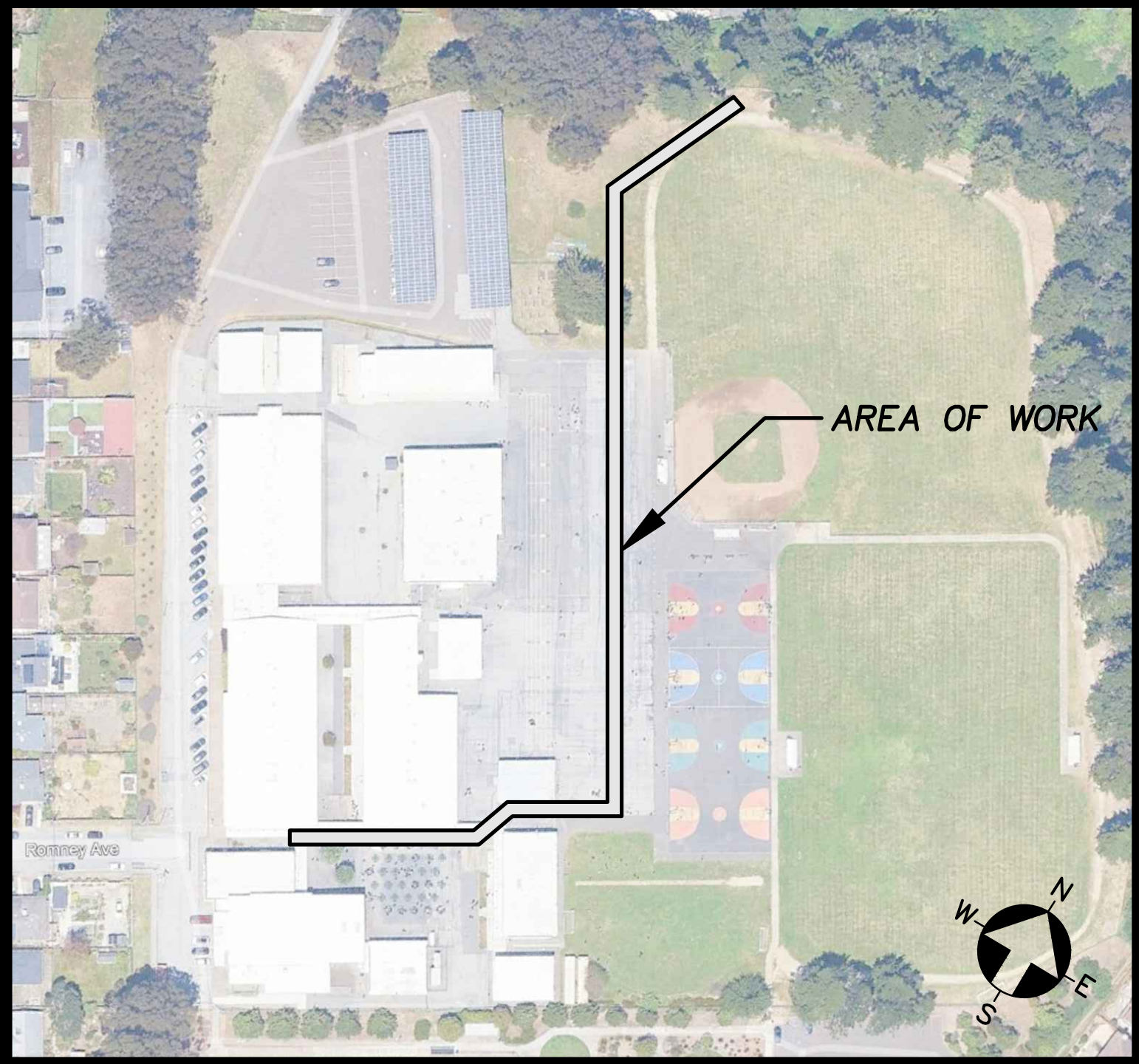


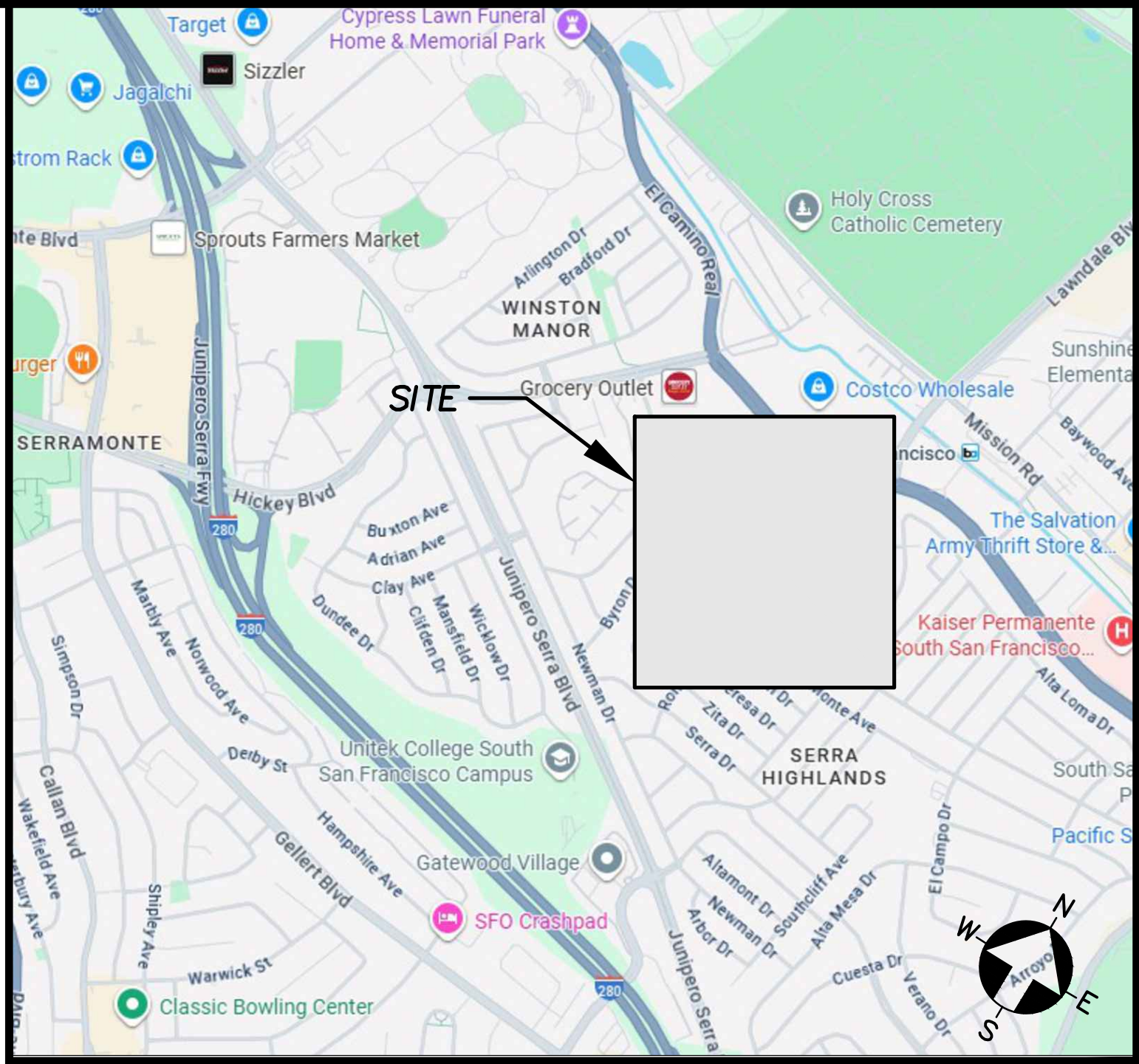


SITE MAP

SCALE: NTS

ALTA LOMA MIDDLE SCHOOL PARTIAL STORM DRAIN REPLACEMENT

SOUTH SAN FRANCISCO UNIFIED SCHOOL DISTRICT 116 ROMNEY AVE. SOUTH SAN FRANCISCO, CA 94080



VICINITY MAP

SCALE: NTS

STANDARD GENERAL NOTES

1. THE CONTRACTOR AGREES THAT, IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXEMPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF ENGINEER.
2. EXCAVATIONS SHALL BE ADEQUATELY SHORED, BRACED, AND SHEETED SO THAT THE EARTH WILL NOT SLIDE OR SETTLE AND SO THAT ALL EXISTING IMPROVEMENTS OF ANY KIND WILL BE FULLY PROTECTED FROM DAMAGE. ANY DAMAGE RESULTING FROM A LACK OF ADEQUATE SHORING, BRACING AND SHEETING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND HE SHALL EFFECT NECESSARY REPAIRS OR RECONSTRUCTION AT HIS OWN EXPENSE. WHERE THE EXCAVATION FOR A CONDUIT TRENCH, AND/OR STRUCTURE IS FIVE FEET OR MORE IN DEPTH, THE CONTRACTOR SHALL PROVIDE ADEQUATE SHEETING, SHORING, AND BRACING OR EQUIVALENT METHOD, FOR THE PROTECTION OF LIFE OR LIMB, WHICH SHALL CONFORM TO THE APPLICABLE CONSTRUCTION SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY OF THE STATE OF CALIFORNIA. THE CONTRACTOR SHALL ALWAYS COMPLY WITH OSHA REQUIREMENTS.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN PERMITS NECESSARY TO PERFORM THE WORK SHOWN IN THESE PLANS FROM THE APPROPRIATE AGENCIES.
4. THE CONTRACTOR SHALL PROVIDE FOR INGRESS AND EGRESS FOR PRIVATE PROPERTY ADJACENT TO WORK THROUGHOUT THE PERIOD OF CONSTRUCTION.
5. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGGERS, OR OTHER DEVICES NECESSARY TO PROVIDE FOR SAFETY.
6. THE CONTRACTOR SHALL POST EMERGENCY TELEPHONE NUMBERS FOR POLICE, FIRE, AMBULANCE, AND THOSE AGENCIES RESPONSIBLE FOR MAINTENANCE OF UTILITIES IN THE VICINITY OF JOB SITE.
7. LENGTHS OF STORM DRAINS ARE HORIZONTAL DISTANCES FROM CENTER TO CENTER OF STRUCTURES, ROUNDED OFF TO THE NEAREST FOOT.
8. EXISTING UNDERGROUND UTILITIES AND IMPROVEMENTS ARE SHOWN IN THEIR APPROXIMATE LOCATIONS BASED UPON RECORD INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME OF THE PREPARATION OF THESE PLANS. LOCATIONS MAY NOT HAVE BEEN VERIFIED IN THE FIELD AND NO GUARANTEE IS MADE AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AT LEAST TWO WORKING DAYS IN ADVANCE OF CONSTRUCTION TO FIELD LOCATE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXISTENCE AND LOCATION OF THOSE UTILITIES SHOWN ON THESE PLANS OR INDICATED IN THE FIELD BY LOCATING SERVICES. ANY ADDITIONAL COSTS INCURRED AS A RESULT OF CONTRACTOR'S FAILURE TO VERIFY LOCATIONS OF EXISTING UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION IN THEIR VICINITY SHALL BE BORNE BY THE CONTRACTOR AND ASSUMED INCLUDED AND MERGED IN THE CONTRACT UNIT PRICE. IT IS MANDATORY THAT THE CONTRACTOR EXPOSE AND VERIFY THE TOP AND BOTTOM OF ALL UTILITIES PRIOR TO ANY WORK ON SUBSEQUENTLY EXPOSED FACILITIES. IT IS THE RESPONSIBILITY AND DUTY OF THE CONTRACTOR TO MAKE THE FINAL DETERMINATION AS TO THE EXISTENCE, LOCATION AND ELEVATION OF ALL UTILITIES AND TO BRING ANY DISCREPANCY TO THE ATTENTION OF THE ENGINEER.
9. ALL EXISTING UTILITIES AND IMPROVEMENTS THAT BECOME DAMAGED DURING CONSTRUCTION SHALL BE COMPLETELY RESTORED TO THE SATISFACTION OF THE LOCAL AGENCY ENGINEER, AT THE CONTRACTOR'S SOLE EXPENSE.
10. ANY RELOCATION OF PUBLIC UTILITIES SHALL BE CONDUCTED IN ACCORDANCE WITH ANY AND ALL REQUIREMENTS OF THE UTILITY COMPANY INCLUDING FEES, BONDS, PERMITS AND WORKING CONDITIONS, ETC.
11. IF ARCHAEOLOGICAL MATERIALS ARE UNCOVERED DURING GRADING, TRENCHING OR OTHER EXCAVATION, EARTHWORK WITHIN 100 FEET OF THESE MATERIALS SHALL BE STOPPED UNTIL A PROFESSIONAL ARCHAEOLOGIST WHO IS CERTIFIED BY THE SOCIETY OF CALIFORNIA ARCHAEOLOGY (SCA) AND/OR THE SOCIETY OF PROFESSIONAL ARCHAEOLOGY (SOPA) HAS HAD AN OPPORTUNITY TO EVALUATE THE SIGNIFICANCE OF THE FIND AND SUGGEST APPROPRIATE MITIGATION MEASURES, IF THEY ARE DEEMED NECESSARY.
12. UNDERWOOD & ROSENBLUM, INC. DOES NOT SPECIFY NOR RECOMMEND THE USE OR INSTALLATION OF ANY MATERIAL OR EQUIPMENT WHICH IS MADE FROM OR WHICH CONTAINS ASBESTOS FOR USE IN THE CONSTRUCTION OF THESE IMPROVEMENTS. ANY PARTY INSTALLING OR USING SUCH MATERIALS OR EQUIPMENT SHALL BE SOLELY RESPONSIBLE FOR ALL INJURIES, DAMAGES OR LIABILITIES OF ANY KIND, CAUSED BY THE USE OF SUCH MATERIALS OR EQUIPMENT. THE PROVISIONS OF THIS NOTE SHALL APPLY UNLESS THEY ARE EXPRESSLY WAIVED IN WRITING BY UNDERWOOD & ROSENBLUM, INC.
13. SHOULD IT APPEAR THAT THE WORK TO BE DONE OR ANY MATTER RELATIVE THERETO IS NOT SUFFICIENTLY DETAILED OR EXPLAINED ON THESE PLANS, THE CONTRACTOR SHALL CONTACT UNDERWOOD & ROSENBLUM, INC. AT (408) 453-1222 FOR SUCH FURTHER EXPLANATIONS AS MAY BE NECESSARY.

PROJECT GENERAL NOTES

1. CONSTRUCTION AND GRADING OPERATIONS SHALL BE LIMITED TO MONDAY THROUGH SATURDAY 7:00 A.M. TO 6:00 P.M. AND DUST CONTROL MEASURES SHALL BE FOLLOWED AT ALL TIMES.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE STATE OF CALIFORNIA, THE APPLICABLE PROVISIONS OF CALTRANS STANDARD SPECIFICATIONS, AND TO THE SATISFACTION OF THE STATE INSPECTOR.
3. THESE PLANS AND SPECIFICATIONS, INCLUDING GRADES AND DRAINAGE ARE SUBJECT TO MODIFICATION DURING CONSTRUCTION. SHOULD CONDITIONS APPEAR THAT WERE NOT APPARENT DURING DESIGN, ANY SUCH MODIFICATION SHALL BE APPROVED BY THE ARCHITECT AND CIVIL ENGINEER.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THE EXISTING ELEVATIONS AT THIS SITE PRIOR TO THE START OF CONSTRUCTION AND TO NOTIFY UNDERWOOD & ROSENBLUM, INC. IN WRITING IMMEDIATELY OF ANY DIFFERENCES FROM THOSE SHOWN ON THE PLAN.
5. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY FIELD CHANGES MADE WITHOUT WRITTEN AUTHORIZATION FROM THE ARCHITECT AND CIVIL ENGINEER.
6. THE NOTES SHOWN ON THIS PLAN SHALL BE COORDINATED WITH THE GENERAL AND SPECIAL CONDITIONS FOR THIS PROJECT.
7. AN ENCROACHMENT PERMIT FROM THE CITY IS REQUIRED FOR ANY WORK WITHIN THE CITY RIGHT OF WAY.
8. ALL EXISTING UTILITY BOXES SHALL BE ADJUSTED TO NEW FINISH GRADE OR OVERLAY GRADE.

CONSTRUCTION NOTES

GENERAL

1. THE CONTRACTOR WILL HOLD HARMLESS, INDEMNIFY, AND DEFEND THE OWNER, THE ENGINEER, AND HIS CONSULTANTS, AND EACH OF THEIR OFFICERS AND EMPLOYEES AND AGENTS, FROM ANY AND ALL LIABILITY CLAIMS, LOSSES, OR DAMAGES ARISING OR ALLEGED TO ARISE FROM THE PERFORMANCE OF THE WORK DESCRIBED HEREIN, BUT NOT INCLUDING THE SOLE NEGLIGENCE OF THE OWNER, THE ENGINEER AND HIS CONSULTANTS, AND EACH OF THEIR OFFICERS, EMPLOYEES, AND AGENTS.
2. THE CONTRACTOR SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE STATE CONSTRUCTION SAFETY ORDERS AND ALL GOVERNMENT ORDINANCES AND REGULATIONS RELATING TO THE WORK SHOWN ON THESE PLANS.
3. ALL WORK IS TO BE DONE IN CONFORMANCE WITH THE STANDARDS OF THE STATE OF CALIFORNIA OR AS OTHERWISE APPROVED ON THE PLANS.
4. CAUTION! THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION IN ORDER TO DETERMINE THE FIELD LOCATION OF ANY EXISTING UNDERGROUND UTILITIES. PHONE (800) 642-2444.
5. THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL PREVENT THE FORMATION OF AN AIRBORNE DUST NUISANCE WHEN HE OR HIS SUBCONTRACTORS ARE OPERATING EQUIPMENT ON THE SITE AT ALL TIMES DURING CONSTRUCTION AND UNTIL FINAL COMPLETION. THEY SHALL DO SO BY WATERING AND/OR TREATING THE SITE OF WORK. THEY SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE BY DUST FROM THEIR CONSTRUCTION ACTIVITIES IN PERFORMING THE WORK UNDER THIS CONTRACT. THE PRICES FOR THE VARIOUS ITEMS OF WORK SHALL INCLUDE PROVIDING ADEQUATE DUST CONTROL, AS REQUIRED BY THE LOCAL AGENCY.
6. THE ENGINEER ASSUMES NO RESPONSIBILITY BEYOND THE ADEQUACY OF THE DESIGN CONTAINED HEREIN.
7. ALL DISTANCES AND DIMENSIONS ARE SHOWN IN FEET AND DECIMALS THEREOF.
8. CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY TIE-IN OR WORK WITH THEIR UTILITIES.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATE TEMPORARY DRAINAGE FACILITIES DURING RAINY SEASON OPERATION AND PROTECT ALL GRADED AREAS FROM EROSION. CONTRACTOR SHALL REPAIR ANY AREAS OF EROSION PRIOR TO ACCEPTANCE OF GRADING.
10. ALL UTILITY BOXES TO REMAIN SHALL BE ADJUSTED TO NEW FINISH GRADE. ANY UTILITY BOXES THAT FALL WITHIN THE VEHICULAR TRAVEL WAY SHALL BE CONVERTED TO TRAFFIC BEARING CAPACITY.
11. THE CONTRACTOR SHALL LAY OUT THE WORK, SETTING GRADE STAKES, ESTABLISHING LINES, BASE LINES, ELEVATIONS AND OTHER REFERENCE MARKERS, AND INFORMATION NECESSARY TO COMPLETE THE WORK, AND SHALL BE RESPONSIBLE FOR THE ACCURACY THEREOF.
12. CONTRACTOR SHALL IMPORT REQUIRED MATERIALS OR EXPORT EXCESS AS REQUIRED TO ESTABLISH PLAN GRADES. EXCESS MATERIAL IF ANY SHALL BE DISPOSED OFF-SITE IN A LEGAL MANNER AT CONTRACTOR'S EXPENSE.

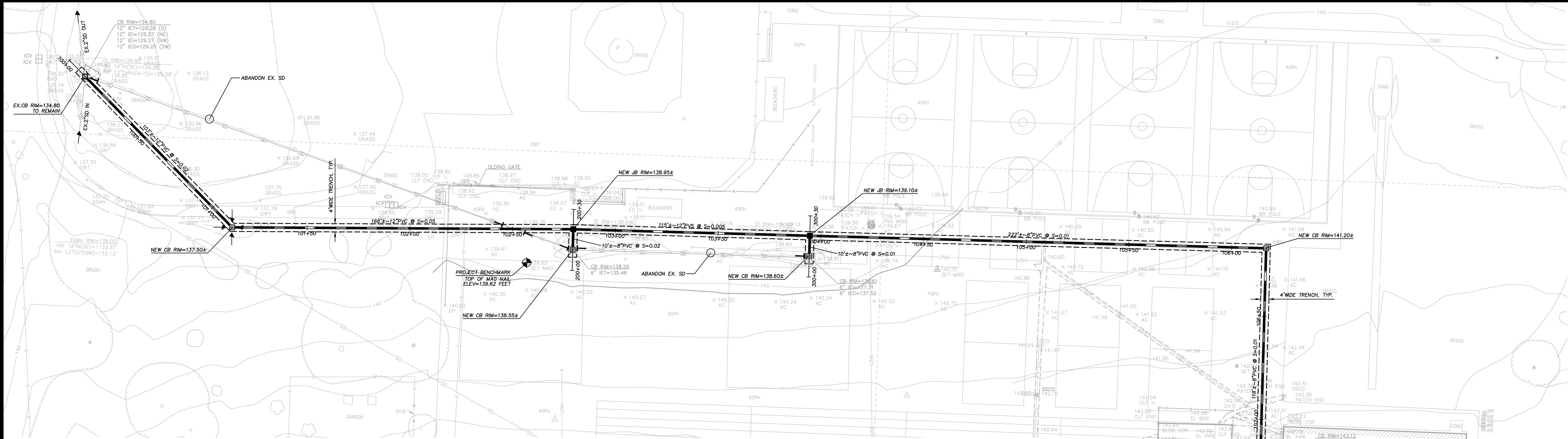
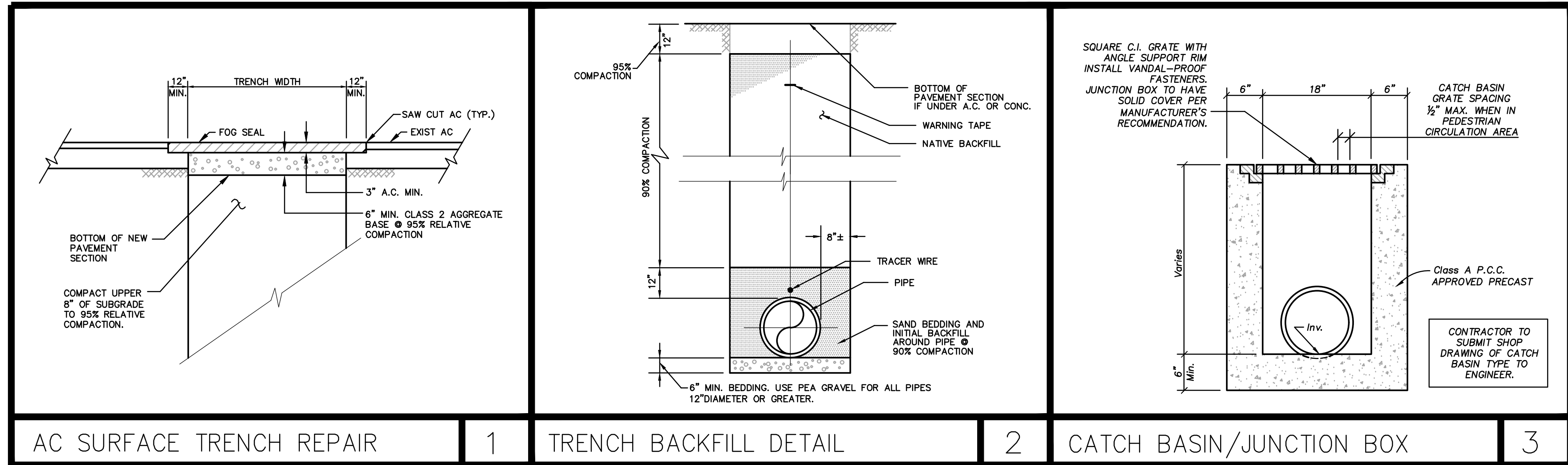
SHEET INDEX

C1	TITLE SHEET/NOTES
C2	STORM DRAINAGE PLAN AND DETAILS
C3	STORM DRAINAGE PROFILE
C4	TECHNICAL SPECIFICATIONS



REVISIONS		DATE	
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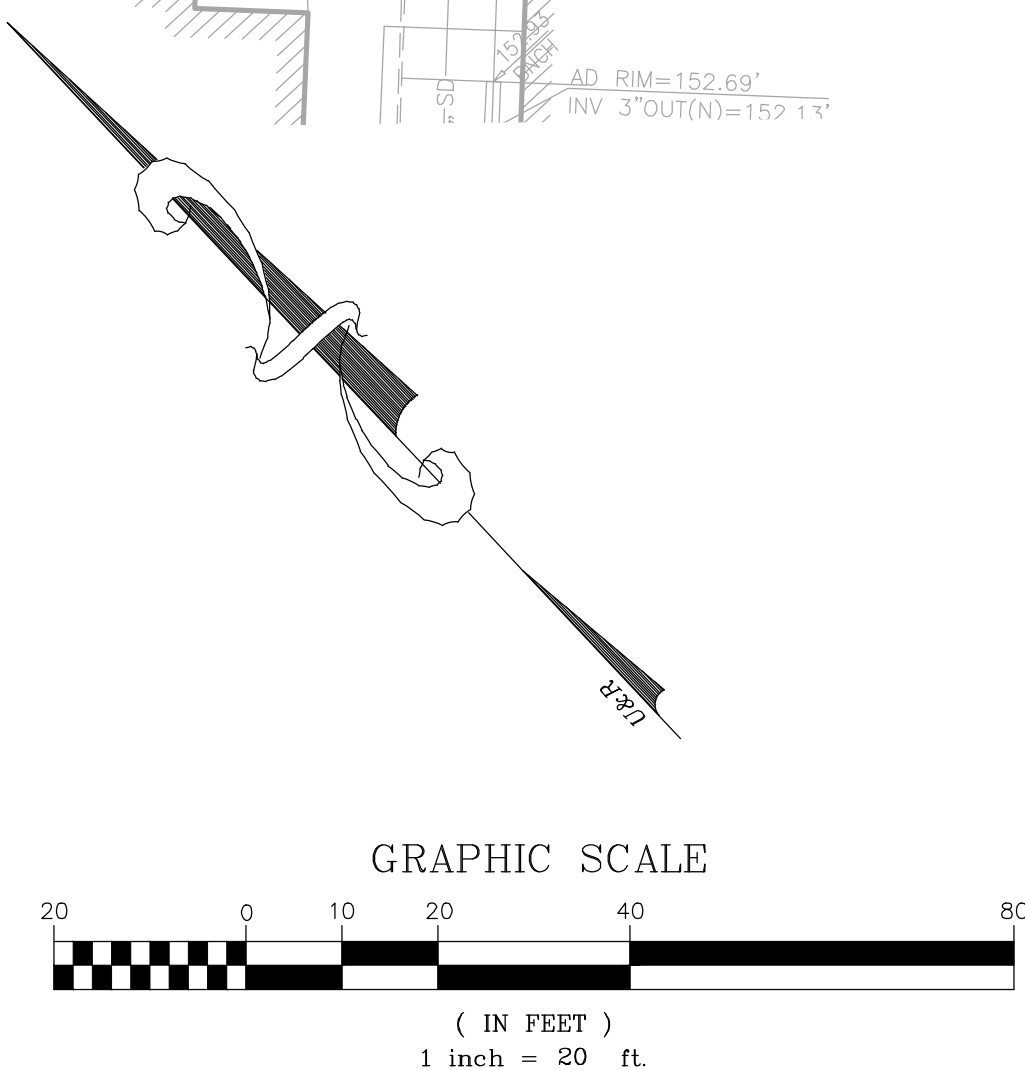
- ### GENERAL NOTES
1. THE CONTRACTOR SHALL LAY OUT THE WORK, SETTING GRADE STAKES, ESTABLISHING LINES, BASE LINES, ELEVATIONS AND OTHER REFERENCE MARKERS AND INFORMATION NECESSARY TO COMPLETE THE WORK AND SHALL BE RESPONSIBLE FOR THE ACCURACY THEREOF.
 2. ANY INCONSISTENCIES IN EXISTING OR PROPOSED ELEVATIONS SHALL BE BROUGHT TO THE NOTICE OF THE OWNER'S REPRESENTATIVE FOR RESOLUTION PRIOR TO CONSTRUCTION OR AS SOON AS DISCOVERED.
 3. IN THE EVENT THAT ANY UNKNOWN UNDERGROUND TANKS OR STRUCTURES OR UTILITY LINES ARE DISCOVERED ON THE SITE, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE TO DETERMINE THE DISPOSITION OF THE STRUCTURE.
 4. CONTRACTOR SHALL IMPORT REQUIRED MATERIALS OR EXPORT EXCESS AS REQUIRED TO ESTABLISH PLAN GRADES. EXCESS MATERIAL, IF ANY, SHALL BE DISPOSED OFF-SITE IN A LEGAL MANNER AT CONTRACTOR'S EXPENSE.
 5. EXISTING WATER, STORM AND SANITARY INVERTS SHALL BE EXPOSED AND VERIFIED PRIOR TO ANY NEW CONSTRUCTION.
 6. PLUMBING CONTRACTOR TO PROVIDE TRACER WIRES ON ALL BURIED PLASTIC PIPING.
 7. VALVE BOXES TO BE CHRISTY 10\"/>
 8. WHEN WATER AND SEWER LINES ARE INSTALLED IN JOINT TRENCH, WATER LINES TO BE SET MINIMUM 1' HIGHER THAN SEWER LINES WITH MINIMUM 1' HORIZONTAL CLEARANCE.
 9. UTILITY POINTS OF CONNECTION ARE 5' OUTSIDE OF BUILDING. SEE MECHANICAL AND PLUMBING DRAWINGS FOR UTILITY CONNECTION.
 10. CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERIFICATION OF LOCATIONS OF ALL EXISTING UTILITIES IN THE FIELD.
 11. ALL UTILITY TRENCHES SHOULD BE BACKFILLED WITH COMPACTED FILL IN ACCORDANCE WITH LOCAL REQUIREMENTS OR THE RECOMMENDATIONS IN THE SOILS REPORT. FILL MATERIAL SHOULD BE PLACED IN LIFT NOT EXCEEDING 6 INCHES IN UNCOMPACTED THICKNESS AND SHOULD BE COMPACTED TO AT LEAST 90 PERCENT RELATIVE COMPACTION (ASTM D-1557, LATEST EDITION) BY MECHANICAL MEANS ONLY. EXCEPT WHERE LOCAL REQUIREMENTS SPECIFY HIGHER REQUIREMENTS. IF IMPORTED SAND IS USED AS BACKFILL, THE UPPER THREE FEET IN BUILDING AND PAVEMENT AREAS SHALL BE COMPACTED TO 95 PERCENT. THE UPPER 6 INCHES OF BACKFILL IN ALL PAVEMENT AREAS SHALL BE COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION.

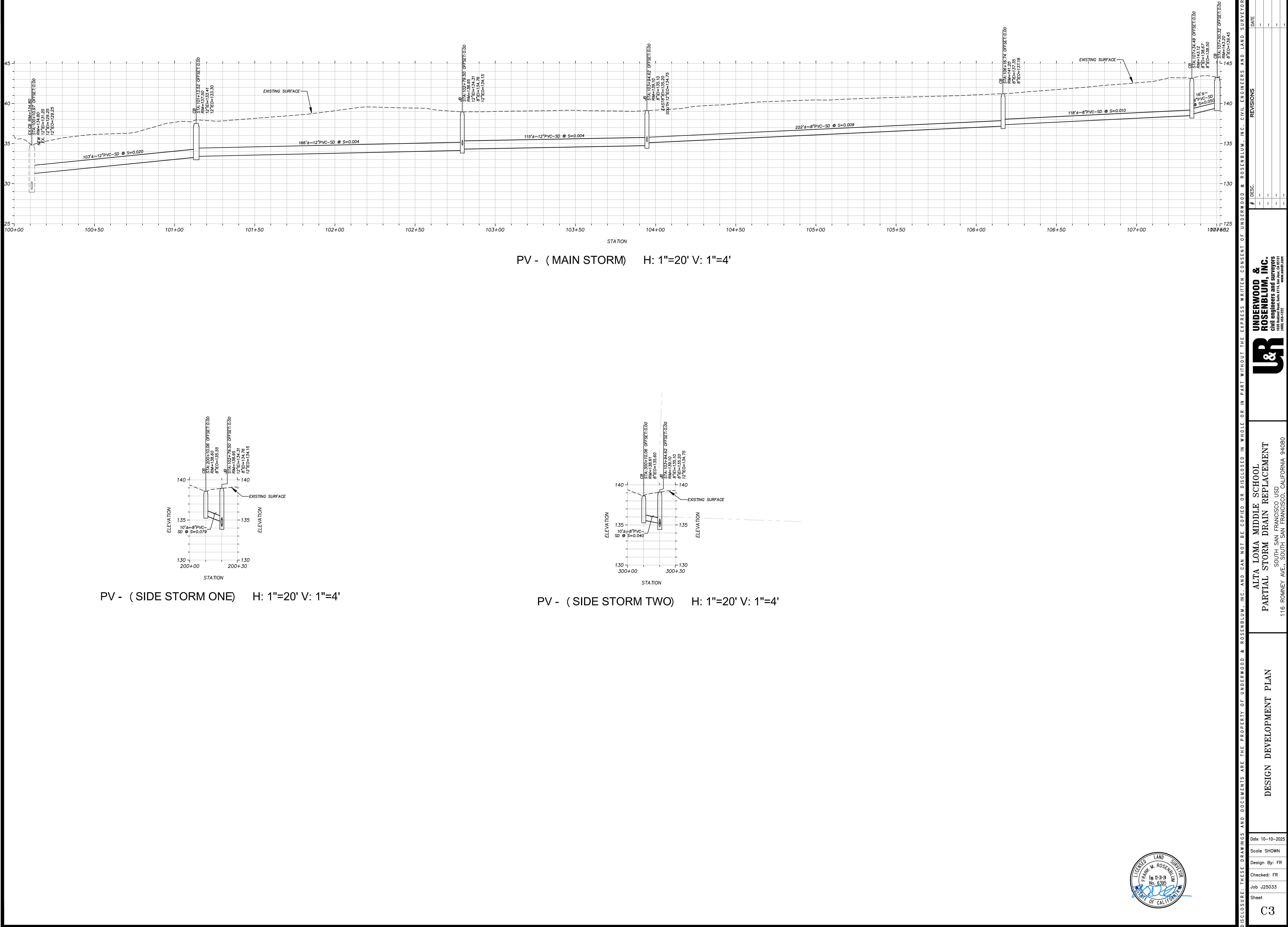
THE FOLLOWING SECTIONS OF THE STANDARD SITE WORK SPECIFICATIONS FOR THE CONSTRUCTION OF THIS PROJECT ARE APPLICABLE TO THE WORK SHOWN ON THIS DRAWING:

- SECTION 311000 - SITE CLEARING
SECTION 312333 - TRENCHING & BACKFILLING
SECTION 321112 - CONCRETE PAVING
SECTION 334100 - STORM UTILITY DRAINAGE PIPING

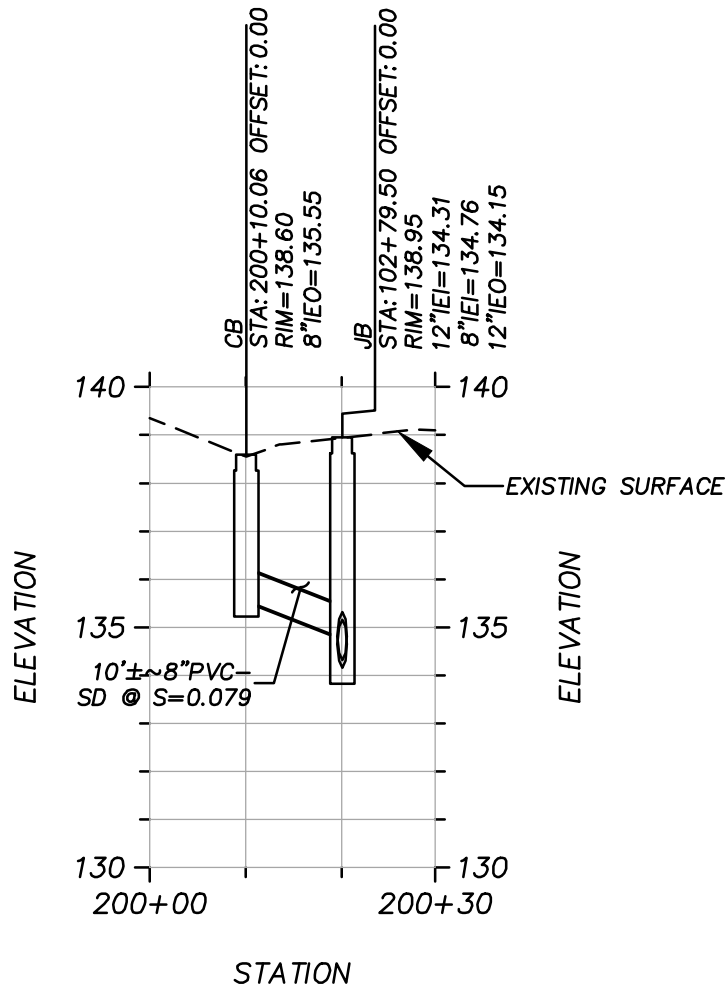
PLUMBING LEGEND

- | | |
|----------------|------------------------------------|
| — | NEW STORM DRAIN |
| — | SIZE AND SLOPE, AS INDICATED |
| — | SEE SHEET C3 FOR INVERT ELEVATIONS |
| AD | AREA DRAIN |
| CB | CATCH BASIN |
| JB | JUNCTION BOX |
| SDMH | STORM DRAIN MAINTENANCE HOLE |
| SSMH | SANITARY SEWER MAINTENANCE HOLE |
| RWL | RAIN WATER LEADER |
| OOIG/SSOO/SSOO | CLEAN OUT TO GRADE |
| WV | WATER VALVE |
| WM | WATER METER |
| BFP | BACK FLOW PREVENTER |
| FH | FIRE HYDRANT |
| D.I.P. | DUCTILE IRON PIPE |
| EX., EXIST. | EXISTING |
| FF | FINISH FLOOR |
| HDPE | HIGH DENSITY POLYETHYLENE PIPE |
| INV | INVERT ELEVATION |
| IEI | INVERT ELEVATION IN |
| IEO | INVERT ELEVATION OUT |
| ET | INVERT ELEVATION THROUGH |
| PVC | POLYVINYL CHLORIDE |
| RCP | REINFORCED CONCRETE PIPE |
| SS | SANITARY SEWER |
| SD | STORM DRAIN |
| TYP. | TYPICAL |
| W, DW | DOMESTIC WATER |
| — | PLUG EX. STORM DRAIN PIPE |
| — | WITH CONCRETE |

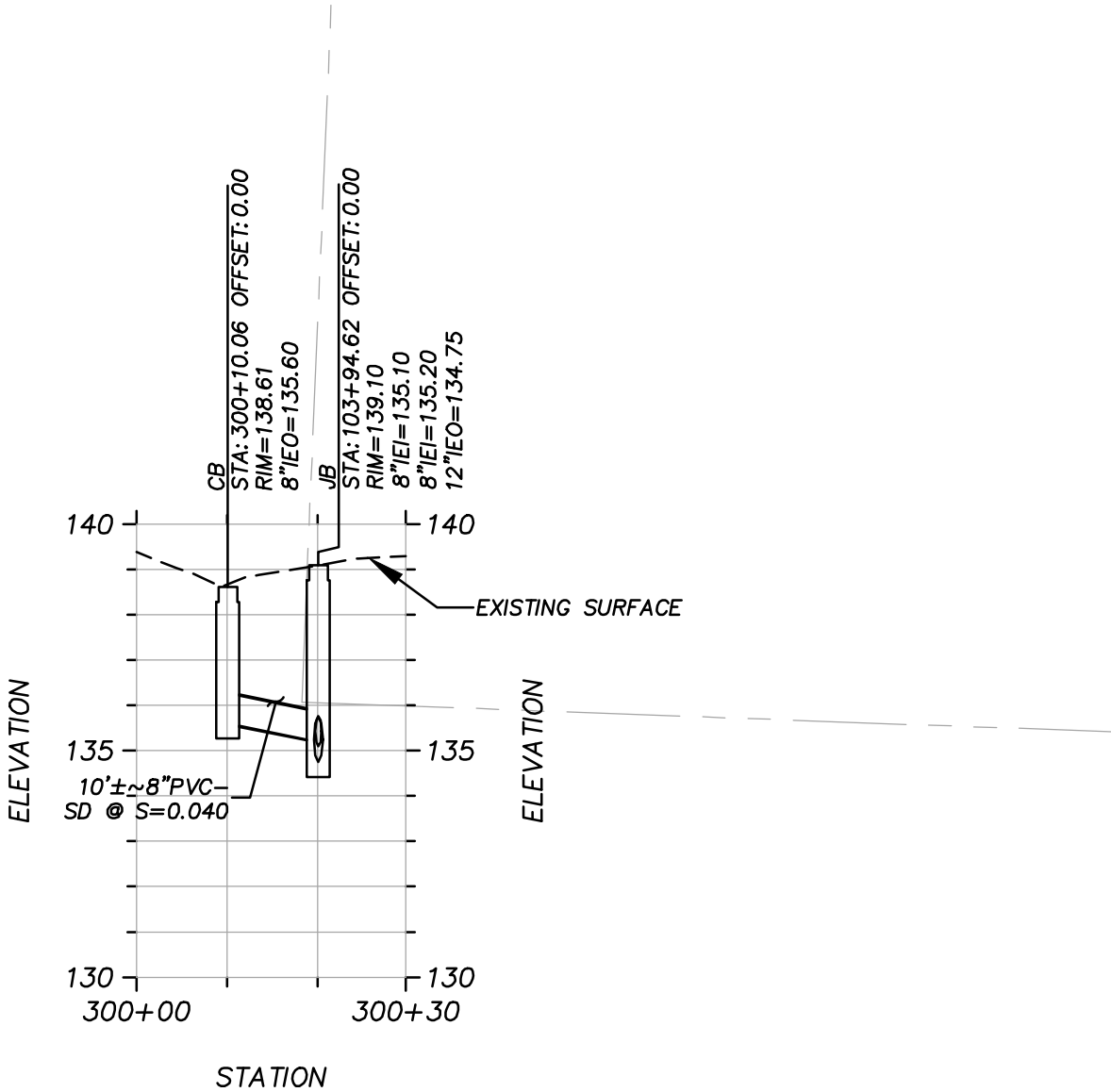




PV - (MAIN STORM) H: 1"=20' V: 1"=4'



PV - (SIDE STORM ONE) H: 1"=20' V: 1"=4'



PV - (SIDE STORM TWO) H: 1"=20' V: 1"=4'



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DESIGN DEVELOPMENT PLAN

ALTA LOMA MIDDLE SCHOOL
PARTIAL STORM DRAIN REPLACEMENT
SOUTH SAN FRANCISCO USD
116 ROMNEY AVE., SOUTH SAN FRANCISCO, CALIFORNIA 94080

UNDERWOOD & ROSENBLUM, INC.
civil engineers and surveyors
1800 Redwood Road, Suite 4114, San Jose, CA 95131
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TRENCHING AND BACKFILLING

SECTION 31 23 33 - TRENCHING & BACKFILLING

PART 1 - GENERAL

- 1.1 RELATED WORK
- A. Division 31: Grading.
- 1.2 SUMMARY
- A. Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the Work.
- 1.3 QUALITY ASSURANCE
- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the construction soil engineer.

PART 2 - PRODUCTS

- 2.1 SOIL MATERIALS
- A. Fill and backfill materials:
1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 3" in greatest dimension, and with not more than 10% of the rocks or lumps larger than 1" in their greatest dimension.
2. Fill material is subject to the approval of the construction soil engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soil free from roots and other deleterious matter.
3. Imported fill material shall, in addition, have 10 to 40% by weight passing the #200 sieve, a plasticity index of less than 15, and a liquid limit of less than 30%.
- 2.2 OTHER MATERIALS
- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

- 3.1 SURFACE CONDITIONS
- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

D. Depressions:

1. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing for the pipe on prepared bottom of the trench.
2. Except where rock is encountered, do not excavate below the depth indicated or specified.
3. Where rock is encountered, excavate rock to a minimum overdepth of 4" below the trench depth indicated or specified.
- E. Where utility runs traverse public property or are subject to governmental or utility company jurisdiction, provide depth, bedding, cover, and other requirements as set forth by legally constituted authority having jurisdiction, but in no case less than the depth shown in the Contract Documents.
- F. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.
- G. Cover:

1. Provide minimum trench depth indicated below to maintain a minimum cover over the top of the installed item below the finish grade or subgrade:
- a. Areas subject to vehicular traffic:
- (1) Sanitary sewers: 24";
- (2) Storm drains: 24".
- b. Areas not subject to vehicular traffic:
- (1) Sanitary sewers: 18";
- (2) Storm drains: 18".
- c. All areas:
- (1) Water lines: 18";
- (2) Natural gas lines: 18";
- (3) Electrical cables: 24";
- (4) Electrical ducts: 18".
- d. Concrete encased:
- (1) Pipe sleeves for water and gas lines: 18";
- (2) Sanitary sewers and storm drains: 12";
- (3) Electrical ducts: 18".

2. Where utilities are under a concrete structure slab or pavement, the minimum depth need only be sufficient to completely encase the conduit or pipe sleeve, and electrical long-radius rigid metal conduit riser, provided it will not interfere with the structural integrity of the slab or pavement.

3. Where the minimum cover is not provided, encase the pipes in concrete as indicated. Provide concrete with a minimum 28-day compressive strength of 2500 psi.

3.2 FINISH ELEVATIONS AND LINES

- A. Comply with documents.

3.3 PROCEDURES

- A. Utilities:
1. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to trenching. If damaged, repair or replace at no additional cost to the Owner.
2. If active utility lines are encountered and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Architect and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Architect.
- B. Protection of persons and property:
1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.
- C. De-watering:
1. Remove all water, including rainwater, encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.
2. Keep trenches and site construction area free from water.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
1. Maintain access to adjacent areas at all times.

3.5 BEDDING

- A. Provide bedding as indicated on the Drawings.

3.6 BACKFILLING

A. General:

1. Do not completely backfill trenches until required pressure and leakage tests have been performed, and until the utilities systems as installed conform to the requirements specified in the pertinent Sections of these Specifications.
2. Except as otherwise specified or directed for special conditions, backfill trenches to the ground surface with selected material approved by the construction soil engineer.
3. Reopen trenches that have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified, or otherwise correct to the approval of the construction soil engineer.
4. Do not allow or cause any of the Work performed or installed to be covered up or enclosed by work of this Section prior to required inspections, tests, and approvals.
5. Should any of the Work be so enclosed or covered up before it has been approved, uncover all such Work and, after approvals have been made, refill and compact as specified, at at no additional cost to the Owner.

B. Lower portion of trench:

1. Deposit approved backfill and bedding material in layers of 6" maximum thickness, and compact with suitable tampers to 90% relative density (85% in landscape areas), until there is a cover of not less than 24" over sewers and 12" over other utility lines.
2. Take special care in backfilling and bedding operations to not damage pipe and pipe coatings.

C. Remainder of trench:

1. Except for special materials for pavements, backfill the remainder of the trench with approved backfill.
2. Deposit backfill material in layers not exceeding the thickness specified, and compact each layer to the minimum density indicated by the construction soil engineer.
- D. Adjacent to buildings: Mechanically compact backfill within ten feet of buildings.
- E. Consolidation of backfill by jetting with water may be permitted, when specifically approved by the construction soil engineer, in areas other than building and pavement areas.

3.7 TEST FOR DISPLACEMENT OF SEWERS AND STORM DRAINS

- A. Check sewers and storm drains to determine whether displacement has occurred after the trench has been backfilled to above the pipe and has been compacted as specified.
- B. Flash a light between manholes or, if the manholes have not yet been constructed, between the locations of the manholes, by means of a flashlight or by reflecting sunlight with a mirror.

END OF SECTION

3.4 TRENCHING

- A. Provide sheeting and shoring necessary for protection of the Work and for the safety of personnel.
1. Prior to backfilling, remove all sheeting.
2. Do not permit sheeting to remain in the trenches except when, in the opinion of the Architect, field conditions or the type of sheeting or methods of construction such as use of concrete bedding are such as to make removal of sheeting impracticable. In such cases, the Architect may permit portions of sheeting to be cut off and remain in the trench.
- B. Open cut:
1. Excavate for utilities by open cut.
2. If conditions at the site prevent such open cut, and if approved by the Architect, trenching may be used.
3. Short sections of a trench may be tunneled if, in the opinion of the Architect, the conductor can be installed safely and backfill can be compacted properly into such tunnel.
4. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects as directed by the construction soil engineer.
5. When the void is below the subgrade for the utility bedding, use approved earth materials and compact to the relative density directed by the construction soil engineer, but in no case to a relative density less than 90%.
6. When the void is in the side of the utility trench or open cut, use approved earth or sand compacted as approved by the construction soil engineer, but in no case to a relative density less than 85%.
7. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the Owner.
8. Excavating for appurtenances:
- a. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.
- b. Overdepth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete as directed by the construction soil engineer, and at no additional cost to the Owner.
- C. Trench to the minimum width necessary for proper installation of the utility, with sides as nearly vertical as possible. Accurately grade the bottom to provide uniform bearing for the utility.

- C. If the illuminated interior of the pipeline shows poor alignment, displaced pipes, or any other defects, correct the defects to the specified conditions and at no additional cost to the Owner.

3.8 PIPE JACKING

- A. The Contractor may, at his option, install steel pipe casings, long-and-groove reinforced concrete pipes, and steel pipes under existing roads or pavements by jacking into place using procedures approved by the governmental agencies having jurisdiction and approved by the construction soil engineer.

3.9 TUNNELING OPERATIONS

- A. The Contractor may, at his option, tunnel pipes into position using procedures approved by the construction soil engineer and the governmental agencies having jurisdiction.

3.10 FIELD QUALITY CONTROL

- A. The construction soil engineer will inspect open cuts and trenches before installation of utilities, and will make the following tests:
1. Assure that trenches are not backfilled until all tests have been completed.
2. Check backfilling for proper layer thickness and compaction.
3. Verify that test results conform to the specified requirements, and that sufficient tests are performed.
4. Assure that defective work is removed and properly replaced.

STORM DRAINAGE

SECTION 33 41 00 STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide storm sewerage system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- 1.2 SUBMITTALS
- A. Comply with pertinent provisions of General Conditions.
- B. Product data: Within 20 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS

- A. Provide pipe and associated materials of the size indicated on the Drawings and meeting the following requirements:

1. Polyvinyl chloride pipe (PVC): Drainpipe shall conform to requirements for ASTM D3034, for SDR-35.

2.2 DRAINAGE STRUCTURES

A. General:

1. Construct manholes, inlets, and junction structures of reinforced concrete or precast reinforced concrete, complete with metal frames and covers or gratings, and with fixed ladder rungs where indicated on the Drawings or required by codes.

B. Materials:

1. Concrete: Comply with provisions for a minimum of 2500-psi concrete.
2. Mortar for pipe joints and connections to other drainage structures, and manhole construction:
- a. Comply with requirements of ASTM C270, type M, except the maximum placement time shall be one hour.
- b. Hydrated lime complying with ASTM C141, type B, may be added to the mixture of sand and cement in an amount equal to 25% of the volume of cement used.

- c. Provide a quantity of water in the mixture sufficient to produce a stiff workable mortar, which shall be clean and free from harmful acids, alkalis, and organic impurities. Use the mortar within 30 minutes after water is added to the mix.

3. Precast reinforced concrete manholes:

- a. Comply with ASTM C478, precast rings and cone sections.
- b. Fully bed the joints between precast concrete risers and tops in mortar, and smooth both interior and exterior surfaces uniformly.
- c. Acceptable products:
- (1) Manufactured by Ameron Pipe Products Group, El Monte, California.

4. Reinforcement: Provide intermediate grade billet steel complying with ASTM A615, grade 40.

5. Frames and covers or gratings:

- a. Provide all gratings or covers from the same manufacturer.
- b. Provide standard black finish, supplied as a total unit, sized as shown on the Drawings or larger sizes except where in a pavement area, and with the wording "STORM DRAIN" cast into the cover.
- c. Acceptable products:
- (1) Manufactured by Alhambra Foundry, Alhambra, California.
- (2) Manufactured by NEENAH Foundry Company, Neenah, Wisconsin.

6. Precast concrete catch basins:

- a. Provide reinforced and bottom open for field pouring to ensure slope through the structure.
- b. Contractor may select this option in lieu of cast-in-place concrete catch basins.
- c. Precast concrete, Christy Products "U" Series.
- d. All products within pedestrian paths shall conform to ADA standards.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 EXCAVATING, TRENCHING, AND BEDDING

- A. Excavate, trench, and bed for site drains in accordance with pertinent provisions of Section 312333, and the following:

B. Movement of construction machinery:

1. Use means necessary to avoid displacement of, and injury to, pipe and structures while compacting by rolling or operating equipment parallel to the pipe.
2. Movement of construction machinery over a culvert or storm drain at any stage of construction is solely at the Contractor's risk.

C. Bedding:

1. Provide a bedding surface for the pipe with a firm foundation of uniform density throughout the entire length of the pipe.
2. Bed the pipe carefully in a soil foundation accurately shaped and rounded to conform to the lower 1/4 of the outside perimeter of circular pipe, or set the pipe in a bed of sand.
3. Tamp bedding where necessary.
4. Provide bell holes and depressions for pipe joints of only the length, depth, and width required for making the particular pipe joint properly.
5. Where plastic pipe is used, provide a minimum of 4" of sand bedding over the top and under the pipe.

3.3 INSTALLING PIPE

A. General:

1. Carefully examine each pipe prior to placing.
- a. Promptly set aside defective pipe and damaged pipe.
- b. Clearly identify defects.
- c. Do not install defective pipe or damaged pipe.
2. Place pipe to the grades and alignment indicated, with a tolerance of one in 1000 vertical and one in 500 horizontal, unless otherwise directed by the Architect.
3. Provide adequate facilities for lowering pipe safely into the trenches.
4. Do not place pipe in water, or place pipe when trench or weather is unsuitable for such work.
- B. Concrete pipe: Place by proceeding upgrade with the tongue ends of tongue and groove pipe, jointing in the direction of flow.

3.4 JOINTS

A. Joining concrete pipe:

1. Use the specified mortar ingredients.
2. Use the mortar within 60 minutes from the time water is first added to the mix.
3. Wipe the inside of the joint clean and smooth. Perform wiping by dragging a suitable swab or long handled brush through the pipe as installation progresses.
4. Protect the mortar bead on the outside from air and sun with suitable covering until cured. Unless otherwise directed by the Architect, use one of the following methods of jointing for tongue and groove pipe:
- a. Cement mortar tongue and groove joint:
- (1) Bed the first pipe to the established grade line, with the groove end placed upstream.
- (2) Clean surface of groove with wet brush, and fill lower portion with mortar to such depth as to bring the inner surfaces of the abutting pipes flush and even.
- (3) Clean the tongue end of each subsequent pipe with a wet brush, and uniformly match the groove so that the sections are closely fitted.
- (4) After laying each section, fill remainder of joint with mortar, and form a bead around the outside of the joint with mortar.
- (5) Use the specified mortar. If mortar can slump before setting, wrap or bandage the outside of the joint with cheesecloth to retain mortar in place.

GRADING

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONFIRM THE GROUND ELEVATIONS AND OVERALL TOPOGRAPHY OF THE SITE PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY UNDERWOOD & ROSENBLUM, INC. IN WRITING IMMEDIATELY OF ANY DIFFERENCES IN TOPOGRAPHY FROM THAT SHOWN ON THIS PLAN WHICH MAY AFFECT THE EARTHWORK QUANTITY AND/OR REQUIRE CHANGES IN DESIGN.
2. ALL ABANDONED UNDERGROUND PIPELINES EXPOSED DURING GRADING SHALL BE REMOVED OR ADEQUATELY PLUGGED.
3. PROTECTIVE FENCING AND/OR BARRIERS SHALL BE PROVIDED WHEN NECESSARY TO PROTECT ADJACENT PROPERTIES DURING GRADING OPERATION.
4. ALL EXPLORATORY TRENCHES AND PITS SHALL BE EXCAVATED AND RECOMPACTED, UNDER THE DIRECTION AND SUPERVISION OF THE PROJECT INSPECTOR.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR HAULING OFF ALL EXCESS MATERIAL AND DEMOLISHED MATERIAL, AND DISPOSING OF SUCH MATERIAL IN A LEGAL MANNER.
6. EROSION CONTROL MEASURES SHALL BE EMPLOYED DURING THE RAINY SEASON AS REQUIRED BY THE CITY.
7. PERCENT COMPACTION REFERS TO PERCENT OF MAXIMUM DRY DENSITY, AS DETERMINED BY ASTM D1557-78, AND SHALL BE AT NEAR OPTIMUM MOISTURE CONTENT.

ASPHALT AND CONCRETE

1. MATERIAL AND CONSTRUCTION OF ASPHALT PAVEMENT AND CONCRETE IMPROVEMENTS SHALL CONFORM TO STATE STANDARDS AND SPECIFICATIONS.
- A. AGGREGATE BASE-- CLASS II WITH GRADING AND QUALITY AS SPECIFIED IN SECTION 26 OF THE STATE STANDARD SPECIFICATIONS.
- B. ASPHALT CONCRETE-- TYPE A 3/8" MAXIMUM, MEDIUM AGGREGATE, AS SPECIFIED IN SECTION 39 OF THE STATE STANDARD SPECIFICATIONS.
- C. PRIME COAT-- LIQUID ASPHALT TYPE MC-10 OR MC-250 AS SPECIFIED IN SECTION 43 OF THE STATE STANDARD SPECIFICATIONS.
- D. TACK COAT-- EMULSIFIED ASPHALT TYPE SS-1, SS-1H, CSS-1, OR CSS-1H AS SPECIFIED IN SECTION 44 OF THE STATE STANDARD SPECIFICATIONS, DILUTED WITH THREE PARTS WATER TO ONE PART EMULSIFIED ASPHALT.
- E. SLURRY COAT-- "POLY-KOTE" TA-1000, "OVERKOTE" BY REED & GRAHAM, OR APPROVED EQUAL.
2. UNLESS OTHERWISE NOTED, PAVING CONFORMS SHALL BE MADE AT A SMOOTHLY TRIMMED BUTT JOINT. DO NOT OVERLAP EXISTING PAVEMENT.
3. EXISTING CURB GUTTERS OR SIDEWALKS THAT ARE DAMAGED OR DISPLACED, EVEN THOUGH THEY WERE NOT TO BE REMOVED, SHALL BE REPAIRED OR REPLACED EVEN IF DAMAGE OR DISPLACEMENT OCCURRED PRIOR TO ANY WORK PERFORMED BY THE CONTRACTOR.
4. WHERE ANY PIPE IS TO BE INSTALLED AT SUCH A GRADE THAT ANY PART OF THE PIPE WILL BE ABOVE THE SUBGRADE LINE, THE PIPE SHALL BE INSTALLED AFTER THE SUBBASE IS COMPLETED AND SHALL BE SUPPORTED.
5. MANHOLES, WATER VALVE BOXES, AND CLEAN OUT FRAMES AND COVERS SHALL BE BROUGHT TO FINISHED GRADE BY THE CONTRACTOR AFTER PAVING IS COMPLETED.
6. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
7. FINISHED TOP OF CURB AND PAVEMENT GRADES ARE GIVEN AT CRITICAL POINTS. GRADES BETWEEN THESE POINTS TO BE CONSTRUCTED ON A STRAIGHT GRADIENT.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY GRAFFITI CARVED INTO CURING CONCRETE.
9. SAW CUT ALL CONCRETE AND ASPHALT JOINTS PRIOR TO REMOVAL.
10. SEAL COAT ALL NEW AND EXISTING AC PAVEMENT PRIOR TO STRIPING.
11. CONSTRUCT 2"x 6"REDWOOD HEADERS ALONG ALL NEW AC PAVEMENT BORDERING SOIL.

END OF SECTION

REVISIONS

#	DESC.	DATE
1		
2		
3		
4		

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TECHNICAL SPECIFICATIONS

Date	10-10-2025
Scale	SHOWN
Design By:	FR
Checked:	FR
Job	J25033
Sheet	

