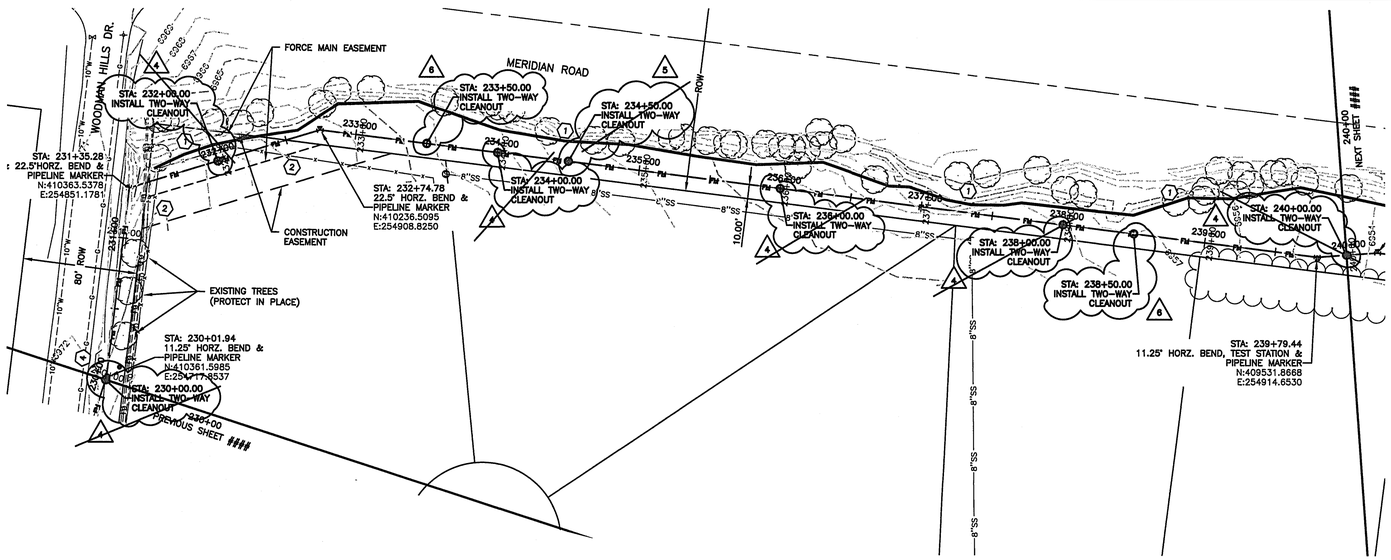

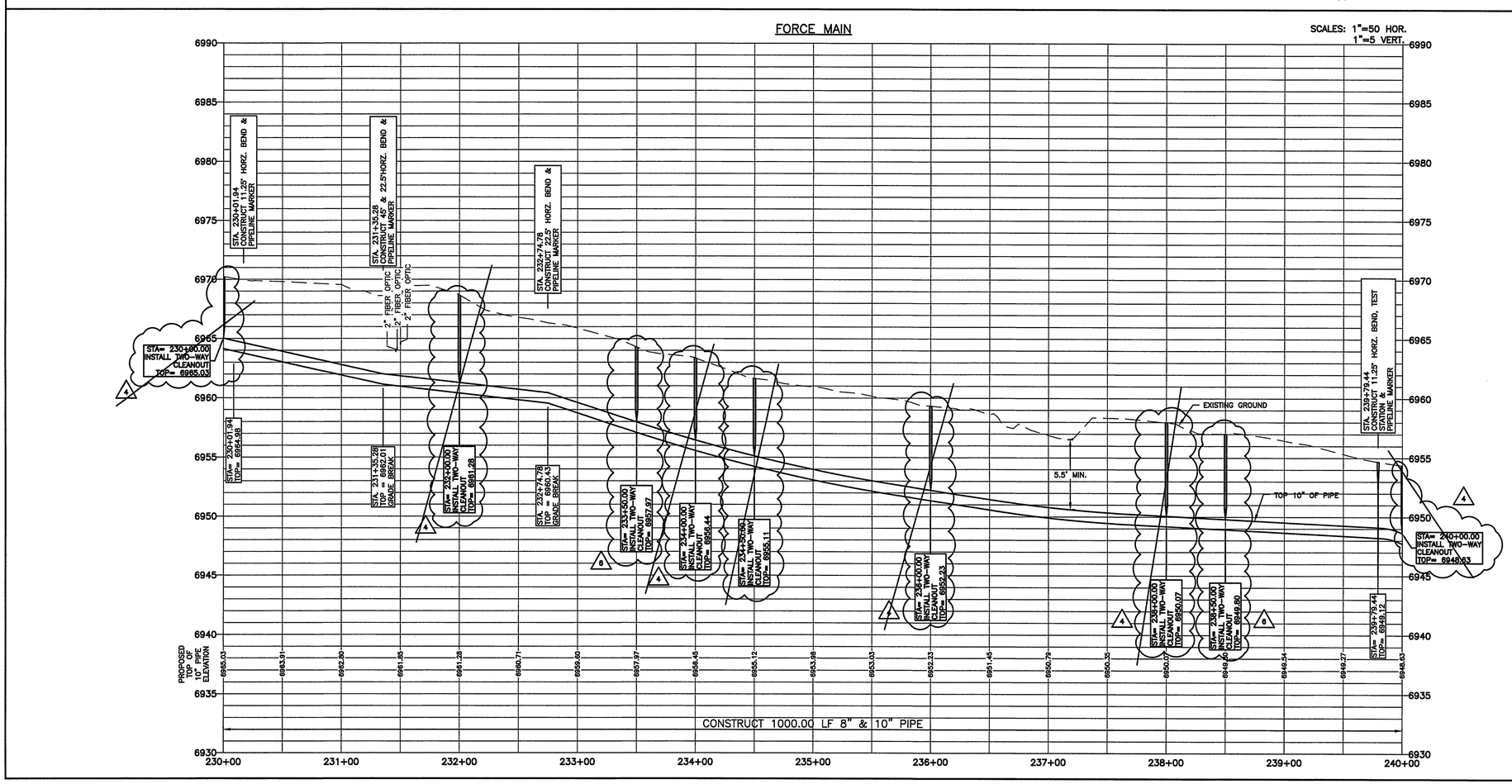

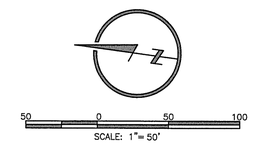

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KEYNOTES:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4
2. REMOVE AND REPLACE 180 L.F. OF EXISTING FENCE.
3. NOT USED.
4. CONTRACTOR SHALL REMOVE AND RE-INSTALL EXISTING DECORATIVE FENCE.

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER-FASKS	041601
BOOK AND PAGE	

REVISIONS	
1	REVISED PER COMMENTS - 06/07/19
2	REVISED PER COMMENTS - 07/02/19
3	REVISED PER COMMENTS - 08/28/19

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LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER BRADLEY A. SIMONS 34705

BRADLEY A. SIMONS
34705

SHEET
FM1.23

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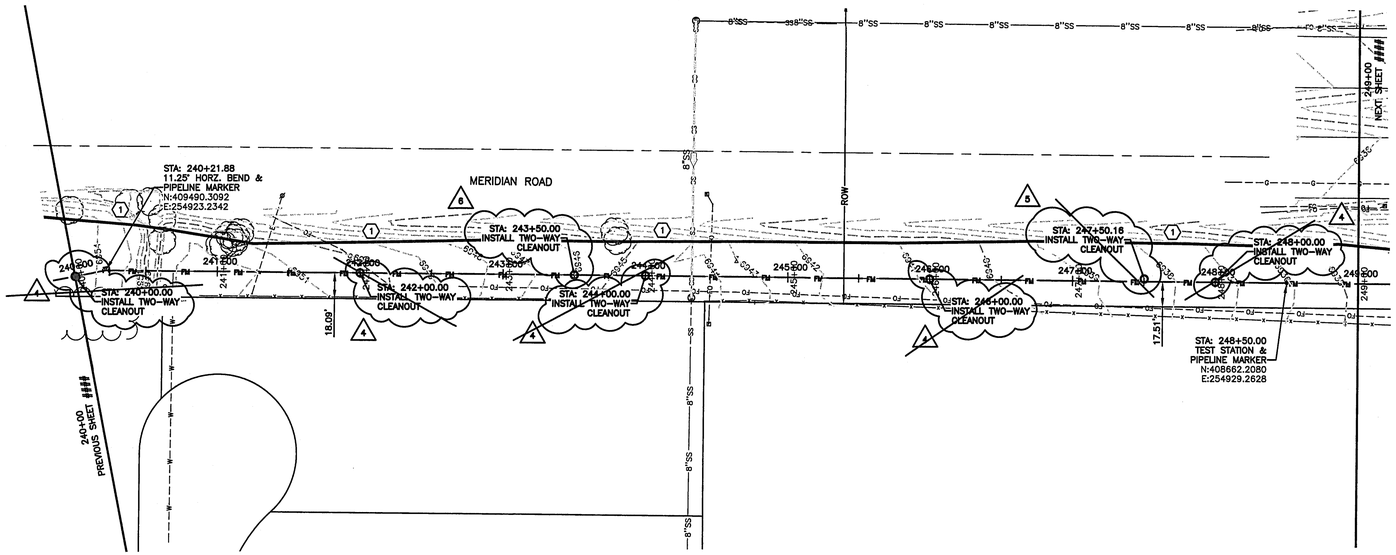

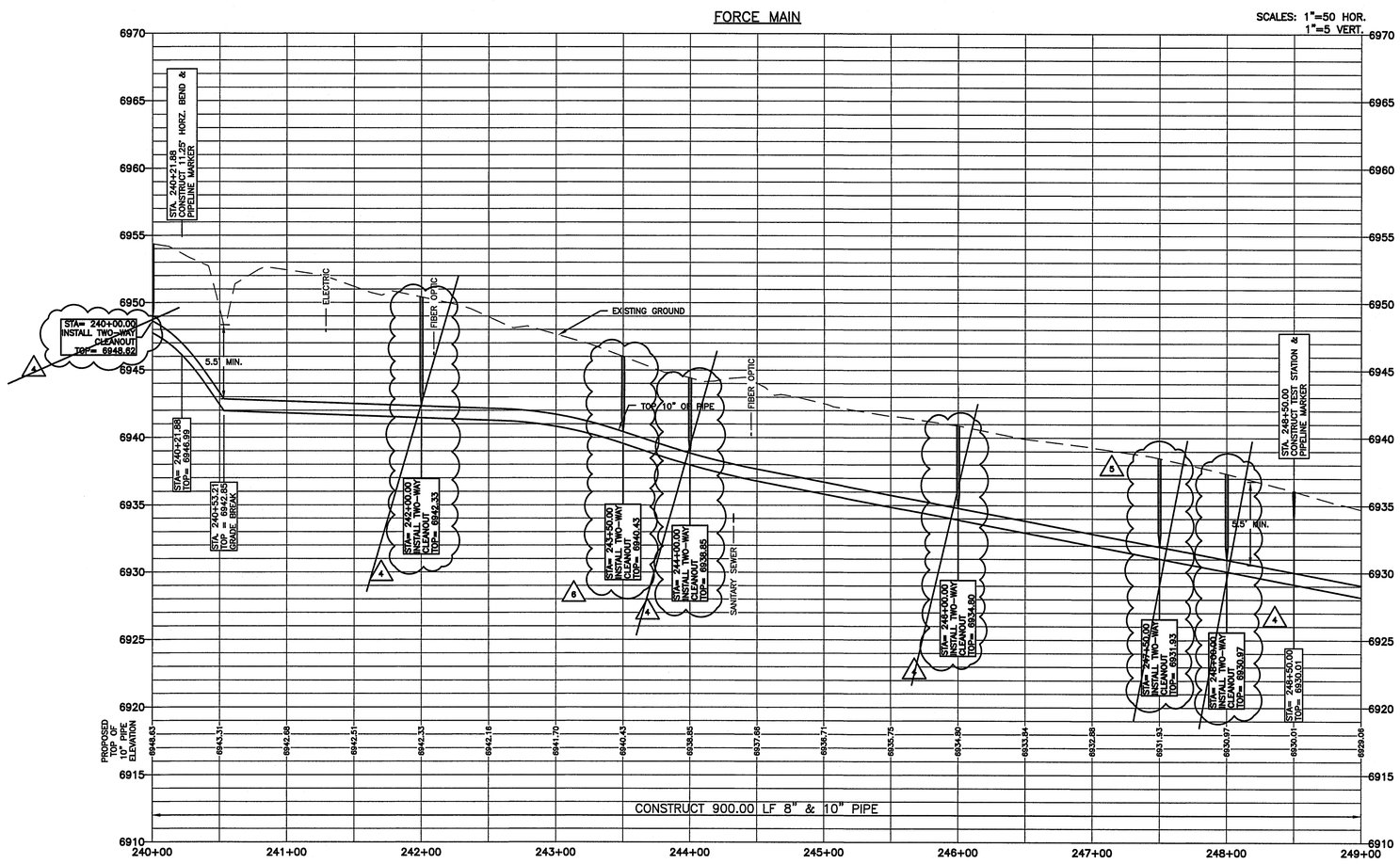

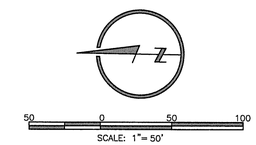

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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER-TASK3	0416011
BOOK AND PAGE	

REVISIONS
1 REVISED PER COMMENTS – 06/07/19
2 REVISED PER COMMENTS – 07/02/19
3 REVISED PER COMMENTS – 08/28/19

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FORCE MAIN PLAN & PROFILE
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LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.24

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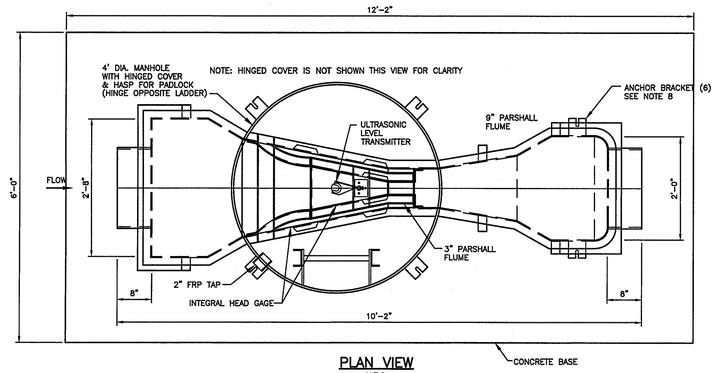
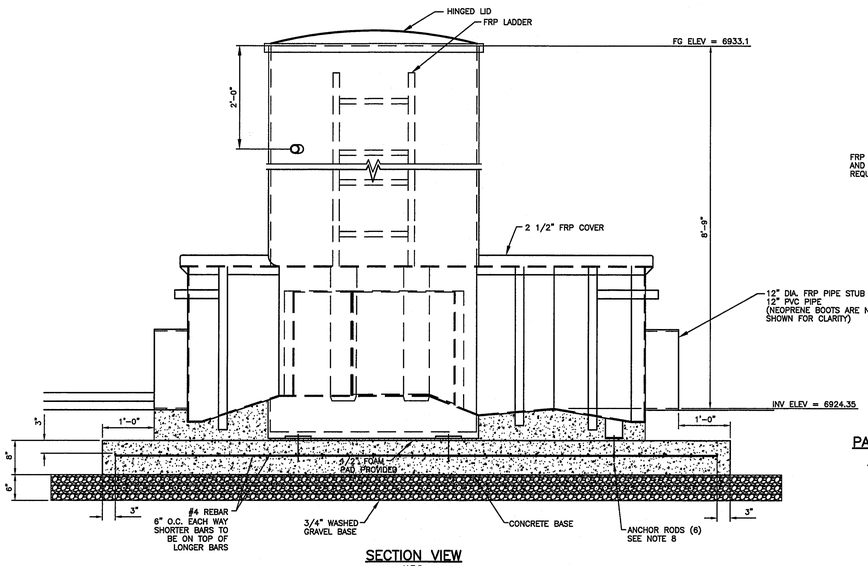


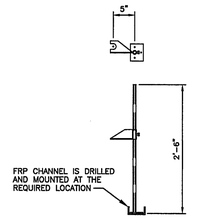
PLAN VIEW
N.T.S.

NOTES:

1. PACKAGED METERING MANHOLE SHALL BE PLASTI-FAB OR APPROVED EQUAL.
2. MATERIAL IS FRP (FIBERGLASS REINFORCED POLYESTER).
3. NEOPRENE BOOTS ARE SECURED WITH STAINLESS STEEL BANDS.
4. THE MINIMUM MANHOLE BARREL THICKNESS IS 1/2" FRP.
5. HINGE, HASP, ANCHOR BRACKET & BOLTS ARE TYPE 304 S/S.
6. A 3" PARSHALL FLUME SHALL BE INSTALLED INSIDE THE 9" PARSHALL FLUME PER MANUFACTURER'S RECOMMENDATIONS.
7. CONTRACTOR SHALL FILL MANHOLE WITH CONCRETE TO THE TOP OF THE FLUME.
8. HAS-R 304 SS OR HAS-R 316 SS ANCHOR RODS, 1/2" DIA. WITH 5" EMBEDMENT INTO CONCRETE WITH HILTI HIT-RE 500 V3 EPOXY OR APPROVED EQUAL.

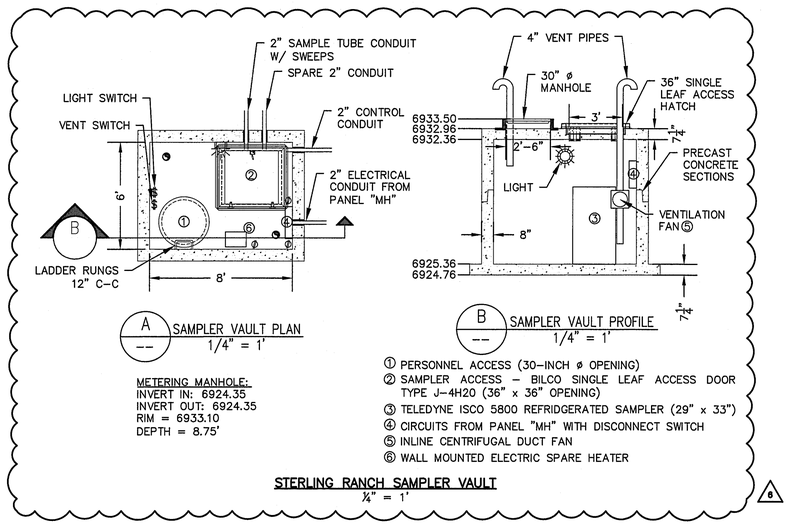


SECTION VIEW
N.T.S.



ADJUSTABLE SONIC MOUNTING BRACKET
TYPE 304 STAINLESS STEEL

PACKAGED METERING MANHOLE
3" X 9" PARSHALL FLUME
N.T.S.



A SAMPLER VAULT PLAN
1/4" = 1'

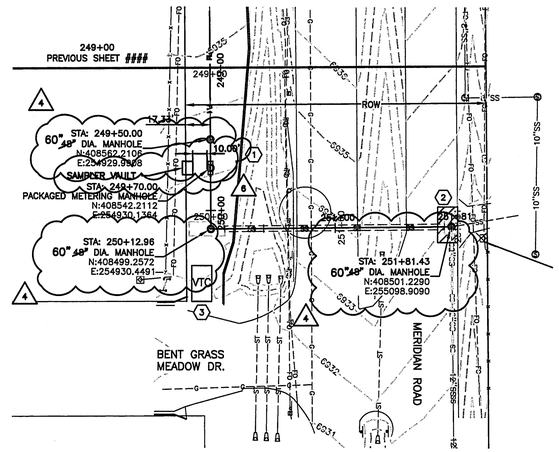
B SAMPLER VAULT PROFILE
1/4" = 1'

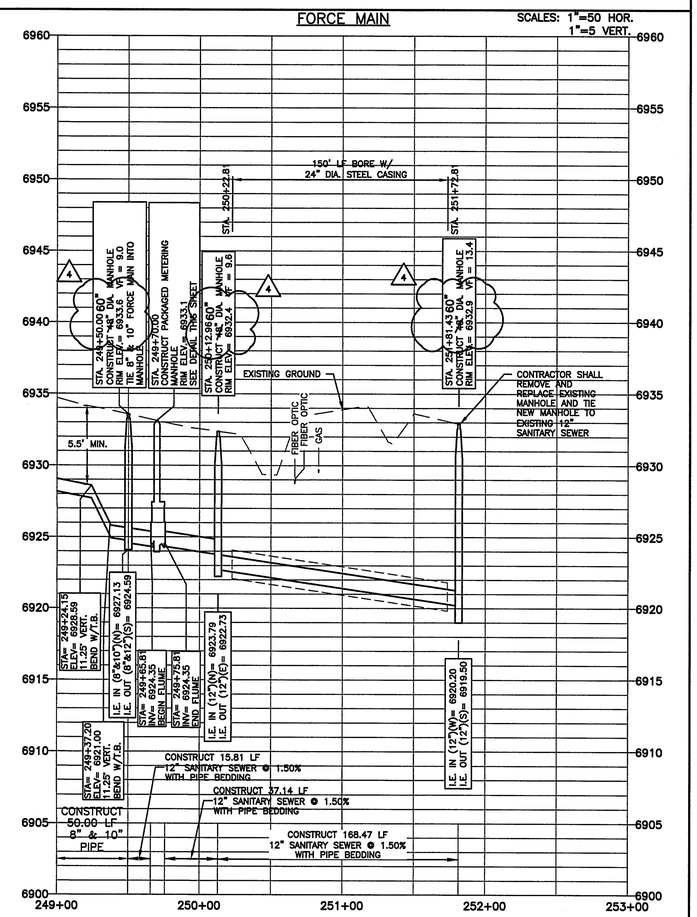
METERING MANHOLE:
INVERT IN: 6924.35
INVERT OUT: 6924.35
RIM = 6933.10
DEPTH = 8.75'

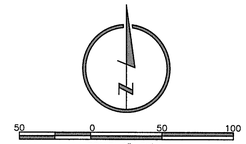
① PERSONNEL ACCESS (30-INCH ø OPENING)
② SAMPLER ACCESS – BILCO SINGLE LEAF ACCESS DOOR TYPE J-4H20 (36" x 36" OPENING)
③ TELEDYNE ISCO 5800 REFRIDGERATED SAMPLER (29" x 33")
④ CIRCUITS FROM PANEL "MH" WITH DISCONNECT SWITCH
⑤ INLINE CENTRIFUGAL DUCT FAN
⑥ WALL MOUNTED ELECTRIC SPARE HEATER

STERLING RANCH SAMPLER VAULT
¼" = 1'

6







NOTES:

1. SEE SHEET G0.2 FOR GENERAL NOTES.
2. STATIONING IS BASED ON THE CENTERLINE BETWEEN THE 8" AND 10" FORCE MAINS.
3. CONTRACTOR SHALL INSTALL THRUST BLOCKS AT ALL HORIZONTAL AND VERTICAL BENDS PER DETAIL.
4. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES WITHIN THE AREA OF WORK 7 DAYS PRIOR TO THE START OF INSTALLATION OF THE PIPELINE. THE CONTRACTOR SHALL NOTIFY OWNER AND ENGINEER OF ANY CONFLICTS THAT ARISE AND REQUIRE REDESIGN OF ANY PORTION OF THE PROJECT. REFER TO GENERAL NOTES FOR FURTHER INFORMATION.
5. CONTRACTOR SHALL BE REQUIRED TO STAY WITHIN THE CONSTRUCTION EASEMENTS AND/OR ROAD RIGHT OF WAY WHEN CONSTRUCTING THE PIPELINE. TRAFFIC CONTROL MEASURES SHALL BE IN PLACE DURING CONSTRUCTION PER EL PASO COUNTY REQUIREMENTS.
6. CONTRACTOR SHALL PROVIDE A MINIMUM 1' OF CLEARANCE BETWEEN ALL UTILITIES UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL PLACE SEDIMENT CONTROL LOGS UPSTREAM OF ALL STORM DRAIN PIPES WITHIN THE PROJECT AREA.
8. CONTRACTOR SHALL BLADE A SMALL 6" HIGH BERM ALONG THE DOWNSTREAM SIDE OF TRENCHING OPERATIONS TO CONTROL STORM DRAINAGE FLOWS AND MINIMIZE TRANSPORTATION SEDIMENT DOWNSTREAM. SEE DETAIL SHEET FM2.4.
9. CONTRACTOR SHALL RESEED ALL AREAS DISTURBED DURING CONSTRUCTION, INCLUDING ANY SOD AND/OR LANDSCAPING.
10. CONTRACTOR SHALL PROTECT IN PLACE OR REMOVE AND REPLACE ANY SIGNS, MAILBOXES, LANDSCAPING, OR OTHER OBSTRUCTIONS DISTURBED DURING CONSTRUCTION.

KEYNOTES:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4
2. CONTRACTOR SHALL SAW CUT, REMOVE & REPLACE EXISTING PAVEMENT PER EL PASO COUNTY SPECIFICATIONS.
3. VEHICLE TRACKING CONTROL PER SHEET FM2.4

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER	04160111
BOOK AND PAGE	

REVISIONS
1 REVISED PER COMMENTS – 06/07/19
2 REVISED PER COMMENTS – 08/28/19

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 249+00 TO STA. 251+83.43
AND
PACKAGED METERING MANHOLE

LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER
BRADLEY A. SIMONS
34705
4/30/19

COLORADO 811
KNOW WHAT'S BELOW CALL BEFORE YOU DIG

BRADLEY A. SIMONS
34705

SHEET
FM1.25

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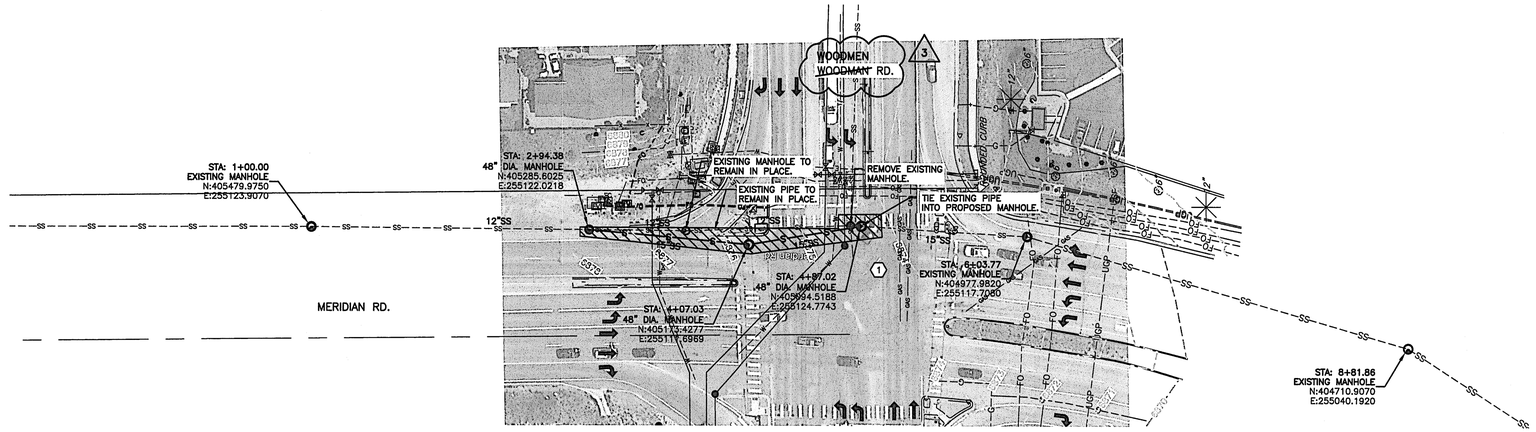

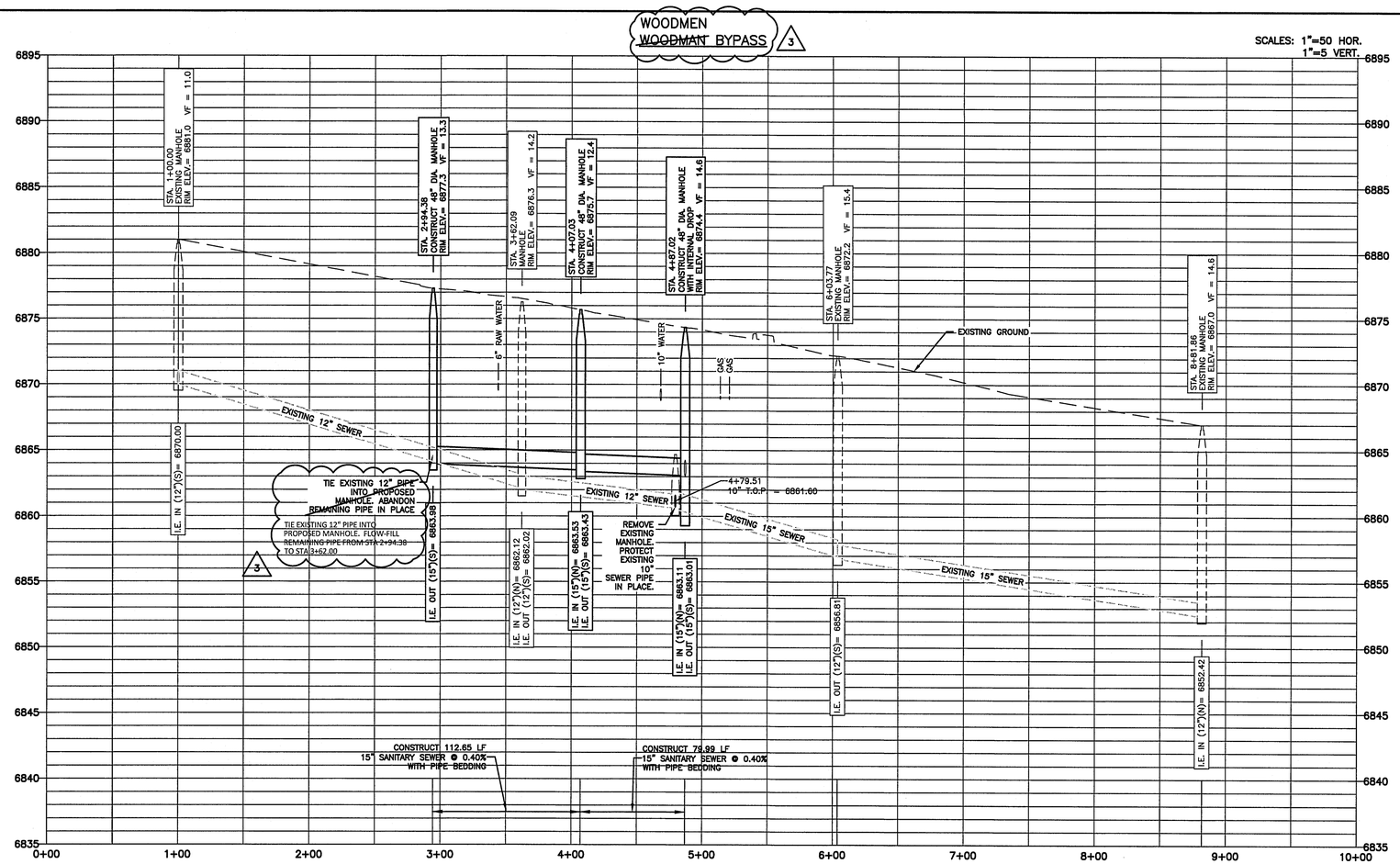

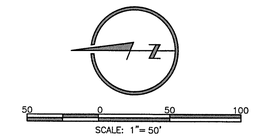

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KEYNOTES:

(1) CONTRACTOR SHALL SAW CUT, REMOVE & REPLACE EXISTING PAVEMENT PER EL PASO COUNTY SPECIFICATIONS.

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	JUN. 24, 2017
JOB NUMBER	4U6/3
	0416011
BOOK AND PAGE	

REVISIONS
3 – PER EPC COMMENTS – 05/31/2019

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

SANITARY SEWER PLAN & PROFILE WOODMAN BYPASS

LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER
BRADLEY A. SIMONS
34705

SHEET
FM1.26

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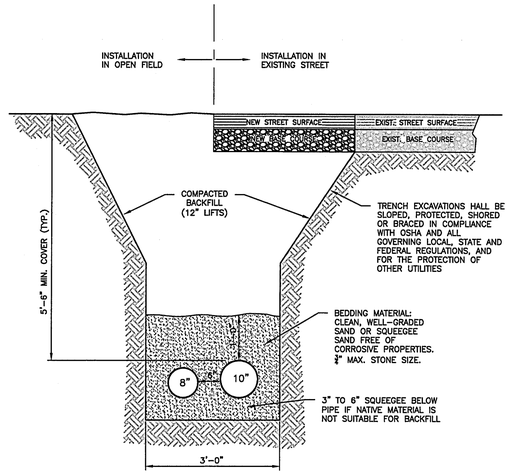
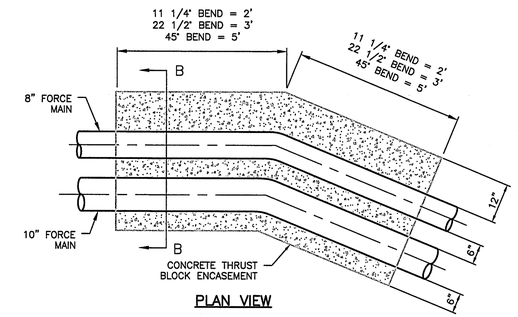
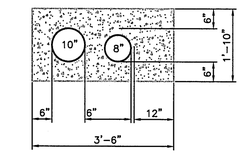


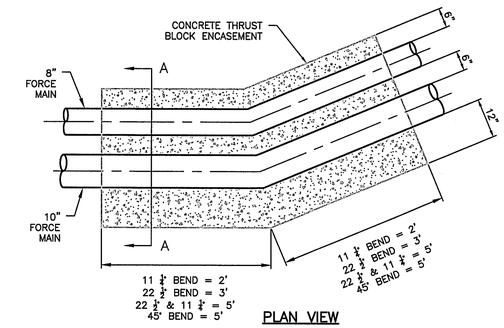
TYPICAL TRENCH SECTION
N.T.S



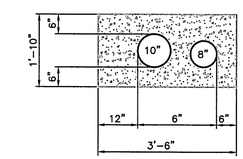
PLAN VIEW



SECTION B–B

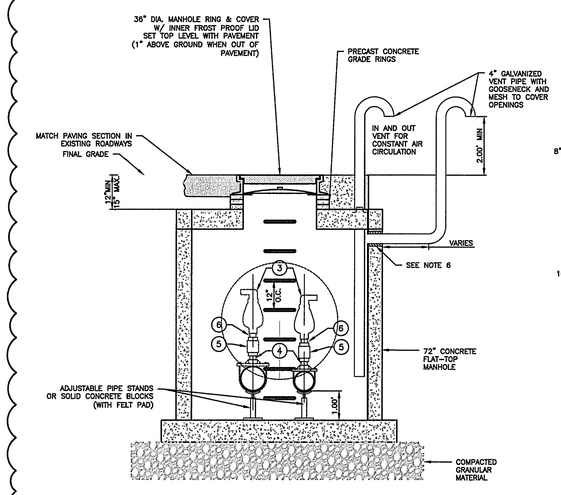


PLAN VIEW

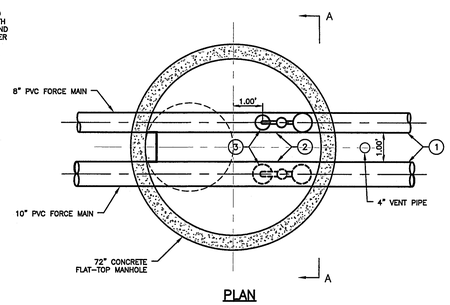


SECTION A–A

HORIZONTAL THRUST BLOCK DETAIL
N.T.S



SECTION A–A



PLAN

ITEM	8" FORCE MAIN	10" FORCE MAIN
1	8" HDPE	10" HDPE
2	8" DIP	10" DIP
3	2" COMBINATION AIR VALVE	SEE NOTE 1
4	2" TAPPING SADDLE	SEE NOTE 1
5	2" STAINLESS STEEL THREADED BALL VALVE	SEE NOTE 1
6	2" THREADED NIPPLE	SEE NOTE 1

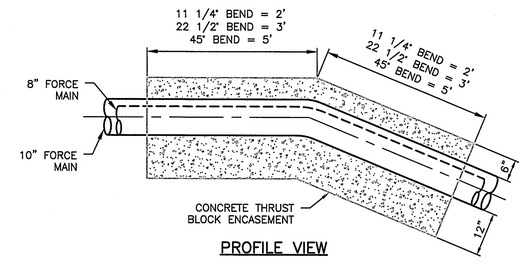
1

AIR RELEASE MANHOLE
N.T.S.

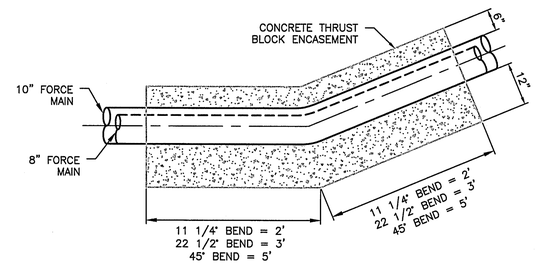
2

NOTES:

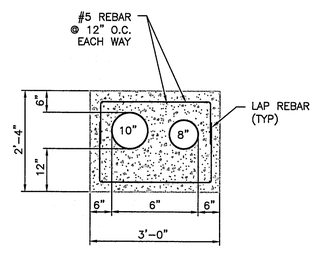
1. THE FUTURE COMBINATION AIR VALVE AND APPURTENANCES ASSOCIATED WITH THE 10" FORCEMAIN SHALL BE SIZED AND INSTALLED PRIOR TO THE USE OF THE 10" FORCE MAIN.
2. ALL CONCRETE WORK SHALL COMPLY WITH LATEST ACI-318 SPECIFICATIONS.
3. ALL LADDER RUNGS MUST LINE UP BOTH HORIZONTALLY AND VERTICALLY.
4. ALL SUPPORT MATERIALS SHALL BE GIVEN 2 COATS OF RUST INHIBITIVE PAINT.
5. AIR AND VACUUM VALVE STATIONS TO BE HOUSED IN A 6' DIAMETER CONCRETE VAULT DESIGNED FOR HS-20 LOADING CONDITIONS AND 300 PSF SURCHARGE LOAD.
6. GROUT ALL PENETRATIONS FULL W/ PORTLAND CEMENT, NON-SHRINK GROUT. SEAL AS NECESSARY FOR WATERTIGHT CONNECTION.
7. AIR AND VACUUM VALVE STATIONS SHALL BE DESIGNED PER PIPELINE REQUIREMETS.
8. FOR ADDITIONAL DETAILS REFER TO COLORADO SPRINGS UTILITIES DETAIL A6-10.



PROFILE VIEW



PROFILE VIEW



SECTION

VERTICAL THRUST BLOCK DETAIL
N.T.S

DRAWN BY	SAS
DESIGNED BY	SAS
DATE	APRIL 24, 2017
JOB NUMBER	041601
BOOK AND PAGE	

REVISIONS
1 REV. AIR RELEASE MANHOLE 11/01/17
2 REV. PER MSMD COMMENTS 04/23/19

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN
CONSTRUCTION DETAILS

LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER
BRADLEY A. SIMONS
34705

SHEET
FM2.1

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FIELD INSTALLATION OF POLYETHYLENE TUBING FOR DIP PIPE AND FITTINGS

STEP 1:

PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO TRENCH.

TABLE 1
SUITABLE CONDUCTOR SIZES FOR JOINT BONDING OF DUCTILE IRON PIPE

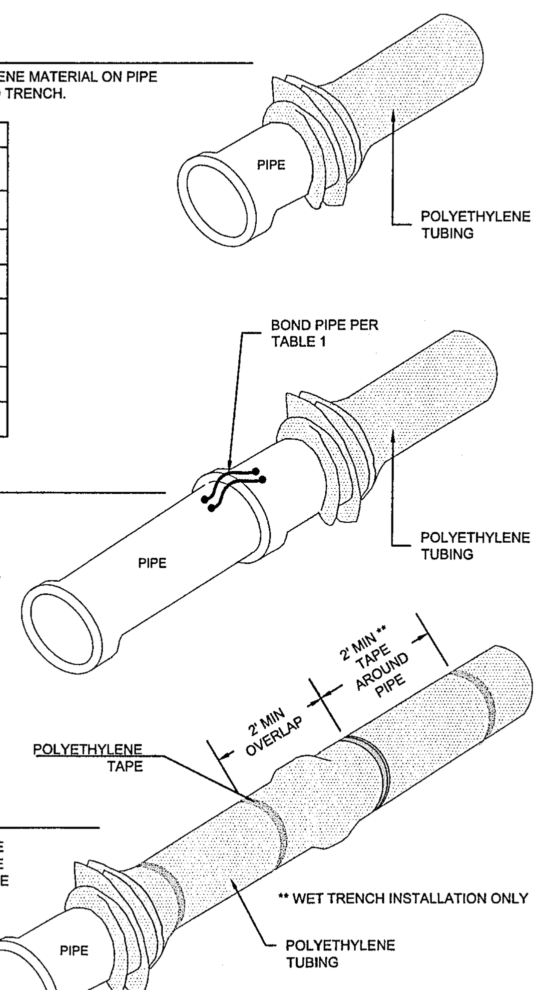
PIPE SIZE (IN)	QUANTITY - SIZE OF BOND	SIZE OF CHARGE (G)
8 TO 14	2 - #8 STRANDED OR SOLID	25
16 TO 36	2 - #4 STRANDED OR SOLID	32
	4 - #8 STRANDED OR SOLID	25
	1 - BONDING STRAP	15
42 TO 64	2 - #2 STRANDED OR SOLID	32
	4 - #4 STRANDED OR SOLID	32

STEP 2:

INSTALL BONDING STRAP OR WIRE AT EVERY JOINT OF PIPE PRIOR TO WRAPPING. PULL TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO END AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

STEP 3:

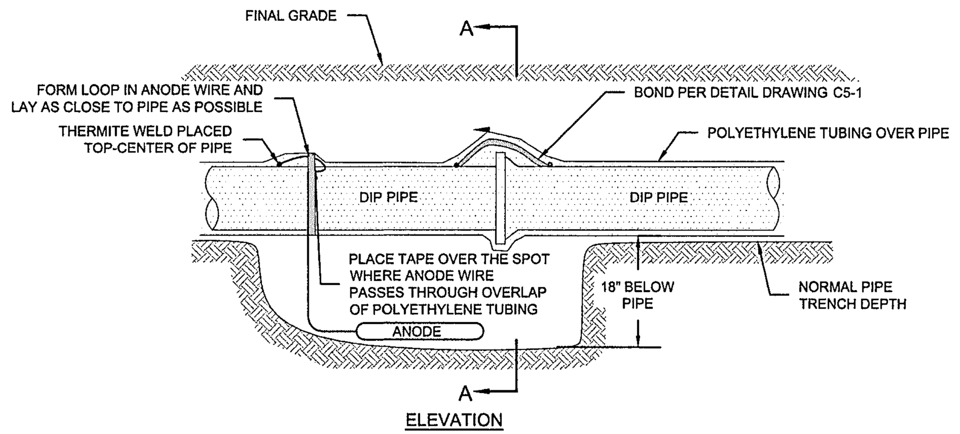
OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL FOLDED ON TOP OF PIPE AND TAPED IN PLACE

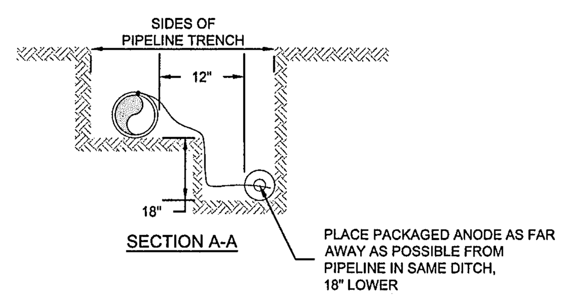


NOTES:

1. ANY TEARS OR HOLES SHALL BE REPAIRED WITH POLYETHYLENE TUBING AND TAPE.
2. WHEN WORKING AROUND EXISTING POLY WRAPPED PIPE, ANY TEARS AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED.
3. WHEN WORKING AROUND EXISTING BONDED PIPE, ANY BROKEN BONDS AS A RESULT OF CONSTRUCTION, SHALL BE REPAIRED.

Colorado Springs Utilities — It's how we're all connected | POLYETHYLENE TUBING | C5-1 DATED 5/2015

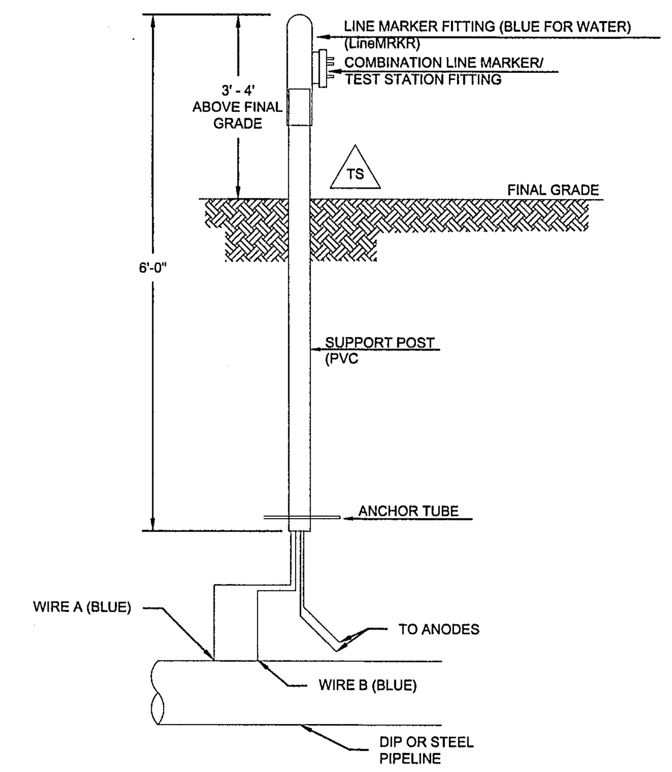




NOTES:

1. THERMITE WELD ANODE TO PIPE WITH A 15 GRAM CHARGE. INSTALL A COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
2. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
3. PACKED ANODE SHOULD BE COVERED WITH FINE SOIL CONTAINING NO ROCKS OR DIRT CLUMPS AND SHALL BE HAND TAMPED TO THE BOTTOM OF THE PIPE FOR COMPACTION.
4. ANODE WITH BROKEN BAGS SHALL NOT BE USED.
5. ANODES SHALL BE REMOVED FROM PLASTIC PACKAGING.
6. IT IS NOT NECESSARY TO WET THE ANODES.
7. DIP PIPE SHALL BE ENCASED IN POLYETHYLENE TUBING PER DETAIL DRAWING C5-1.

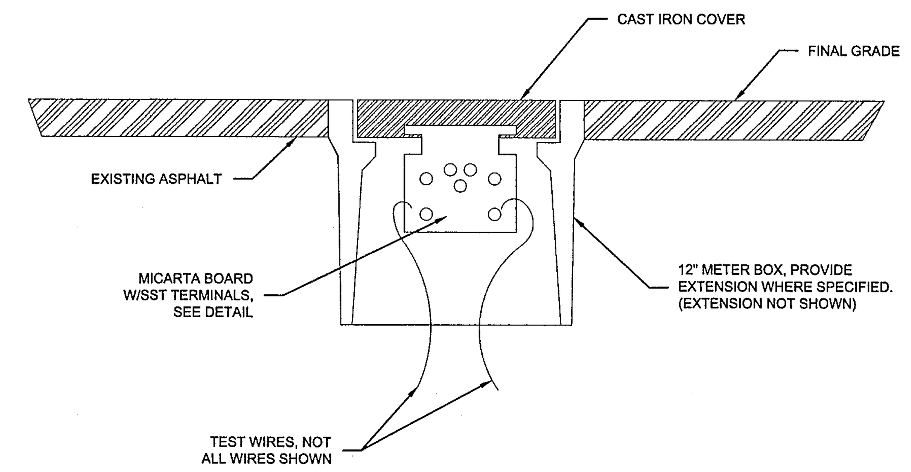
Colorado Springs Utilities — It's how we're all connected | BONDING JOINT AND ANODE INSTALLATION | C5-2 DATED 5/2015



NOTES:

1. THE CONTRACTOR SHALL COORDINATE WITH COLORADO SPRINGS UTILITIES TO WIRE TERMINAL BOARD.
2. THERMITE WELD WIRES TO PIPE WITH A 15 GRAM CHARGE. INSTALL A COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
3. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
4. THE CONTRACTOR SHALL VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.
5. COLOR CODE WIRE INSULATION AS SHOWN IN APPLICABLE TEST STATION DETAILS. CONNECT EACH TEST WIRE TO SEPARATE TERMINAL.
6. WIRE CONFIGURATION FOR FLUSH MOUNT STYLE TEST STATIONS SIMILAR TO POST MOUNT STYLE TEST STATIONS.
7. PROVIDE 18 INCHES SLACK IN TEST WIRES, MINIMUM.

Colorado Springs Utilities — It's how we're all connected | INSTALLATION OF POST MOUNT TEST STATION IN UNIMPROVED AREAS | A8-11 DATED 06/2015



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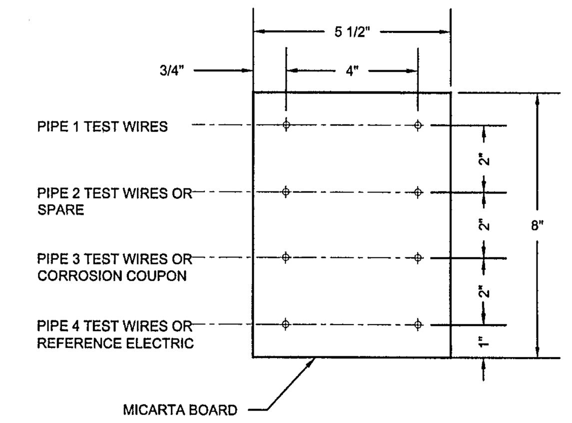
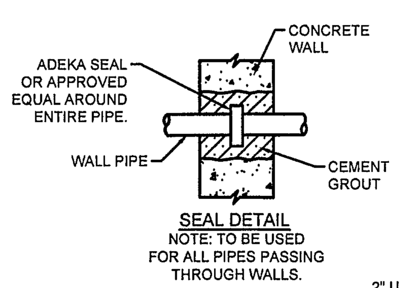
6. WIRE CONFIGURATION FOR FLUSH MOUNT STYLE TEST STATIONS SIMILAR TO POST MOUNT STYLE TEST STATIONS.
7. PROVIDE 18 INCHES SLACK IN TEST WIRES, MINIMUM.

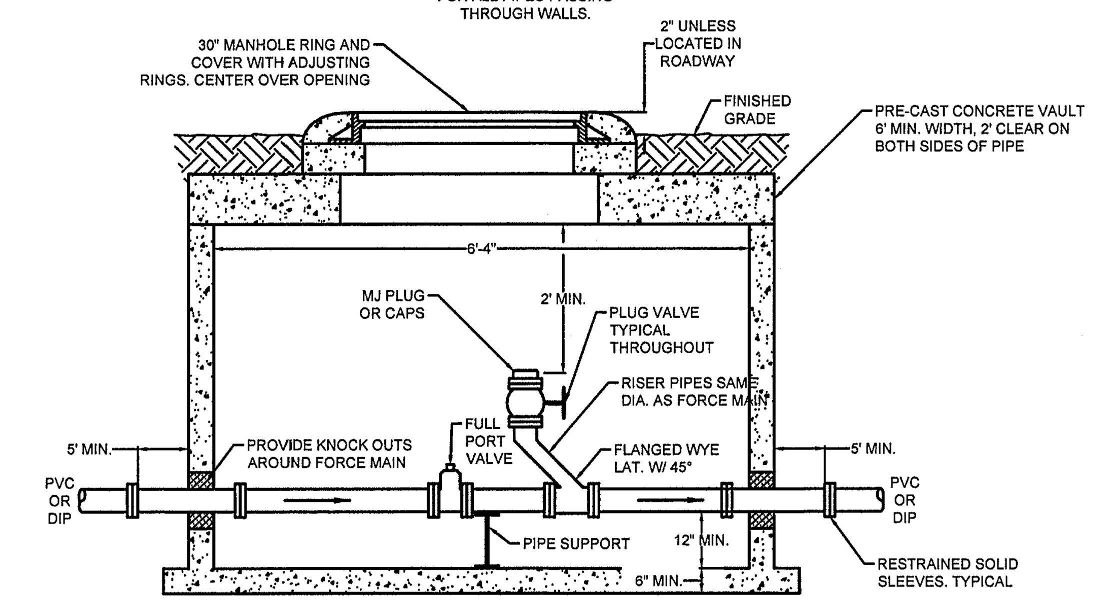
NOTES:

1. TERMINALS SHALL BE 1/4" STAINLESS STEEL W/LOCKING WASHER, TWO FLAT WASHERS, AND DOUBLE NUTS.
2. ALL WIRE CONNECTIONS TO BE W/RING TONGUE COMPRESSION TERMINALS.
3. WIRES ON TEST STATIONS TO BE PERMANENTLY LABELED WITH PIPE IDENTIFICATION (i.e. 12" DIP) USING NYLON WIRE MARKER TAGS.



Colorado Springs Utilities — It's how we're all connected | TEST STATION FLUSH MOUNT | A8-9 DATED 03/2014



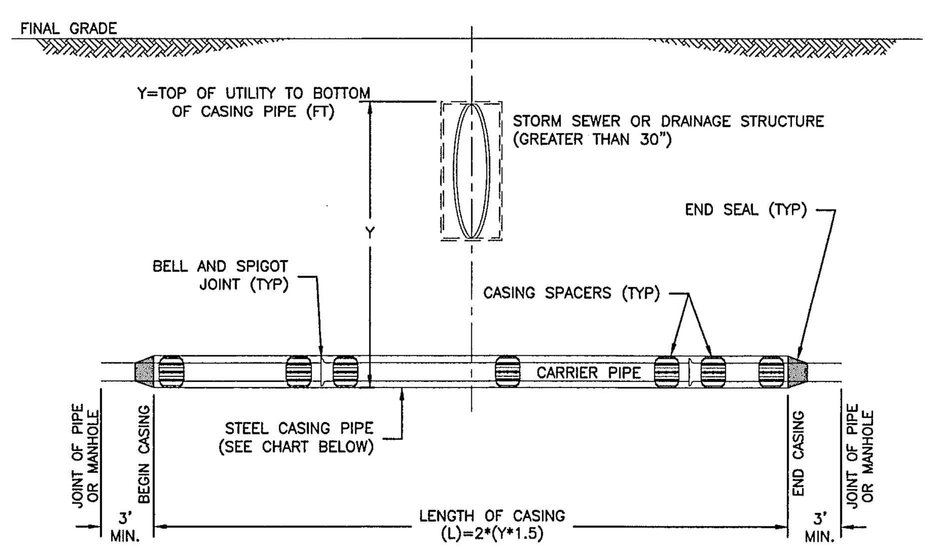


* NOTE: ALL PIPING 4" AND LARGER IN CLEAN-OUT CHAMBER, EXCEPT AS NOTED, TO BE DUCTILE IRON CONNECTED WITH FLANGED JOINTS AND STAINLESS STEEL BOLTS.

ONE-WAY FORCE MAIN CLEAN-OUT

STA: 208+50

5

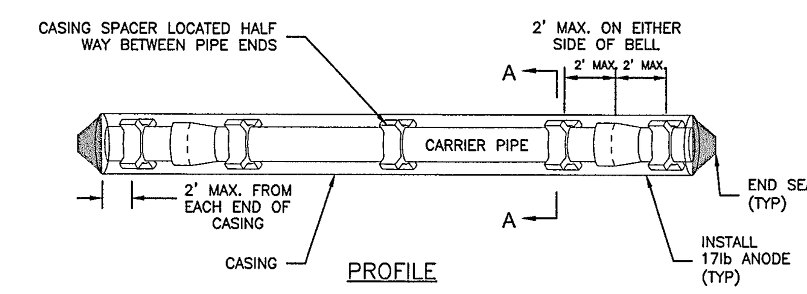


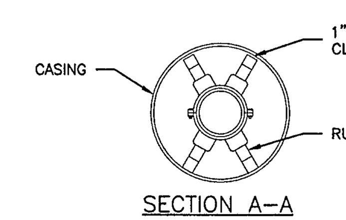
CARRIER PIPE SIZE (INCH)	MIN. CASING PIPE SIZE (INCH)	MIN. CASING WALL THICKNESS (INCH)
8	12	0.250
12	16	0.312
18	22	0.375
20 & 21	24	0.500
24	30	0.500
30	36	0.625
36	42	0.625

NOTES:

1. THE DESIGN ENGINEER SHALL VERIFY THAT THE SIZE OF THE CASING PIPE WILL MEET THE NEEDS OF THE PROJECT.
2. CASING WALL THICKNESS BASED ON E80 LOADING.
3. CASING SHALL BE STEEL PIPE WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI.
4. SEE DETAIL DRAWING C2-5 FOR CASING SPACER DETAILS.
5. WHERE THE WASTEWATER MAIN CROSSES ABOVE A WATER MAIN, SEE SECTION 2.5.F.3.
6. WHERE THE WASTEWATER MAIN CROSSES UNDER A RAILWAY OR MAJOR ROADWAY, THE LENGTH OF CASING AND ITS PROPERTIES SHALL BE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.

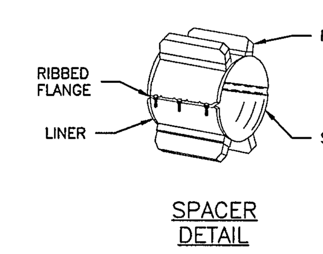
Colorado Springs Utilities — It's how we're all connected | TYPICAL STEEL CASING INSTALLATION | C2-4 DATED 5/2015





CARRIER PIPE:

1. CARRIER PIPE SHALL BE CENTERED WITHIN CASING BY USE OF APPROVED CASING SPACERS. (SEE CHAPTER 4)



PLACEMENT OF SPACERS ON CARRIER PIPE:

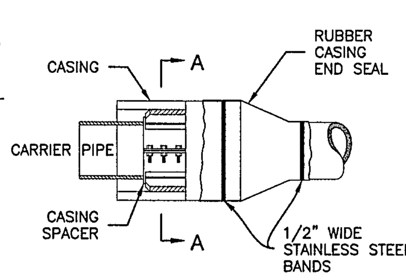
1. CASING SPACERS SHALL BE PLACED MAX. 2' FROM EACH END OF CASING AND ON EITHER SIDE OF EACH BELL. WHEN CARRIER PIPE IS PVC, CASING SPACER SHALL BE PLACED AT THE HOME MARK TO PREVENT OVER-BELLING. SPACERS SHALL ALSO BE PLACED HALF WAY BETWEEN PIPE ENDS, OR IN ACCORDANCE WITH PIPE MANUFACTURERS RECOMMENDATIONS.

END SEALS:

1. END SEALS SHALL BE USED TO ENSURE A WATER TIGHT SEAL ON EITHER END OF THE CASING.

CATHODIC PROTECTION:

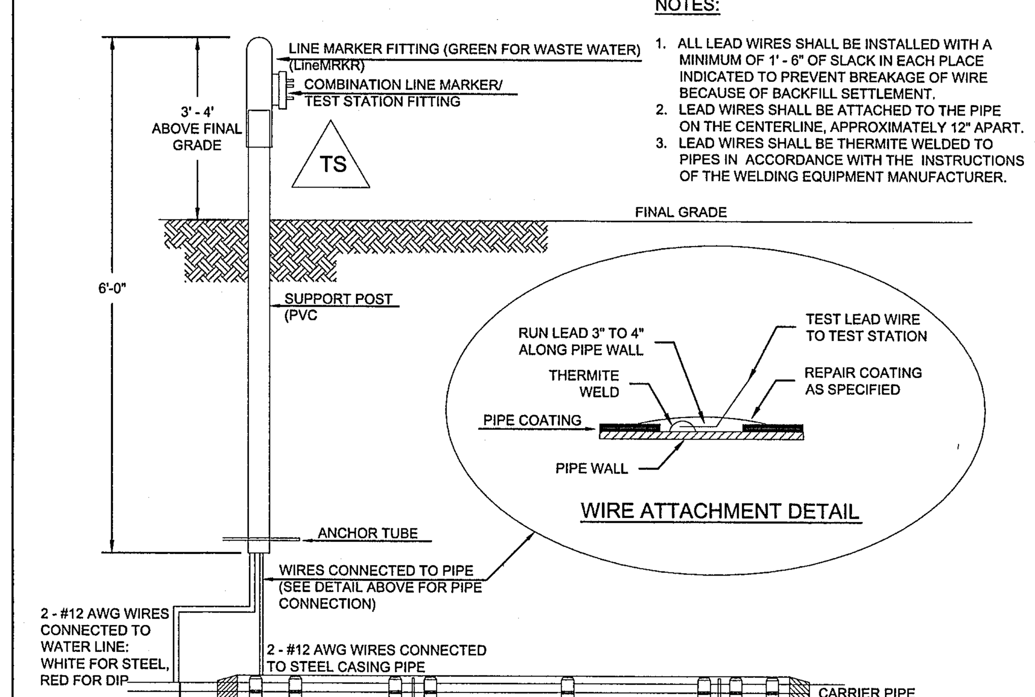
1. CASING SHALL BE CATHODICALLY PROTECTED USING A 17 LB HIGH POTENTIAL ANODE AND AN APPROVED COATING. SEE SECTION 2.5.G.



Colorado Springs Utilities — It's how we're all connected | TYPICAL STEEL CASING INSTALLATION (CONTINUED) | C2-5 DATED 5/2015

NOTES:

1. ALL LEAD WIRES SHALL BE INSTALLED WITH A MINIMUM OF 1' - 6" OF SLACK IN EACH PLACE INDICATED TO PREVENT BREAKAGE OF WIRE BECAUSE OF BACKFILL SETTLEMENT.
2. LEAD WIRES SHALL BE ATTACHED TO THE PIPE ON THE CENTERLINE, APPROXIMATELY 12" APART.
3. LEAD WIRES SHALL BE THERMITE WELDED TO PIPES IN ACCORDANCE WITH THE INSTRUCTIONS OF THE WELDING EQUIPMENT MANUFACTURER.



TYPICAL DETAIL FOR TEST STATION WITH STEEL SLEEVE INSTALLATION

NOTES:

1. THE CASING SHALL BE CATHODICALLY PROTECTED UNDER THE DIRECTION OF THE COLORADO SPRINGS UTILITIES INSPECTOR. SEE SECTION 2.5.G.
2. EXAMPLE CAN VARY DUE TO SITE CONDITIONS AND COLORADO SPRINGS UTILITIES INSPECTORS' DIRECTION.
3. SEE STANDARD DETAIL DRAWING C2-4 - STEEL CASING INSTALLATION.
4. CONTRACTOR TO COORDINATE W/ COLORADO SPRINGS UTILITIES TO WIRE TERMINAL BOARD.
5. THERMITE WELD WIRES TO PIPE W/ 15 GRAM CHARGE. INSTALL COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
6. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
7. CONTRACTOR TO VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.

Colorado Springs Utilities — It's how we're all connected | INSTALLATION OF CATHODIC PROTECTION TEST STATION AT A CASING PIPE | C5-5 DATED 5/2015

DRAWN BY SAS
DESIGNED BY SAS
DATE APRIL 24, 2017
JOB NUMBER-TASKS 0416011
BOOK AND PAGE

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN CONSTRUCTION DETAILS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

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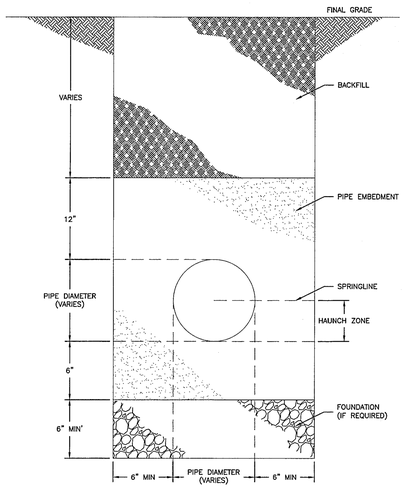


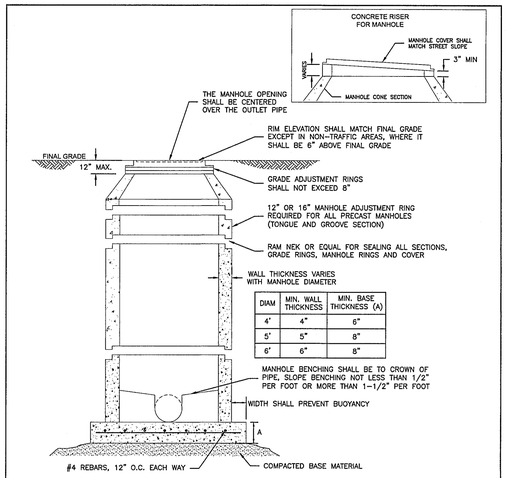
NOTE:

1. TRENCH BACKFILL SHALL CONFORM TO THE SPECIFICATIONS OF THE AUTHORITY HAVING JURISDICTION AND ASTM D2321.

Colorado Springs Utilities — It's how we're all connected

TYPICAL TRENCH SECTION

C2–1 DATED 5/2015



DIAM	MIN. WALL THICKNESS	MIN. BASE THICKNESS (A)
4'	4"	6"
5'	5"	8"
6'	6"	8"

NOTES:

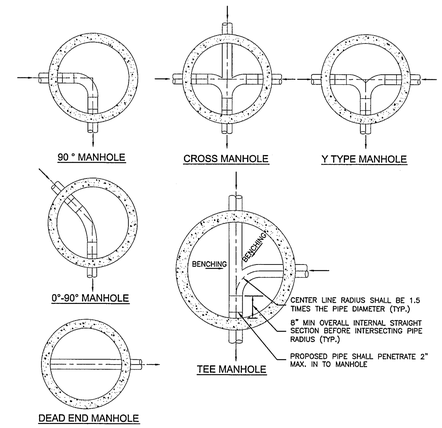
1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI @ 28 DAYS AND DESIGNED FOR HS–20 LOADING CONDITIONS.
2. ALL CONCRETE SHALL BE MECHANICALLY VIBRATED.
3. FOR CAST IN PLACE MANHOLES, DO NOT DROP CONCRETE A DISTANCE OF MORE THAN 5' UNLESS APPROVED BY COLORADO SPRINGS UTILITIES.
4. 3/4" CRUSHED ROCK REQUIRED UNDER BASE TO A DEPTH OF 6" UP TO SPRINGLINE OF PIPE, 2'–3" RADIUS AROUND BASE.
5. ALL STEPS SHALL BE REMOVED FOLLOWING CONSTRUCTION.
6. STRUCTURAL REINFORCEMENT SHALL COMPLY TO ASTM C–478. ASTM C–478 SHALL BE STAMPED ON THE OUTSIDE OF THE MANHOLE.

Colorado Springs Utilities — It's how we're all connected

STANDARD CONCRETE MANHOLE

C3–1 DATED 5/2015

TYPICAL INTERSECTING PIPE MANHOLE LAYOUTS



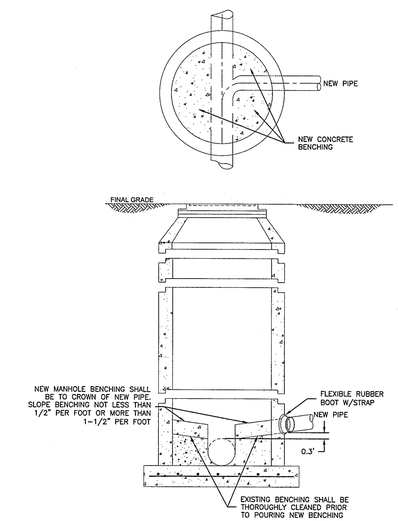
NOTES:

1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.
2. LAYOUTS SHOWN ARE FOR 8"–12" PIPES; LAYOUTS FOR LARGER DIAMETER PIPELINES AND MANHOLES SHALL BE DESIGNED BY THE DESIGN ENGINEER AND APPROVED BY COLORADO SPRINGS UTILITIES.
3. TO BE READ IN CONJUNCTION WITH CHAPTER 2, MANHOLE SIZES.

Colorado Springs Utilities — It's how we're all connected

TYPICAL MANHOLE LAYOUTS AND INTERSECTIONS

C3–2 DATED 5/2015



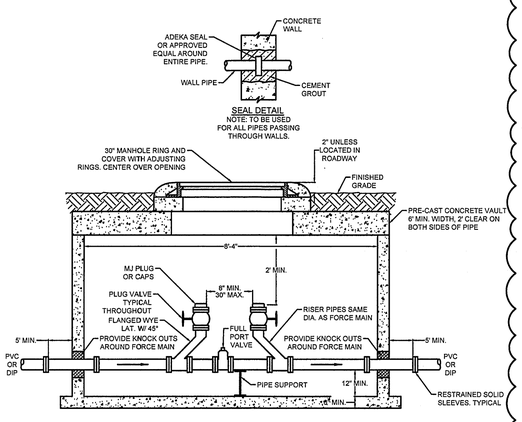
NOTES:

1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.

Colorado Springs Utilities — It's how we're all connected

CORE DRILLING INTO AN EXISTING MANHOLE

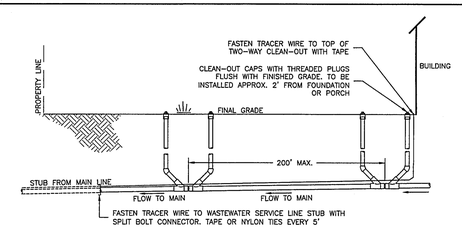
C3–3 DATED 5/2015



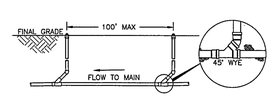
* NOTE: ALL PIPING 4" AND LARGER IN CLEAN-OUT CHAMBER, EXCEPT AS NOTED, TO BE DUCTILE IRON CONNECTED WITH FLANGED JOINTS AND STAINLESS STEEL BOLTS.

TWO-WAY FORCE MAIN CLEAN-OUT

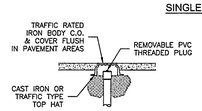
STA: 221+50, 234+50, & 247+50



TWO-WAY CLEAN-OUT INSTALLATION



SINGLE CLEAN-OUT INSTALLATION



CLEAN-OUT INSTALLATION IN PAVEMENT

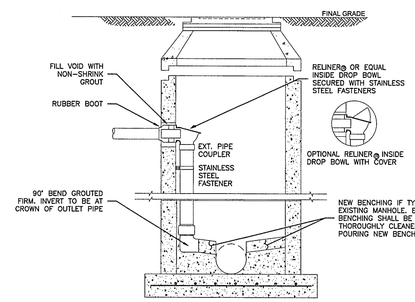
NOTES:

1. SINGLE CLEAN–OUT TO BE PLACED AT 100' INTERVALS, TWO–WAY CLEAN–OUTS AT 200' INTERVALS (100' EACH WAY CLEANING).
2. TRACER WIRE TO BE CONTINUOUSLY CONNECTED FROM THE MAIN LINE TO THE CLEAN–OUT LOCATED AT THE BUILDING.

Colorado Springs Utilities — It's how we're all connected

TYPICAL WASTEWATER SERVICE LINE WITH TRACER WIRE AND CLEAN–OUTS

D1–4 DATED 5/2015



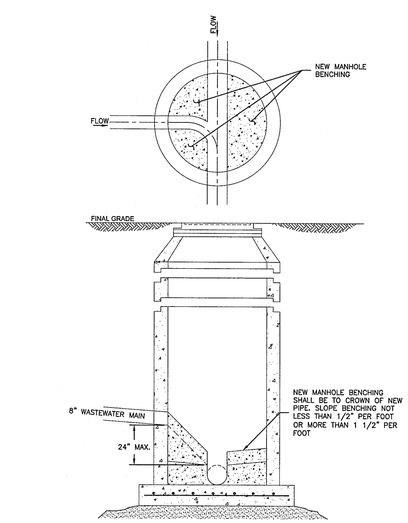
NOTES:

1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.
2. DROP MANHOLES ARE NOT ALLOWED ON 10" AND LARGER PIPELINES. DROP MANHOLES SHALL BE REVIEWED AND APPROVED ON A CASE BY CASE BASIS BY WASTEWATER PLANNING AND ENGINEERING STAFF.
3. ALL INTERIOR CONCRETE SURFACES SHALL BE EPOXY COATED.
4. MINIMUM SIZE FOR A DROP MANHOLE IS 5' DIAMETER MANHOLE.
5. MANHOLES WITH 8' OR LESS OF INTERNAL DROP SHALL HAVE ONE STRAP AT THE TOP AND ONE AT THE BOTTOM OF THE DROP SECTION.
6. 1/4" – 2" STRAPS TO BE ANCHORED WITH 1/2" GALVANIZED LUG BOLTS IN TO WALL (TYP).

Colorado Springs Utilities — It's how we're all connected

INTERNAL DROP MANHOLE WITH DROP GREATER THAN 24"

C3–6 DATED 5/2015



NOTES:

1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.

Colorado Springs Utilities — It's how we're all connected

DROP MANHOLE LESS THAN 24"

C3–7 DATED 5/2015

5

4

REVISIONS	
1	REVISED PER COMMENTS – 06/07/19
2	REVISED PER COMMENTS – 07/02/19

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DESIGNED BY	SAS
DATE	SAS
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BOOK AND PAGE	

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN CONSTRUCTION DETAILS

LAMP RYNEARSON - ENGINEERS

COLORADO REGISTERED PROFESSIONAL ENGINEER 34705

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34705

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Temporary and Permanent Seeding (TS/PS) EC-2

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

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

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

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

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

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

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

EC-2 Temporary and Permanent Seeding (TS/PS)

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

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

Temporary and Permanent Seeding (TS/PS) EC-2

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

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

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

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

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

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

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

EC-2 Temporary and Permanent Seeding (TS/PS)

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

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

Mulch

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

Maintenance and Removal

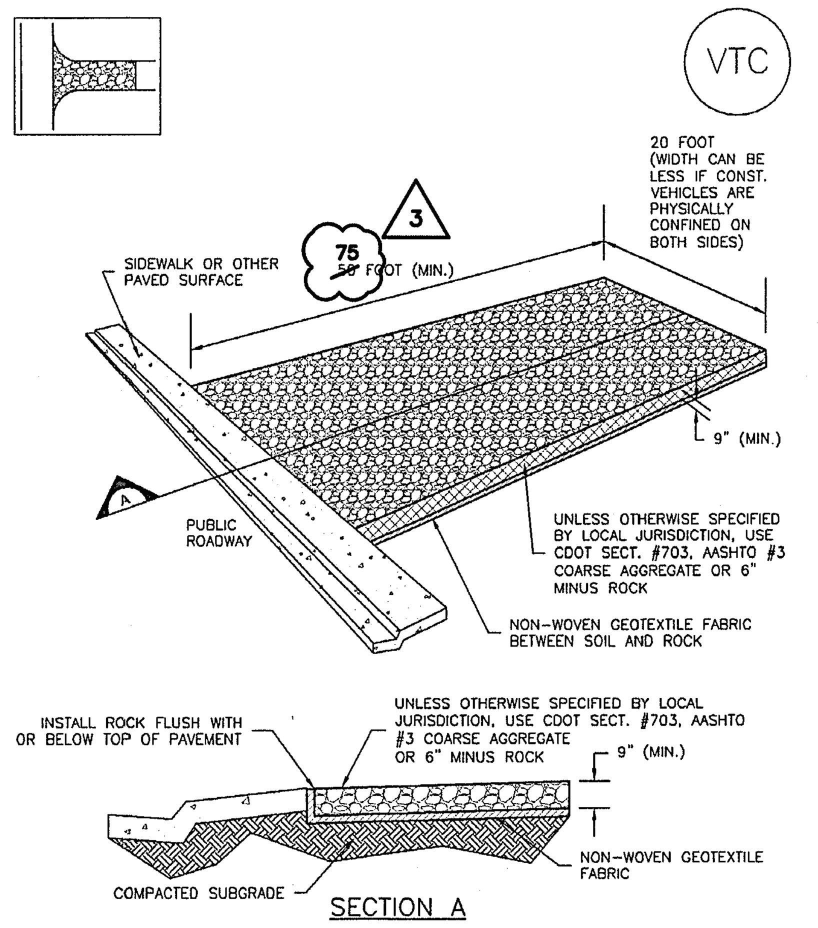
Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

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

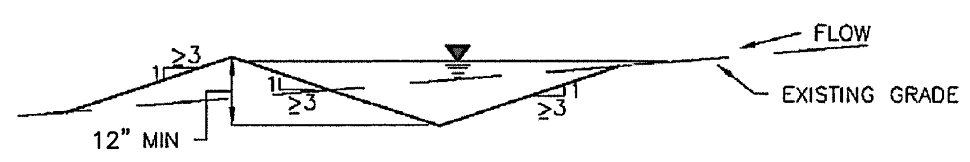
Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.

Vehicle Tracking Control (VTC) SM-4



VTC-1. AGGREGATE VEHICLE TRACKING CONTROL



EARTH DIKE AND DRAINAGE SWALE INSTALLATION NOTES

1. SEE SITE PLAN FOR:
   - LOCATION OF DIVERSION SWALE
   - TYPE OF SWALE (UNLINED, COMPACTED AND/OR LINED).
   - LENGTH OF EACH SWALE.
   - DEPTH, D, AND WIDTH, W DIMENSIONS.
   - FOR ECB/TRM LINED DITCH, SEE ECB DETAIL.
   - FOR RIPRAP LINED DITCH, SIZE OF RIPRAP, D50.
2. SEE DRAINAGE PLANS FOR DETAILS OF PERMANENT CONVEYANCE FACILITIES AND/OR DIVERSION SWALES EXCEEDING 2-YEAR FLOW RATE OR 10 CFS.
3. EARTH DIKES AND SWALES INDICATED ON SWMP PLAN SHALL BE INSTALLED PRIOR TO LAND-DISTURBING ACTIVITIES IN PROXIMITY.
4. EMBANKMENT IS TO BE COMPACTED TO 90% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D698.
5. SWALES ARE TO DRAIN TO A SEDIMENT CONTROL BMP.
6. FOR LINED DITCHES, INSTALLATION OF ECB/TRM SHALL CONFORM TO THE REQUIREMENTS OF THE ECB DETAIL.
7. WHEN CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION SWALE, INSTALL A TEMPORARY CULVERT WITH A MINIMUM DIAMETER OF 12 INCHES.

EARTH DIKE AND DRAINAGE SWALE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SWALES SHALL REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION; IF APPROVED BY LOCAL JURISDICTION, SWALES MAY BE LEFT IN PLACE.
5. WHEN A SWALE IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

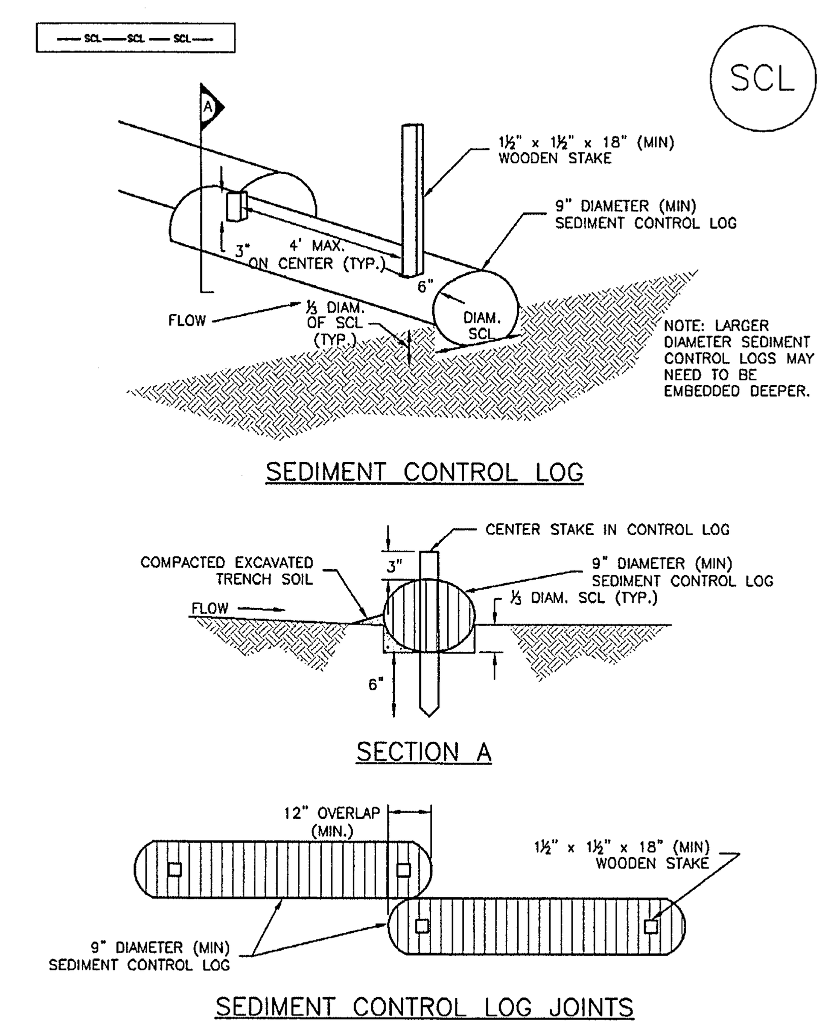
(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF COLORADO SPRINGS, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

GRADED BERM

N.T.S

Sediment Control Log (SCL) SC-2



SCL-1. SEDIMENT CONTROL LOG

Sediment Control Log (SCL) SC-2

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.
2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS OR HIGH VELOCITY DRAINAGE WAYS.
5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING
6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER.
7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

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

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

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FORCE MAIN
EROSION CONTROL DETAILS

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