EXHIBIT H – PROJECT DRAWINGS

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

TOWN OF RAMAH
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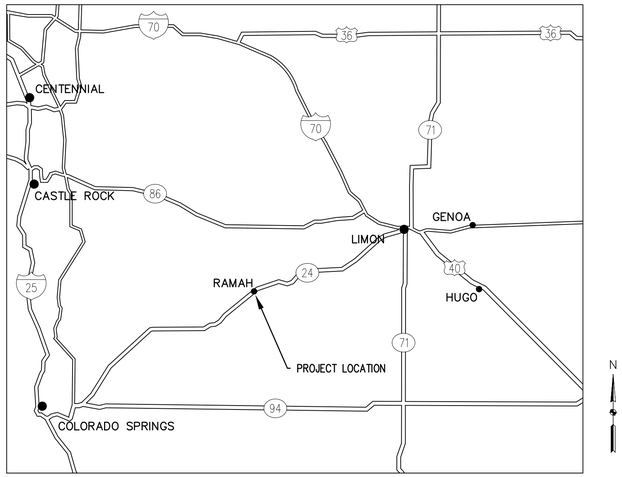
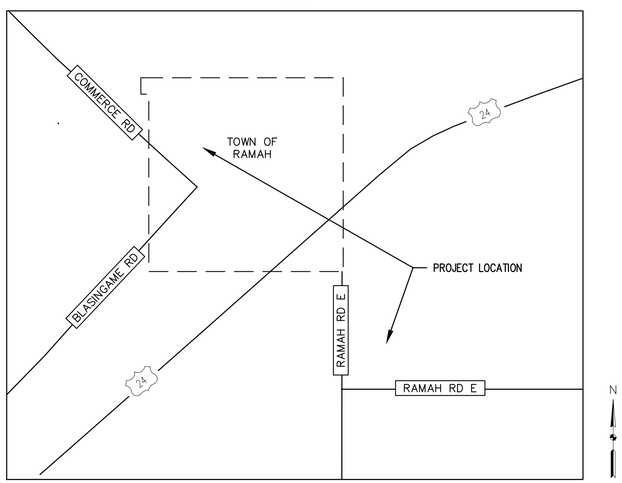
PUBLIC WORKS DIRECTOR DATE

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 WARRANTEES.



LOCATION MAP
NTS



VICINITY MAP
NTS

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CIVIL

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REVISIONS

NO.	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 C27

GENERAL NOTES

1. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL PERMITS REQUIRED OF THIS WORK AND SHALL FAITHFULLY ADHERE TO THE ALL PERMIT REQUIREMENTS.

9. TEMPORARY AND PERMANENT EROSION CONTROL STRUCTURE METHODS SHALL BE IN ACCORDANCE WITH COUNTY REGULATIONS AND ARE TO BE UTILIZED DURING CONSTRUCTION.

10. ALL EROSION CONTROL STRUCTURES SHOWN OR AS REQUIRED DURING CONSTRUCTION SHALL BE CONTINUOUSLY MAINTAINED THROUGH WARRANTY PERIOD AND UNTIL RE-VEGETATION TAKES HOLD.

11. CONTRACTOR SHALL CLEAN UP, SEED, AND RESTORE DISTURBED AREAS IMMEDIATELY UPON COMPLETION OF THE WORK IN THE AFFECTED AREA.

12. 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.

13. 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.

14. 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.

15. UNLESS OTHERWISE GRANTED PERMISSION BY THE OWNER IN WRITING, THE CONTRACTOR MUST ALLOW ACCESS TO ALL PROPERTIES FOR BOTH RESIDENTS AND EMERGENCY VEHICLES.

16. 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.

17. 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.

18. 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.

19. 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.

20. SURVEY MONUMENTS MUST BE SET WITHIN 60 DAYS OF COMPLETION OF THE PROJECT.

21. SERVICE TRENCHES AND UTILITY MAIN TRENCHES SHALL BE COMPACTED THROUGHOUT THE DEPTH OF THE TRENCH PER THE SPECIFICATIONS.

22. 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.

23. 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.

24. 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.

25. MEGALUGS AND CONCRETE THRUST BLOCKS WILL BE REQUIRED FOR ALL MAIN LINES.

26. 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.

27. ALL BOLTS FOR ABOVE GRADE FITTINGS SHALL BE ASTM 316 STAINLESS STEEL.

28. 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.

29. 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.

30. 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.

31. 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.

32. NO DEFLECTION SHALL BE PERMITTED ON INTERIOR PIPE AND FITTINGS.

33. 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.

34. 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.

35. 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.

36. 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.

37. FLEXIBLE COUPLINGS AND FLANGE ADAPTERS SHALL BE DESIGNED TO RELIVE 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.

38. 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.

39. VALVE COMPONENTS SHALL WITHSTAND THE ENVIRONMENTAL CONDITIONS AND PROVIDE CONTINUOUS TROUBLE-FREE SERVICE.

40. 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.

41. ALL DIRECT BURY SEWER MAINS SHALL BE PVC, ASTM D-3034, SDR35 OR APPROVED EQUAL, UNLESS OTHERWISE NOTED.

42. SEWER LINES SHALL BE 10 FEET FROM WATER LINES EXCEPT WHEN CROSSING EACH OTHER. FOR SEWER LINES THAT CROSS LESS THAN 1 ½ FEET VERTICALLY FROM WATER LINES, THE CLOSEST SANITARY SEWER JOINT SHALL BE A MINIMUM OF 6 FEET FROM THE CROSSING.

43. 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.

44. SEWER RIM ELEVATIONS AND INVERTS SHOWN ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS.

45. 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.

46. 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.

47. 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.

48. 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.

49. 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.

50. ALL MANHOLES SHALL HAVE SHAPED INVERTS.

51. 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 ⅜ INCHES.

52. 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.

53. FERNCO STRONGBACK RC SERIES PIPE COUPLINGS WILL BE REQUIRED FOR PIPE AND LATERAL SERVICES.

54. ALL BARREL SECTIONS OF MANHOLES SHALL BE GROUTED INSIDE AT JOINTS.

55. 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.

56. 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.

57. 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.

58. ALL MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12-INCH WIDE CONSEAL CS 212 OR APPROVED EQUIVALENT.

59. MANHOLE/VAULT BARREL SECTIONS WILL REQUIRE AN EXTERIOR COATING OF TNEMEC SERIES 46-465 OR APPROVED EQUIVALENT.

60. ALL PRECAST CONCRETE SHALL BE 4,000 PSI MINIMUM STRENGTH.

61. ALL EXISTING PIPING INTO EXISTING MANHOLES MUST BE RECONNECTED IN NEW MANHOLES.

62. 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.

63. 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.

64. 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.

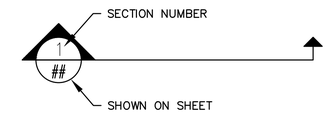
65. ALL EQUIPMENT AND MATERIAL IS TO BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS. ALL EQUIPMENT STARTUP SHALL BE PROVIDED BY A MANUFACTURER APPROVED FIELD REPRESENTATIVE. MANUFACTURER FIELD TRAINING FOR THE OPERATIONS STAFF SHALL ALSO BE PROVIDED AT EITHER THE TIME OF STARTUP OR AT ANOTHER TIME AS APPROVED BY THE OPERATOR.

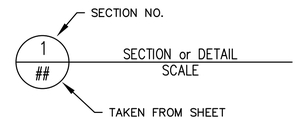
66. THE CONTRACTOR SHALL FURNISH AND INSTALL 12" X 24" SIGNS AS DIRECTED BY THE ENGINEER ON THE PERIMETER FENCING. THE GENERAL SPACING IS 200-FT CENTERS. THE SIGNS SHALL BE MADE FROM 20 GAUGE ALUMINUM SHEET METAL WITH A PAINTED WHITE BACKGROUND AND RED LETTERING. THE SIGNS SHALL READ AS FOLLOWS:

DANGER – KEEP OUT
WASTEWATER TREATMENT FACILITY

67. 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 VACUMBREAKER VALVE	MH	MANHOLE
BEG	BELOW EXISTING GRADE	N	NORTH
BFV	BUTTERFLY VALVE	NE	NORTHEAST
℄	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		

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REVISIONS

NO.	DESCRIPTION	DATE	BY
1	DESCRIPTION NO. 1	01/17	XXX

WASTEWATER TREATMENT PLANT

GENERAL NOTES

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
C2 OF C27

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') INCREMENTS.
B. ONE (1) TEST EVERY TWO HUNDRED (200) LF OF MAINLINE TRENCH AT TWO–FOOT (2.0') 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.

FENCE

1. AT EACH LOCATION WHERE AN ELECTRIC TRANSMISSION, DISTRIBUTION, OR SECONDARY LINE CROSSES A FENCE, THE CONTRACTOR SHALL FURNISH AND INSTALL A GROUND CONFORMING TO ARTICLE 250 OF THE NATIONAL ELECTRIC CODE. A GROUND SHALL ALSO BE INSTALLED A MAXIMUM OF EVERY 500 FT ALONG THE FENCE. THE GROUND ROD SHALL BE A MINIMUM DIAMETER OF ½ IN AND 8 FT IN LENGTH, AND DRIVEN AT LEAST 7½ FT INTO THE GROUND. THE ROD SHALL BE CONNECTED TO EACH WIRE WITH A MINIMUM AWG NO. 8 STRANDED COPPER WIRE. GROUNDING WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE FENCE.

2. H (HEIGHT OF FABRIC) SHALL BE AS SHOWN ON THE PLANS. FABRIC IS AVAILABLE IN THE FOLLOWING HEIGHTS: 36 IN, 42 IN, 60 IN, 72 IN, 84 IN, 96 IN, 108 IN, 120 IN, AND 144 IN.

3. CHAIN LINK FENCE SHALL CONFORM TO AASHTO M 181.

4. CHAIN LINK FABRIC SHALL BE 2 IN MESH NO. 9 GAGE GALVANIZED OR ALUMINUM COATED WIRE SECURELY FASTENED TO TENSION WIRE, LINE POSTS, RAILS, BRACES AND STRETCHER BARS SPACE AS SHOWN. WIRE FASTENERS AND TIE CLIPS SHALL BE NO. 11 GAGE (W&M) GALVANIZED STEEL WIRE OR NO. 7 GAGE (B&S) ALUMINUM WIRE, AND HOG RINGS SHALL BE NO. 9 GAGE, ALL IN CONFORMANCE WITH ASTM F 626.

5. STEEL POSTS, RAILS AND GATE FRAMES SHALL CONFORM TO AASHTO M 181 TYPE 1, GRADE 1 OR GRADE 2.

6. AT THE CONTRACTOR'S OPTION, PIPE USED FOR CONSTRUCTION SHALL CONFORM TO THE DIMENSIONS AND WEIGHTS FOR ORDINARY PIPE PER CDOT.

7. TENSION WIRE SHALL BE CONTINUOUS BETWEEN END OR CORNER POST AND LINE BRACE POST. A TURNBUCKLE OR OTHER APPROVED TIGHTENING DEVICE SHALL BE USED FOR EACH CONTINUOUS SPAN OF TENSION WIRE.

8. TENSION WIRE SHALL CONFORM TO AASHTO M 181.

9. CONCRETE FOOTINGS SHALL HAVE TOPS CROWNED AT GROUND LEVEL AND SHALL BE CLASS B. CONCRETE WITH LIGHTWEIGHT AGGREGATE CONFORMING TO AASHTO M 195, MAY BE SUBSTITUTED.

10. TERMINATION OF FENCE AT BRIDGES OR OTHER STRUCTURES SHALL BE AS SHOWN ON THE PLANS.

11. CHAIN LINK FABRIC UP TO 5 FT HIGH SHALL BE KNUCKLED AT THE TOP AND BOTTOM SELVAGES.

12. FENCE MAY BE CONSTRUCTED WITH EITHER ROUND PIPE OR ROLL–FORMED STEEL COMPONENTS. THE CONTRACTOR SHALL STATE AT THE PROCONSTRUCTION CONFERENCE, THE TYPE OF CONSTRUCTION AND TYPE OF LINE POST TO BE USED THROUGHOUT THE PROJECT.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RE–ESTABLISHING DISTURBED OR DESTROYED SURVEY MONUMENTS TO THE APPROPRIATE ACCURACY.

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

REVISIONS

NO.	DESCRIPTION	DATE	BY
1	DESCRIPTION NO. 1	01/17	XXX

WASTEWATER TREATMENT PLANT

GENERAL NOTES

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

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

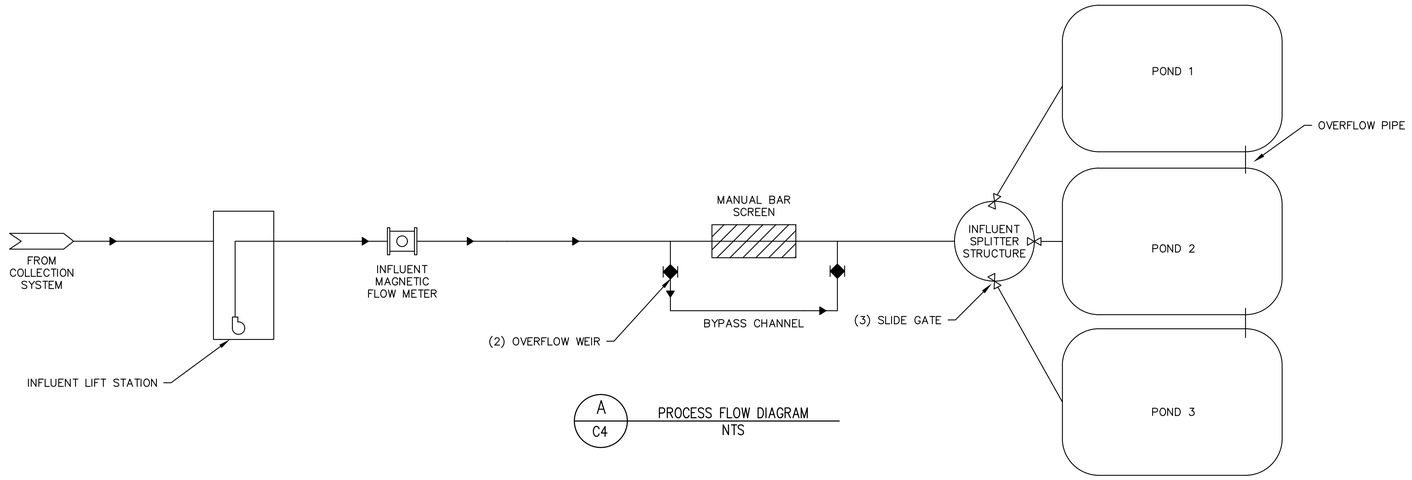
DATE
OCTOBER 2022

JOB NUMBER
0043.0001

SCALE
NTS

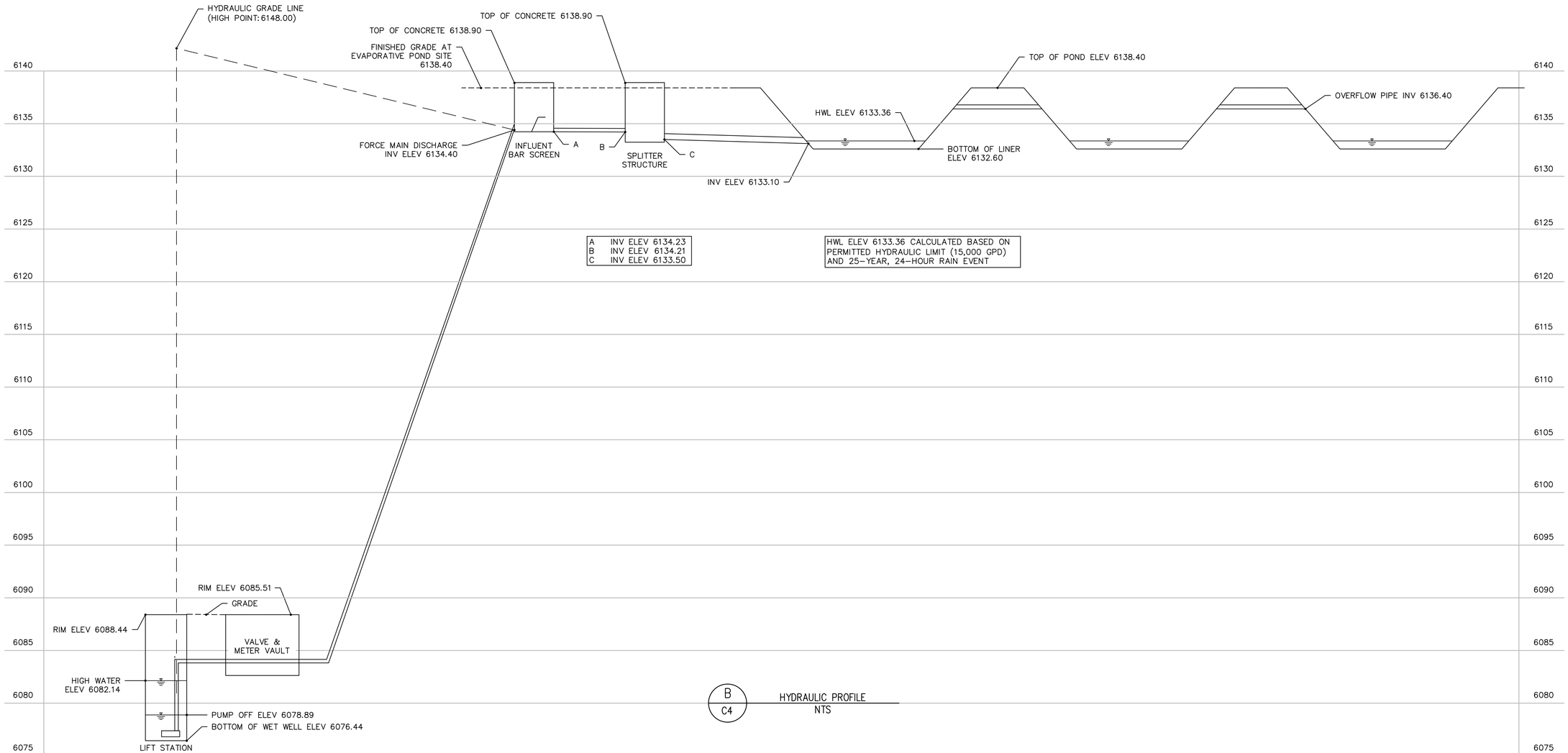
EDITION
PERMITTING

SHEET
C3 OF C27



A / C4 PROCESS FLOW DIAGRAM
NTS

DESIGN SUMMARY		
PERMITTED DESIGN FLOW	0.015	MGD
PERMITTED ORGANIC LOADING	32	LBS/DAY
LIFT STATION PERMITTED FLOW	42	GPM
TOTAL BOTTOM OF POND AREA	310,000	SF
TOTAL TOP OF POND AREA	372,049	SF



B / C4 HYDRAULIC PROFILE
NTS

ELEMENT ENGINEERING LLC
1268F W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80226
720.749.4165
WWW.ELEMENTENGINEERING.NET

REVISIONS

NO.	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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DATE: OCTOBER 2022
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SCALE: NTS
EDITION: PERMITTING
SHEET: C4 OF C27

LEGEND	
●	FOUND MONUMENT AS DESCRIBED
●	SET 18" #5 REBAR WITH 1 1/2" ALUMINUM CAP "FLATIRONS SURV 16406"
(AM)	AS MEASURED AT TIME OF SURVEY
(C)	CALCULATED FROM RECORD AND AS MEASURED INFORMATION
(P)	AS PER THE PLAT OF ~PLAT NAME~
(R)	AS PER RECORD INFORMATION
	CONCRETE
	EDGE OF ASPHALT
	GRAVEL
X X X X	FENCE
	SIGN/ MARKER
X"/X'	DECIDUOUS TREE (TRUNK DIAMETER/DRIP LINE RADIUS)
X"/X'	CONIFEROUS TREE (TRUNK DIAMETER/DRIP LINE RADIUS)
W	WATER LINE
WV	WATER VALVE
WM	WATER METER
W	WELL
	FIRE HYDRANT
IRR IRR	IRRIGATION LINE
SS SS SS	SANITARY SEWER LINE (8" PVC)
	SANITARY SEWER MANHOLE
E	ELECTRIC LINE
	TRANSFORMER
EM	ELECTRIC METER
EP	ELECTRICAL PANEL
EV	ELECTRIC VAULT/BOX
	LIGHT POLE

LEGEND	
OVU OVU OVU	OVERHEAD UTILITY LINE
	UTILITY POLE
	GUY WIRE
CTV CTV	CABLE TV LINE
CV	CABLE/FIBEROPTIC VAULT
FO FO FO	FIBEROPTIC LINE
GAS	GAS LINE
T T T T	TELEPHONE LINE
T	TELEPHONE MANHOLE
TR	TELEPHONE RISER
	UNIDENTIFIED MANHOLE
UV	UNIDENTIFIED VAULT
MB	MAILBOX
	POST

N

GRAPHIC SCALE
100 0 100 200
(IN FEET)
1 INCH = 100 FT

BIG SANDY CREEK

EXISTING WASTEWATER TREATMENT LAGOON

FOUND RED PLASTIC CAP WITH KITLICA PLS 10384

FOUND SECTION CORNER

UNNAMED STREAM/WASH

APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY

APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY

SANITARY MH
RIM: 6084.29
(SW) INV: 6080.87
(NE) INV: 6080.81
FLOOR: 6070.36

SANITARY MH
RIM: 6086.07
NO ACCESS

SANITARY MH
RIM: 6083.74
(NE) INV: 6081.47
FLOOR: 6076.56

SANITARY MH
RIM: 6083.71

EXISTING SEPTIC TANK

SANITARY MH
RIM: 6083.71

SANITARY MH
RIM: 6083.65
(SW) INV: 6081.77

CP2
6088.53
SET REBAR

12IN CMP FES
INV= 6084.55

12IN CMP EOP
INV= 6084.93

PIKES PEAK AVE
ROW VARIES

ROCK ISLAND AVE
40' ROW

SANITARY MH

SANITARY MH
RIM: 6089.38
(SE) INV: 6083.02
(SW) INV: 6083.20
(NE) INV: 6083.01
(NW) INV: 6082.96

WATER VALVE
RIM: 6091.23
TOP NUT: 6085.76

WATER VALVE
RIM: 6091.38
TOP NUT: 6086.32

WATER VALVE
RIM: 6090.89
TOP NUT: 6086.48

CP1
6095.38
SET REBAR

WELL HEAD
COVER: 6095.80'

SANITARY MH
RIM: 6090.89
(SE) INV: 6084.45
(NW) INV: 6084.31

OWNER: TOWN OF RAMAH

TRASH CONTAINERS

2ND STREET
80' ROW

WATER VALVE
RIM: 6094.09
TOP NUT: 6090.45

SANITARY MH
RIM: 6096.17
(E) INV: 6086.00
(SW) INV: 6086.02
(NW) INV: 6085.87

SANITARY SEWER SERVICE. APPROXIMATE LOCATION

¾" WATER SERVICES. APPROXIMATE LOCATION.

WATER VALVE
RIM: 6097.45
TOP NUT: 6093.07

COMMERCIAL ST
80' ROW

WATER VALVE
RIM: 6097.98
TOP NUT: 6093.84

SANITARY MH
RIM: 6104.99
(E) INV: 6094.45
(N+S) INV: 6094.46
(W) INV: 6094.32

CEDAR ST
80' ROW

SANITARY MH
RIM: 6110.21
(E) INV: 6099.69
(N+S) INV: 6099.83
(W) INV: 6099.69

PINE ST
80' RO

SANITARY MH
RIM: 6123.49
(E) INV: 6113.68
(N) INV: 6113.69
(S) INV: 6113.79
(W) INV: 6113.54

SANITARY MH
RIM: 6125.66
(W) INV: 6118.80

1ST STREET
80' ROW

RAILROAD STREET
70' ROW

WATER VALVE
RIM: 6098.03
TOP NUT: 6094.05

15IN CMP EOP
INV= 6104.70

15IN CMP EOP
INV= 6105.28

WATER VALVE
RIM: 6107.98
TOP NUT: 6103.29

WATER VALVE
RIM: 6107.27
TOP NUT: 6102.65

WATER VALVE
RIM: 6107.14
TOP NUT: 6102.54

18IN CMP EOP
INV= 6110.70

18IN CMP EOP
INV= 6111.45

WATER VALVE
RIM: 6115.23
NO ACCESS

WATER VALVE
RIM: 6115.28
TOP NUT: 6110.94

CHESTNUT ST
80' ROW

WATER VALVE
RIM: 6121.54
TOP NUT: 6117.59

WATER VALVE
RIM: 6121.46
NO ACCESS

2ND STREET
80' ROW

MAIN STREET
80' ROW

FOUND SECTION CORNER

MATCH LINE A - SEE SHEET C6

SURVEY INFORMATION

COORDINATE DATUM: COORDINATES ON THIS PROJECT ARE FOR THE EXCLUSIVE USE FOR THE CONSTRUCTION OF THIS PROJECT AND ARE CONSIDERED PROJECT COORDINATES ONLY. PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE CENTRAL ZONE NAD83 COORDINATES. PLEASE CONTACT B.L. LAMAN, brad@interstatesurveygroup.com, FOR ANY QUESTIONS ABOUT CONTROL POINTS ON THIS PROJECT.

ELEVATIONS ARE BASED ON NAVD88, DERIVED FROM AN OPUS SOLUTION.

CONTRACTOR TO VERIFY SURVEY INFORMATION AND REPORT ANY DESCREPANCIES BETWEEN SURVEY AND FIELD INFORMATION TO OWNER AND ENGINEER.

OBSERVATIONS WERE COLLECTED USING GPS RTK BETWEEN SEPTEMBER 20, 2021 AND OCTOBER 7, 2021.

NO RIGHT-OF-WAY DOCUMENTATION WAS FOUND FOR HWY 24 AND RAMAH ROAD EAST INTERSECTION. THE APPROXIMATE RIGHT-OF-WAY SHOWN WAS ESTABLISHED USING, AND BEST FIT TO, FOUND MONUMENTS

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REVISIONS

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WASTEWATER TREATMENT PLANT

TOPOGRAPHIC SURVEY

TOWN OF RAMAH
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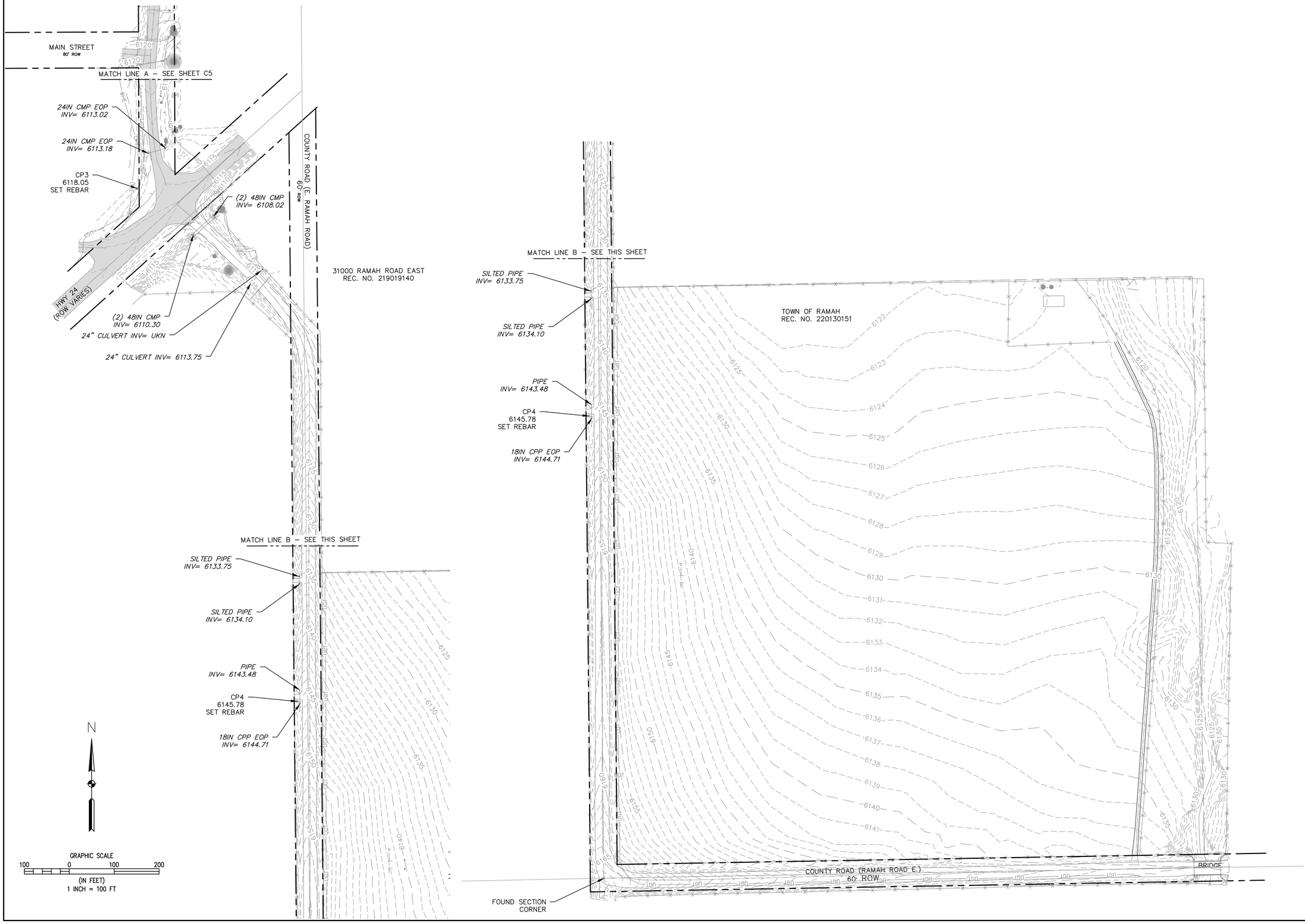
SCALE
1" = 100'

EDITION
PERMITTING

SHEET
C5 OF C27



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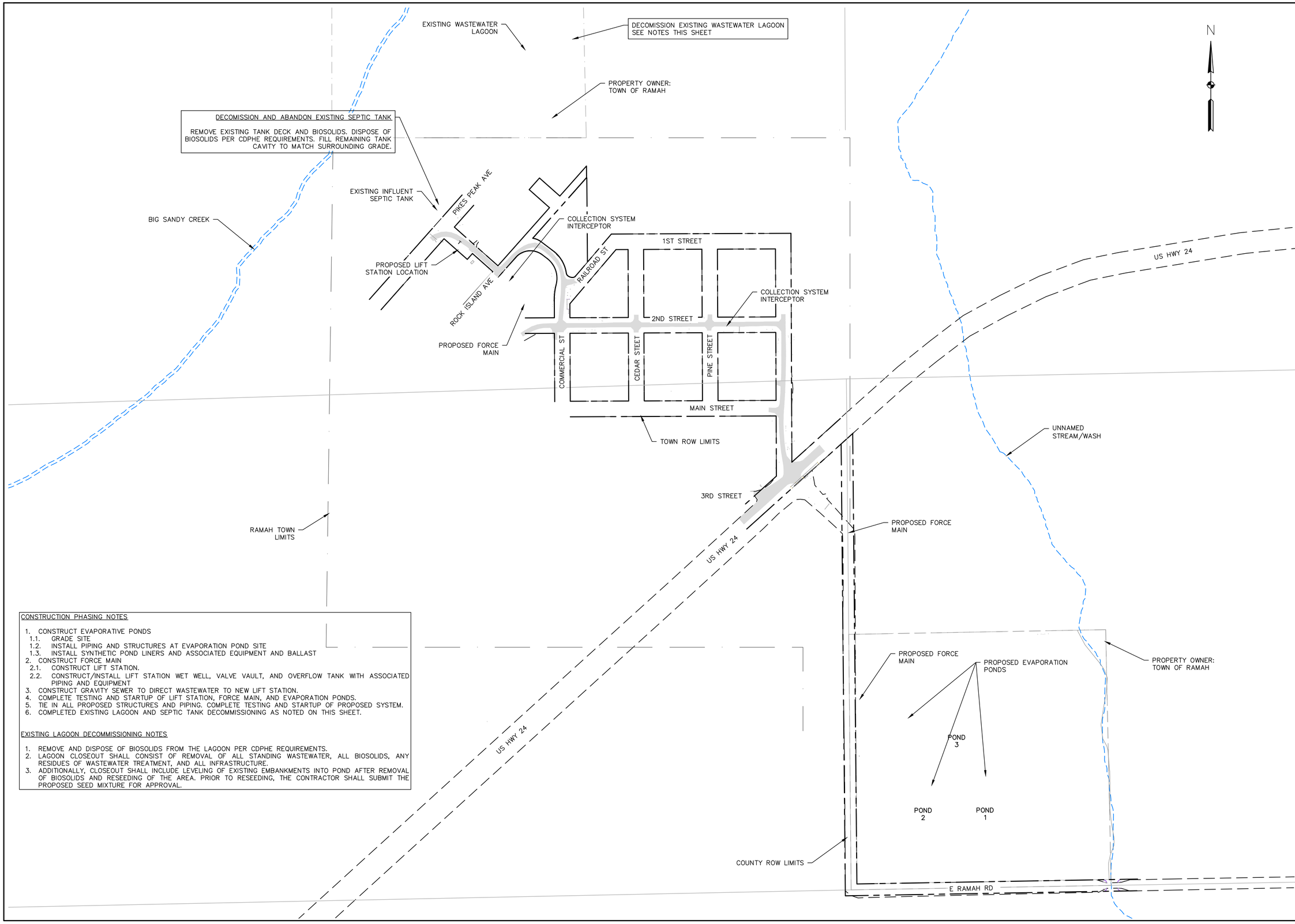
C6 OF C27



CONSTRUCTION PHASING NOTES

1. CONSTRUCT EVAPORATIVE PONDS
   - 1.1. GRADE SITE
   - 1.2. INSTALL PIPING AND STRUCTURES AT EVAPORATION POND SITE
   - 1.3. INSTALL SYNTHETIC POND LINERS AND ASSOCIATED EQUIPMENT AND BALLAST
2. CONSTRUCT FORCE MAIN
   - 2.1. CONSTRUCT LIFT STATION.
   - 2.2. CONSTRUCT/INSTALL LIFT STATION WET WELL, VALVE VAULT, AND OVERFLOW TANK WITH ASSOCIATED PIPING AND EQUIPMENT
3. CONSTRUCT GRAVITY SEWER TO DIRECT WASTEWATER TO NEW LIFT STATION.
4. COMPLETE TESTING AND STARTUP OF LIFT STATION, FORCE MAIN, AND EVAPORATION PONDS.
5. TIE IN ALL PROPOSED STRUCTURES AND PIPING. COMPLETE TESTING AND STARTUP OF PROPOSED SYSTEM.
6. COMPLETED EXISTING LAGOON AND SEPTIC TANK DECOMMISSIONING AS NOTED ON THIS SHEET.

EXISTING LAGOON DECOMMISSIONING NOTES

1. REMOVE AND DISPOSE OF BIOSOLIDS FROM THE LAGOON PER CDPHE REQUIREMENTS.
2. LAGOON CLOSEOUT SHALL CONSIST OF REMOVAL OF ALL STANDING WASTEWATER, ALL BIOSOLIDS, ANY RESIDUES OF WASTEWATER TREATMENT, AND ALL INFRASTRUCTURE.
3. 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.

ELEMENT ENGINEERING LLC
12687 W. CEDAR DRIVE, SUITE 300
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REVISIONS

NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

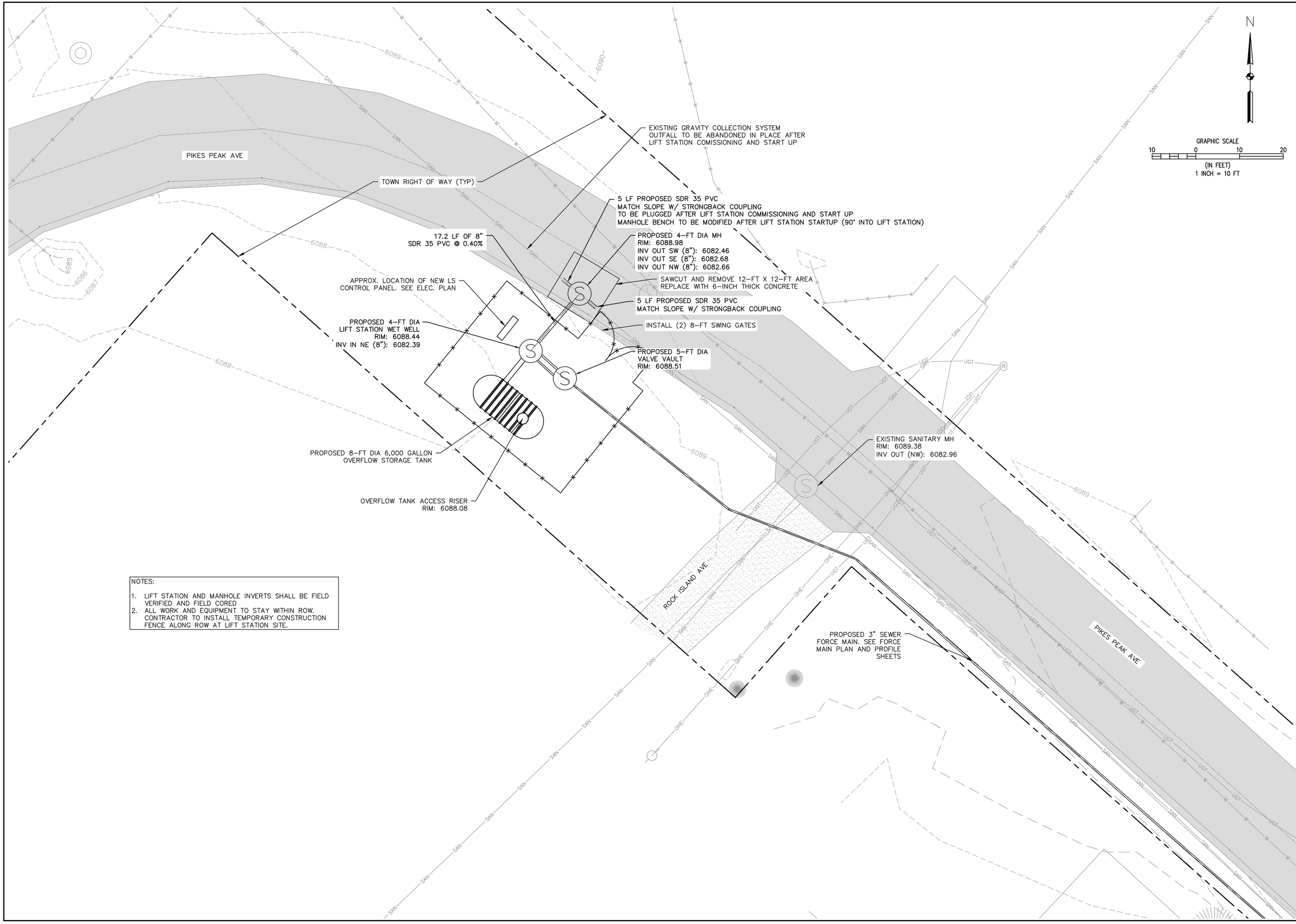
PROPOSED IMPROVEMENTS, CONST. PHASING, AND DEMO

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: C7 OF C27



NOTES:

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

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WASTEWATER TREATMENT PLANT

LIFT STATION YARD PIPING

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

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SCALE
1" = 10'

EDITION
PERMITTING

SHEET
C8 OF C27

PIKES PEAK AVE

TOWN RIGHT OF WAY (TYP)

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

N 1472668.25
E 3377388.88

N 1472670.36
E 3377399.30

N 1472673.27
E 3377382.66

INSTALL 6-INCH THICK CONCRETE (34-FT X 9-FT)

APPROX. LOCATION OF NEW LS CONTROL PANEL. SEE ELEC. PLAN

INSTALL PORTABLE PUMP HOIST

PROPOSED 4-FT DIA LIFT STATION WET WELL
RIM: 6088.44
INV IN NE (8"): 6082.39

PROPOSED 4-FT DIA MH
RIM: 6088.98
INV OUT SW (8"): 6082.46
INV OUT SE (8"): 6082.68
INV OUT NW (8"): 6082.66

SAWCUT AND REMOVE 12-FT X 12-FT AREA
REPLACE WITH 6-INCH THICK CONCRETE

INSTALL (2) 8-FT SWING GATES

PROPOSED 5-FT DIA VALVE VAULT
RIM: 6088.51

30'

N 1472649.93
E 3377363.82

N 1472657.25
E 3377388.14

N 1472650.99
E 3377395.93

N 1472648.15
E 3377413.79

40'

N 1472641.80
E 3377386.30

ROADBASE ENTIRE FENCED AREA AND AREA BETWEEN FENCE AND CONCRETE ON NORTHEAST SIDE OF FENCE WITH 4-INCH THICK ROADBASE (APPROX 150 SY)

PROPOSED 6-FT CHAIN LINK FENCE

OVERFLOW TANK ACCESS RISER
RIM: 6088.08

N 1472624.80
E 3377394.95

EXISTING SANITARY MH
RIM: 6089.38
INV OUT (NW): 6082.96

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

ROCK ISLAND AVE

PIKES PEAK AVE

6085 6086 6087 6088 6089 6090

NOTES:

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N

GRAPHIC SCALE
10 0 10 20
(IN FEET)
1 INCH = 10 FT

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LAKEWOOD, CO 80226
720.749.4165
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WASTEWATER TREATMENT PLANT

LIFT STATION SITE PLAN

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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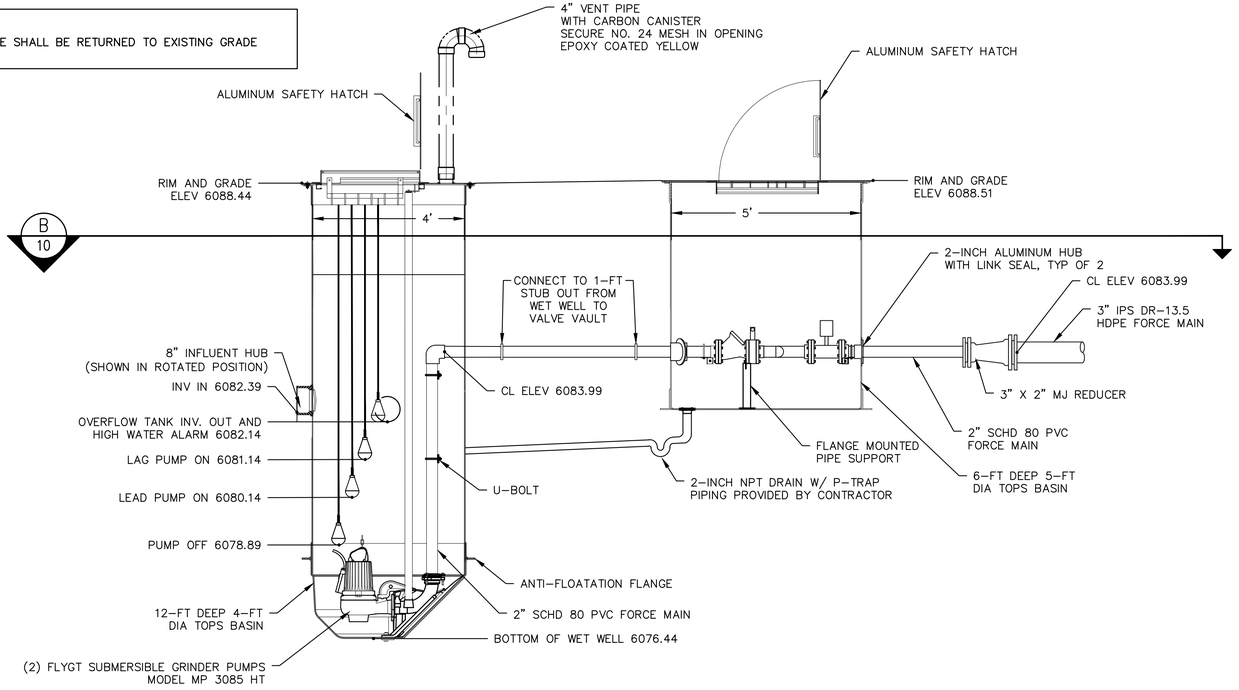
SCALE
1" = 10'

EDITION
PERMITTING

SHEET
C9 OF C27

GRADE NOTES:

1. FINAL GRADE SHALL BE RETURNED TO EXISTING GRADE ELEVATION



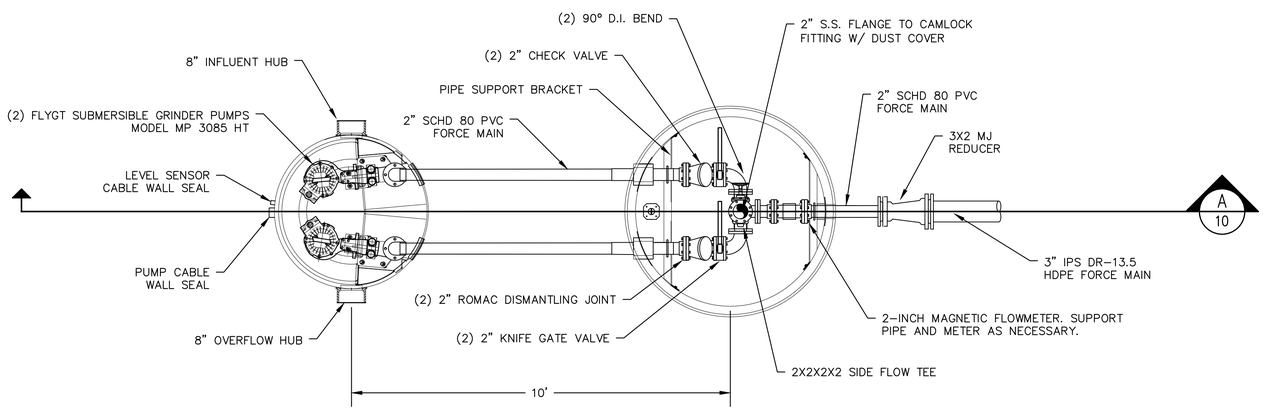
A
C10 LIFT STATION & VALVE VAULT PROFILE VIEW
1/2" = 1'

LIFT STATION DESIGN POINT: 42 GPM

ADJUST KNIFE GATE TO CREATE ARTIFICIAL SYSTEM HEAD TO ALLOW DESIGN POINT OPERATION (APPROX 99 FT TDH)

INFLUENT PUMP & MOTOR INFORMATION		
PUMP MAKE	FLYGT SUBMERSIBLE GRINDER	
PUMP MODEL	MP 3085 HT	
DISCHARGE DIAMETER	2	IN
IMPELLER DIAMETER	150	MM
RATED POWER	4	HP
FREQUENCY	60	HZ
RATED VOLTAGE	230	V
NO. POLES	2	
RATED CURRENT	9.9	AMP
STARTING CURRENT	62.0	AMP
RATED SPEED	3445	RPM

PUMP CURVE	
FLOW (GPM)	TDH (FT) 60 HZ
0	124
5	121
10	118
15	115
20	113
25	110
30	107
35	104
40	100
42	99
45	96
50	92
55	87
60	81
65	73



B
C10 LIFT STATION & VALVE VAULT PLAN VIEW
1/2" = 1'

LIFT STATION NOTES:

1. DISCHARGE CL MUST BE AT LEAST 18" FROM BOTTOM OF VALVE VAULT
2. DISCHARGE CL OF VAULT MUST EQUAL DISCHARGE CL OF ORDERED STATION
3. ALL BOLT PENETRATIONS THRU WALLS MUST BE SEALED WITH SILICONE SEALANT
4. ALL 2-INCH FORCE MAIN PIPING SHALL BE SCHD 80 PVC
5. ALL 3-INCH FORCE MAIN PIPING SHALL BE IPSS DR-13.5 HDPE
6. ALL 8-INCH GRAVITY PIPING SHALL BE SDR 35 PVC
7. PIPE COATING/COLORING AND LABELING PER SPECIFICATIONS
8. PIPE AND STRUCTURE PRESSURE TESTING PER SPECIFICATIONS
9. PIPE FITTINGS SHALL MATCH PIPE REQUIREMENTS INCLUDING INTERIOR COATING
10. FLOATS SHALL BE PLACED AS FAR AWAY FROM THE INFLUENT INVERT AS ALLOWABLE BASED ON THE GEOMETRY OF THE BASIN. THE PUMP OFF FLOAT SHALL BE LOCATED AT THE FURTHEST ALLOWABLE POSITION. FLOATS SHALL BE LOCATED IN INCREASING HEIGHT AS THEY GET CLOSER TO THE INFLUENT INVERT, WITH THE HIGH-WATER ALARM FLOAT BEING CLOSEST TO THE INVERT. FLOAT LOCATIONS SHOWN ON THESE PLANS ARE FOR ILLUSTRATIVE PURPOSES ONLY.

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WASTEWATER TREATMENT PLANT

LIFT STATION DETAILS

TOWN OF RAMAH
113 S. COMMERCIAL STREET
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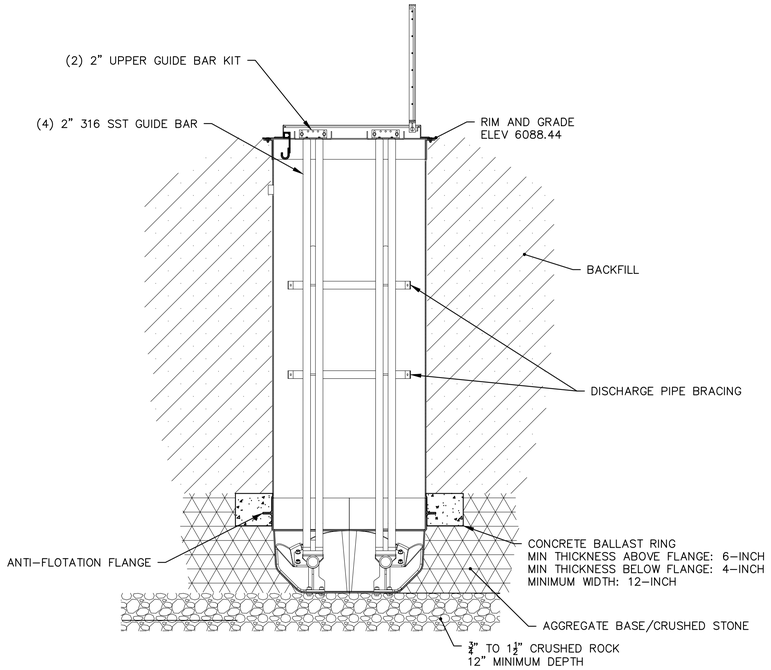
SHEET
C10 OF C27

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:

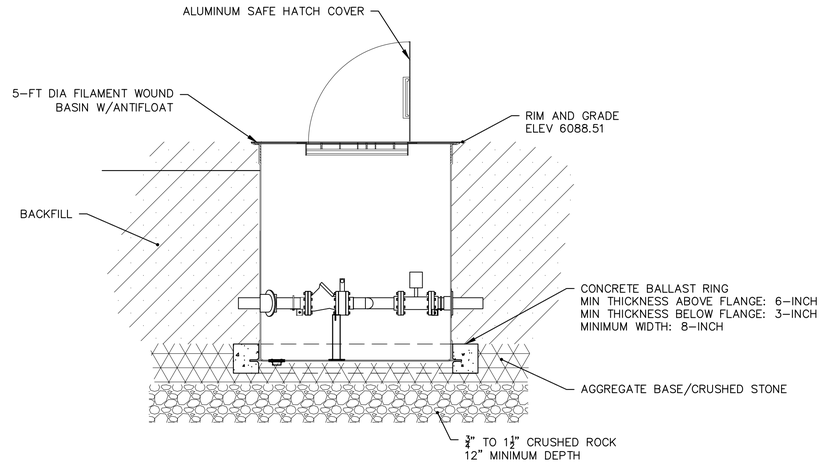
1. PRE–PACKAGED LIFT STATION:
   - 1.1. EXCAVATION AREA SHALL PROVIDE ADEQUATE WORKING ROOM AROUND THE PUMP STATION. SEE PUMP STATION INSTALLATION, CARE AND MAINTENANCE MANUAL FOR HANDLING, INSTALLATION, AND BALLASTING INSTRUCTIONS.
   - 1.2. CONCRETE BALLAST DESIGN SHALL BE SUFFICIENT TO RESIST HEAD 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'

GRADE NOTES:

1. FINAL GRADE SHALL BE RETURNED TO EXISTING GRADE ELEVATION



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

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LAKEWOOD, CO 80226
720.749.4165
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REVISIONS

NO.	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

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ELEMENT ENGINEERING, LLC

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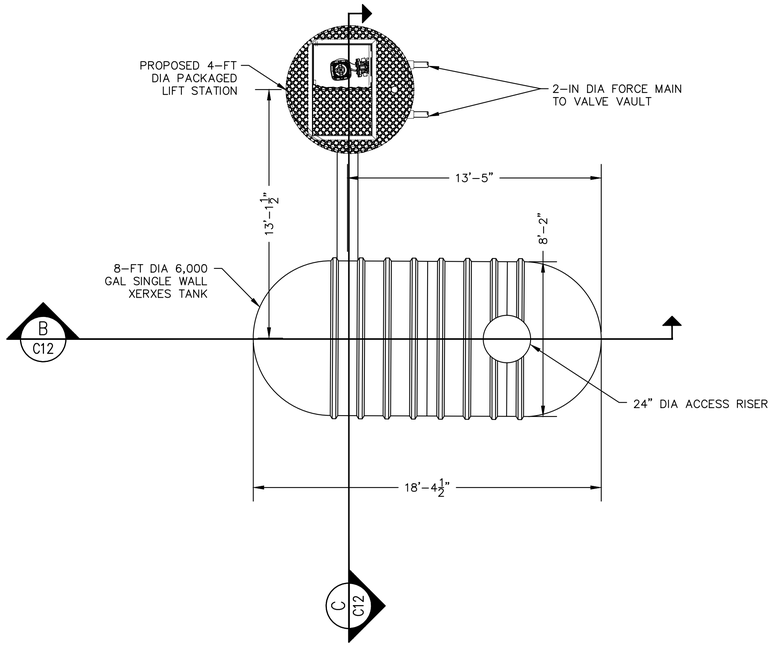
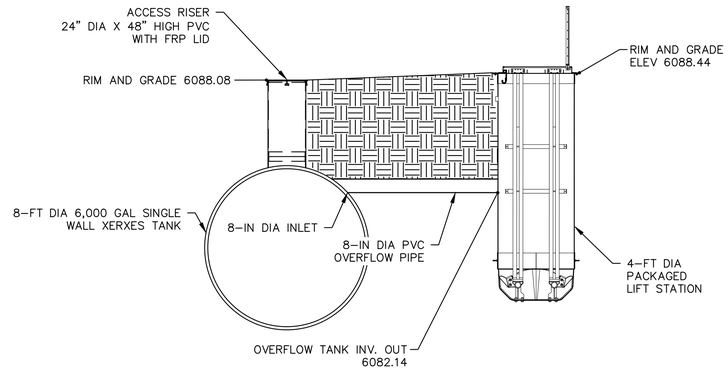
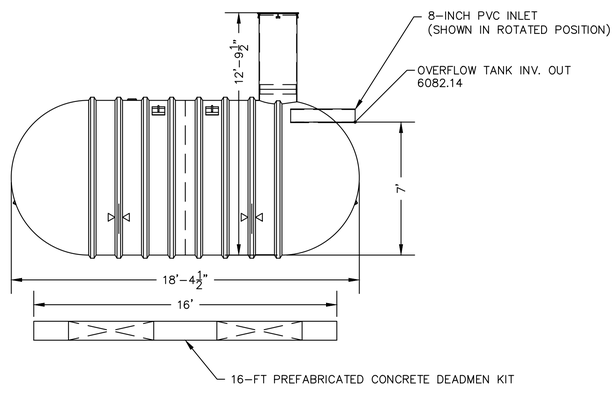


A C12 OVERFLOW PLAN VIEW
1/4" = 1'



C C12 OVERFLOW SIDE VIEW
1/4" = 1'



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

B C12 OVERFLOW PROFILE VIEW
1/4" = 1'

8–FT DIAMETER 6,000 GALLON TANK	
QTY	DESCRIPTION
1	4" NPT SERVICE FITTING
1	8" DIA PVC INLET HORIZONTAL PIPE
1	23 ½" IS FIBERGLASS ACCESS OPENING WITH 23 ½" 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

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WASTEWATER TREATMENT PLANT

OVERFLOW DETAILS

TOWN OF RAMAH
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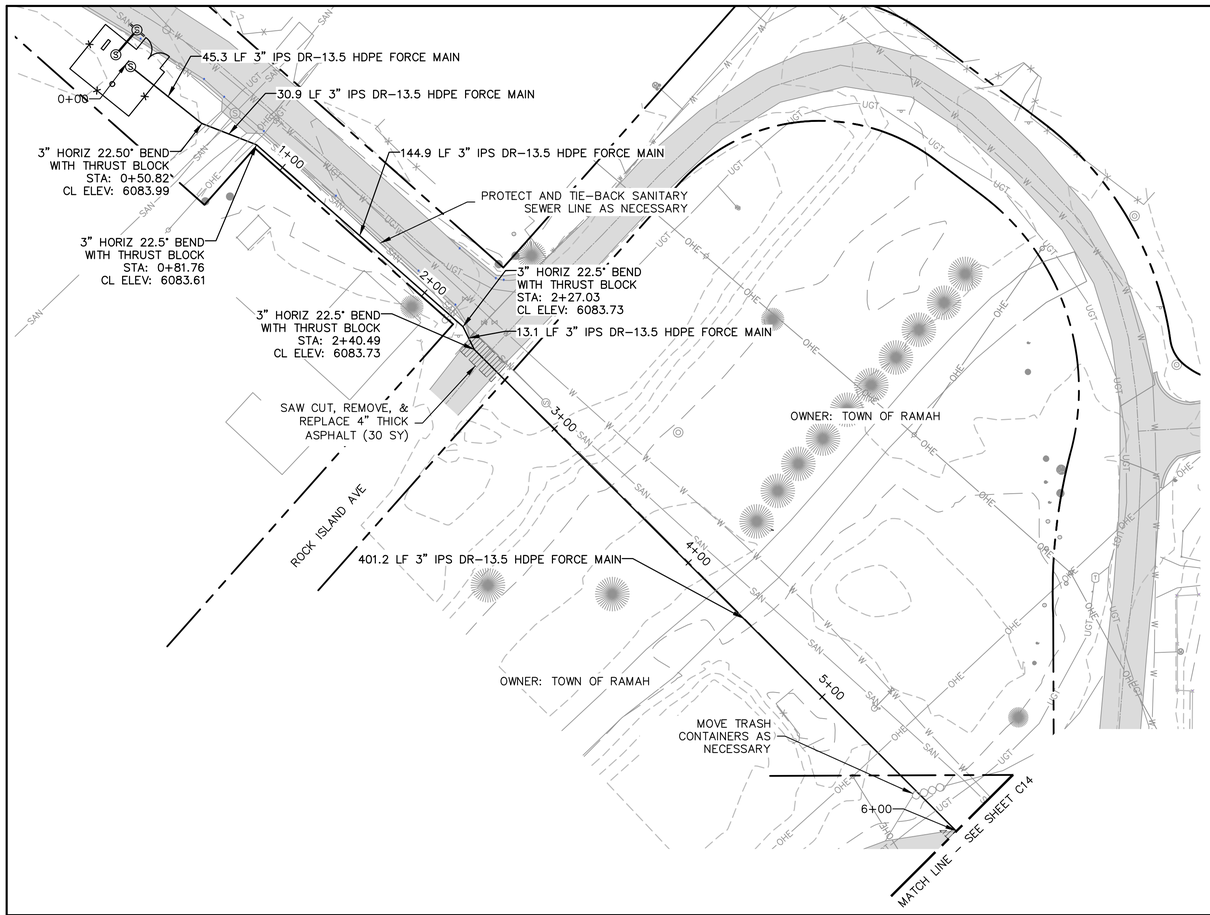
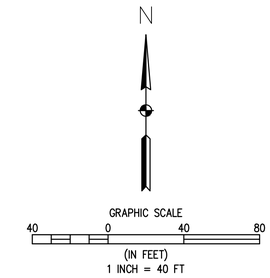
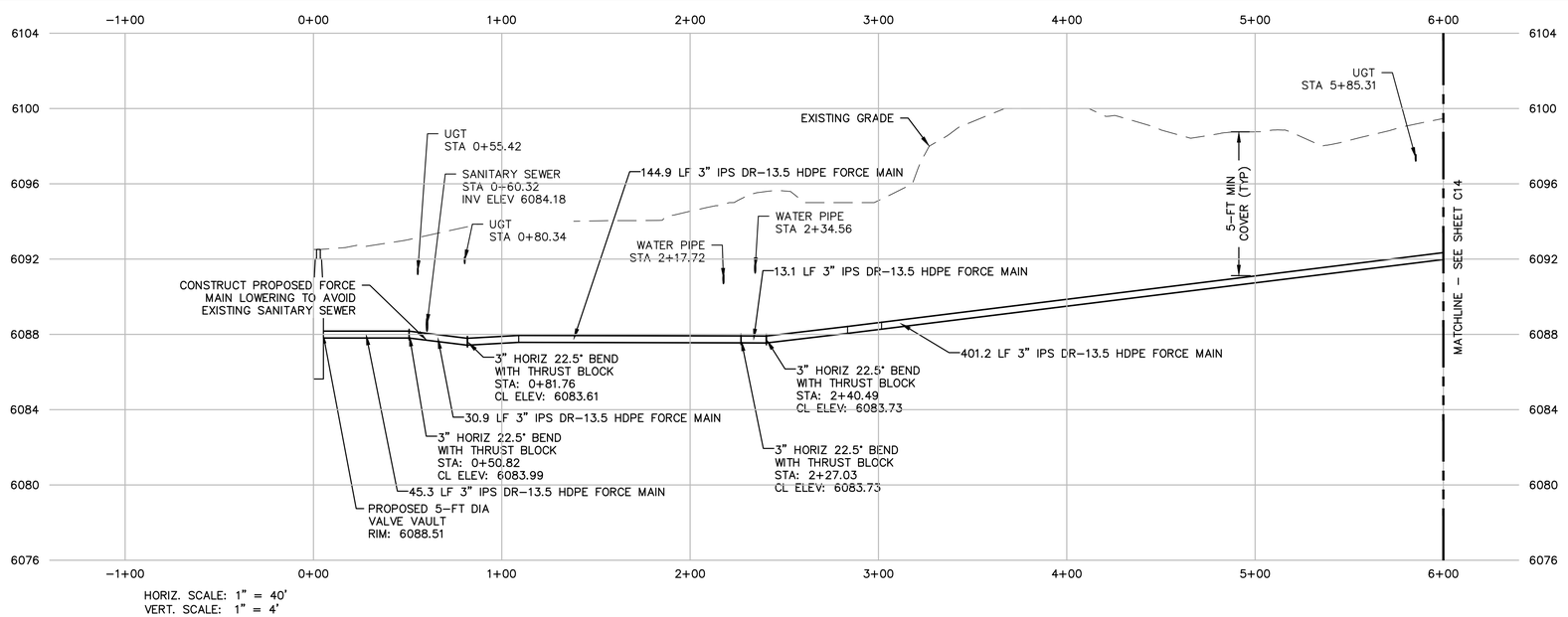




NOTES:
1. INSTALL 3" IPS DR-13.5 HDPE FORCE MAIN TO MAINTAIN 5-FT TO 6-FT BURY DEPTH WITH TRACER WIRE. INSTALL VERTICAL BENDS AS NECESSARY.
2. MAXIMUM ALLOWABLE JOINT DEFLECTION = 1°
3. PIPE DEFLECTION SHALL ONLY BE ALLOWED AT JOINTS. NO BENDING OF THE PIPE SHALL BE ALLOWED.
4. AVOID HIGH POINTS IN THE FORCE MAIN WHERE POSSIBLE. AIR VAC VAULTS SHALL BE REQUIRED AT ALL HIGH POINTS.
5. CONTRACTOR TO SURVEY AND MARK ACCESS EASEMENT, DISCUSS UTILITIES EASEMENTS, AND FINAL PROPERTY BOUNDARY.
6. 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.
7. CONTRACTOR TO REMOVE TREES AND BRUSH AND HAUL AWAY MATERIAL AS NECESSARY THROUGH WORK AREAS. DO NOT REMOVE OR DISTURB TREES UNNECESSARILY.
8. CONTRACTOR TO POTHOLE UTILITIES AT ALL CROSSINGS.
9. MAINTAIN 18-INCH MINIMUM VERTICAL SEPARATION AT ALL UTILITY CROSSINGS



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

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

REVISIONS

NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

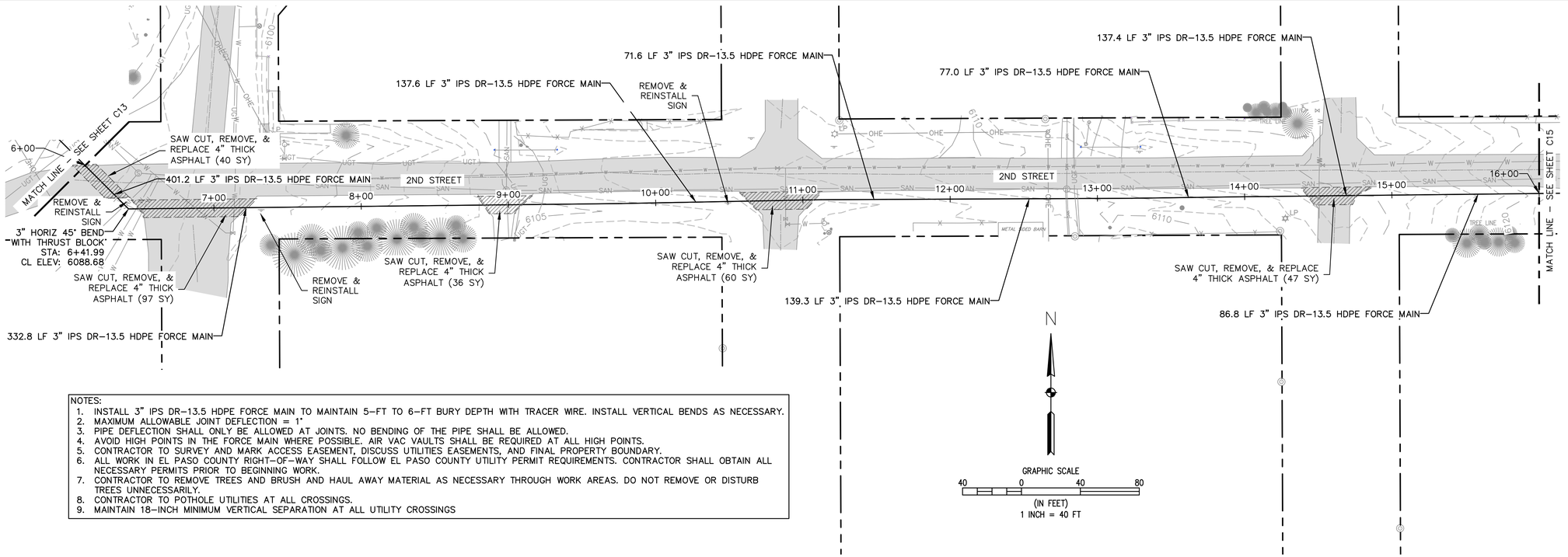
FORCE MAIN PLAN & PROFILE 0+00 - 6+00

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: C13 OF C27



N

GRAPHIC SCALE
40 0 40 80
(IN FEET)
1 INCH = 40 FT

NOTES:
1. 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.
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7. CONTRACTOR TO REMOVE TREES AND BRUSH AND HAUL AWAY MATERIAL AS NECESSARY THROUGH WORK AREAS. DO NOT REMOVE OR DISTURB TREES UNNECESSARILY.
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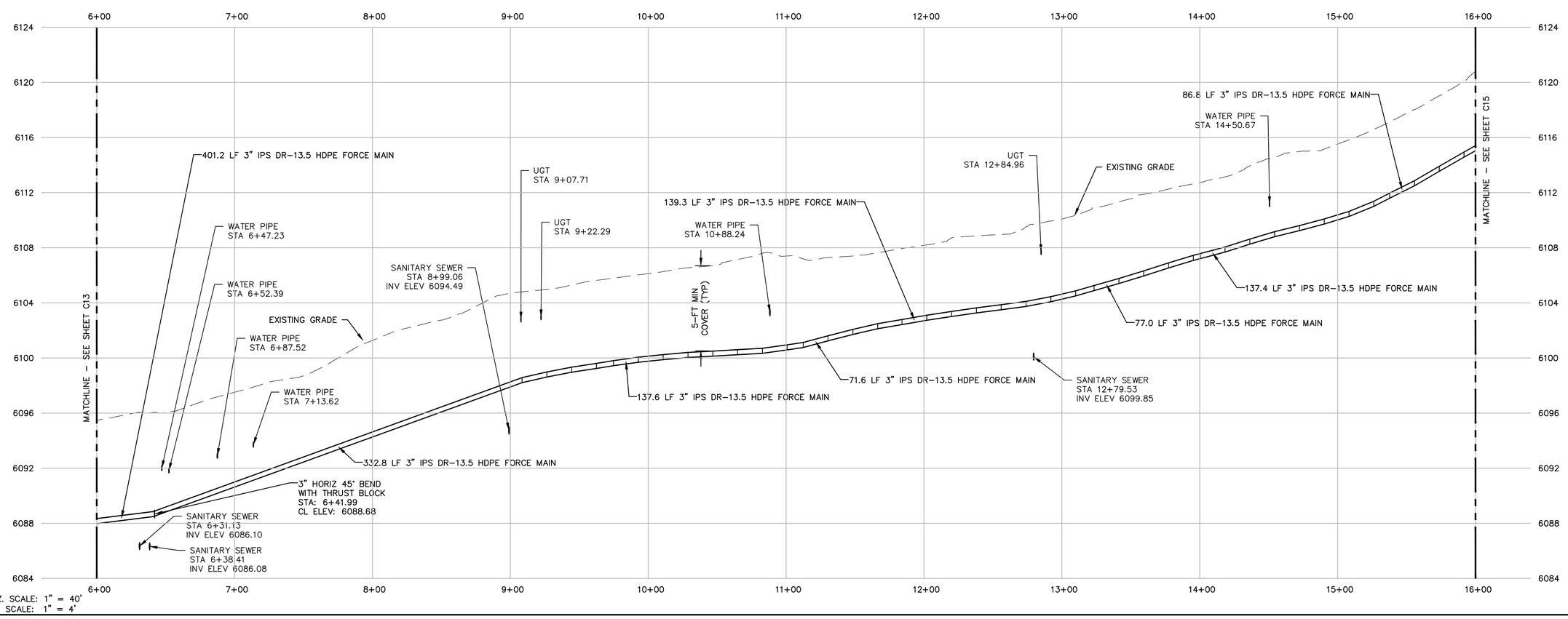

HORIZ. SCALE: 1" = 40'
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WASTEWATER TREATMENT PLANT

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
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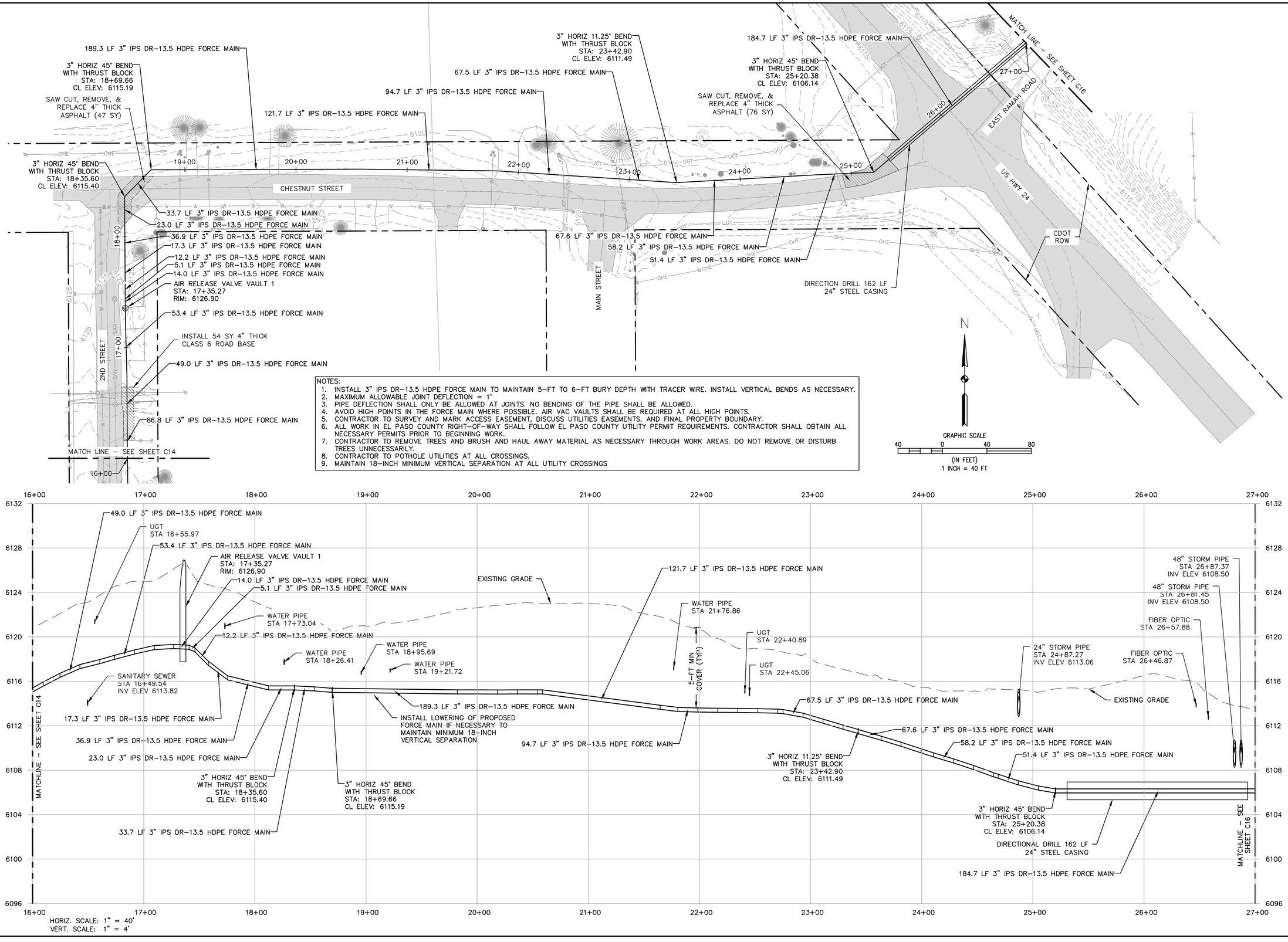
SCALE: 1" = 40'
EDITION: PERMITTING
SHEET: C14 OF C27



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12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165
WWW.ELEMENTENGINEERING.NET

REVISIONS

NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

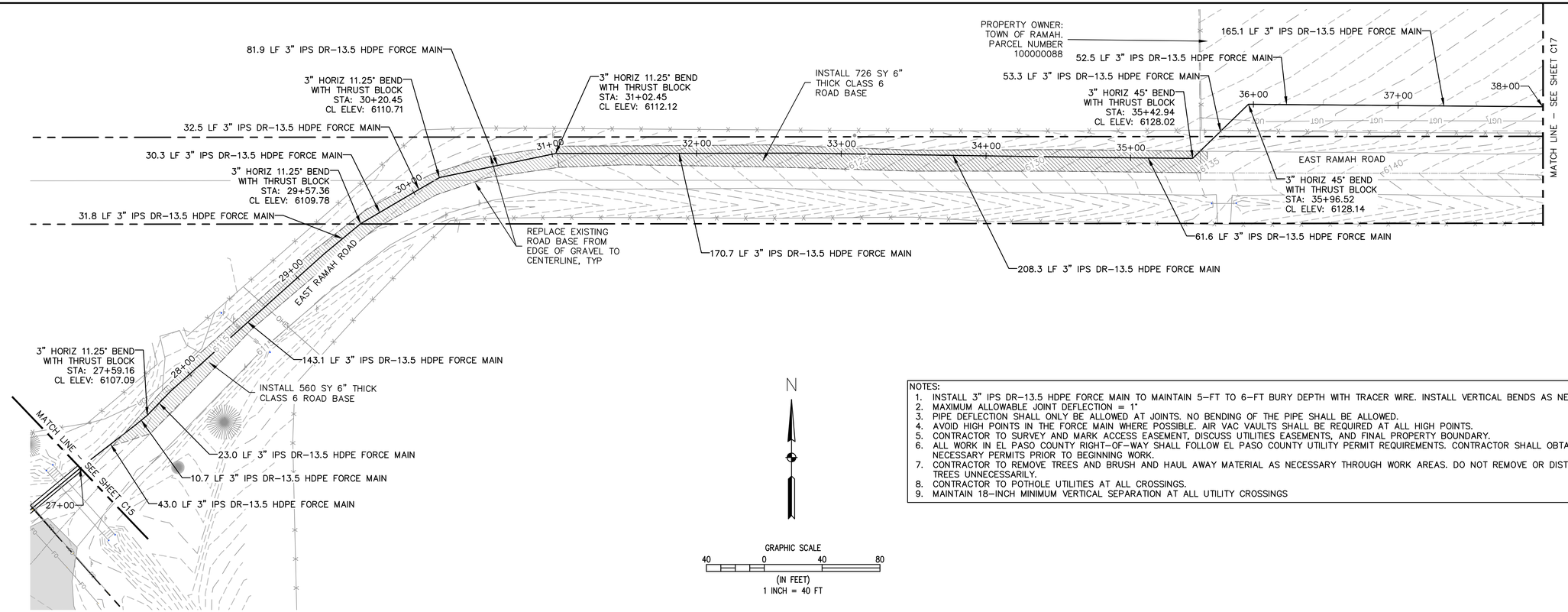
FORCE MAIN PLAN & PROFILE 16+00 - 27+00

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

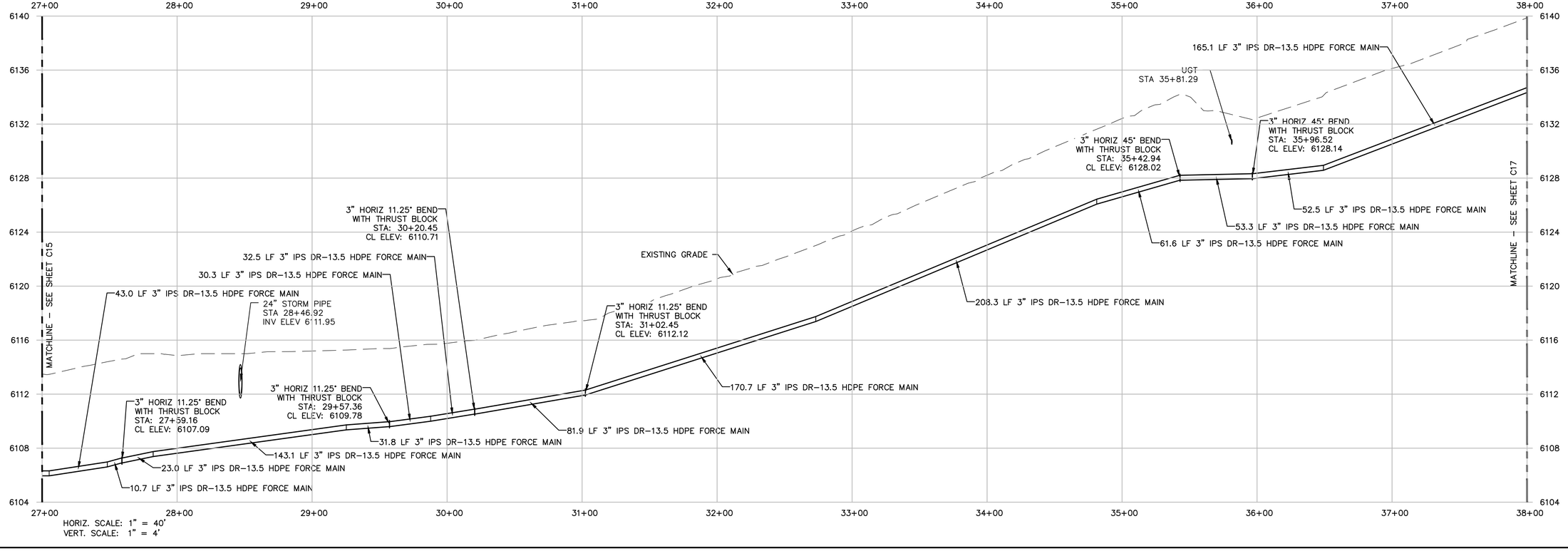
PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

DATE: OCTOBER 2022
JOB NUMBER: 0043.0001
SCALE: AS SHOWN
EDITION: PERMITTING
SHEET: C15 OF C27



NOTES:
1. 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.
2. MAXIMUM ALLOWABLE JOINT DEFLECTION = 1°
3. PIPE DEFLECTION SHALL ONLY BE ALLOWED AT JOINTS. NO BENDING OF THE PIPE SHALL BE ALLOWED.
4. AVOID HIGH POINTS IN THE FORCE MAIN WHERE POSSIBLE. AIR VAC VAULTS SHALL BE REQUIRED AT ALL HIGH POINTS.
5. CONTRACTOR TO SURVEY AND MARK ACCESS EASEMENT, DISCUSS UTILITIES EASEMENTS, AND FINAL PROPERTY BOUNDARY.
6. 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.
7. CONTRACTOR TO REMOVE TREES AND BRUSH AND HAUL AWAY MATERIAL AS NECESSARY THROUGH WORK AREAS. DO NOT REMOVE OR DISTURB TREES UNNECESSARILY.
8. CONTRACTOR TO POTHOLE UTILITIES AT ALL CROSSINGS.
9. MAINTAIN 18-INCH MINIMUM VERTICAL SEPARATION AT ALL UTILITY CROSSINGS



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

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

FORCE MAIN PLAN & PROFILE 27+00 - 38+00

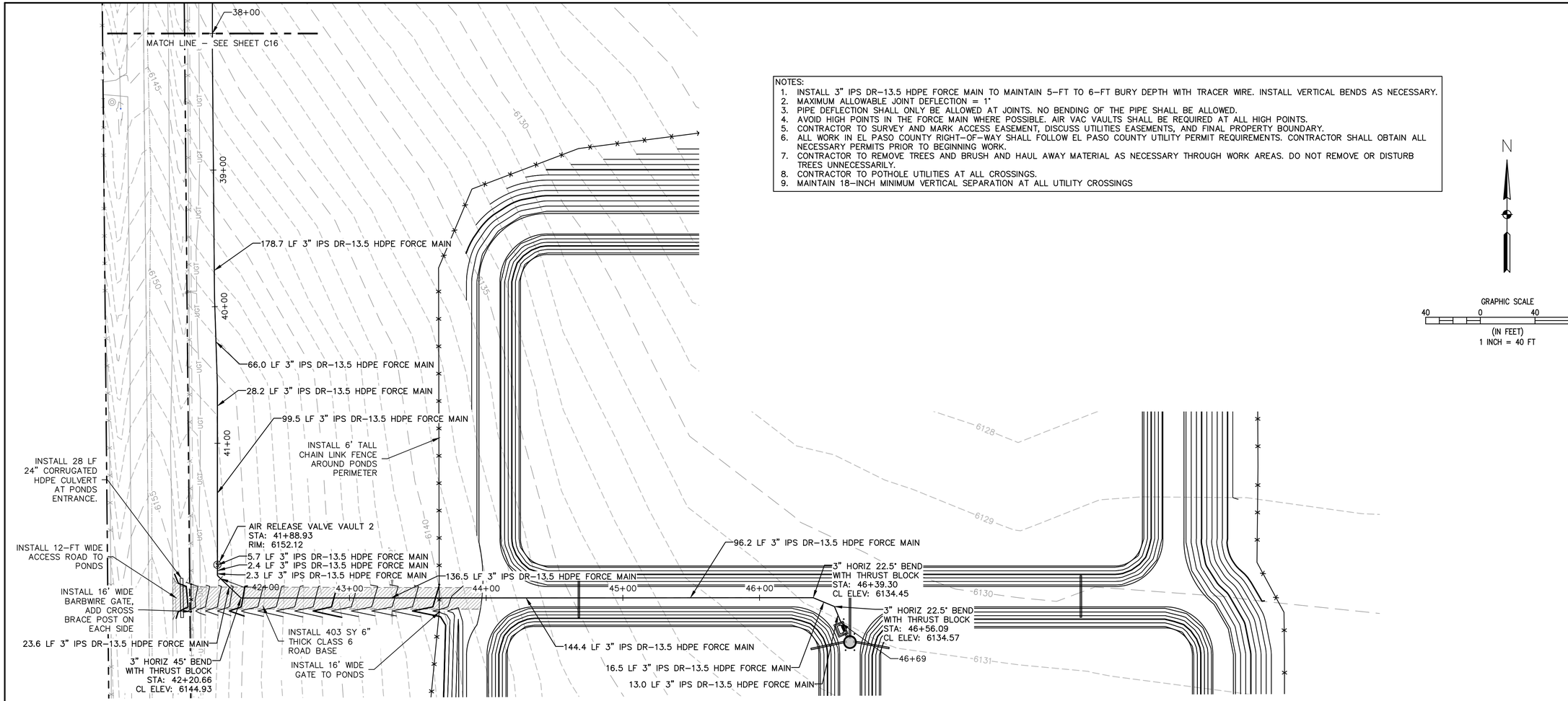
TOWN OF RAMAH
113 S. COMMERCIAL STREET
RAMAH, CO 80832

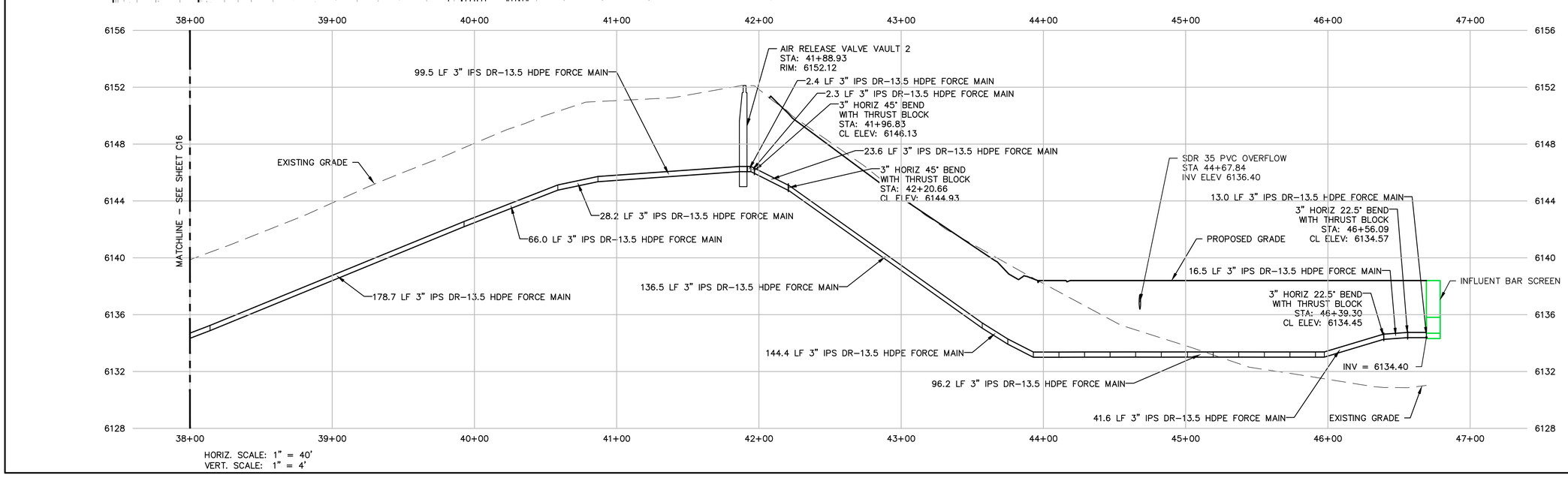
PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

DATE: OCTOBER 2022
JOB NUMBER: 0043.0001
SCALE: 1" = 40'
EDITION: PERMITTING
SHEET: C16 OF C27

NOTES:
1. 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.
2. MAXIMUM ALLOWABLE JOINT DEFLECTION = 1°
3. PIPE DEFLECTION SHALL ONLY BE ALLOWED AT JOINTS. NO BENDING OF THE PIPE SHALL BE ALLOWED.
4. AVOID HIGH POINTS IN THE FORCE MAIN WHERE POSSIBLE. AIR VAC VAULTS SHALL BE REQUIRED AT ALL HIGH POINTS.
5. CONTRACTOR TO SURVEY AND MARK ACCESS EASEMENT, DISCUSS UTILITIES EASEMENTS, AND FINAL PROPERTY BOUNDARY.
6. 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.
7. CONTRACTOR TO REMOVE TREES AND BRUSH AND HAUL AWAY MATERIAL AS NECESSARY THROUGH WORK AREAS. DO NOT REMOVE OR DISTURB TREES UNNECESSARILY.
8. CONTRACTOR TO POTHOLE UTILITIES AT ALL CROSSINGS.
9. MAINTAIN 18–INCH MINIMUM VERTICAL SEPARATION AT ALL UTILITY CROSSINGS





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

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REVISIONS

NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

FORCE MAIN PLAN & PROFILE 38+00 – 46+75

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

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

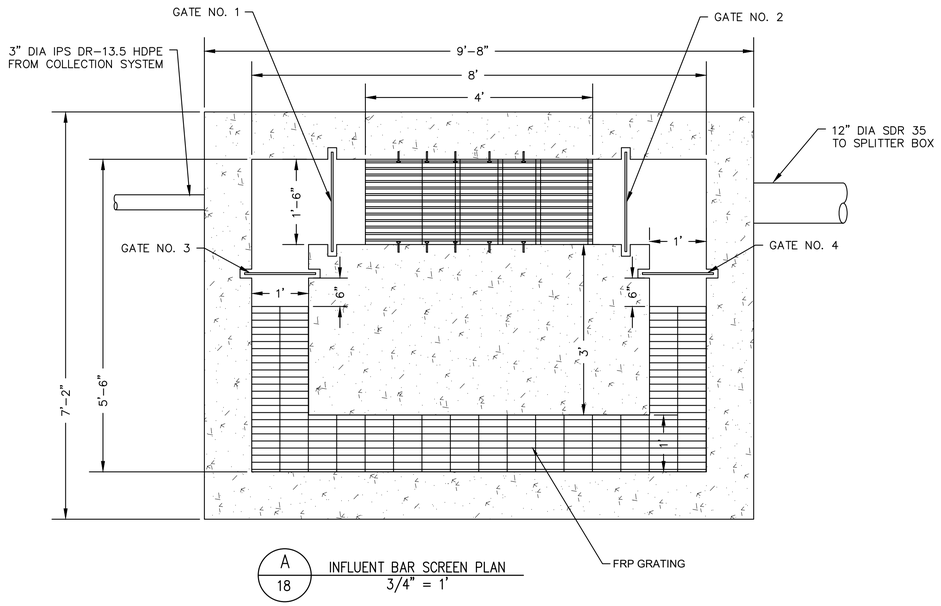
DATE
OCTOBER 2022

JOB NUMBER
0043.0001

SCALE
1" = 40'

EDITION
PERMITTING

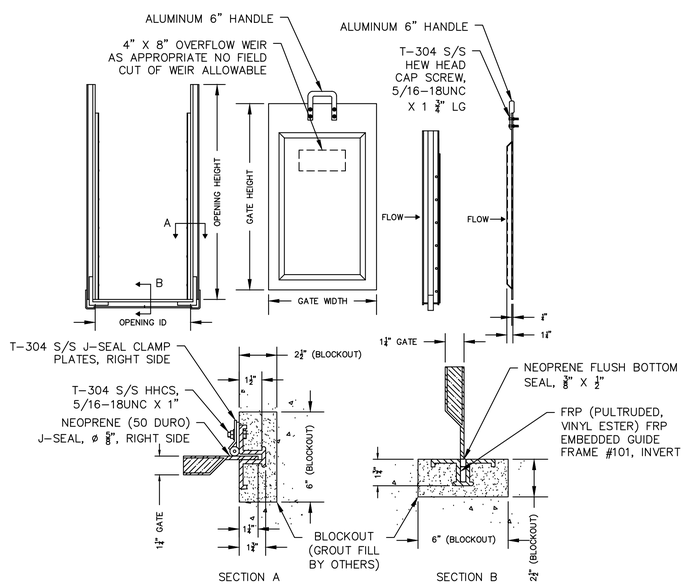
SHEET
C17 OF C27



A / 18 INFLUENT BAR SCREEN PLAN
3/4" = 1'

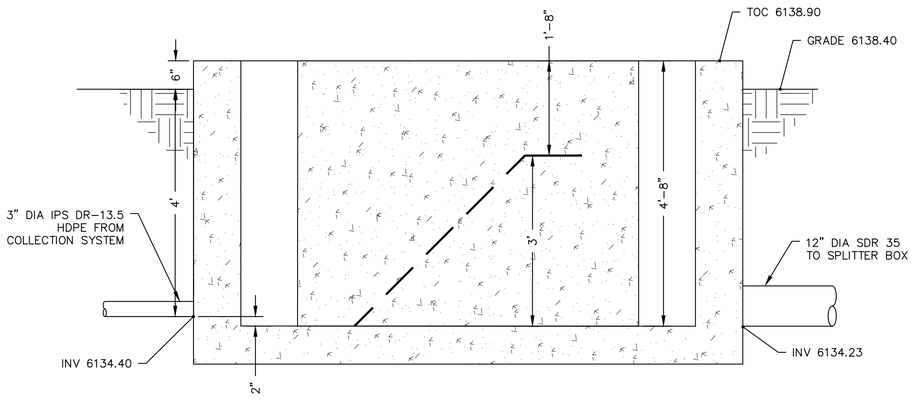
GATE TABLE				
GATE NUMBER	GATE TYPE	MOUNTING TYPE	CHANNEL DIMENSIONS (H' X W')	NOTES
1	MANUAL STOP GATE	FE	3'-6" X 1'-6"	
2	MANUAL STOP GATE	FE	3'-6" X 1'-6"	
3	MANUAL STOP GATE	FE	3'-6" X 1'	EMERGENCY OVERFLOW WEIR
4	MANUAL STOP GATE	FE	3'-6" X 1'	EMERGENCY OVERFLOW WEIR

FE FRAME EMBEDDED INSIDE CHANNEL
H HEIGHT
W WIDTH

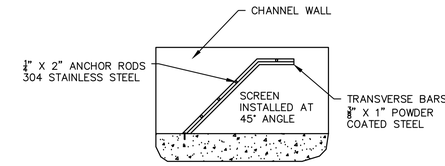


NOTES:
1. STOP GATES TO BE MANUFACTURED BY PLASTI-FAB OR ENGINEER APPROVED EQUAL
2. SEE PLANS FOR OPENING AND GATE DIMENSIONS
3. STOP GATE IS SANDWICH CONSTRUCTION W/ FRP SKINS, FOAM CORE, AND INTERNAL STRUCTURAL STEEL
4. STOP GATE COLOR IS GREY
5. RESIN: MCWHORTER 712-3765
6. GUIDE FRAME IS PULTRUDED FRP (VINYL-ESTER)
7. ALL JOINTS ARE BONDED WITH PLEXUS MA-300
8. ALL HARDWARE MATERIAL IS T-304 S/S
9. APPROXIMATE WEIGHT OF GATE ALONE IS 14 LBS

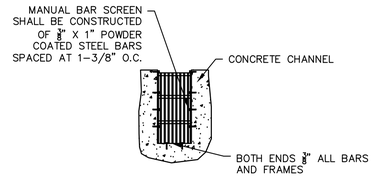
1 / 18 STOP GATE DETAIL
NTS



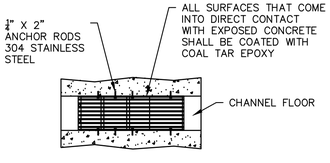
B / 18 INFLUENT BAR SCREEN PROFILE
3/4" = 1'



2 / 18 MANUAL BAR SCREEN SECTION
NTS



3 / 18 MANUAL BAR SCREEN FRONT VIEW
NTS



4 / 18 MANUAL BAR SCREEN TOP VIEW
NTS

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WASTEWATER TREATMENT PLANT

INFLUENT SCREEN 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

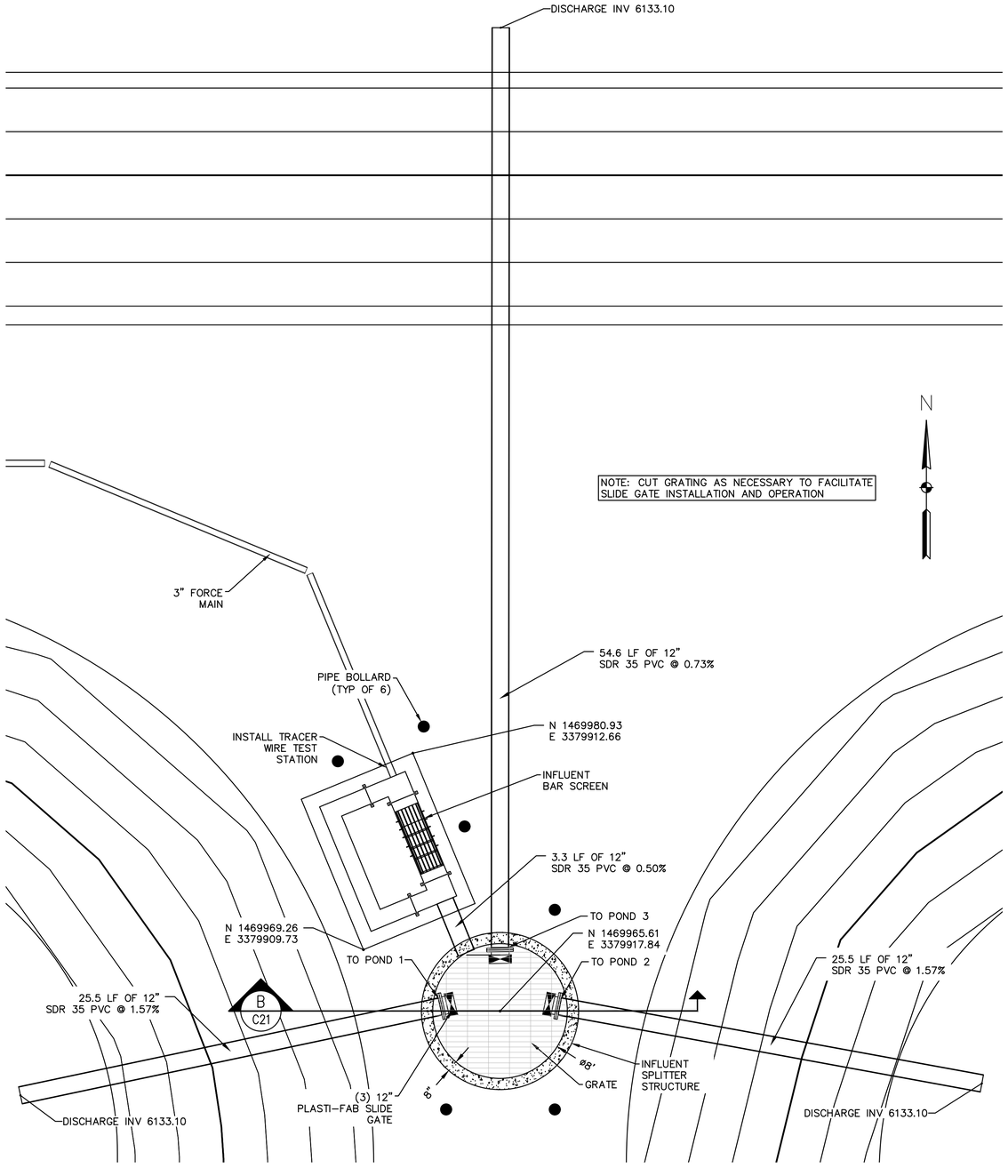
DATE
OCTOBER 2022

JOB NUMBER
0043.0001

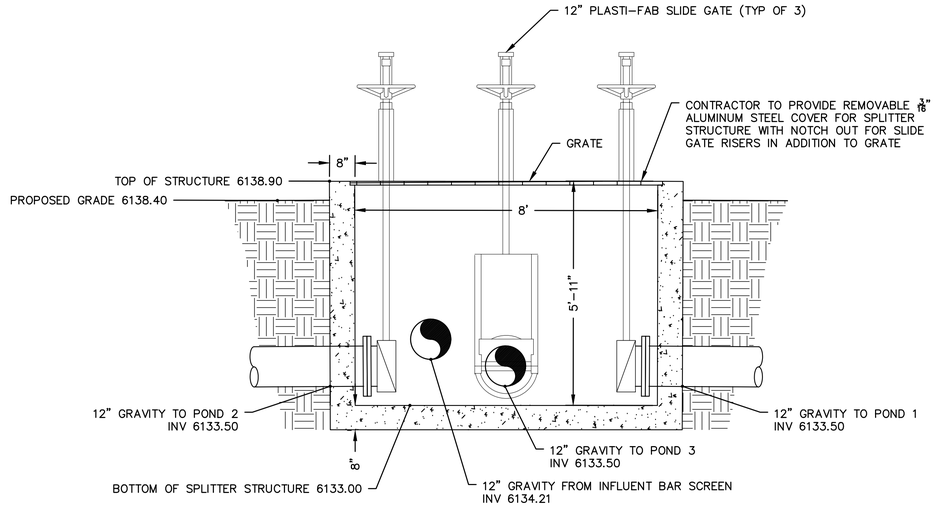
SCALE
AS SHOWN

EDITION
PERMITTING

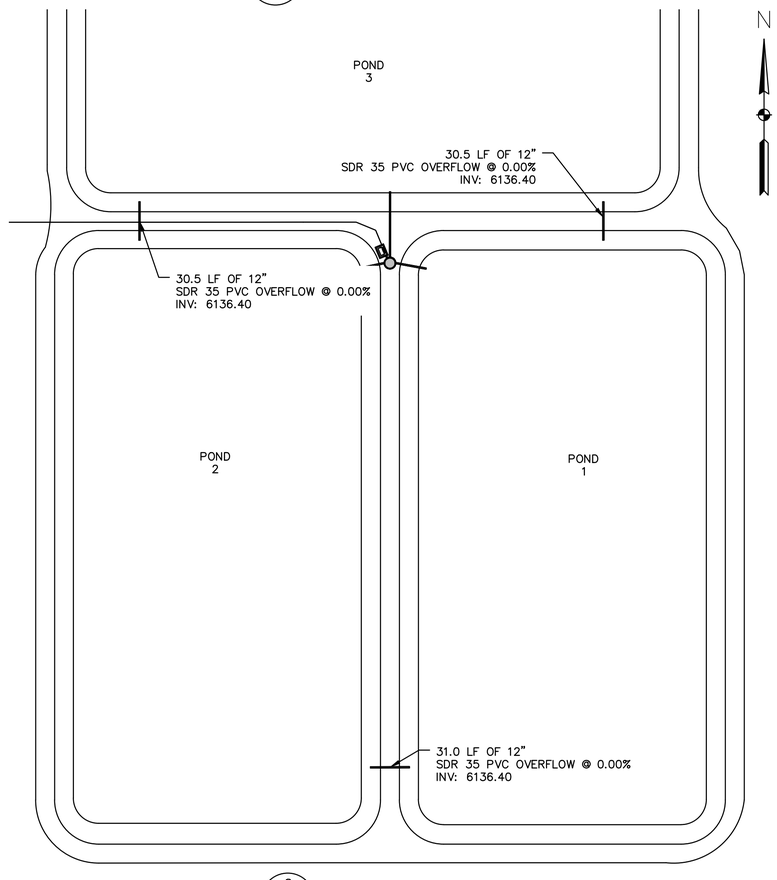
SHEET
C18 OF C27



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



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



C C21 OVERFLOW PIPING
1" = 60'

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NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

SPLITTER BOX & POND OVERFLOW PIPING

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

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

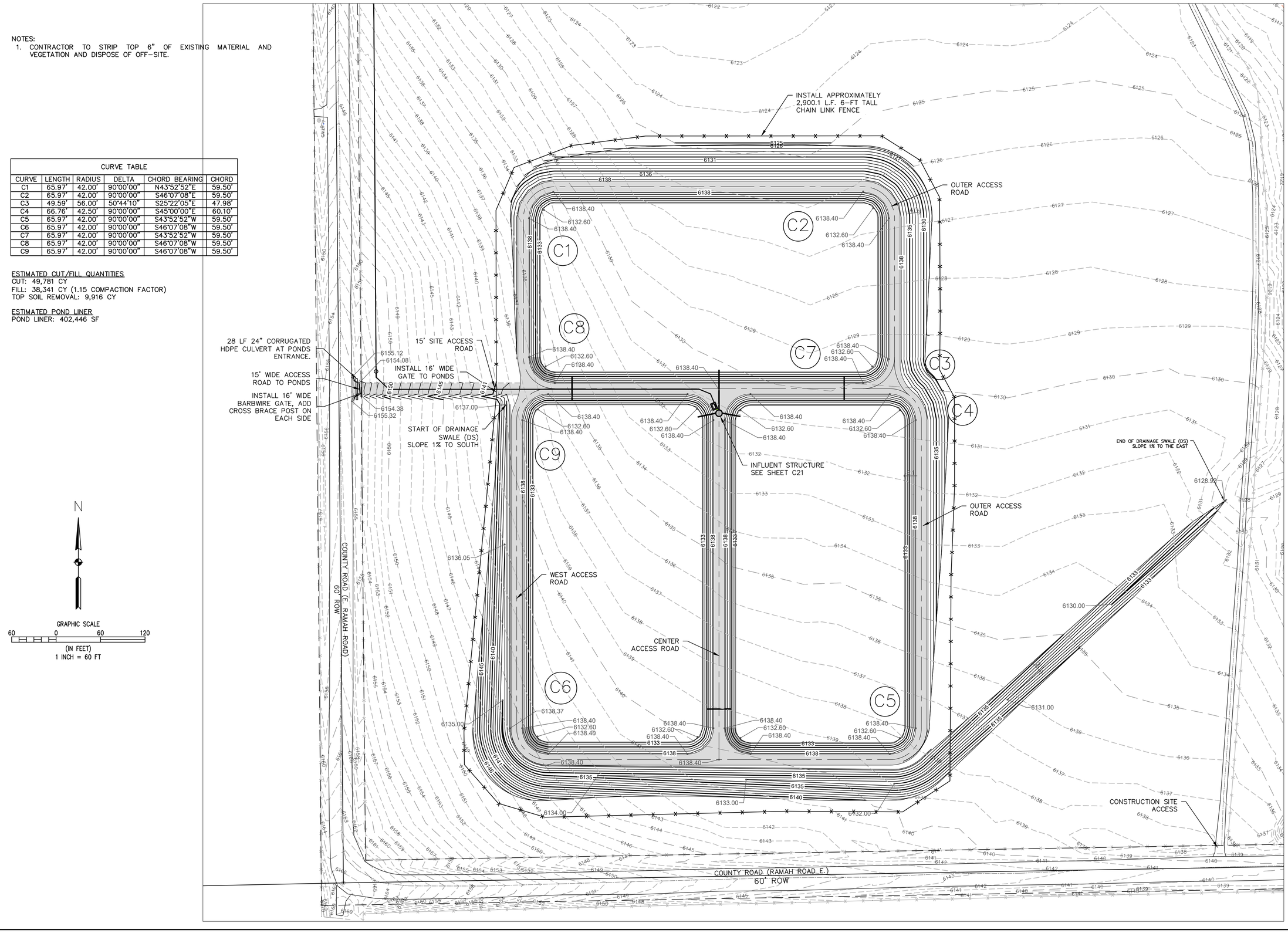
DATE: OCTOBER 2022
JOB NUMBER: 0043.0001
SCALE: AS SHOWN
EDITION: PERMITTING
SHEET: C19 OF C27

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

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: 49,781 CY
FILL: 38,341 CY (1.15 COMPACTION FACTOR)
TOP SOIL REMOVAL: 9,916 CY

ESTIMATED POND LINER
POND LINER: 402,446 SF



N

GRAPHIC SCALE
60 0 60 120
(IN FEET)
1 INCH = 60 FT

ELEMENT ENGINEERING LLC
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LAKEWOOD, CO 80228
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REVISIONS			
NO.	DESCRIPTION	DATE	BY

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

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

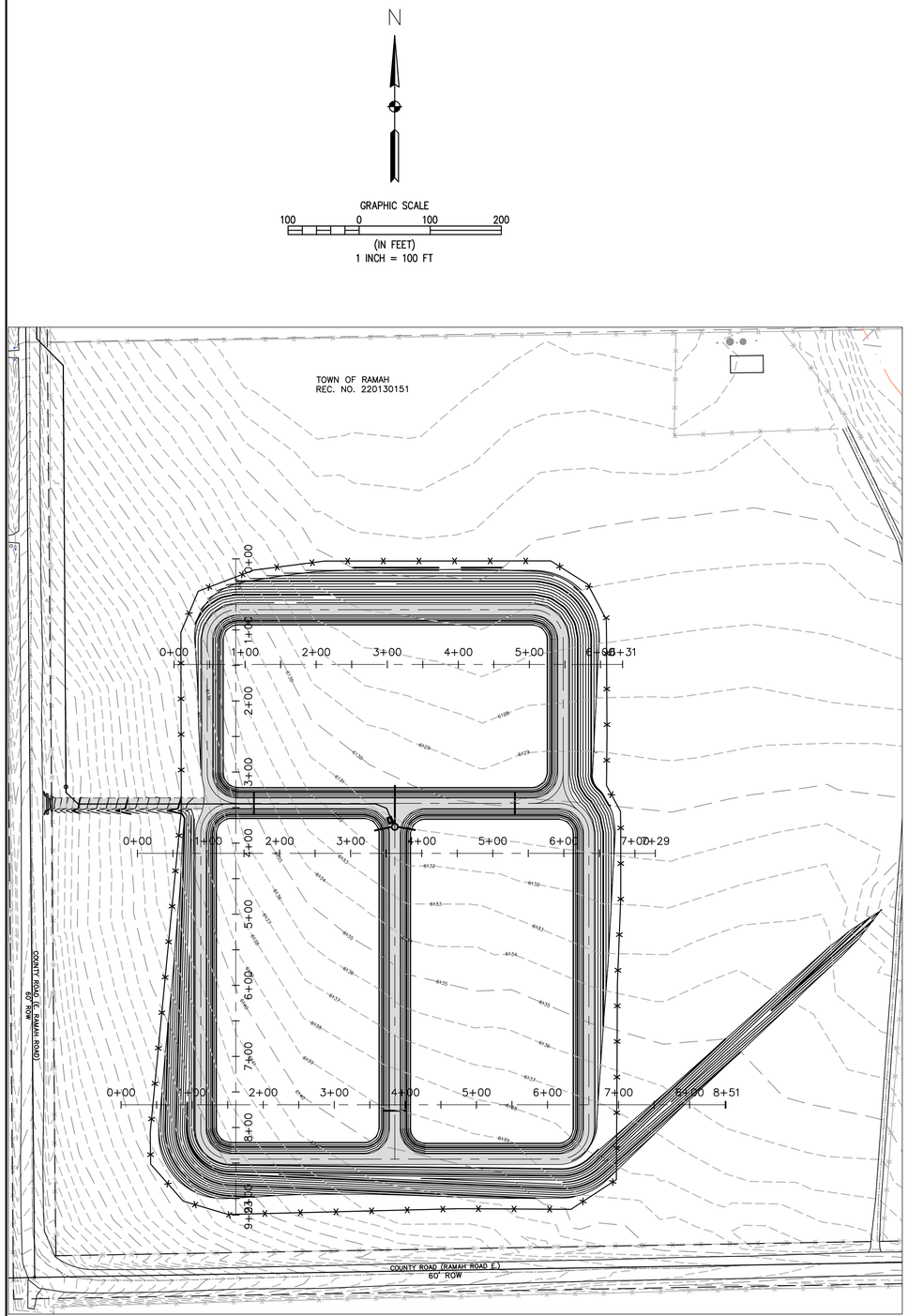
DATE
OCTOBER 2022

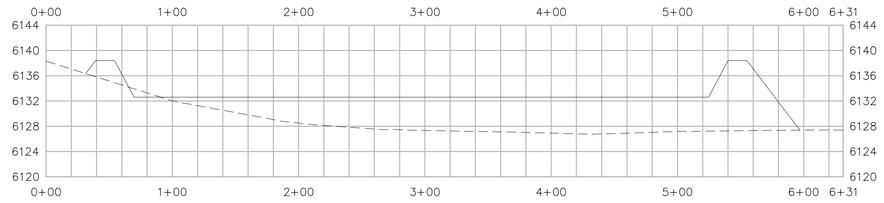
JOB NUMBER
0043.0001

SCALE
1" = 60'

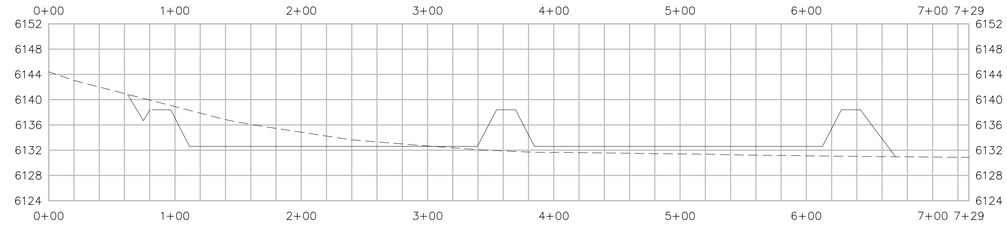
EDITION
PERMITTING

SHEET
C20 OF C27

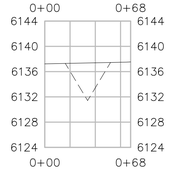




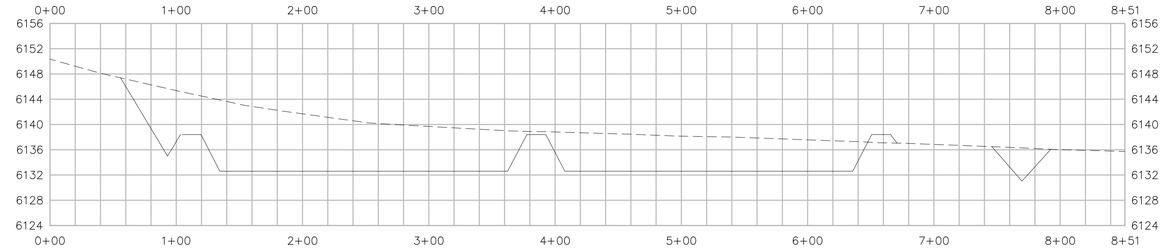
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'



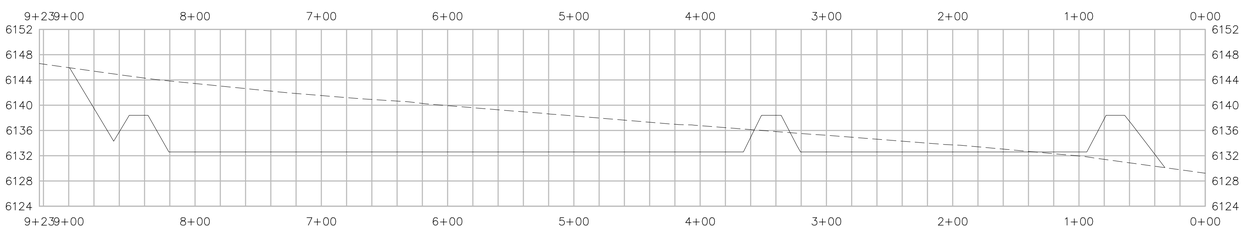
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'



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



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



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

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NO.	DESCRIPTION	DATE	BY

REVISIONS

WASTEWATER TREATMENT PLANT

POND GRADING PROFILES

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

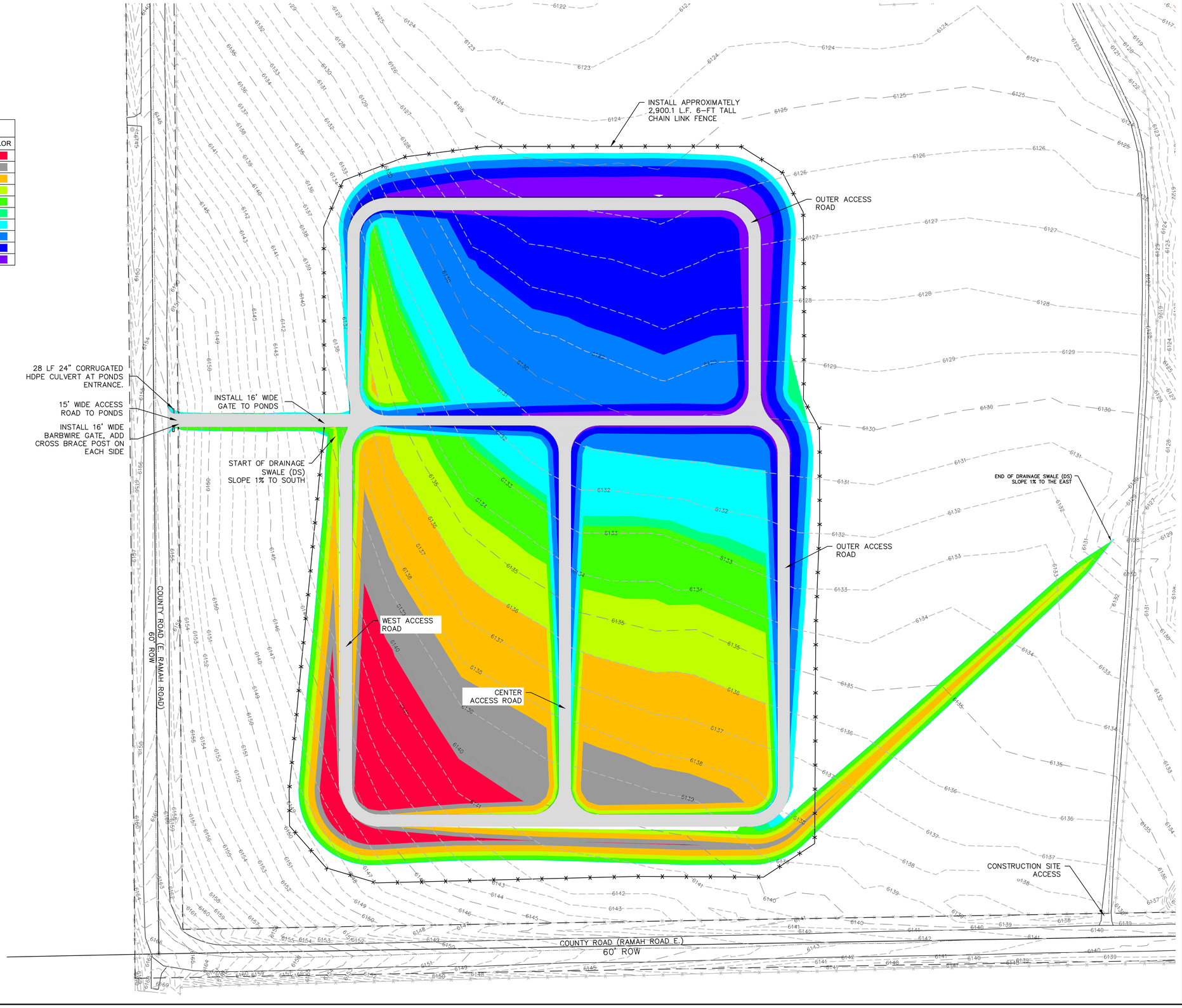
JOB NUMBER
0043.0001

SCALE
1" = 100'

EDITION
PERMITTING

SHEET
C21 of C27

ELEVATIONS TABLE			
NUMBER	MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
1	−11.98	−7.62	
2	−7.62	−5.76	
3	−5.76	−3.40	
4	−3.40	−1.76	
5	−1.76	−0.23	
6	−0.23	0.00	
7	0.00	1.64	
8	1.64	4.11	
9	4.11	7.28	
10	7.28	12.90	



N

GRAPHIC SCALE
60 0 60 120
(IN FEET)
1 INCH = 60 FT

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

CUT & FILL PLAN

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

EDITION
PERMITTING

SHEET
C22 OF C27

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:

1. CONTRACTOR TO REMOVE ANY DIRT AND DEBRIS WHICH MAY DAMAGE LINER SYSTEM. ANY DEBRIS GREATER THAN 3" DIAMETER TO BE REMOVED PRIOR TO INSTALLATION.
2. CONTRACTOR RESPONSIBLE FOR LOCATION AND PROTECTION OF ALL UTILITIES PRIOR TO AND DURING CONSTRUCTION.
3. AIR/GAS VENTING STRIP TO BE INSTALLED AFTER SUBGRADE IS COMPACTED AND AT FINAL GRADE.
4. CONTRACTOR TO FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS FOR HAULING, STOCKPILING, STAGING, UNLOADING, AND INSTALLATION OF LINER SYSTEM.
5. PROTECT EXISTING ASPHALT, STRUCTURES, AND CURB AND GUTTER FROM DAMAGE. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO EXISTING INFRASTRUCTURE.
6. PRIOR TO INSTALLATION OF LINER, ENGINEER'S REPRESENTATIVE SHALL APPROVE THE INSTALLATION OF AIR/GAS VENTING STRIPS.
7. PRIOR TO INSTALLATION OF BALLAST, ENGINEER'S REPRESENTATIVE SHALL APPROVE THE LINER AND AIR/GAS VENT.
8. AIR/GAS VENTING STRIP TO MEET THE FOLLOWING SPECIFICATIONS:
   - 8.1. STRUCTURE: SIMPLED STRIP
   - 8.2. POLYMER: PS
   - 8.3. THICKNESS: 1-INCH
   - 8.4. THRU-FLOW: YES
   - 8.5. COMPRESSIVE STRENGTH (ASTM D 1621): 9,500 PSF
   - 8.6. FLOW (ASTM D 4716): 30 GPM/FT
   - 8.7. FABRIC/BACKING: CORE ENCAPSULATED W/ 4 OZ NW
   - 8.8. WIDTH: 12-INCH
9. INSTALL AIR/GAS VENT 6-INCHES BELOW CREST OF LINER ABOVE EACH AIR/GAS VENTING STRIP. SEE DETAILS FOR INSTALLATION INFORMATION.
10. ENGINEER AND LINER MANUFACTURER REPRESENTATIVE TO APPROVE SUBGRADE PREPARATION PRIOR TO LINER INSTALLATION.
11. LINER AND MESH UNDER-LINER TO BE INSTALLED BY MANUFACTURER CERTIFIED INSTALLATION TECHNICIANS.
12. RESTORE AND RE-SEED SITE PER SPECIFICATIONS.
13. 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.

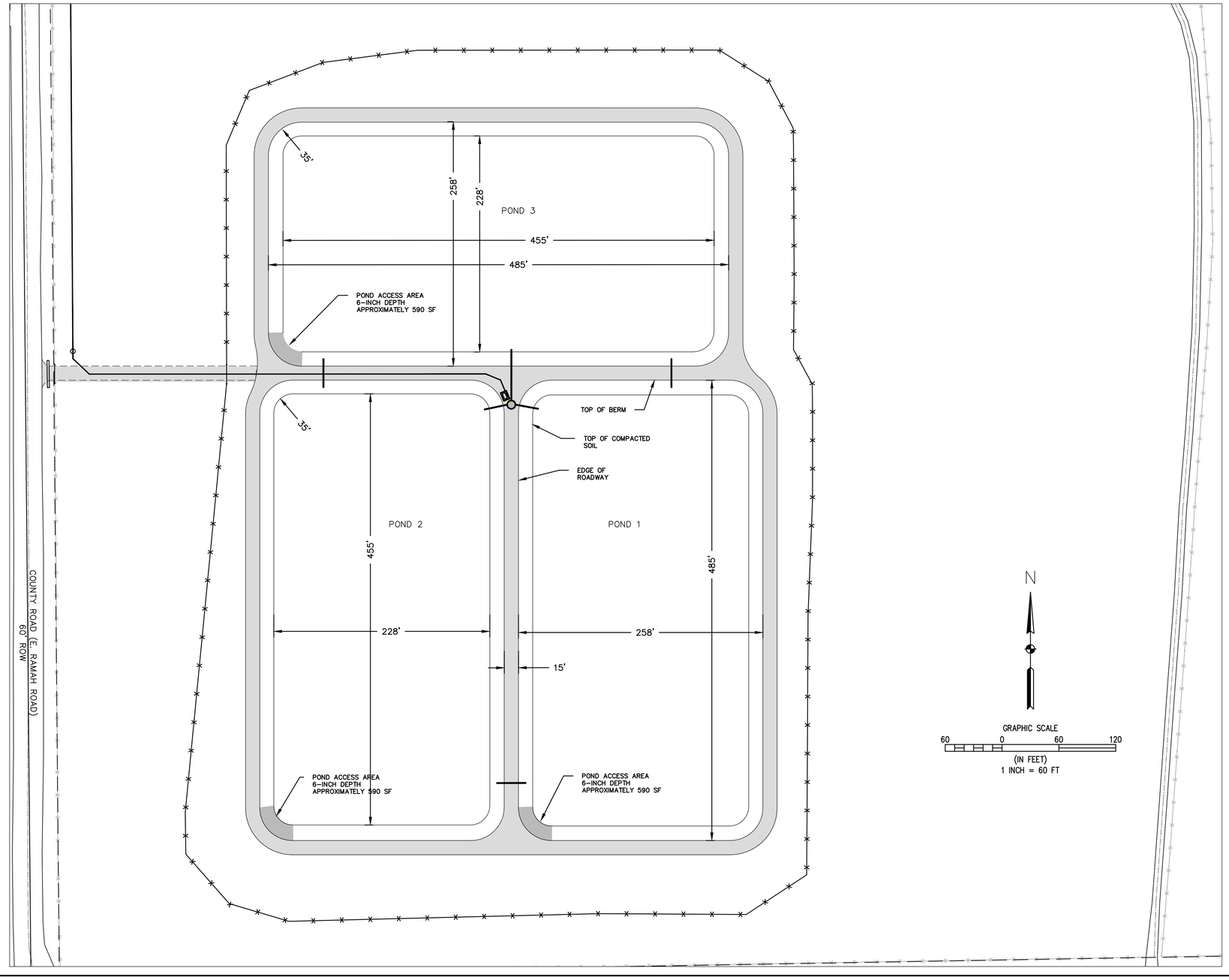
SUMMARY BALLAST TUBES PER POND

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)
POND TOP SURFACE AREA (PER POND):	124,016 SF (2.85 ACRES)
ASSUMED SLUDGE DEPTH:	6-INCHES
MAX OPERATING WATER LEVEL:	3-FEET
FREEBOARD:	2-FEET
SIDE SLOPE RATIO:	3:1
POND LENGTH TO WIDTH RATIO:	2:1
NO. PONDS	3

RADIUS OF CORNER AT BOTTOM:	20-FT
RADIUS OF CORNER AT TOP:	35-FT
WIDTH OF POND AT BOTTOM:	228-FT
LENGTH OF POND AT BOTTOM:	455-FT
WIDTH OF POND AT TOP:	258-FT
LENGTH OF POND AT TOP:	485-FT
ROADWAY WIDTH:	15-FT



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REVISIONS

NO.	DESCRIPTION	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

JOB NUMBER: 0043.0001

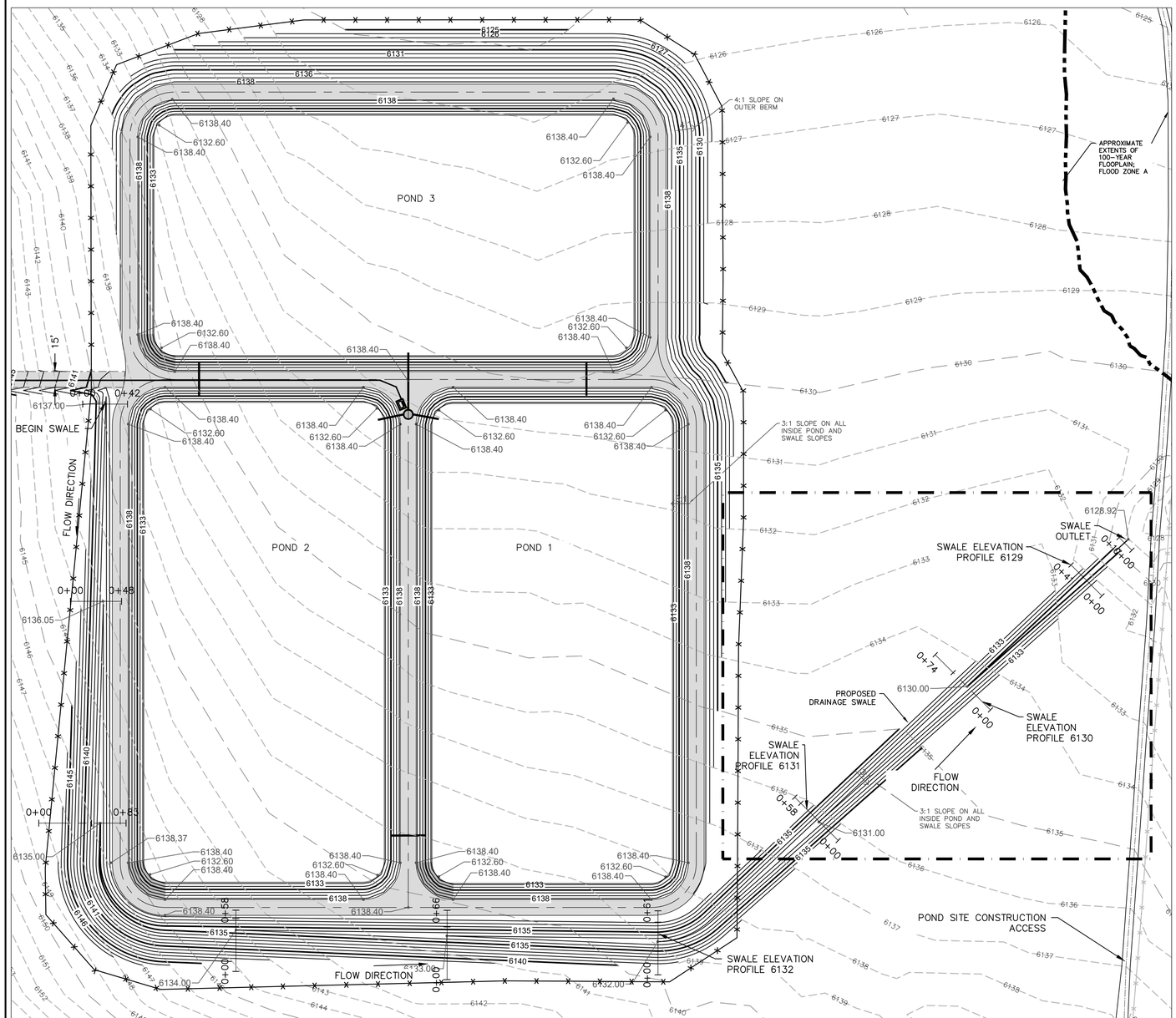
SCALE: 1" = 60'

EDITION: PERMITTING

SHEET: C23 OF C27

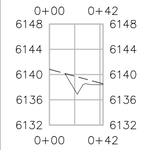
N

GRAPHIC SCALE
60 0 60 120
(IN FEET)
1 INCH = 60 FT



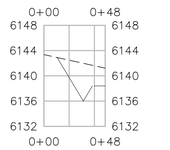
A C24 EVAPORATIVE PONDS DRAINAGE PLAN
1" = 60'

PROFILE 1: 6137'



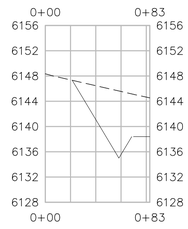
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'

PROFILE 2: 6136'



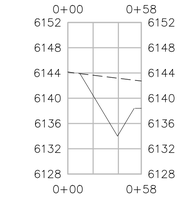
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'

PROFILE 3: 6135'



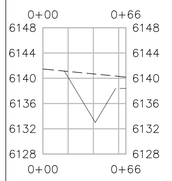
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'

PROFILE 4: 6134'



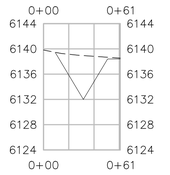
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'

PROFILE 5: 6133'



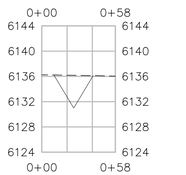
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'

PROFILE 6: 6132'



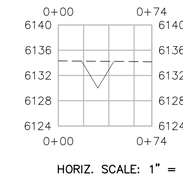
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'

PROFILE 7: 6131'



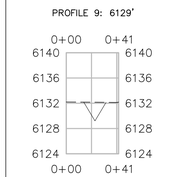
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'

PROFILE 8: 6130'



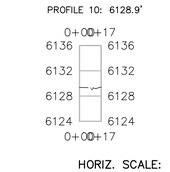
HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 12'

PROFILE 9: 6129'



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

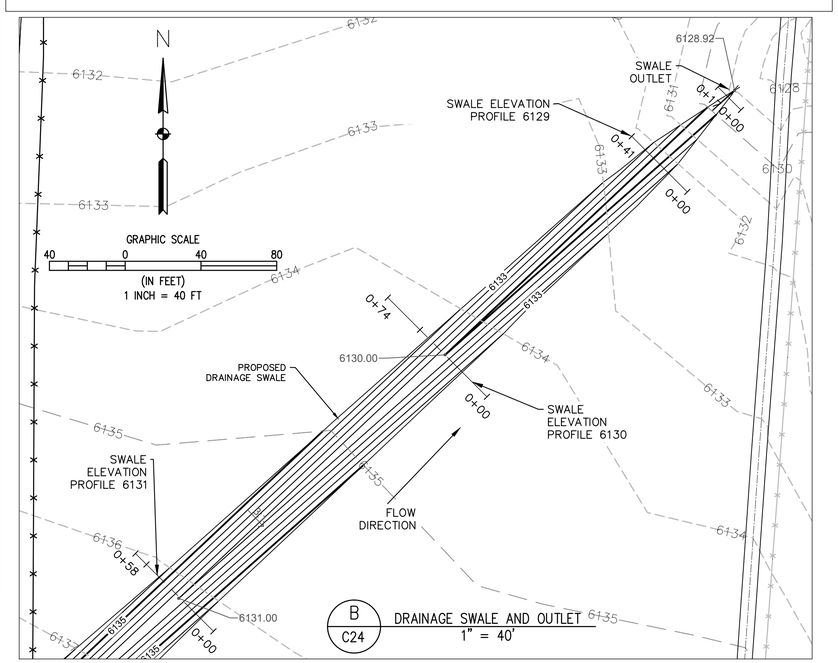
PROFILE 10: 6128.9'



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

EXISTING GRADE
PROPOSED GRADE

C C24 DRAINAGE SWALE ELEV PROFILES
NTS



B C24 DRAINAGE SWALE AND OUTLET
1" = 40'

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

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT
DRAINAGE SWALE PLAN & PROFILE
TOWN OF RAMAH
113 S. COMMERCIAL STREET
RAMAH, CO 80832

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

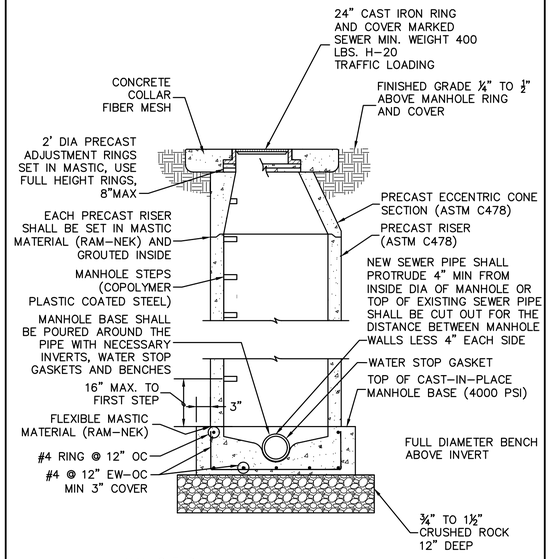
DATE
OCTOBER 2022

JOB NUMBER
0043.0001

SCALE
AS SHOWN

EDITION
PERMITTING

SHEET
C24 OF C27

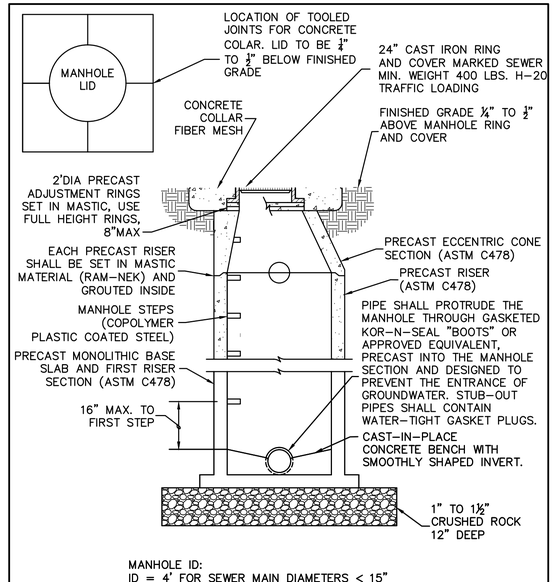


MANHOLE ID:
ID = 4' FOR SEWER MAIN DIAMETERS < 15"
ID = 5' FOR SEWER MAIN DIAMETERS 15"-36"
ID = 6' FOR SEWER MAIN DIAMETERS 42"-48"

NOTE:
MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12" WIDE CONSEAL JOINT WRAP CS 212.

SANITARY SEWER MANHOLE (CIP BASE)

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



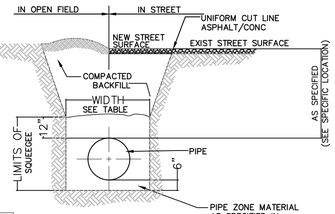
MANHOLE ID:
ID = 4' FOR SEWER MAIN DIAMETERS < 15"
ID = 5' FOR SEWER MAIN DIAMETERS 15"-36"
ID = 6' FOR SEWER MAIN DIAMETERS 42"-48"

NOTE: MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12" WIDE CONSEAL JOINT WRAP CS 212. ALL INTERIOR JOINTS AND RISER RINGS MUST BE GROUTED.

SANITARY SEWER MANHOLE (PRECAST BASE)

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	

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



TYPICAL TRENCH SECTION

PIPE ø	MIN WIDTH	MAX WIDTH
4" & LESS	1'-4"	2'-4"
6"	1'-6"	2'-6"
8"	1'-8"	2'-8"
12"	2'-0"	3'-0"
16"	2'-4"	3'-4"
20"	2'-8"	3'-8"
24"	4'-0"	5'-0"

NOTES:
1. MIN COVER TO BE 5.0' BELOW GRADE.
2. TRENCH WALLS TO BE SUPPORTED AS REQUIRED BY OSHA.
3. PIPE SHALL BE BEDDED WITH SQUEEGEE FROM 6" BELOW THE BOTTOM OF THE PIPE TO 12" ABOVE THE TOP OF THE PIPE.
4. COMPACTION SHALL BE IN ACCORDANCE WITH SPECIFICATIONS
5. TAPPING SADDLES REQUIRED IN AREAS WHERE THE BEDDING SECTION IS USED.
6. NEW STREET SURFACE SHALL COMPLY WITH COUNTY STANDARDS.

TOWN OF RAMAH
TYPICAL TRENCH SECTION PIPE PROTECTION

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	

PIPE BEDDING:

(A) INSTALLATION OF BEDDING AND PIPE: AFTER COMPLETION OF THE TRENCH EXCAVATION AND PROPER PREPARATION OF THE FOUNDATION, SIX INCHES (6") OF BEDDING MATERIAL SHALL BE PLACED ON THE TRENCH BOTTOM FOR SUPPORT UNDER THE PIPE. BELL HOLES SHALL BE DUG DEEP ENOUGH TO PROVIDE A MIMIMUM OF TWO INCHES (2") OF CLEARANCE BETWEEN THE BELL AND BEDDING MATERIAL. ALL PIPE SHALL BE INSTALLED IN SUCH A MANNER AS TO ENSURE FULL SUPPORT OF THE PIPE BARREL OVER ITS ENTIRE LENGTH. AFTER THE PIPE IS ADJUSTED FOR LINE AND GRADE, AND THE JOINT IS MADE, THE BEDDING MATERIAL SHALL BE CAREFULLY PLACED AND TAMPED UNDER THE HAUNCHES OF THE PIPE AND IN THE PREVIOUSLY DUG BELL HOLES.

TAMPING IS HEREIN DEFINED AS THE ACT OF PLACING APPROVED BEDDING MATERIAL UNDER THE HAUNCHES OF THE PIPE, PAYING PARTICULAR ATTENTION TO VOIDS, BELL HOLES, AND SLING HOLES. THE PURPOSE OF TAMPING IS TO ENSURE UNIFORM SUPPORT FOR THE PIPE.

THE LIMITS OF BEDDING SHALL BE FROM SIX INCHES (6") BELOW THE BOTTOM OF THE PIPE TO TWELVE INCHES (12") ABOVE THE TOP OF THE PIPE. APPROVED BACKFILL MAY THEN BE INSTALLED TO THE GROUNDLINE. SEE SECTION 6 OF THESE STANDARDS FOR BACKFILL AND COMPACTION OF BACKFILL. COMPACTION OF BEDDING IS NOT REQUIRED. THE ONLY REQUIREMENT IS SUFFICIENT TAMPING TO ACHIEVE UNIFORM SUPPORT UNDER THE PIPE. SEE DETAILS OF THE FOR A TYPICAL TRENCH CROSS SECTION.

(B) BEDDING MATERIAL: THE BEDDING MATERIAL SHALL BE A CLEAN WELL-GRADED SAND OR SQUEEGEE SAND AND SHALL CONFORM TO THE FOLLOWING LIMITS WHEN TESTED BY MEANS OF LABORATORY SIEVES:

WELL-GRADED SAND

SIEVE SIZE	TOTAL PERCENT PASSING BY WEIGHT
3/8 INCH	100
NO. 4	95-100
NO. 8	80-100
NO. 16	50-85
NO. 50	25-60
NO. 50	10-30
NO. 100	2-10
NO. 200	0

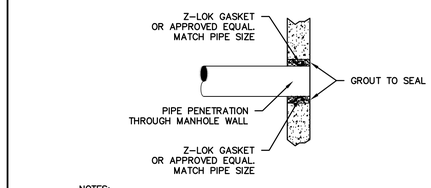
SQUEEGEE SAND

SIEVE SIZE	TOTAL PERCENT PASSING BY WEIGHT
3/8 INCH	100
NO. 100	0-5

IF APPROVED BY THE TOWN, FINES FROM THE TRENCH WALLS AND SPOILS PILE MAY BE USED TO PROVIDE UNIFORM SUPPORT FOR THE PIPE. NO ROCK OR STONE LARGER THAN THAT ALLOWED BY THE SIEVE ANALYSIS, OR ANY OTHER DETRIMENTAL SUBSTANCE, SHALL BE PLACED CLOSER TO THE PIPE THAN SIX INCHES (6"). APPROVED BEDDING MATERIALS SHALL BE STOCKPILED ON THE JOBSITE TO BE USED IN THE EVENT NATURAL MATERIALS BECOME UNSATISFACTORY. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THE USE OF THE SPECIFIED BEDDING MATERIAL AT ANY TIME.

TOWN OF RAMAH
PIPE BEDDING

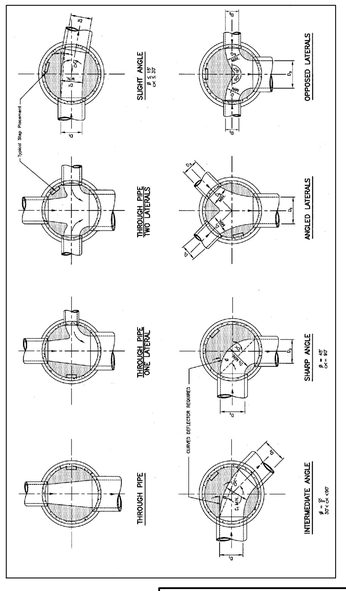
SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



NOTES:
1. FOR FIELD CORED PENETRATIONS, LEAK SEAL IS REQUIRED.

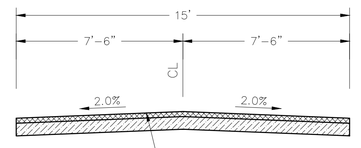
TOWN OF RAMAH
MANHOLE WALL PENETRATION DETAIL

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	

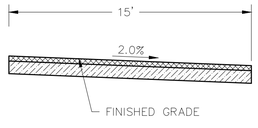


TOWN OF RAMAH
TYPICAL MH BASE CHANNELIZATION DETAIL

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



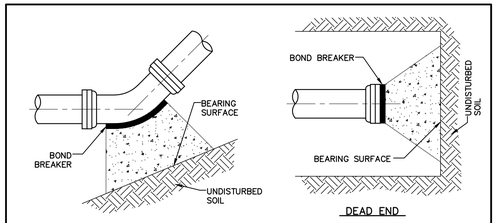
ACCESS ROAD AND CENTER ROAD AT EVAPORATION PONDS
NTS



OUTSIDE SERVICE ROAD AT EVAPORATION PONDS SLOPE AWAY FROM LINER
NTS

TOWN OF RAMAH
ROADS

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



NOTES:
1. ON 16" AND 20" MAINS, ALL BENDS SHALL BE BOTH RODDED AND KICKBLOCKED.
2. BEARING SURFACES SHOWN IN CHART ARE MIN.
3. BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER.
   2" – 4", 6", 8", 12" WATER HAMMER = 110 PSI
   16", 20" AND 24" WATER HAMMER = 70 PSI
4. BASED ON 3,000 PSF SOIL BEARING CAPACITY.
5. ALL VALVES, TEES, BENDS AND PLUGS SHALL BE BOTH RODDED AND KICKBLOCKED.

MINIMUM BEARING SURFACE AREA (IN SQUARE FEET)

SIZE OF PIPE	BENDS				TEE OR DEAD END
	11 1/4°	22 1/2°	45°	90°	
4" & LOWER	1.00	1.00	1.00	N/A	1.50
6"	1.00	1.25	2.25	N/A	3.00
8"	1.00	2.00	4.00	N/A	5.25
12"	2.25	4.50	8.75	N/A	11.25
16"	3.75	7.50	14.50	27.00	19.00
20"	5.00	10.00	19.50	35.50	25.00
24"	7.00	14.00	27.75	51.00	36.00

TOWN OF RAMAH
CONCRETE KICKBLOCKS BEARING SURFACES & INSTALLATION

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	

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

REVISIONS

NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

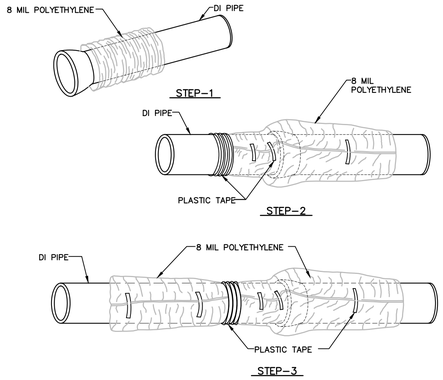
GENERAL DETAILS

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
SCALE: NTS
EDITION: PERMITTING
SHEET: C25 OF C27



FIELD INSTALLATION—POLYETHYLENE WRAP

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

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

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

ALL FITTINGS, VALVES, BELL JOINT RESTRAINTS TO BE WRAPPED.

TOWN OF RAMAH

POLYETHYLENE WRAP

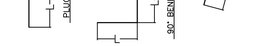
SCALE: *NONE* | DATE: *OCTOBER 2022*

REVISED:

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
	90° BEND, TEE PLUG, VALVE	3/4"	50'	MS	3/4"	71'	MS	3/4"	84'	MS	3/4"	134'	MS	1"	173'	HS	1"	212'	HS	D	250'	–
	45° BEND	3/4"	25'	MS	3/4"	35'	MS	3/4"	40'	MS	3/4"	66'	HS	1"	85'	HS	1 1/4"	104'	HS	–	122'	–
	22 1/2° BEND	3/4"	12'	MS	3/4"	17'	MS	3/4"	23'	MS	3/4"	32'	HS	1"	41'	HS	1 1/4"	50'	HS	–	59'	–
	11 1/4° BEND	–	–	–	–	–	–	3/4"	7'	MS	3/4"	10'	HS	1"	13'	HS	1 1/4"	15'	HS	–	18'	–

NOTES:
1. LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM VALVES AND BENDS.
2. CLAMPS, RODS & MEGALUGS NOT ALLOWED FOR 24" & LARGER PIPES.
3. ENDS OF RODS SHALL BE PROVIDED WITH DOUBLE HEX NUTS AND WASHERS.
4. MIN 4.5' GROUND COVER REQUIRED.
5. BASED ON 150 PSI INTERNAL PRESSURE PLUS WATER HAMMER.
6. ALL RODS SHALL BE ASTM A36.
7. HS = HIGH STRENGTH ROD, ASTM A 193 GRADE B7.
8. MS = MEDIUM STRENGTH ROD, ASTM A 36 OR B HEXAGON HEAVY SERIES. HS NUTS SHALL CONFORM TO ASTM A194 GRADE 2H.
9. LENGTH REFERS TO THE AMOUNT OF PIPE WHICH MUST BE RESTRAINED TOGETHER AND ON EACH SIDE OF THE FITTING OR VALVE. MECHANICAL JOINT RESTRAINTS MUST BE USED ON THESE PIPES.
10. LENGTH OF RESTRAINED PIPE CHART IS ALSO FOR THE LENGTH OF JOINT RESTRAINT FOR MEGALUGS.
11. ALL FITTINGS SHALL BE RESTRAINED IN ALL APPLICABLE DIRECTIONS.
12. 12" AND SMALLER IN-LINE VALVES AND TEES SHALL HAVE A MECHANICAL JOINT RESTRAINT DEVICE ON EACH SIDE OF THE FITTING OR VALVE. MECHANICAL JOINT RESTRAINTS MUST BE USED ON THESE PIPES.
13. A SECOND VALVE WILL BE REQUIRED TO BE CLOSED WHEN EXCAVATING NEXT TO AN EXISTING VALVE.
14. ON PLUGS, TEES AND BENDS, KICKBLOCKS SHALL BE USED IN ADDITION TO RESTRAINT.
15. WHEN REDUCERS ARE USED ON VALVE INSTALLATIONS THE LENGTH OF RESTRAINT SHALL BE BASED ON THE SIZE OF THE REDUCER. IF THE REDUCER IS OVER 10", THE
16. IF INTERNAL PRESSURE EXCEEDS 250 PSI OR IF PIPE DIAMETER IS OVER 10", THE DESIGN ENGINEER WILL PROVIDE LENGTH OF RESTRAINED PIPE FOR REVIEW.

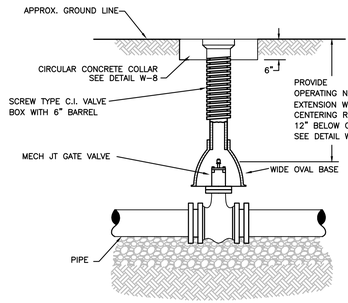


TOWN OF RAMAH

LENGTH OF RESTRAINED PIPE

SCALE: *NONE* | DATE: *OCTOBER 2022*

REVISED:



6—INCH VALVE BOXES

MATERIALS:

VALVE BOX PARTS SHALL BE MADE FROM GRAY CAST IRON, ASTM A48 CLASS 20A.

USE OF AN ALUMINUM ALLOY AS A CASTING MATERIAL IS NOT ACCEPTABLE.

APPROVED PATTERNS:

VALVE BOXES SHALL BE THE THREE—PIECE ADJUSTABLE SCREW TYPE AND THE FOLLOWING TWO PATTERNS ARE ACCEPTABLE.

1. TYLER SCREW—TYPE 6—INCH CAST IRON VALVE BOX ASSEMBLY SERIES 6860 WITH NO. 160 LARGE OVAL BASE OR ENGINEER APPROVED EQUAL.

2. CLAY AND BAILEY SCREW—TYPE 6—INCH CAST IRON VALVE BOX ASSEMBLY NO. P—108 WITH NO. 160 LARGE OVAL BASE OR ENGINEER APPROVED EQUAL.

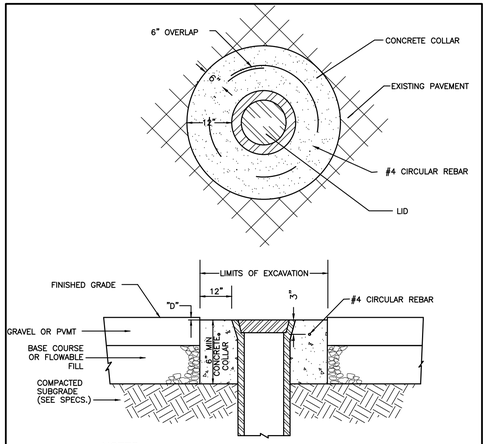
NOTES:
1. ALL C.I. SHALL BE WRAPPED WITH 8 MIL MIN. THICKNESS POLYETHYLENE.
2. VALVE NUT SHALL BE CENTERED.
3. VALVE BOX SHALL BE PLUMB.

TOWN OF RAMAH

VALVE BOX DETAIL

SCALE: *NONE* | DATE: *OCTOBER 2022*

REVISED:



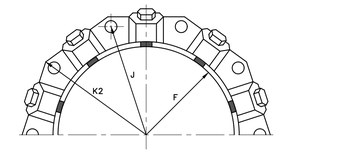
NOTES:
1. "D" = 1/2" FOR H.M.A. PAVEMENT OVERLAYS OR SURFACE TREATMENTS
2. "D" = 1/2" FOR H.M.A. PAVEMENT RECONSTRUCTION OR NEW CONSTRUCTION
3. "D" = 1/4" FOR CONCRETE STREETS.
4. "D" = 1/2" FOR GRAVEL ROADS
5. VALVE BOX MUST BE PLUMB AND CENTERED OVER THE VALVE NUT.
6. THIS DETAIL APPLIES TO BOTH ASPHALT AND CONCRETE STREETS AND GRAVEL
7. PLACE #4 CIRCULAR REBAR WITH 3" COVER — END OVERLAP 6".
8. COVER STAMP: AIR (AIR PIPE), WATER (WATER PIPE), SEWER (SEWER PIPE)

TOWN OF RAMAH

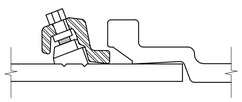
VALVE BOX FINISHING DETAIL

SCALE: *NONE* | DATE: *OCTOBER 2022*

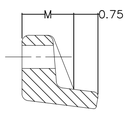
REVISED:



MECHANICAL JOINT RESTRAINT



WEDGE DETAIL



BOLT HOLE DETAIL

DIMENSIONS

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

TOWN OF RAMAH

MECHANICAL JOINT RESTRAINT DETAILS

SCALE: *NONE* | DATE: *OCTOBER 2022*

REVISED:

NOTE:
1. FIBERGLASS COMPOSITE MARKER POST. POLYTECH STANDARD COLOR: GREEN. 72" LENGTH
2. VALVE MARKER TO BE PLACED AS NOTED ON PLANS.

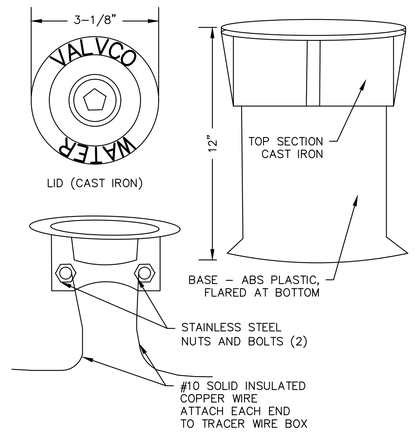
TOWN OF RAMAH

MARKER DETAIL

SCALE: *NONE* | DATE: *OCTOBER 2022*

REVISED:

NOTE:
TRACER WIRE SHALL BE TERMINATED AT EACH END IN A FLUSH MOUNT ACCESS BOX. ACCESS BOX SHALL HAVE A CAST IRON LID THAT CAN BE LOCKED AND OPENED WITH A STANDARD PENTAGON HEAD KEY WRENCH. TRACER WIRES SHALL BE STRIPPED AND ATTACHED TO STAINLESS STEEL SCREWS MOUNTED TO THE UNDERSIDE OF THE LID. SUFFICIENT SLACK SHALL BE LEFT IN THE WIRE LENGTH SO COVER CAN BE LIFTED WITH WIRE INTACT. TRACER WIRE ACCESS BOX SHALL BE LOCATED DIRECTLY IN FRONT OF FIRE HYDRANTS OR WHERE INDICATED ON DRAWINGS AND BE SET TO GRADE. TRACER WIRE ACCESS BOX SHALL BE OF DOMESTIC MANUFACTURE AND BE EQUAL TO VALVCO TWAB.

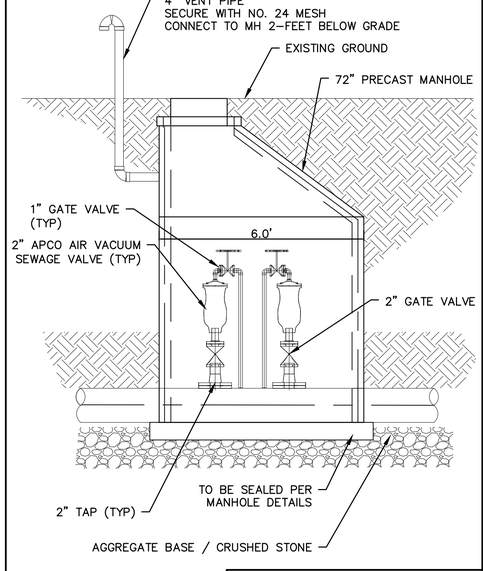


TOWN OF RAMAH

TRACER WIRE ACCESS BOX

SCALE: *NONE* | DATE: *OCTOBER 2022*

REVISED:



TOWN OF RAMAH

AIR RELEASE VALVE VAULT

SCALE: *NONE* | DATE: *OCTOBER 2022*

REVISED:

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

REVISIONS

NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

GENERAL 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

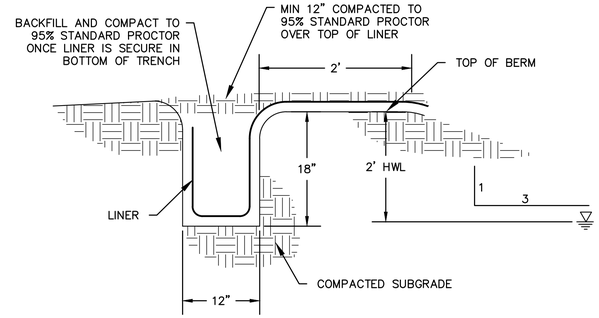
DATE: OCTOBER 2022

JOB NUMBER: 0043.0001

SCALE: NTS

EDITION: PERMITTING

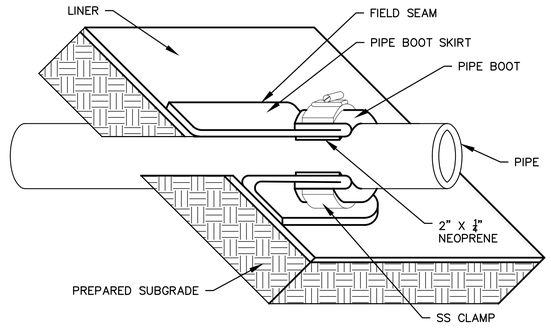
SHEET: C26 OF C27



TOWN OF RAMAH

TYPICAL LINER ANCHOR TRENCH

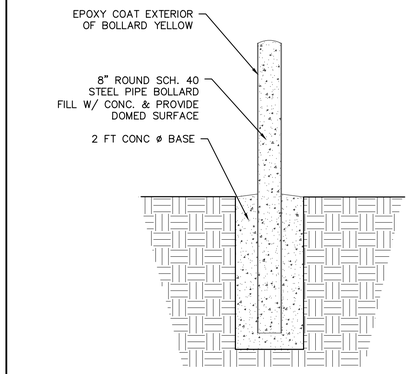
SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



TOWN OF RAMAH

TYPICAL PIPE BOOT

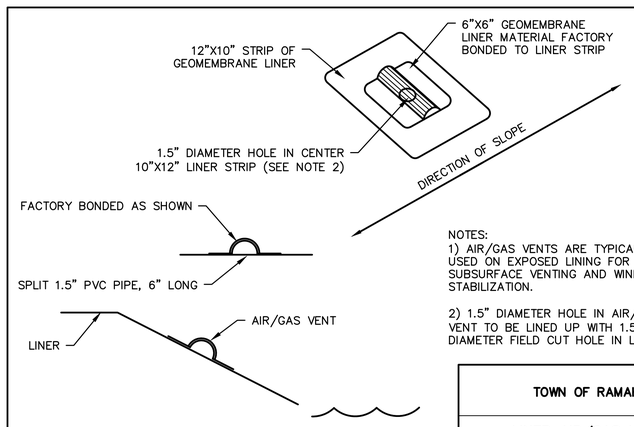
SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



TOWN OF RAMAH

PIPE BOLLARD DETAIL

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



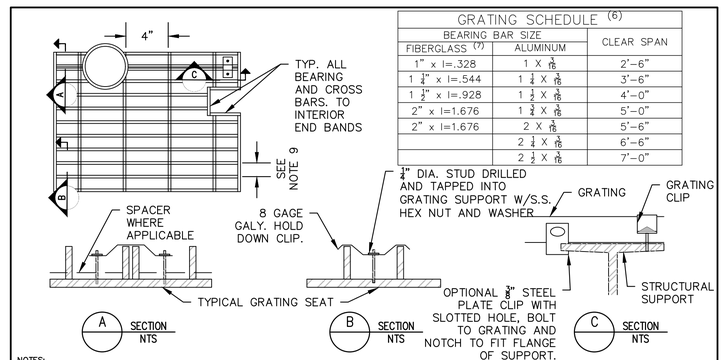
NOTES:
1) AIR/GAS VENTS ARE TYPICALLY USED ON EXPOSED LINING FOR SUBSURFACE VENTING AND WIND STABILIZATION.

2) 1.5" DIAMETER HOLE IN AIR/GAS VENT TO BE LINED UP WITH 1.5" DIAMETER FIELD CUT HOLE IN LINER.

TOWN OF RAMAH

LINER AIR/GAS VENT

SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



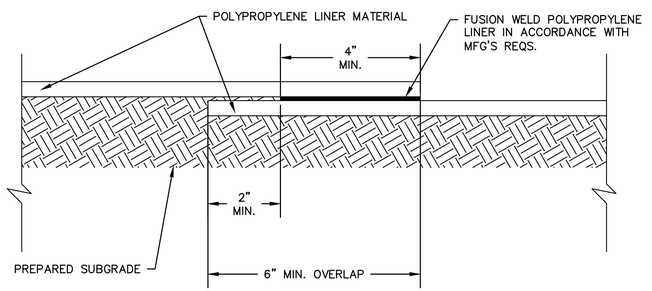
GRATING SCHEDULE (6)		
BEARING BAR SIZE		CLEAR SPAN
FIBERGLASS (7)	ALUMINUM	
1" x I=.328	1 X 3/16	2'-6"
1 1/4" x I=.544	1 1/4 X 3/16	3'-6"
1 1/2" x I=.928	1 1/2 X 3/16	4'-0"
2" x I=1.676	1 1/2 X 1/4	5'-0"
2" x I=1.676	2 X 1/4	5'-6"
	2 1/4 X 3/16	6'-6"
	2 1/2 X 1/16	7'-0"

NOTES:
1. GRATING SHALL CONFORM TO THE METAL BAR GRATING MANUAL OF NAAMM, UNLESS OTHERWISE SPECIFIED. GRATING SHALL BE ALUMINUM UNLESS NOTED OTHERWISE.
2. GRATING SHALL BE SWAGED AND FORGED.
3. WHERE BOLTED GRATING IS SPECIFIED. PROVIDE 4 GRATING CLIPS APPROX. 4" FROM THE CORNERS OF EACH PIECE. ADJACENT PIECES MAY BE ANCHORE WITH ONE CLIP AND 2 STUDS (SEE SECTION 1).
4. GRATING SHALL BE REMOVABLE.
5. CLEAR SPAN SHALL BE PLAN DIMENSION. FACE TO FACE OF OPENING.
6. GRATING SCHEDULE IS SUITABLE FOR DESIGN LIVE LOADS OF 250 PSF OR LESS.
7. I IS MINIMUM MOMENT OF INERTIA REQUIRED (INCHES/LIN. FT.) FOR FIBERGLASS.
8. END BAND TO BE 1" LESS THAN GRATING DEPTH.
9. 1 3/16" AT ALUMINUM. 1 1/2" AT FIBERGLASS.

TOWN OF RAMAH

GRATING SCHEDULE AND CONNECTION DETAILS

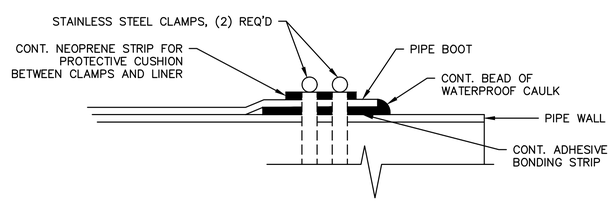
SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



TOWN OF RAMAH

TYPICAL POLYPROPYLENE LINER FIELD SEAM DETAIL

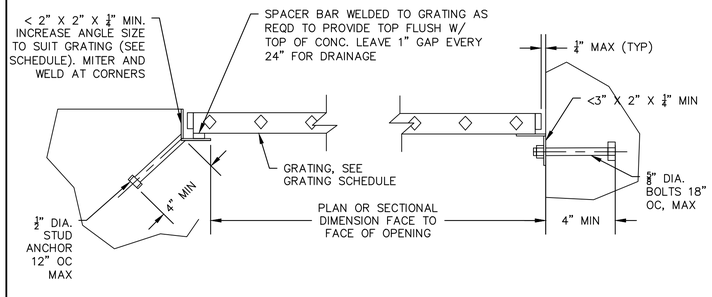
SCALE: *NONE*	DATE: *OCTOBER 2022*
REVISED:	



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:	

ELEMENT ENGINEERING LLC
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165
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REVISIONS

NO.	DESCRIPTION	DATE	BY

WASTEWATER TREATMENT PLANT

GENERAL DETAILS

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

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SCALE
NTS

EDITION
PERMITTING

SHEET
C27 OF C27