

CONSTRUCTION PLANS

HOLLY HILLS WATER AND SANITATION DISTRICT

SOUTH HOLLY STREET SEWER REPLACEMENT

SECTIONS 29 AND 30, TOWNSHIP 4 SOUTH, RANGE 67 WEST OF THE 6TH MERIDIAN

48 hours before you dig, CALL UTILITY NOTIFICATION  
CENTER OF COLORADO (UNCC)

811

Gas, Electric, Telephone, CATV and  
Pannhandle Eastern Pipeline Locations



2023.7.19.2026  
7245 W. ALASKA DR., SUITE 210  
LAKEWOOD, CO 80226  
WWW.ELEMENTENGINEERING.NET

PREPARED FOR:

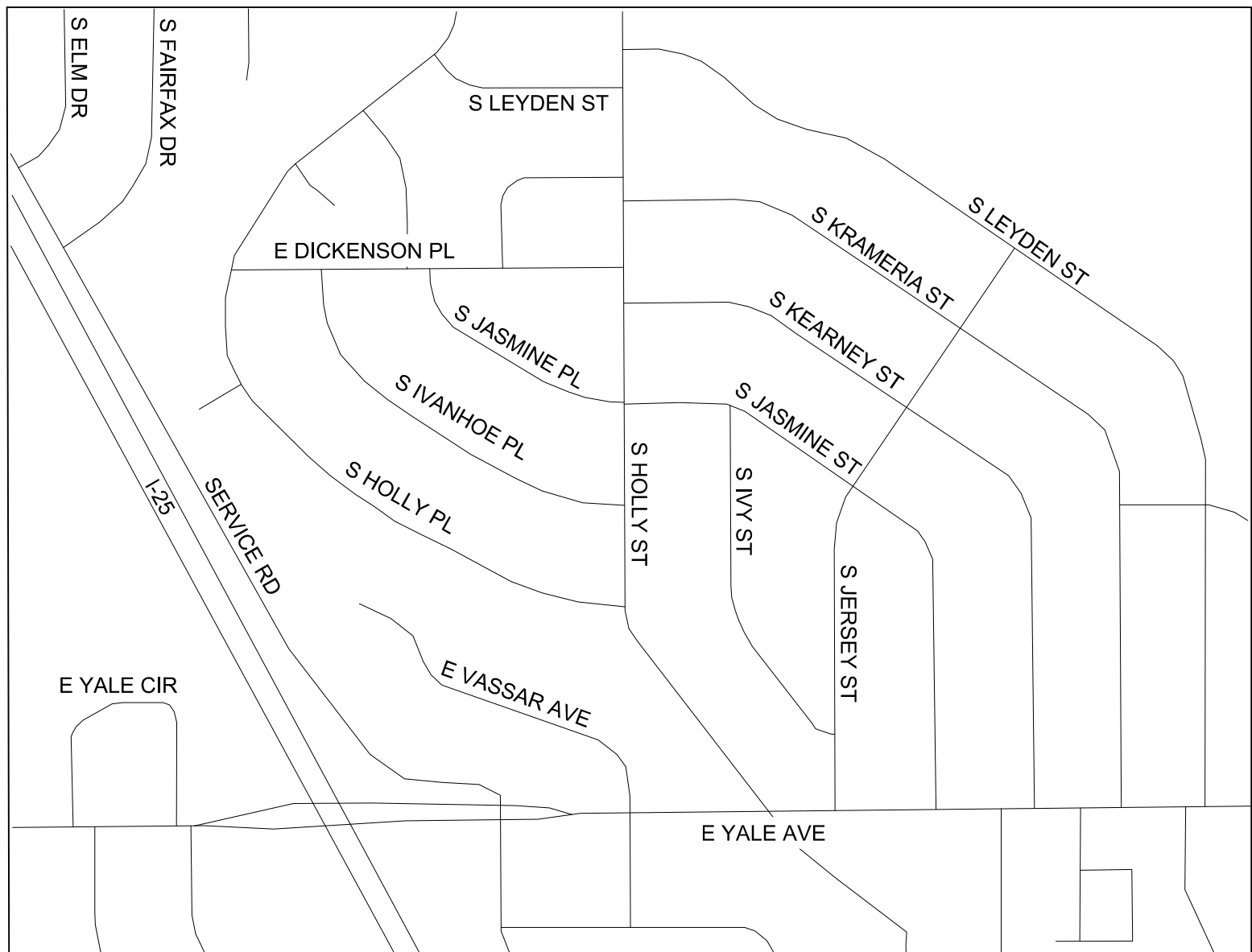
HOLLY HILLS WATER AND SANITATION DISTRICT  
JUSTIN JANCA, DISTRICT MANAGER  
720-213-6621

WILL RAATZ, DISTRICT ENGINEER  
W2 ENGINEERS, LLC.  
720-331-2332

ARAPAHOE COUNTY CASE NO.



VICINITY MAP  
NOT TO SCALE



LOCATION MAP  
1" = 500'

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DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT  
APPROVAL BLOCK

I HEREBY AFFIRM THAT THESE (PRELIMINARY/FINAL) CONSTRUCTION PLANS  
FOR SOUTH HOLLY STREET SEWER REPLACEMENT WERE PREPARED  
BY ME (OR UNDER MY DIRECT SUPERVISION) IN ACCORDANCE WITH THE  
REQUIREMENTS OF THE INFRASTRUCTURE DESIGN AND CONSTRUCTION  
STANDARDS AND THE STORMWATER MANAGEMENT MANUAL."

NICHOLAUS MARCOTTE  
PE NO. 47164  
ELEMENT, A BOWMAN COMPANY

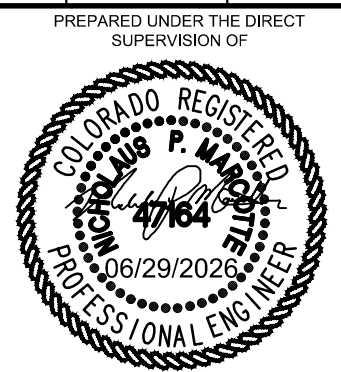
DATE: \_\_\_\_\_

APPROVAL OF THE PLANS DOES NOT SUPERSEDE DISTRICT SPECIFICATIONS.  
WHERE CONFLICTS EXIST, DISTRICT SHALL DETERMINE WHICH OPTION PREVAILS.

SOUTH HOLLY STREET SEWER REPLACEMENT

COVER

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228



|                         |                   |
|-------------------------|-------------------|
| DESIGNED BY<br>JAM      | CHECKED BY<br>MEH |
| DATE<br>JUNE 2026       |                   |
| JOB NUMBER<br>0166.0001 |                   |
| EDITION<br>CONSTRUCTION |                   |
| SHEET<br>C1 OF C22      |                   |



Q:\CO-LAKE-EESHARED\_PROJECTS\0166 - HOLLY HILLS SANITATION DISTRICT\0001 - SOUTH HOLLY STREET SEWER REPLACEMENT\CADD\DWG\COVER AND NOTES.DWG

GENERAL CONSTRUCTION NOTES

1.

ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS.
2.

THE CONTRACTOR SHALL PROVIDE ALL BONDS AND INSURANCE REQUIRED BY THE CONTRACT DOCUMENTS.
3.

UNLESS OTHERWISE APPROVED BY THE ENGINEER AND OWNER, CONSTRUCTION SHALL BE LIMITED TO HOURS BETWEEN 7:00 AM AND 5:00 PM, MONDAY THROUGH FRIDAY.
4.

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 COMPLETION. THIS SCHEDULE SHALL BE PROVIDED TO THE ENGINEER TWO (2) WEEKS PRIOR TO CONSTRUCTION AND UPDATED WEEKLY.
5.

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 TO PROVIDE A COMPLETED PROJECT.
6.

THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR AND EQUIPMENT AND PERFORM WORK INCLUDING CONSTRUCTION AND ALL OTHER IMPROVEMENTS SHOWN OR IMPLIED AS NECESSARY FOR THE COMPLETED UTILITIES, READY FOR USE.
7.

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 THEIR WORK SO AS TO AVOID DAMAGE TO ANY UTILITIES. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
8.

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.
9.

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.
10.

CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED OF THIS WORK AND SHALL FAITHFULLY ADHERE TO THE ALL PERMIT REQUIREMENTS. DISTRICT WILL PAY FOR ARAPAHOE COUNTY PERMITS.
11.

TEMPORARY AND PERMANENT EROSION CONTROL STRUCTURE METHODS SHALL BE IN ACCORDANCE WITH ARAPAHOE COUNTY AND CDOT REGULATIONS AND ARE TO BE UTILIZED DURING CONSTRUCTION.
12.

ALL EROSION CONTROL STRUCTURES SHOWN OR AS REQUIRED DURING CONSTRUCTION SHALL BE CONTINUOUSLY MAINTAINED THROUGH CONSTRUCTION.
13.

CONTRACTOR SHALL CLEAN UP, SEED, AND RESTORE DISTURBED AREAS IMMEDIATELY UPON COMPLETION OF THE WORK IN THE AFFECTED AREA AS SHOWN ON THE PLANS.
14.

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.
15.

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 AND SIGNS SHALL BE IN PLACE PRIOR TO THE BEGINNING OF ANY CONSTRUCTION ACTIVITY.
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 DOWN THE PROJECT.
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 ENGINEER AT LEAST 48 HOURS PRIOR TO ANY DESIRED INSPECTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
20.

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

DISTURBED SURVEY MONUMENTS MUST BE SET WITHIN 60 DAYS OF COMPLETION OF THE PROJECT.
22.

THE CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF APPROVED DRAWINGS ON THE CONSTRUCTION SITE AT ALL TIMES WHEREON THEY 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.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING AS-BUILT INFORMATION ON A SET OF RECORD DRAWINGS KEPT ON THE CONSTRUCTION SITE, AND AVAILABLE TO THE DISTRICT AND ENGINEER AT ALL TIMES.
25.

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.
26.

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.
27.

MANHOLE VAULT/EXTERIOR JOINTS SHALL BE WRAPPED IN 12" WIDE CONSEAL CS-212 OR APPROVED EQUAL.
28.

MANHOLE VAULT/BARREL SECTIONS WILL REQUIRE AN EXTERIOR COATING OF TNE MEC SERIES 46-465 OR APPROVED EQUAL.
29.

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.
30.

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.
31.

THE INTERIOR OF ALL PIPE AND FITTINGS SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATTER PRIOR TO INSTALLATION. BEFORE JOINTING, ALL JOINT CONTACT SURFACES SHALL BE WIRE BRUSHED IF NECESSARY, WIPED CLEAN, AND KEPT CLEAN UNTIL JOINTING IS COMPLETED.
32.

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.
33.

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.
34.

ALL MATERIALS AND WORKMANSHIP FOR WASTEWATER AND SANITARY SEWER CONSTRUCTION SHALL CONFORM TO THE PROJECT DRAWINGS, DETAILS AND TECHNICAL SPECIFICATIONS, CDPHE AND ALL OTHER APPLICABLE AGENCIES.
35.

ALL DIRECT BURY SEWER MAINS SHALL BE PVC, ASTM D-3034, SDR26 OR APPROVED EQUAL, UNLESS OTHERWISE NOTED.
36.

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.
37.

ALL MANHOLES SHALL BE WATER TIGHT PRECAST CONCRETE, A MINIMUM OF 48 INCH IN DIAMETER WITH ECCENTRIC 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.
38.

SEWER RIM ELEVATIONS AND INVERTS SHOWN ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS.
39.

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 DISTRICT ENGINEER.
40.

PIPE BEDDING SHALL BE SQUEEGEE BEDDING. 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.
41.

AT LEAST 5 DAYS PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING WILL BE HELD AND ATTENDED BY THE CONTRACTOR AND REPRESENTATIVES OF THE OTHER APPROVING AGENCIES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE DISTRICT ENGINEER TO SCHEDULE THIS MEETING.
42.

CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL TIE-IN LOCATIONS TO EXISTING STRUCTURES AND PIPES PRIOR TO BEGINNING WORK. PROVIDE ANY DISCREPANCIES TO ENGINEER.
43.

ALL MANHOLES SHALL HAVE SHAPED INVERTS.
44.

ALL SEWER LINES SHALL BE TESTED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS PRIOR TO INITIAL ACCEPTANCE OR ANY CONNECTION TO AN EXISTING SEWER LINE. THE MAXIMUM "BELLY" ON LOW SPOTS IN THE NEW SEWER MAIN SHALL NOT EXCEED 3/8 INCHES.
45.

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.
46.

FERNCO STRONGBACK RC SERIES PIPE COUPLINGS WILL BE REQUIRED FOR PIPE AND LATERAL SERVICES.
47.

ALL BARREL SECTIONS OF MANHOLES SHALL BE GROUTED INSIDE AT JOINTS.
48.

SHOULD TRENCH DE-WATERING BECOME NECESSARY, THE CONTRACTOR WILL OBTAIN ALL REQUIRED PERMITS AND SUPPLY THE PUMPS REQUIRED.
49.

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.
50.

ALL MANHOLE AND SANITARY SEWER MAIN TESTING SHALL BE WITNESSED BY A REPRESENTATIVE OF THE OWNER. A MINIMUM OF 24 HOURS ADVANCED NOTICE IS REQUIRED PRIOR TO TESTING.
51.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL REQUIRED OR NECESSARY INSPECTIONS ARE COMPLETED BY AUTHORIZED INSPECTORS PRIOR TO PROCEEDING WITH THE SUBSEQUENT WORK THAT COVERS OR THAT IS DEPENDENT ON THE WORK TO BE INSPECTED. FAILURE TO OBTAIN NECESSARY INSPECTION(S) AND APPROVAL(S) SHALL RESULT IN THE CONTRACTOR BEING FULLY RESPONSIBLE FOR ANY ISSUES ARISING FROM UN-INSPECTED WORK.
52.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING ROADWAYS FREE AND CLEAR OF ALL CONSTRUCTION DEBRIS AND DIRT TRACKED FROM THE SITE.

53.

THE CONTRACTOR SHALL COMPLY WITH ALL TERMS AND CONDITIONS OF THE CDPHE PERMIT FOR STORM WATER DISCHARGE, THE STORM WATER MANAGEMENT PLAN, AND THE EROSION CONTROL PLAN, WHERE APPLICABLE.
54.

ALL STRUCTURAL EROSION CONTROL MEASURES SHALL BE INSTALLED, AT THE LIMITS OF CONSTRUCTION, PRIOR TO ANY OTHER GROUND DISTURBING ACTIVITY. ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED IN GOOD REPAIR BY THE CONTRACTOR, UNTIL SUCH TIME AS THE ENTIRE DISTURBED AREA IS STABILIZED WITH HARD SURFACE LANDSCAPING. THE DISTRICT MAINTAINS THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES IF NECESSARY DURING CONSTRUCTION.
55.

ALL EXISTING STRUCTURES, FENCES, SIGNS, AND IMPROVEMENTS DESTROYED, DAMAGED, OR REMOVED DUE TO THE CONSTRUCTION OF THIS PROJECT SHALL BE REPLACED OR RESTORED IN LIKE AND KIND AT THE CONTRACTOR'S EXPENSE, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
56.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A DISPOSAL SITE FOR ALL UNUSABLE MATERIAL REMOVED FROM THE PROJECT.
57.

ALL PRECAST CONCRETE SHALL BE 4,000 PSI MINIMUM STRENGTH.
58.

ALL EXISTING PIPING INTO EXISTING MANHOLES MUST BE RECONNECTED IN NEW MANHOLES.
- BACKFILLING GENERAL

A.

ALL TRENCHES SHALL BE BACKFILLED AFTER PIPE, FITTINGS AND APPURTENANCES HAVE BEEN INSTALLED, INSPECTED AND APPROVED BY THE CITY 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 NOT 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 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 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.

PROCEDURE AT STREET ZONE - THE TOP TWO AND ONE-HALF-FOOT (2 ½') FROM FINISH STREET GRADE OR GROUND SURFACE, AS THE CASE MAY BE, SHALL BE COMPACTED HORIZONTAL LAYERS NOT EXCEEDING EIGHT INCHES (8") IN THICKNESS, USING APPROVED HAND PNEUMATIC OR MECHANICAL TYPE TAMPERS TO OBTAIN A STANDARD PROCTOR DENSITY OF NINETY-FIVE PERCENT (95%). FLOODING AND JETTING ARE NOT PERMITTED.

COMPACTION TESTS

COMPACTION TESTS WILL BE TAKEN BY AN APPROVED TESTING LABORATORY AT LOCATIONS DESIGNATED BY THE ENGINEER. ALL EXPENSES INVOLVED IN THESE TESTS WILL BE BORNE BY THE CONTRACTOR. RESULTS OF THE TESTS WILL BE MADE AVAILABLE TO THE ENGINEER IMMEDIATELY AND COPIES OF TEST RESULTS WILL BE SUPPLIED TO THE ENGINEER ONCE PER WEEK. A FINAL TYPED BOUND COPY OF FINAL TEST RESULTS MUST BE SUBMITTED TO THE 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 DISTRICT WILL BE CONTINGENT UPON SATISFACTORY COMPACTION RESULTS. 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' VERTICAL) INCREMENTS.
- B.

ONE (1) TEST EVERY TWO HUNDRED (200) LF OF MAINLINE TRENCH AT TWO-FOOT (2' VERTICAL) INCREMENTS BEGINNING TWO FEET (2') ABOVE PIPE TO FINAL GRADE AND ONE TEST AT FINAL GRADE.
- C.

ONE (1) TEST AT EVERY SERVICE WHICH EXTENDS BEYOND THE MAINLINE TRENCH AT TWO-FOOT (2' VERTICAL) INCREMENTS BEGINNING TWO FEET (2.0') ABOVE PIPE TO FINAL GRADE AND ONE TEST AT FINAL GRADE.

FINAL VIDEOING

ALL NEW SEWER LINES SHALL BE VIDEOED PRIOR TO PLACING NEW ASPHALT. VIDEOS SHALL BE SENT TO THE ENGINEER VIA. DROP BOX FOR REVIEW PRIOR TO PROJECT INITIAL ACCEPTANCE.

ELEMENT

A BOWMAN COMPANY

303.379.2860

WWW.ELEMENTENGINEERING.NET

7045 W. ALASKA DR. SUITE 210

LAKEWOOD, CO 80228

REVISIONS

| NO | DESCRIPTION | DATE | BY |
|----|-------------|------|----|
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|    |             |      |    |
|    |             |      |    |
|    |             |      |    |

SOUTH HOLLY STREET SEWER REPLACEMENT

GENERAL NOTES

PREPARED UNDER THE DIRECT SUPERVISION OF



FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DESIGNED BY  
JAM

CHECKED BY  
MEH

DATE  
JUNE 2026

JOB NUMBER  
0166.0001

EDITION

CONSTRUCTION

SHEET

C2

OF

C22

HOLLY HILLS SANITATION DISTRICT

405 URBAN ST SUITE 310

LAKEWOOD, CO 80228



Q:\CO-LAKE-EESHARED\_PROJECTS\01686 - HOLLY HILLS SANITATION DISTRICT\0001 - SOUTH HOLLY STREET SEWER REPLACEMENT\CADD\DWG\COVER AND NOTES.DWG

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. CONTRACTOR'S 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.

11. THE CONTRACTOR SHALL BE REQUIRED TO REPAIR, AT HIS OWN EXPENSE, ANY DAMAGE TO PUBLIC OR PRIVATE PROPERTY CAUSED BY HIS OPERATIONS.

12. 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.

13. 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.

14. 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.

15. 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.

16. 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.

17. 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.

GRADING AND EROSION CONTROL NOTES

1. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE PROJECT TECHNICAL SPECIFICATIONS.

2. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.

3. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE REVEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND PROTECTED FROM EROSION ELEMENTS.

4. TEMPORARY VEGETATION SHALL BE INSTALLED ON ALL DISTURBED AREAS WHERE PERMANENT SURFACE IMPROVEMENTS ARE NOT SCHEDULED FOR INSTALLATION WITHIN THREE MONTHS. VEGETATION SHALL BE A VIGOROUS, DROUGHT TOLERANT, NATIVE SPECIES MIX. PROJECT SCHEDULING SHOULD TAKE ADVANTAGE OF SPRING OR FALL PLANTING SEASONS FOR NATURAL GERMINATION, BUT SEEDED AREAS SHALL BE IRRIGATED, IF CONDITIONS SO MERIT.

5. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.

6. TEMPORARY CUT/FILL SLOPES SHALL NOT EXCEED A STEEPNESS OF 2:1 (2H:1V). PERMANENT SLOPES SHALL NOT EXCEED 4:1 (4H:1V) IN AREAS TO BE SEEDED OR SODDED.

7. THE CONTRACTOR SHALL PROVIDE ANY ADDITIONAL DUST ABATEMENT AND EROSION CONTROL MEASURES DEEMED NECESSARY BY THE COUNTY, SHOULD CONDITIONS MERIT THEM.

8. TEMPORARY FENCES SHALL BE INSTALLED ALONG ALL BOUNDARIES OF THE CONSTRUCTION LIMITS OR PROPERTY LINES AS SHOWN ON THE APPROVED EROSION CONTROL PLAN, TO PREVENT GRADING ON PROPERTY NOT OWNED BY THE DEVELOPER. IN ADDITION, THE COUNTY MAY REQUIRE ADDITIONAL TEMPORARY FENCES IF FIELD CONDITIONS SO MERIT THEM.

9. IMPERVIOUS SURFACES WHICH ARE ADJACENT TO OR CONTAINED WITHIN CONSTRUCTION SITES WILL BE SWEEPED ON A DAILY BASIS OR AS NEEDED DURING THE DAY WHEN SEDIMENT AND OTHER MATERIALS ARE TRACKED OR DISCHARGED ON TO THEM. EITHER SWEEPING BY HAND OR USE OF STREET SWEEPERS IS ACCEPTABLE. STREET SWEEPERS USING WATER WHILE SWEEPING IS PREFERRED IN ORDER TO MINIMIZE DUST. FLUSHING OFF PAVED SURFACES WITH WATER IS PROHIBITED.

10. THE CONTRACTOR SHALL PROTECT ALL STORM SEWER FACILITIES ADJACENT TO ANY LOCATION WHERE PAVEMENT CUTTING OPERATIONS INVOLVING WHEEL CUTTING, SAW CUTTING, OR ABRASIVE WATER JET CUTTING ARE TO TAKE PLACE. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL WASTE PRODUCTS GENERATED BY SAID CUTTING OPERATIONS ON A DAILY BASIS OR AS NEEDED THROUGHOUT THE WORK DAY. THE DISCHARGE OF ANY WATER CONTAMINATED BY WASTE PRODUCTS FROM CUTTING OPERATIONS TO THE STORM SEWER SYSTEM IS PROHIBITED.
11. THE DISCHARGE OF WATER CONTAINING WASTE CEMENT TO ADJACENT WATERWAYS, WETLANDS, OTHER PROPERTIES, ETC., IS PROHIBITED. THE CLEANING OF CEMENT TRUCK DELIVERY CHUTES, EXCEPT IN DESIGNATED CONCRETE WASHOUT AREAS, IS PROHIBITED AT THE JOB SITE.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING DISTURBED OR DESTROYED SURVEY MONUMENTS TO THE APPROPRIATE ACCURACY.
- ARAPHOE COUNTY GENERAL NOTES
1. THE COUNTY ENGINEER STAMP AND SIGNATURE AFFIXED TO THIS DOCUMENT INDICATES THE DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT HAS REVIEWED THE DOCUMENT AND FOUND IT IN GENERAL CONFORMANCE WITH THE ARAPAHOE COUNTY SUBDIVISION REGULATIONS OR APPROVED VARIANCES TO THOSE REGULATIONS. THE COUNTY ENGINEER, THROUGH APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY, OTHER THAN STATED ABOVE, FOR THE COMPLETENESS AND/OR ACCURACY OF THESE DOCUMENTS. THE OWNER AND ENGINEER UNDERSTAND THAT IT IS THE POLICY AND PRACTICE OF ARAPAHOE COUNTY NOT TO ACCEPT LIABILITY FOR FACILITIES DESIGNED BY OTHERS. THE RESPONSIBILITY FOR THE ENGINEERING ADEQUACY OF THE FACILITIES DEPICTED IN THIS DOCUMENT LIES SOLELY WITH THE REGISTERED PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT.

2. ALL ROADWAY CONSTRUCTION SHALL CONFORM TO THE ARAPAHOE COUNTY INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS.

3. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE ARAPAHOE COUNTY DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT. THE COUNTY RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.

4. THE CONTRACTOR SHALL NOTIFY THE ARAPAHOE COUNTY DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT INSPECTION SECTION AT 720-874-6500, A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO STARTING CONSTRUCTION.

5. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO ACTUAL CONSTRUCTION. FOR INFORMATION CONTACT THE DENVER INTER-UTILITY GROUP AT 303-534-6700, OR AT 1-800-922-1987.

6. THE CONTRACTOR SHALL HAVE ONE (1) SIGNED COPY OF THE PLANS (APPROVED BY THE DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT) AND ONE (1) COPY OF THE INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS AT THE JOB SITE AT ALL TIMES.

7. A PLAN FOR TRAFFIC CONTROL DURING CONSTRUCTION SHALL BE SUBMITTED TO ARAPAHOE COUNTY FOR APPROVAL WITH THE PERMIT APPLICATION. A STREET CUT AND RIGHT OF WAY USE PERMIT OR PUBLIC IMPROVEMENT CONSTRUCTION PERMIT WILL NOT BE ISSUED WITHOUT AN APPROVED TRAFFIC CONTROL PLAN FOR TRAFFIC CONTROL DURING CONSTRUCTION.

8. THESE CONSTRUCTION PLANS SHALL BE CONSIDERED VALID FOR A PERIOD OF TWO (2) YEARS FROM THE DATE OF COUNTY ACCEPTANCE, AFTER WHICH TIME THESE PLANS SHALL BE VOID AND WILL BE SUBJECT TO ADDITIONAL REVIEW AND ACCEPTANCE BY ARAPAHOE COUNTY.

9. CONTRACTOR SHALL NOTIFY THE ARAPAHOE COUNTY ENGINEERING INSPECTION SECTION WHEN WORKING OUTSIDE OF THE PUBLIC RIGHT-OF-WAY ON A FACILITY, WHICH WILL BE CONVEYED TO THE COUNTY, URBAN DRAINAGE AND FLOOD CONTROL DISTRICT, OR OTHER SPECIAL DISTRICT FOR MAINTENANCE (STORM SEWER, ENERGY DISSIPATORS, DETENTION POND OUTLET STRUCTURES, OR OTHER DRAINAGE INFRASTRUCTURE). FAILURE TO NOTIFY THE ENGINEERING INSPECTION SECTION TO ALLOW FOR INSPECTION OF THIS CONSTRUCTION MAY RESULT IN NON-ACCEPTANCE OF THE FACILITIES BY THE COUNTY.
- |        |                                |       |                                     |
|--------|--------------------------------|-------|-------------------------------------|
| A      | AMP, MIXER                     | N     | NORTH, NORTHING                     |
| ABND   | ABANDON(ED)                    | NC    | NORMALLY CLOSED                     |
| AERO   | AEROMOD                        | NE    | NORTHEAST                           |
| AL     | AIRLIFT                        | NO    | NORMALLY OPEN, NUMBER               |
| ALUM   | ALUMINUM                       | NPSH  | NET POSITIVE SUCTION HEAD           |
| APPROX | APPROXIMATE(LY)                | NPSHA | NET POSITIVE SUCTION HEAD AVAILABLE |
| ASSY   | ASSEMBLY                       | NPSHR | NET POSITIVE SUCTION HEAD REQUIRED  |
| AT     | INSTRUMENT TRANSMITTER         | NPT   | NATIONAL PIPE THREAD                |
|        |                                | NPW   | NON-POTABLE WATER                   |
|        |                                | NW    | NORTHWEST                           |
| B      | BLOWER                         |       |                                     |
| BF     | BLIND FLANGE                   | OB    | OFFICE BUILDING                     |
| BFV    | BUTTERFLY VALVE                | OD    | OUTER DIAMETER                      |
| BLDG   | BUILDING                       | OF    | OVERFLOW                            |
| BV     | BALL VALVE                     | OH    | OVERHEAD                            |
|        |                                | ORP   | OXIDATION REDUCTION POTENTIAL       |
| C1D1   | CLASS ONE DIVISION ONE         |       |                                     |
| CA     | CHEMICAL APPLICATION           | P     | PUMP                                |
| CIP    | CAST IN PLACE                  | PCP   | PLANT CONTROL PANEL                 |
| CFM    | CUBIC FEET PER MINUTE          | PDF   | PROCESS FLOW DIAGRAM                |
| CFS    | CUBIC FEET PER SECOND          | PI    | PRESSURE INDICATOR                  |
| CI     | CHEMICAL INJECTION             | PIT   | PRESSURE INDICATOR TRANSMITTER      |
| CL     | CENTERLINE                     | PLCS  | PLACES                              |
| COMM   | COMMUNICATION(S)               | PSI   | POUNDS PER SQUARE INCH              |
| CONC   | CONCENTRIC, CONCRETE           | PV    | PLUG VALVE, POSITIONING VALVE       |
| COR    | CORNER                         |       | POLYVINYL CHLORIDE                  |
| CP     | CONTROL PANEL                  |       |                                     |
| CV     | CHECK VALVE                    | RAS   | RETURN ACTIVATED SLUDGE             |
| CY     | CUBIC YARD                     | RED   | REDUCER                             |
|        |                                | REF   | REFERENCE                           |
| D      | DRIER                          | REJ   | REJECT                              |
| DB     | DECIBEL                        | RFP   | ROTARY FAN PRESS                    |
| DC     | DIRECT CURRENT, DUST COLLECTOR | RPM   | ROTATIONS PER MINUTE                |
| DH     | DEHUMIDIFIER                   | RTM   | RESIN TRANSFER MOLDING              |
| DIA,   | Ø, DIAMETER                    |       |                                     |
| DIP    | DUCTILE IRON PIPE              |       |                                     |
| DO     | DISSOLVED OXYGEN               | SAN   | SANITARY                            |
|        |                                | SCFM  | STANDARD CUBIC FEET PER MINUTE      |
| E      | EAST, EASTING, EQUIPMENT       | SCH   | SCHEDULE                            |
| EDC    | ENSURE DOSING CONTROLLER       | SDR   | STANDARD DIMENSION RATIO            |
| EFF    | EFFLUENT                       | SE    | SOUTHEAST                           |
| EL     | ELEVATION                      | SF    | SAFETY FACTOR, SQUARE FEET          |
| ELB    | ELBOW                          | SG    | SLIDE GATE                          |
| EX     | EXISTING                       | SM    | STATIC MIXER                        |
|        |                                | SOV   | SOLENOID VALVE                      |
| F      | FAHRENHEIT, FILTER             | SQC   | SEQUOX CONTROL                      |
| FCV    | FLOW CONTROL VALVE             | SSMH  | SANITARY SEWER MANHOLE              |
| FFE    | FINISHED FLOOR ELEVATION       | SST   | STAINLESS STEEL                     |
| FIT    | FLOW INDICATOR TRANSMITTER     | ST    | STRAINER                            |
| FL     | FLOWLINE                       | STA   | STATION                             |
| FLG    | FLANGE(D)                      | SW    | SOUTHWEST                           |
| FM     | FLOW METER, FORCE MAIN         |       |                                     |
| FNPT   | FEMALE NATIONAL PIPE THREAD    | T     | TOP                                 |
| FRP    | FIBERGLASS REINFORCED PLASTIC  | TDH   | TOTAL DYNAMIC HEAD                  |
| FT, '  | FEET/FOOT                      | TI    | TEMPERATURE INDICATOR               |
|        |                                | TK    | TANK                                |
|        |                                | TOP   | TOP OF POND                         |
|        |                                | TOV   | TOP OF VAULT                        |
|        |                                | TOW   | TOP OF WALL                         |
|        |                                | TX    | TREATMENT                           |
|        |                                | TYTP  | TYPICAL                             |
| GC     | GENERAL CONTRACTOR             |       |                                     |
| GPM    | GALLONS PER MINUTE             | UNC   | UNIFIED NATIONAL COARSE THREAD      |
| GV     | GATE VALVE                     | UTIL  | UTILITY                             |
|        |                                | UV    | ULTRAVIOLET                         |
|        |                                | UVS   | ULTRAVIOLET INTENSITY SENSOR        |
| H      | HIGH                           |       |                                     |
| HA     | HAND ACTUATED                  | VFD   | VARIABLE FREQUENCY DRIVE            |
| HGL    | HYDRAULIC GRADE LINE           | V     | VOLT, VOLTAGE                       |
| HHC    | HEX HEAD CAP SCREW             | VCP   | VITRIFIED CLAY PIPE                 |
| HP     | HORSEPOWER                     | VV    | VALVE VAULT                         |
| HW     | HEADWORKS                      |       |                                     |
| HZ     | HERTZ                          | WAS   | WASTE ACTIVATED SLUDGE              |
| ID     | INNER DIAMETER                 | WL    | WATER LEVEL                         |
| IN, "  | INCH(ES)                       | WWTP  | WASTEWATER TREATMENT PLANT          |
| INF    | INFLUENT                       |       |                                     |
| INV    | INVERT                         |       |                                     |
| IO     | INPUT/OUTPUT                   | X     | BY, TIMES                           |
| IPS    | IRON PIPE SIZE                 | ZA    | ACCESS ALARM                        |
|        |                                |       |                                     |
| KV     | KNIFE VALVE                    |       |                                     |
| LB, #  | POUND                          |       |                                     |
| LC     | LEVEL CONTROLLER, LOAD CELL    |       |                                     |
| LD     | LEAK DETECTION                 |       |                                     |
| LE     | LEVEL ELEMENT                  |       |                                     |
| LG     | LONG                           |       |                                     |
| LIT    | LEVEL INDICATOR TRANSMITTER    |       |                                     |
| LOC    | LOCATION                       |       |                                     |
| LS     | LIFT STATION                   |       |                                     |
| M      | MOTOR                          |       |                                     |
| MAG    | MAGNETIC                       |       |                                     |
| MAX    | MAXIMUM                        |       |                                     |
| MGOH2  | MAGNESIUM HYDROXIDE            |       |                                     |
| MH     | MANHOLE                        |       |                                     |
| MIN    | MINIMUM                        |       |                                     |
| MJ     | MECHANICAL JOINT               |       |                                     |
| MM     | MILLIMETER                     |       |                                     |
| MNPT   | MALE NATIONAL PIPE THREAD      |       |                                     |
| MP     | METER PANEL                    |       |                                     |
- CIVIL/ARCHITECTURAL/PROCESS SYMBOLS LIBRARY
- SECTION NUMBER

1

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SHOWN ON SHEET

SECTION NO.

1

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SECTION or DETAIL SCALE

TAKEN FROM SHEET

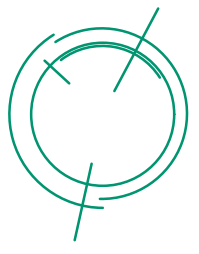
DETAIL NO.

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C1.01

ON SHEET WHERE DETAIL IS REFERENCED:  
SHEET WHERE DETAIL IS LOCATED

ON DETAIL SHEET:  
SHEET WHERE DETAIL IS USED
- ELEMENTA BOWMAN COMPANY



303.376.2660  
WWW.ELEMENTENGINEERING.NET

7045 W. ALASKA DR., SUITE 210  
LAKEWOOD, CO 80226

REVISIONS

| NO | DATE | BY | DESCRIPTION |
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SOUTH HOLLY STREET SEWER REPLACEMENT

GENERAL NOTES II

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF



FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DESIGNED BY  
JAM

CHECKED BY  
MEH

DATE  
JUNE 2026

JOB NUMBER  
0166.0001

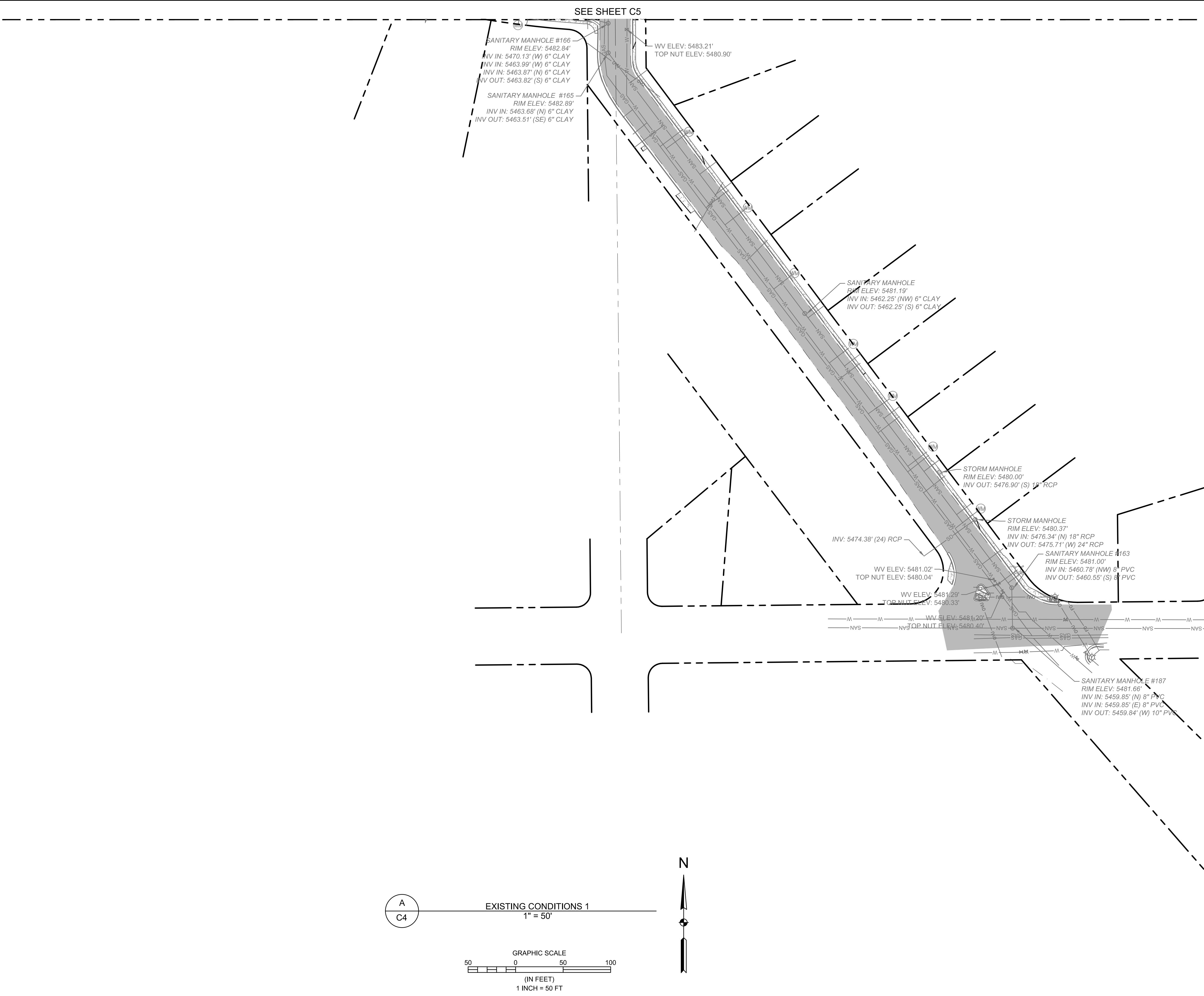
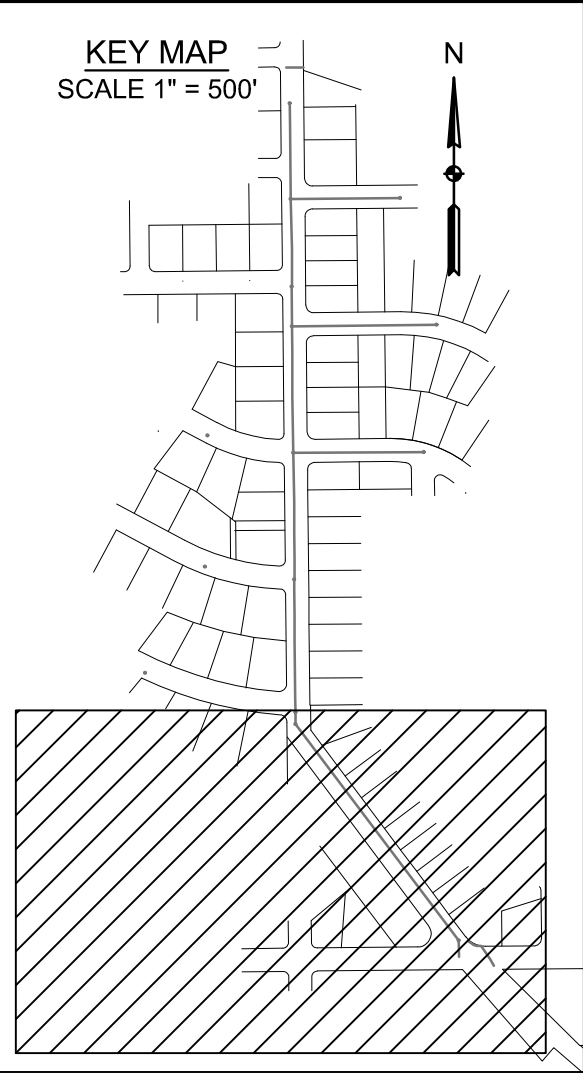
EDITION

CONSTRUCTION

SHEET  
C3 OF C22



Q:\CO-LAKE-EE\SHARED\_PROJECTS\0166 - HOLLY HILLS SANITATION DISTRICT\0001 - SOUTH HOLLY STREET SEWER REPLACEMENT\CAD\DWG\EXISTING CONDITIONS.DWG



**ELEMENT**  
A BOWMAN COMPANY

7245 W. ALASKA DR., SUITE 210  
LAKEWOOD, CO 80226  
303.376.2860  
WWW.ELEMENTENGINEERING.NET

| REVISIONS |             | BY | DATE |
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| NO        | DESCRIPTION |    |      |
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SOUTH HOLLY STREET SEWER REPLACEMENT

**EXISTING CONDITIONS 1**

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

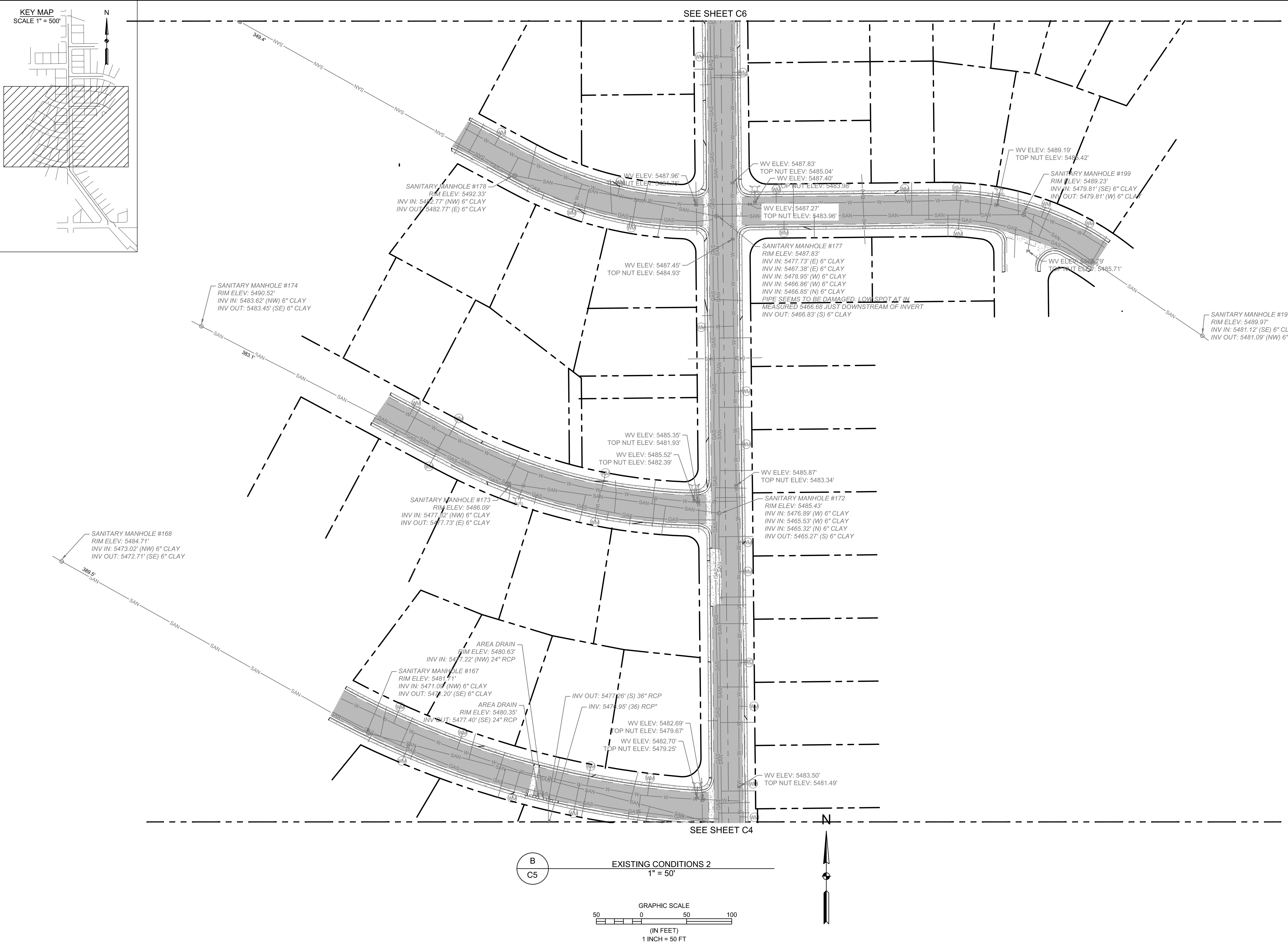
DESIGNED BY: JAM  
CHECKED BY: MEH

DATE: JUNE 2026  
JOB NUMBER: 0166.0001  
EDITION: CONSTRUCTION

SHEET: C4 OF C22



Q:\CO-LAKE-EESHARED\_PROJECTS\0166 - HOLLY HILLS SANITATION DISTRICT\0001 - SOUTH HOLLY STREET SEWER REPLACEMENT\CAD\DWG\EXISTING CONDITIONS.DWG



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LAKEWOOD, CO 80228

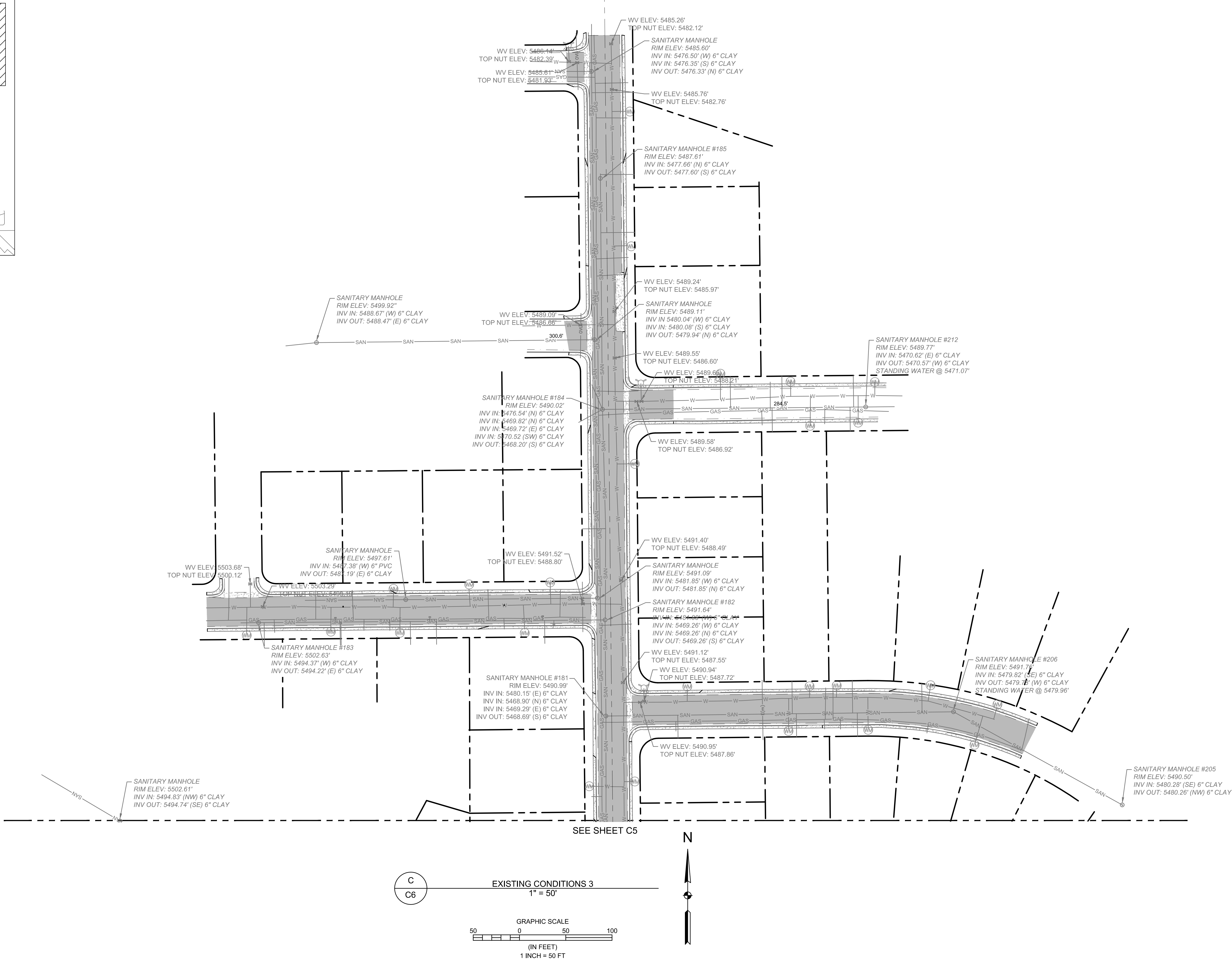
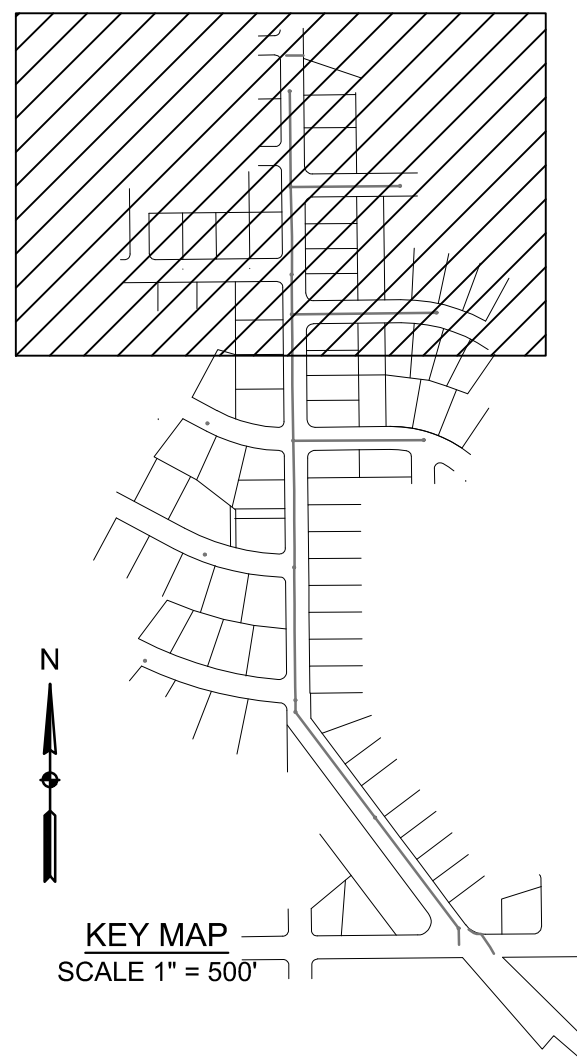
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| SOUTH HOLLY STREET SEWER REPLACEMENT                                            |  |
| EXISTING CONDITIONS 2                                                           |  |
| HOLLY HILLS SANITATION DISTRICT<br>405 URBAN ST SUITE 310<br>LAKEWOOD, CO 80228 |  |

|                                                  |                   |
|--------------------------------------------------|-------------------|
| PREPARED UNDER THE DIRECT SUPERVISION OF         |                   |
|                                                  |                   |
| FOR AND ON BEHALF OF<br>ELEMENT ENGINEERING, LLC |                   |
| DESIGNED BY<br>JAM                               | CHECKED BY<br>MEH |
| DATE<br>JUNE 2026                                |                   |
| JOB NUMBER<br>0166.0001                          |                   |
| EDITION<br>CONSTRUCTION                          |                   |
| SHEET<br>C5 OF C22                               |                   |



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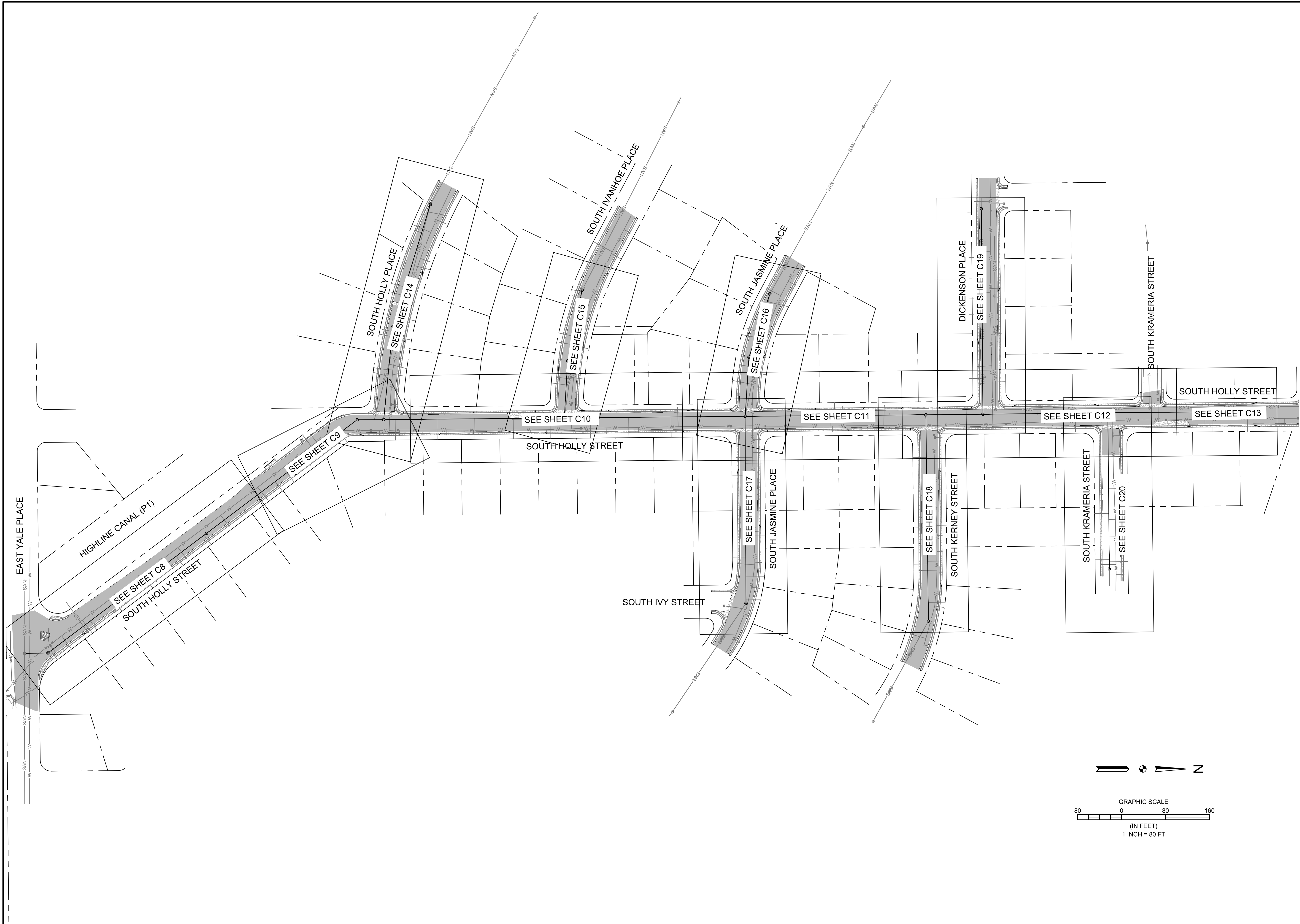
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|                                                                                 |  |
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| SOUTH HOLLY STREET SEWER REPLACEMENT                                            |  |
| EXISTING CONDITIONS 3                                                           |  |
| HOLLY HILLS SANITATION DISTRICT<br>405 URBAN ST SUITE 310<br>LAKEWOOD, CO 80228 |  |

|                                               |                   |
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| PREPARED UNDER THE DIRECT SUPERVISION OF      |                   |
|                                               |                   |
| FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC |                   |
| DESIGNED BY<br>JAM                            | CHECKED BY<br>MEH |
| DATE<br>JUNE 2026                             |                   |
| JOB NUMBER<br>0166.0001                       |                   |
| EDITION<br>CONSTRUCTION                       |                   |
| SHEET<br>C6 OF C22                            |                   |



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SOUTH HOLLY STREET SEWER REPLACEMENT

KEYMAP PLAN

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

4764

06/29/2026

PROFESSIONAL ENG

DESIGNED BY  
JAM

CHECKED BY  
MEH

DATE  
JUNE 2026

JOB NUMBER  
0166.0001

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C7 OF C22

ELEMENT

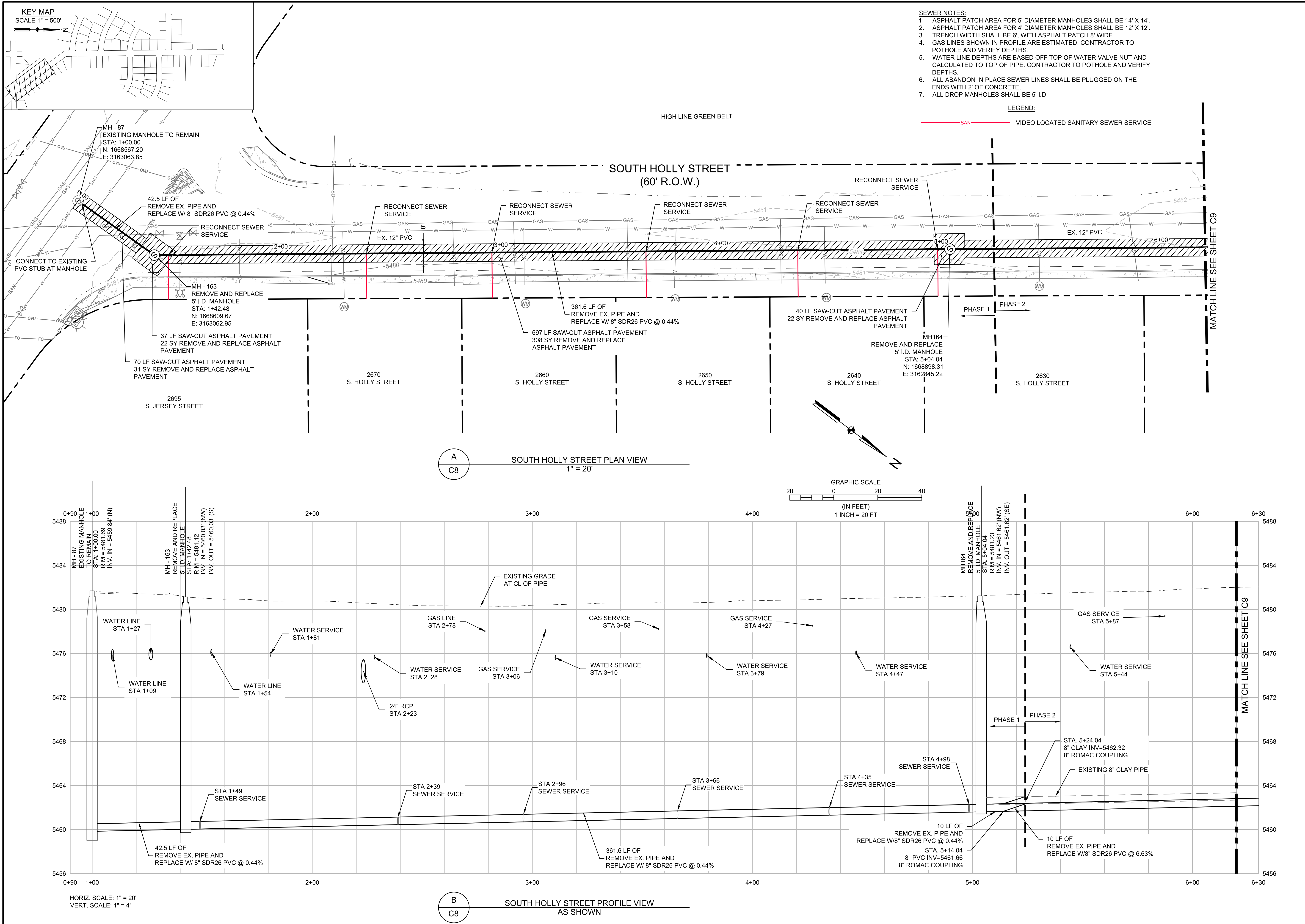
A BOWMAN COMPANY

7045 W. ALASKA DR. SUITE 210  
LAKEWOOD, CO 80226

303.376.2660  
WWW.ELEMENTENGINEERING.NET



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**ELEMENT**  
A BOWMAN COMPANY

303.379.2860  
WWW.ELEMENTENGINEERING.NET

7045 W. ALASKA DR. SUITE 210  
LAKEWOOD, CO 80228

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**SOUTH HOLLY STREET SEWER REPLACEMENT**

**SOUTH HOLLY STREET PLAN & PROFILE**

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF



FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DESIGNED BY  
JAM

CHECKED BY  
MEH

DATE  
JUNE 2026

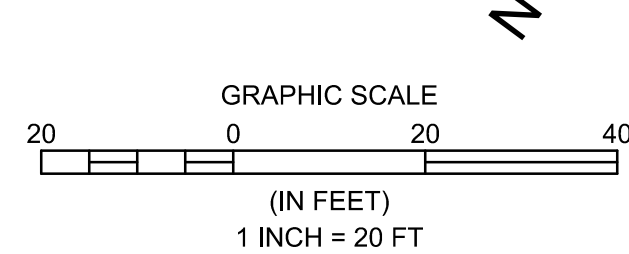
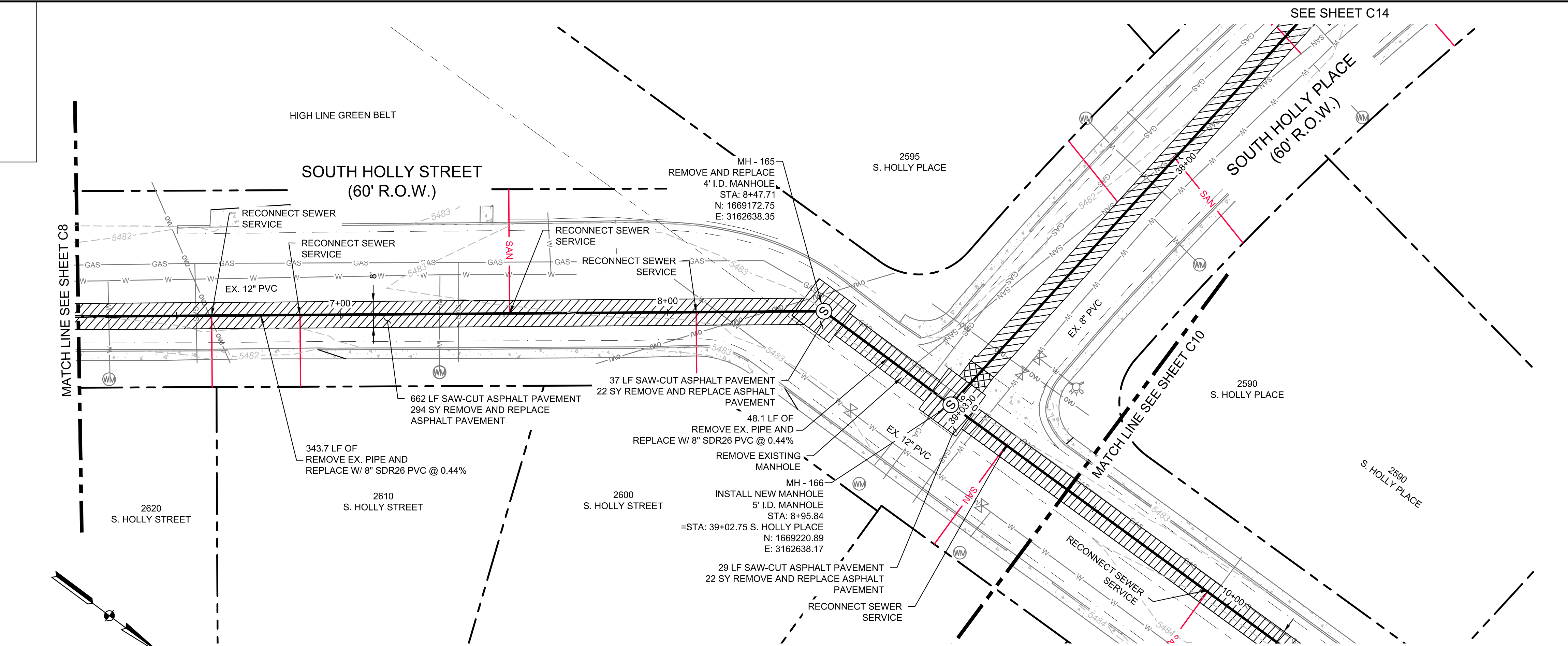
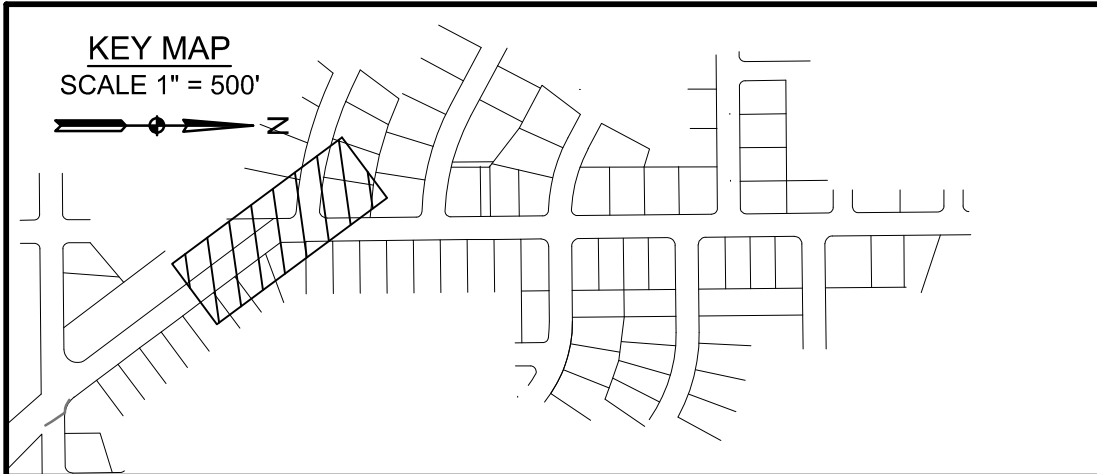
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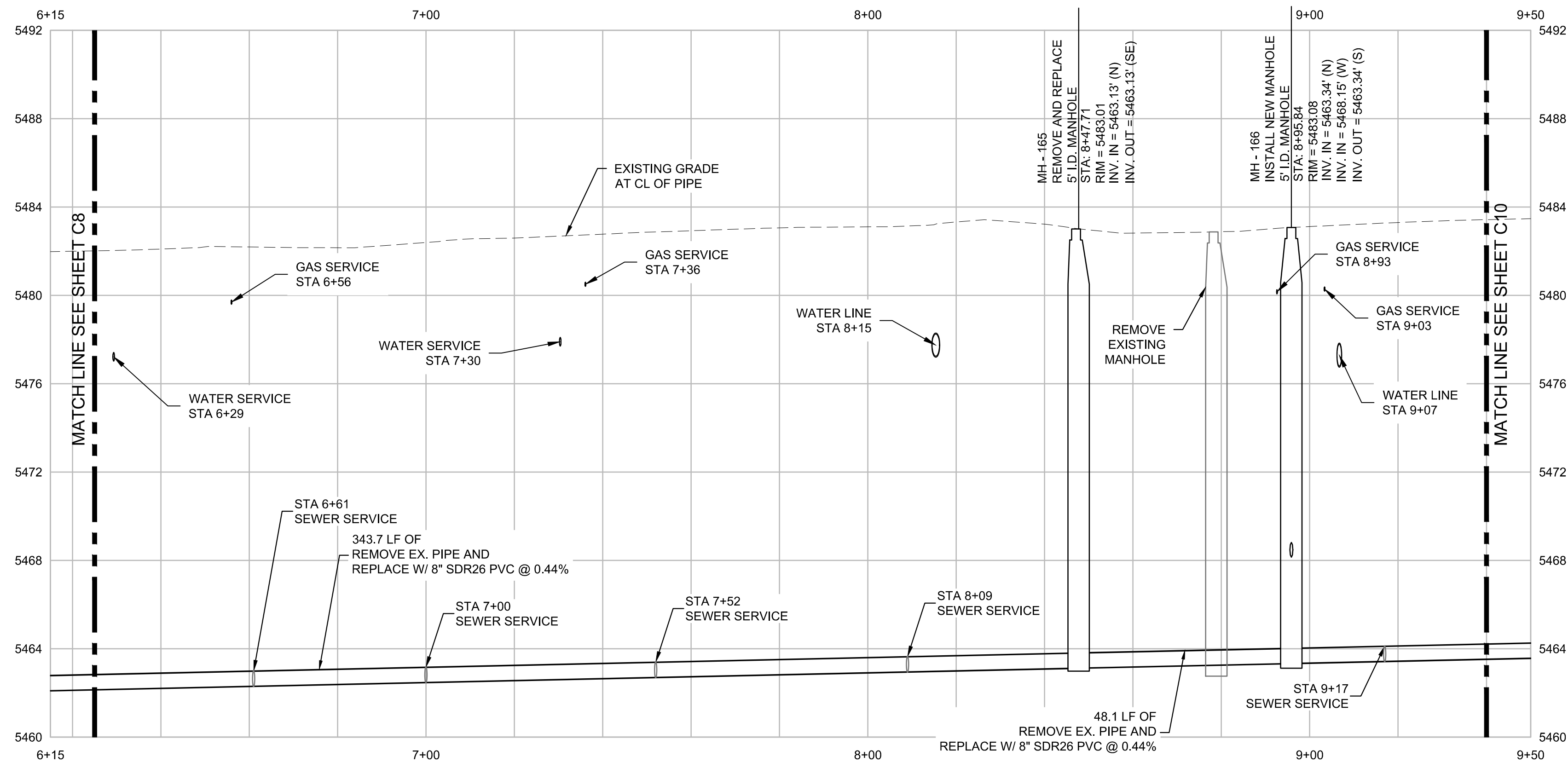
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A  
C9  
SOUTH HOLLY STREET PLAN VIEW  
1" = 20'



HORIZ. SCALE: 1" = 20'  
VERT. SCALE: 1" = 4'

B  
C9  
SOUTH HOLLY STREET PROFILE VIEW  
AS SHOWN

- SEWER NOTES:
1. ASPHALT PATCH AREA FOR 5' DIAMETER MANHOLES SHALL BE 14' X 14'.
  2. ASPHALT PATCH AREA FOR 4' DIAMETER MANHOLES SHALL BE 12' X 12'.
  3. TRENCH WIDTH SHALL BE 6' WITH ASPHALT PATCH 8' WIDE.
  4. GAS LINES SHOWN IN PROFILE ARE ESTIMATED. CONTRACTOR TO POT HOLE AND VERIFY DEPT HS.
  5. WATER LINE DEPT HS ARE BASED OFF TOP OF WATER VALVE NUT AND CALCULATED TO TOP OF PIPE. CONTRACTOR TO POT HOLE AND VERIFY DEPT HS.
  6. ALL ABANDON IN PLACE SEWER LINES SHALL BE PLUGGED ON THE ENDS WITH 2' OF CONCRETE.
  7. ALL DROP MANHOLES SHALL BE 5' I.D.

LEGEND:

SAN VIDEO LOCATED SANITARY SEWER SERVICE



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SOUTH HOLLY STREET SEWER REPLACEMENT  
SOUTH HOLLY STREET PLAN & PROFILE  
HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

|                    |                   |
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| DESIGNED BY<br>JAM | CHECKED BY<br>MEH |
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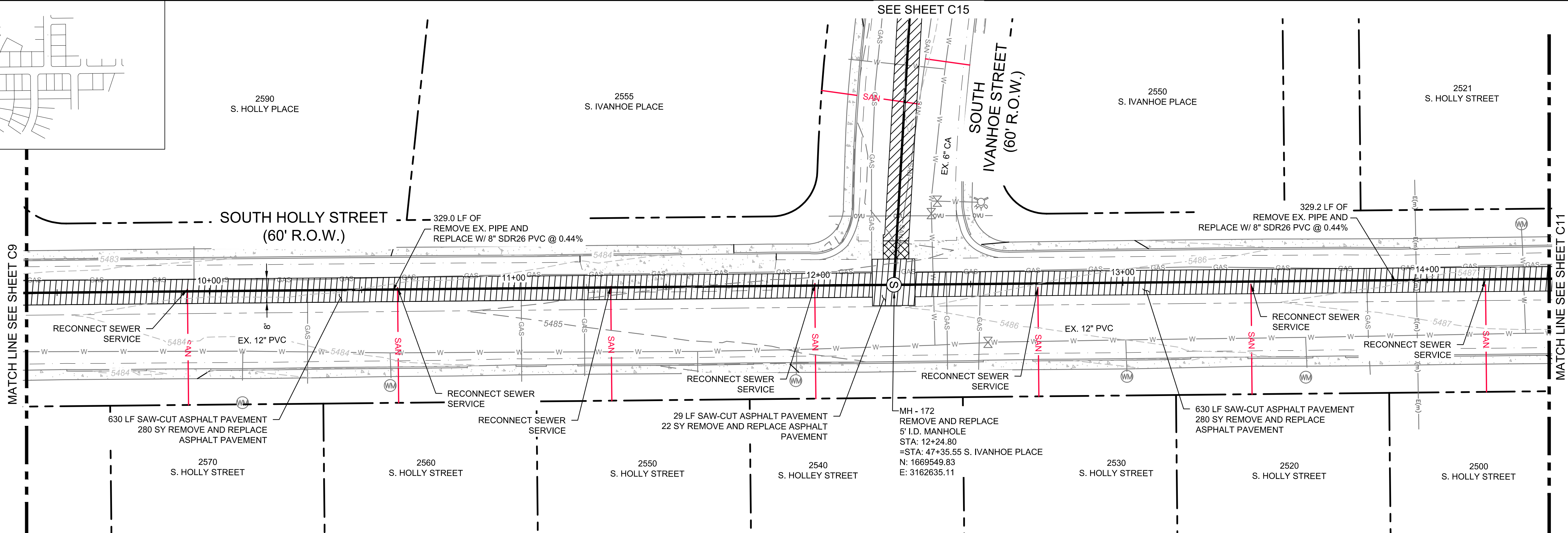
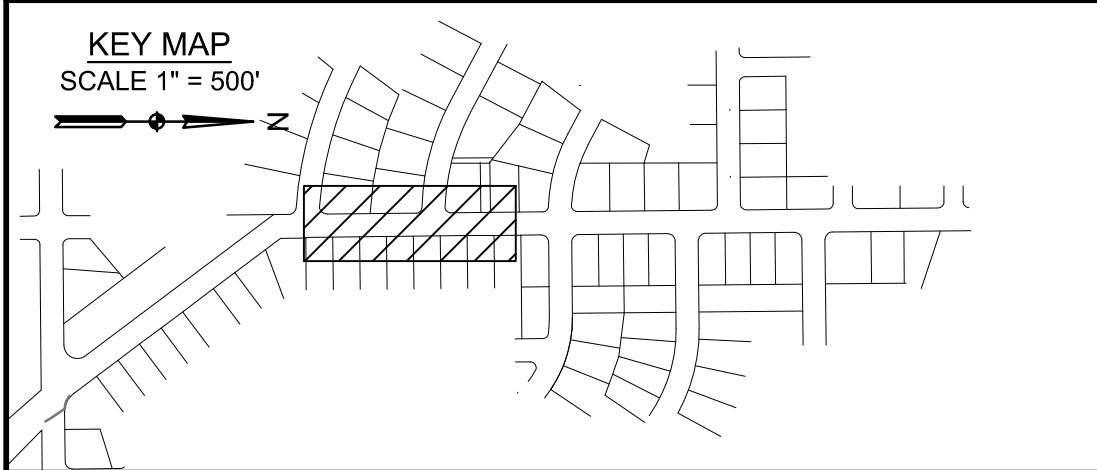
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JOB NUMBER  
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SHEET  
C9 OF C22



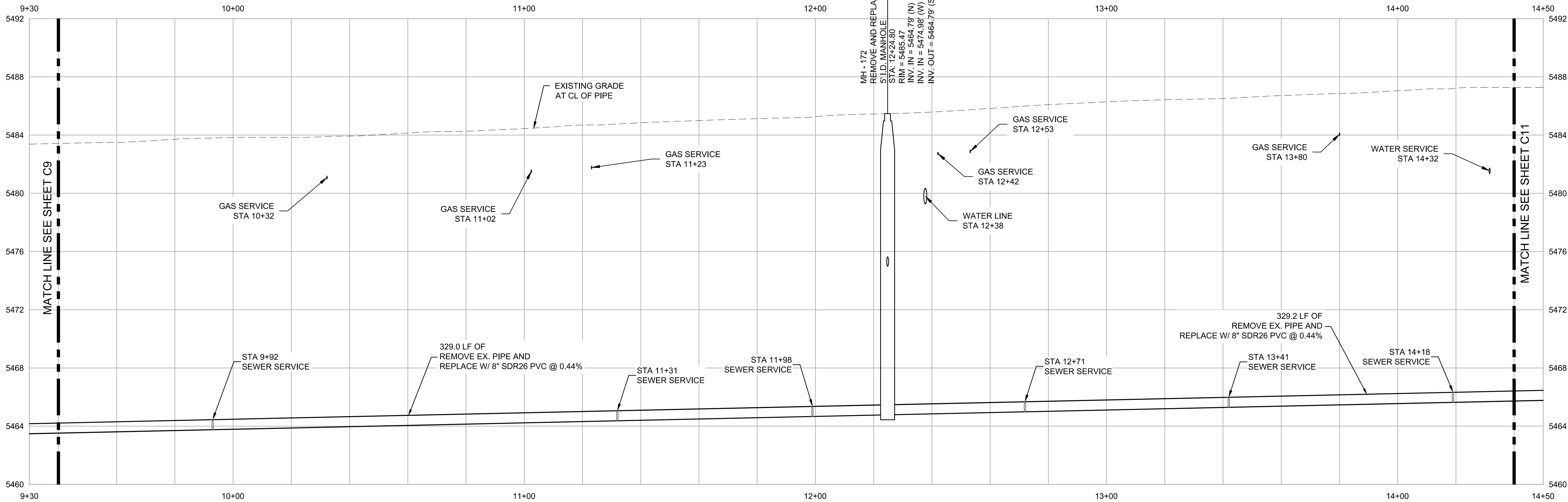
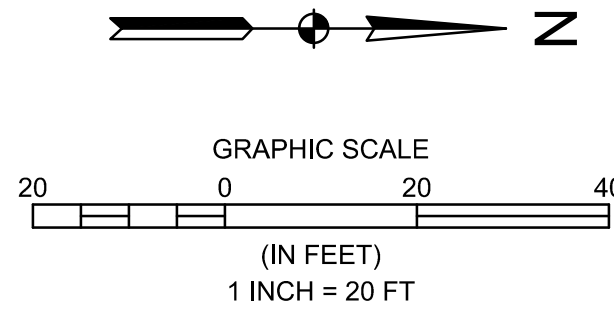


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  7. ALL DROP MANHOLES SHALL BE 5' I.D.

LEGEND:

— SAN — VIDEO LOCATED SANITARY SEWER SERVICE

A  
C10  
SOUTH HOLLY STREET PLAN VIEW  
1" = 20'



HORIZ. SCALE: 1" = 20'  
VERT. SCALE: 1" = 4'

B  
C10  
SOUTH HOLLY STREET PROFILE VIEW  
AS SHOWN



303.378.2860  
WWW.ELEMENTENGINEERING.NET

7045 W. ALASKA DR. SUITE 210  
LAKEWOOD, CO 80228

| REVISIONS | NO | DATE | BY | DESCRIPTION |
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SOUTH HOLLY STREET SEWER REPLACEMENT  
SOUTH HOLLY STREET PLAN &  
PROFILE  
HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DESIGNED BY  
JAM

CHECKED BY  
MEH

DATE  
JUNE 2026

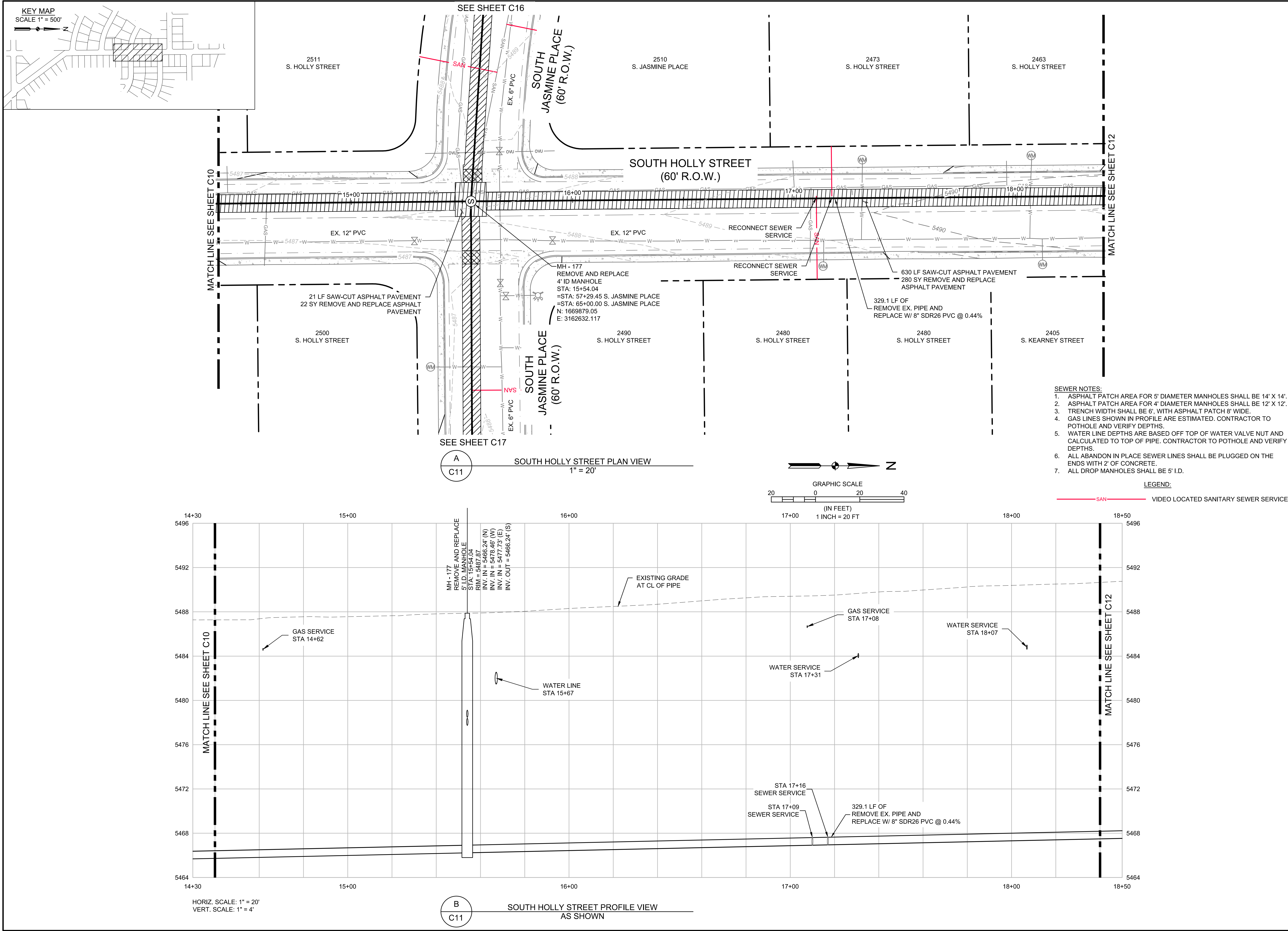
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**ELEMENT**  
A BOWMAN COMPANY

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7045 W. ALASKA DR., SUITE 210  
LAKEWOOD, CO 80228

| REVISIONS |             | BY | DATE |
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| NO        | DESCRIPTION |    |      |

**SOUTH HOLLY STREET SEWER REPLACEMENT**

**SOUTH HOLLY STREET PLAN & PROFILE**

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DESIGNED BY  
JAM

CHECKED BY  
MEH

DATE  
JUNE 2026

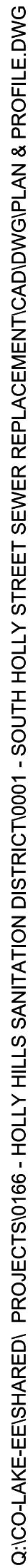
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0166.0001

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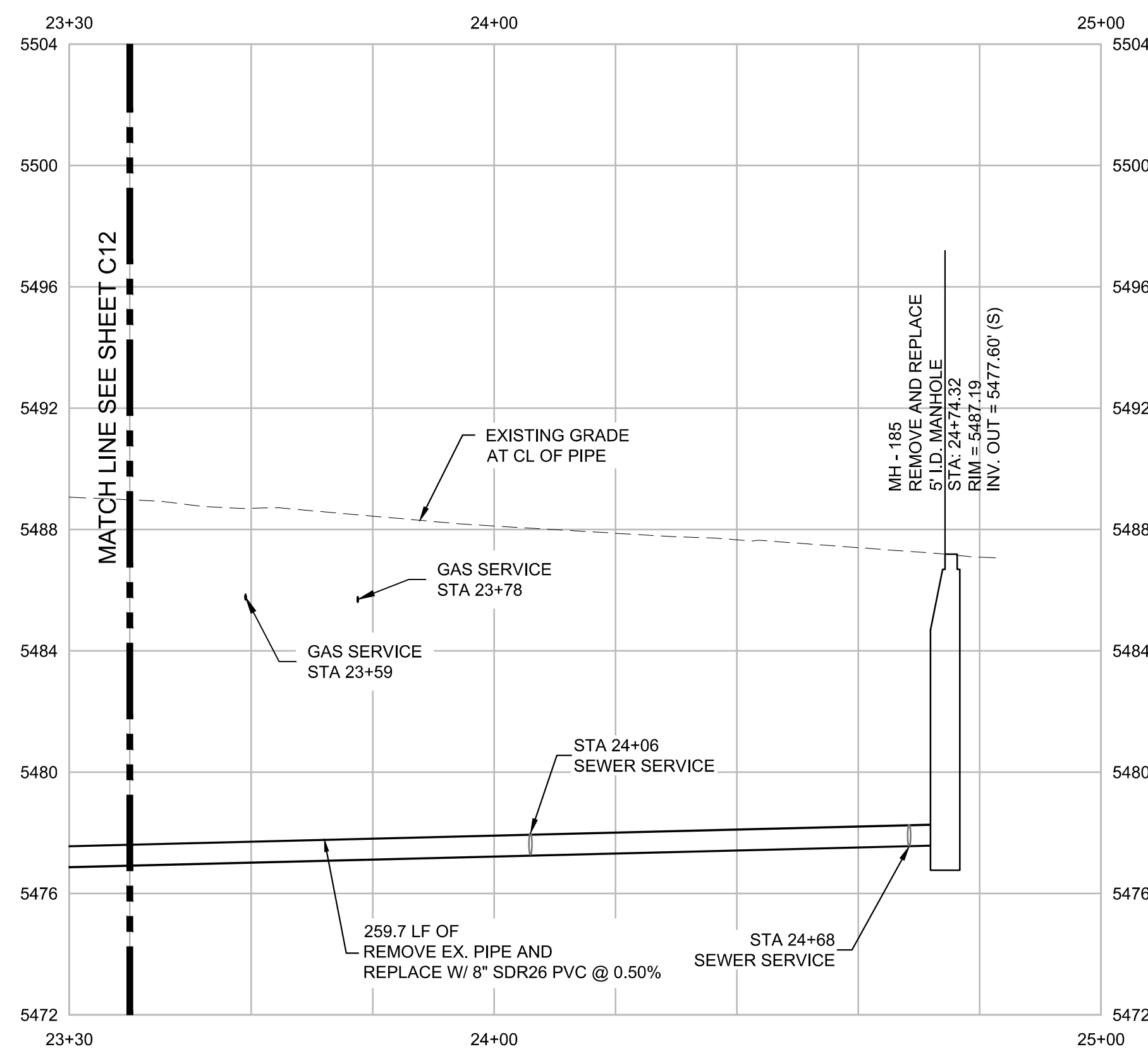
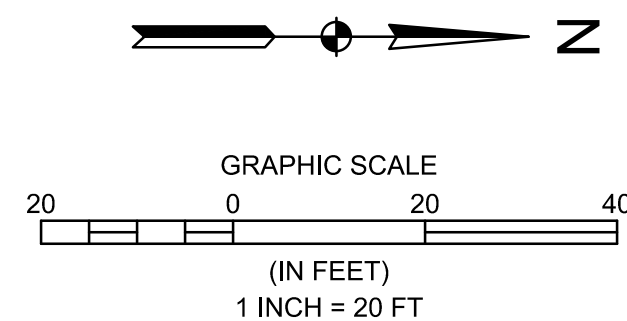
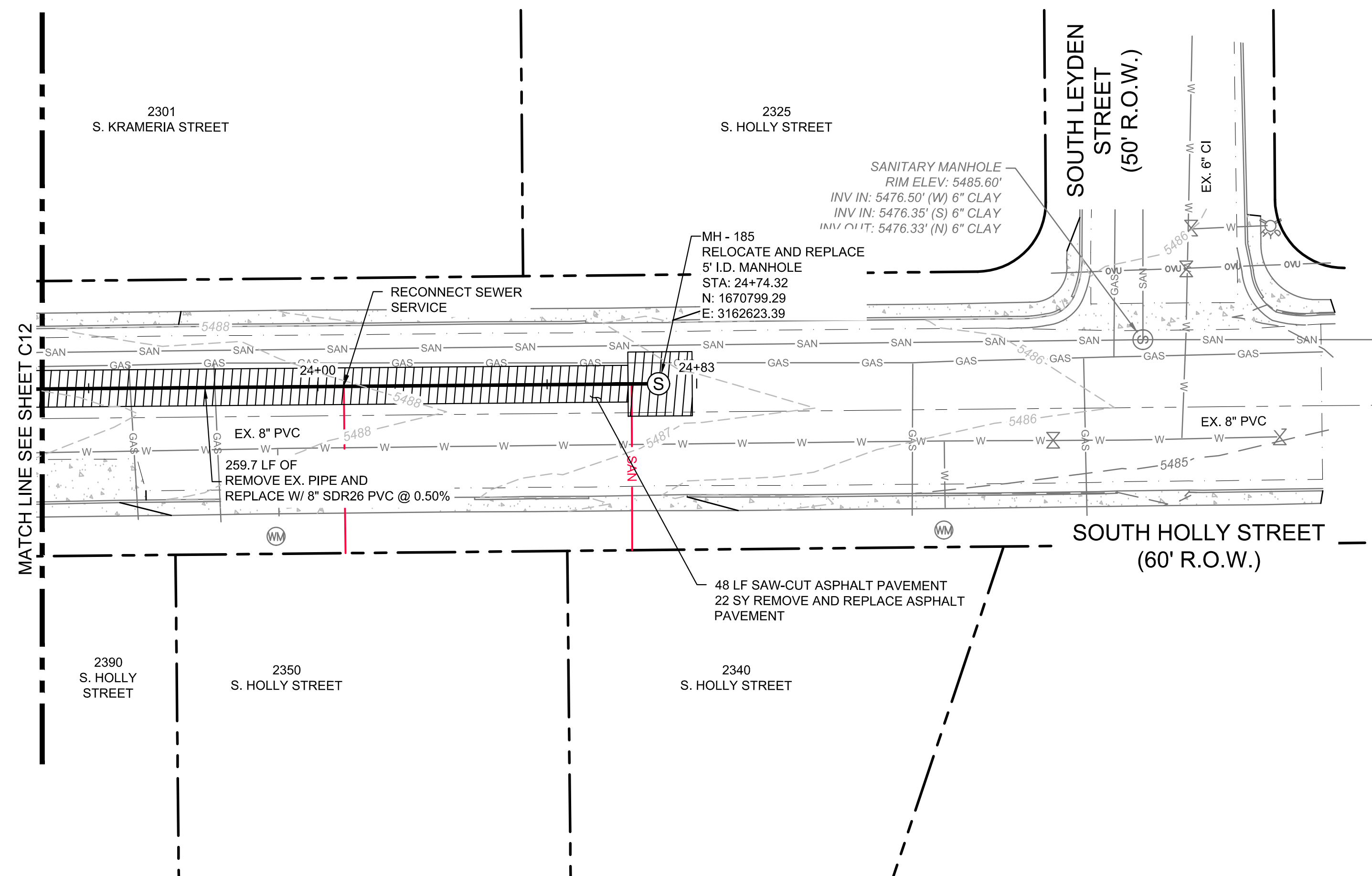
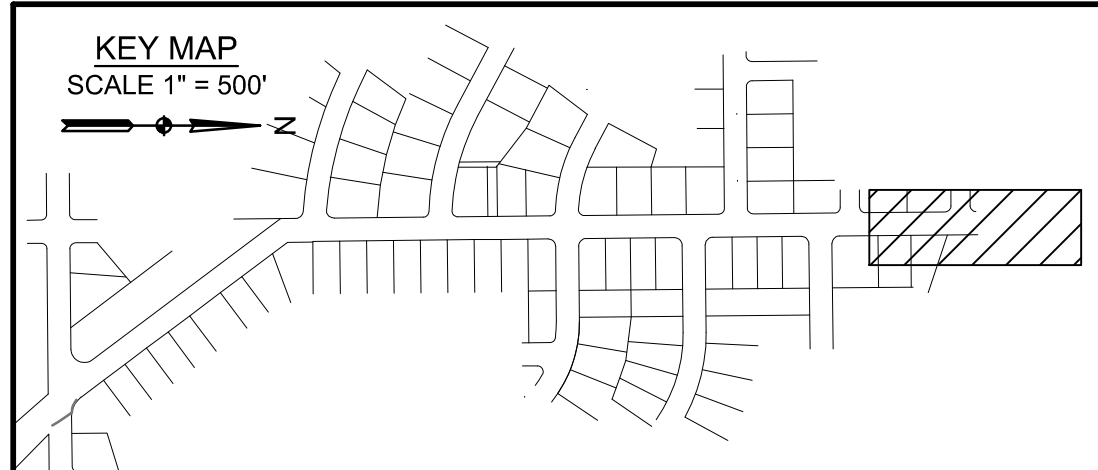
**CONSTRUCTION**

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C11 OF C22









**SEWER NOTES:**

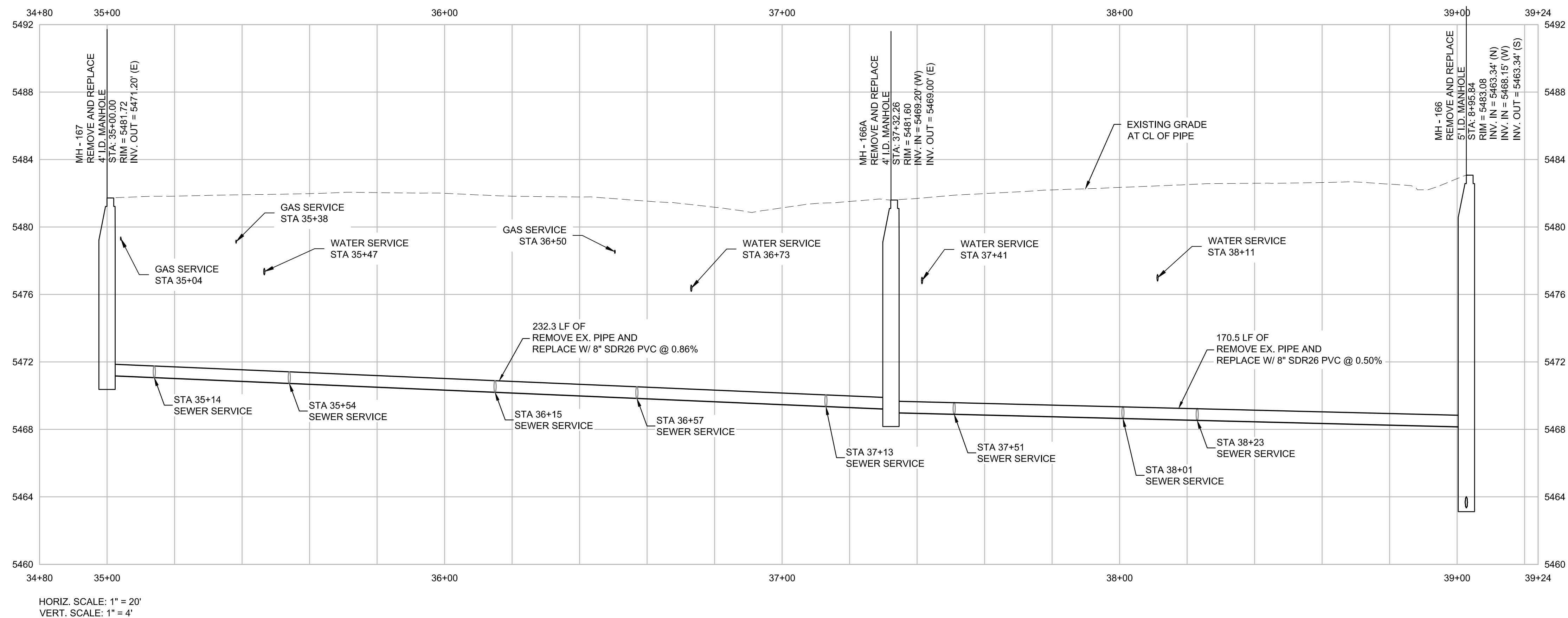
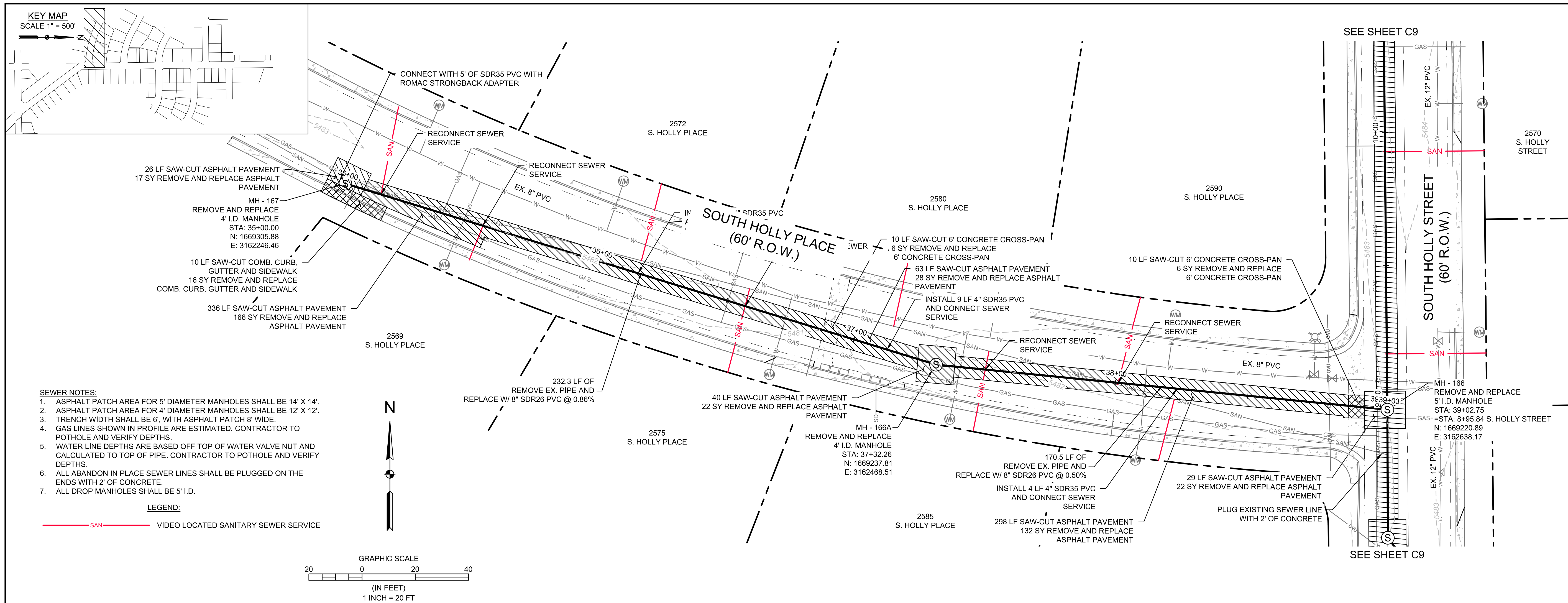
1. ASPHALT PATCH AREA FOR 5' DIAMETER MANHOLES SHALL BE 14' X 14'.
2. ASPHALT PATCH AREA FOR 4' DIAMETER MANHOLES SHALL BE 12' X 12'.
3. TRENCH WIDTH SHALL BE 6', WITH ASPHALT PATCH 8' WIDE.
4. GAS LINES SHOWN IN PROFILE ARE ESTIMATED, CONTRACTOR TO POT HOLE AND VERIFY DEPTHS.
5. WATER LINE DEPTHS ARE BASED OFF TOP OF WATER VALVE NUT AND CALCULATED TO TOP OF PIPE. CONTRACTOR TO POT HOLE AND VERIFY DEPTHS.
6. ALL ABANDON IN PLACE SEWER LINES SHALL BE PLUGGED ON THE ENDS WITH 2' OF CONCRETE.
7. ALL DROP MANHOLES SHALL BE 5' I.D.

LEGEND:

— SAN — VIDEO LOCATED SANITARY SEWER SERVICE

|                                                                                                                                                                                       |                   |                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------|
| SOUTH HOLLY STREET SEWER REPLACEMENT<br>SOUTH HOLLY STREET PLAN &<br>PROFILE<br>HOLLY HILLS SANITATION DISTRICT<br>405 URBAN ST SUITE 310<br>LAKEWOOD, CO 80228                       |                   | NO<br>DESCRIPTION<br>BY<br>DATE |
| PREPARED UNDER THE DIRECT<br>SUPERVISION OF<br> FOR AND ON BEHALF OF<br>ELEMENT ENGINEERING, LLC |                   |                                 |
| DESIGNED BY<br>JAM                                                                                                                                                                    | CHECKED BY<br>MEH |                                 |
| DATE<br>JUNE 2026<br>JOB NUMBER<br>0166.0001                                                                                                                                          |                   |                                 |
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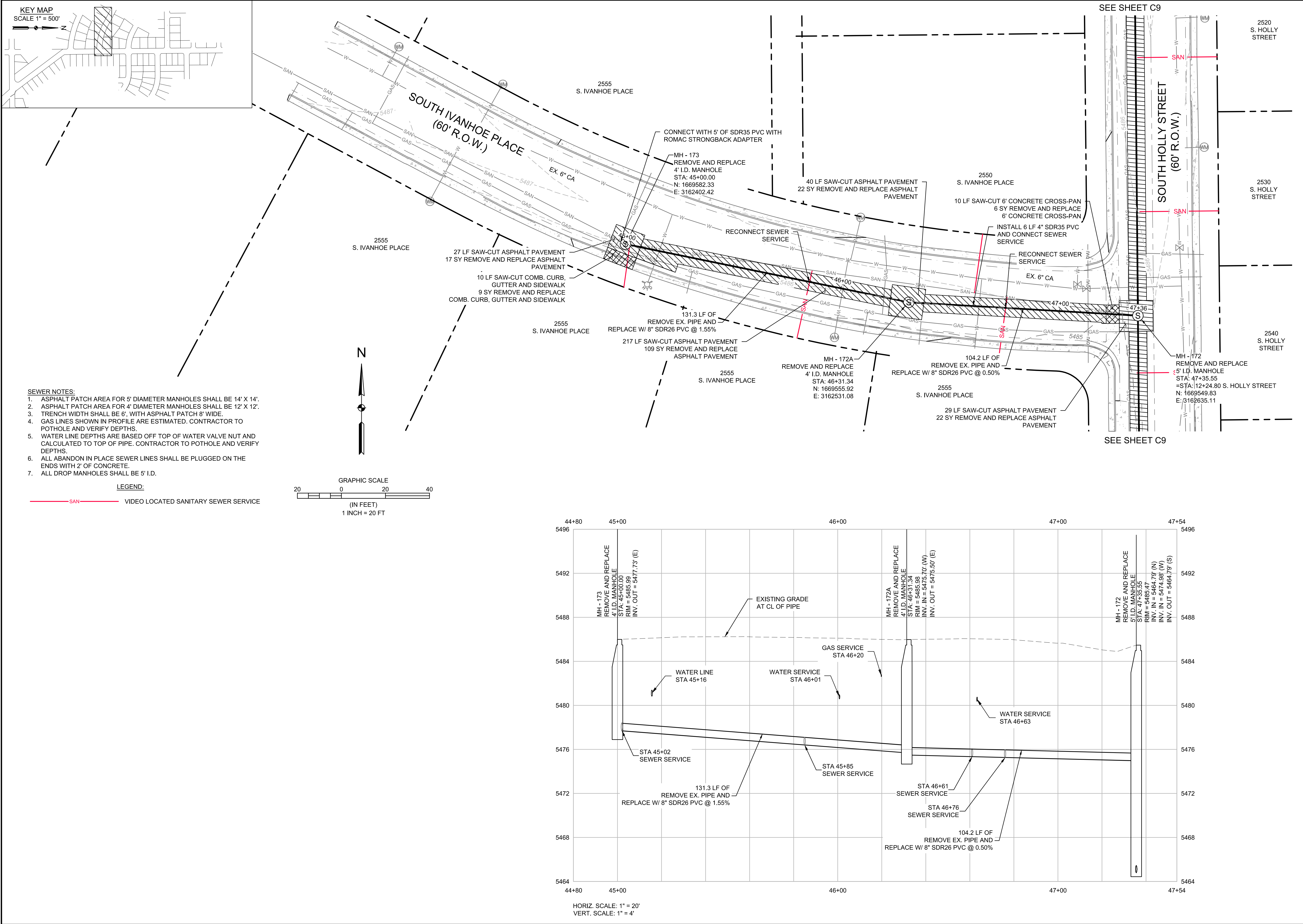




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**ELEMENT A BOWMAN COMPANY**

303.376.2860  
WWW.ELEMENTENGINEERING.NET

7045 W. ALASKA DR. SUITE 210  
LAKEWOOD, CO 80226

| NO. | REVISIONS | DESCRIPTION | DATE | BY |
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**SOUTH HOLLY STREET SEWER REPLACEMENT**

**SOUTH IVANHOE PLACE PLAN & PROFILE**

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

**COLORADO REGISTERED PROFESSIONAL ENGINEER**  
P. M. WILSON  
06/29/2026

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

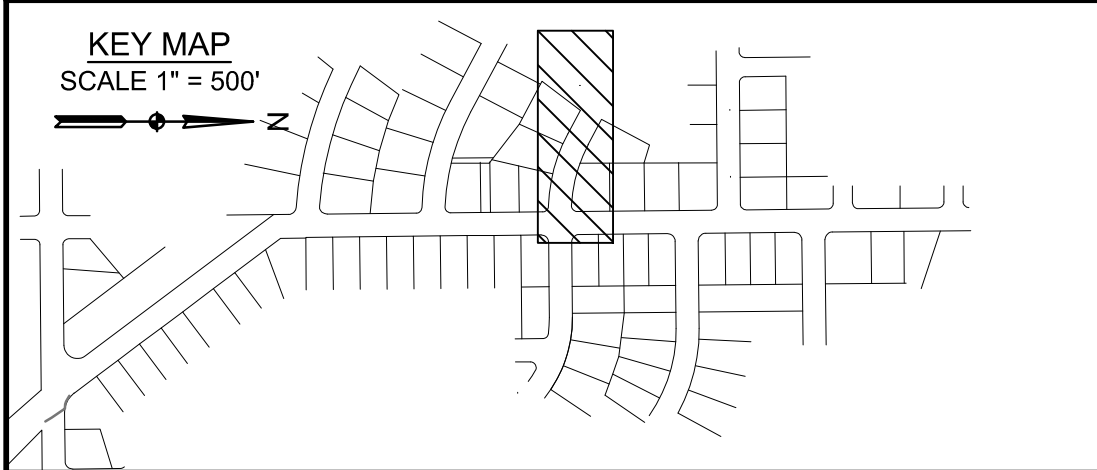
DESIGNED BY: JAM  
CHECKED BY: MEH

DATE: JUNE 2026  
JOB NUMBER: 0166.0001  
EDITION: CONSTRUCTION

SHEET: C15 OF C22



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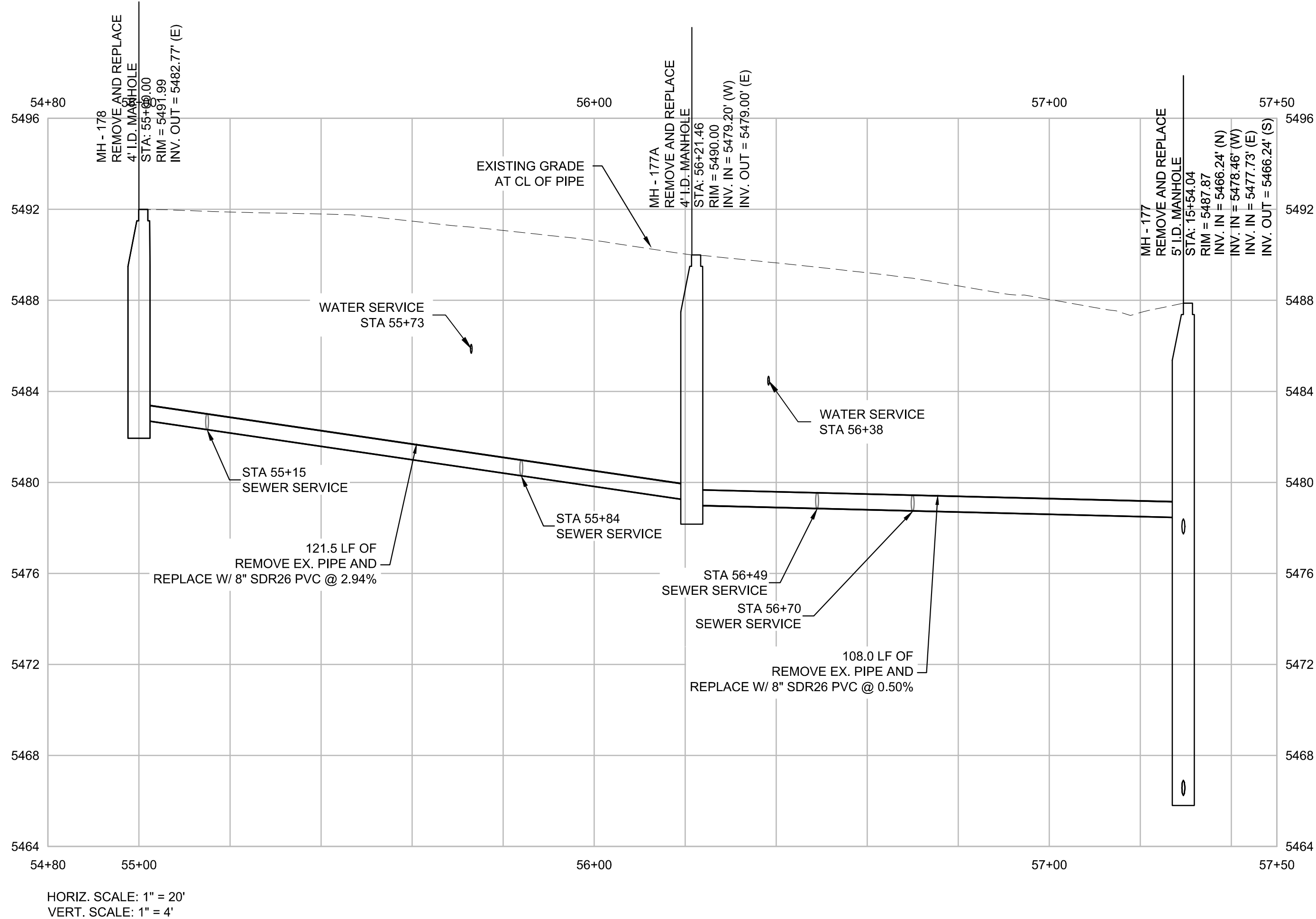
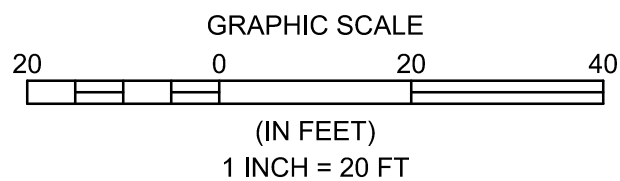
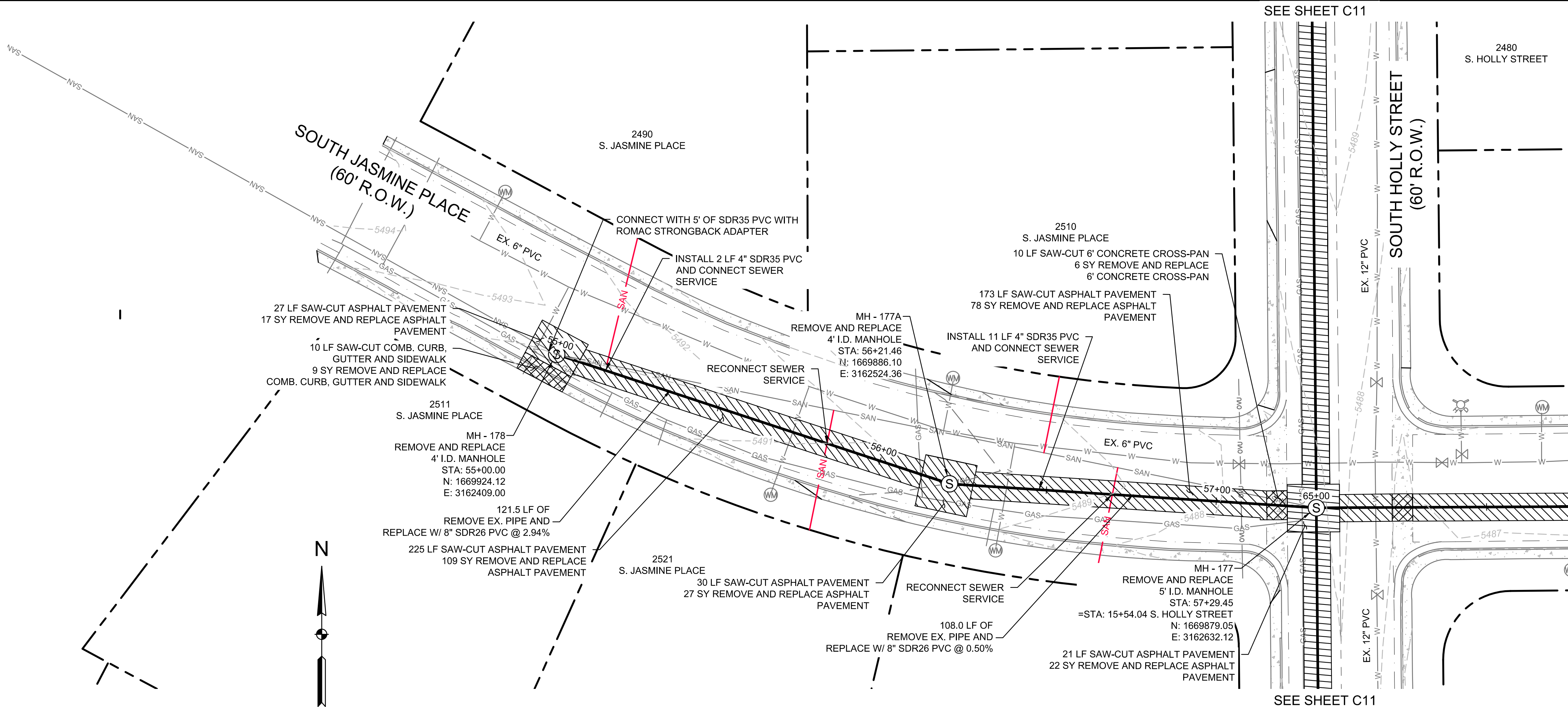


SEWER NOTES:

1. ASPHALT PATCH AREA FOR 5' DIAMETER MANHOLES SHALL BE 14' X 14'.
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4. GAS LINES SHOWN IN PROFILE ARE ESTIMATED. CONTRACTOR TO POT HOLE AND VERIFY DEPT HS.
5. WATER LINE DEPT HS ARE BASED OFF TOP OF WATER VALVE NUT AND CALCULATED TO TOP OF PIPE. CONTRACTOR TO POT HOLE AND VERIFY DEPT HS.
6. ALL ABANDON IN PLACE SEWER LINES SHALL BE PLUGGED ON THE ENDS WITH 2' OF CONCRETE.
7. ALL DROP MANHOLES SHALL BE 5' I.D.

LEGEND:

— SAN — VIDEO LOCATED SANITARY SEWER SERVICE



HORIZ. SCALE: 1" = 20'  
VERT. SCALE: 1" = 4'

**ELEMENT**  
A BOWMAN COMPANY

7045 W. ALASKA DR. SUITE 210  
LAKEWOOD, CO 80226  
303.378.2860  
WWW.ELEMENTENGINEERING.NET

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**SOUTH HOLLY STREET SEWER REPLACEMENT**

**SOUTH JASMINE PLACE PLAN & PROFILE**

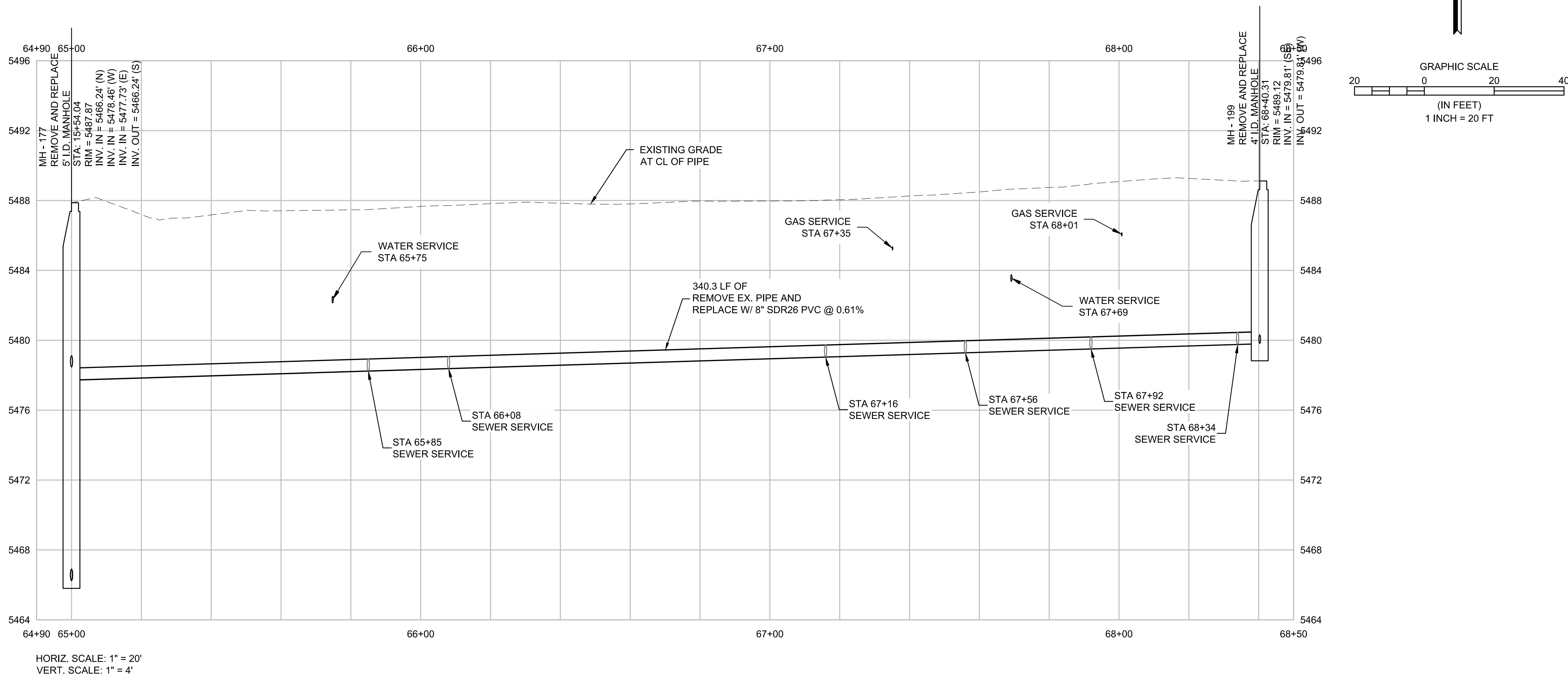
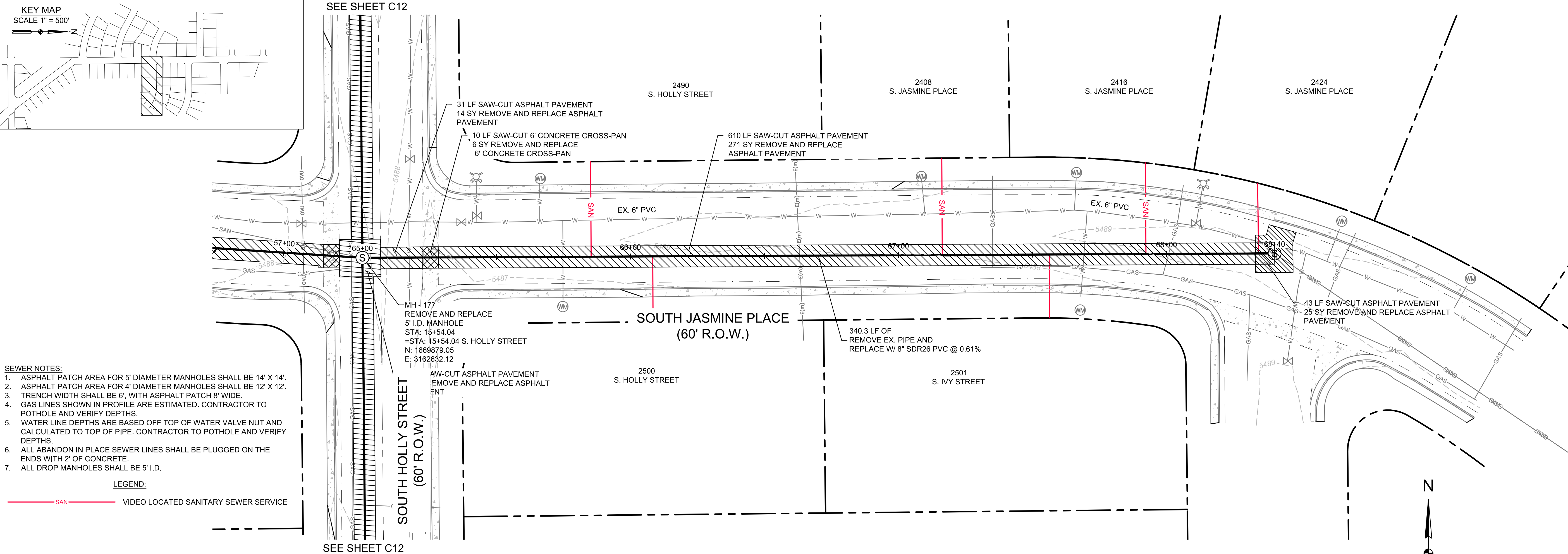
HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

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| DESIGNED BY<br>JAM      | CHECKED BY<br>MEH |
| DATE<br>JUNE 2026       |                   |
| JOB NUMBER<br>0166.0001 |                   |
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SOUTH HOLLY STREET SEWER REPLACEMENT

**SOUTH JASMINE PLACE PLAN & PROFILE**

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF



FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

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| DESIGNED BY<br>JAM | CHECKED BY<br>MEH |
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DATE  
JUNE 2026

JOB NUMBER  
0166.0001

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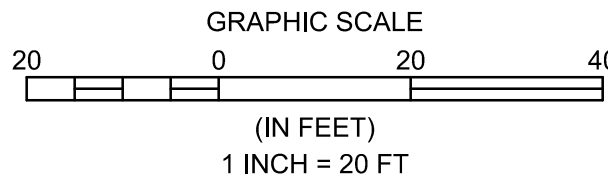
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7. ALL DROP MANHOLES SHALL BE 5' I.D.

— SAN — VIDEO LOCATED SANITARY SEWER SERVICE

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HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD CO 80228



DATE  
JUNE 2026

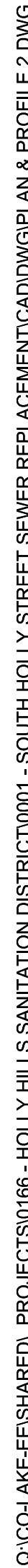
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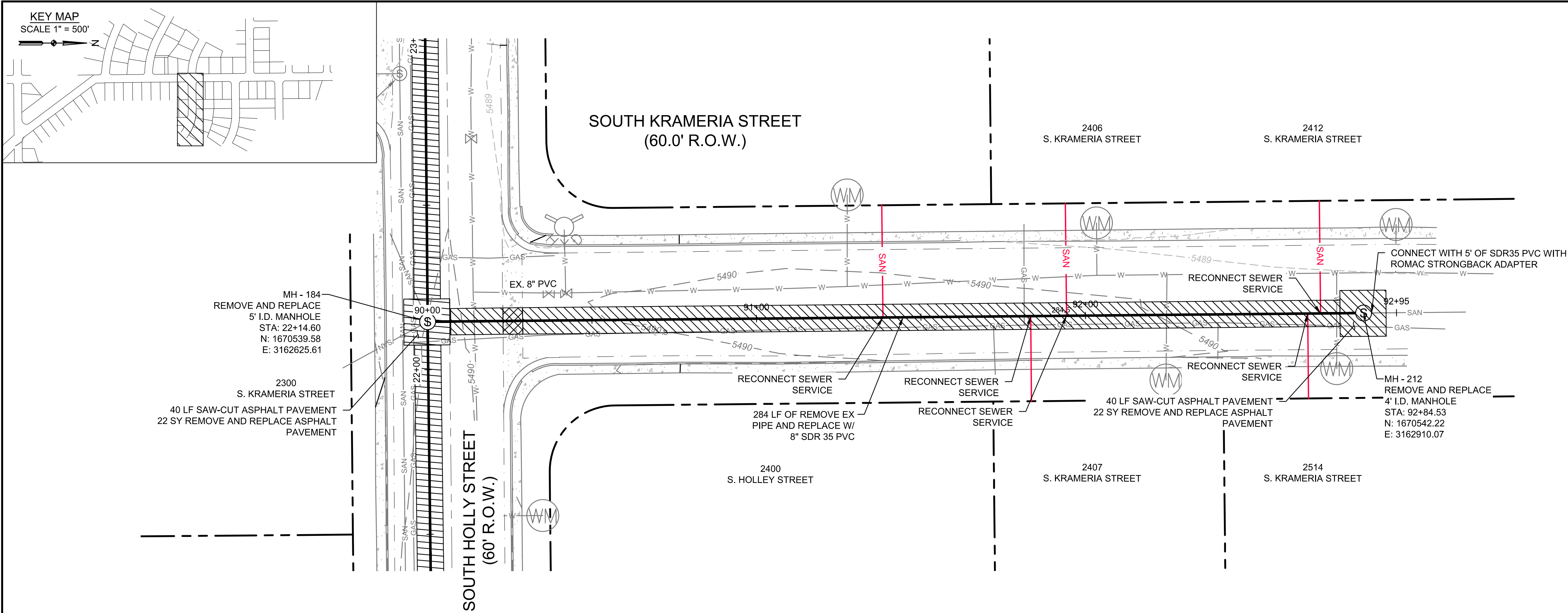
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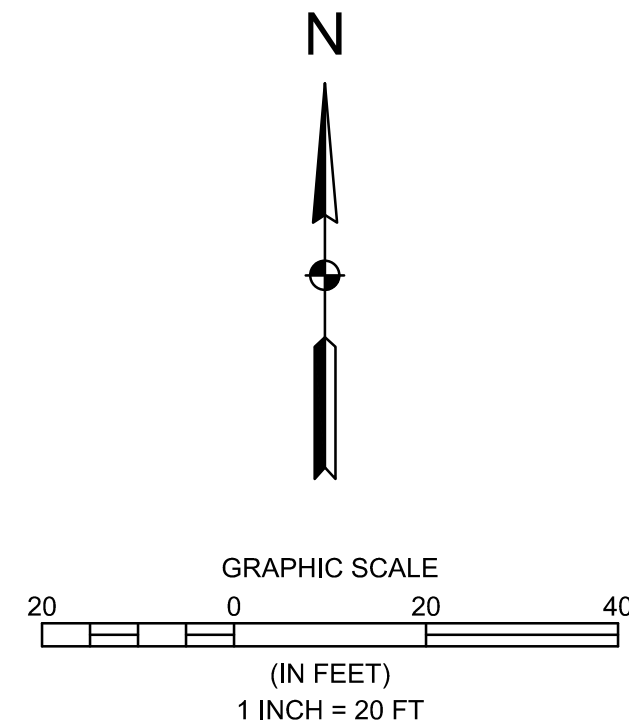
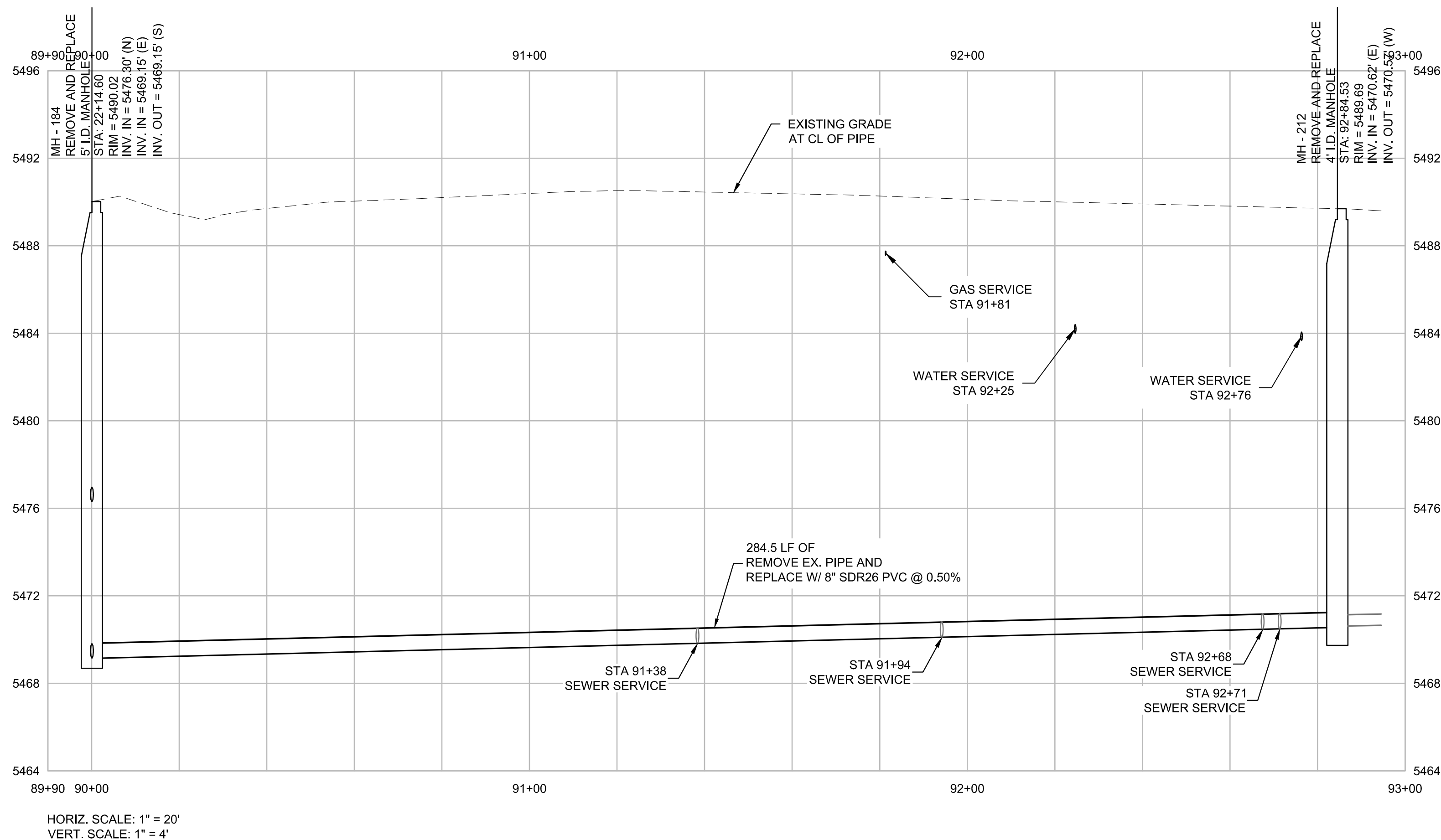
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- SEWER NOTES:**
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**LEGEND:**

— SAN — VIDEO LOCATED SANITARY SEWER SERVICE



**ELEMENT**  
A BOWMAN COMPANY

303.378.2860  
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LAKEWOOD, CO 80228

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| NO          |  |    |      |

**SOUTH HOLLY STREET SEWER REPLACEMENT**

**SOUTH KRAMERIA STREET PLAN & PROFILE**

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

|                    |                   |
|--------------------|-------------------|
| DESIGNED BY<br>JAM | CHECKED BY<br>MEH |
|--------------------|-------------------|

DATE  
JUNE 2026

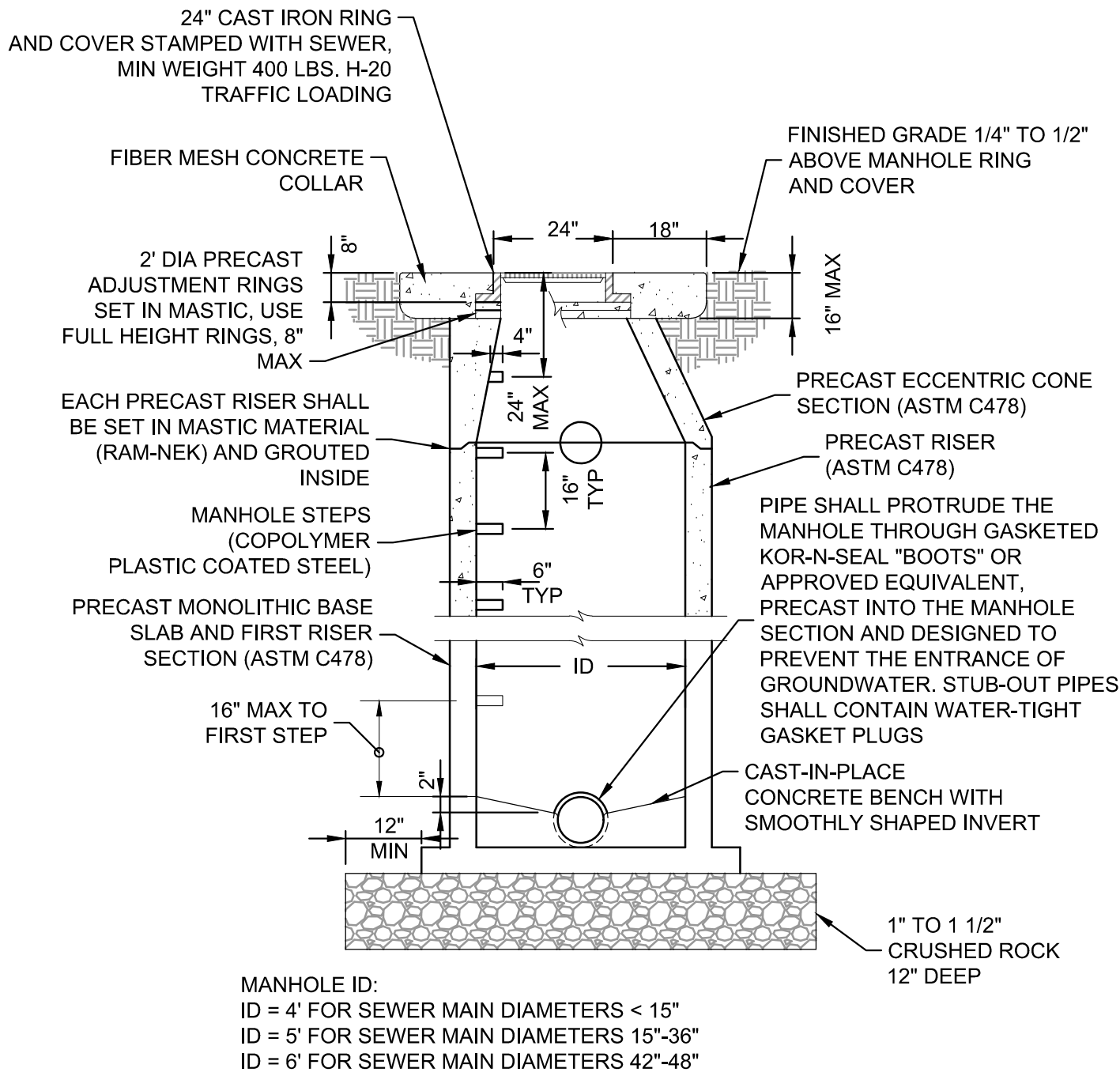
JOB NUMBER  
0166.0001

EDITION  
CONSTRUCTION

SHEET  
C20 OF C22



Q:\CO-LAKE-EES\SHARED\_PROJECTS\0168 - HOLLY HILLS SANITATION DISTRICT\0001 - SOUTH HOLLY STREET SEWER REPLACEMENT\CADD\DWG\COVER AND NOTES.DWG



- NOTE:
- MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12" WIDE CONSEAL JOINT WRAP CS 212.
  - ALL DROP MANHOLES SHALL BE INSIDE DROPS WITH DURAN RELINER.

NOTE:  
MANHOLE/VAULT BARREL SECTIONS WILL REQUIRE AN EXTERIOR COATING OF TNEEC SERIES 46-465.

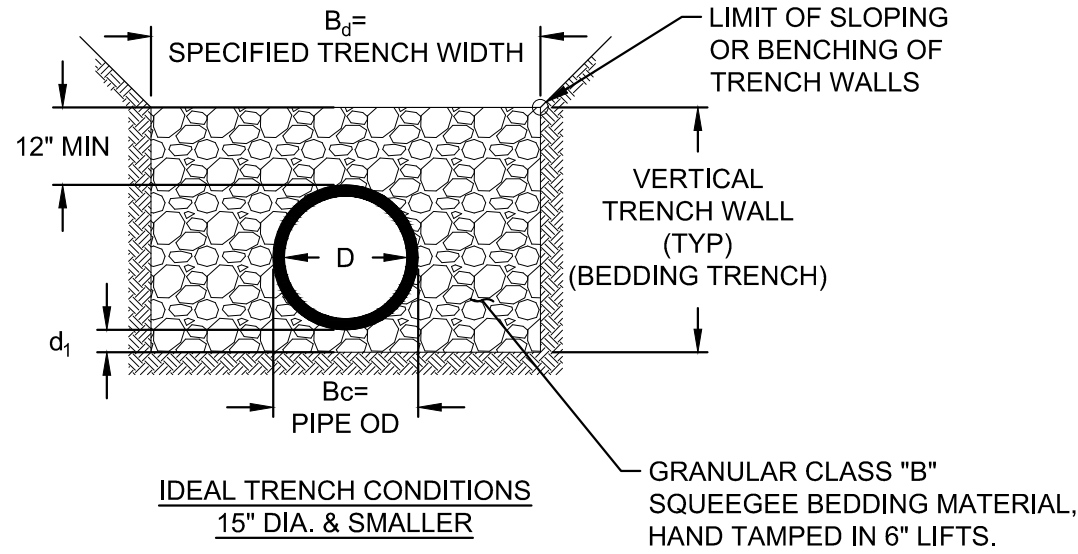
SANITARY SEWER MANHOLE  
(PRECAST BASE)

SCALE: NONE      DETAIL: SS-2

| PIPE SIZE-D   | d <sub>1</sub> |
|---------------|----------------|
| 18" & SMALLER | 6"             |
| 21" TO 36"    | 6"             |
| 42" TO 60"    | 6"             |
| 66" TO 96"    | 8"             |
| 104" & LARGER | 12"            |

B<sub>1</sub> = SPECIFIED TRENCH WIDTH AT A POINT 12" ABOVE CROWN (MAX ALLOWANCE)  
B<sub>2</sub> = PIPE OD  
D = PIPE ID  
d<sub>1</sub>, d<sub>2</sub>, d<sub>3</sub> = DEPTH OF BEDDING MATERIAL BELOW BOTTOM OF PIPE.

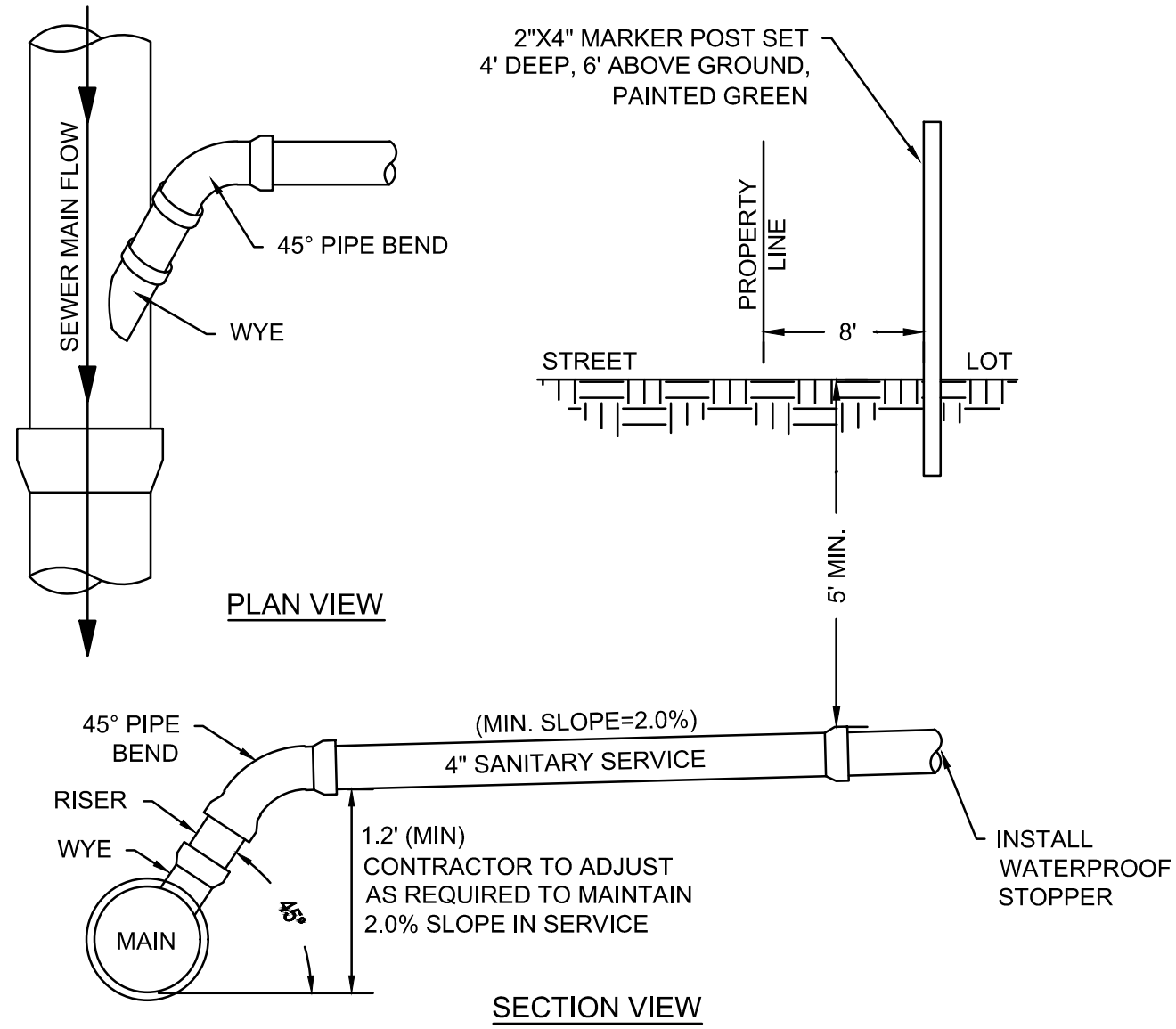
- NOTES:
- BELL HOLES SHALL BE EXCAVATED AT ALL BELL AND SPIGOT JOINTS.
  - BEDDING TRENCH BACKFILL TO BE COMPACTED TO 90% DENSITY, AASHTO T-180 IN OPEN AREAS AND 95% DENSITY AASHTO T-99 IN ALL PUBLIC R.O.W.



CLASS "B" BEDDING MATERIAL SHALL CONSIST OF A WELL GRADED MIXTURE OF MINERAL AGGREGATE. THE AGGREGATE SHALL BE SQUEEGEE WITH A MAXIMUM AMOUNT OF FINES PASSING A NO 200 SCREEN NOT TO EXCEED 5% BY WEIGHT. THE AGGREGATE SHALL COMPLY WITH ASTM C-33 OR ASTM D-448, GRADATION #6 OR #67. IF THE EXCAVATION FOR BEDDING IS BELOW THE WATER TABLE, THE SUB-BEDDING MATERIAL SHALL CONSIST OF 3/4-INCH TO 1-1/2-INCH CRUSHED ROCK.

SANITARY SEWER  
PIPE BEDDING DETAIL

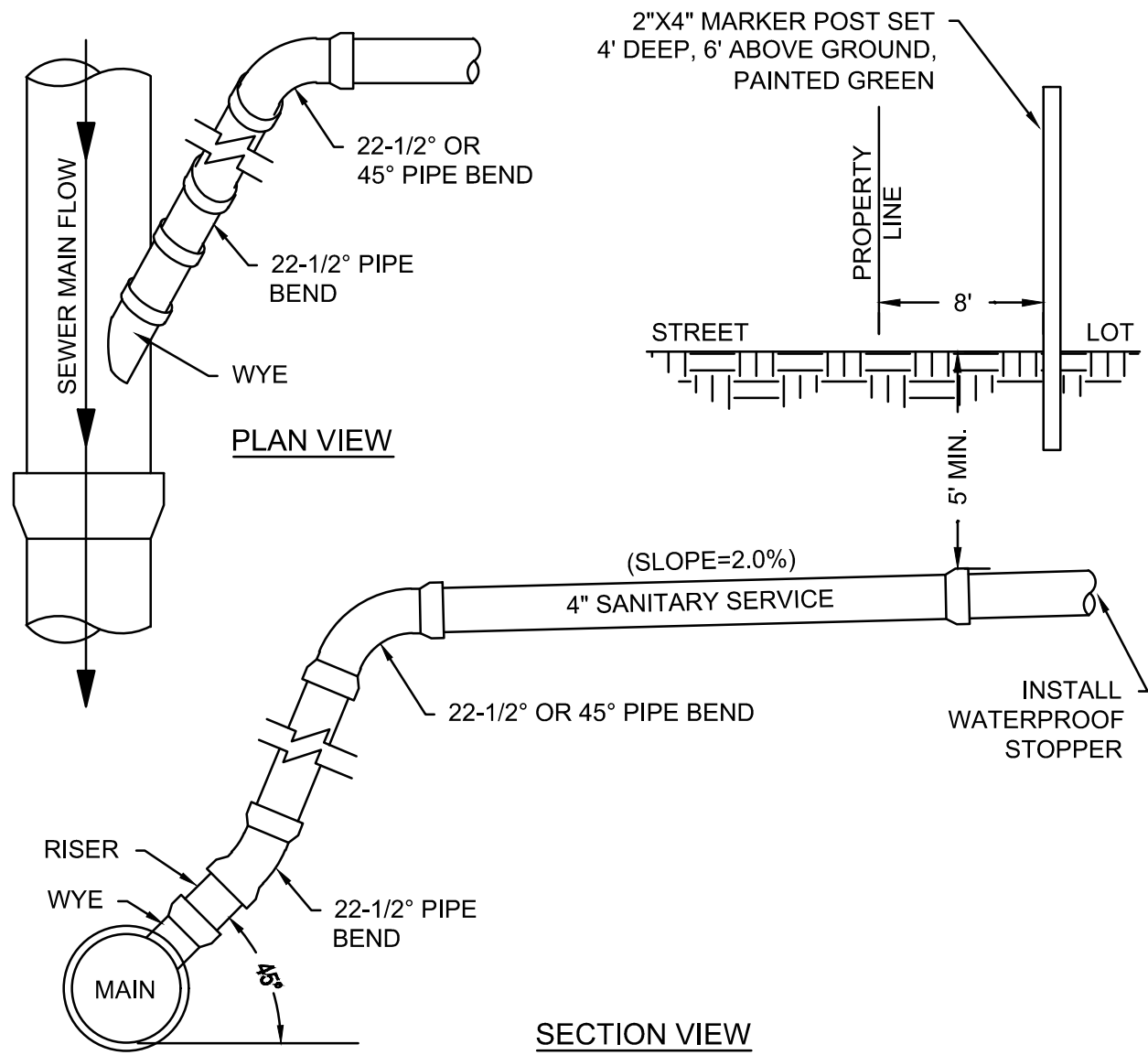
SCALE: NONE      DETAIL: SS-3



- NOTES:
- SANITARY SEWER SERVICE TAPS SHALL BE LOCATED ON THE MAIN AT THE 2 O'CLOCK OR 10 O'CLOCK POSITION.
  - SANITARY SEWER SERVICE TAPS SHALL NOT BE MADE WITHIN 3 FEET OF A PIPE JOINT OR 5 FEET FROM EDGE OF MANHOLE BASE.
  - DEPTH OF BURY OF SANITARY SEWER SERVICE LINE AT ROW WILL BE AT THE DISCRETION OF THE DISTRICT AND TO BE DETERMINED ON A PROJECT BASIS AND DISCUSSED AT THE PRE-DESIGN MEETING.
  - MINIMUM DISTANCE BETWEEN TWO 45° BENDS IS 3 FEET.
  - SEWER SERVICE CONNECTIONS SHALL BE MADE USING "WYE" FITTINGS UNLESS OTHERWISE APPROVED BY DISTRICT ENGINEER.
  - RISER SEGMENT SHALL BE EXTENDED AS NEEDED TO MAINTAIN THE 4" SANITARY SERVICE AT A SLOPE OF 2%-8%.

SANITARY SEWER WYE BRANCH CONNECTION  
FOR MAIN DEPTH LESS THAN 12 FEET

SCALE: NONE      DETAIL: SS-8



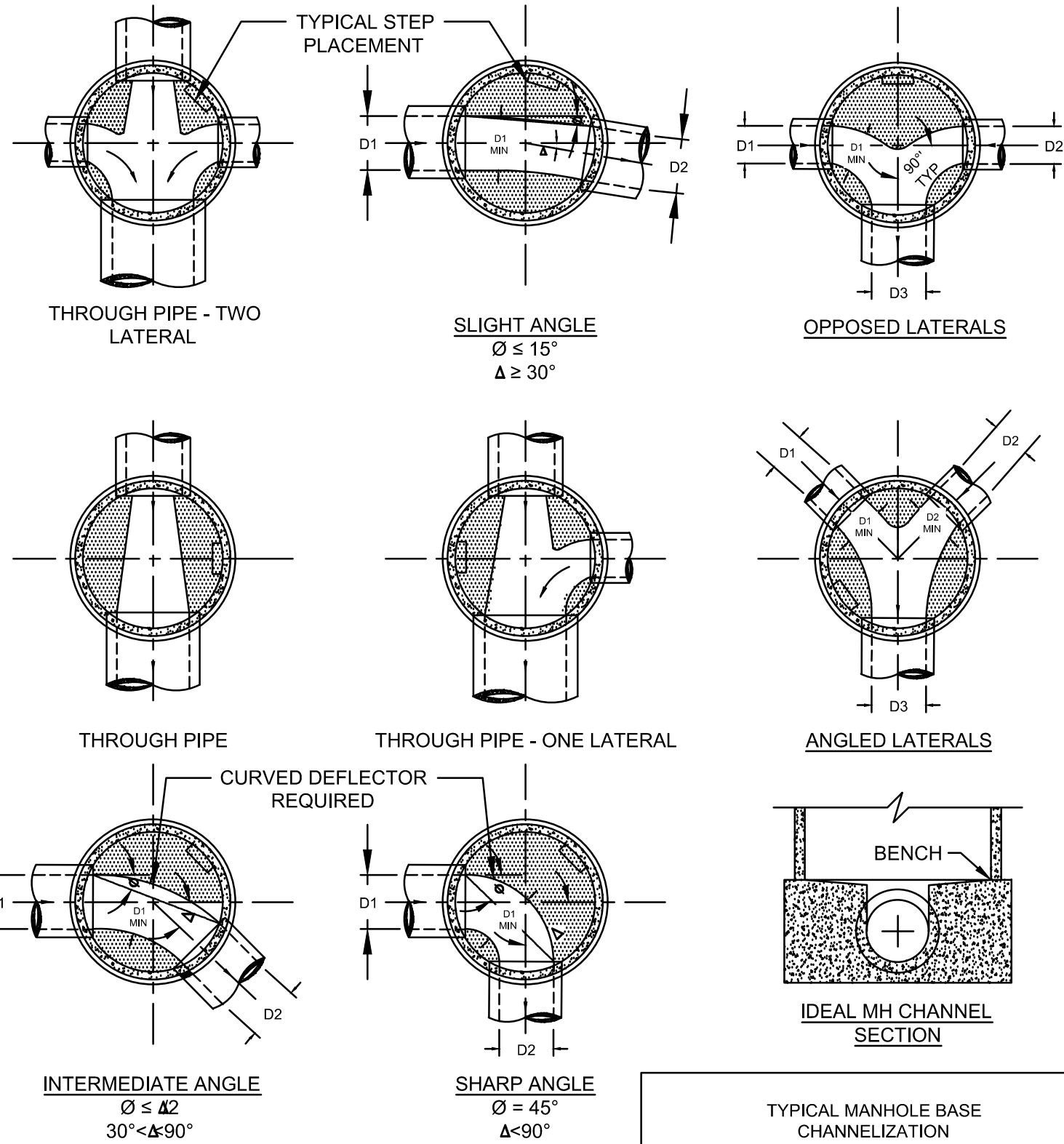
- NOTES:
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  - RISER SEGMENT SHALL BE EXTENDED AS NEEDED TO MAINTAIN THE 4" SANITARY SERVICE AT A SLOPE OF 2%-8%.

SANITARY SEWER WYE BRANCH CONNECTION  
FOR MAIN DEPTH GREATER THAN 12 FEET

SCALE: NONE      DETAIL: SS-9

CHANNELIZATION NOTES:

- DETAILS SHOWN ARE TYPICAL ONLY FOR INSTALLATIONS WITH ALL INVERTS AT SAME RELATIVE ELEVATION. FOR EXCESSIVE ELEVATION DIFFERENCE BETWEEN INVERTS, ETC. SPECIAL BASE/CHANNEL DETAILS SHALL BE SHOWN ON PLANS.
- CHANNELIZATION DETAILS & STEP PLACEMENT TYPICAL FOR BOTH STORM AND SANITARY SEWER MH'S.
- THE MINIMUM VERTICAL DROP THRU MANHOLE BASE SHALL BE 0.10 FOOT FOR STORM SEWERS AND 0.2 FOOT FOR SANITARY SEWER.
- FOR SANITARY SEWER, VERTICAL DROPS IN EXCESS OF 18" REQUIRE AN INSIDE DROP.



SCALE: NONE      DETAIL: SS-11

| REVISIONS | BY | DATE | DESCRIPTION |
|-----------|----|------|-------------|
| NO        |    |      |             |

SOUTH HOLLY STREET SEWER REPLACEMENT

**STANDARD DETAILS**

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

**COLORADO REGISTERED PROFESSIONAL ENGINEER**  
P. M. MEH  
06/29/2026

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DESIGNED BY: JAM      CHECKED BY: MEH

DATE: JUNE 2026

JOB NUMBER: 0166.0001

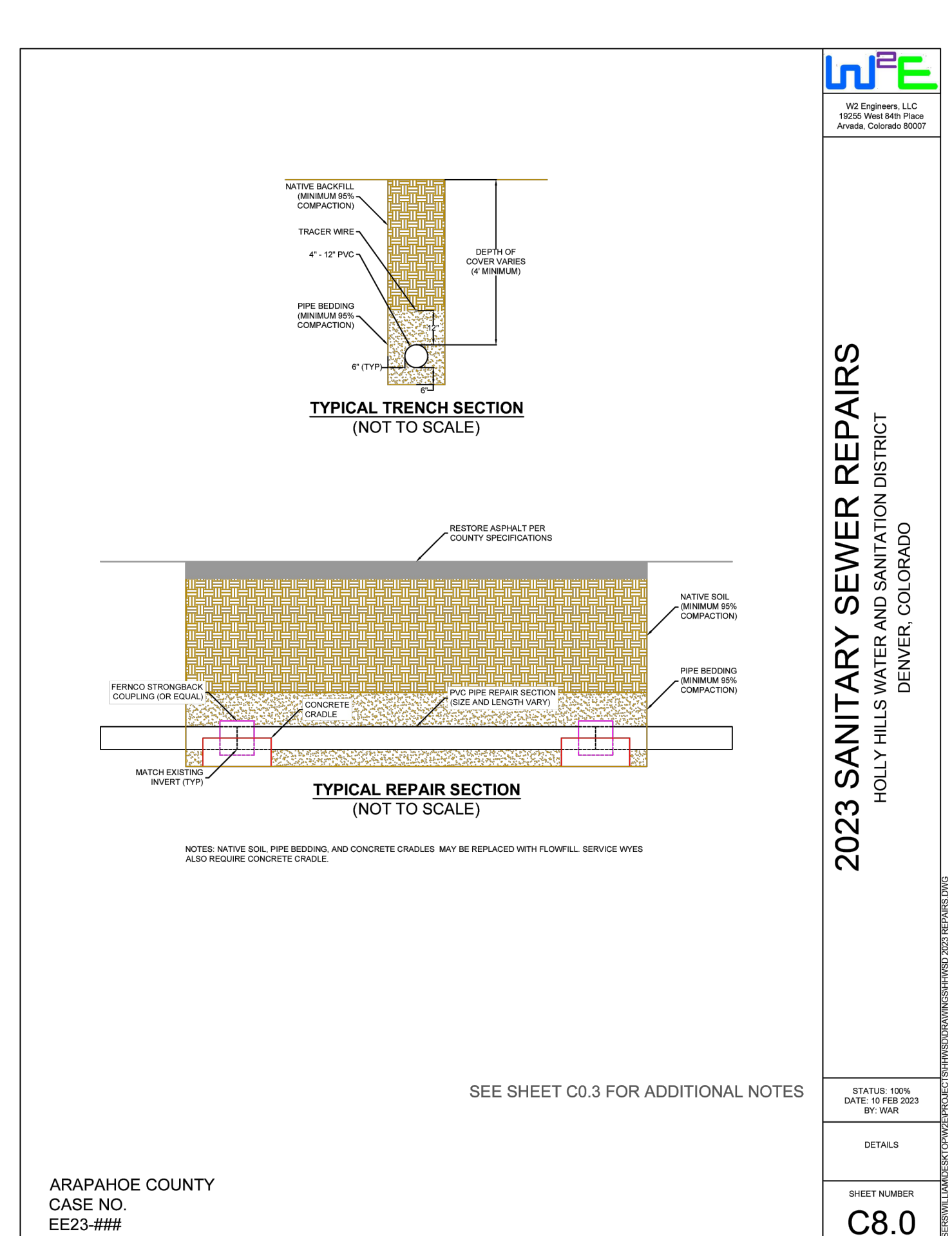
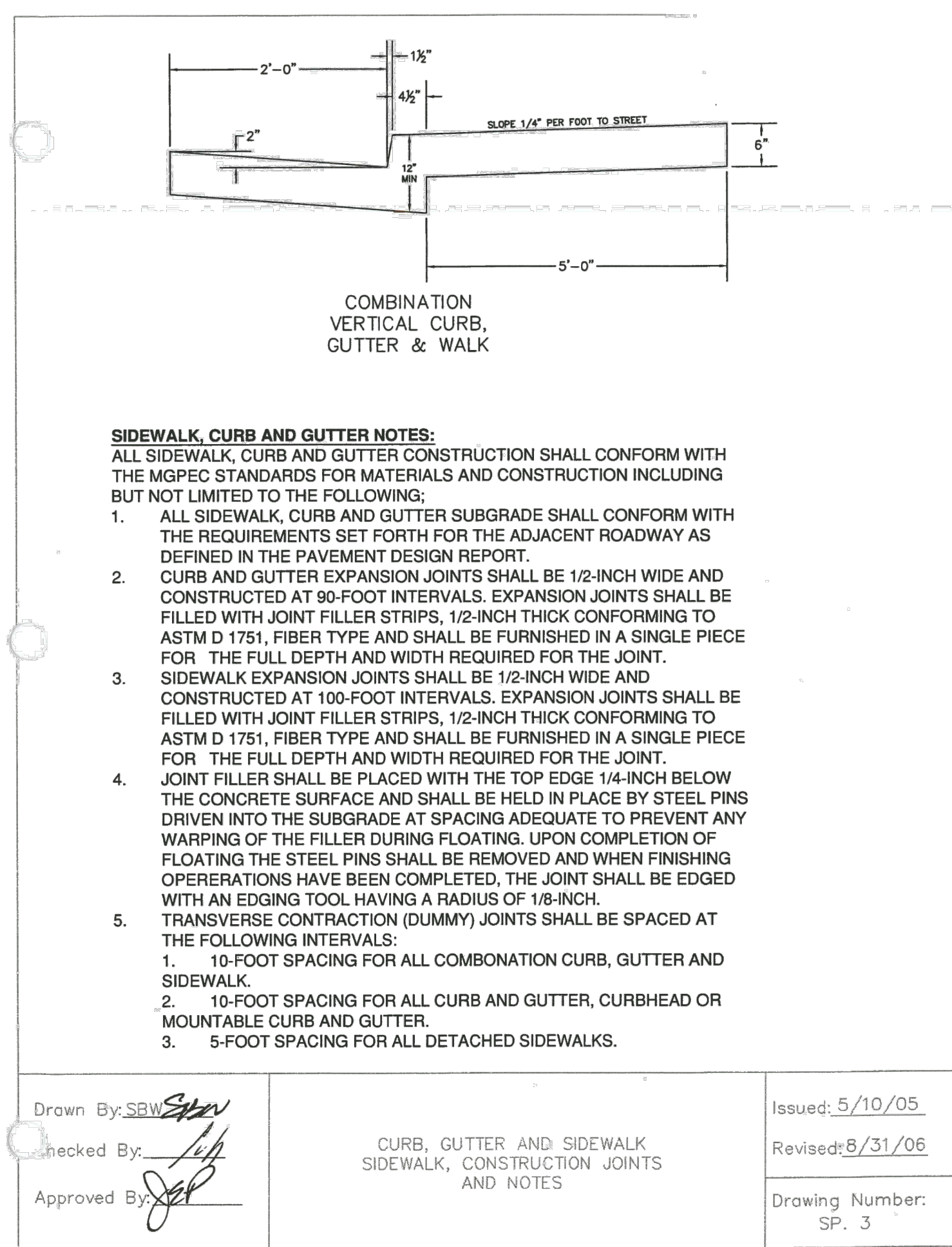
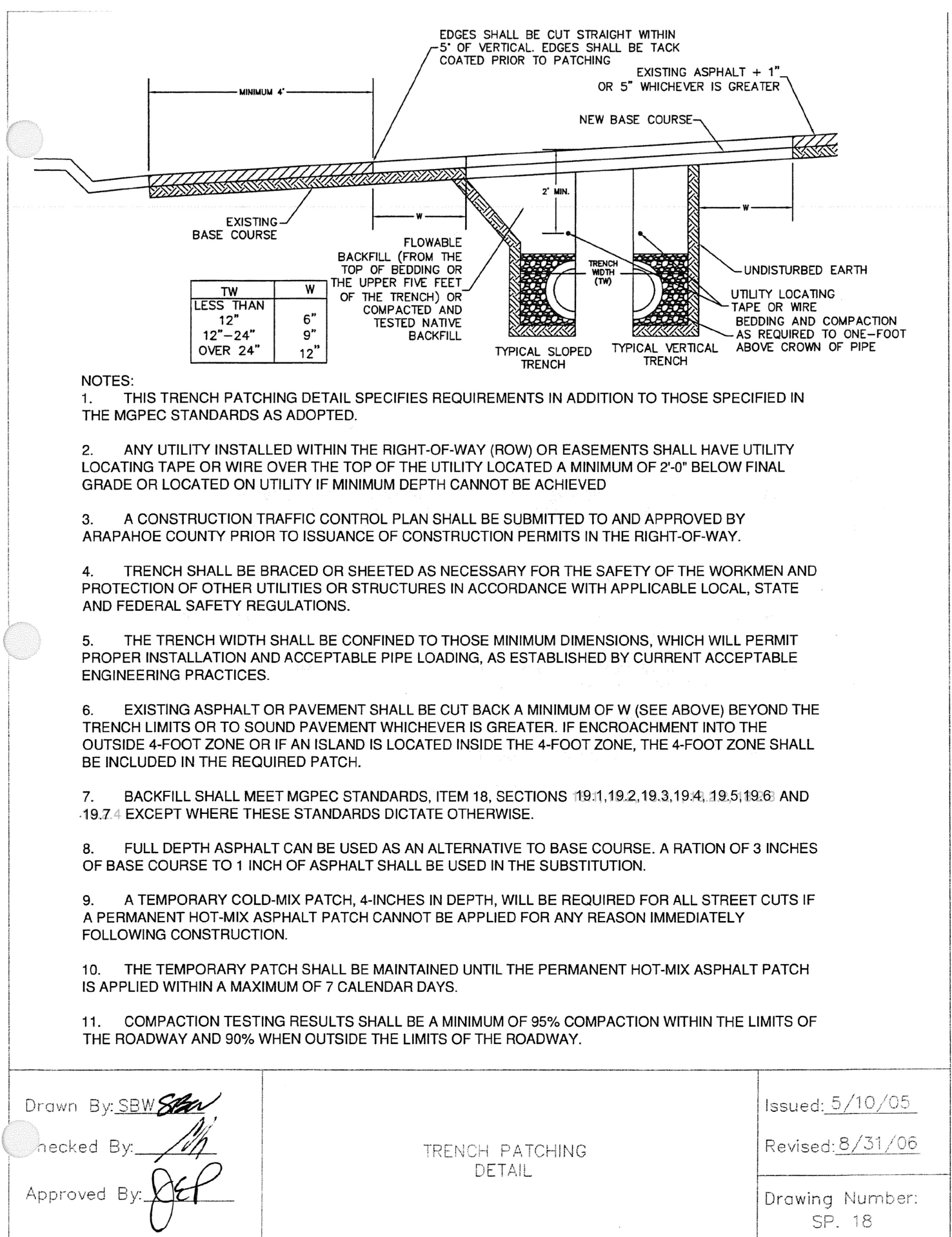
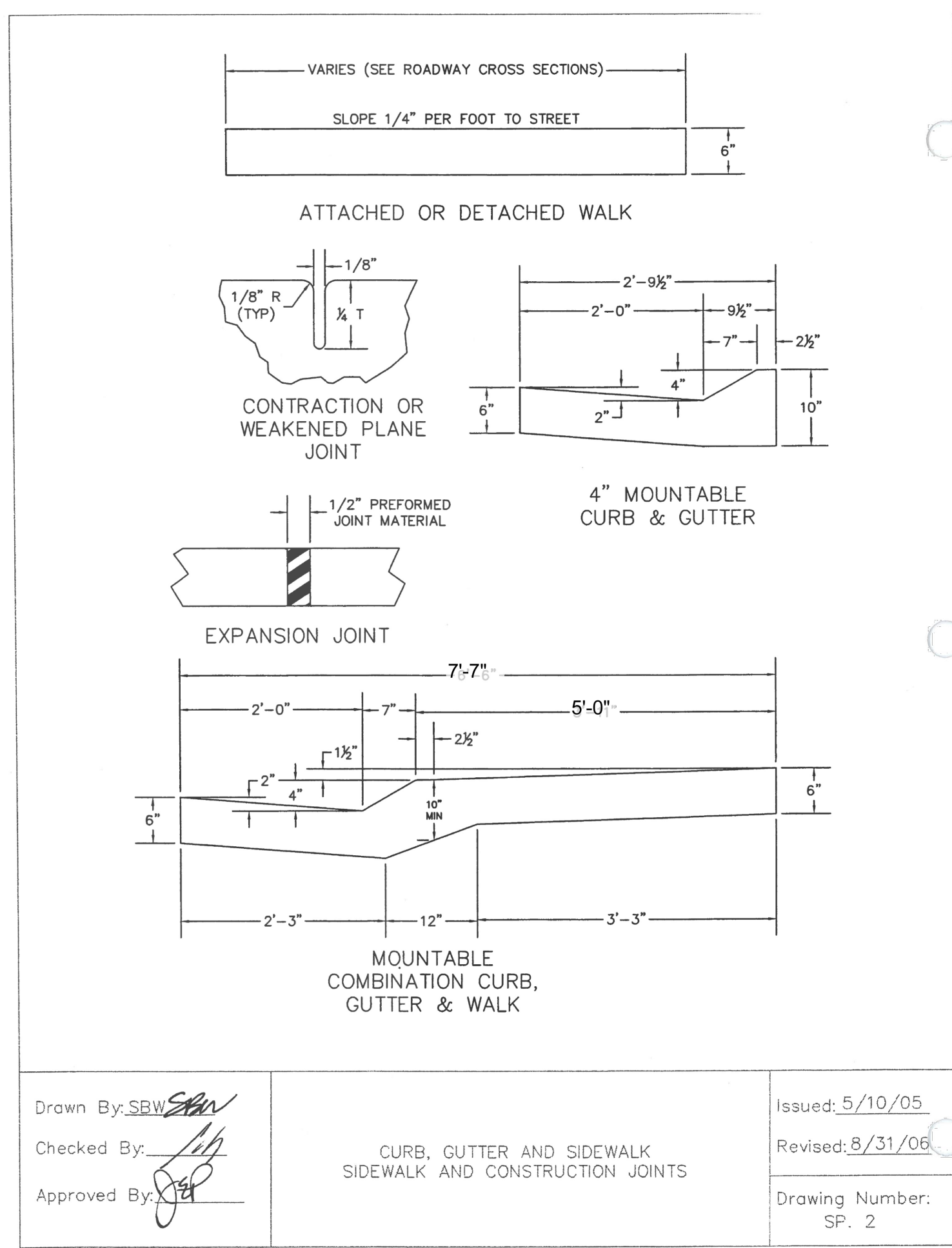
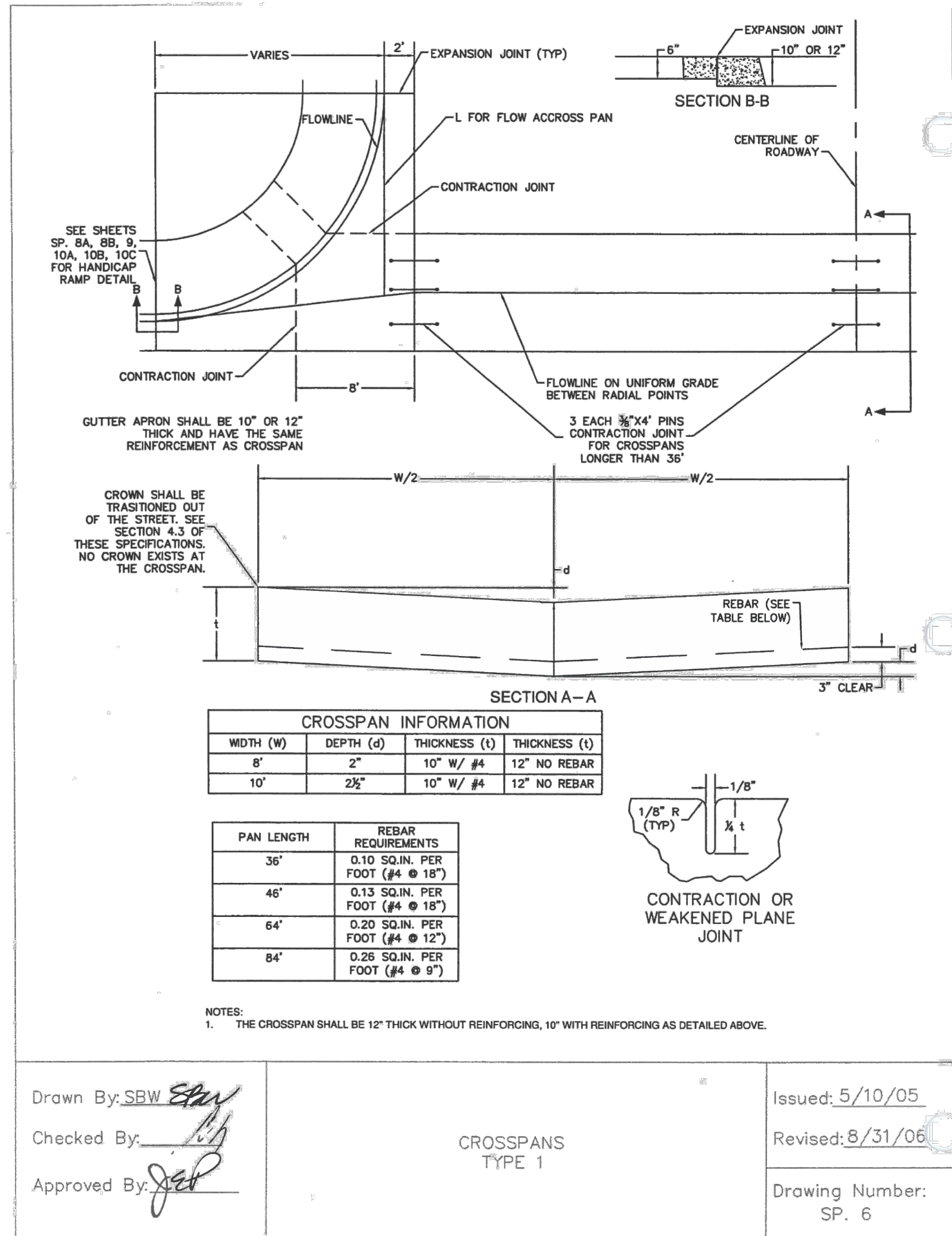
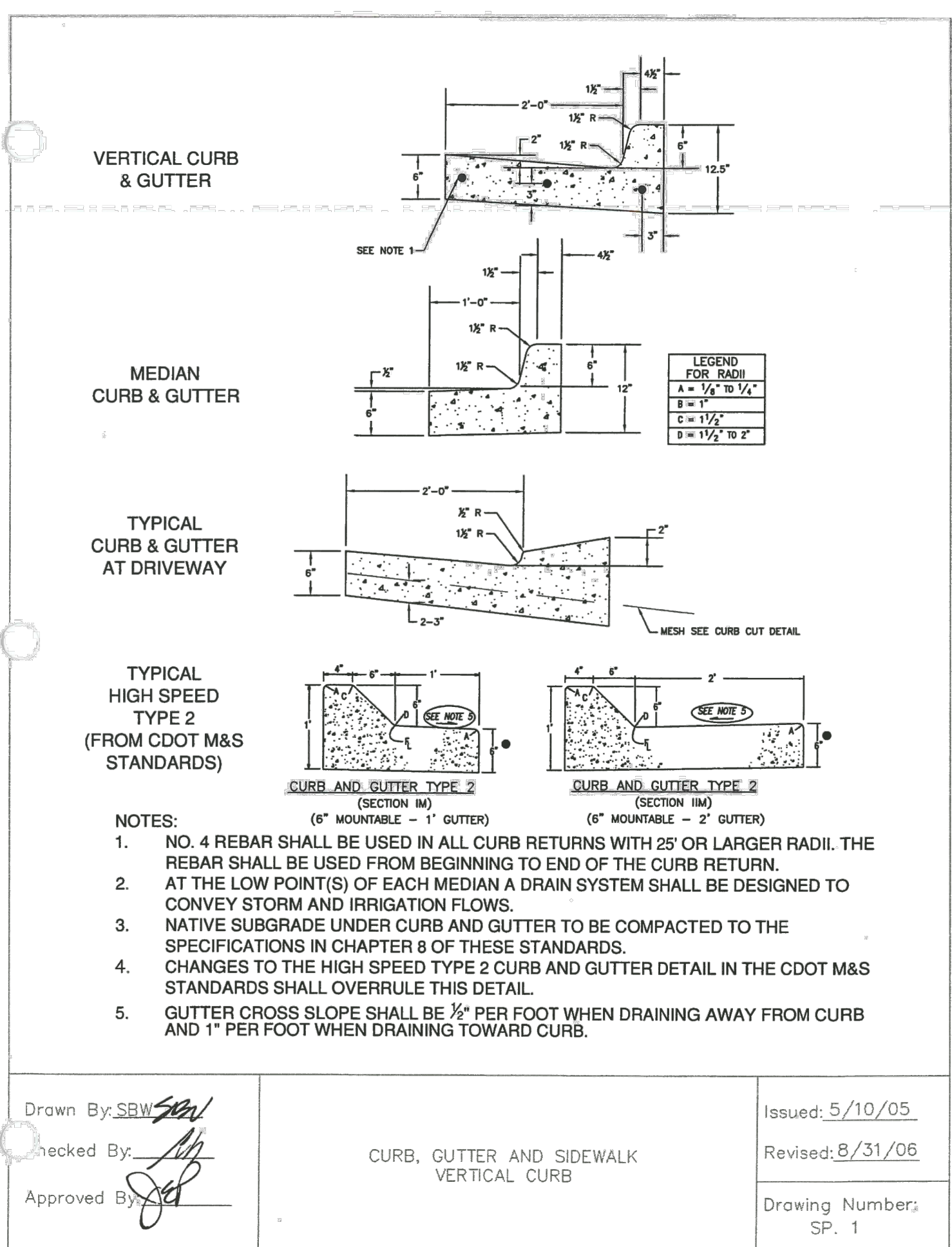
EDITION:

**CONSTRUCTION**

SHEET: C21 OF C22



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**ELEMENT A BOWMAN COMPANY**

303.376.2860  
WWW.ELEMENTENGINEERING.NET

7045 W. ALASKA DR. SUITE 210  
LAKEWOOD, CO 80226

**SOUTH HOLLY STREET SEWER REPLACEMENT**

**ARAPAHOE COUNTY STANDARD DETAILS**

HOLLY HILLS SANITATION DISTRICT  
405 URBAN ST SUITE 310  
LAKEWOOD, CO 80228

PREPARED UNDER THE DIRECT SUPERVISION OF

**COLORADO REGISTERED PROFESSIONAL ENGINEER**

FOR AND ON BEHALF OF  
ELEMENT ENGINEERING, LLC

DESIGNED BY: JAM  
CHECKED BY: MEH

DATE: JUNE 2026  
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EDITION: CONSTRUCTION

SHEET  
C22 OF C22