

EPC STORMWATER REVIEW COMMENTS  
IN ORANGE BOXES WITH BLACK TEXT

# PLANS FOR PERMITTING

## TOWN OF RAMAH

### WASTEWATER SYSTEM IMPROVEMENTS

#### 0.015 MGD WASTEWATER TREATMENT PLANT

SECTION 1, TOWNSHIP 11S, RANGE 61W, 6TH PRINCIPAL MERIDIAN AND SECTION 1, TOWNSHIP 11S, RANGE 61W, 6TH P.M.

WWTP SITE APPROVAL NO. 06505

LIFT STATION SITE APPROVAL NO. 06507

**PREPARED FOR**

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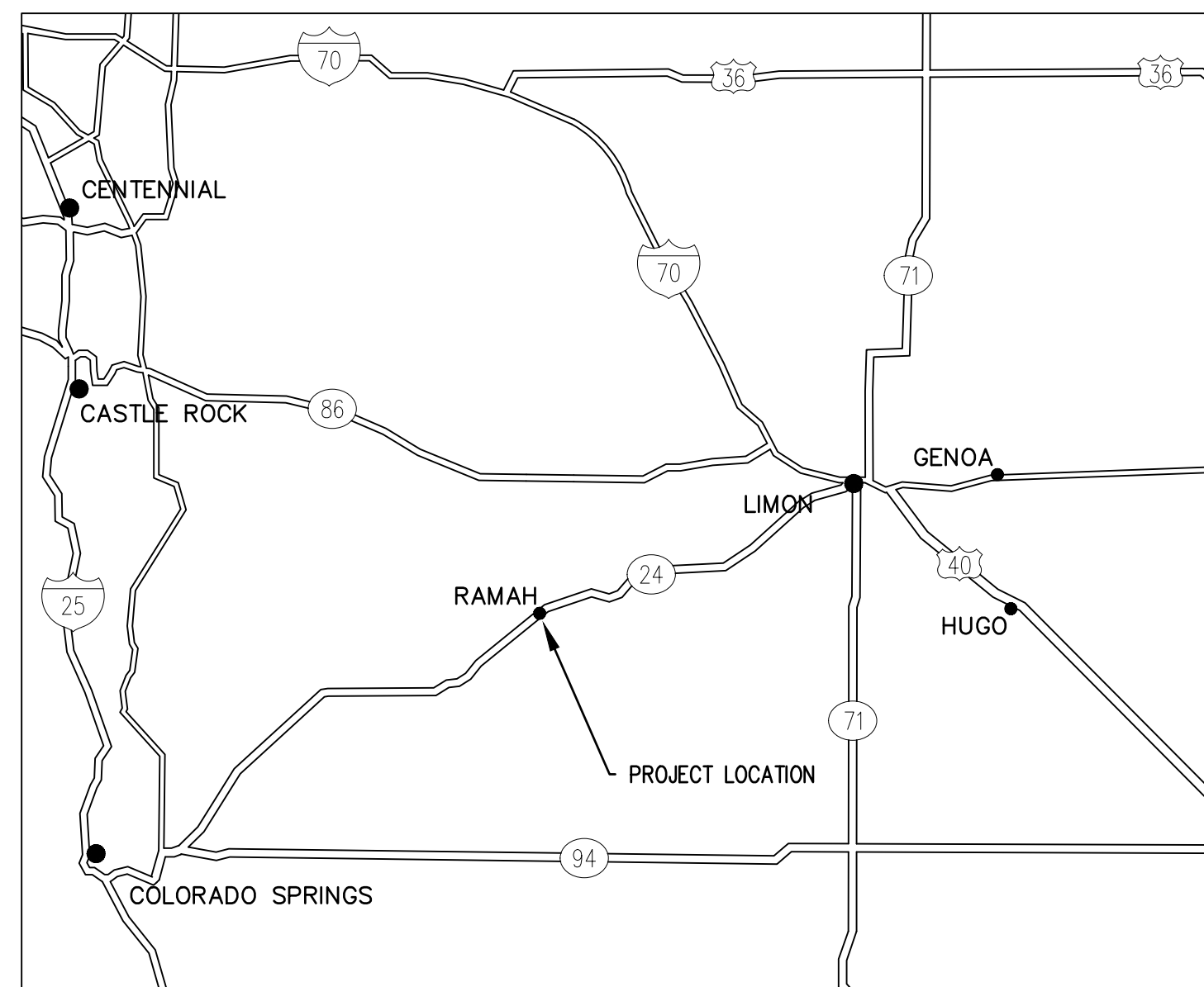
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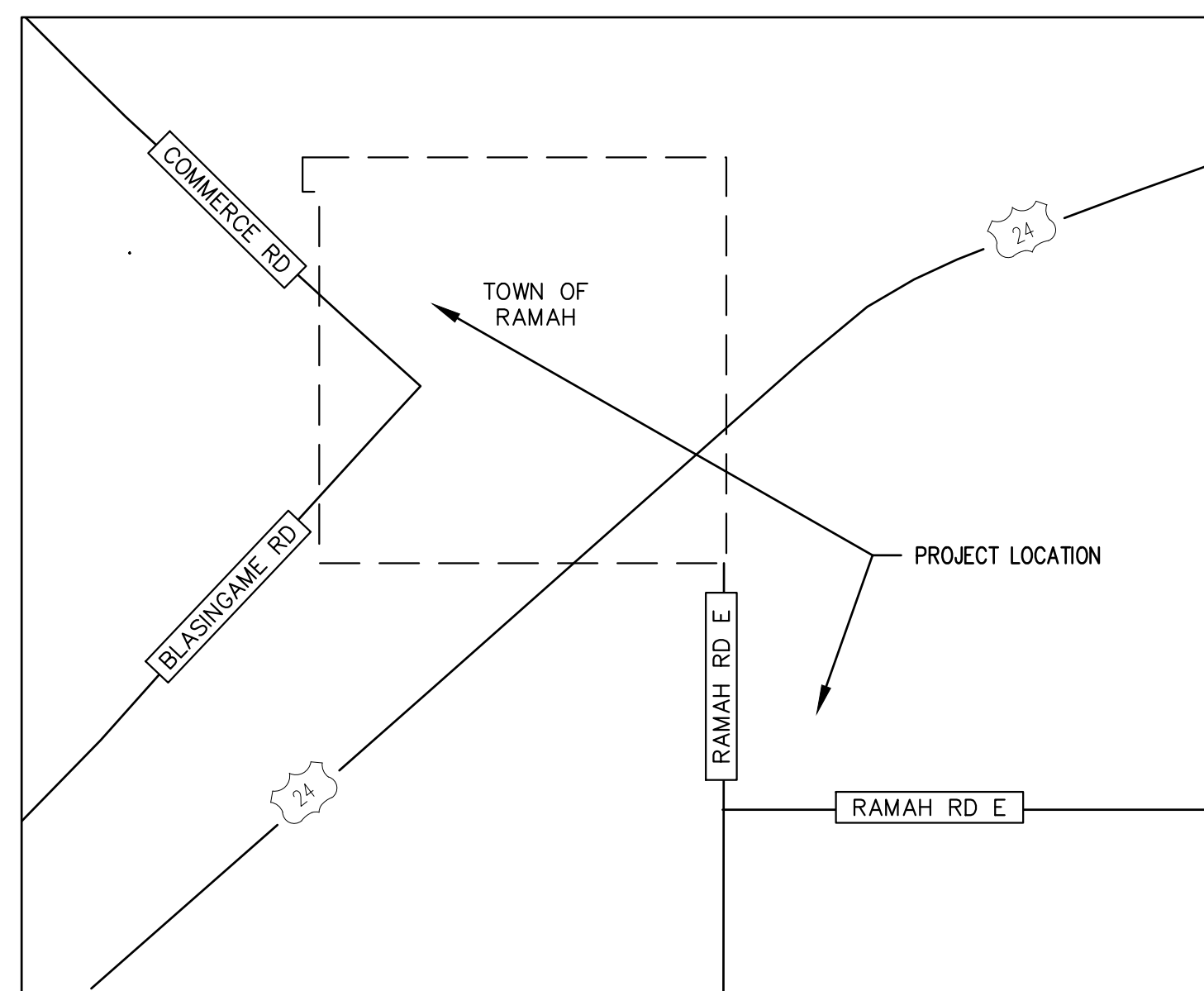
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PUBLIC WORKS DIRECTOR \_\_\_\_\_ DATE \_\_\_\_\_

THESE PLANS HAVE BEEN APPROVED BY THE TOWN OF RAMAH. A TOWN REPRESENTATIVE WILL OBSERVE THE WORK FOR COMPLIANCE WITH THE APPROVED PLANS, BUT DOES NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION OF THE FACILITIES IN ACCORDANCE WITH THE APPROVED PLANS AND WITH APPLICABLE RULES AND REGULATIONS. WORK NOT PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS WILL NOT BE ACCEPTED. ACCEPTANCE OF THE WORK DOES NOT RELIEVE THE CONTRACTOR OF THEIR OBLIGATIONS UNDER APPLICABLE WARRANTIES.



LOCATION MAP  
NTS



VICINITY MAP  
NTS

Please change title to "Construction Drawings"

Design Engineer's stamp is required on all engineering design sheets (for approval of final plans only).

Please include the construction drawing signature blocks (engineer, developer, and county). Refer to provided link for El Paso County Standard Signature Blocks: <https://planningdevelopment.elpasoco.com/wp-content/uploads/Engineering/EngineeringDocuments/Standard-Signature-Blocks-1.doc>

Please refer to comments provided on the Site Development Plan and update CDs accordingly.

Please include El Paso County Standard Construction Drawing Notes and GEC notes. See attached documents.

Please include the project benchmark (County requires NAVD88) and basis of bearing on the cover sheet. Refer to provided link for CD requirements: <https://epc-assets.elpasoco.com/wp-content/uploads/sites/12/Checklists/CDs.pdf>

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**ELECTRICAL**

**STRUCTURAL**



NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
COVER  
TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DATE  
OCTOBER 2022

JOB NUMBER  
0043.0001

SCALE  
NTS

EDITION  
PERMITTING

SHEET  
C1 OF C29

Please add "PCD File No. PPR2325"



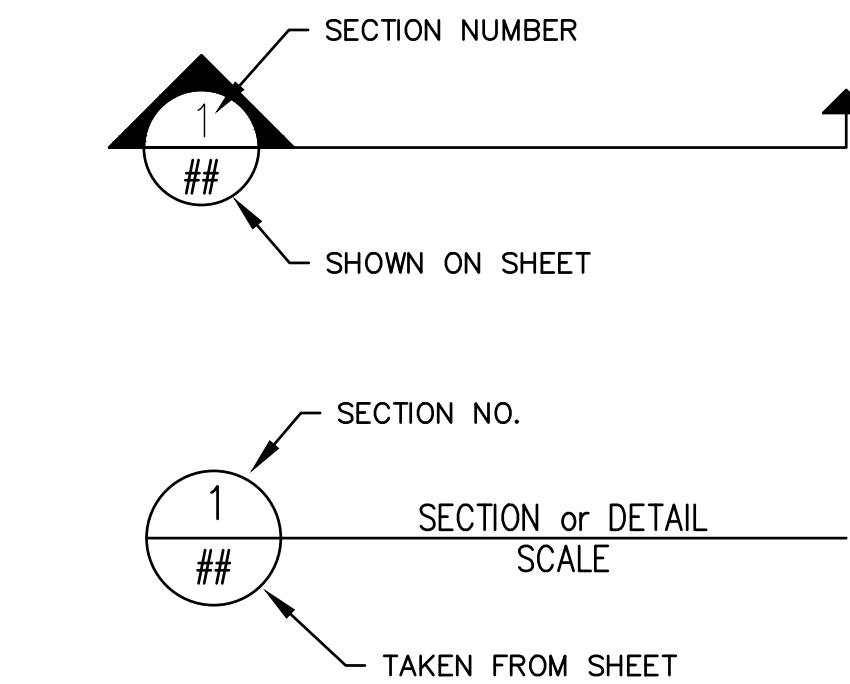
**GENERAL NOTES**

- ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- THE CONTRACTOR IS TO PROVIDE A DETAILED CONSTRUCTION SCHEDULE DELINEATING CONSTRUCTION MILESTONES AND THE NATURE OF WORK BEING PERFORMED. THE SCHEDULE SHALL DETAIL ACTIVITIES FROM THE START OF CONSTRUCTION THROUGH STARTUP. THIS SCHEDULE SHALL BE PROVIDED TO THE ENGINEER TWO (2) WEEKS PRIOR TO CONSTRUCTION AND UPDATED WEEKLY.
- THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO COMPLETE THE PROJECT IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DRAWINGS INCLUDING SUCH INCIDENTALS AS MAY BE NECESSARY TO MEET APPLICABLE AGENCY REQUIREMENTS AND PROVIDE A COMPLETED PROJECT.
- THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR AND EQUIPMENT AND PERFORM WORK SHOWN OR IMPLIED AS NECESSARY FOR THE COMPLETED LIFT STATION, PIPING, AND EVAPORATION PONDS, READY FOR USE.
- THE ENGINEER HAS ATTEMPTED TO LOCATE EXISTING SUBSURFACE UTILITIES. HOWEVER, SOME MAY EXIST THAT ARE NOT SHOWN. THE CONTRACTOR SHALL POTHOLE AS NECESSARY AND EXERCISE CARE IN HIS WORK SO AS TO AVOID DAMAGE TO ANY UTILITIES. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING, ALL DIMENSIONS, ELEVATIONS, AND LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO BEGINNING THE WORK.
- ANY SUBSURFACE CONDITIONS ENCOUNTERED THAT ARE UNUSUAL OR DIFFERENT THAN THOSE INDICATED BY THE ENGINEER SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
- CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL PERMITS REQUIRED OF THIS WORK AND SHALL FAITHFULLY ADHERE TO THE ALL PERMIT REQUIREMENTS.
- TEMPORARY AND PERMANENT EROSION CONTROL STRUCTURE METHODS SHALL BE IN ACCORDANCE WITH COUNTY REGULATIONS AND ARE TO BE UTILIZED DURING CONSTRUCTION.
- ALL EROSION CONTROL STRUCTURES SHOWN OR AS REQUIRED DURING CONSTRUCTION SHALL BE CONTINUOUSLY MAINTAINED THROUGH WARRANTY PERIOD AND UNTIL RE-VEGETATION TAKES HOLD.
- CONTRACTOR SHALL CLEAN UP, SEED, AND RESTORE DISTURBED AREAS IMMEDIATELY UPON COMPLETION OF THE WORK IN THE AFFECTED AREA.
- ALL EXISTING FACILITIES SHALL BE MAINTAINED IN-PLACE BY THE CONTRACTOR UNLESS OTHERWISE SHOWN OR DIRECTED. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO SUPPORT, MAINTAIN, OR OTHERWISE PROTECT EXISTING UTILITIES AND OTHER FACILITIES AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR TO LEAVE EXISTING FACILITIES IN AN EQUAL OR BETTER-THAN-ORIGINAL CONDITION.
- THE CONTRACTOR SHALL ERECT AND MAINTAIN BARRICADES, WARNING SIGNS, CONES IN ACCORDANCE WITH STATE, LOCAL AND FEDERAL GUIDELINES TO ENSURE THE SAFETY OF WORKERS AND THE PUBLIC. ALL BARRICADES, SIGNS SHALL BE IN PLACE PRIOR TO THE BEGINNING OF ANY CONSTRUCTION ACTIVITY.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL FOR A TRAFFIC CONTROL PLAN. THE TRAFFIC CONTROL PLAN MUST BE SUBMITTED AND APPROVED BY COUNTY AND THE OWNER'S REPRESENTATIVE.
- UNLESS OTHERWISE GRANTED PERMISSION BY THE OWNER IN WRITING, THE CONTRACTOR MUST ALLOW ACCESS TO ALL PROPERTIES FOR BOTH RESIDENTS AND EMERGENCY VEHICLES.
- THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE CLEANLINESS AND SAFETY OF ALL ROADWAYS ADJACENT TO THE PROJECT SITE. IF AT ANY TIME, THESE ROADWAYS ARE FOUND TO BE DANGEROUS OR NOT PASSABLE DUE TO DEBRIS OR MUD, THE COUNTY MAY SHUT THE PROJECT DOWN.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE ENGINEER OF ANY PROBLEM IN CONFORMING TO THE APPROVED PLANS FOR ANY ELEMENT OF THE PROPOSED IMPROVEMENTS PRIOR TO ITS CONSTRUCTION.
- BLUE STAKES - THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AND THE FACILITY OPERATOR FOR LOCATION OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, AS WELL AS ANY INDEPENDENT LOCATOR FOR PRIVATE LINES.
- THE CONTRACTOR SHALL NOTIFY THE INSPECTOR AT LEAST 48 HOURS PRIOR TO ANY DESIRED INSPECTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
- SURVEY MONUMENTS MUST BE SET WITHIN 60 DAYS OF COMPLETION OF THE PROJECT.
- SERVICE TRENCHES AND UTILITY MAIN TRENCHES SHALL BE COMPACTED THROUGHOUT THE DEPTH OF THE TRENCH PER THE SPECIFICATIONS.
- THE CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF APPROVED DRAWINGS ON THE CONSTRUCTION SITE AT ALL TIMES WHEREON HE WILL RECORD ANY APPROVED DEVIATIONS IN THE CONSTRUCTION FROM THE APPROVED DRAWINGS AS WELL AS THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES. THESE FIELD RECORD DRAWINGS SHALL BE KEPT UP TO DATE AT ALL TIMES AND SHALL BE AVAILABLE FOR INSPECTION BY THE OWNER'S REPRESENTATIVE UPON REQUEST.
- UPON COMPLETION OF CONSTRUCTION AND PRIOR TO INITIAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL SUBMIT A CLEAN SET OF FIELD RECORD DRAWINGS CONTAINING ALL AS-BUILT INFORMATION TO THE ENGINEER. ALL INFORMATION SHOWN ON THE CONTRACTOR'S FIELD RECORD DRAWINGS SHALL BE SUBJECT TO VERIFICATION BY THE ENGINEER. IF SIGNIFICANT ERRORS OR DEVIATIONS ARE NOTED BY THE ENGINEER, AN AS-BUILT SURVEY PREPARED AND STAMPED BY A REGISTERED PROFESSIONAL LAND SURVEYOR SHALL BE COMPLETED AT THE CONTRACTOR'S EXPENSE.

- ALL SUBMITTAL RECORDS ARE TO BE KEPT ONSITE AS WELL AS ALL DAILY INSPECTION REPORTS, INCLUDING, BUT NOT LIMITED TO, COMPACTION TESTS, CONCRETE TESTS, ETC.
- MEGALUGS AND CONCRETE THRUST BLOCKS WILL BE REQUIRED FOR ALL MAIN LINES.
- TRACER WIRE IS REQUIRED ON ALL PIPES. TRACER WIRE SHALL BE 10 GAUGE DIRECT BURY SOLID SINGLE STRAND COPPER WIRE WITH TEST STATIONS AS SHOWN ON THE PLANS.
- ALL BOLTS FOR ABOVE GRADE FITTINGS SHALL BE ASTM 316 STAINLESS STEEL.
- CONTRACTOR SHALL HAUL OFF AND DISPOSE OF ANY EXCESS SPOIL MATERIAL, ANY MISCELLANEOUS DEBRIS, AND ANY STRUCTURES, PIPING OR OTHER DEBRIS CALLED OUT TO BE DEMOLISHED AT HIS OWN EXPENSE. ALL MATERIAL MUST BE DISPOSED OF IN AN APPROVED OFFSITE LOCATION.
- PIPE, FITTINGS, AND ACCESSORIES SHALL BE HANDLED IN SUCH A MANNER THAT WILL ENSURE INSTALLATION IN SOUND, UNDAMAGED CONDITION. EQUIPMENT, TOOLS, AND METHODS USED IN HANDLING AND INSTALLING PIPE AND FITTINGS SHALL NOT DAMAGE THE PIPE AND FITTINGS.
- PRECAUTIONS SHALL BE TAKEN TO PREVENT FOREIGN MATERIAL FROM ENTERING THE PIPE DURING INSTALLATION. DEBRIS, TOOLS, CLOTHING, OR OTHER OBJECTS SHALL NOT BE PLACED IN OR ALLOWED TO ENTER THE PIPE. END OF LINES TO BE PLUGGED TO PREVENT DEBRIS OR ANIMALS FROM ENTERING PIPE.
- CUTTING SHALL BE DONE IN A NEAT MANNER, WITHOUT DAMAGE TO THE PIPE OR THE LINING. CUTS SHALL BE SMOOTH, STRAIGHT, AND AT RIGHT ANGLES TO THE PIPE AXIS. AFTER CUTTING, THE ENDS OF THE PIPE SHALL BE DRESSED WITH A FILE OR POWER GRINDER TO REMOVE ALL ROUGHNESS AND SHARP EDGES. THE CUT ENDS OF PUSH-ON JOINT PIPE SHALL BE SUITABLY BEVELED.
- NO DEFLECTION SHALL BE PERMITTED ON INTERIOR PIPE AND FITTINGS.
- DIAMETRICALLY OPPOSITE NUTS SHALL BE TIGHTENED PROGRESSIVELY AND EVENLY. FINAL TIGHTENING SHALL BE DONE WITH A TORQUE LIMITING WRENCH SET FOR THE TORQUE RECOMMENDED BY THE MANUFACTURER FOR ALL FITTINGS AND SERVICE SADDLES.
- BEFORE THE JOINT IS ASSEMBLED, THE FLANGE FACES SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATERIAL WITH A POWER WIRE BRUSH. THE GASKET SHALL BE CENTERED AND THE CONNECTING FLANGES DRAWN UP WATERTIGHT WITHOUT UNNECESSARY STRESSING OF THE FLANGES. ALL BOLTS SHALL BE TIGHTENED IN A PROGRESSIVE DIAMETRICALLY OPPOSITE SEQUENCE USING TORQUE WRENCHES AT SETTINGS RECOMMENDED BY THE MANUFACTURER. WHERE DISSIMILAR FLANGES ARE CONNECTED, AN INSULATING CONNECTION SHALL BE PROVIDED.
- ALL JOINTS SHALL BE WATERTIGHT AND FREE FROM LEAKS. EACH LEAK WHICH IS DISCOVERED WITHIN THE CORRECTION PERIOD STIPULATED IN THE GENERAL PROVISIONS SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR.
- ALL CONTRACTOR INSTALLED PIPE, FITTINGS, VALVES, PIPE JOINTS, AND OTHER MATERIALS WHICH ARE FOUND TO BE DEFECTIVE SHALL BE REMOVED AND REPLACED WITH NEW AND ACCEPTABLE MATERIALS, AND THE AFFECTED PORTION OF THE PIPING RETESTED BY AND AT THE EXPENSE OF THE CONTRACTOR.
- FLEXIBLE COUPLINGS AND FLANGE ADAPTERS SHALL BE DESIGNED TO RELIEVE STRESS IN PIPELINES DUE TO THERMAL EXPANSION/CONTRACTION, DIFFERENTIAL SETTLEMENT OR MISALIGNMENT AND MECHANICAL VIBRATION. FLEXIBLE COUPLINGS SHALL CONSIST OF A SLEEVE WHICH SHALL FIT OVER THE ENDS OF THE TWO PIPE SECTIONS TO BE JOINED. THE COUPLING SHALL FORM A WATER TIGHT SEAL BY COMPRESSING RESILIENT WEDGE-SHAPED GASKETS BETWEEN THE ENDS OF THE SLEEVE AND THE PIPE SECTIONS. THE GASKETS SHALL BE COMPRESSED BY TWO RETAINER RINGS BOLTED TO ONE ANOTHER ON THE OUTSIDE OF THE COUPLING SLEEVE. FLANGE ADAPTERS SHALL BE EQUIVALENT TO FLEXIBLE COUPLINGS EXCEPT THAT ONE RETAINER RING AND GASKET SHALL BE REPLACED WITH A FLANGED CONNECTION ON THE COUPLING SLEEVE.
- ALL VALVES SHALL HAVE THE MANUFACTURER AND SIZE OF THE VALVE VISIBLY CAST ON THE BODY OR ON A PLATE ATTACHED TO THE BODY OF THE VALVE. VALVES AND REQUIRED OPERATING APPURTENANCES SHALL BE THE PRODUCT OF THE SAME MANUFACTURER. VALVE SEALS SHALL BE ABLE TO PROVIDE TIGHT CLOSURE AND PREVENT METAL-TO-METAL CONTACT. VALVES SHALL OPEN RIGHT.
- VALVE COMPONENTS SHALL WITHSTAND THE ENVIRONMENTAL CONDITIONS AND PROVIDE CONTINUOUS TROUBLE-FREE SERVICE.
- ALL MATERIALS AND WORKMANSHIP FOR SANITARY SEWER CONSTRUCTION SHALL CONFORM TO THE LATEST LINCOLN COUNTY STANDARDS AND SANITARY SEWER CONSTRUCTION DETAILS AND TECHNICAL SPECIFICATIONS, CDPHE AND ALL OTHER APPLICABLE AGENCIES.
- ALL DIRECT BURY SEWER MAINS SHALL BE PVC, ASTM D-3034, SDR35 OR APPROVED EQUAL, UNLESS OTHERWISE NOTED.
- SEWER LINES SHALL BE 10 FEET FROM WATER LINES EXCEPT WHEN CROSSING EACH OTHER. FOR SEWER LINES THAT CROSS LESS THAN 1 1/2 FEET VERTICALLY FROM WATER LINES, THE CLOSEST SANITARY SEWER JOINT SHALL BE A MINIMUM OF 6 FEET FROM THE CROSSING.
- ALL MANHOLES SHALL BE WATER TIGHT PRECAST CONCRETE, A MINIMUM OF 48 INCH IN DIAMETER WITH CONCENTRIC CONE, 24 INCH CAST IRON RING (8" DEPTH) AND COVER, UNLESS OTHERWISE SPECIFIED. CONCRETE ADJUSTMENT RINGS SHALL BE USED FOR ADJUSTMENT TO MATCH FINAL SURFACE ELEVATIONS AND SET IN MASTIC TO OBTAIN A WATER TIGHT SEAL. CONCRETE ADJUSTMENT RINGS SHALL BE 4" MINIMUM IN DEPTH TO ELIMINATE MULTIPLE JOINTS.
- SEWER RIM ELEVATIONS AND INVERTS SHOWN ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS.
- THE CONTRACTOR TO VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL TIE IN POINTS AND INVERTS PRIOR TO CONSTRUCTION AND PROVIDE THE DATA TO THE TOWN ENGINEER.
- PIPE BEDDING SHALL BE CLASS "B" AND SHALL CONFORM TO ASTM C-33 OR

- D-448 GRADATION NO. 6 OR NO. 67. SQUEEGEE BEDDING IS PREFERRED. BEDDING DEPTH SHALL BE 6" UNDER AND AROUND THE SIDES OF THE PIPE AND 12" OVER THE PIPE. CONSOLIDATION IN PIPE ZONE SHALL BE BY HAND TAMPING.
- AT LEAST 5 DAYS PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING WILL BE HELD AT THE TOWN'S OFFICE AND ATTENDED BY THE CONTRACTOR AND REPRESENTATIVES OF THE OTHER APPROVING AGENCIES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE TOWN ENGINEER TO SCHEDULE THIS MEETING.
- THE CONTRACTOR WILL IDENTIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF APPROVED DRAWINGS ON THE CONSTRUCTION SITE AT ALL TIMES WHEREON HE WILL RECORD ANY APPROVED DEVIATIONS IN THE CONSTRUCTION FROM THE APPROVED DRAWINGS AS WELL AS THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES. THESE FIELD RECORD DRAWINGS SHALL BE KEPT UP TO DATE AT ALL TIMES AND SHALL BE AVAILABLE FOR INSPECTION BY THE OWNER'S REPRESENTATIVE UPON REQUEST.
- ALL MANHOLES SHALL HAVE SHAPED INVERTS.
- ALL SEWER LINES SHALL BE TESTED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS PRIOR TO INITIAL ACCEPTANCE OR ANY CONNECTION TO AN EXISTING SEWER LINE. THE MAXIMUM "BELLY" ON LOW SPOTS IN THE NEW SEWER MAIN SHALL NOT EXCEED 3/8 INCHES.
- ALUMINUM FOIL WARNING TAPE SHALL BE USED FOR ALL NEW DIRECT BURY SEWER MAINS. THE TAPE WILL BE INSTALLED 2' BELOW FINISHED GRADE. TAPE MUST BE GREEN IN COLOR.
- FERNCO STRONGBACK RC SERIES PIPE COUPLINGS WILL BE REQUIRED FOR PIPE AND LATERAL SERVICES.
- ALL BARREL SECTIONS OF MANHOLES SHALL BE GROUTED INSIDE AT JOINTS.
- SHOULD TRENCH DE-WATERING BECOME NECESSARY, THE CONTRACTOR WILL OBTAIN ALL REQUIRED PERMITS AND SUPPLY THE PUMPS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
- THE OPENING OR CHANNEL IN THE MANHOLE MUST BE NO LESS THAN THE DIAMETER OF THE PIPE, AND NO LESS THAN THE MANHOLE DIAMETER MINUS 4 INCHES IN LENGTH TO ACCOMMODATE EQUIPMENT NECESSARY TO MAINTAIN THE SEWER LINE.
- ALL MANHOLE AND SANITARY SEWER MAIN TESTING SHALL BE WITNESSED BY A REPRESENTATIVE OF THE TOWN. A MINIMUM OF 24 HOURS ADVANCED NOTICE IS REQUIRED PRIOR TO TESTING.
- ALL MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12-INCH WIDE CONSEAL CS 212 OR APPROVED EQUIVALENT.
- MANHOLE/VAULT BARREL SECTIONS WILL REQUIRE AN EXTERIOR COATING OF TNEC SERIES 46-46S OR APPROVED EQUIVALENT.
- ALL PRECAST CONCRETE SHALL BE 4,000 PSI MINIMUM STRENGTH.
- ALL EXISTING PIPING INTO EXISTING MANHOLES MUST BE RECONNECTED IN NEW MANHOLES.
- WHERE FILL IS REQUIRED BY THE DRAWINGS, THE EXISTING VEGETATION AND TOPSOIL SHALL BE FULLY REMOVED AND THE SURFACE SCARIFIED PER THE SPECIFICATIONS TO PROVIDE FOR ADEQUATE BONDING OF THE FILL.
- FILL SHALL BE PLACED TO MATCH THE CONTOURS SHOWN ON THE DRAWINGS. ALL BERM CONSTRUCTION AND OVERLOT GRADING SHALL BE UNDERTAKEN SUCH THAT THE CORNERS ARE ROUNDED AND BLENDED INTO THE EXISTING TOPOGRAPHY. NEW ELEVATION CONTOURS INDICATE FINAL SURFACE ELEVATIONS.
- GRADING OF THE WASTEWATER TREATMENT PLANT SITE TOGETHER WITH THE GRADING AROUND MANHOLES AND STRUCTURES THAT HAVE THEIR RINGS AND COVERS INSTALLED ABOVE GRADE SHALL BE FINALIZED SUCH THAT ALL AREAS DRAIN FREELY AWAY FROM THE TREATMENT CELLS AND STRUCTURES. COORDINATE WITH THE ENGINEER AND OWNER TO ENSURE THAT THIS CONDITION IS MET.
- ALL EQUIPMENT AND MATERIAL IS TO BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS. ALL EQUIPMENT STARTUP SHALL BE PROVIDED BY A MANUFACTURER APPROVED FIELD REPRESENTATIVE. MANUFACTURER FIELD TRAINING FOR THE OPERATIONS STAFF SHALL ALSO BE PROVIDED AT EITHER THE TIME OF STARTUP OR AT ANOTHER TIME AS APPROVED BY THE OPERATOR.
- THE CONTRACTOR SHALL FURNISH AND INSTALL 12" X 24" SIGNS AS DIRECTED BY THE ENGINEER ON THE PERIMETER FENCING. THE GENERAL SPACING IS 200-FT CENTERS. THE SIGNS SHALL BE MADE FROM 20 GAUGE ALUMINUM SHEET METAL WITH A PAINTED WHITE BACKGROUND AND RED LETTERING. THE SIGNS SHALL READ AS FOLLOWS:  
  
**ANGER -- KEEP OUT  
WASTEWATER TREATMENT FACILITY**
- THE BASE BID ON THE PROJECT INCLUDES A BID ITEM CALLING FOR FURNISHING AND INSTALLING 6-INCHES OF SAND OVER THE BOTTOM OF THE NEW CELLS. THE SAND IS BEING INSTALLED TO MAINTAIN THE INTEGRITY OF THE LINER WHEN MINIMAL TO NO WATER IS CONTAINED WITHIN THE CELL. THE CONTRACTOR WILL NEED TO USE **EXTREME CARE** IN THE PLACEMENT OF THE MATERIAL TO MAINTAIN THE INTEGRITY OF THE NEW LINER. ANY TEARS OR DAMAGE TO THE LINER SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

CIVIL/ARCHITECTURAL/PROCESS SYMBOLS LIBRARY



ABBREVIATIONS

ARVB	AIR RELIEF VACU BREAKER VALVE	MH	MANHOLE
BEG	BELOW EXISTING GRADE	N	NORTH
BFV	BUTTERFLY VALVE	NE	NORTHEAST
CL	CENTERLINE	NW	NORTHWEST
CMP	CORRUGATED METAL PIPE	OH	OVERHEAD
DIA. OR Ø	DIAMETER	PVC	POLYVINYL CHLORIDE
E	EAST	RAD OR R	RADIUS
EA	EACH	RPP	REINFORCED POLYPROPYLENE
ELEC	ELECTRICAL LINE	S	SOUTH
EOA	EDGE OF ASPHALT	SE	SOUTHEAST
EXIST. OR EX.	EXISTING	SW	SOUTHWEST
INV	INVERT	T.O.P.	TOP OF PIPE
L.P.	LOW POINT	UON	UNLESS OTHERWISE NOTED
FM	FORCE MAIN		

BY	XXX
DATE	07/17
REVISIONS	
DESCRIPTION	
NO.	1
DESCRIPTION NO. 1	

WASTEWATER TREATMENT PLANT
GENERAL NOTES
TOWN OF RAMAH 113 S. COMMERCIAL STREET RAMAH, CO 80832

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC
DATE OCTOBER 2022
JOB NUMBER 0043.0001
SCALE NTS
EDITION PERMITTING
SHEET C2 OF C29

**ELEMENT ENGINEERING LLC**  
 12687 W. CEDAR DRIVE, SUITE 300  
 LAKEWOOD, CO 80226  
 720.749.4165  
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**SEWER BYPASS PUMPING**

1. IF SEWAGE BYPASS PUMPING IS NECESSARY, THE CONTRACTOR WILL SUPPLY AND MONITOR THE PUMP DURING THE ENTIRE PUMPING PERIOD. A BACK-UP PUMP WILL BE ONSITE FOR USE IF NECESSARY. BYPASS HOSE SHALL BE PROTECTED FROM TRAFFIC DAMAGE USING APPROVED APPARATUS. FOR ALL SEWAGE BYPASS PUMPING, THE CONTRACTOR WILL HAVE CONTINUOUS ON SITE MONITORING OF PUMPING OPERATIONS.
2. FURNISH ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS REQUIRED TO MAINTAIN CONTINUOUS AND RELIABLE WASTEWATER SERVICE IN ALL WASTEWATER LINES DURING CONSTRUCTION.
3. DURING VARIOUS PHASES OF THE WORK, IT WILL BE NECESSARY TO CONSTRUCT AND MAINTAIN TEMPORARY BYPASS SEWERS TO MAINTAIN CONTINUOUS AND RELIABLE WASTEWATER FLOW IN ALL PIPES, INCLUDING INDIVIDUAL SERVICE CONNECTIONS. VARIOUS PHASES OF THE WORK THAT SHALL REQUIRE THE IMPLEMENTATION OF TEMPORARY BYPASS SEWERS INCLUDING, BUT ARE NOT LIMITED TO, SEWER MAIN AND MANHOLE REPLACEMENT, TRENCHLESS REHABILITATION OF EXISTING SEWERS, AND PIPELINE INSPECTION.
4. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY BYPASS SEWERS AND BE RESPONSIBLE FOR ALL BYPASS PUMPING OF SEWAGE THAT MAY BE REQUIRED TO PREVENT BACKING UP OF SEWAGE AND ALLOW APPROPRIATE CONDITIONS FOR PROPER INSPECTION, REHABILITATION, REPLACEMENT OR RECONNECTIONS TO EXISTING SEWERS. THE CONTRACTOR SHALL IMMEDIATELY REMOVE AND DISPOSE OF ALL OFFENSIVE MATTER SPILLED DURING THE BYPASS PUMPING AT HIS OWN EXPENSE. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PAYING ANY FINES IMPOSED AS A RESULT OF SPILLS OR OVERFLOWS THAT OCCUR AS A RESULT OF THE BYPASS PUMPING OPERATIONS.
5. CONTRACTOR SHALL PROVIDE A REDUNDANT BYPASS PUMP, INTAKE AND DISCHARGE CONDUIT, AND OTHER EQUIPMENT NECESSARY TO PROVIDE CONTINUOUS WASTEWATER FLOW AND PREVENT THE BACKING UP OF SEWAGE IN THE CASE OF EMERGENCIES AT ALL TIMES.
6. WHERE NO ALTERNATE SANITARY SEWER ROUTE IS AVAILABLE OR WHEN TWENTY-FOUR HOURS OF STORAGE IS NOT FEASIBLE, REDUNDANT BYPASS PUMPING SHALL BE INSTALLED.
7. PRIMARY BYPASS PUMPS SHALL BE CRITICALLY SILENCED WHEN USED IN RESIDENTIAL SETTINGS OR AREAS WHERE EXCESSIVE NOISE LEVELS WOULD CREATE A DISTURBANCE. REDUNDANT BYPASS PUMPING DOES NOT HAVE TO BE CRITICALLY SILENCED.
8. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A SCHEDULE TO COMPLETE THE WORK. IT WILL INCLUDE THE SEQUENCING AND COORDINATION OF CONNECTIONS TO EXISTING SEWERS, PIPELINE INSPECTION, TRENCHLESS REHABILITATION AND TESTING OF EXISTING SEWERS, AND THE HANDLING OF WASTEWATER FLOW DURING CONSTRUCTION. THE SCHEDULE OF WORK SHALL ALSO BE REVIEWED AND APPROVED BY THE OPERATOR IN RESPONSIBLE CHARGE (ORC).
9. THE DESIGN, INSTALLATION, AND OPERATION OF THE TEMPORARY PUMPING SYSTEM SHALL BE THE CONTRACTOR'S RESPONSIBILITY. THE CONTRACTOR SHALL EITHER DEMONSTRATE, OR EMPLOY THE SERVICES OF A SUBCONTRACTOR WHO CAN DEMONSTRATE, TO THE ENGINEER AND ORC THAT HE SPECIALIZES IN THE DESIGN AND OPERATION OF TEMPORARY BYPASS PUMPING SYSTEMS.
10. THE CONTRACTOR SHALL PREPARE A SPECIFIC, DETAILED DESCRIPTION OF THE PROPOSED PUMPING SYSTEM (BYPASS PUMPING PLAN). THE BYPASS PUMPING PLAN SHALL BE SUBMITTED AND APPROVED PRIOR TO THE MOBILIZATION OF ANY OF THE EQUIPMENT INCLUDED IN THE BYPASS PUMPING PLAN. THE BYPASS PUMPING PLAN SHALL OUTLINE ALL PROVISIONS AND PRECAUTIONS TO BE TAKEN BY THE CONTRACTOR REGARDING HANDLING OF EXISTING WASTEWATER FLOWS. THIS BYPASS PUMPING PLAN MUST BE SPECIFIC AND COMPLETE, INCLUDING SUCH ITEMS AS SCHEDULES, LOCATIONS, CAPACITIES OF EQUIPMENT, MATERIALS, AND ALL OTHER INCIDENTAL ITEMS NECESSARY AND/OR REQUIRED TO ENSURE PROPER PROTECTION OF THE FACILITIES, INCLUDING PROTECTION OF THE ACCESS AND BYPASS PUMPING LOCATIONS FOR DAMAGE DUE TO THE DISCHARGE FLOWS, AND COMPLIANCE WITH THE REQUIREMENTS AND PERMIT CONDITIONS SPECIFIED HEREIN. NO CONSTRUCTION SHALL BEGIN UNTIL ALL PROVISIONS AND REQUIREMENTS HAVE BEEN REVIEWED AND ACCEPTED BY THE ENGINEER AND ORC. THE PLAN SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING DETAILS:
  - A. SEWER PLUGGING METHOD AND TYPES OF PLUGS.
  - B. SIZE OF SUCTION AND DISCHARGE HOSE OR PIPING.
  - C. BYPASS PUMP SIZES (ONE STANDBY PUMP WILL BE REQUIRED AT EACH LOCATION IN CASE OF A PUMP FAILURE), CAPACITIES, AND NUMBER OF EACH SIZE TO BE PROVIDED ON-SITE INCLUDING ALL PRIMARY, SECONDARY, AND SPARE PUMPING UNITS.
  - D. METHOD OF PROTECTING DISCHARGE MANHOLES OR STRUCTURES FROM EROSION AND DAMAGE.
  - E. SECTIONS SHOWING SUCTION AND DISCHARGE PIPE DEPTH, EMBEDMENT, SELECT FILL AND SPECIAL BACKFILL, IF COVER IS NECESSARY.
  - F. METHOD OF NOISE CONTROL FOR EACH PUMP AND ANY ADDITIONAL EQUIPMENT THAT IS INCLUDED IN THE BYPASS PUMPING PLAN.
  - G. SCHEDULE FOR INSTALLATION OF AND MAINTENANCE OF BYPASS PUMPING LINES.
  - H. PLAN INDICATING LOCATION OF BYPASS PUMPING PIPE LOCATIONS.
  - I. CONTRACTORS PLAN FOR PROVIDING CONTINUOUS MONITORING OF THE BYPASS PUMPING OPERATION AS WELL AS THE MONITORING PERSONS' QUALIFICATIONS.

11. THE CONTRACTOR SHALL SUPPLY PUMPS, CONDUITS, POWER, AND OTHER EQUIPMENT TO DIVERT THE FLOW OF SEWAGE AROUND THE SECTION IN WHICH WORK IS TO BE PERFORMED. THE BYPASS SYSTEM SHALL BE OF SUFFICIENT CAPACITY TO HANDLE THE WASTEWATER FLOWS. IT IS THE INTENT OF THESE SPECIFICATIONS TO REQUIRE THE CONTRACTOR TO ESTABLISH ADEQUATE BYPASS PUMPING AS REQUIRED REGARDLESS OF THE FLOW CONDITION.
12. THE CONTRACTOR SHALL PERFORM LEAKAGE AND PRESSURE TESTS OF THE BYPASS PUMPING DISCHARGE PIPING USING CLEAN WATER PRIOR TO THE ACTUAL OPERATION. THE PRESSURE AND LEAKAGE TEST SHALL BE CONDUCTED AT ONE-AND-A-HALF TIMES THE MAXIMUM PRESSURE THE SYSTEM WILL EXPERIENCE BASED ON THE APPROVED BYPASS PUMPING PLAN FOR A PERIOD OF TWO HOURS. NO LEAKAGE IS PERMITTED DURING THIS TEST. THE ENGINEER WILL BE GIVEN 24 HOURS NOTICE PRIOR TO TESTING. IN ADDITION, THE CONTRACTOR SHALL DEMONSTRATE THAT THE PUMPING SYSTEM IS IN GOOD WORKING ORDER AND IS SUFFICIENTLY SIZED TO SUCCESSFULLY HANDLE FLOWS BY PERFORMING A TEST RUN FOR A PERIOD OF 24 HOURS PRIOR TO BEGINNING THE WORK.
13. THE CONTRACTOR SHALL BE REQUIRED TO REPAIR, AT HIS OWN EXPENSE, ANY DAMAGE TO PUBLIC OR PRIVATE PROPERTY CAUSED BY HIS OPERATIONS.
14. SHOULD DAMAGE OF ANY KIND OCCUR TO THE EXISTING SEWERS, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE MAKE REPAIRS TO THE SATISFACTION OF THE ENGINEER AND THE ORC.
15. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE AUTHORITY SHOULD A SANITARY SEWER OVERFLOW (SSO) OCCUR AND TAKE THE NECESSARY ACTION TO CLEAN UP AND DISINFECT THE SPILLAGE TO THE SATISFACTION OF THE AUTHORITY AND/OR OTHER GOVERNMENTAL AGENCY. IF SEWAGE IS SPILLED ONTO PUBLIC OR PRIVATE PROPERTY, THE CONTRACTOR SHALL WASH DOWN, CLEAN UP, AND DISINFECT THE SPILLAGE TO THE SATISFACTION OF THE PROPERTY OWNER, AUTHORITY, AND/OR OTHER GOVERNMENTAL AGENCY.
16. THE CONTRACTOR SHALL NOT BE PERMITTED TO OVERFLOW, BYPASS, PUMP OR BY ANY OTHER MEANS CONVEY DRAINAGE TO ANY LAND, STREET, STORM DRAIN OR WATER COURSE.
17. THE CONTRACTOR SHALL CEASE BYPASS PUMPING OPERATIONS AND RETURN FLOWS TO THE NEW AND/OR EXISTING SEWER WHEN DIRECTED BY THE OWNER. DURING BYPASSING, NO WASTEWATER SHALL BE LEAKED, DUMPED, OR SPILLED IN OR ONTO ANY AREA OUTSIDE THE EXISTING WASTEWATER SYSTEM. WHEN BYPASS OPERATIONS ARE COMPLETE, ALL BYPASS PIPING SHALL BE FLUSHED WITH FRESH WATER AND DRAINED INTO THE WASTEWATER SYSTEM PRIOR TO DISASSEMBLY.
18. CONTRACTOR MUST TAKE CARE TO PREVENT DAMAGE TO EXISTING STRUCTURES. DISCHARGE PIPING TO GRAVITY SEWER SYSTEMS SHALL BE DESIGNED IN SUCH A MANNER AS TO PREVENT DISCHARGE FROM CONTACTING MANHOLE WALLS OR BENCHING AND FULL DISCHARGE SHALL GO INTO DOWNSTREAM PIPE WITH AS MINIMAL TURBULENCE AS POSSIBLE. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO MANHOLES. IT MAY BE NECESSARY TO REMOVE THE MANHOLE CONE TO PROVIDE SUFFICIENT SPACE FOR THE BYPASS PIPING. IF THIS IS REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING MANHOLE COMPONENTS.
19. THE 24-HOUR MONITORING PERSON SHALL BE PROPERLY TRAINED, EXPERIENCED, AND MECHANICALLY QUALIFIED SUCH THAT THEY CAN QUICKLY AND EFFECTIVELY ADDRESS ANY POTENTIAL EMERGENCY AND NON-EMERGENCY SITUATIONS ASSOCIATED WITH THE PUMPS AND BYPASS PUMPING SYSTEM THAT MUST REMAIN IN OPERATION FOR AN EXTENDED PERIOD.

**BACKFILLING GENERAL**

- A. ALL TRENCHES SHALL BE BACKFILLED AFTER PIPES, FITTINGS AND APPURTENANCES HAVE BEEN INSTALLED, INSPECTED AND APPROVED BY THE TOWN ENGINEER.
- B. WHENEVER A COMPACTION REQUIREMENT VALUE IS SPECIFIED HEREIN, THE OPTIMUM MOISTURE CONTENT AND STANDARD PROCTOR DENSITY SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T-99 FOR NINETY-FIVE PERCENT (95%).

**DENSITY REQUIREMENTS IN TRENCH**

THE CONTRACTOR SHALL OBTAIN A STANDARD PROCTOR DENSITY OF NINETY-FIVE (95%) STANDARD PROCTOR FOR THE TOTAL DEPTH OF ALL TRENCHES IN OPEN FIELDS AND IN DEDICATED ROWS. BACKFILLING SHALL BE DONE WITH GOOD SOUND EARTH, SAND OR GRAVEL, AND NO BITUMINOUS PAVEMENT, CONCRETE, ROCK OR OTHER LUMPY MATERIAL SHALL BE USED IN THE BACKFILL UNLESS THESE MATERIALS ARE SCATTERED AND DO NOT EXCEED SIX INCHES (6") IN ANY DIMENSION AND ARE NOT PLACED WITHIN ONE FOOT OF THE 2-1/2' LIMIT. MATERIAL OF PERISHABLE, SPONGY OR OTHERWISE IMPROPER NATURE SHALL NOT BE USED IN BACKFILLING AND NO MATERIAL GREATER THAN FOUR INCHES (4") IN ANY DIMENSION SHALL BE PLACED WITHIN ONE FOOT (1') OF ANY PIPE, MANHOLE OR STRUCTURE. BACKFILLING SHALL BE ACCOMPLISHED IN THE ZONE IN LAYERS NOT TO EXCEED TWO FEET (2') OR AS RECOMMENDED BY TESTER. ALL BACKFILL MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE TOWN ENGINEER.

**COMPACTED FILL**

COMPACTION SHALL BE DONE BY USE OF VIBRATORY EQUIPMENT, TAMPING ROLLERS, PNEUMATIC TIRE ROLLERS OR OTHER MECHANICAL TAMPERS OF THE TYPE AND SIZE APPROVED BY THE TOWN ENGINEER. HAND TAMPERS SHALL BE USED AROUND ALL MANHOLES, VALVE BOXES, AND ANY SURFACE STRUCTURE. THE BACKFILL SHALL BE PLACED IN HORIZONTAL LAYERS OF SUCH DEPTHS AS ARE CONSIDERED PROPER FOR THE TYPE OF COMPACTING EQUIPMENT BEING USED IN RELATION TO THE BACKFILL MATERIAL BEING PLACED. EACH LAYER SHALL BE EVENLY SPREAD, PROPERLY MOISTENED AND COMPACTED. ANY DAMAGE TO THE PIPE AS A RESULT OF CONTRACTOR'S OPERATION SHALL BE REPAIRED AND/OR REPLACED.

**COMPACTION TESTS**

COMPACTION TESTS WILL BE TAKEN BY AN APPROVED TESTING LABORATORY AT LOCATIONS DESIGNATED BY THE TOWN ENGINEER. ALL EXPENSES INVOLVED IN THESE TESTS WILL BE BORNE BY THE CONTRACTOR. RESULTS OF THE TESTS WILL BE MADE AVAILABLE TO THE TOWN ENGINEER IMMEDIATELY AND COPIES OF TEST RESULTS WILL BE SUPPLIED TO THE TOWN ENGINEER ONCE PER WEEK, A FINAL TYPED BOUND COPY OF FINAL TEST RESULTS MUST BE SUBMITTED TO THE TOWN ENGINEER AT THE END OF THE PROJECT. IN ALL CASES WHERE THE TESTS INDICATE COMPACTION LESS THAN THAT REQUIRED IN THESE STANDARDS, ADDITIONAL COMPACTION AND TESTS WILL BE REQUIRED UNTIL THESE SPECIFICATIONS ARE MET. PROBATIONARY ACCEPTANCE OF THE LINES BY THE TOWN WILL BE CONTINGENT UPON SATISFACTORY COMPACTION RESULTS. NO HYDROSTATIC TESTING OF THE WATER MAIN WILL BE ALLOWED UNTIL SATISFACTORY COMPACTION IS OBTAINED. FREQUENCY OF TESTING WILL BE AS FOLLOWS:

- A. ONE (1) TEST AT EVERY ABOVE GROUND APPURTENANCE (I.E. VALVE BOX, MANHOLE) AT TWO-FOOT (2.0') VERTICAL INCREMENTS.
- B. ONE (1) TEST EVERY FOUR HUNDRED (400) LF OF MAINLINE FORCEMAIN TRENCH AT TWO-FOOT (2.0') VERTICAL INCREMENTS BEGINNING TWO FEET (2') ABOVE PIPE TO FINAL GRADE AND ONE TEST AT FINAL GRADE.
- C. SEE TECHNICAL SECTION 02200 FOR EMBANKMENT TESTING REQUIREMENTS.



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NO.	REVISIONS DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT	GENERAL NOTES
TOWN OF RAMAHH 113 S. COMMERCIAL STREET RAMAHH, CO 80832	

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DATE  
OCTOBER 2022

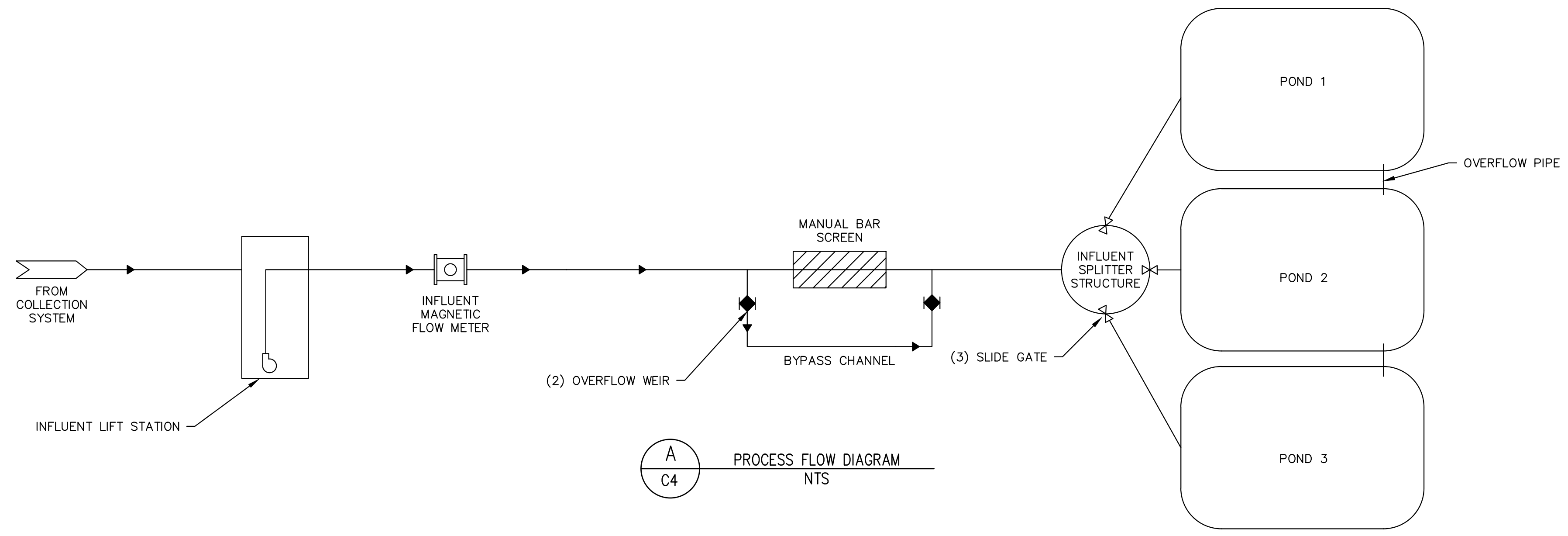
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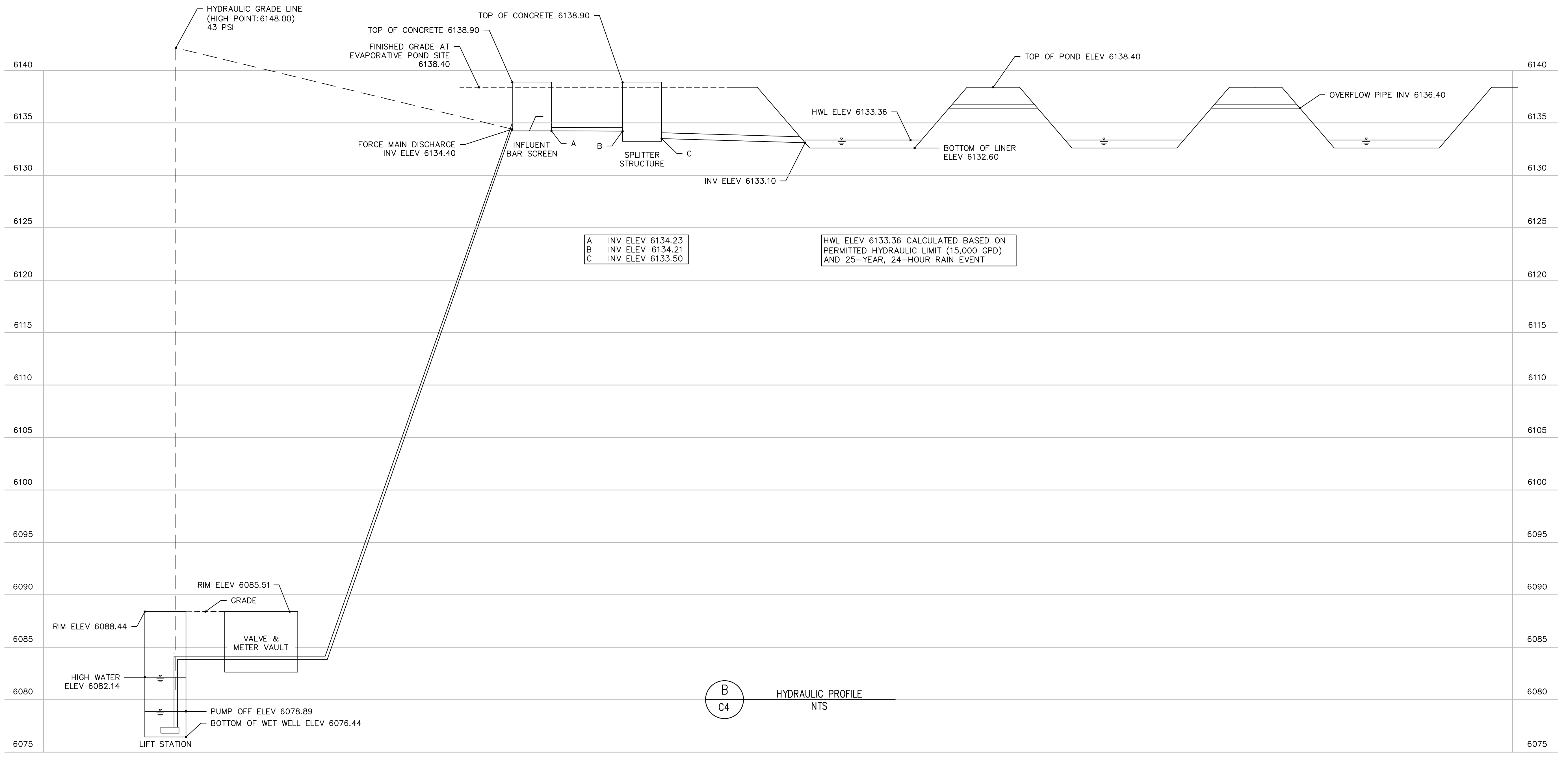
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PERMITTING

SHEET  
C3 OF C29





DESIGN SUMMARY		
PERMITTED DESIGN FLOW	0.015	MGD
PERMITTED ORGANIC LOADING	32	LBS/DAY
EXISTING AVERAGE DAY FLOW (APPROX)	0.011	MGD
PEAK DAY FLOW (APPROX)	0.022	MGD
PEAK HOUR FLOW	0.060	MGD
LIFT STATION PERMITTED FLOW	42	GPM
TOTAL BOTTOM OF POND AREA	310,000	SF
TOTAL TOP OF POND AREA	372,049	SF



NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
 PROCESS FLOW DIAGRAM  
 & HYDRAULIC PROFILE  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

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 ELEMENT ENGINEERING, LLC

DATE  
 OCTOBER 2022

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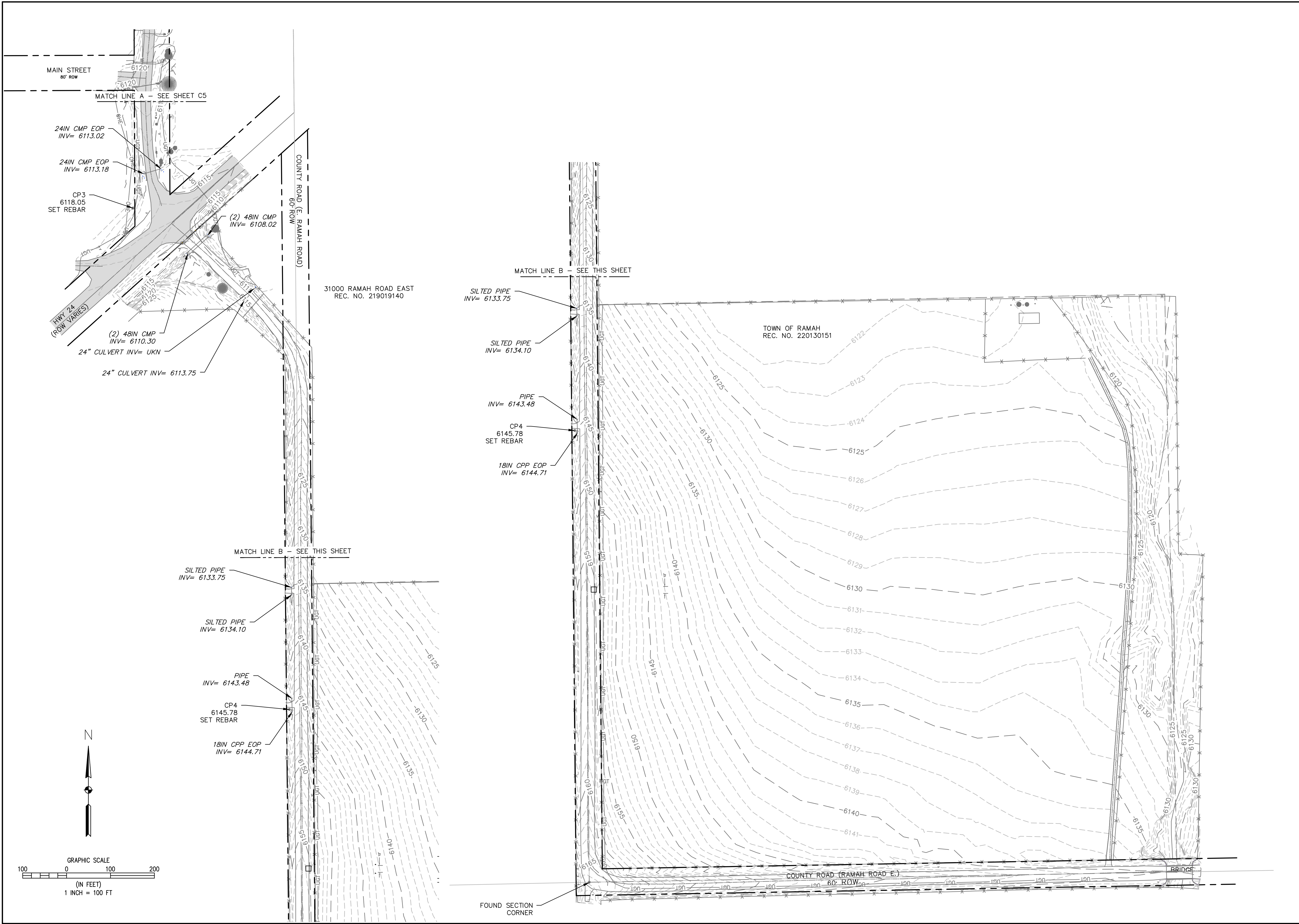
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SHEET  
 C4 OF C29







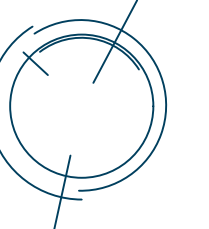


NO.	REVISIONS DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
**TOPOGRAPHIC SURVEY**  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF  
 FOR AND ON BEHALF OF  
 ELEMENT ENGINEERING, LLC  
 DATE  
**OCTOBER 2022**  
 JOB NUMBER  
**0043.0001**  
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**1" = 100'**  
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**PERMITTING**  
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**C6 OF C29**





NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
**PROPOSED IMPROVEMENTS,  
 CONST. PHASING, AND DEMO**  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

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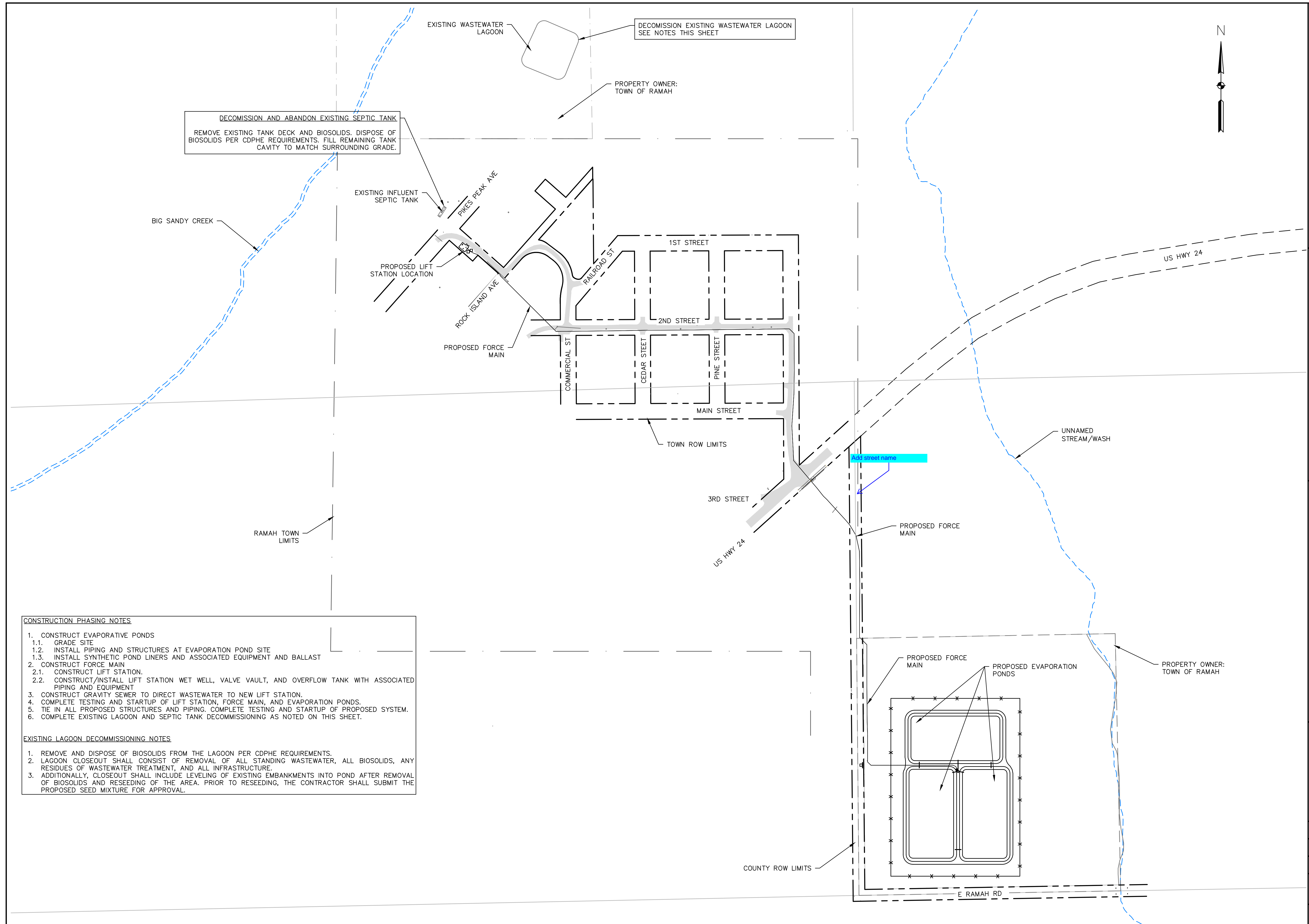
DATE  
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EDITION  
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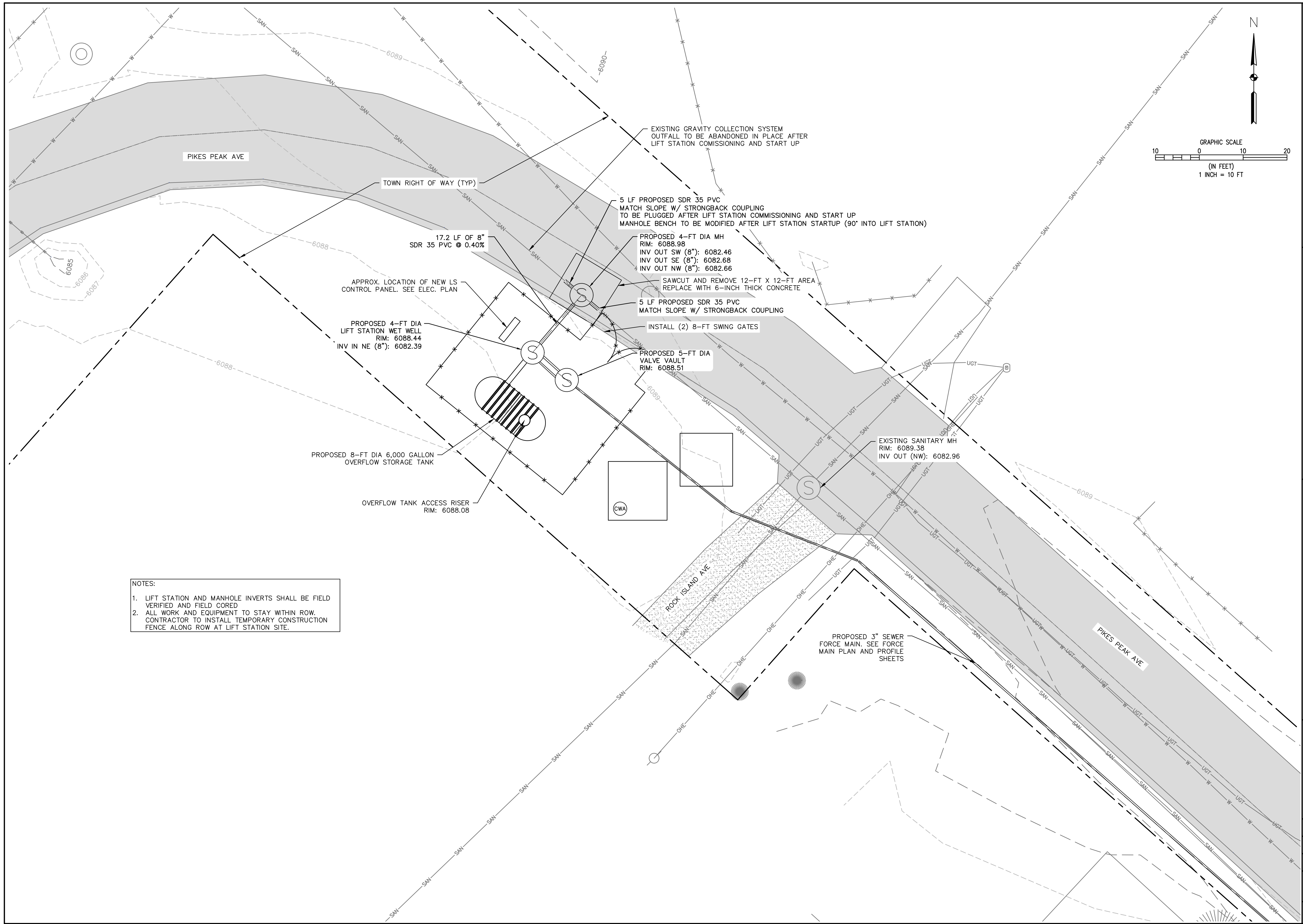


**DECOMMISSION AND ABANDON EXISTING SEPTIC TANK**  
 REMOVE EXISTING TANK DECK AND BIOSOLIDS. DISPOSE OF BIOSOLIDS PER CDPHE REQUIREMENTS. FILL REMAINING TANK CAVITY TO MATCH SURROUNDING GRADE.

DECOMMISSION EXISTING WASTEWATER LAGOON  
 SEE NOTES THIS SHEET

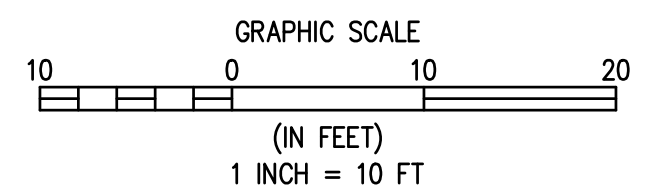
- CONSTRUCTION PHASING NOTES**
- CONSTRUCT EVAPORATIVE PONDS
    - GRADE SITE
    - INSTALL PIPING AND STRUCTURES AT EVAPORATION POND SITE
    - INSTALL SYNTHETIC POND LINERS AND ASSOCIATED EQUIPMENT AND BALLAST
  - CONSTRUCT FORCE MAIN
    - CONSTRUCT LIFT STATION
    - CONSTRUCT/INSTALL LIFT STATION WET WELL, VALVE VAULT, AND OVERFLOW TANK WITH ASSOCIATED PIPING AND EQUIPMENT
  - CONSTRUCT GRAVITY SEWER TO DIRECT WASTEWATER TO NEW LIFT STATION.
  - COMPLETE TESTING AND STARTUP OF LIFT STATION, FORCE MAIN, AND EVAPORATION PONDS.
  - TIE IN ALL PROPOSED STRUCTURES AND PIPING. COMPLETE TESTING AND STARTUP OF PROPOSED SYSTEM.
  - COMPLETE EXISTING LAGOON AND SEPTIC TANK DECOMMISSIONING AS NOTED ON THIS SHEET.
- EXISTING LAGOON DECOMMISSIONING NOTES**
- REMOVE AND DISPOSE OF BIOSOLIDS FROM THE LAGOON PER CDPHE REQUIREMENTS.
  - LAGOON CLOSEOUT SHALL CONSIST OF REMOVAL OF ALL STANDING WASTEWATER, ALL BIOSOLIDS, ANY RESIDUES OF WASTEWATER TREATMENT, AND ALL INFRASTRUCTURE.
  - ADDITIONALLY, CLOSEOUT SHALL INCLUDE LEVELING OF EXISTING EMBANKMENTS INTO POND AFTER REMOVAL OF BIOSOLIDS AND RESEEDING OF THE AREA. PRIOR TO RESEEDING, THE CONTRACTOR SHALL SUBMIT THE PROPOSED SEED MIXTURE FOR APPROVAL.





**NOTES:**

- LIFT STATION AND MANHOLE INVERTS SHALL BE FIELD VERIFIED AND FIELD CORED
- ALL WORK AND EQUIPMENT TO STAY WITHIN ROW. CONTRACTOR TO INSTALL TEMPORARY CONSTRUCTION FENCE ALONG ROW AT LIFT STATION SITE.



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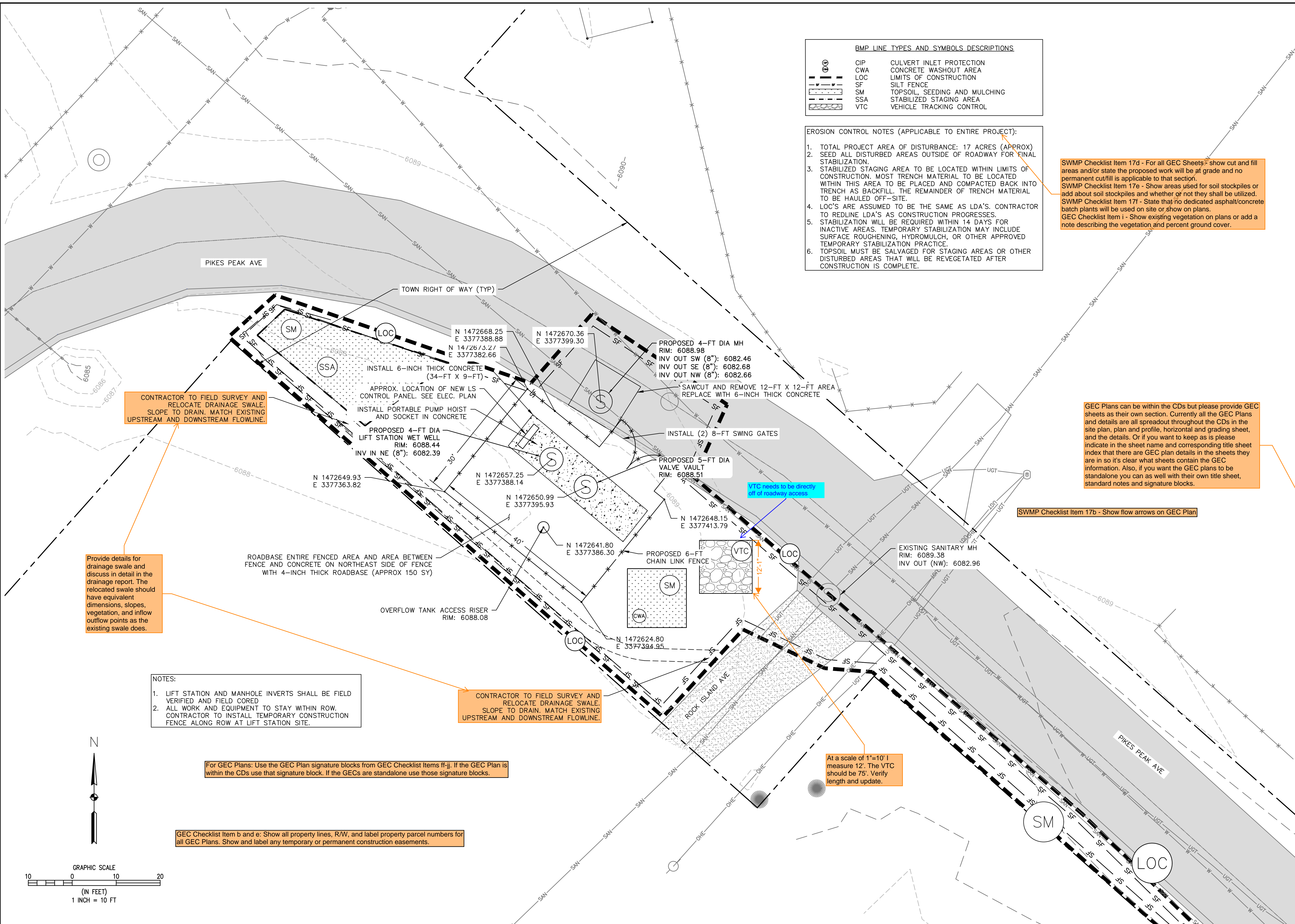
NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
**LIFT STATION YARD PIPING**  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

DATE	OCTOBER 2022
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SCALE	1" = 10'
EDITION	
<b>PERMITTING</b>	
SHEET	C8 OF C29





**BMP LINE TYPES AND SYMBOLS DESCRIPTIONS**

	CIP	CULVERT INLET PROTECTION
	CWA	CONCRETE WASHOUT AREA
	LOC	LIMITS OF CONSTRUCTION
	SF	SILT FENCE
	SM	TOPSOIL, SEEDING AND MULCHING
	SSA	STABILIZED STAGING AREA
	VTC	VEHICLE TRACKING CONTROL

- EROSION CONTROL NOTES (APPLICABLE TO ENTIRE PROJECT):**
- TOTAL PROJECT AREA OF DISTURBANCE: 17 ACRES (APPROX)
  - SEED ALL DISTURBED AREAS OUTSIDE OF ROADWAY FOR FINAL STABILIZATION.
  - STABILIZED STAGING AREA TO BE LOCATED WITHIN LIMITS OF CONSTRUCTION. MOST TRENCH MATERIAL TO BE LOCATED WITHIN THIS AREA TO BE PLACED AND COMPACTED BACK INTO TRENCH AS BACKFILL. THE REMAINDER OF TRENCH MATERIAL TO BE HAULED OFF-SITE.
  - LOC'S ARE ASSUMED TO BE THE SAME AS LDA'S. CONTRACTOR TO REDLINE LDA'S AS CONSTRUCTION PROGRESSES.
  - STABILIZATION WILL BE REQUIRED WITHIN 14 DAYS FOR INACTIVE AREAS. TEMPORARY STABILIZATION MAY INCLUDE SURFACE ROUGHENING, HYDROMULCH, OR OTHER APPROVED TEMPORARY STABILIZATION PRACTICE.
  - TOPSOIL MUST BE SALVAGED FOR STAGING AREAS OR OTHER DISTURBED AREAS THAT WILL BE REVEGETATED AFTER CONSTRUCTION IS COMPLETE.

SWMP Checklist Item 17d - For all GEC Sheets - show cut and fill areas and/or state the proposed work will be at grade and no permanent cut/fill is applicable to that section.  
 SWMP Checklist Item 17e - Show areas used for soil stockpiles or add about soil stockpiles and whether or not they shall be utilized.  
 SWMP Checklist Item 17i - State that no dedicated asphalt/concrete batch plants will be used on site or show on plans.  
 GEC Checklist Item i - Show existing vegetation on plans or add a note describing the vegetation and percent ground cover.

GEC Plans can be within the CDs but please provide GEC sheets as their own section. Currently all the GEC Plans and details are all spread out throughout the CDs in the site plan, plan and profile, horizontal and grading sheet, and the details. Or if you want to keep as is please indicate in the sheet name and corresponding title sheet index that there are GEC plan details in the sheets they are in so it's clear what sheets contain the GEC information. Also, if you want the GEC plans to be standalone you can as well with their own title sheet, standard notes and signature blocks.

SWMP Checklist Item 17b - Show flow arrows on GEC Plan

CONTRACTOR TO FIELD SURVEY AND RELOCATE DRAINAGE SWALE. SLOPE TO DRAIN. MATCH EXISTING UPSTREAM AND DOWNSTREAM FLOWLINE.

Provide details for drainage swale and discuss in detail in the drainage report. The relocated swale should have equivalent dimensions, slopes, vegetation, and inflow/outflow points as the existing swale does.

CONTRACTOR TO FIELD SURVEY AND RELOCATE DRAINAGE SWALE. SLOPE TO DRAIN. MATCH EXISTING UPSTREAM AND DOWNSTREAM FLOWLINE.

At a scale of 1"=10' I measure 12'. The VTC should be 75'. Verify length and update.

- NOTES:**
- LIFT STATION AND MANHOLE INVERTS SHALL BE FIELD VERIFIED AND FIELD CORED
  - ALL WORK AND EQUIPMENT TO STAY WITHIN ROW. CONTRACTOR TO INSTALL TEMPORARY CONSTRUCTION FENCE ALONG ROW AT LIFT STATION SITE.

For GEC Plans: Use the GEC Plan signature blocks from GEC Checklist Items ff-jj. If the GEC Plan is within the CDs use that signature block. If the GECs are standalone use those signature blocks.

GEC Checklist Item b and e: Show all property lines, R/W, and label property parcel numbers for all GEC Plans. Show and label any temporary or permanent construction easements.

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NO.	DATE	BY	DESCRIPTION

WASTEWATER TREATMENT PLANT  
**LIFT STATION SITE PLAN**  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

FOR AND ON BEHALF OF  
 ELEMENT ENGINEERING, LLC

DATE  
**OCTOBER 2022**

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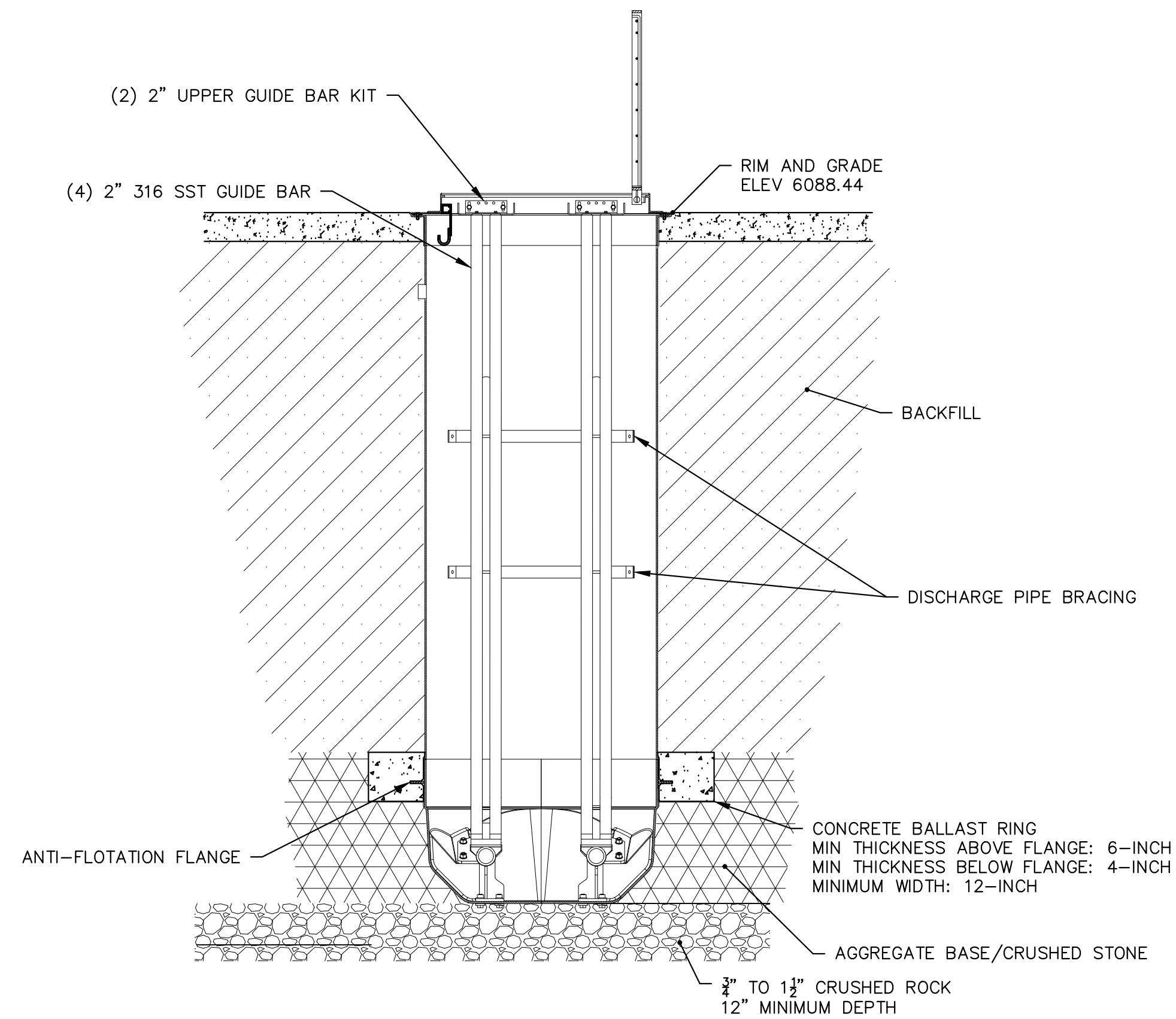


**LIFT STATION CONSTRUCTION NOTES:**

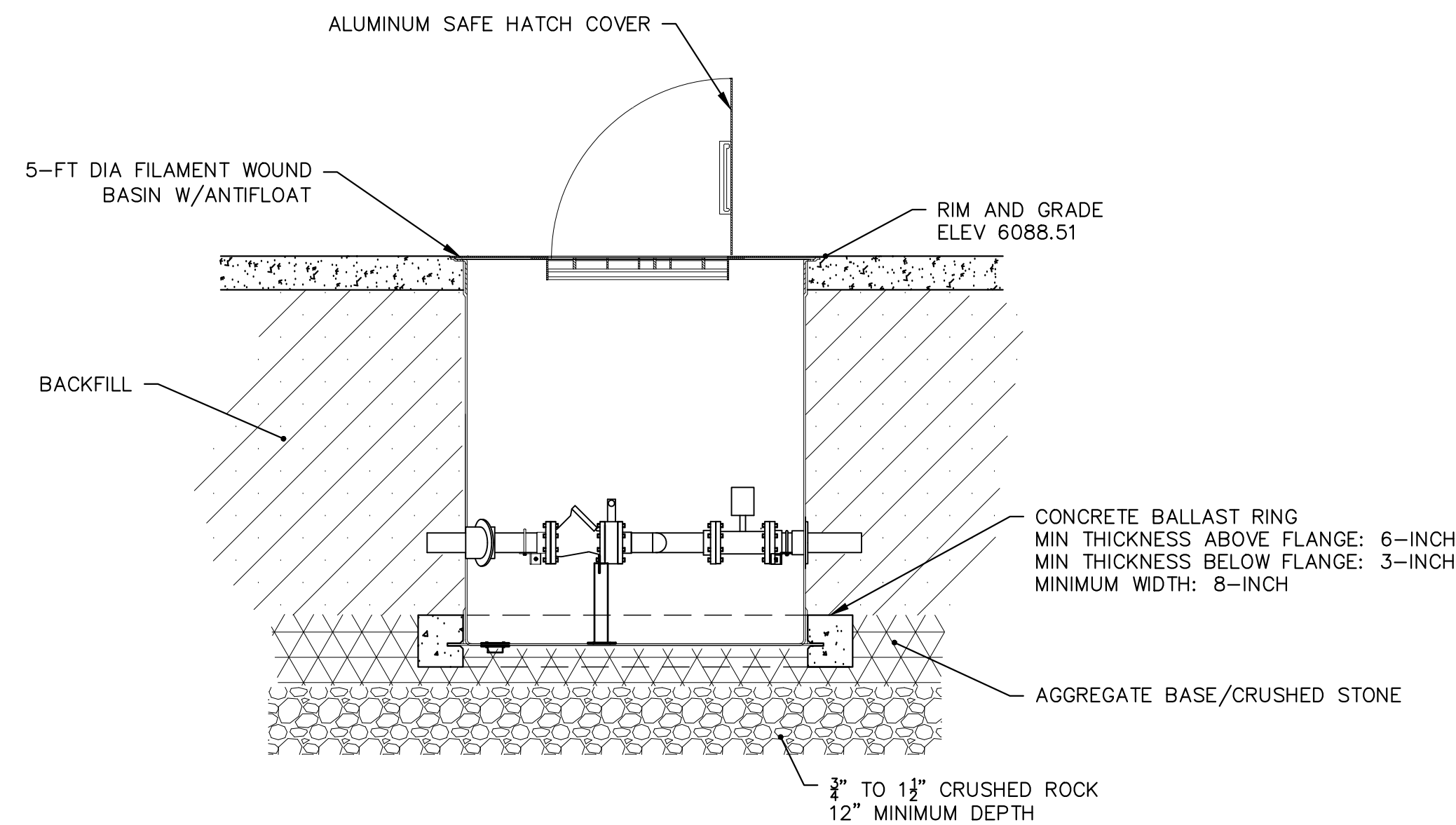
1. CONTRACTOR TO SUBMIT A CONSTRUCTION PHASING PLAN TO ENGINEER FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION. AN EXAMPLE CONSTRUCTION PHASING PLAN IS AS FOLLOWS:
  - 1.1. CONSTRUCT THE PROPOSED LIFT STATION INCLUDING INSTALLING ALL PUMPS, RAILS, PANELS, ETC.
  - 1.2. CONSTRUCT ALL YARD PIPING UP TO THE PROPOSED TIE IN LOCATIONS.
  - 1.3. TEST THE PROPOSED LIFT STATION PUMPS AND EQUIPMENT.
  - 1.4. INSTALL PROPOSED SANITARY SEWER MANHOLE.
  - 1.5. COMPLETE CONSTRUCTION OF ALL YARD PIPING. FINALIZE GRADING AND INSTALLATION OF ALL REQUIRED CONCRETE, BOLLARDS, ETC.
2. BYPASS PUMPING WILL BE REQUIRED DURING CONSTRUCTION. THE CONTRACTOR MUST SUBMIT A BYPASS PUMPING PLAN TO THE ENGINEER FOUR (4) WORKING DAYS PRIOR TO BEGINNING BYPASS PUMPING. NO BYPASS PUMPING SHALL BE ALLOWED UNTIL THE BYPASS PUMPING PLAN IS APPROVED BY THE ENGINEER IN WRITING. THE BYPASS PUMPING PLAN SHALL INCLUDE THE FOLLOWING ITEMS AT A MINIMUM:
  - 2.1. NUMBER OF PUMPS PROVIDED
  - 2.2. BASIC LAYOUT OF BYPASS PUMPS AND PIPE
  - 2.3. BYPASS PUMPING STAFFING PLAN
  - 2.4. EMERGENCY RESPONSE PLAN INCLUDING EMERGENCY CONTACT NUMBERS SHOULD A SANITARY SEWER OVERFLOW (SSO) OCCUR. NOTE THAT ANY REPORTING AND FINES RELATING TO A SSO SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. CONTRACTOR TO LOCATE ALL PROPOSED TIE IN LOCATIONS TO VERIFY DEPTH AND LOCATION. CONTRACTOR TO PROVIDE ANY MATERIALS, FITTINGS, BENDS AND PIPE NECESSARY TO TIE INTO EXISTING PIPES AND STRUCTURES. ANY DISCREPANCIES IN TIE IN LOCATIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
4. PUMPS, RAILS, FLOATS, VALVES AND ALL ANCILLARY EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER RECOMMENDATIONS AND SPECIFICATIONS.
6. AN ADDITIONAL 5 FEET OF WIRE FROM THE CONTROL BOX TO THE FLOATS SHALL BE ASSUMED TO ENSURE SLACK IN THE WIRE.
7. VENT PIPING SHALL BE 4-INCH DUCTILE IRON COATED YELLOW WITH EXTERIOR RATED EPOXY COATING PRODUCT. SECURE NO. 24 MESH IN OPENING. INSTALL CARBON CANISTER FOR ODOR CONTROL.
8. ALL CONCRETE STRUCTURES SHALL BE PRE-CAST. ALL HATCHES SHALL BE CAST INTO THE MANHOLE TOP.
9. PUMP STARTUP AND TRAINING TO BE COMPLETED BY A MANUFACTURER TRAINED AND APPROVED REPRESENTATIVE.
10. PUMP TESTING SHALL BE COMPLETED WITH CLEAN WATER WHICH MAY BE OBTAINED FROM THE TOWN. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY CONSTRUCTION WATER DISCHARGE PERMITS NECESSARY.
11. FOUR (4) HOURS OF OPERATOR TRAINING SHALL BE INCLUDED DURING PUMP STARTUP AND AUTO-DIALER STARTUP. ALL STARTUP AND TRAINING COSTS SHALL BE AT THE CONTRACTOR'S EXPENSE.
12. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING EQUIPMENT AND STRUCTURES FROM DAMAGE. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE IN A MANNER ACCEPTABLE TO THE TOWN.
13. ALL MANHOLE CORES AND PENETRATIONS SHALL BE FIELD CORED AFTER VERIFYING EXISTING UTILITY INFORMATION.
14. CONTRACTOR TO POTHOLE ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION.

**LIFT STATION EXCAVATION AND BALLASTING NOTES:**

1. PRE-PACKAGED LIFT STATION:
  - 1.1. EXCAVATION AREA SHALL PROVIDE ADEQUATE WORKING ROOM AROUND THE PUMP STATION. SEE PUMP STATION INSTALLATION, CARE AND MAINTENANCE MANUAL FOR HANDLING, INSTALLATION, AND BALLASTING INSTRUCTIONS.
  - 1.2. CONCRETE BALLAST DESIGN SHALL BE SUFFICIENT TO RESIST HEAD PRESSURE AND SOIL LOADING WITH PUMP STATION COMPLETELY EMPTY AND WATER TO GRADE. THE DETAIL SHOWN HEREIN SATISFIES THIS CONDITION.
  - 1.3. DO NOT LET CONCRETE FREE FALL TO BOTTOM OF HOLE MORE THAN 3 TO 4 FEET. PLACE CONCRETE USING A TREMMY CHUTE TO HELP PRECLUDE SEGREGATION OF AGGREGATE FROM THE MATRIX. ENSURE THAT CONCRETE FLOWS UNDER THE FIBERGLASS ANTI-FLOTATION FLANGE. CONSOLIDATE CONCRETE WITH PROPER VIBRATION PER THE RECOMMENDED PRACTICE OF ACI 318-05 SECTION 5.10.
  - 1.4. BACKFILL AND COMPACTION SHALL MEET OR EXCEED THE REQUIREMENTS SET FORTH IN THE INSTALLATION, CARE, AND MAINTENANCE MANUAL FOR THE PACKAGE PUMP STATION.
  - 1.5. SLINGING, INSTALLATION, AND HANDLING SHALL FOLLOW ALL MANUFACTURERS REQUIREMENTS.



1  
C11 LIFT STATION BALLAST AND BACKFILL DETAILS  
1/2" = 1'



2  
C11 VALVE VAULT BALLAST AND BACKFILL DETAILS  
1/2" = 1'

GRADE NOTES:  
1. FINAL GRADE SHALL BE RETURNED TO EXISTING GRADE ELEVATION

NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
LIFT STATION NOTES & BALLASTING  
TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DATE  
OCTOBER 2022

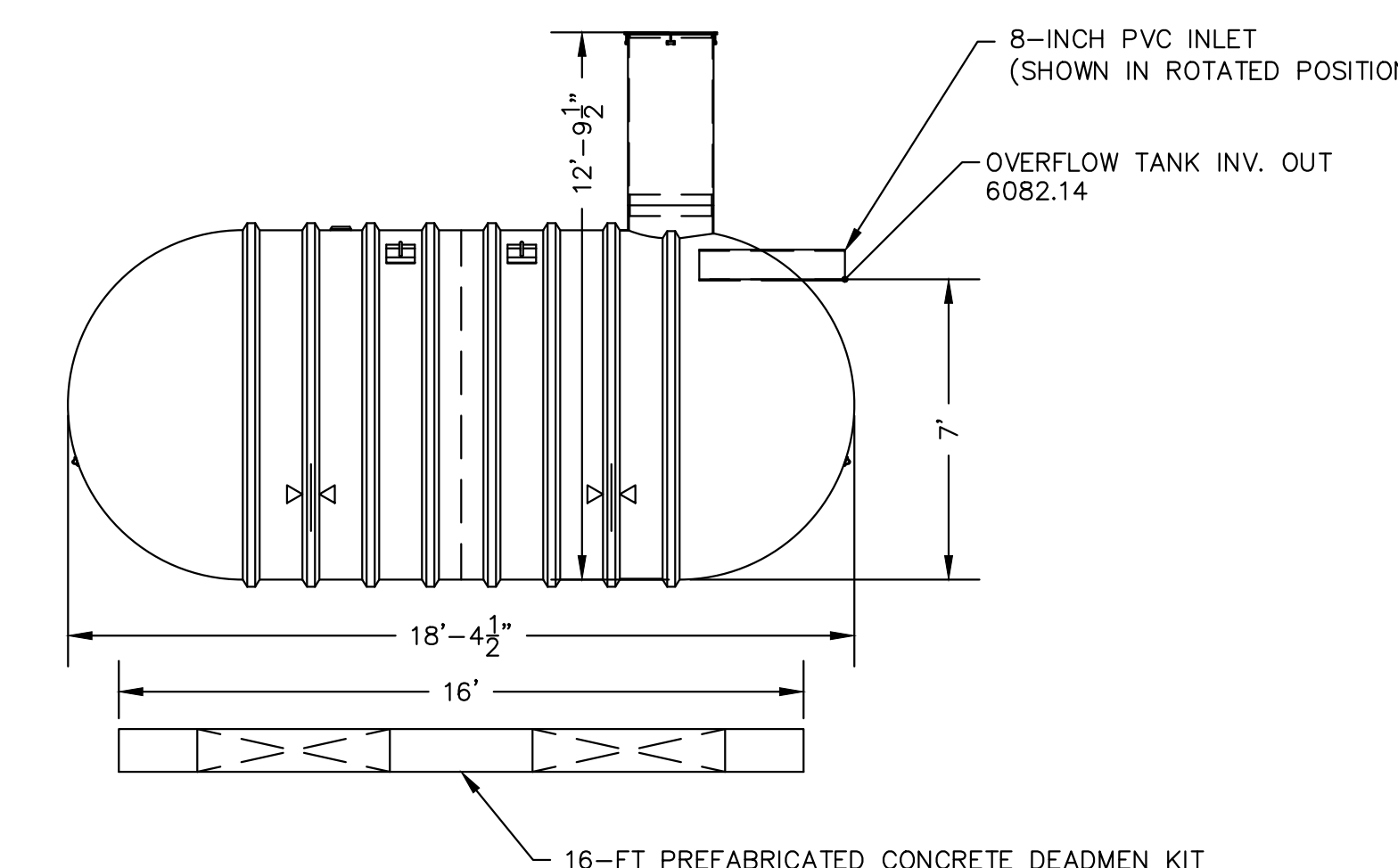
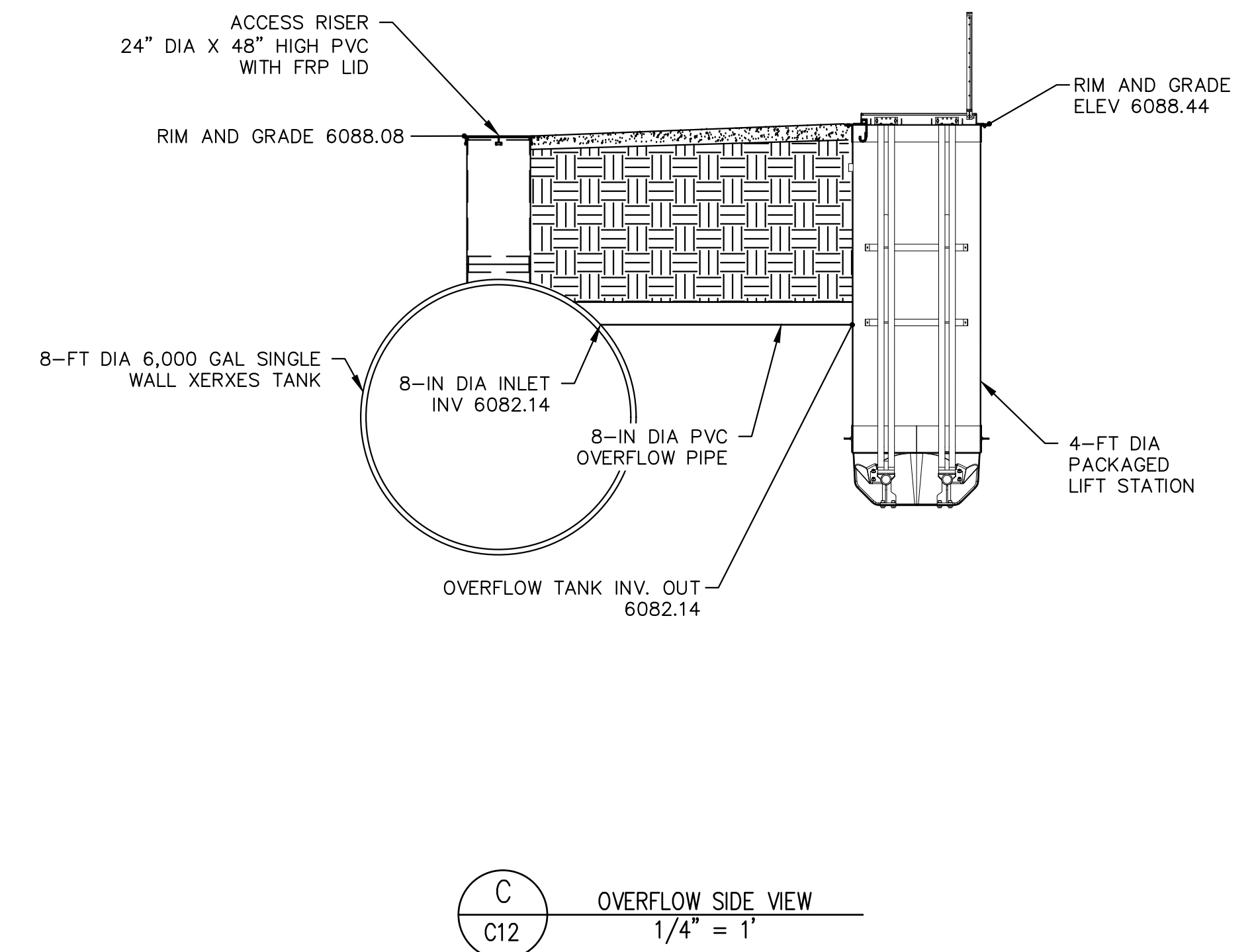
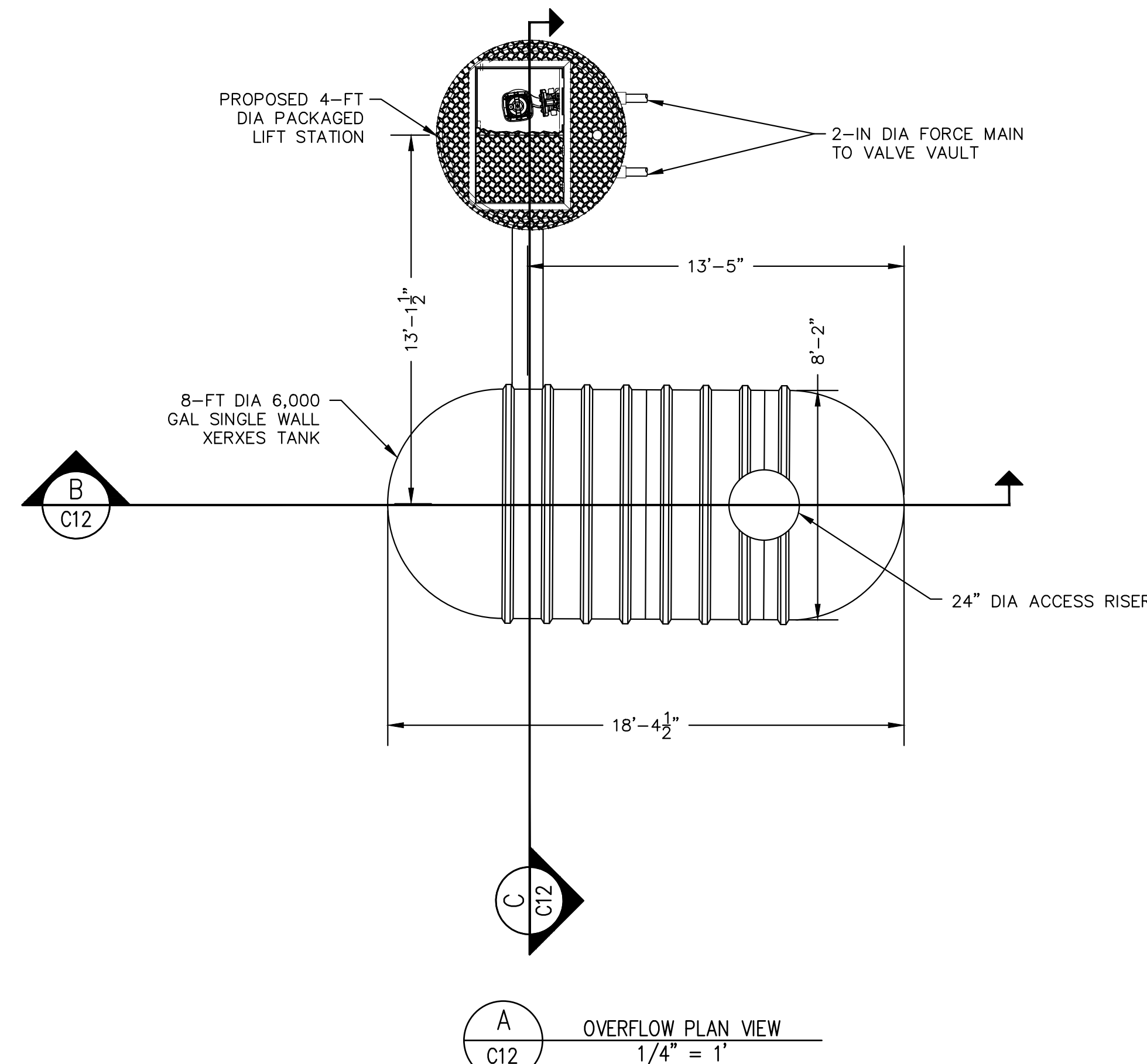
JOB NUMBER  
0043.0001

SCALE  
AS SHOWN

EDITION  
PERMITTING

SHEET  
C11 OF C29





8-FT DIAMETER 6,000 GALLON TANK	
QTY	DESCRIPTION
1	4" NPT SERVICE FITTING
1	8" DIA PVC INLET HORIZONTAL PIPE
1	23 1/2" IS FIBERGLASS ACCESS OPENING WITH 23 1/2" OD ALIGNMENT RING
1	24" DIA X 48" HIGH PVC RISER WITH FRP LID WITH GASKET
2	LIFTING LUG (10" X 8") 25", 25"
2	16-FT PREFABRICATED CONCRETE DEADMENT
2	HOLD DOWN STRAP

NOTE: ALL EQUIPMENT SHOWN IN OVERFLOW PROFILE VIEW PROVIDED BY MANUFACTURER

NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
**OVERFLOW DETAILS**  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
 ELEMENT ENGINEERING, LLC

DATE  
 OCTOBER 2022

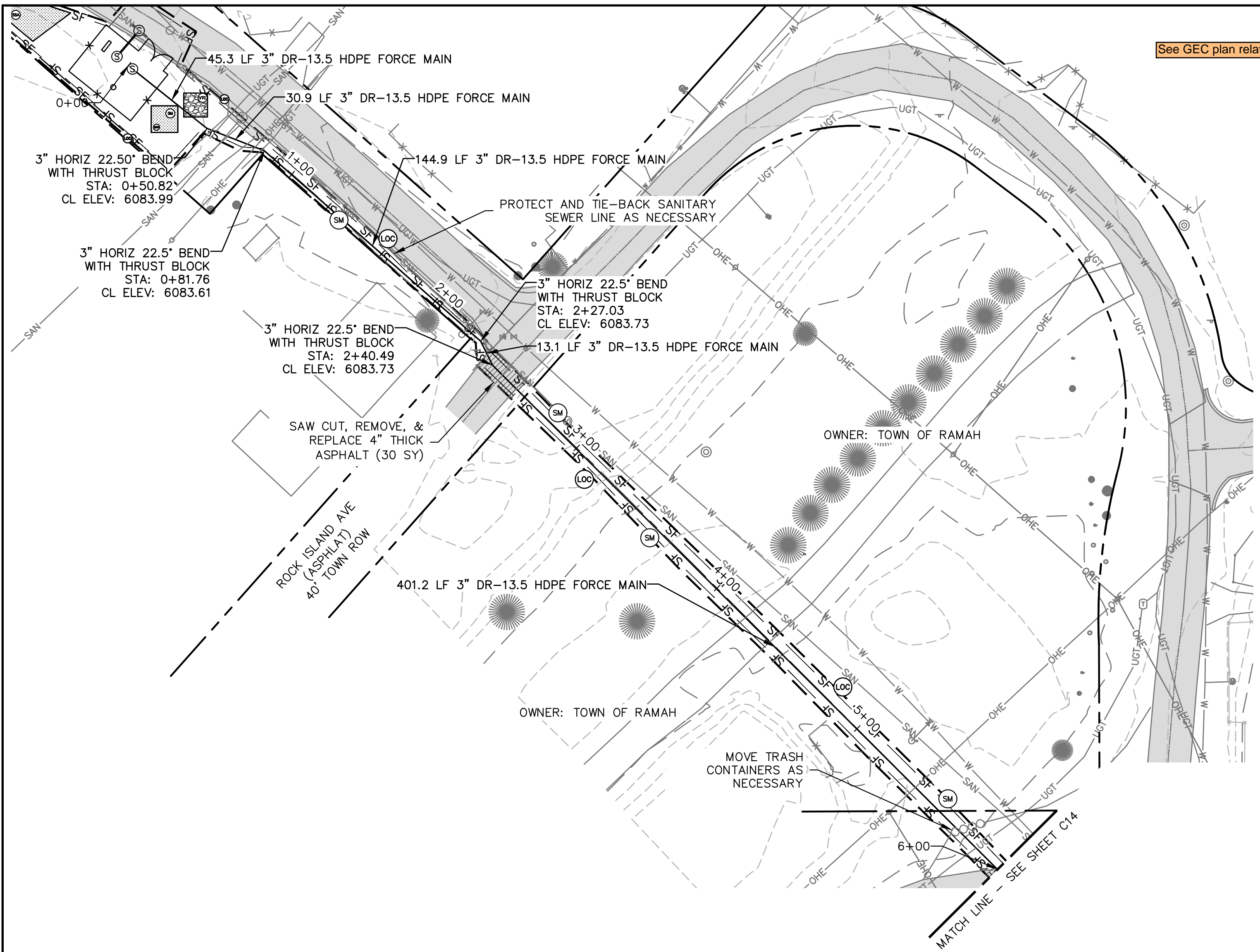
JOB NUMBER  
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SCALE  
 AS SHOWN

EDITION  
 PERMITTING

SHEET  
 C12 OF C29

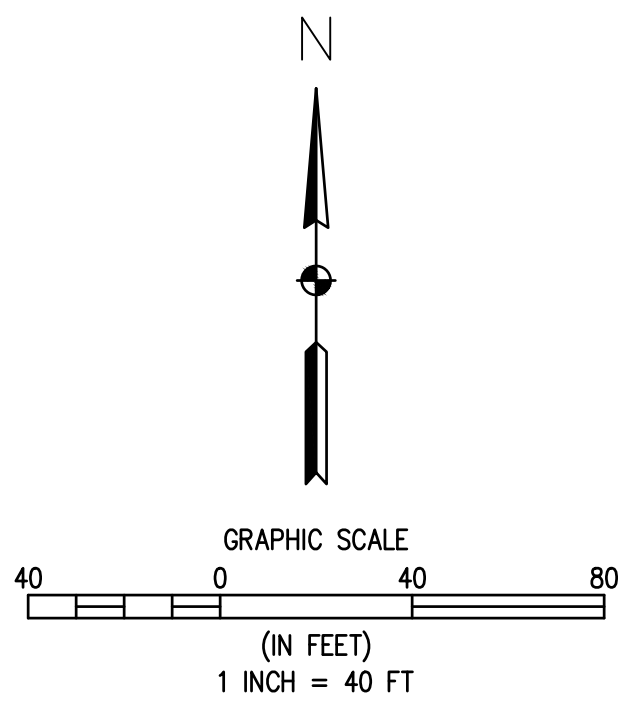




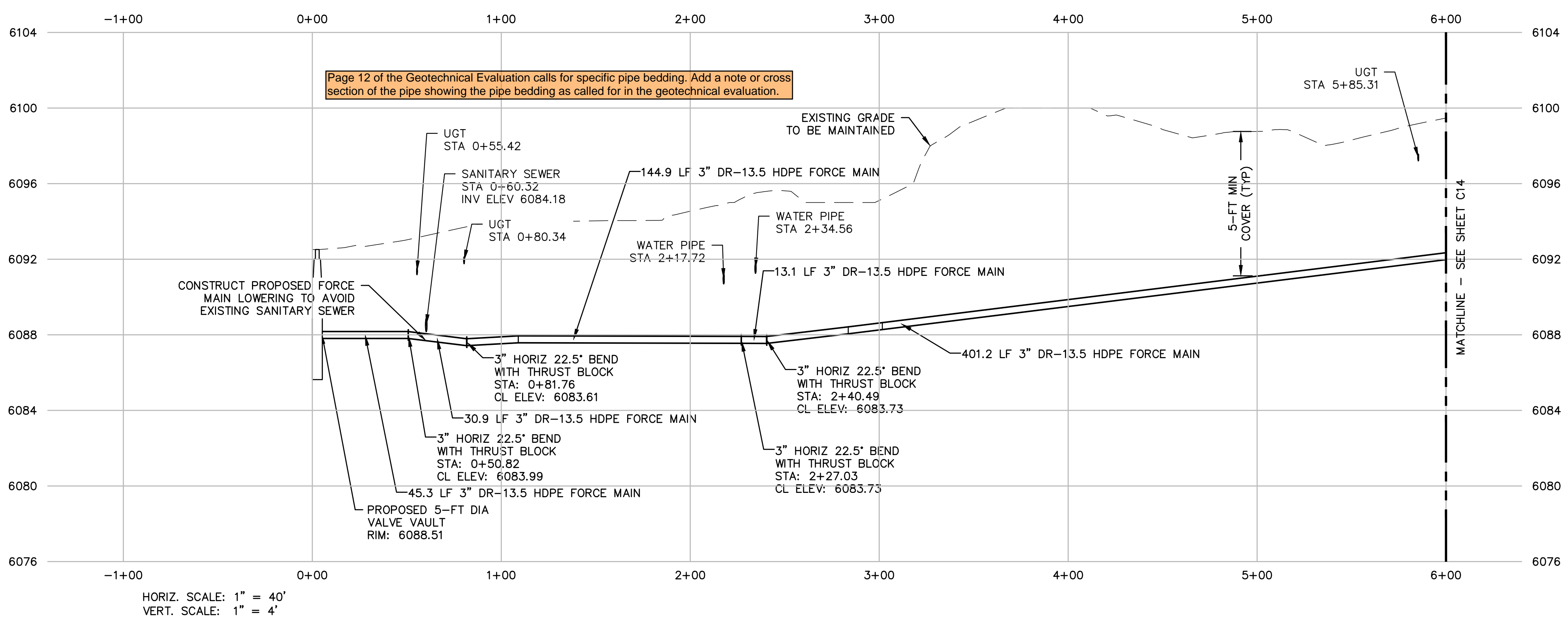
See GEC plan related comments on sheet 9.

BMP LINE TYPES AND SYMBOLS DESCRIPTIONS	
	CIP CULVERT INLET PROTECTION
	CWA CONCRETE WASHOUT AREA
	LOC LIMITS OF CONSTRUCTION
	SF SILT FENCE
	SM TOPSOIL SEEDING AND MULCHING
	SSA STABILIZED STAGING AREA
	VTC VEHICLE TRACKING CONTROL

- EROSION CONTROL NOTES (APPLICABLE TO ENTIRE PROJECT):
- TOTAL PROJECT AREA OF DISTURBANCE: 17 ACRES (APPROX)
  - SEED ALL DISTURBED AREAS OUTSIDE OF ROADWAY FOR FINAL STABILIZATION.
  - STABILIZED STAGING AREA TO BE LOCATED WITHIN LIMITS OF CONSTRUCTION. MOST TRENCH MATERIAL TO BE LOCATED WITHIN THIS AREA TO BE PLACED AND COMPACTED BACK INTO TRENCH AS BACKFILL. THE REMAINDER OF TRENCH MATERIAL TO BE HAULED OFF-SITE.
  - LOC'S ARE ASSUMED TO BE THE SAME AS LDA'S. CONTRACTOR TO REDLINE LDA'S AS CONSTRUCTION PROGRESSES.
  - STABILIZATION WILL BE REQUIRED WITHIN 14 DAYS FOR INACTIVE AREAS. TEMPORARY STABILIZATION MAY INCLUDE SURFACE ROUGHENING, HYDROMULCH, OR OTHER APPROVED TEMPORARY STABILIZATION PRACTICE.
  - TOPSOIL MUST BE SALVAGED FOR STAGING AREAS OR OTHER DISTURBED AREAS THAT WILL BE REVEGETATED AFTER CONSTRUCTION IS COMPLETE.



- NOTES:
- INSTALL 3" IPS DR-13.5 HDPE FORCE MAIN TO MAINTAIN 5-FT TO 6-FT BURY DEPTH WITH TRACER WIRE. INSTALL VERTICAL BENDS AS NECESSARY.
  - MAXIMUM ALLOWABLE JOINT DEFLECTION = 1"
  - PIPE DEFLECTION SHALL ONLY BE ALLOWED AT JOINTS. NO BENDING OF THE PIPE SHALL BE ALLOWED.
  - AVOID HIGH POINTS IN THE FORCE MAIN WHERE POSSIBLE. AIR VAC VAULTS SHALL BE REQUIRED AT ALL HIGH POINTS.
  - CONTRACTOR TO SURVEY AND MARK ACCESS EASEMENT, DISCUSS UTILITIES EASEMENTS, AND FINAL PROPERTY BOUNDARY.
  - ALL WORK IN EL PASO COUNTY RIGHT-OF-WAY SHALL FOLLOW EL PASO COUNTY UTILITY PERMIT REQUIREMENTS. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO BEGINNING WORK.
  - CONTRACTOR TO REMOVE TREES AND BRUSH AND HAUL AWAY MATERIAL AS NECESSARY THROUGH WORK AREAS. DO NOT REMOVE OR DISTURB TREES UNNECESSARILY.
  - CONTRACTOR TO POTHOLE UTILITIES AT ALL CROSSINGS. EXISTING UTILITY PROFILE DEPTHS ARE ESTIMATED, NO POTHOLING WAS PERFORMED AS PART OF THE DESIGN PHASE.
  - MAINTAIN 18-INCH MINIMUM VERTICAL SEPARATION AT ALL UTILITY CROSSINGS

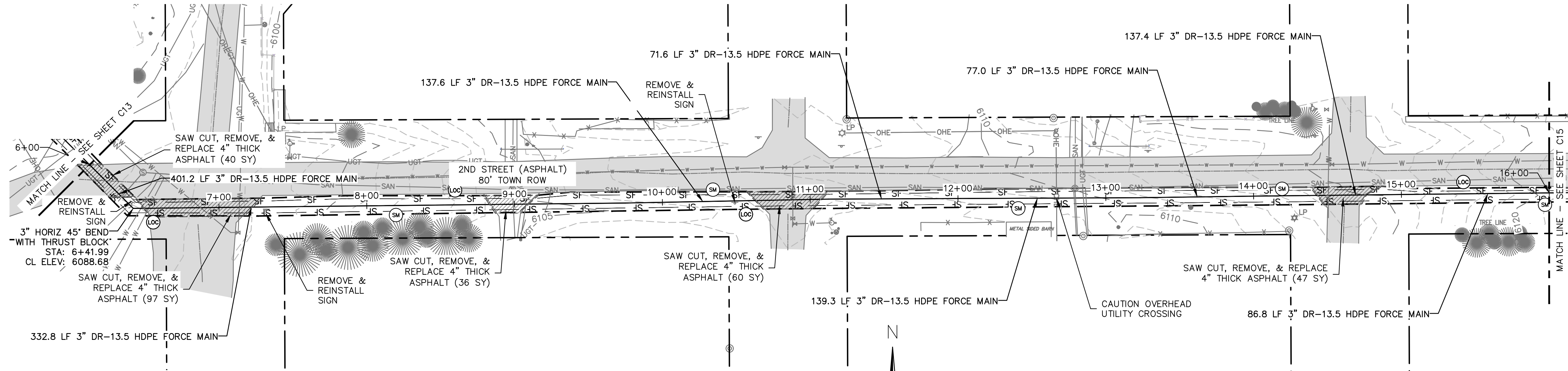
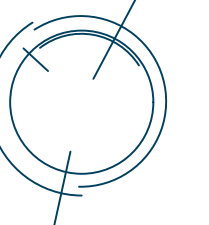


HORIZ. SCALE: 1" = 40'  
VERT. SCALE: 1" = 4'

NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
FORCE MAIN PLAN &  
PROFILE 0+00 - 6+00  
TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832



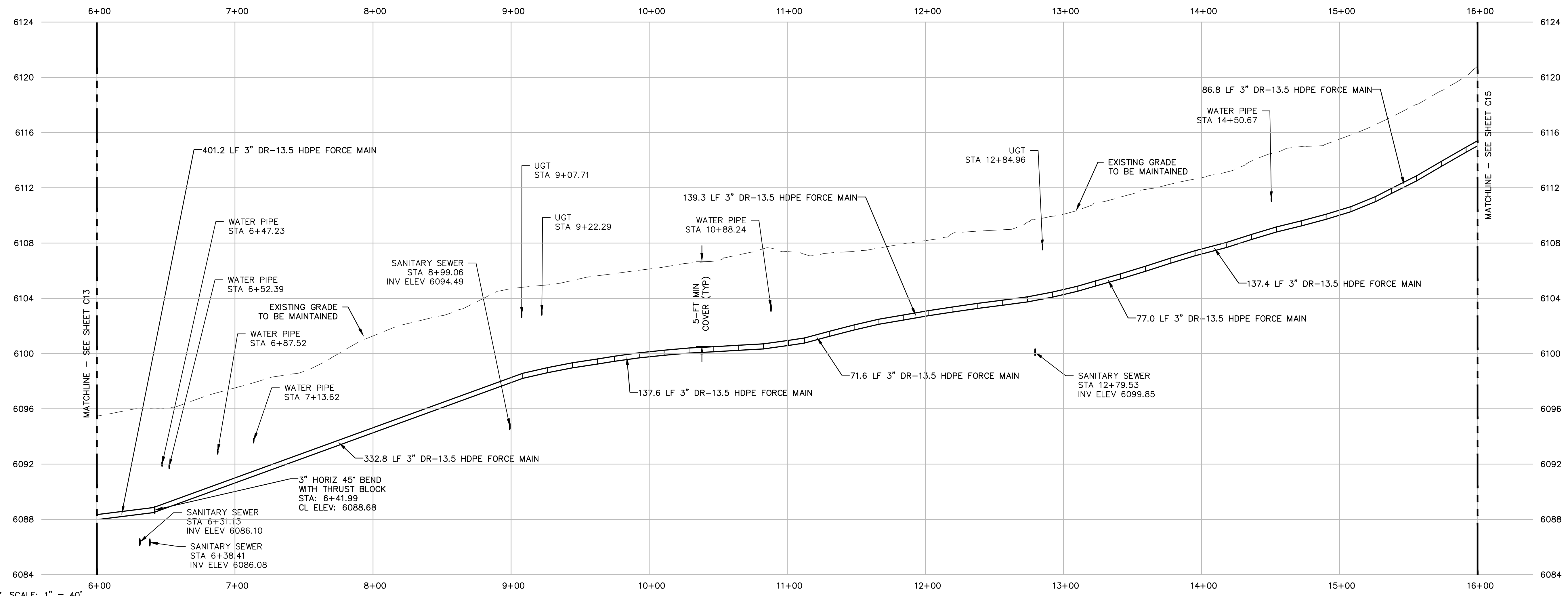
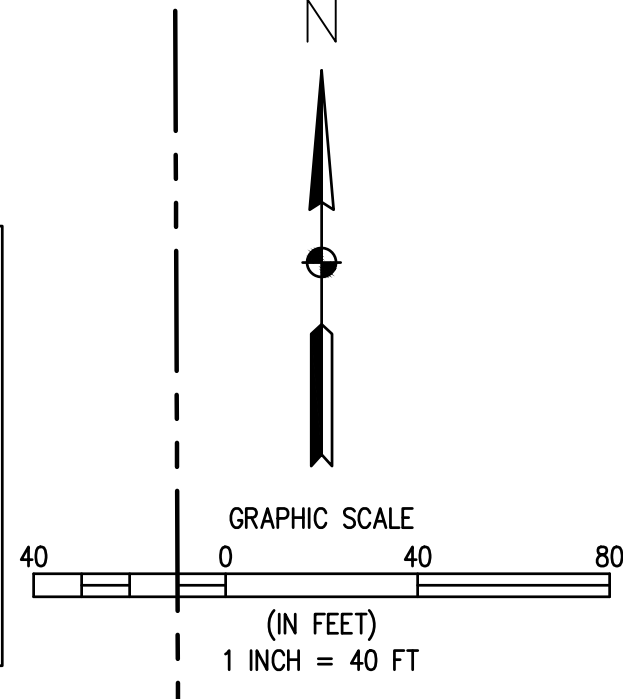


- NOTES:**
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**BMP LINE TYPES AND SYMBOLS DESCRIPTIONS**

	CIP	CULVERT INLET PROTECTION
	CWA	CONCRETE WASHOUT AREA
	LOC	LIMITS OF CONSTRUCTION
	SF	SILT FENCE
	SM	TOPSOIL, SEEDING AND MULCHING
	SSA	STABILIZED STAGING AREA
	VTC	VEHICLE TRACKING CONTROL

- EROSION CONTROL NOTES (APPLICABLE TO ENTIRE PROJECT):**
1. TOTAL PROJECT AREA OF DISTURBANCE: 17 ACRES (APPROX)
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HORIZ. SCALE: 1" = 40'  
VERT. SCALE: 1" = 4'

NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
**FORCE MAIN PLAN & PROFILE 6+00 - 16+00**  
TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF  
FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC  
DATE: OCTOBER 2022  
JOB NUMBER: 0043.0001  
SCALE: 1" = 40'  
EDITION:  
**PERMITTING**  
SHEET: C14 OF C29



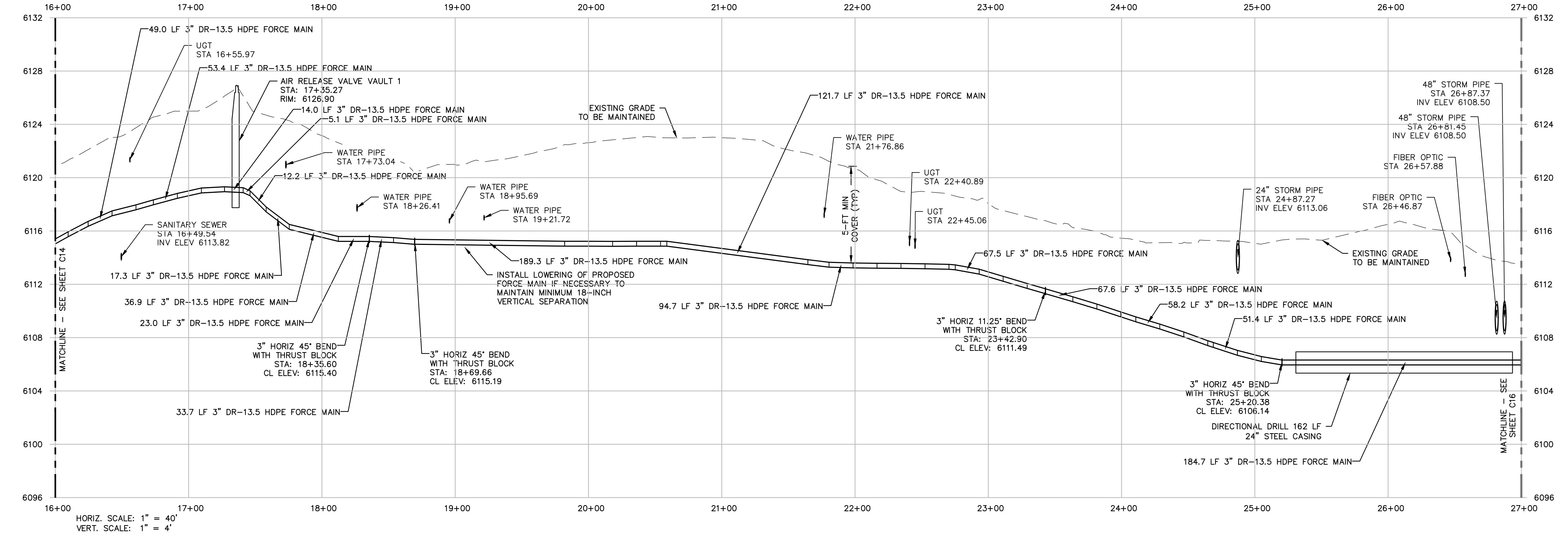
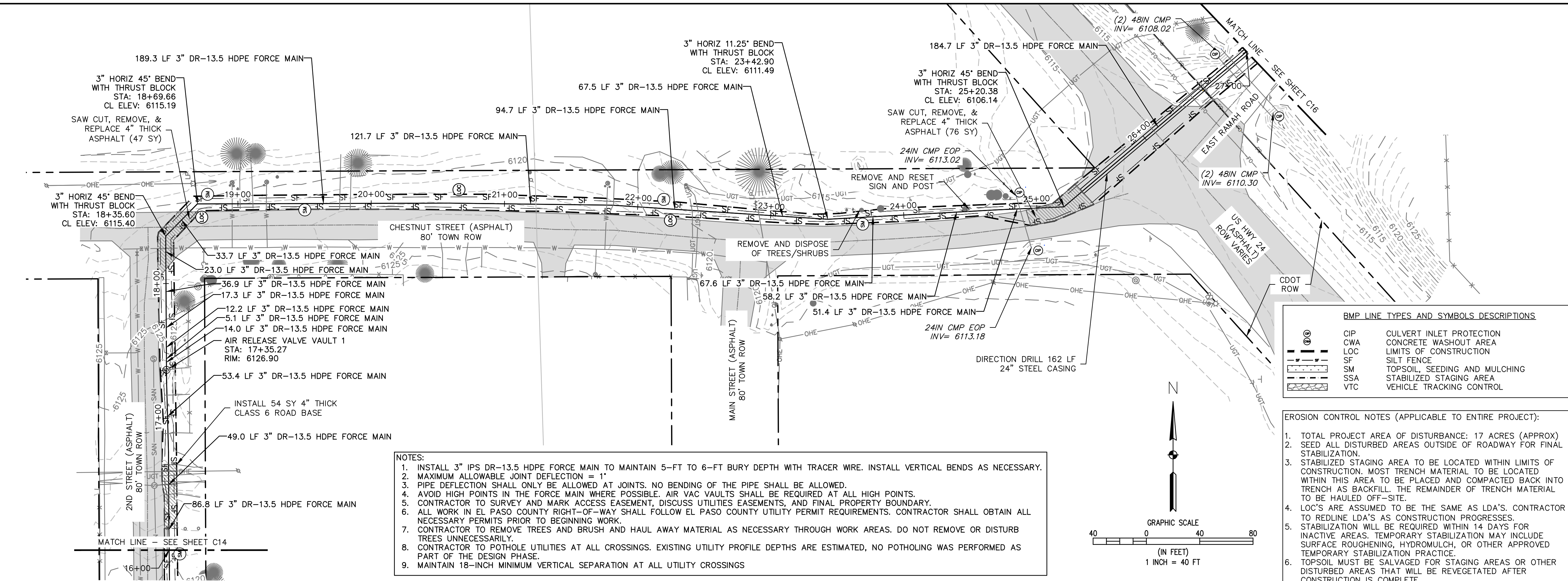
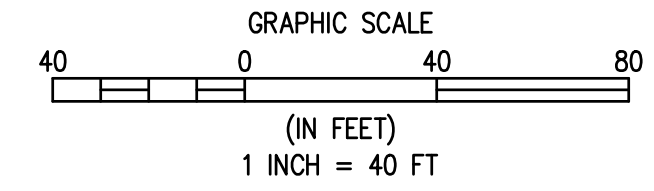


**BMP LINE TYPES AND SYMBOLS DESCRIPTIONS**

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WASTEWATER TREATMENT PLANT  
**FORCE MAIN PLAN & PROFILE**  
16+00 - 27+00  
TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

DATE	OCTOBER 2022
JOB NUMBER	0043.0001
SCALE	AS SHOWN
EDITION	PERMITTING
SHEET	C15 OF C29





NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
**FORCE MAIN PLAN & PROFILE 27+00 - 38+00**  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

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 ELEMENT ENGINEERING, LLC

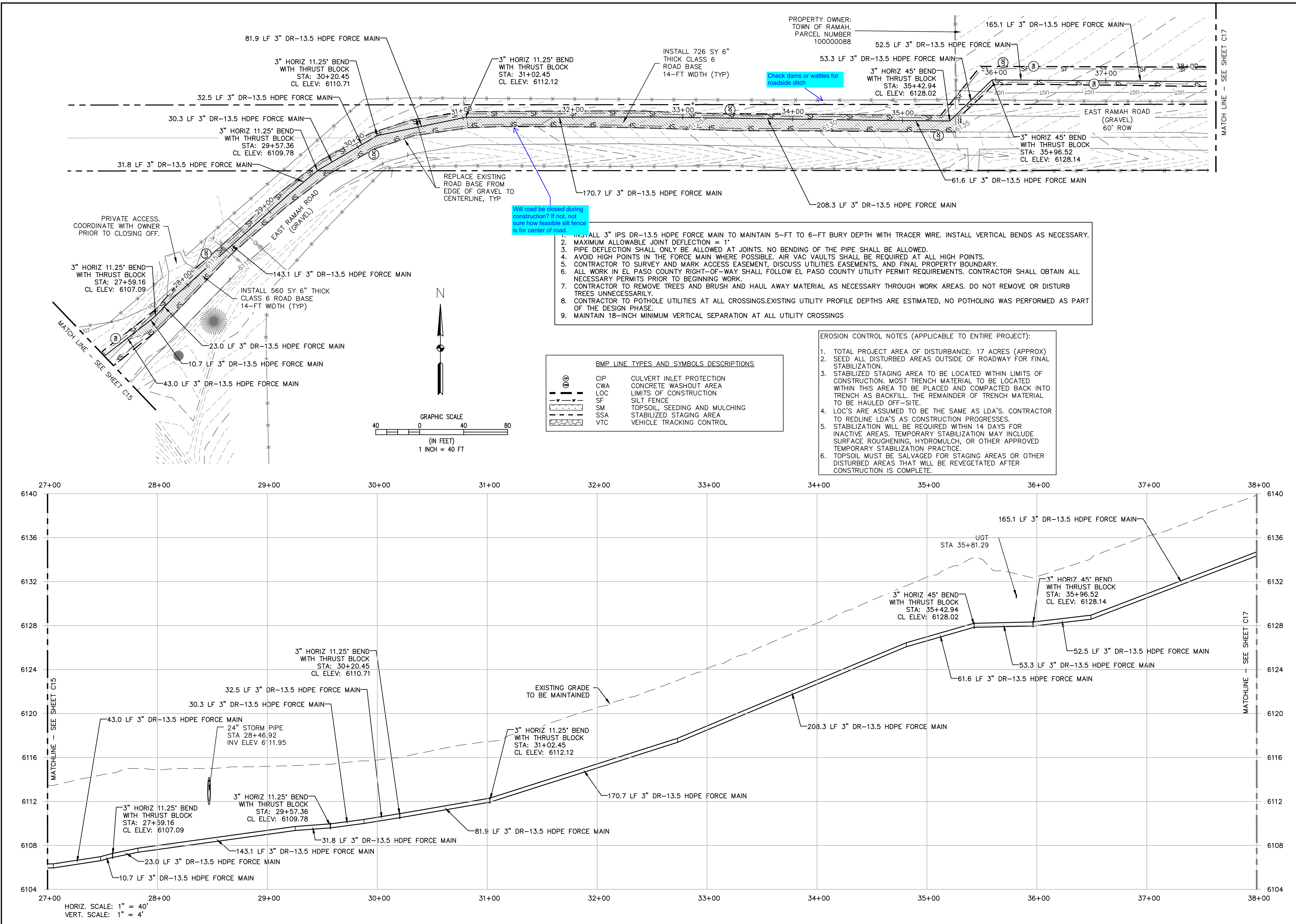
DATE  
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JOB NUMBER  
 0043.0001

SCALE  
 1" = 40'

EDITION  
 PERMITTING

SHEET  
 C16 OF C29



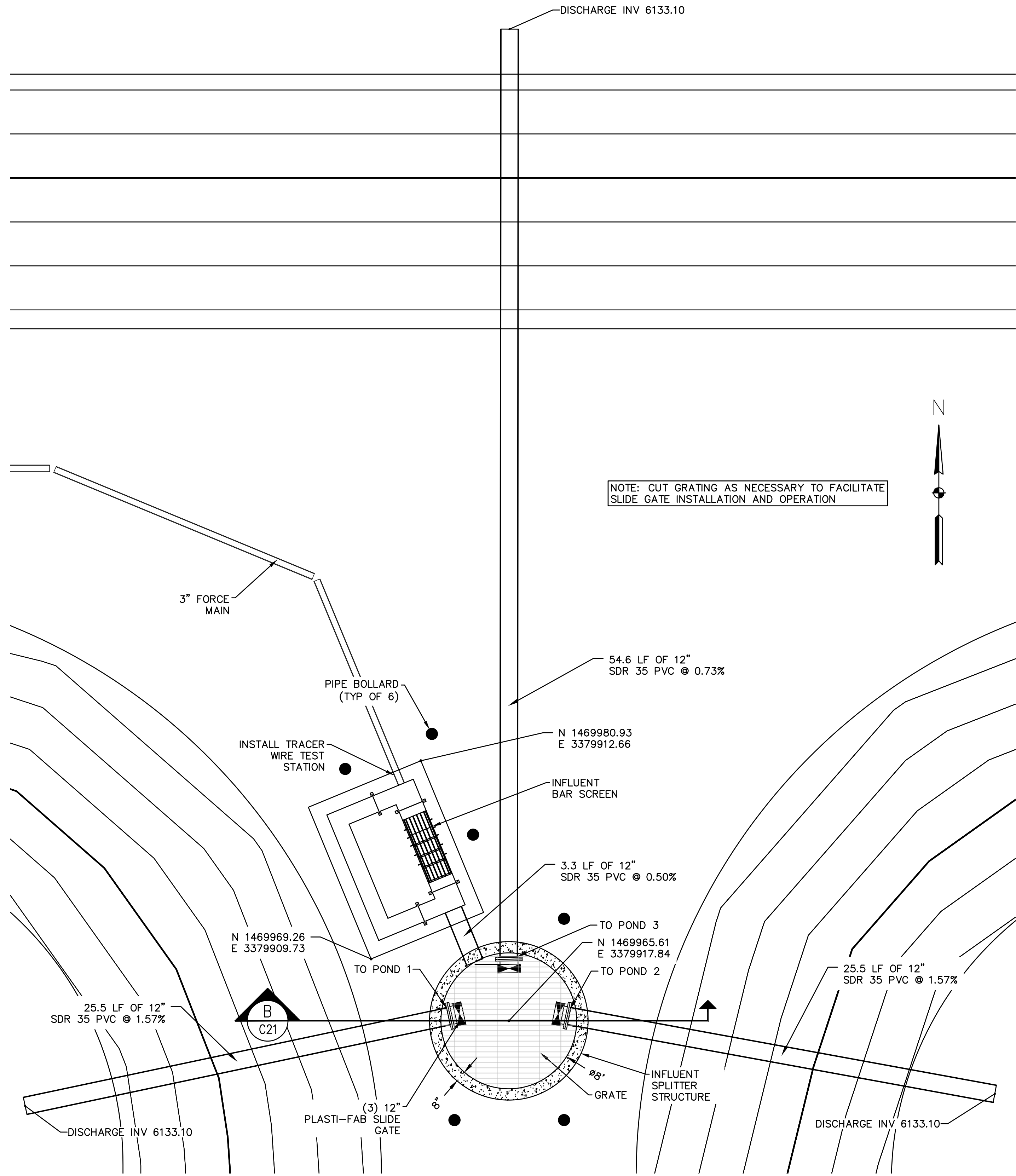






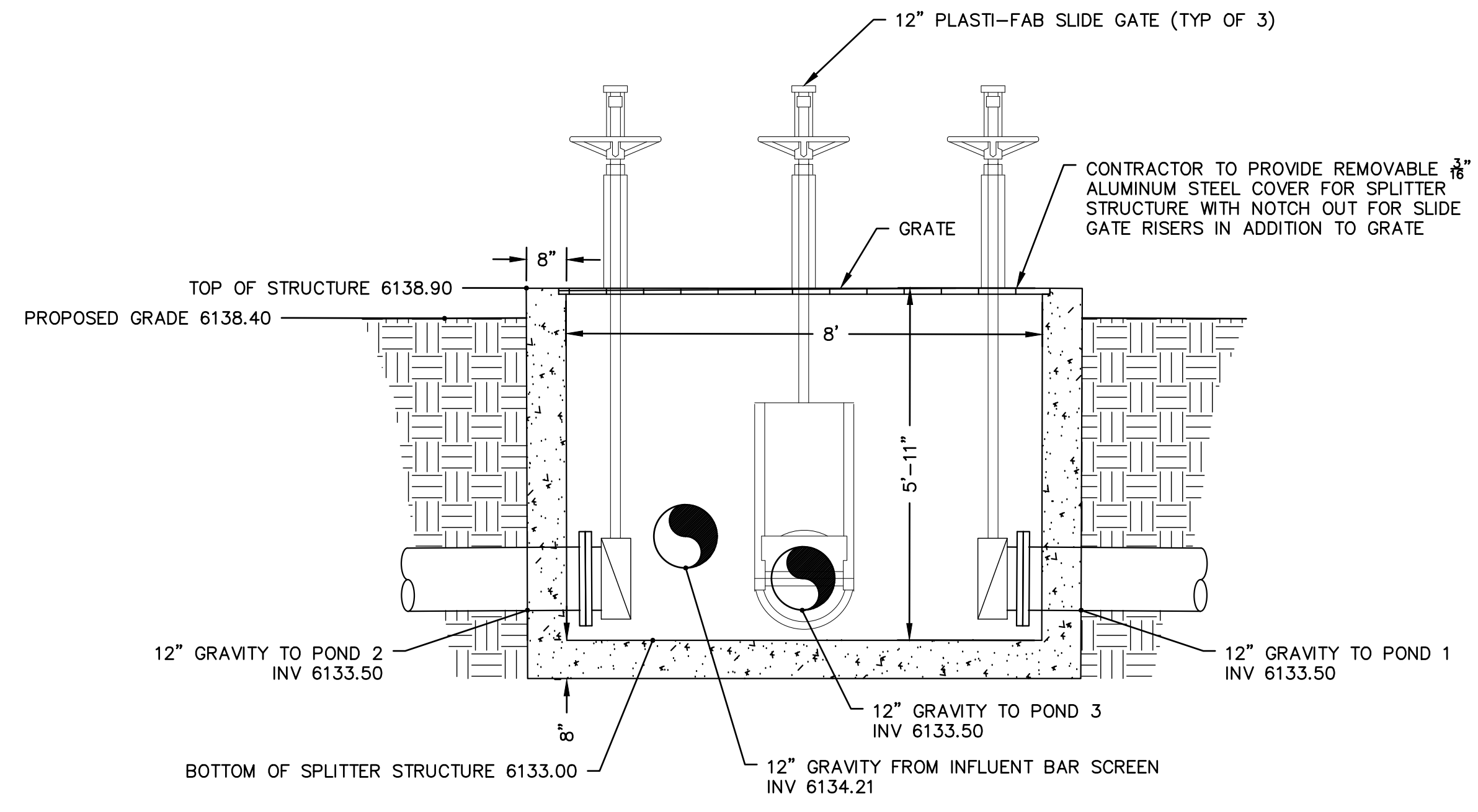




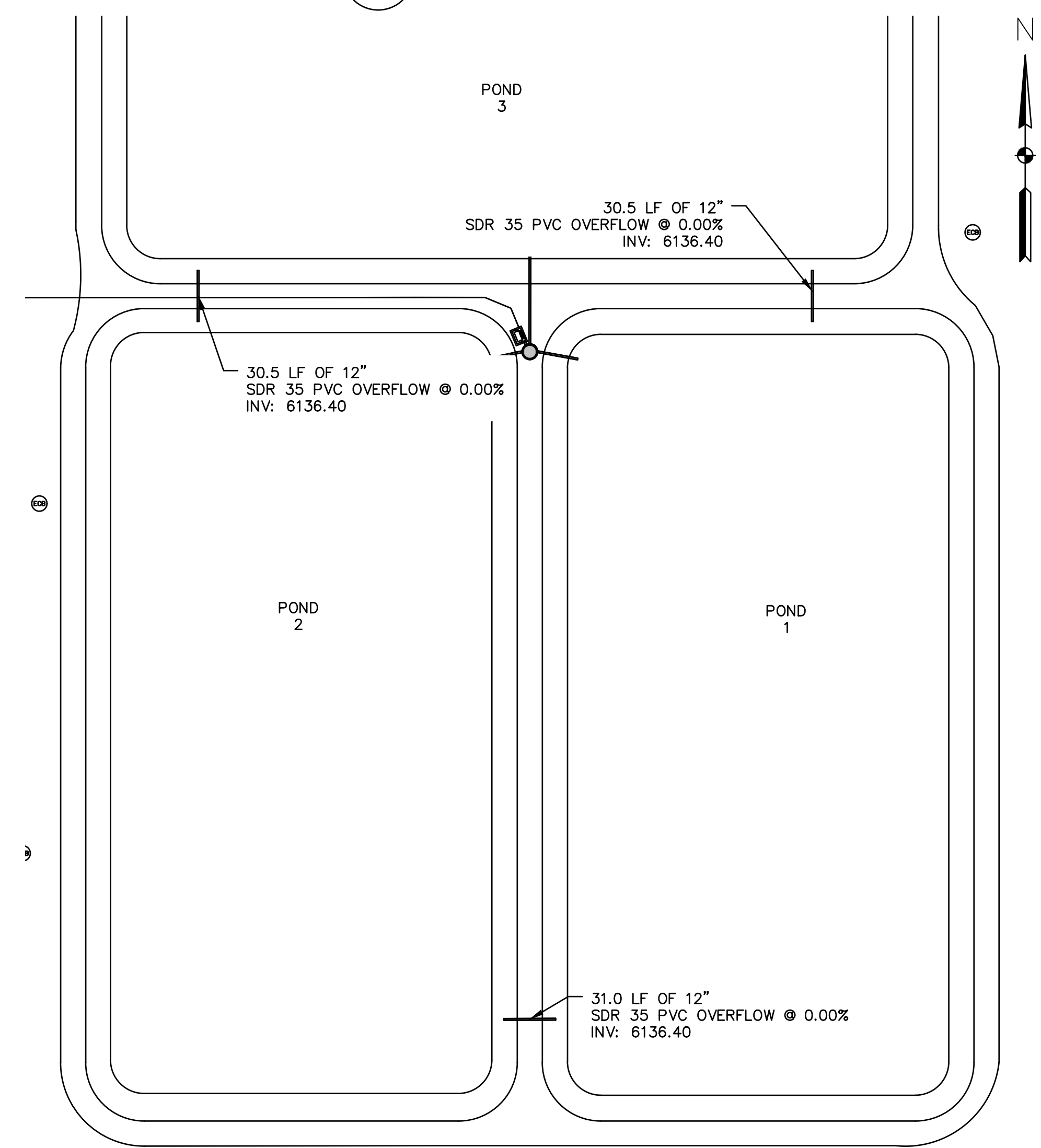


**A** INFLUENT SPLITTER STRUCTURE AND INFLEUNT PIPING PLAN  
C21 1/4" = 1'

NOTE: CUT GRATING AS NECESSARY TO FACILITATE SLIDE GATE INSTALLATION AND OPERATION



**B** INFLUENT SPLITTER STRUCTURE PROFILE  
C21 1/2" = 1'



**C** OVERFLOW PIPING  
C21 1" = 60'

REVISIONS	DATE	DESCRIPTION

WASTEWATER TREATMENT PLANT  
SPLITTER BOX & POND OVERFLOW PIPING  
TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF  
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ELEMENT ENGINEERING, LLC  
DATE  
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SCALE  
AS SHOWN  
EDITION  
PERMITTING  
SHEET  
C19 OF C29



- NOTES:  
 1. CONTRACTOR TO STRIP TOP 6" OF EXISTING MATERIAL AND VEGETATION AND DISPOSE OF OFF-SITE.

The geotechnical hazard report references a natural drainage swale in the middle of the east edge of the site that connects to an eroding gully. Show and label the existing drainageways. On page 20 of the report under the erosional features section, the report state that engineering controls should be implemented to prevent concentrated flows from the eroding existing swales from progressing the headward erosion. Show repairs and engineering control work to address this geotechnical finding.

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD
C1	65.97'	42.00'	90°00'00"	N43°52'52"E	59.50'
C2	65.97'	42.00'	90°00'00"	S46°07'08"E	59.50'
C3	49.59'	56.00'	50°44'10"	S25°22'05"E	47.98'
C4	66.76'	42.50'	90°00'00"	S45°00'00"E	60.10'
C5	65.97'	42.00'	90°00'00"	S43°52'52"W	59.50'
C6	65.97'	42.00'	90°00'00"	S46°07'08"W	59.50'
C7	65.97'	42.00'	90°00'00"	S43°52'52"W	59.50'
C8	65.97'	42.00'	90°00'00"	S46°07'08"W	59.50'
C9	65.97'	42.00'	90°00'00"	S46°07'08"W	59.50'

ESTIMATED CUT/FILL QUANTITIES  
 CUT (EST): 49,781 CY  
 FILL (EST): 38,341 CY (1.15 COMPACTION FACTOR)  
 TOP SOIL REMOVAL (EST): 9,916 CY

ESTIMATED POND LINER  
 POND LINER (EST): 402,446 SF

NOTE: CUT, FILL, AND POND LINER ARE BID AS LUMP SUM. LINER LUMP SUM TO INCLUDE ANCHOR TRENCH, ETC. CONTRACTOR TO VERIFY QUANTITIES FROM CAD FILES PRIOR TO BIDDING.

28 LF 24" CORRUGATED HDPE CULVERT AT PONDS ENTRANCE.

15' WIDE ACCESS ROAD TO PONDS  
 INSTALL 16' WIDE BARB WIRE GATE, ADD CROSS BRACE POST ON EACH SIDE

15' SITE ACCESS ROAD

INSTALL 16' WIDE GATE TO PONDS

START OF DRAINAGE SWALE (DS) SLOPE 1% TO SOUTH

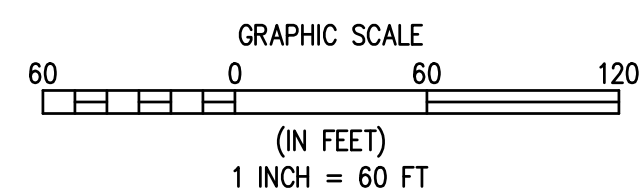
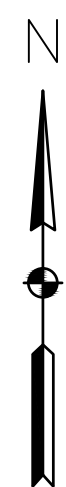
INFLUENT STRUCTURE SEE SHEET C21

Is a temporary crossing needed to convey flows through to existing was area?

SWMP calls for rock check dams in the swale - include them on the GEC drawings and add to details or provide equivalent BMPs. Verify both the SWMP text and GEC plan sheets match.

All construction access points require VTCs.

VTCs must be 75' long and be connected to the roadway. Verify the dimensions shown match the standard detail.

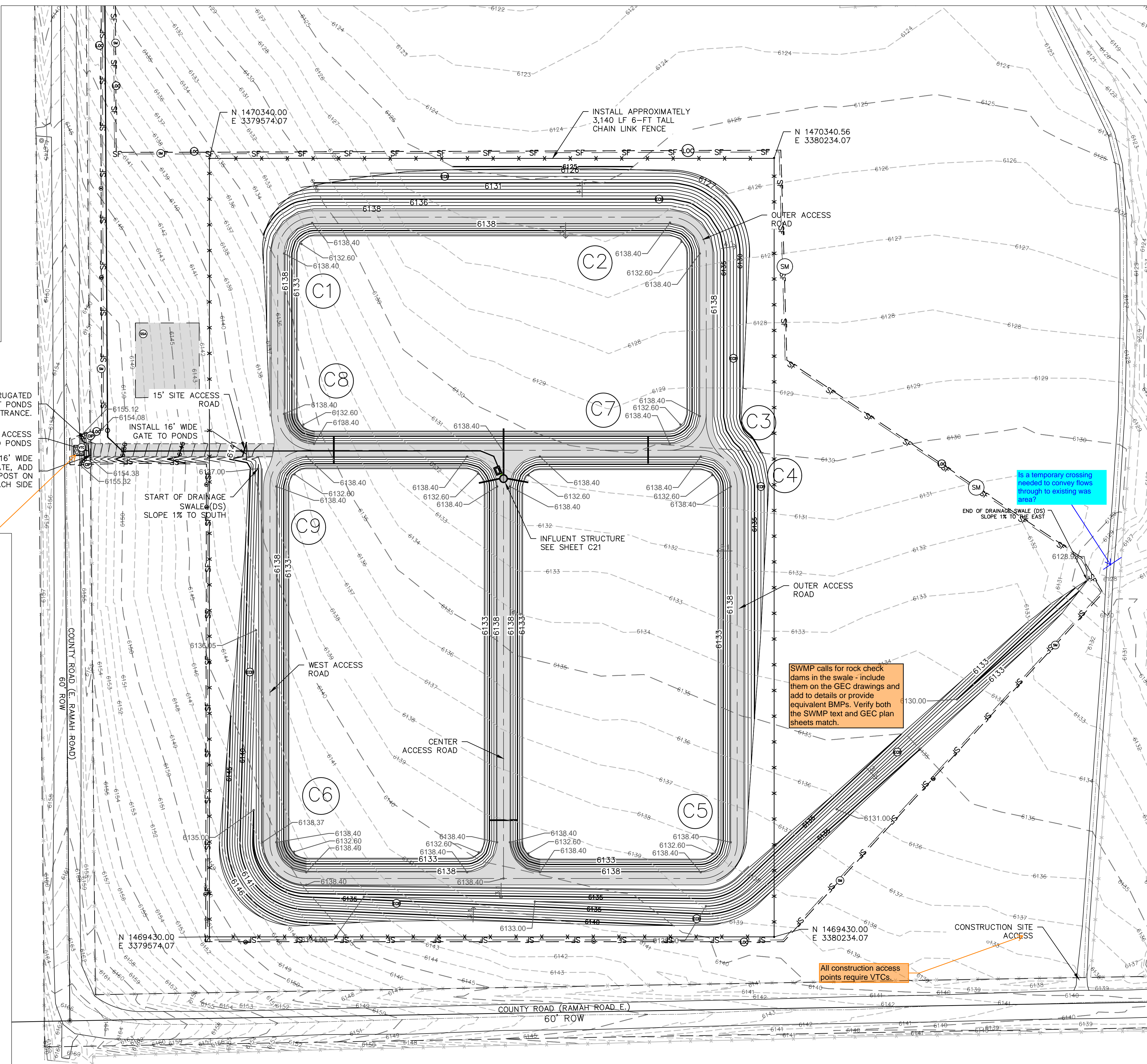


BMP LINE TYPES AND SYMBOLS DESCRIPTIONS

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- EROSION CONTROL BLANKETS TO BE USED ON ALL SLOPES 3:1 OR GREATER



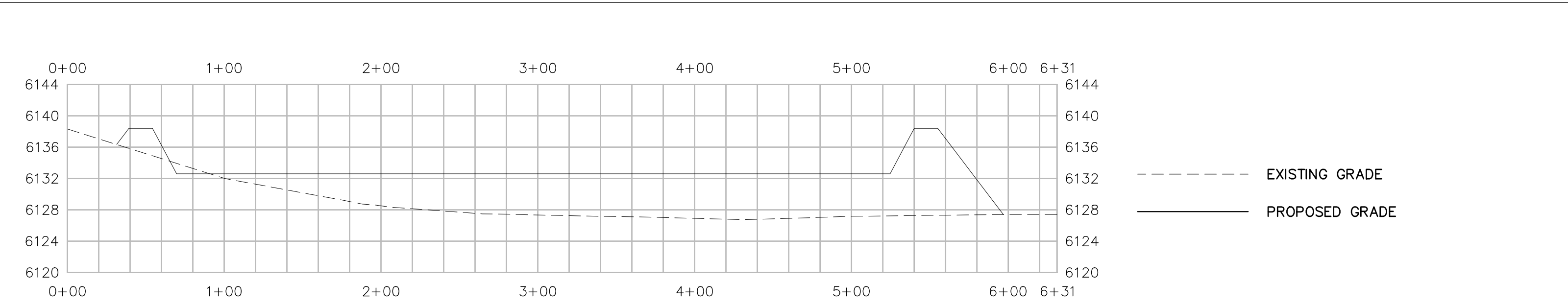
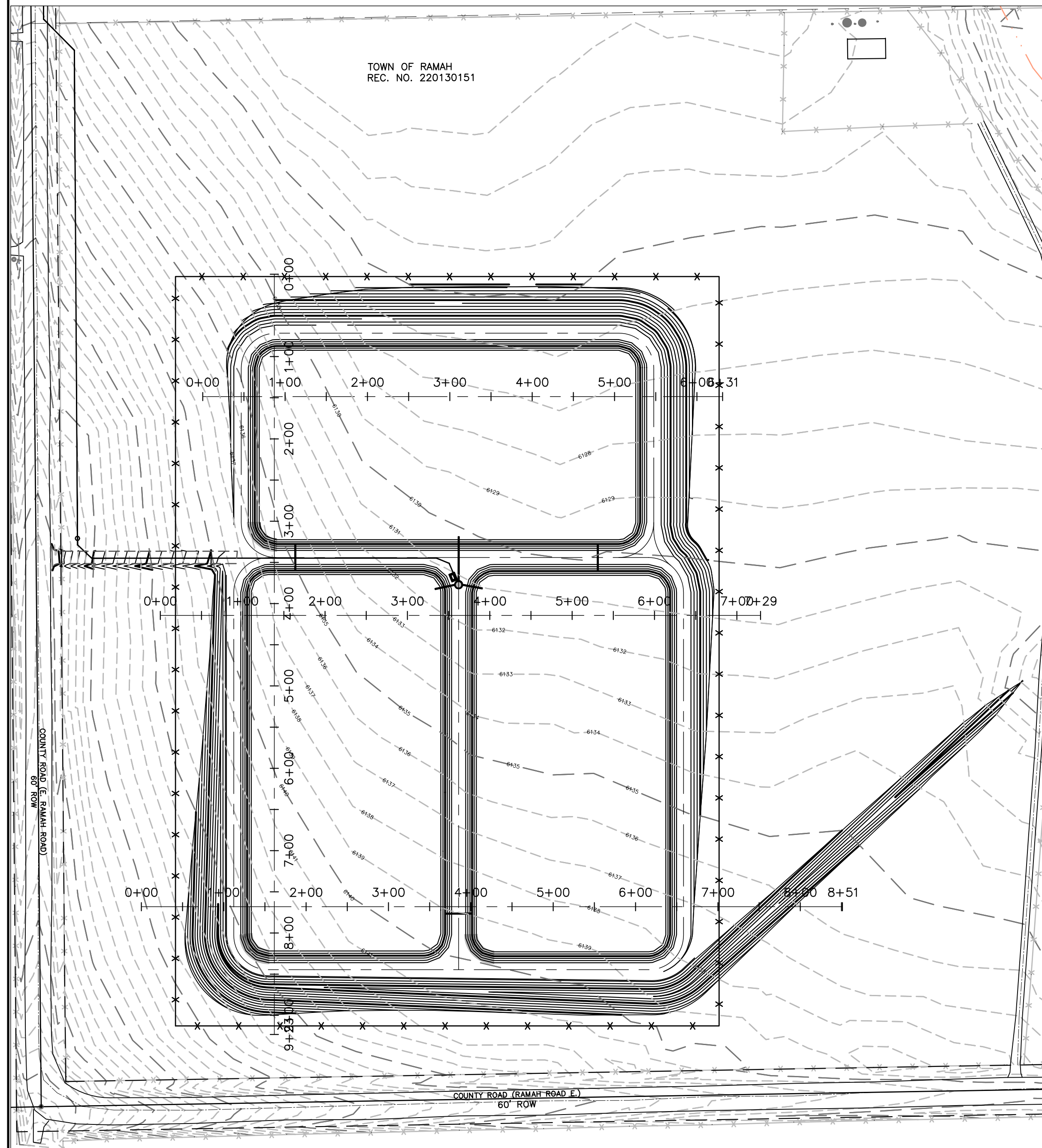
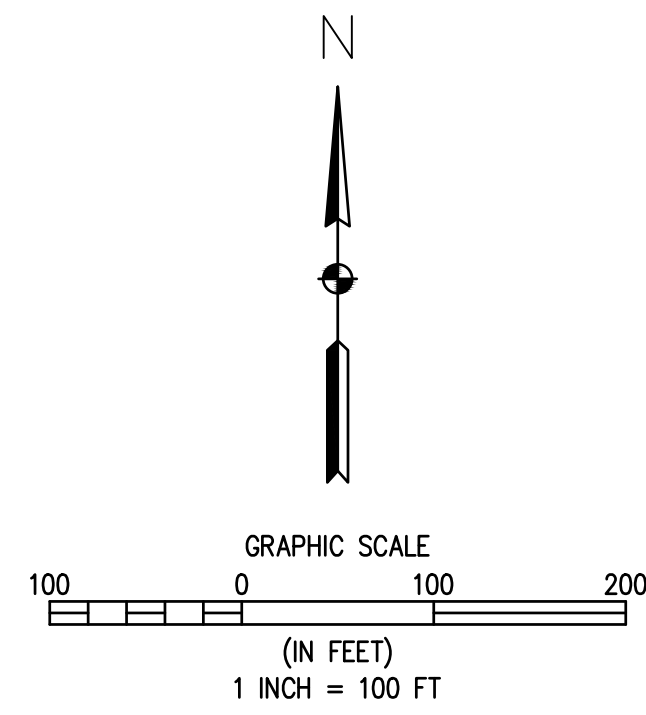
NO.	DATE	DESCRIPTION

WASTEWATER TREATMENT PLANT &  
 HORIZONTAL CONTROL &  
 GRADING  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

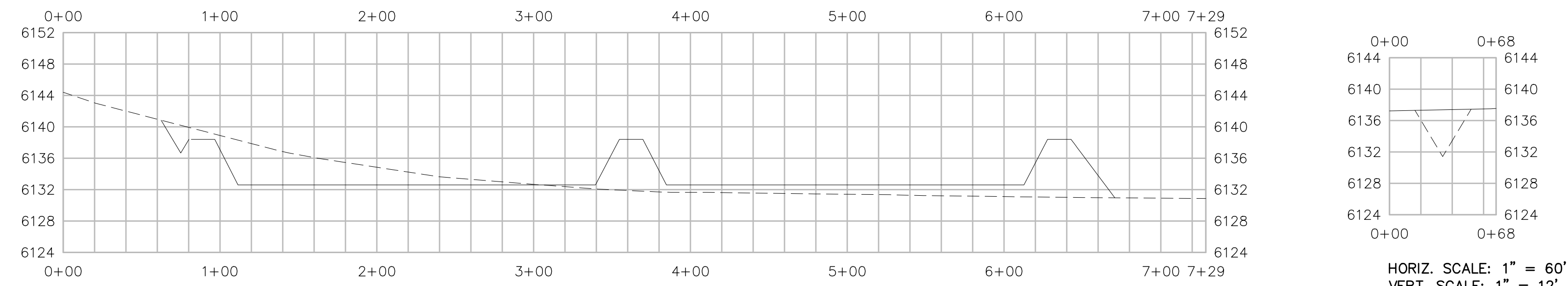
PREPARED UNDER THE DIRECT SUPERVISION OF

DATE	OCTOBER 2022
JOB NUMBER	0043.0001
SCALE	1" = 60'
EDITION	PERMITTING
SHEET	C20 OF C29

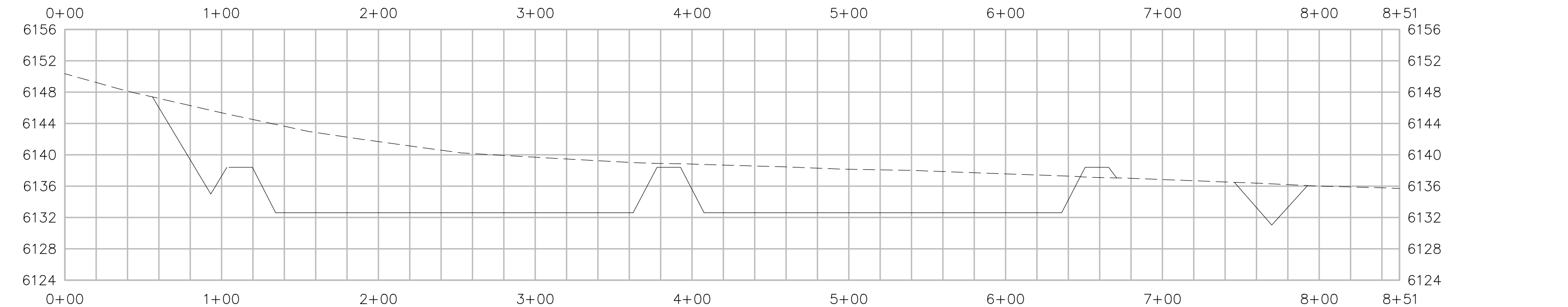




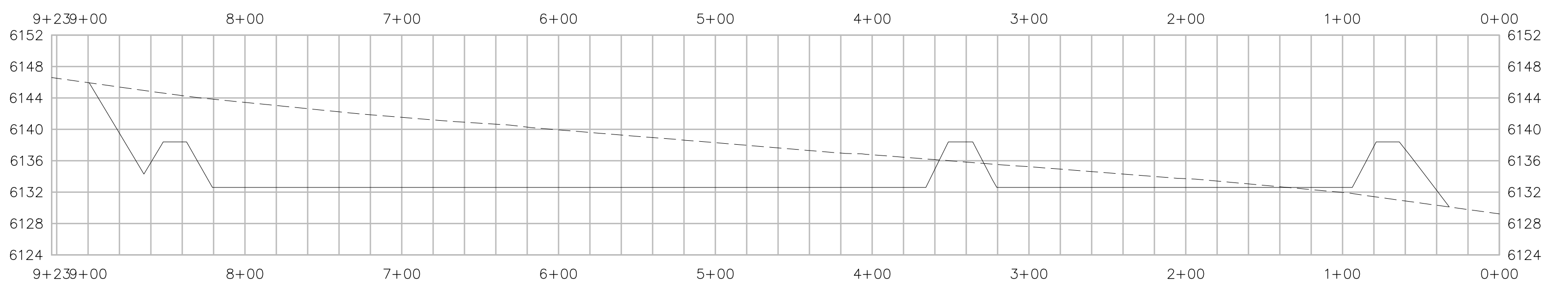
HORIZ. SCALE: 1" = 60'  
VERT. SCALE: 1" = 12'



HORIZ. SCALE: 1" = 60'  
VERT. SCALE: 1" = 12'



HORIZ. SCALE: 1" = 60'  
VERT. SCALE: 1" = 12'



HORIZ. SCALE: 1" = 60'  
VERT. SCALE: 1" = 12'

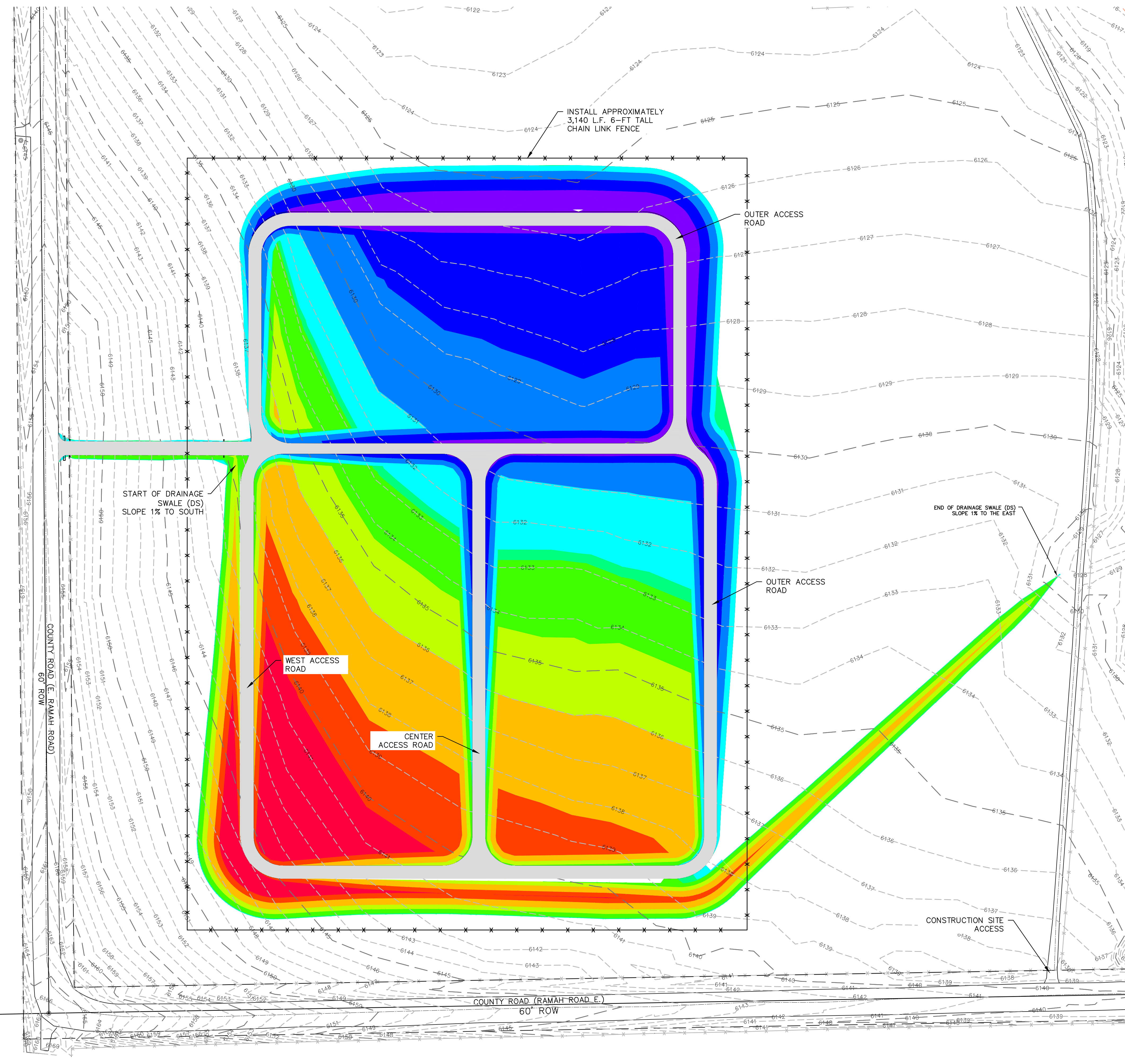
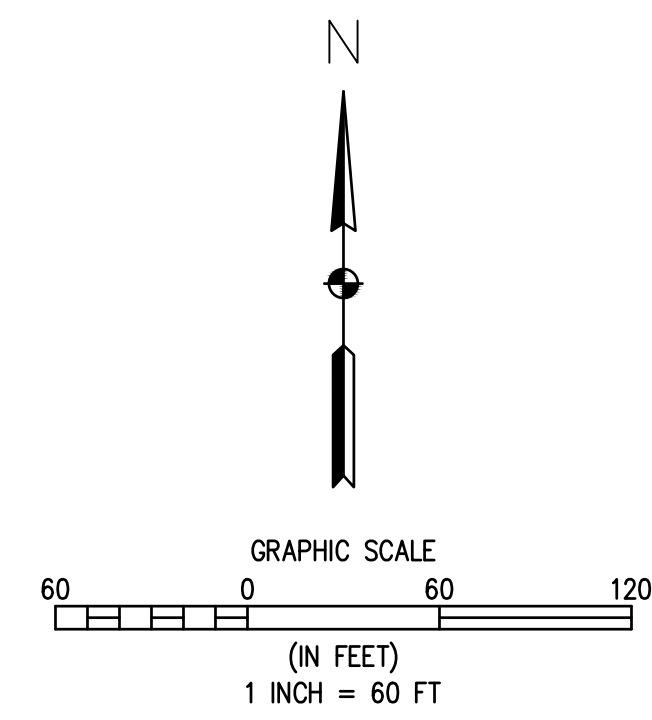
NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
**POND GRADING PROFILES**  
TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF



ELEVATIONS TABLE			
NUMBER	MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
1	-11.98	-7.62	Red
2	-7.62	-5.76	Orange
3	-5.76	-3.40	Yellow
4	-3.40	-1.76	Light Green
5	-1.76	-0.23	Green
6	-0.23	0.00	Cyan
7	0.00	1.64	Blue
8	1.64	4.11	Dark Blue
9	4.11	7.28	Dark Purple
10	7.28	12.90	Light Purple



INSTALL APPROXIMATELY  
3,140 L.F. 6-FT TALL  
CHAIN LINK FENCE

OUTER ACCESS ROAD

START OF DRAINAGE SWALE (DS)  
SLOPE 1% TO SOUTH

END OF DRAINAGE SWALE (DS)  
SLOPE 1% TO THE EAST

WEST ACCESS ROAD

CENTER ACCESS ROAD

OUTER ACCESS ROAD

CONSTRUCTION SITE ACCESS

COUNTY ROAD (RAMAH ROAD E.)  
60' ROW

COUNTY ROAD (E. RAMAH ROAD)  
60' ROW

NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
**CUT & FILL PLAN**  
TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC
DATE OCTOBER 2022
JOB NUMBER 0043.0001
SCALE
EDITION PERMITTING
SHEET C22 OF C29



LINER AND VENT INFORMATION

LINER MATERIAL: 45-MIL FPP-R (FLEXIBLE REINFORCED POLYPROPYLENE) OR 45-MIL LLDPE-R (LINEAR LOW DENSITY REINFORCED POLYETHYLENE)

AIR/GAS VENT STRIP: DIMPLED STRIP AT 45-FT ON CENTER BOTH DIRECTIONS (SEE DETAIL)

AIR/GAS VENTS: ON SIDE SLOPE WITH EACH VENT STRIP (SEE DETAIL)

SPECIFICATIONS: SEE TECHNICAL SPECIFICATIONS FOR SPECIFIC MATERIAL PROPERTIES AND REQUIREMENTS.

- NOTES:
- CONTRACTOR TO REMOVE ANY DIRT AND DEBRIS WHICH MAY DAMAGE LINER SYSTEM. ANY DEBRIS GREATER THAN 3/8" DIAMETER TO BE REMOVED PRIOR TO INSTALLATION.
  - CONTRACTOR RESPONSIBLE FOR LOCATION AND PROTECTION OF ALL UTILITIES PRIOR TO AND DURING CONSTRUCTION.
  - AIR/GAS VENTING STRIP TO BE INSTALLED AFTER SUBGRADE IS COMPACTED AND AT FINAL GRADE.
  - CONTRACTOR TO FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS FOR HAULING, STOCKPILING, STAGING, UNLOADING, AND INSTALLATION OF LINER SYSTEM.
  - PROTECT EXISTING ASPHALT, STRUCTURES, AND CURB AND GUTTER FROM DAMAGE. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO EXISTING INFRASTRUCTURE.
  - PRIOR TO INSTALLATION OF LINER, ENGINEER'S REPRESENTATIVE SHALL APPROVE THE INSTALLATION OF AIR/GAS VENTING STRIPS.
  - PRIOR TO INSTALLATION OF BALLAST, ENGINEER'S REPRESENTATIVE SHALL APPROVE THE LINER AND AIR/GAS VENT.
  - AIR/GAS VENTING STRIP TO MEET THE FOLLOWING SPECIFICATIONS:
    - STRUCTURE: SIMPLED STRIP
    - POLYMER: PS
    - THICKNESS: 1-INCH
    - THRU-FLOW: YES
    - COMPRESSIVE STRENGTH (ASTM D 1621): 9,500 PSF
    - FLOW (ASTM D 4716): 30 GPM/FT
    - FABRIC/BACKING: CORE ENCAPSULATED W/ 4 OZ NW
    - WIDTH: 12-INCH
  - INSTALL AIR/GAS VENT 6-INCHES BELOW CREST OF LINER ABOVE EACH AIR/GAS VENTING STRIP. SEE DETAILS FOR INSTALLATION INFORMATION.
  - ENGINEER AND LINER MANUFACTURER REPRESENTATIVE TO APPROVE SUBGRADE PREPARATION PRIOR TO LINER INSTALLATION.
  - LINER AND MESH UNDER-LINER TO BE INSTALLED BY MANUFACTURER CERTIFIED INSTALLATION TECHNICIANS.
  - RESTORE AND RE-SEED SITE PER SPECIFICATIONS.
  - BALLAST INSTALLATION REQUIREMENTS (PER POND)

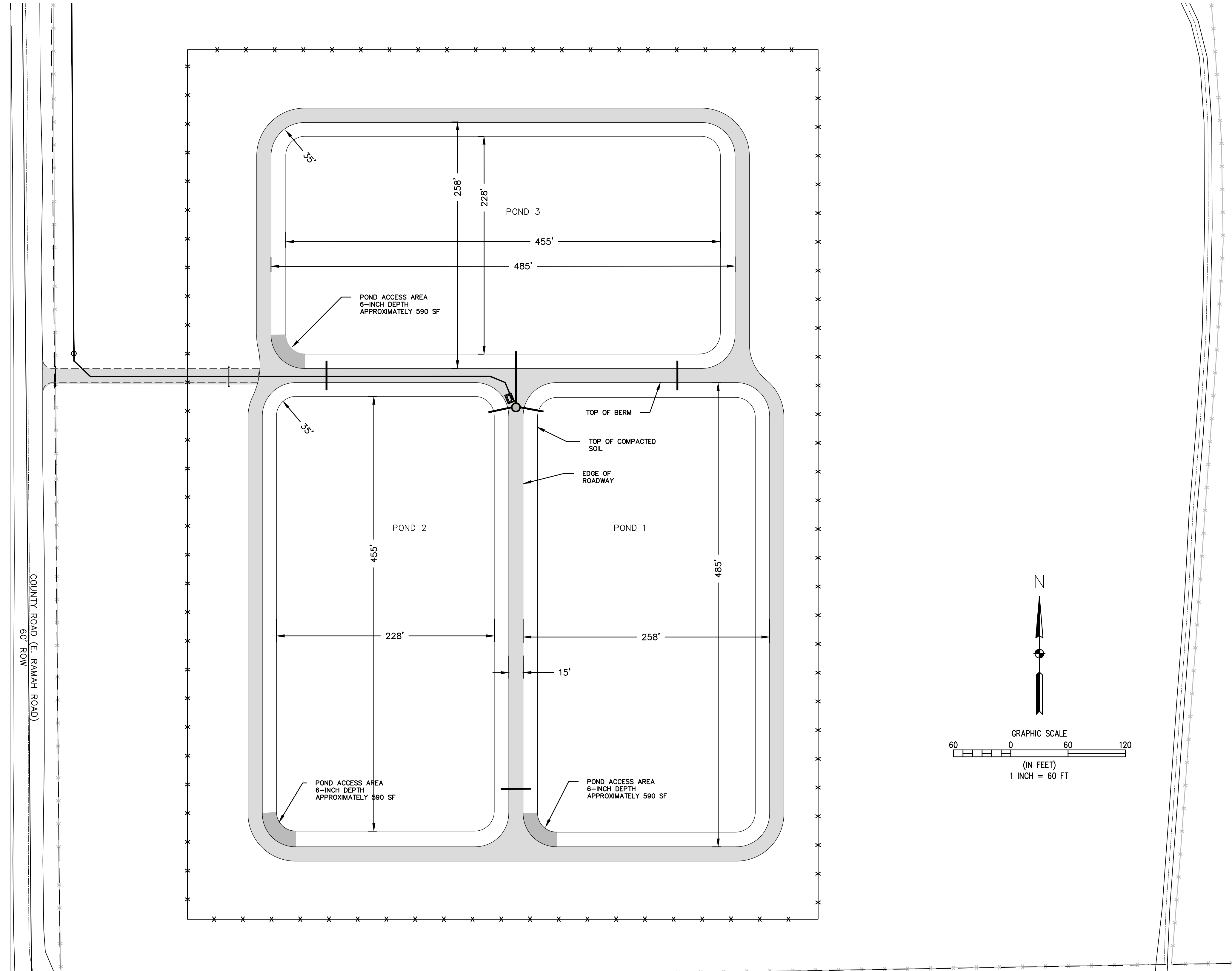
TOE OF SLOPE WILL REQUIRE PERMANENT TOE BALLAST IN THE FORM OF UV RESISTANT SAND TUBES. TOE BALLAST MINIMUM REQUIREMENTS ARE ONE 45 KG SAND TUBE SPACED 5.2 M CENTER TO CENTER ALONG THE TOE OR APPROXIMATELY 80 BALLAST TUBES ALONG THE TOE. IN ADDITION, ALL SLOPE AREAS OF THE CONTAINMENT SHOULD BE BALLASTED ON THE SLOPE WITH A MINIMUM OF 3 SAND TUBES PER CABLE SUPPORTED STRING WITH RESTRAINING CABLE TIE-OFF AT THE TOP OF SLOPE WITHIN THE ANCHOR TRENCH. SPACING OF BALLAST TUBE STRINGS SHOULD BE AT 10.2 M (33.5 FT) INTERVALS ALONG THE INSIDE SLOPE WHICH RESULTS IN APPROXIMATELY 40 BALLAST STRINGS AND 120 BALLAST TUBES. FOR THE BOTTOM OPEN AREA, THE TUBES SHALL BE PLACED IN OFFSET STRINGS PARALLEL TO THE POND LONG DIMENSION OR WIDTH DIMENSION IN SO FAR AS PRACTICAL BUT POSITIONED TO APPROXIMATE ONE TUBE PER 16.4 SQM (176 SF) OR A TOTAL OF 430 BOTTOM SAND TUBES. TOTAL NUMBER OF SAND TUBES PER POND IS ESTIMATED TO BE 630.

SUMMARY BALLAST TUBES PER POND

3H:1V SLOPES	120 (40 BALLAST STRINGS WITH 3 EACH)
TOE OF SLOPE	80 (2 BALLAST TUBES BETWEEN SLOPE TUBES)
BOTTOM	430 (1 BALLAST TUBE PER 16.4 SQM)
TOTAL	630

POND DIMENSION INFORMATION

POND BOTTOM SURFACE AREA (PER POND):	103,333 SF (2.37 ACRES)	RADIUS OF CORNER AT BOTTOM:	20-FT
POND TOP SURFACE AREA (PER POND):	124,016 SF (2.85 ACRES)	RADIUS OF CORNER AT TOP:	35-FT
ASSUMED SLUDGE DEPTH:	6-INCHES	WIDTH OF POND AT BOTTOM:	228-FT
MAX OPERATING WATER LEVEL:	3-FEET	LENGTH OF POND AT BOTTOM:	455-FT
FREEBOARD:	2-FEET	WIDTH OF POND AT TOP:	258-FT
SIDE SLOPE RATIO:	3:1	LENGTH OF POND AT TOP:	485-FT
POND LENGTH TO WIDTH RATIO:	2:1	ROADWAY WIDTH:	15-FT
NO. PONDS	3		



NO.	REVISIONS	DATE	BY

WASTEWATER TREATMENT PLANT  
**POND DETAILS**  
 TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
 ELEMENT ENGINEERING, LLC

DATE  
 OCTOBER 2022

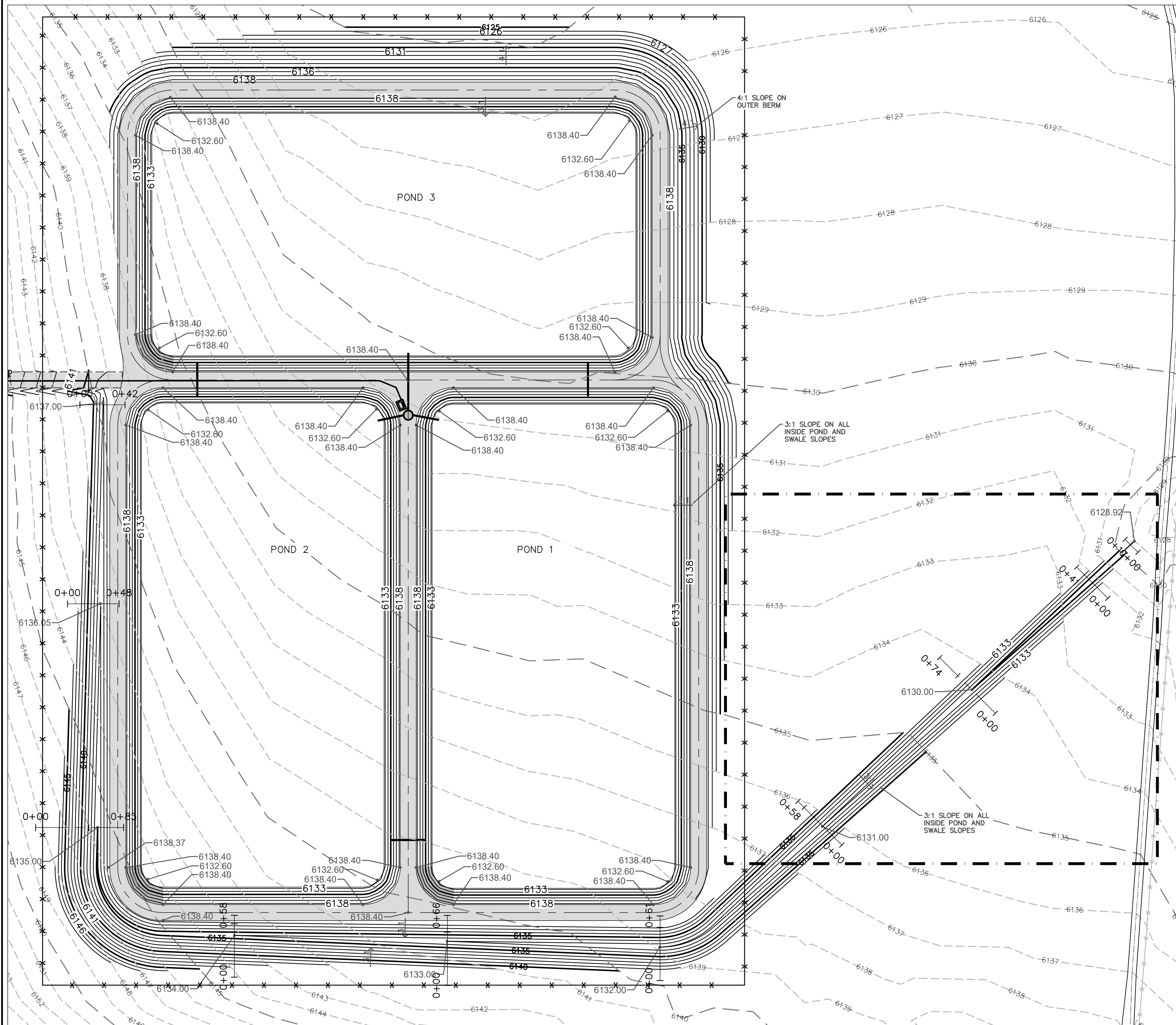
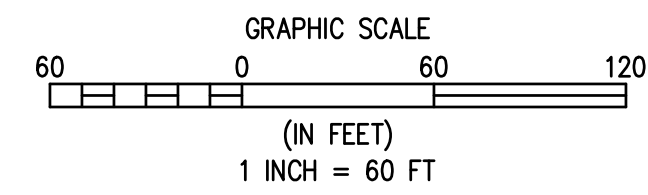
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 0043.0001

SCALE  
 1" = 60'

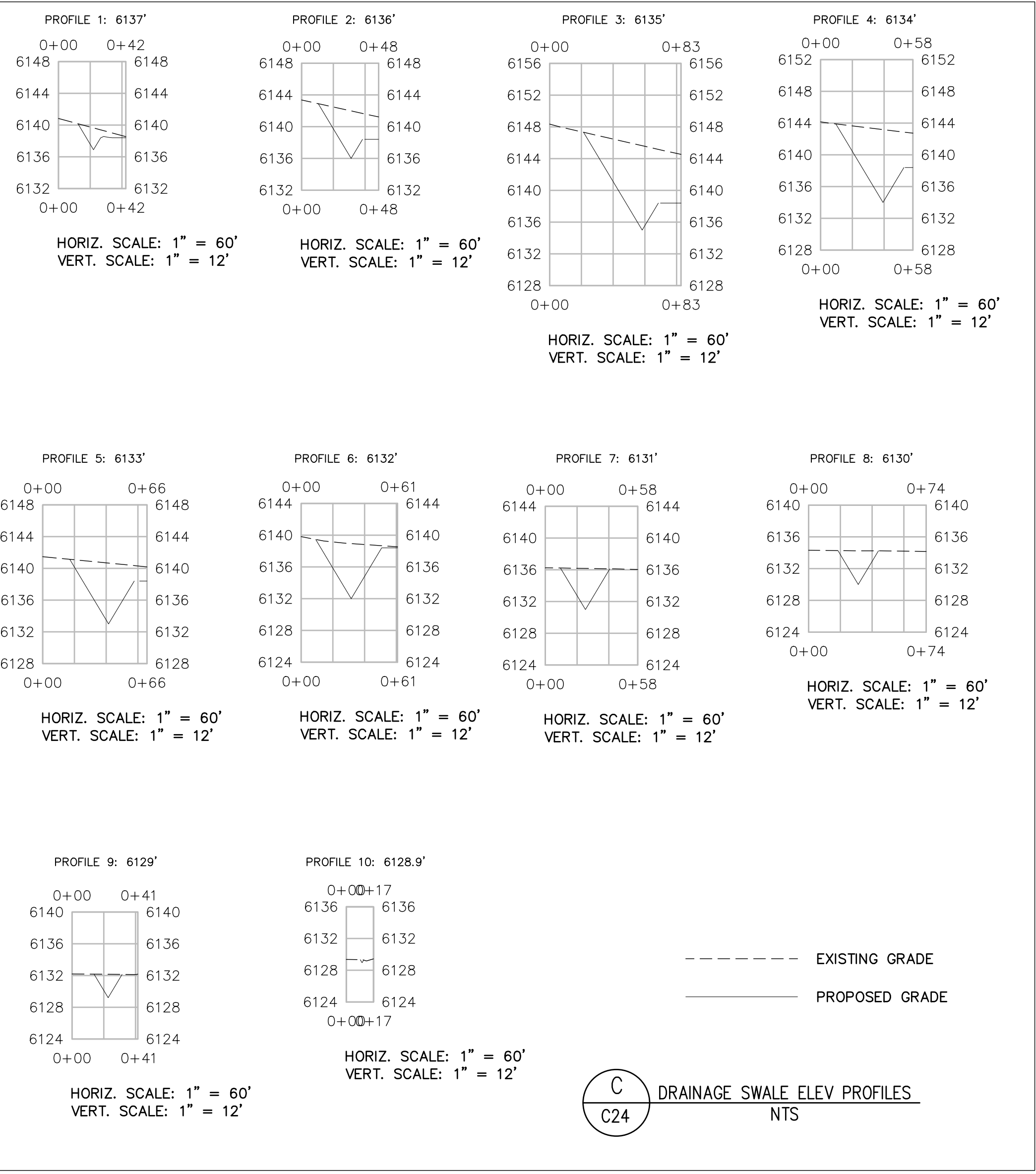
EDITION  
 PERMITTING

SHEET  
 C23 OF C29

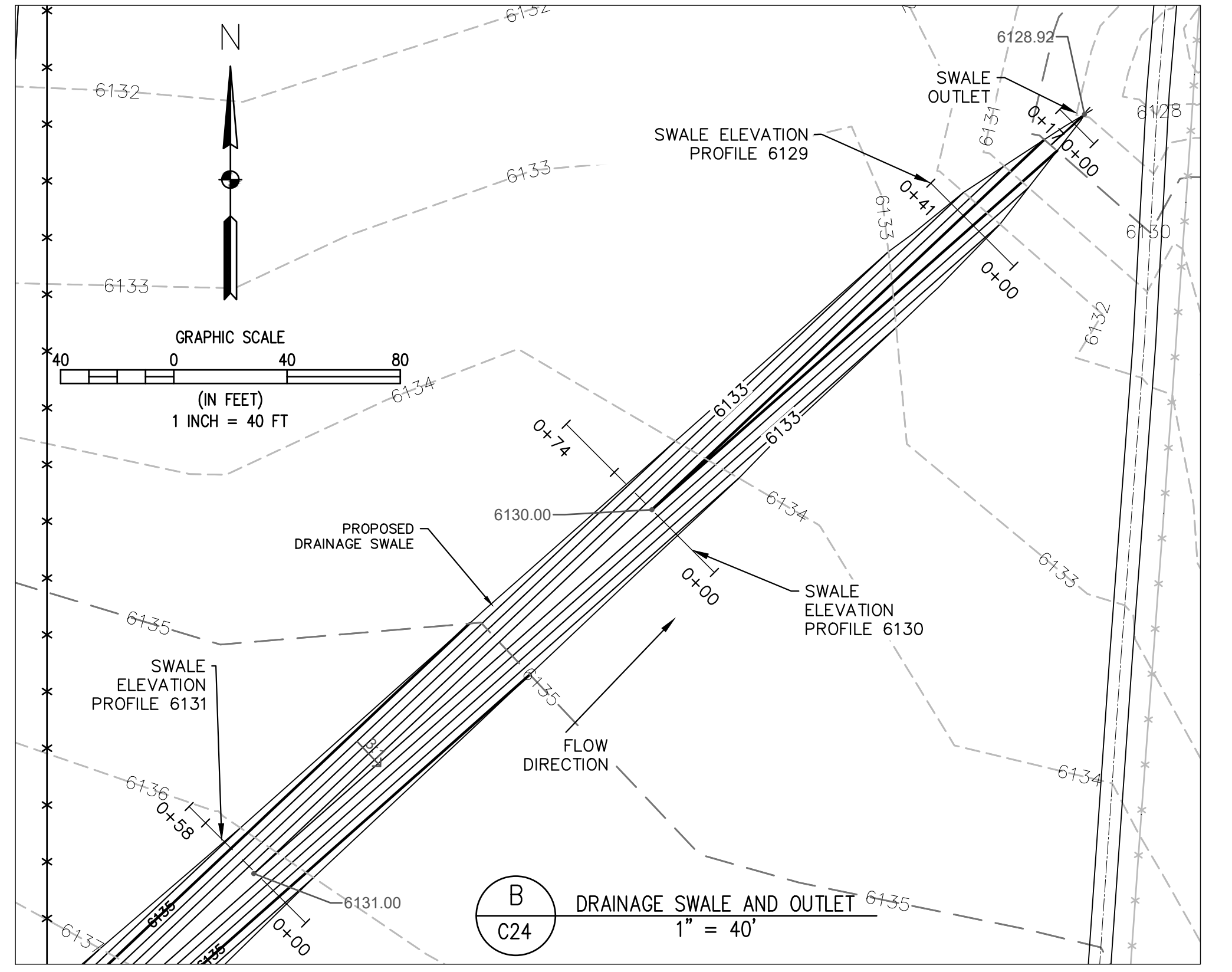




**A**  
C24 EVAPORATIVE PONDS DRAINAGE PLAN  
1" = 60'



**C**  
C24 DRAINAGE SWALE ELEV PROFILES  
NTS



**B**  
C24 DRAINAGE SWALE AND OUTLET  
1" = 40'

NO.	REVISIONS	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT  
DRAINAGE SWALE PLAN &  
PROFILE

TOWN OF RAMAH  
113 S. COMMERCIAL STREET  
RAMAH, CO 80832

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DATE  
OCTOBER 2022

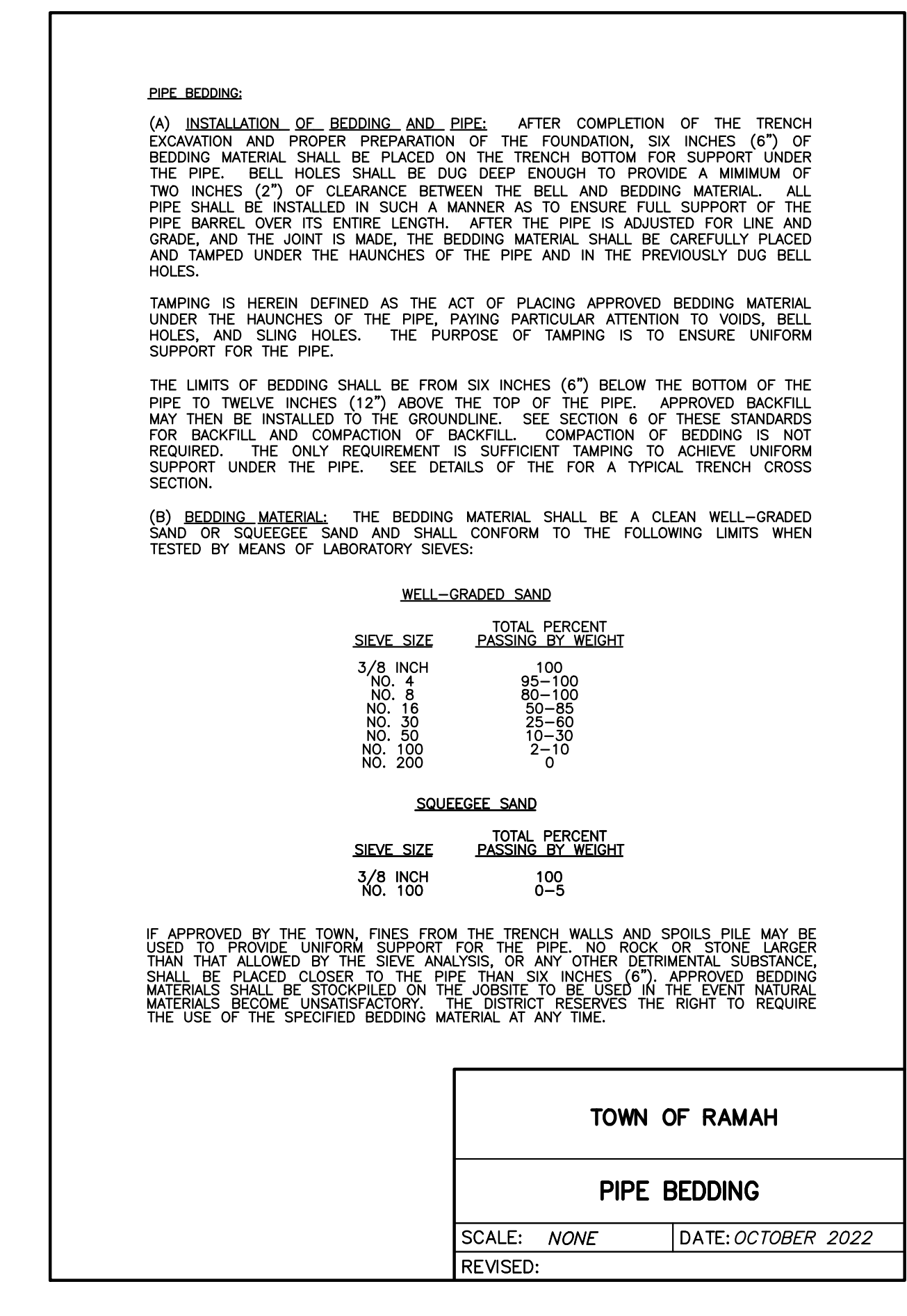
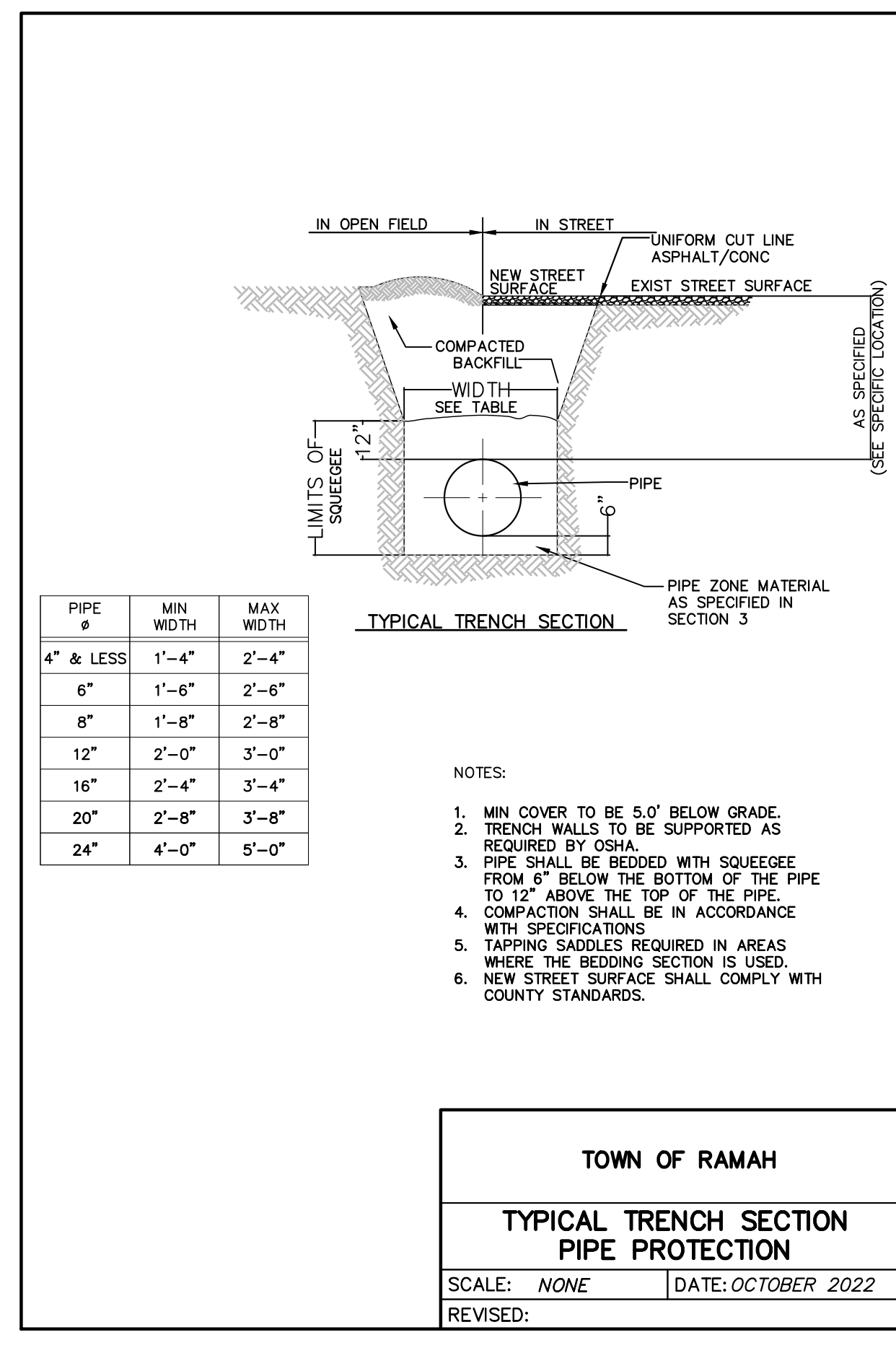
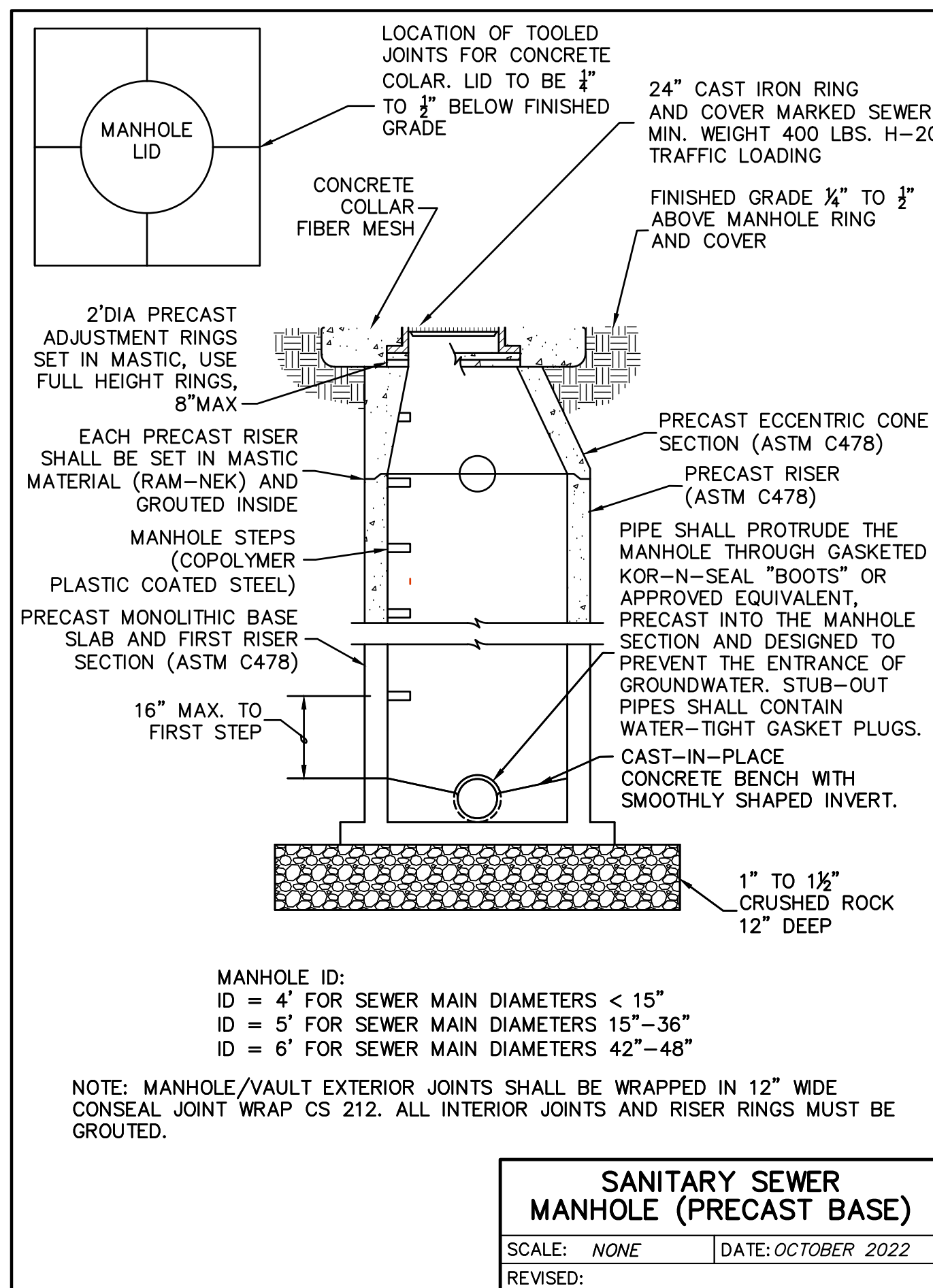
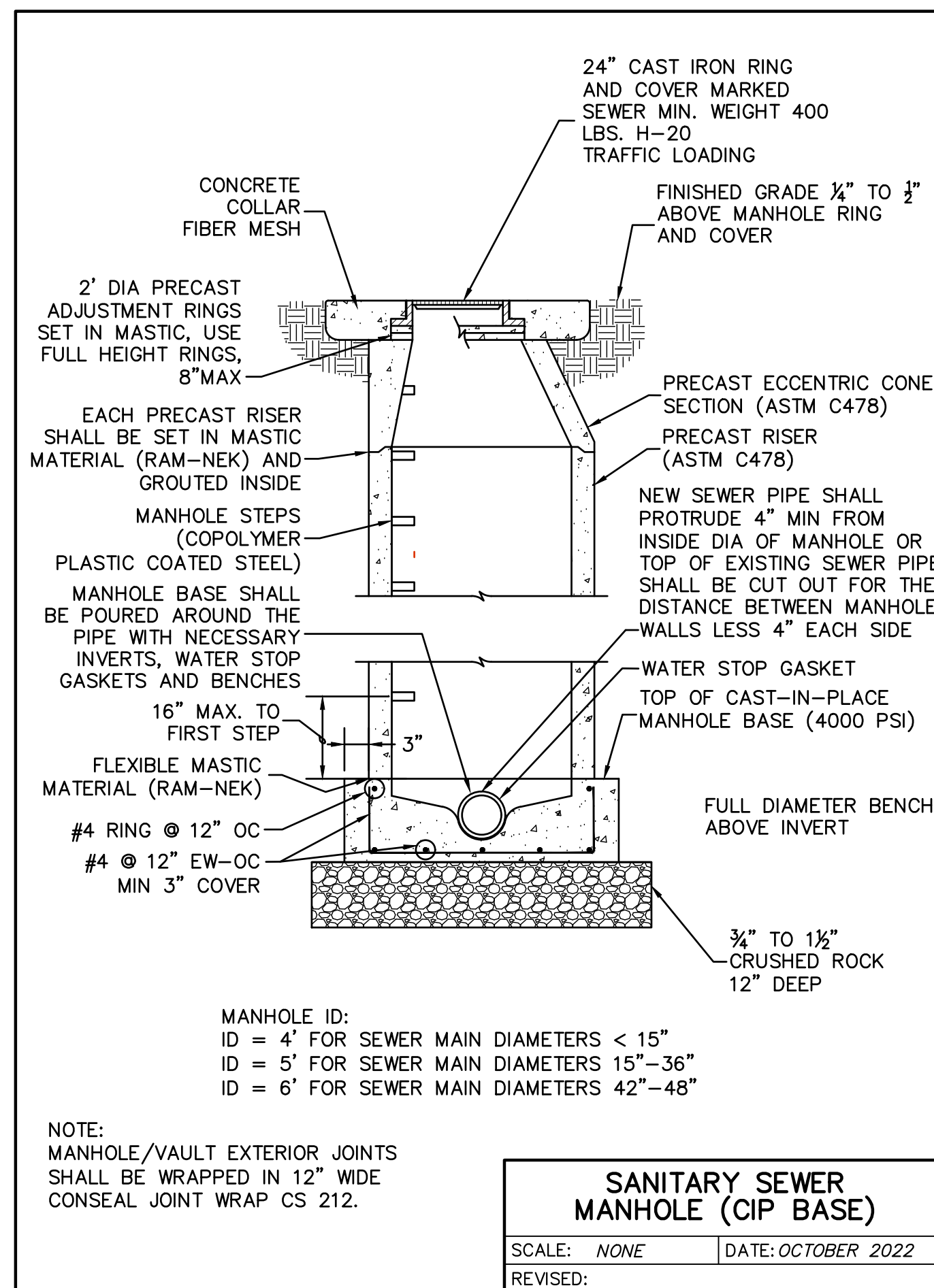
JOB NUMBER  
0043.0001

SCALE  
AS SHOWN

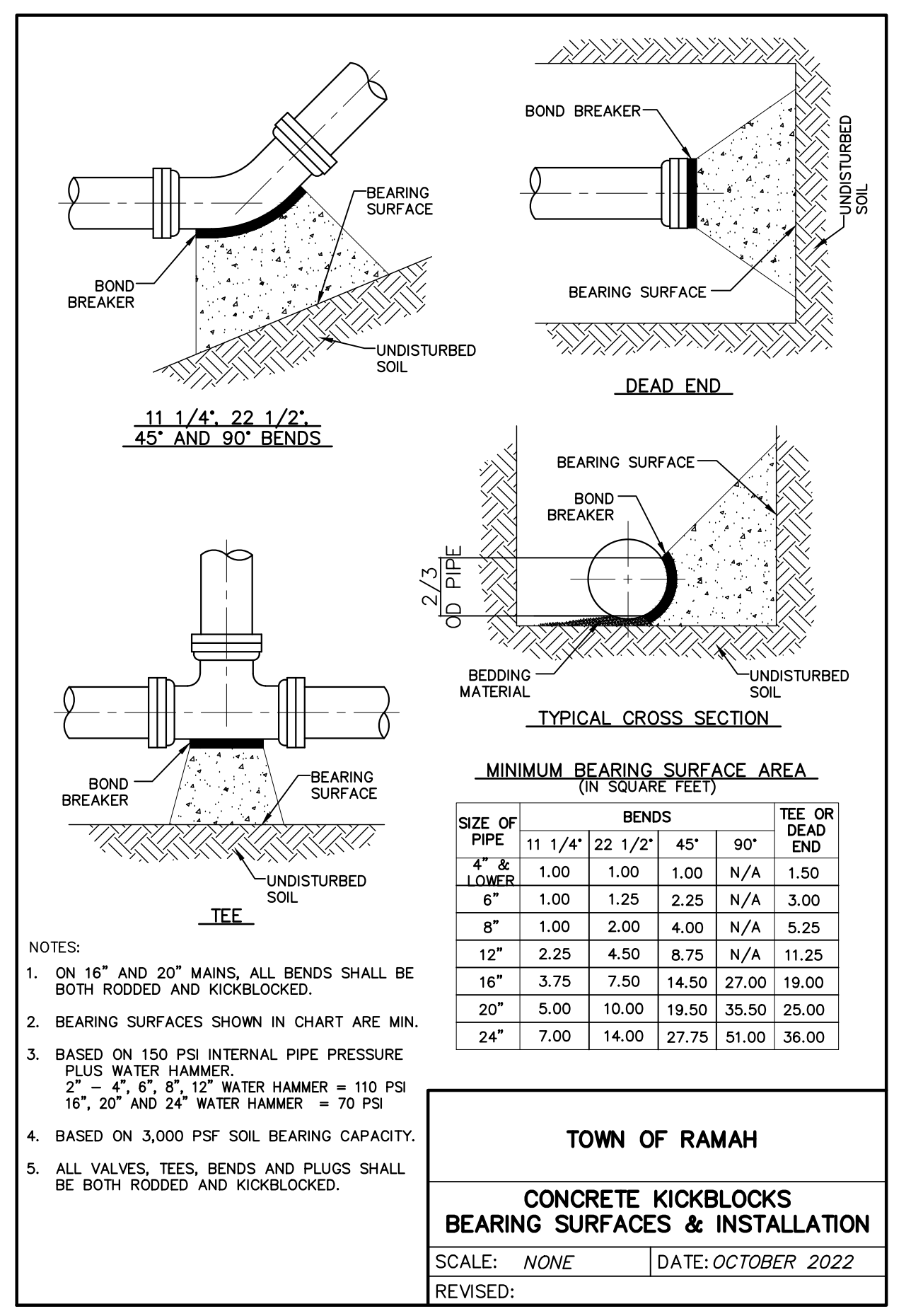
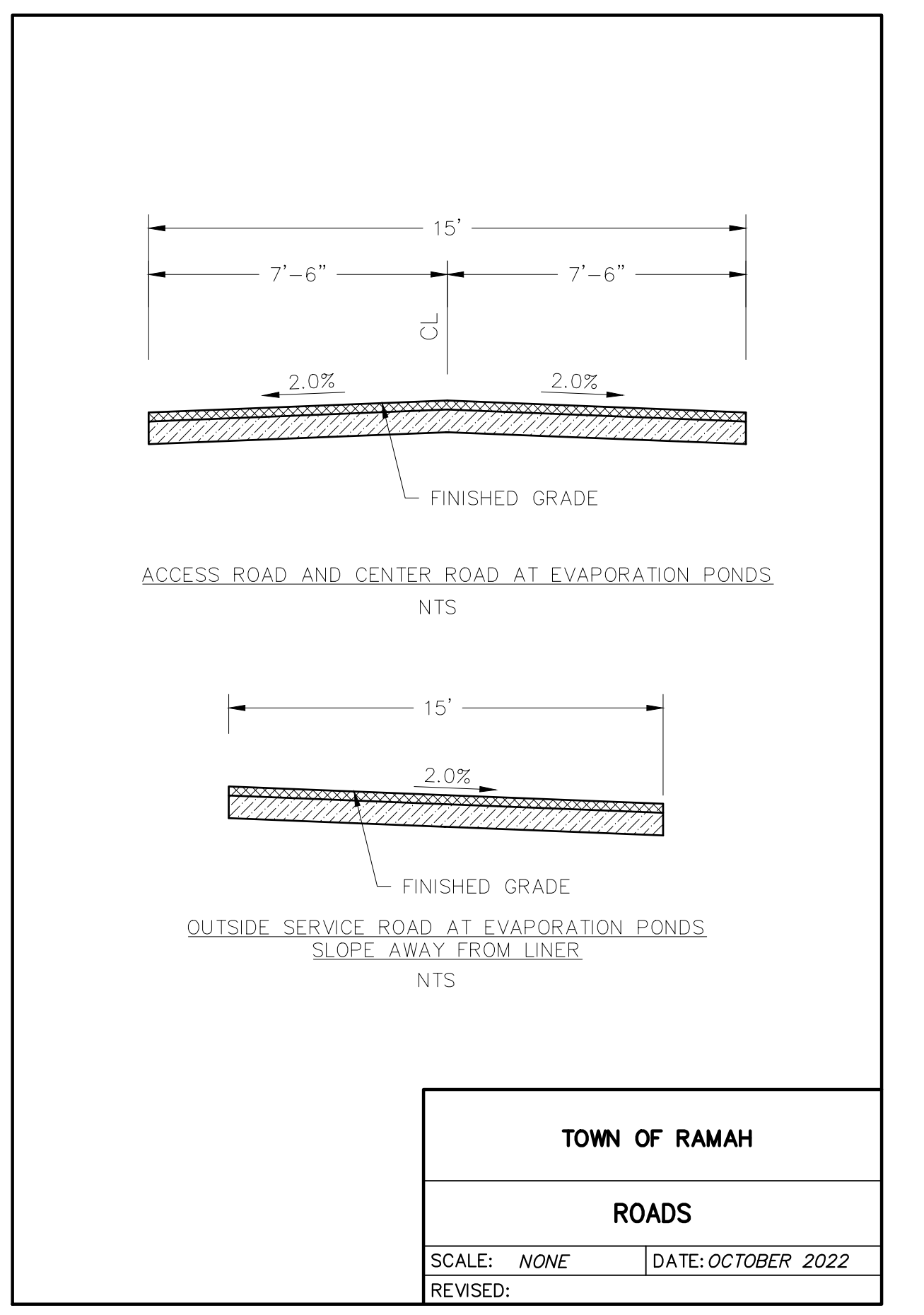
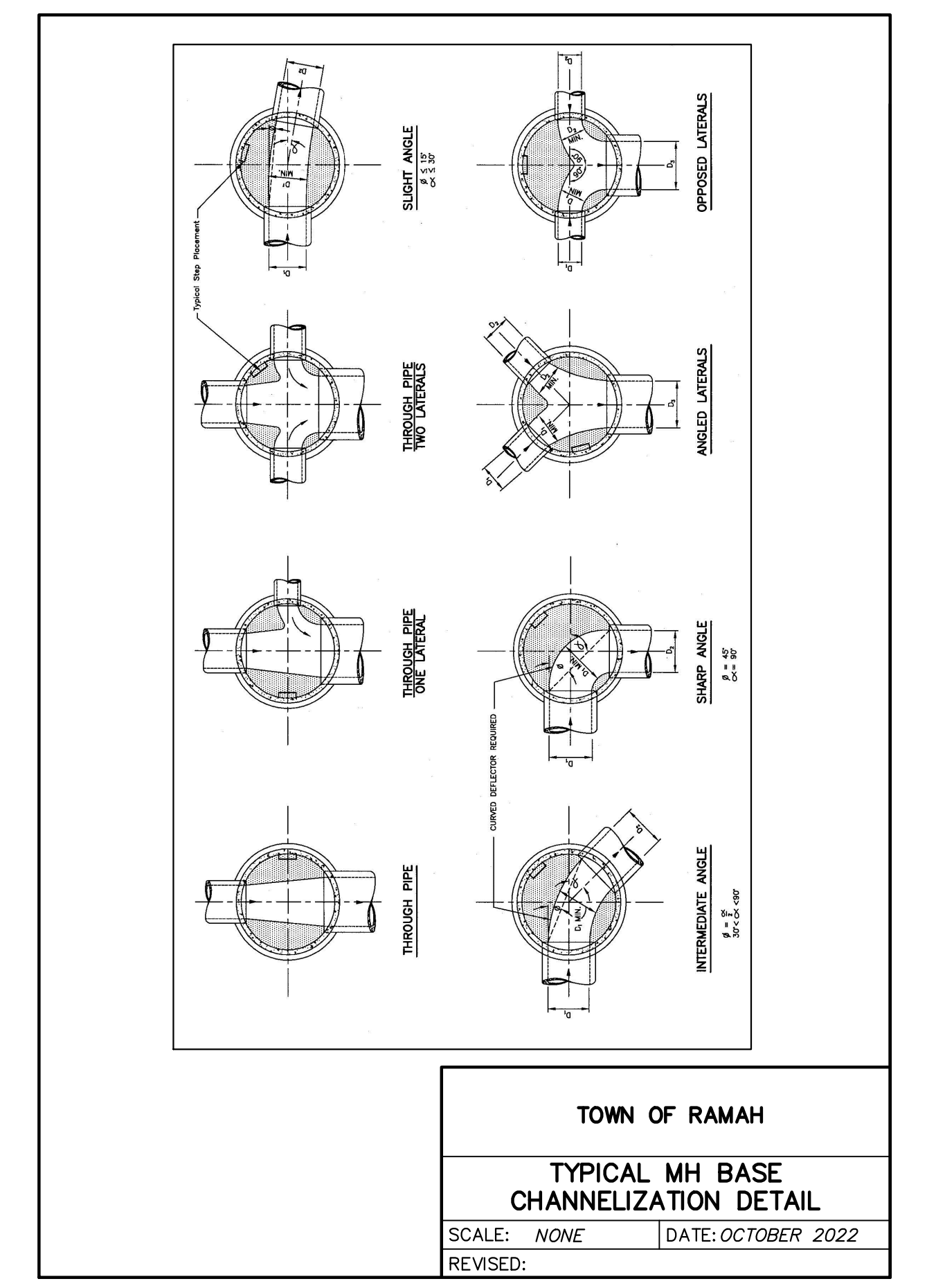
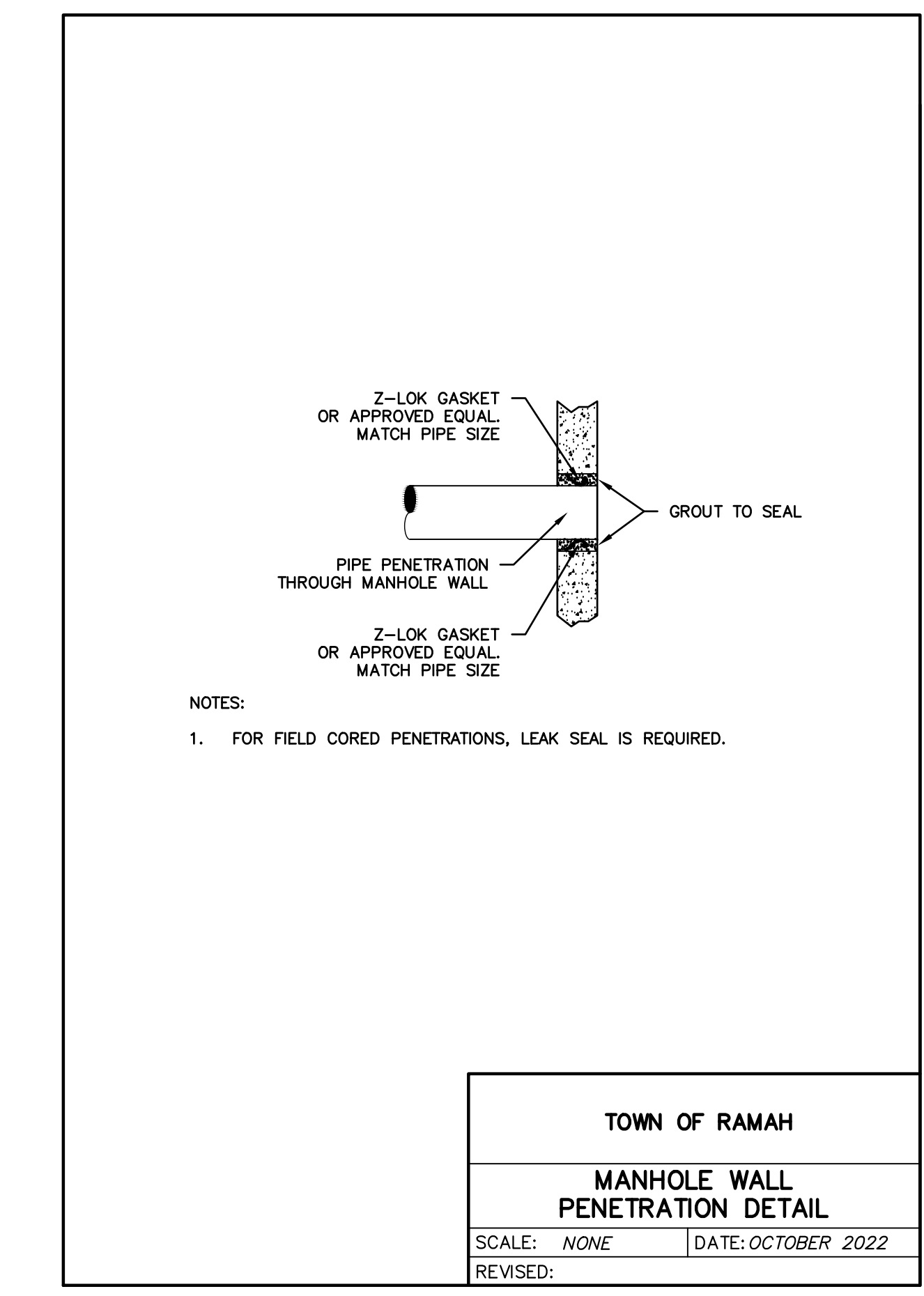
EDITION  
PERMITTING

SHEET  
C24 OF C29





NOTE: MANHOLE/VAULT BARREL SECTIONS WILL REQUIRE AN EXTERIOR COATING OF TNEMC SERIES 46-465 OR APPROVED EQUIVALENT IF GROUNDWATER IS ENCOUNTERED IN THE TRENCH.



**ELEMENT ENGINEERING LLC**  
 12687 W. CEDAR DRIVE, SUITE 300  
 LAKEWOOD, CO 80226  
 720.749.4165  
 WWW.ELEMENTENGINEERING.NET

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WASTEWATER TREATMENT PLANT  
 GENERAL DETAILS

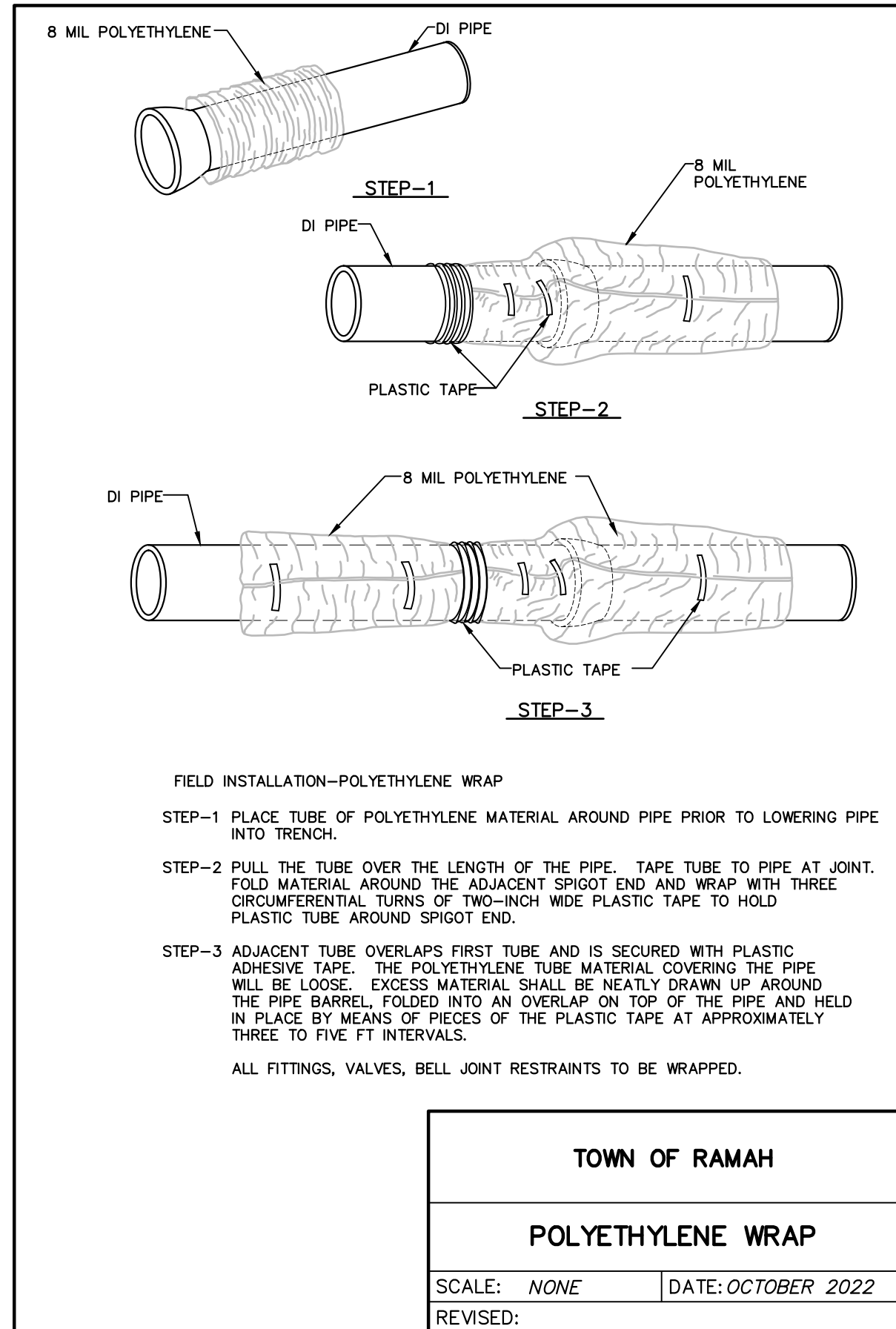
TOWN OF RAMAH  
 113 S. COMMERCIAL STREET  
 RAMAH, CO 80832

FOR AND ON BEHALF OF  
 ELEMENT ENGINEERING, LLC

DATE: OCTOBER 2022  
 JOB NUMBER: 0043.0001  
 SCALE: NTS  
 EDITION: PERMITTING

SHEET: C25 OF C29





**ROD DIAMETER, GRADE & LENGTH OF RESTRAINED PIPE**

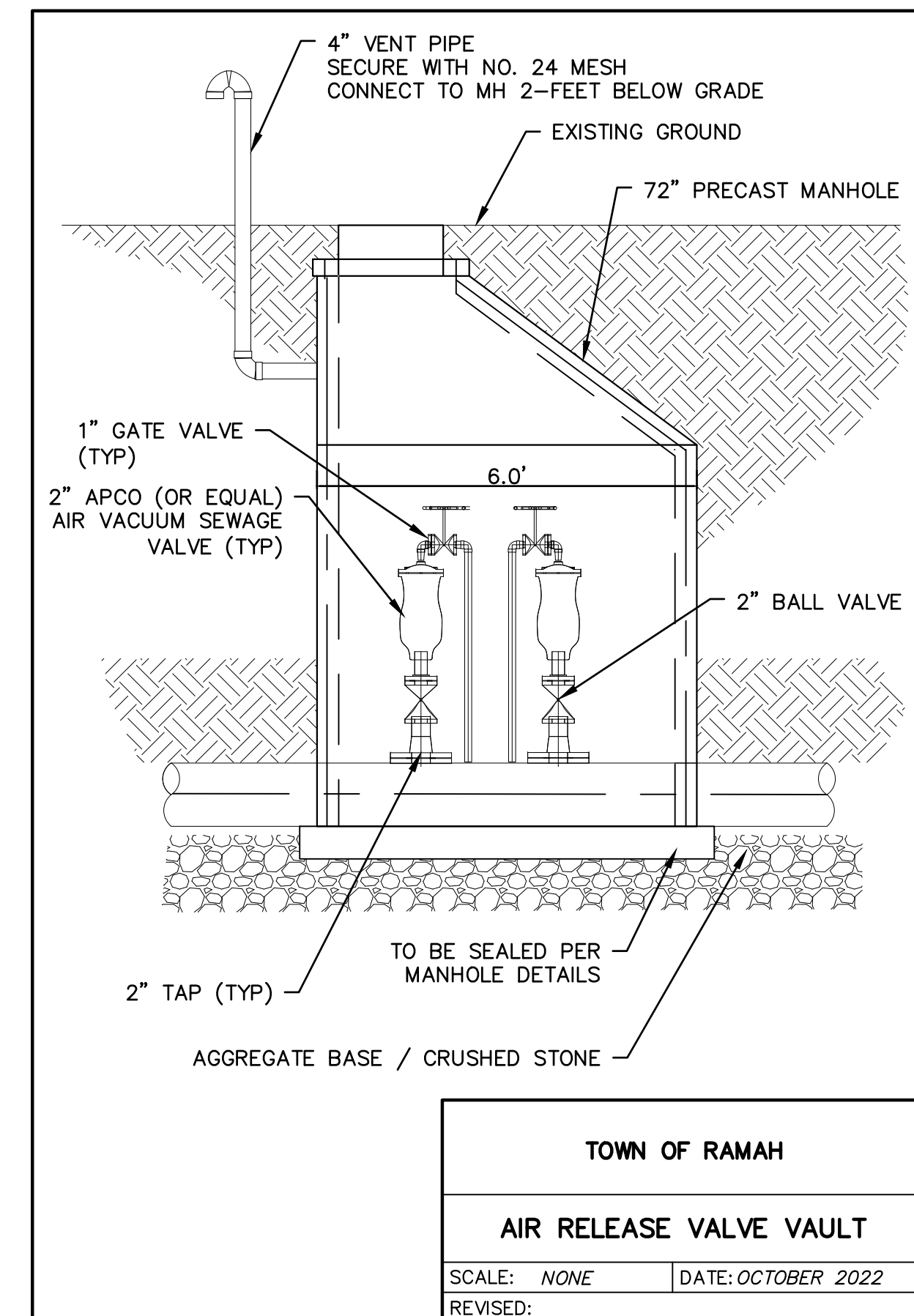
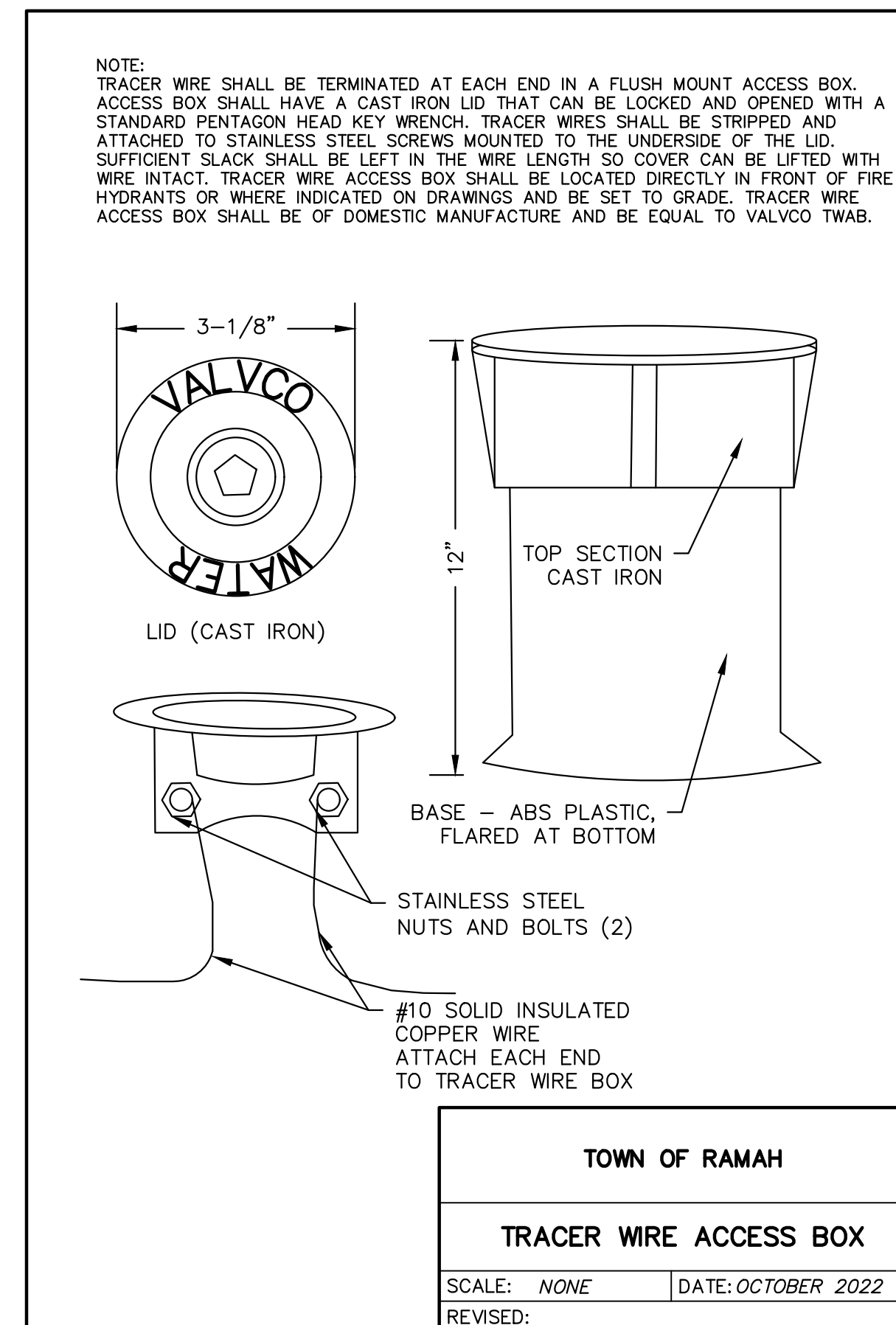
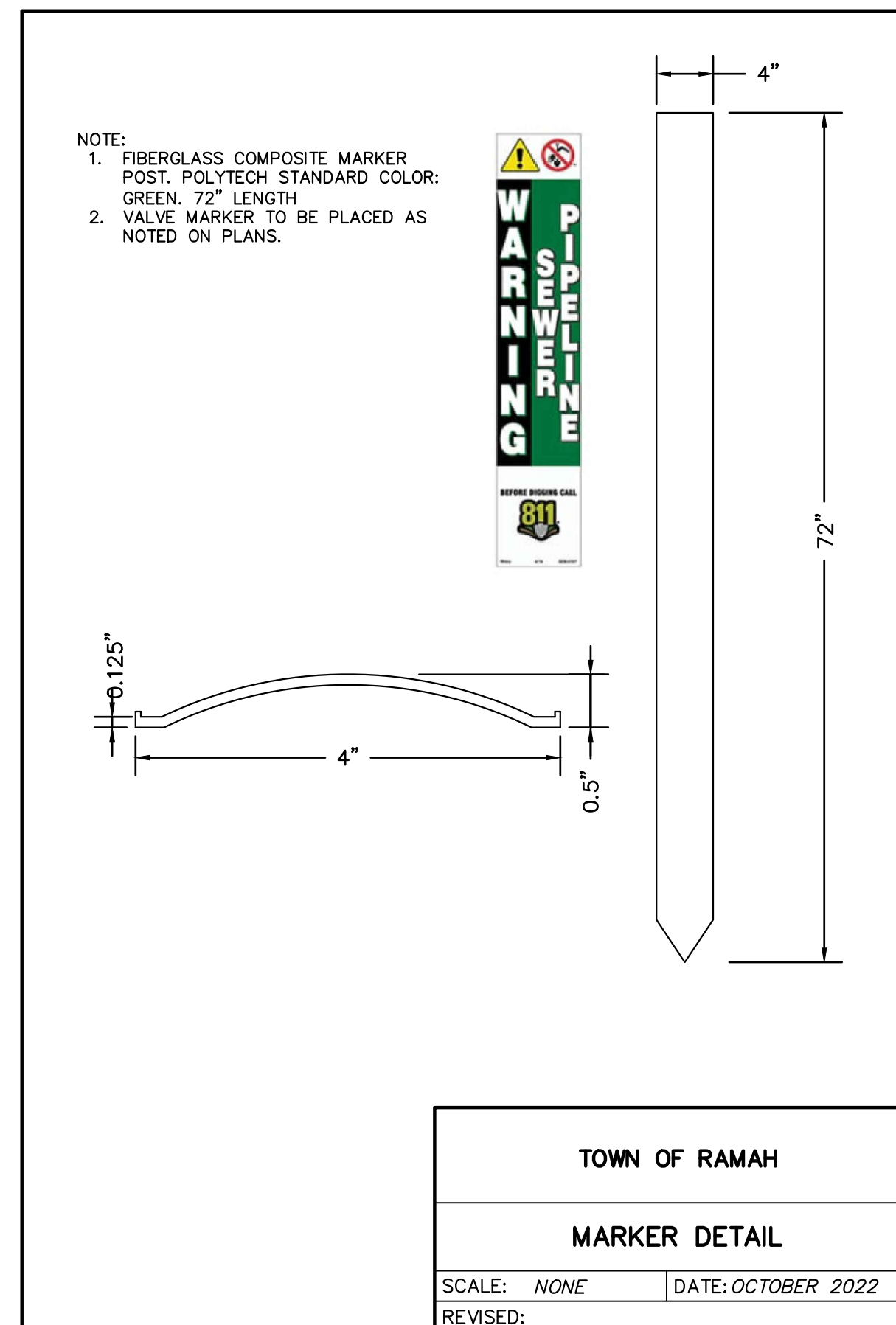
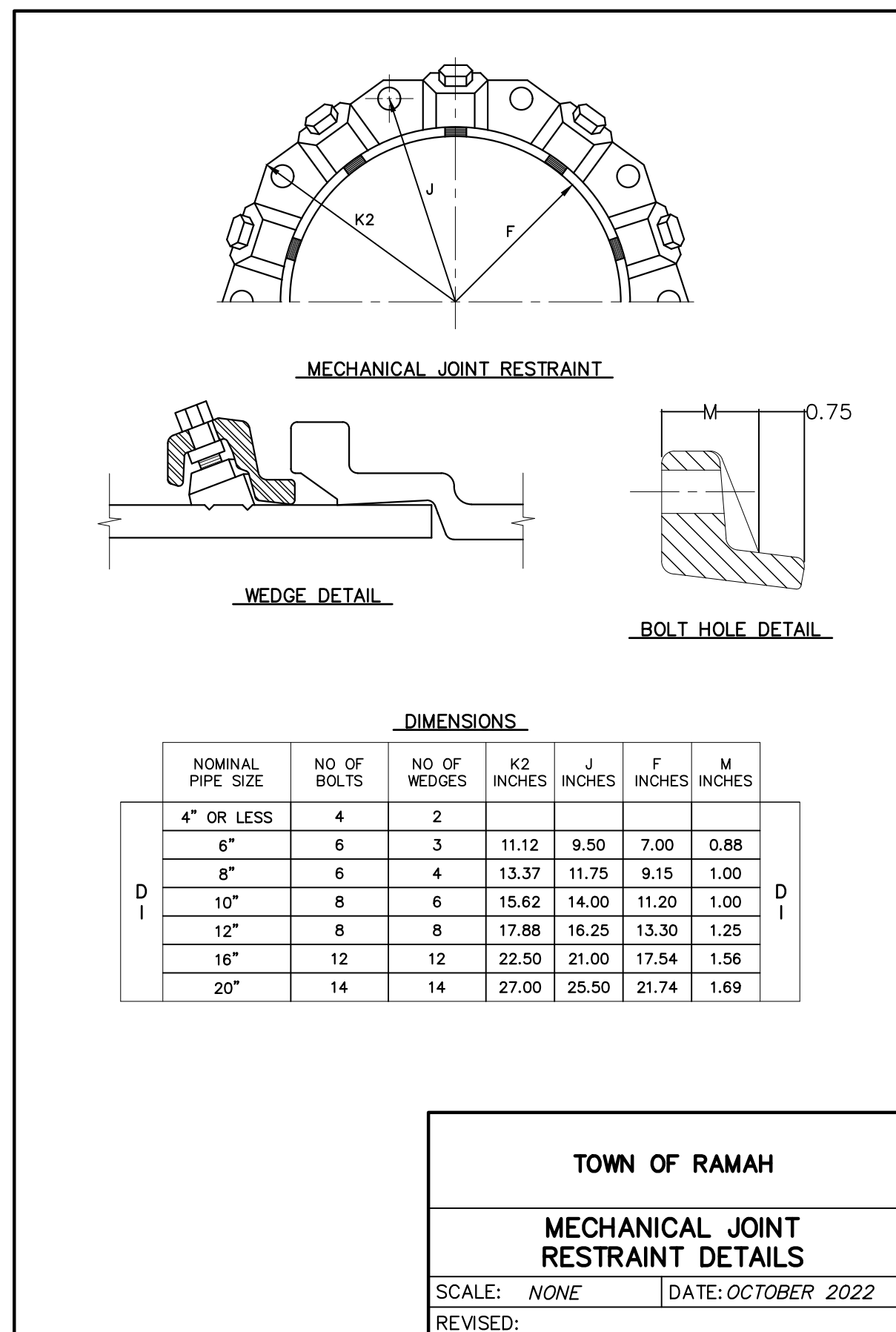
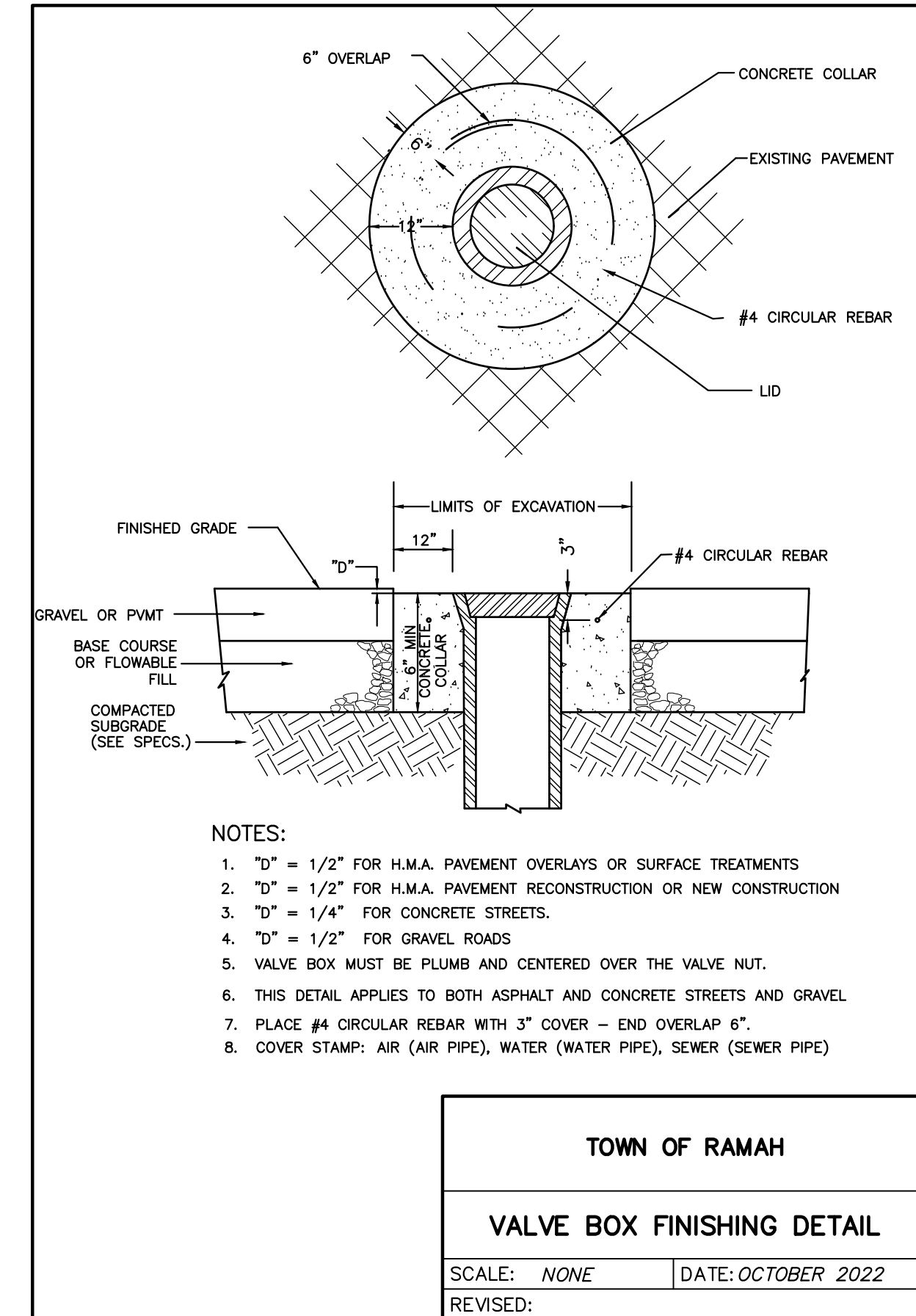
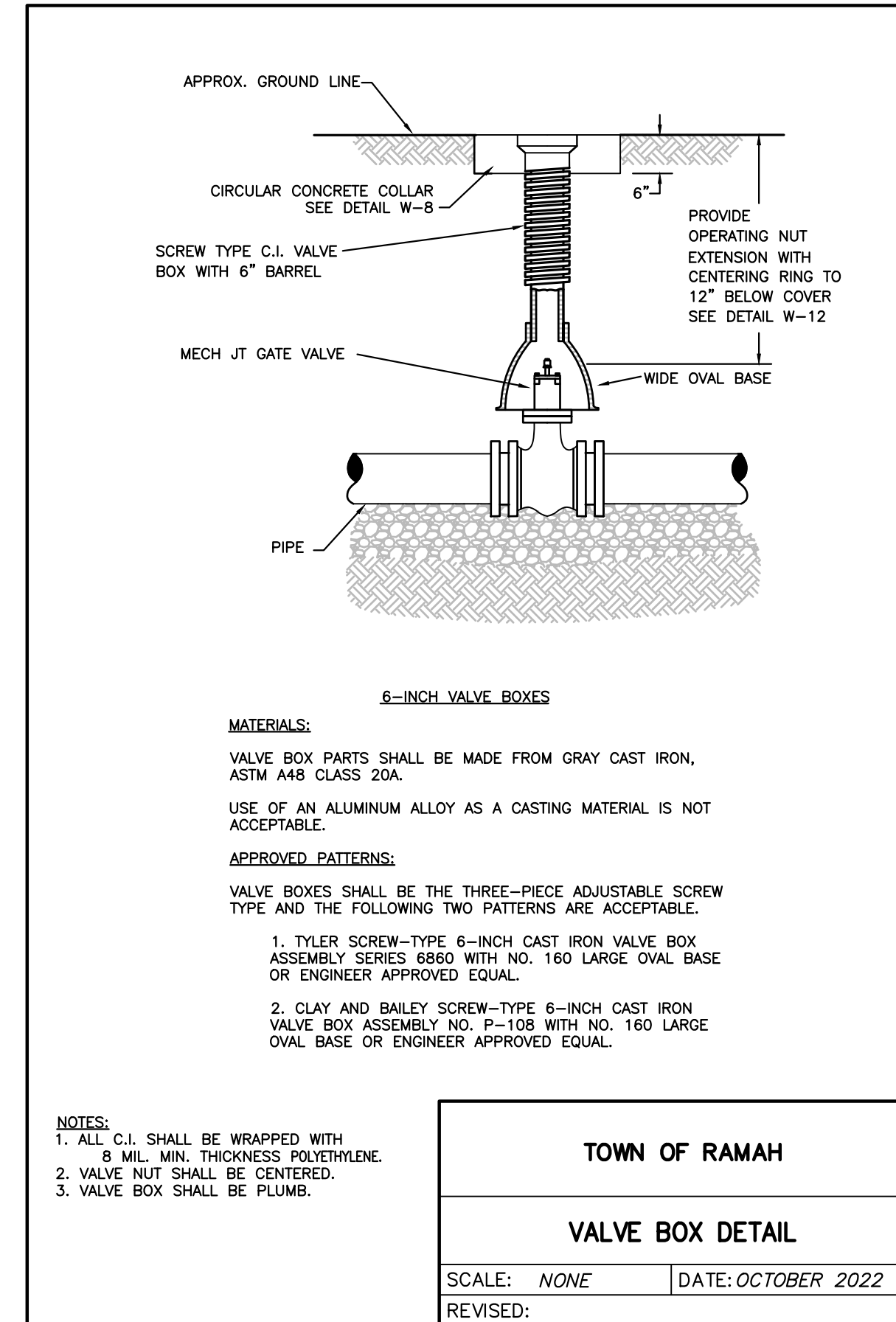
PIPE SIZE 4" AND LESS	6"	8"	12"	16"	20"	24"
FITTING	D L G D L G D L G D L G D L G D L G	D L G D L G D L G D L G D L G D L G	D L G D L G D L G D L G D L G D L G	D L G D L G D L G D L G D L G D L G	D L G D L G D L G D L G D L G D L G	D L G D L G D L G D L G D L G D L G
90° BEND, TEE, PLUG, VALVE	MS 3/4" 50'	MS 3/4" 71'	MS 3/4" 94'	MS 3/4" 104'	MS 1" 173'	MS 1 1/2" 212'
45° BEND	MS 3/4" 25'	MS 3/4" 35'	MS 3/4" 46'	MS 3/4" 66'	MS 1" 104'	MS 1 1/2" 122'
22 1/2° BEND	MS 3/4" 12'	MS 3/4" 17'	MS 3/4" 23'	MS 3/4" 32'	MS 1" 41'	MS 1 1/2" 50'
11 1/4° BEND	-	-	MS 3/4" 7'	MS 3/4" 10'	MS 1" 13'	MS 1 1/2" 15'

**TOWN OF RAMAH**

**LENGTH OF RESTRAINED PIPE**

SCALE: NONE DATE: OCTOBER 2022

REVISED:



**ELEMENT ENGINEERING LLC**  
 12687 W. CEDAR DRIVE, SUITE 300  
 LAKEWOOD, CO 80228  
 720.749.4165  
 WWW.ELEMENTENGINEERING.NET

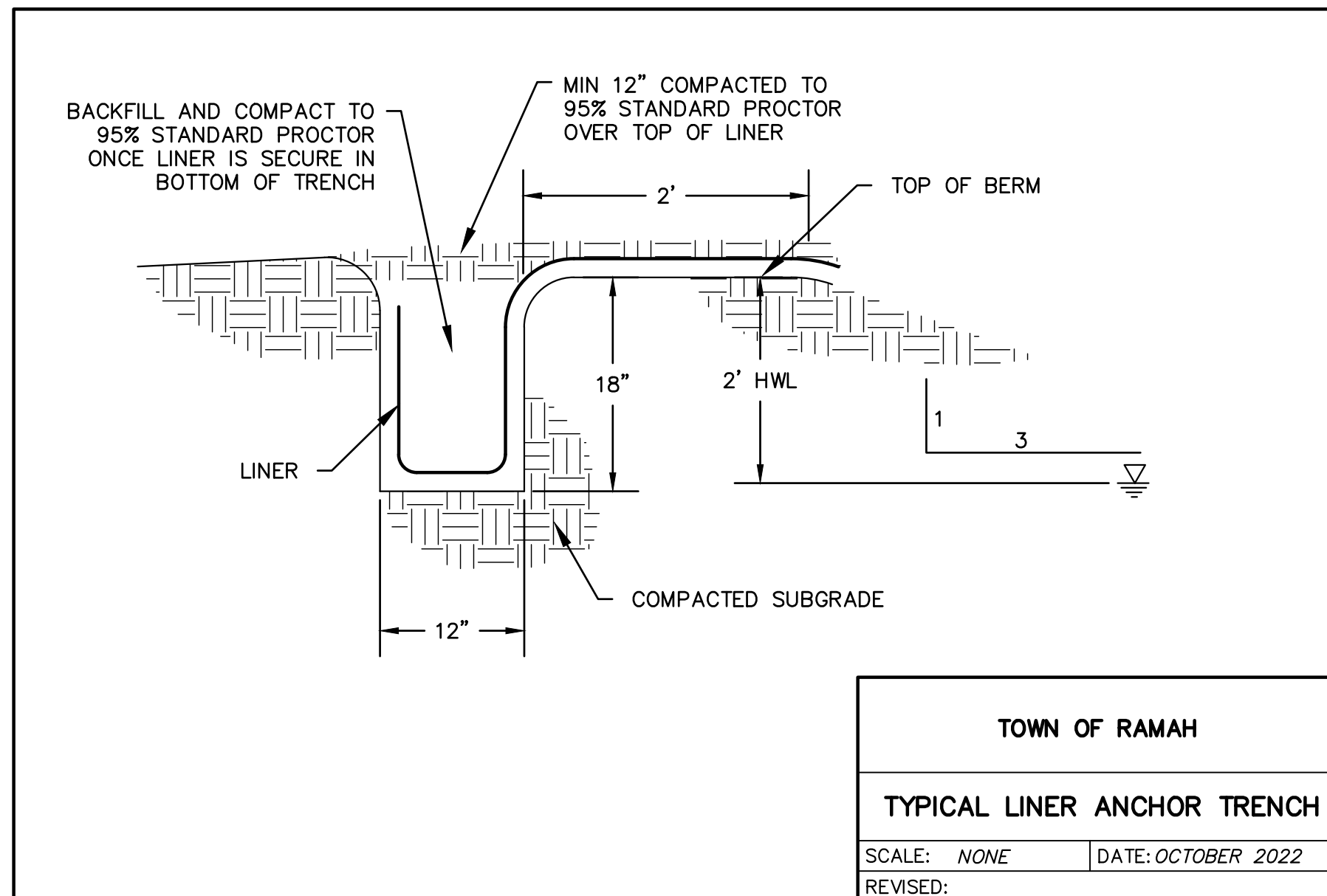
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 ELEMENT ENGINEERING, LLC

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SHEET: C26 OF C29



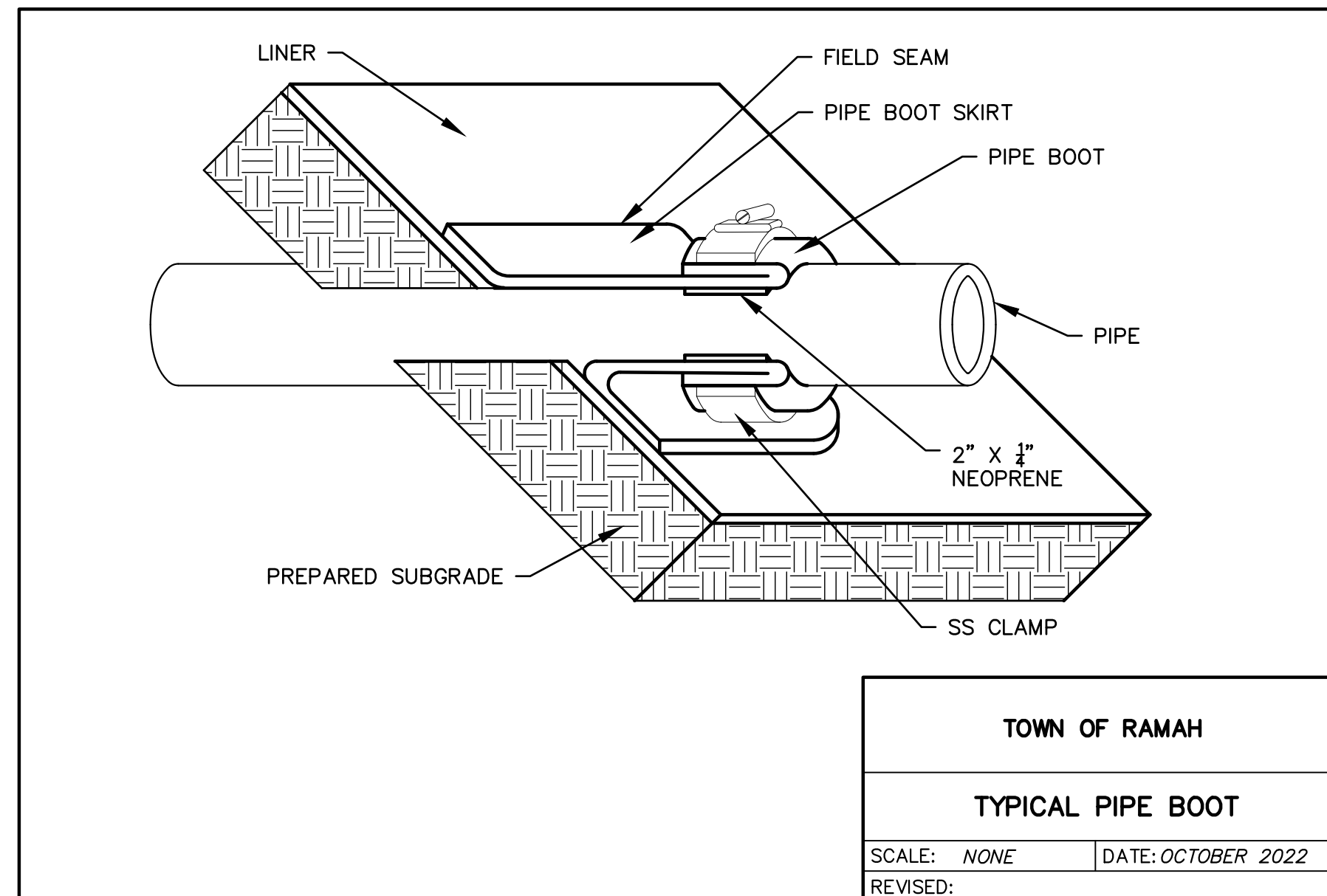


TOWN OF RAMAH

**TYPICAL LINER ANCHOR TRENCH**

SCALE: NONE DATE: OCTOBER 2022

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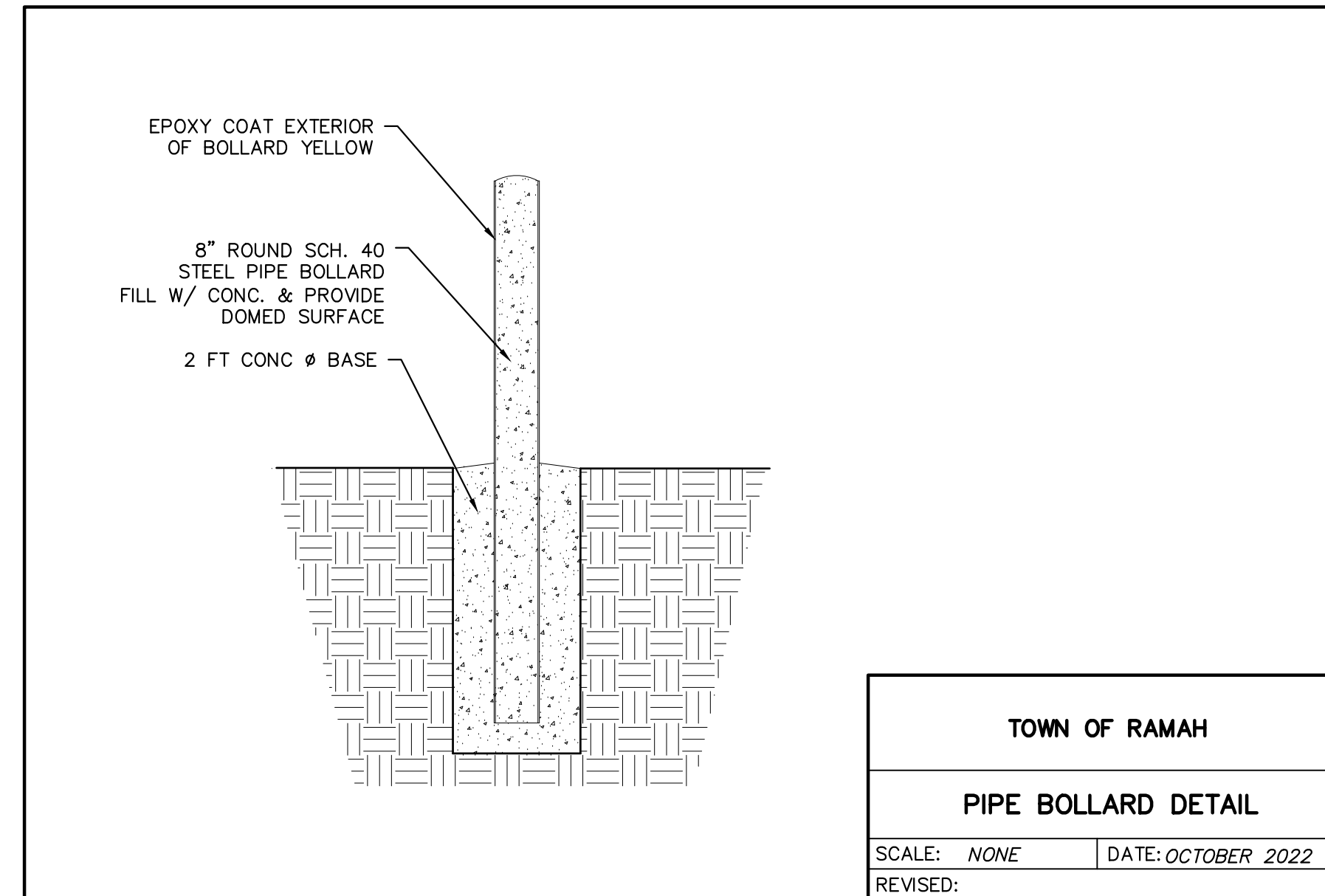


TOWN OF RAMAH

**TYPICAL PIPE BOOT**

SCALE: NONE DATE: OCTOBER 2022

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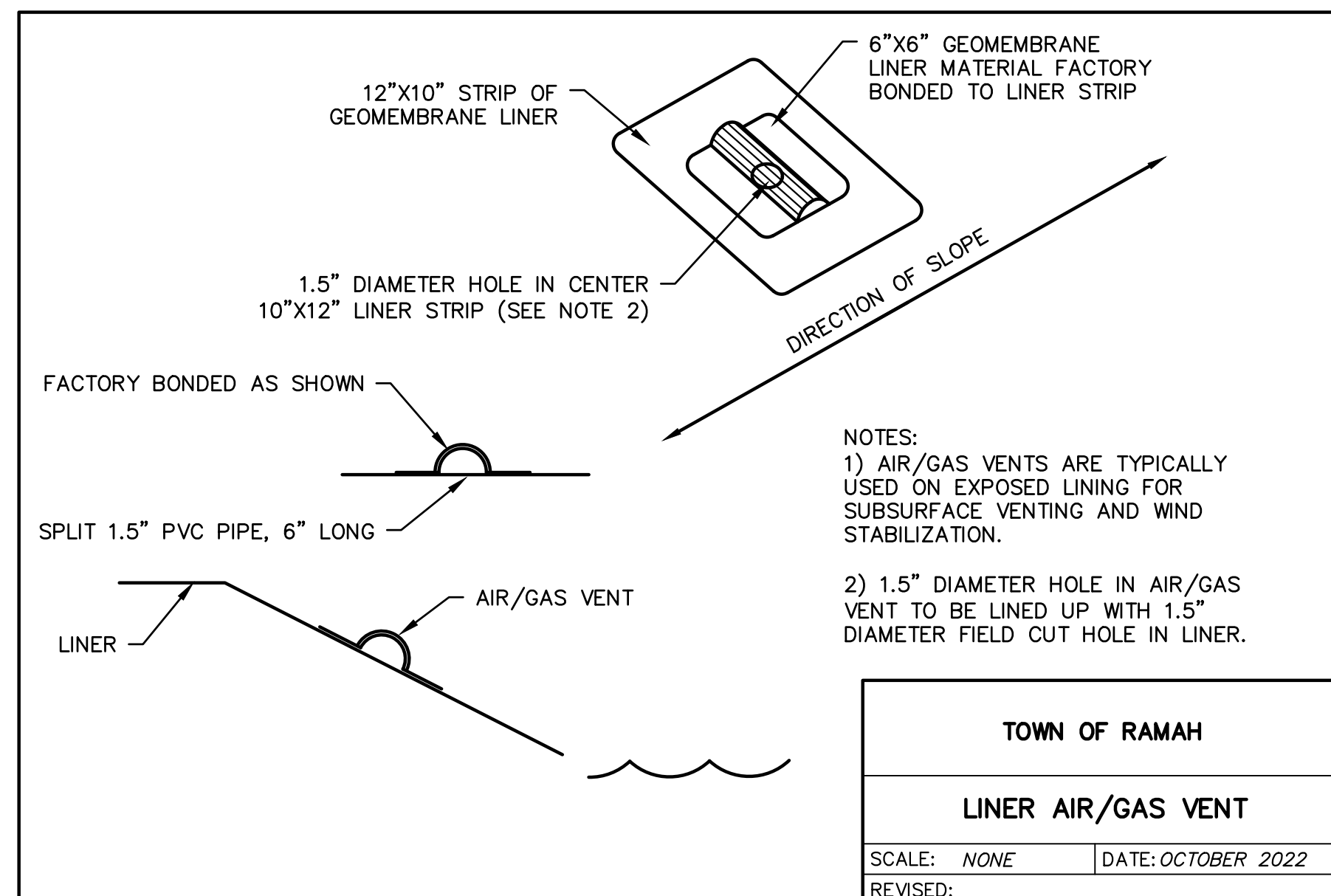


TOWN OF RAMAH

**PIPE BOLLARD DETAIL**

SCALE: NONE DATE: OCTOBER 2022

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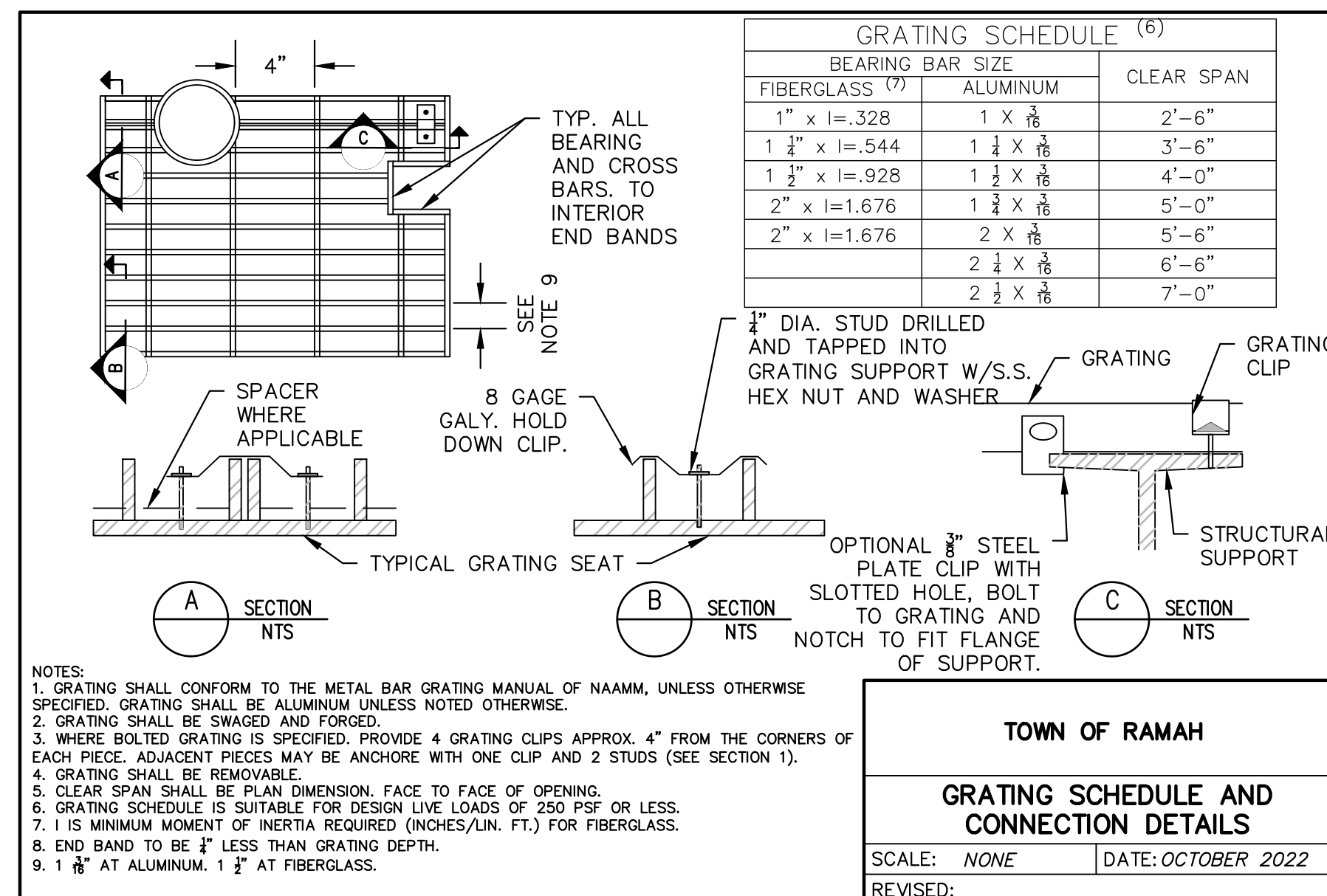


TOWN OF RAMAH

**LINER AIR/GAS VENT**

SCALE: NONE DATE: OCTOBER 2022

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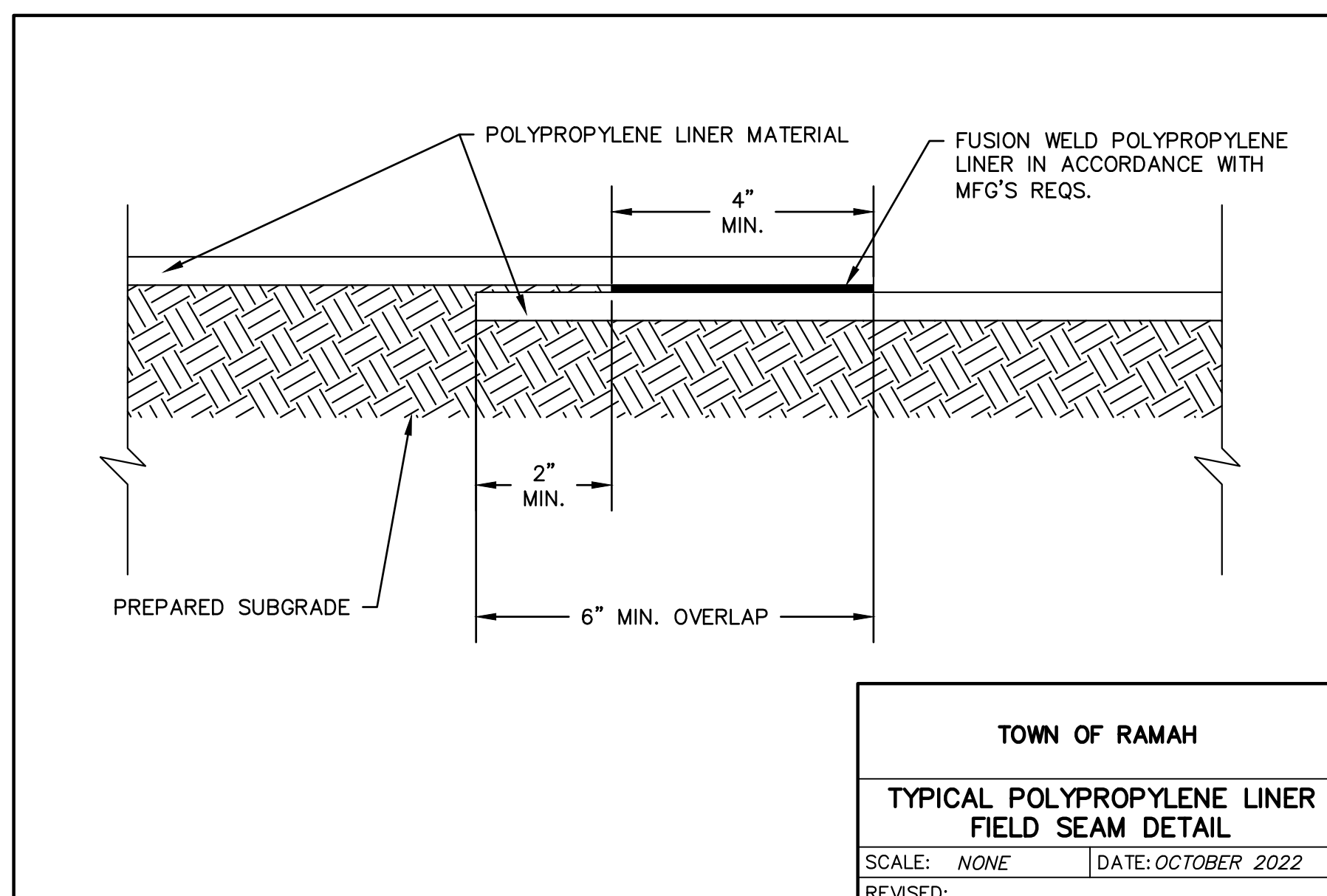


TOWN OF RAMAH

**GRATING SCHEDULE AND CONNECTION DETAILS**

SCALE: NONE DATE: OCTOBER 2022

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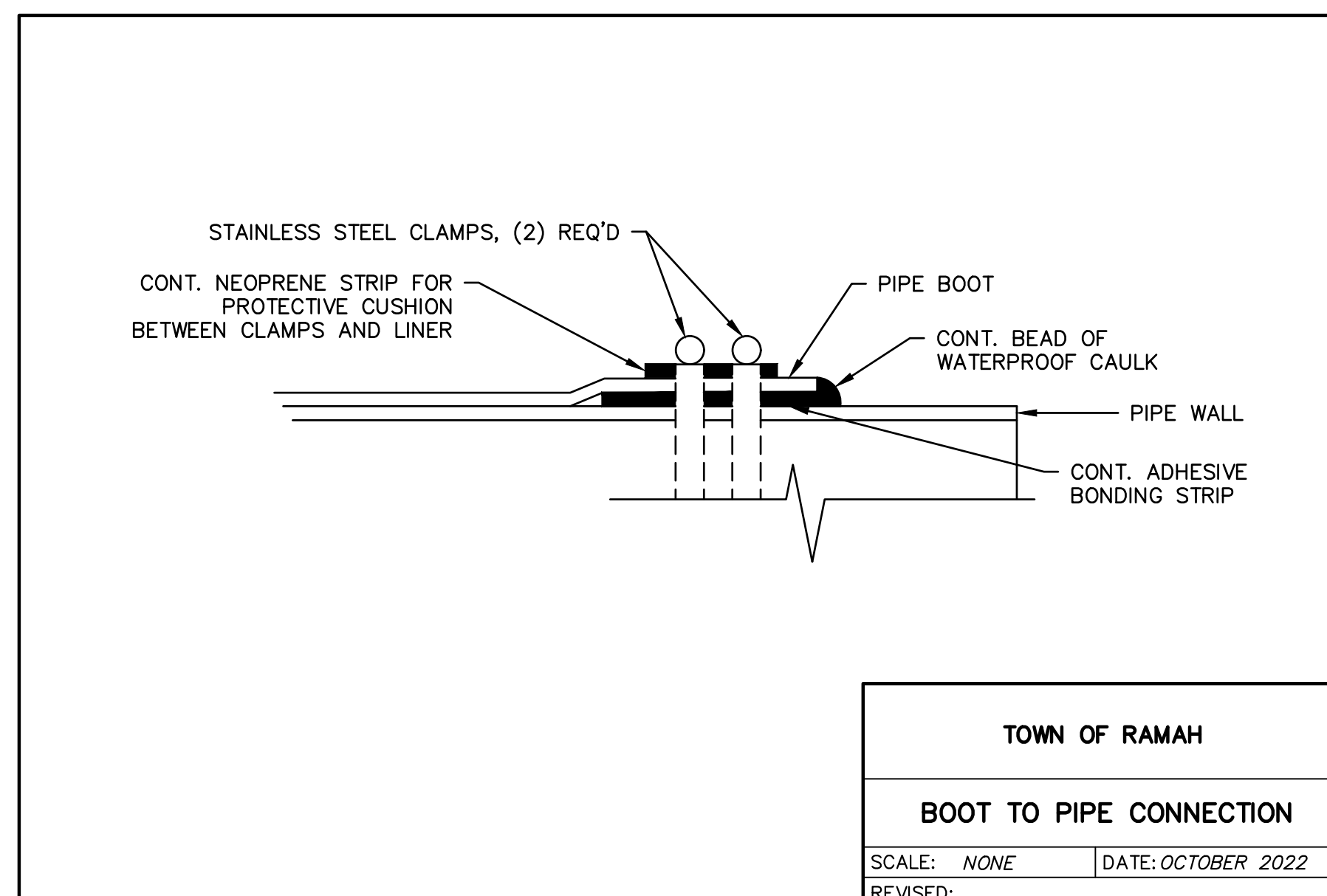


TOWN OF RAMAH

**TYPICAL POLYPROPYLENE LINER FIELD SEAM DETAIL**

SCALE: NONE DATE: OCTOBER 2022

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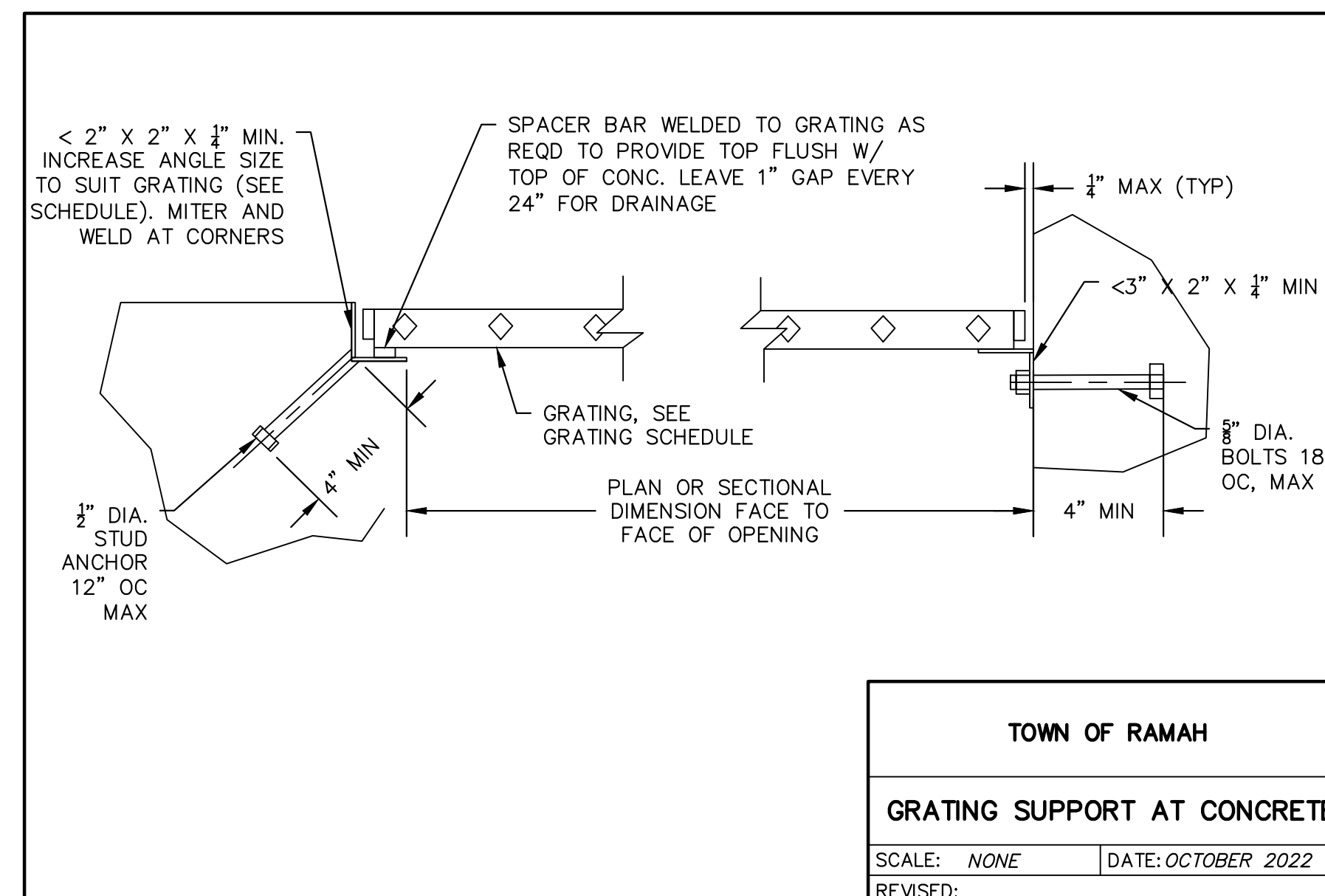


TOWN OF RAMAH

**BOOT TO PIPE CONNECTION**

SCALE: NONE DATE: OCTOBER 2022

REVISED:



TOWN OF RAMAH

**GRATING SUPPORT AT CONCRETE**

SCALE: NONE DATE: OCTOBER 2022

REVISED:



All of the County Standard Notes for EPC Grading & Erosion Control Plans must be put in the GEC Plans.

Show check dams on the plans.

STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES

GENERAL NOTES

- 1. THE APPROVED EROSION CONTROL PLAN SHALL BE MAINTAINED FOR THE ENTIRE DURATION OF THIS PROJECT.
2. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.
3. A THOROUGH INSPECTION OF THE STORMWATER MANAGEMENT PLAN BEST MANAGEMENT PRACTICES (BMPs) IS RECOMMENDED EVERY FOURTEEN (14) DAYS AND AFTER ANY PRECIPITATION OR SNOW MELT EVENT.
4. PERIODIC INSPECTIONS SHALL ALSO INCLUDE INSPECTING EQUIPMENT FOR LEAKS AND REVIEWING EQUIPMENT MAINTENANCE PRACTICE.
5. THE STORMWATER MANAGEMENT PLAN LOG BOOK SHALL BE UPDATED EVERY FOURTEEN (14) DAYS.
6. ALL STREETS WITHIN AND IMMEDIATELY SURROUNDING A CONSTRUCTION SITE SHALL BE CLEANED OF DIRT AND DEBRIS ON A WEEKLY BASIS.
7. ALL CONSTRUCTION SITE OPERATORS SHALL CONTROL WASTE SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, HAZARDOUS CHEMICALS (TO INCLUDE BUT NOT LIMITED TO HEAVY EQUIPMENT MAINTENANCE FLUIDS, MOTOR OIL, ANTIFREEZE AND VEHICLE FUEL), LITTER, AND SANITARY WASTE AT THE CONSTRUCTION SITE THAT MAY CAUSE ADVERSE IMPACTS TO STORMWATER QUALITY.
8. ALL POTENTIAL POLLUTION SOURCES ON-SITE SHALL BE IDENTIFIED AND CONTROL MEASURES INSTALLED AND PRACTICED TO MINIMIZE THE LIKELIHOOD OF A RELEASE.
9. ALL PORTABLE TOILET FACILITIES SHALL BE LOCATED AWAY FROM GUTTERS, INLETS DITCHES, DRAINAGEWAYS, RECEIVING WATERS AND AREAS SUSCEPTIBLE TO FLOODING OR DAMAGE BY CONSTRUCTION EQUIPMENT.
10. ALL PORTABLE TOILET FACILITIES SHALL BE SECURED IN PLACE BY STAKES INTO THE GROUND TO PREVENT TIPPING.
11. STOCKPILES INCLUDING LANDSCAPING MATERIALS, EARTH MATERIALS AND DIRT FROM GRADING OR EXCAVATION SHALL NOT BE LOCATED ADJACENT TO WATERWAYS; SHALL BE STABILIZED WITHIN FOURTEEN (14) DAYS OF ESTABLISHMENT BY SURFACE ROUGHENING, SEEDING, AND MULCHING; AND SHALL NOT EXCEED TEN FEET IN HEIGHT.
12. SLOPES 3:1 OR STEEPER SHALL BE PROTECTED WITH BIODEGRADABLE EROSION CONTROL BLANKETS.
13. ALL MATERIAL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT THE LOSS OF MATERIAL DURING TRANSPORT. HAUL ROUTES MUST BE PRE-APPROVED BY THE COUNTY. NO MATERIAL SHALL BE TRANSPORTED TO ANOTHER SITE WITHOUT FIRST OBTAINING A HAULING PERMIT FROM THE OWNER.
14. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL CONTAIN ALL WASHOUT WATER. STORMWATER SHALL NOT CARRY WASTES FROM WASHOUT LOCATION.
15. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL BE LOCATED A MINIMUM OF FIFTY (50) FEET HORIZONTAL FROM WATERS OF THE STATE. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL BE SIGNED AS - CONCRETE WASHOUT.
16. PERMANENT SOIL STABILIZATION MEASURES SHALL BE APPLIED WITHIN FOURTEEN (14) DAYS TO DISTURBED AREAS IN WHICH FINAL GRADE IS COMPLETED.

BMP MAINTENANCE NOTES

- 1. IT IS ANTICIPATED THAT THE BMPs IMPLEMENTED AT THE SITE WILL HAVE TO BE MODIFIED TO ADAPT TO CHANGING CONDITIONS OR TO ENSURE THAT POTENTIAL POLLUTANTS ARE BEING PROPERLY MANAGED AT THE SITE.
2. ALL INLET/OUTLET PROTECTIONS WILL BE CHECKED FOR MAINTENANCE AND FAILURE. SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF ONCE IT HAS ACCUMULATED TO HALF THE DESIGN OF THE TRAP.
3. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY OR CONTAINED UNTIL APPROPRIATE CLEANUP METHODS CAN BE EMPLOYED. MANUFACTURE'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE FOLLOWED, ALONG WITH PROPER DISPOSAL METHODS.
4. EACH CONCRETE TRUCK OPERATOR SHALL BE AWARE OF THE DESIGNATED CONCRETE WASHOUT AREA.
5. THE CONTRACTOR SHALL CHECK THE CAPACITY FOR ALL CONCRETE WASHOUT AREAS. WASTE MATERIALS MUST BE REMOVED BY THE CONTRACTOR AND LEGALLY DISPOSED OF WHEN ACCUMULATIONS AMOUNT TO TWO-THIRDS OF THE WET STORAGE CAPACITY OF THE STRUCTURE.
6. ALL CONCRETE WASHOUT AREAS SHALL BE CLEARLY MARKED. THE CONCRETE WASHOUT CONTAINMENT DETAIL WILL INCLUDE ORANGE PLASTIC CONSTRUCTION FENCING OR EQUIVALENT AROUND THE WASHOUT STRUCTURE AND A SIGN POSTED WITH THE WORDS 'CONCRETE WASHOUT'.
7. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND/OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
8. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF AT AN APPROVED WASTE SITE.
9. ALL SEDIMENT SHALL BE REMOVED UPON INITIAL ACCEPTANCE FROM TEMPORARY SEDIMENT BASINS AND STORM SEWER FACILITIES, I.E., PIPES, OUTLETS AND INLETS. THIS SEDIMENT SHALL NOT BE FLUSHED OFF-SITE, BUT SHALL BE CAPTURED ON-SITE AND DISPOSED OF AT AN APPROVED LOCATION.
10. 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.
11. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
12. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

CHECK DAM INSTALLATION NOTES

- 1. SEE PLAN VIEW FOR:
1.1. LOCATION OF CHECK DAMS
1.2. CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM)
1.3. LENGTH (L), CREST LENGTH (CL), AND DEPTH (D)
2. CHECK DAMS INDICATED ON INITIAL SWMP SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND DISTURBING ACTIVITIES.
3. RIPRAP UTILIZED FOR CHECK DAMS SHOULD BE OF APPROPRIATE SIZE FOR THE APPLICATION. TYPICAL TYPES OF RIPRAP USED FOR CHECK DAMS ARE TYPE M (D50 12") OR TYPE L (D50 9").
4. RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'.
5. THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1'-6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM MAINTENANCE NOTES

- 1. SEDIMENT ACCUMULATED UPSTREAM OF THE CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS WITHIN 1/2 OF THE HEIGHT OF THE CREST.
2. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
3. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACKFILL. DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

CULVERT INLET PROTECTION INSTALLATION NOTES

- 1. SEE PLAN VIEW FOR LOCATION OF CULVERT INLET PROTECTION
2. SEE ROCK SOCK DESIGN DETAIL FOR ROCK GRADATION REQUIREMENTS AND JOINTING DETAIL.

CULVERT INLET PROTECTION MAINTENANCE NOTES

- 1. SEDIMENT ACCUMULATED UPSTREAM OF THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS 1/2 THE HEIGHT OF THE ROCK SOCK.
2. CULVERT INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

EARTH DIKE AND DRAINAGE SWALE INSTALLATION NOTES

- 1. SEE SITE PLAN FOR:
1.1. LOCATION OF DIVERSION SWALE
1.2. TYPE OF SWALE (UNLINED, COMPACTED AND/OR LINED)
1.3. LENGTH OF EACH SWALE
1.4. DEPTH, D, AND WIDTH, W DIMENSIONS
1.5. FOR ECB/TRM LINED DITCH, SEE ECB DETAIL
1.6. 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 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. SWALES SHALL REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION; IF APPROVED BY LOCAL JURISDICTION, SWALES MAY BE LEFT IN PLACE.
2. 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.

EROSION CONTROL BLANKET INSTALLATION NOTES

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

EROSION CONTROL BLANKET MAINTENANCE NOTES

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

SILT FENCE INSTALLATION NOTES

- 1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.
2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.
3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.
5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.
6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK". THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').
7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

- 1. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".
2. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.
3. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.
4. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED, AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

STABILIZED STAGING AREA INSTALLATION NOTES

- 1. SEE PLAN VIEW FOR:
1.1. LOCATION OF STAGING AREA(S)
1.2. CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION
2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.
3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.
4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THINK GRANULAR MATERIAL.
5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.
6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

- 1. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.
2. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.
3. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED, AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.
4. NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

- 1. SEE PLAN VIEW FOR
1.1. LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S)
1.2. TYPE OF CONSTRUCTION ENTRANCE(S)/EXIT(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM)
2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.
3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.
4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.
6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

- 1. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.
2. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

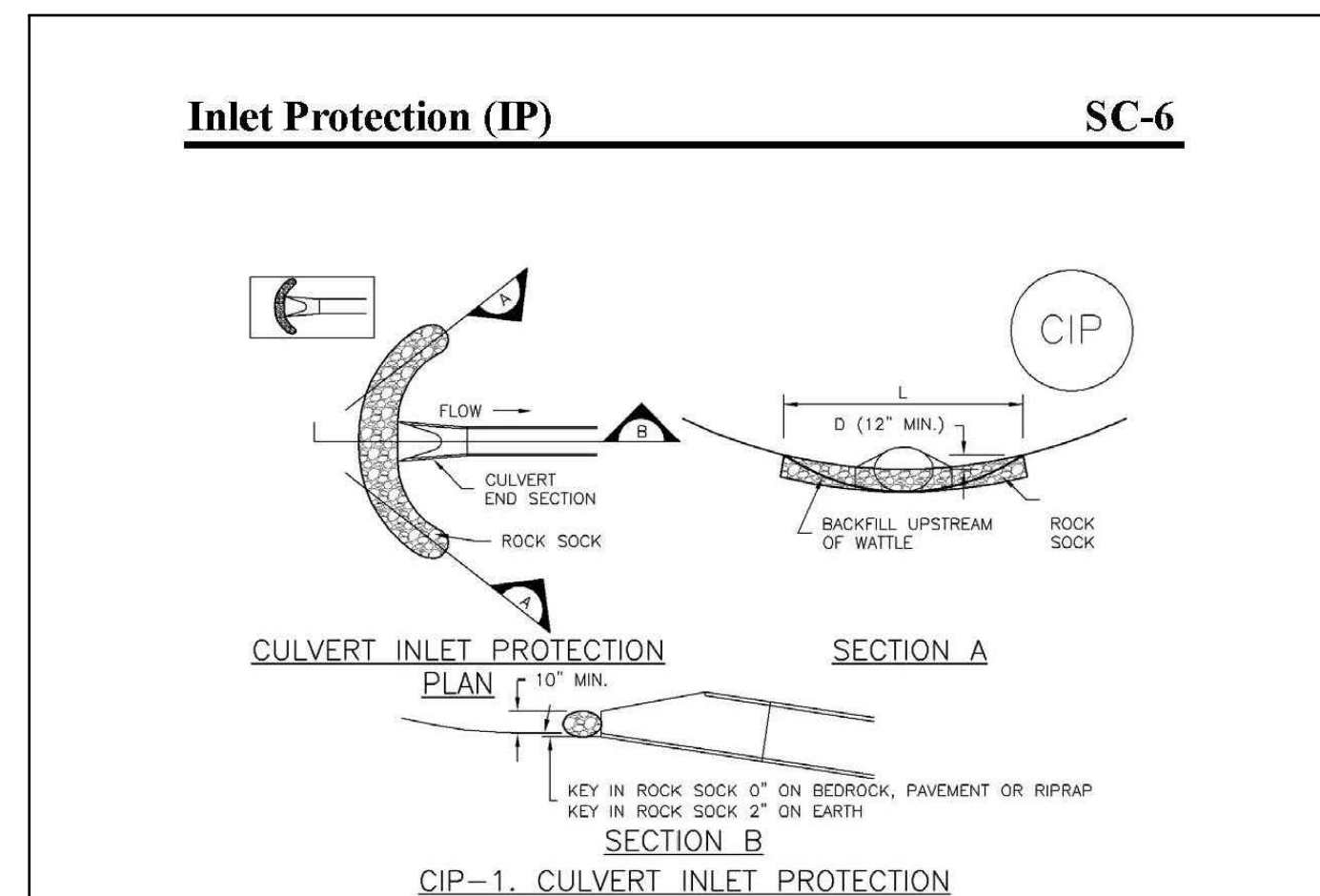
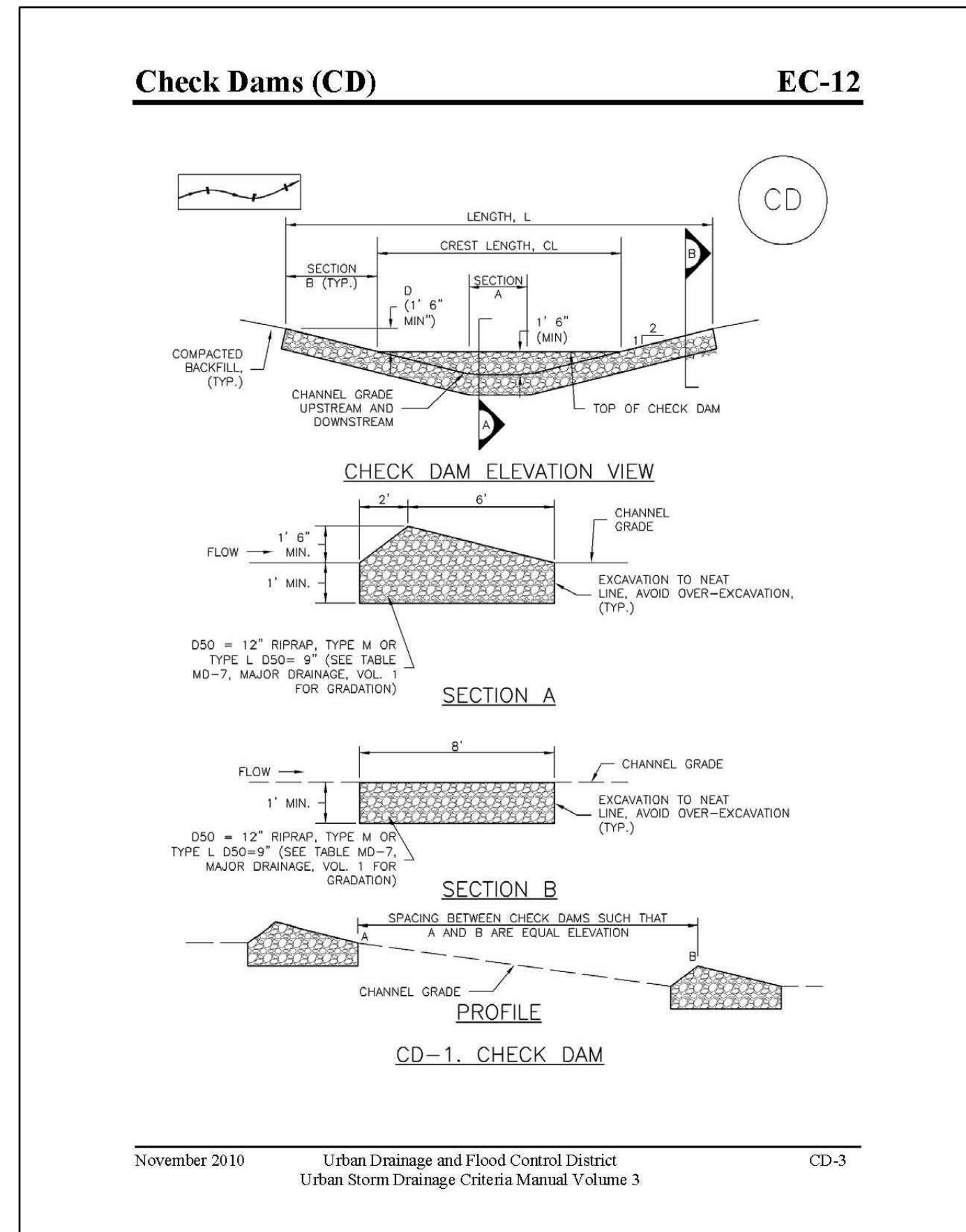


Table with columns: REVISIONS, DESCRIPTION, DATE, BY, NO.

WASTEWATER TREATMENT PLANT
EROSION CONTROL DETAILS
TOWN OF RAMAH
113 S. COMMERCIAL STREET
RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

DATE: OCTOBER 2022

JOB NUMBER: 0043.0001

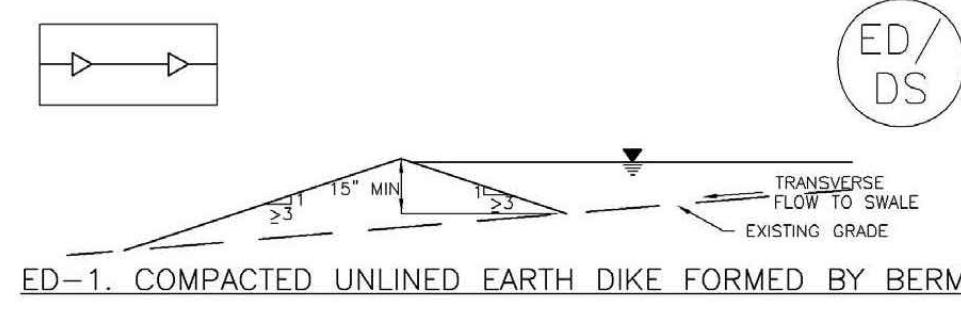
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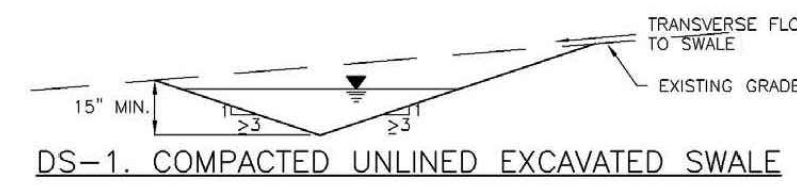
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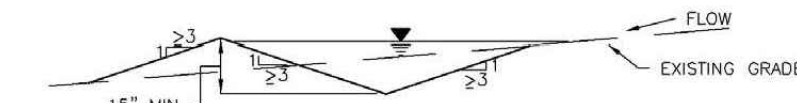
**Earth Dikes and Drainage Swales (ED/DS) EC-10**



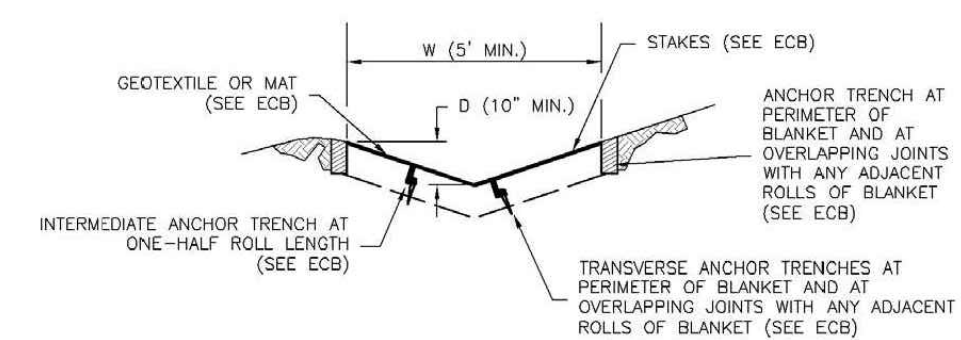
ED-1. COMPACTED UNLINED EARTH DIKE FORMED BY BERM



DS-1. COMPACTED UNLINED EXCAVATED SWALE



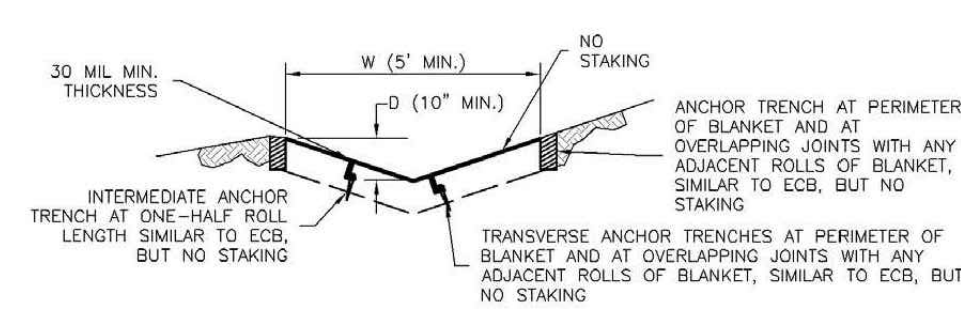
DS-2. COMPACTED UNLINED SWALE FORMED BY CUT AND FILL



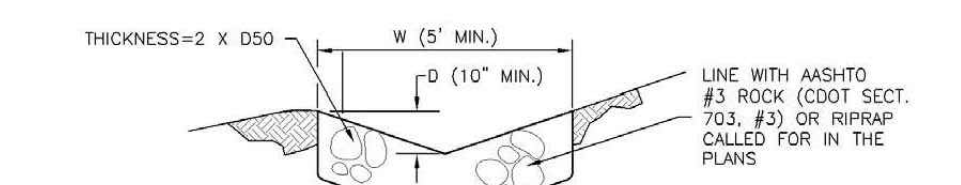
DS-3. ECB LINED SWALE (CUT AND FILL OR BERM)

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**EC-10 Earth Dikes and Drainage Swales (ED/DS)**

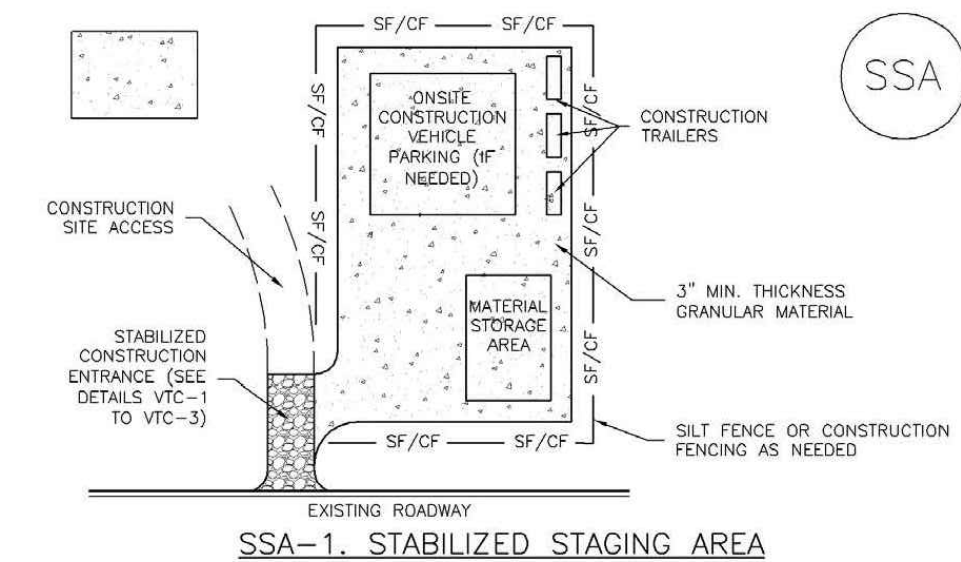


DS-4. SYNTHETIC LINED SWALE



DS-5. RIPRAP LINED SWALE

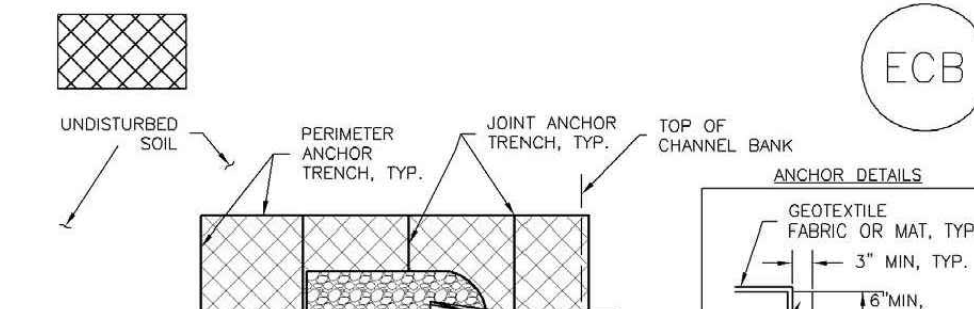
**Stabilized Staging Area (SSA) SM-6**



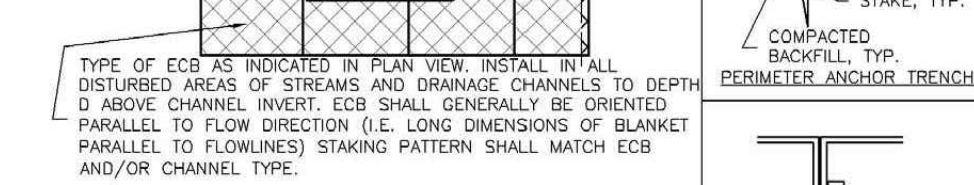
SSA-1. STABILIZED STAGING AREA

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**EC-6 Rolled Erosion Control Products (RECP)**



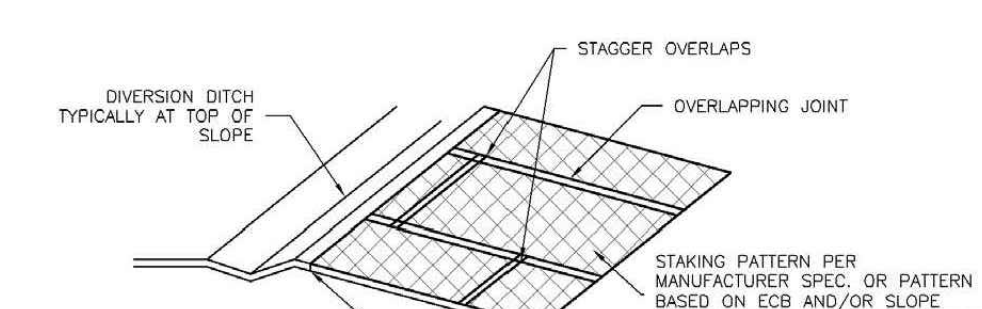
ECB-1. PIPE OUTLET TO DRAINAGE WAY



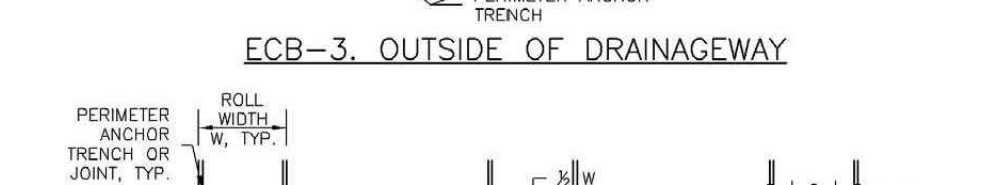
ECB-2. SMALL DITCH OR DRAINAGE WAY

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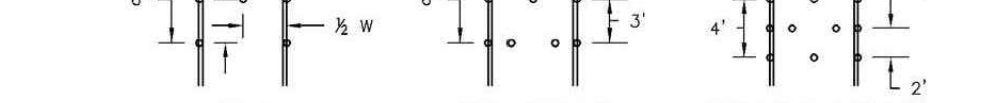
**EC-6 Rolled Erosion Control Products (RECP)**



ECB-3. OUTSIDE OF DRAINAGE WAY



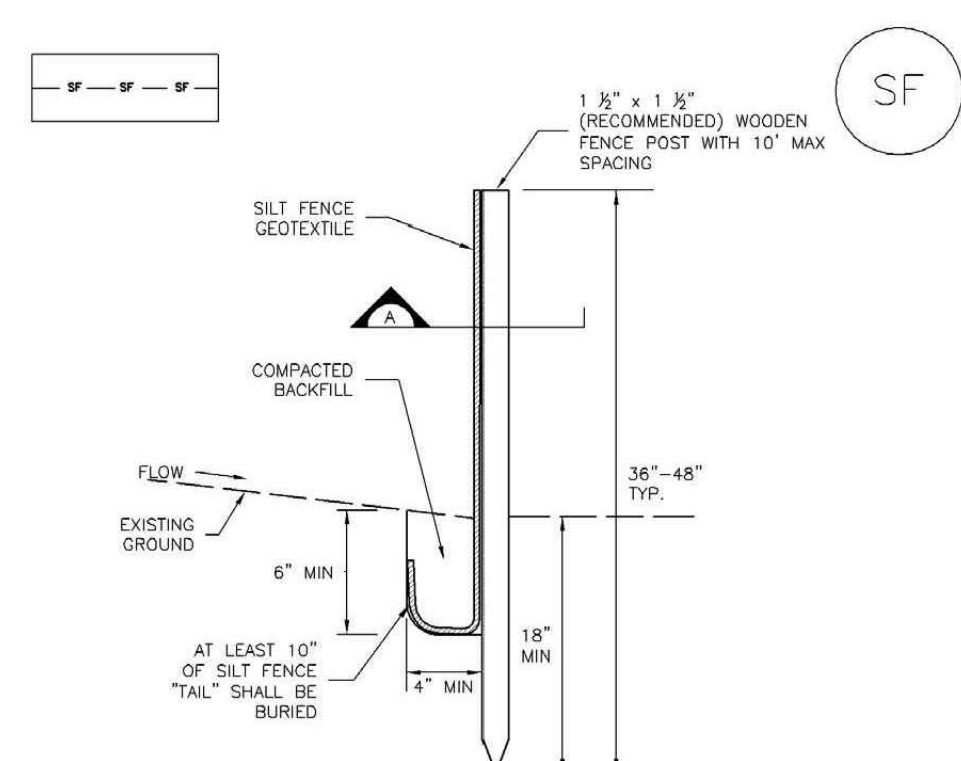
STAKING PATTERNS BY ECB TYPE



STAKING PATTERNS BY SLOPE OR CHANNEL TYPE

RECP-7 Urban Drainage and Flood Control District November 2010  
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**Silt Fence (SF) SC-1**



SILT FENCE

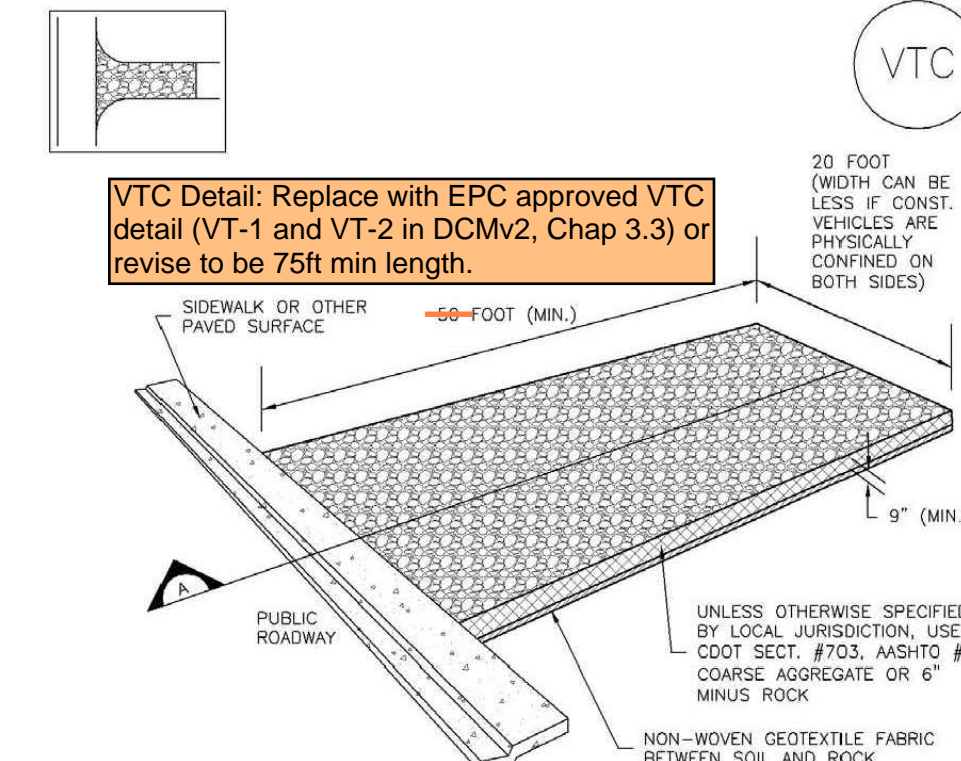


SECTION A

SF-1. SILT FENCE

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**Vehicle Tracking Control (VTC) SM-4**

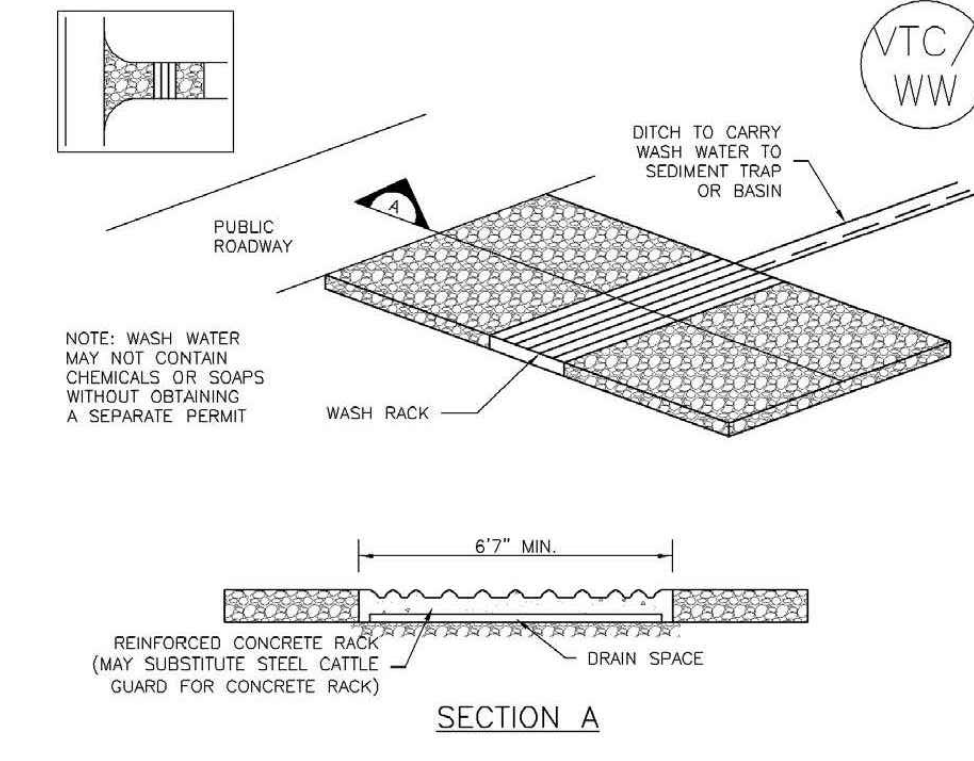


SECTION A

VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

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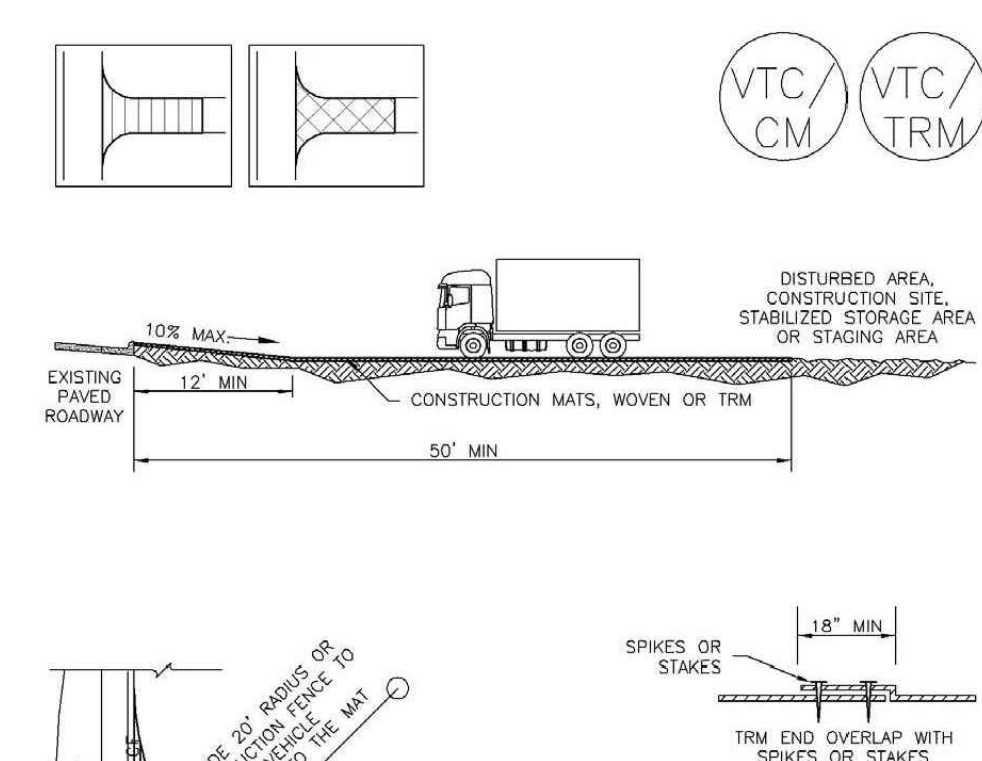
**SM-4 Vehicle Tracking Control (VTC)**



VTC-2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK

VTC-4 Urban Drainage and Flood Control District November 2010  
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**SM-4 Vehicle Tracking Control (VTC)**



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

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