

HOLLY HILLS WATER AND SANITATION DISTRICT

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ARAPAHOE COUNTY
CASE NO.
EE22-###

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
APPROVAL BLOCK



W2 Engineers, LLC
19255 West 84th Place
Arvada, Colorado 80007

2022 SANITARY SEWER REPAIRS

HOLLY HILLS WATER AND SANITATION DISTRICT
DENVER, COLORADO

STATUS: 100%
DATE: 21 FEB 2022
BY: WAR

2022 SANITARY SEWER
REPAIRS

SHEET NUMBER

COVER

ARAPHOE COUNTY GENERAL NOTES



W2 Engineers, LLC
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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 dissipaters, 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.

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ARAPAHOE COUNTY
GENERAL NOTES

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C0.1

ARAPAHOE COUNTY
CASE NO.
EE22-###

NOTES:

1. CONTRACTOR SHALL COORDINATE ALL WORK WITH OWNER, INCLUDING PERMITTING, PROPOSED SCHEDULE, CHANGES IN WORK, EMERGENCIES, AND OTHER ASPECTS RELATED TO THE PROJECT.
2. ALL WORK SHALL CONFORM TO CITY AND COUNTY OF DENVER OR ARAPAHOE COUNTY CODES PER LOCATION, AND OTHER REFERENCED AND APPLICABLE CODES.
3. CONTRACTOR SHALL AT THEIR EXPENSE OBTAIN ALL NECESSARY LICENSES, PERMITS, BONDS, ETC. WHICH ARE NECESSARY TO PERFORM THE PROPOSED WORK, INCLUDING BUT NOT LIMITED TO BUILDING PERMITS, RIGHT OF WAY PERMITS, TRAFFIC CONTROL PERMITS, GROUNDWATER DISCHARGE PERMITS, STORMWATER DISCHARGE PERMITS, ETC. OWNER WILL PAY FOR PERMIT FEES ONLY.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR SAFETY AND SECURITY OF THE SITE AND COMPLETING ALL WORK IN COMPLIANCE WITH OSHA REQUIREMENTS.
5. CONTRACTOR SHALL PERFORM CONSTRUCTION SURVEYING AND VERIFY EXISTING ELEVATIONS AND PROPOSED COLLECTION SYSTEM ELEVATIONS. CONTRACTOR SHALL NOTIFY OWNER OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH ANY WORK.
6. CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE WORK AREA UTILIZING COLORADO 811 (VIA 811 OR COLORADO811.ORG), OWNER'S STAFF, AND PRIVATE UTILITY LOCATE SERVICES AS REQUIRED. CONTRACTOR SHALL POTHOLE UTILITY CROSSINGS (INCLUDING SERVICE LINES) AND THOSE ADJACENT AND WITHIN 10 FEET OF THE EDGE OF TRENCH. CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGES AND COSTS INCURRED TO REPAIR AND RESTORE UTILITIES DAMAGED IN CONJUNCTION WITH THEIR WORK ON THE PROJECT. LOCATION OF UTILITIES ON CONSTRUCTION DRAWINGS ARE APPROXIMATE AND SHOULD NOT BE RELIED UPON.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OWNER, ENGINEER, REGULATORY AGENCIES/AUTHORITIES, AND OTHER RELEVANT PARTIES AT LEAST 48 HOURS IN ADVANCE OF ANY WORK REQUIRING OBSERVATIONS, INSPECTIONS, APPROVALS, OR OTHER NOTIFICATION, AND SHALL NOT PROCEED UNTIL THE APPROPRIATE RESPONSE IS RECEIVED.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN AND IMPLEMENTATION OF A BYPASS PUMPING PLAN AND SYSTEM. WASTEWATER SHALL NOT BE ALLOWED TO LEAK OR SPILL ABOVE GRADE, AND ALL WASTEWATER SHALL BE DIRECTED THROUGH ADJACENT SANITARY SEWER MANHOLES AND PIPING.
9. CONTRACTOR SHALL EMPLOY APPROPRIATE TRAFFIC CONTROL SIGNAGE, BARRICADES, AND PERSONNEL MEETING MUTCD STANDARDS AND AS NEEDED TO ENSURE PUBLIC SAFETY AND A SAFE WORKING ENVIRONMENT. TRAFFIC CONTROL SHALL BE COORDINATED WITH ARAPAHOE COUNTY AND THE CITY AND COUNTY OF DENVER. TRAFFIC CONTROL PLANS ARE PROVIDED AS RECOMMENDATION ONLY. POSTING OF "NO PARKING" SIGNS ONE WEEK PRIOR TO WORK IS RECOMMENDED FOR ALL LOCATIONS.
10. CONTRACTOR SHALL PROVIDE ALL AFFECTED RESIDENTS WITH 48 HOURS ADVANCED NOTICE OF WORK ON THEIR STREET AND POTENTIAL LIMITATIONS ON ACCESS. ALL DRIVEWAY ACCESS SHALL BE RESTORED OUTSIDE OF WORKING HOURS.
11. CONTRACTOR SHALL RECONNECT OR RESTORE ALL EXISTING SERVICE LINES.
12. CONTRACTOR SHALL MAINTAIN AN ONSITE COPY OF THE CONSTRUCTION DRAWINGS, SPECIFICATIONS, STANDARDS, AND OTHER CONTRACT DOCUMENTS.
13. CONTRACTOR SHALL MAINTAIN A SET OF RECORD DRAWINGS, NOTING DISCREPANCIES FROM CONSTRUCTION DRAWINGS, AND PROVIDE TO OWNER AT THE END OF THE PROJECT.
14. CONTRACTOR SHALL WARRANT ALL WORK TO BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.

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DATE: 21 FEB 2022
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GENERAL NOTES 1

SHEET NUMBER
C0.2



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SPECIFICATIONS:

1. SANITARY SEWER PIPE SHALL CONFORM TO ASTM D3034 SDR35 PVC. BELLS SHALL POINT UPHILL. REPAIR SECTIONS SHALL MATCH EXISTING INVERTS AT BOTH ENDS AND SLOPE EVENLY BETWEEN.
2. SERVICE CONNECTIONS SHALL UTILIZE PREFABRICATED SDR35 PVC 45° WYE (GASKETED) ORIENTED AT 30° ABOVE HORIZONTAL.
3. COUPLINGS SHALL BE FERNCO STRONGBACK COUPLING OR APPROVED EQUAL. COUPLINGS SHALL BE SUPPORTED BY A CONCRETE CRADLE (SEE SHEET C4.0).
4. PIPE BEDDING MATERIAL SHALL BE SQUEEGEE OR WELL GRADED SAND ($\frac{3}{8}$ " MINUS).
5. TRACER WIRE SHALL BE SOLID COPPER 12 AWG WITH GREEN INSULATION.
6. STANDARD DETAILS FOR TRENCHES AND MANHOLES ARE ON SHEET C3.0.
7. MANHOLES SHALL COMPLY WITH ASTM C478 SPECIFICATIONS AND MEET HS-20 LOADING.
8. GRANULAR BEDDING MATERIAL SHALL CONFORM TO ASTM D448 SIZE NUMBER 67.
9. NON-SHRINK GROUT SHALL CONFORM TO ASTM C1107.
10. ASPHALT PATCHING AND PAVING SHALL CONFORM TO CITY AND COUNTY OF DENVER OR ARAPAHOE COUNTY REQUIREMENTS. TEE PATCH REQUIRED. MATCH EXISTING ASPHALT THICKNESS PLUS 1 INCH (INCLUDING POTHOLE REPAIRS).
11. CURED-IN-PLACE PIPE REPAIRS SHALL COMPLY WITH SECTION 330130.80.

TESTING:

1. CONDUCT COMPACTION TESTING AT A MINIMUM OF THREE (3) DEPTHS PER REPAIR LOCATION WHERE EXCAVATION AND BACKFILLING OCCURS. LOCATIONS SHALL BE REPRESENTATIVE OF OVERALL TRENCH LENGTH AND DEPTH.
2. PIPE SHALL BE VIDEOED BEFORE AND AFTER REPAIR IN THE SAME DIRECTION, AND VIDEOS SHALL BE PROVIDED TO ENGINEER. VIDEOS SHALL BE RECORDED IN A CLEAN PIPE WHILE NO WASTEWATER FLOW IS PRESENT (I.E. BYPASS IS IN PLACE).

ITEM	QUANTITY	UNITS
MH 63 TO MH 62 REPAIR	10	FEET
MH 103 TO MH 95 REPAIR	25	FEET
MH 89 TO MH 90 REPAIR	287.6	FEET
MH 67 TO MH 68 REPAIR	191.4	FEET
SERVICE CONNECTIONS REPLACE	3	EACH
SERVICE CONNECTIONS RESTORE	10	EACH
ASPHALT PATCHING	45	SY

2022 SANITARY SEWER REPAIRS

HOLLY HILLS WATER AND SANITATION DISTRICT
DENVER, COLORADO

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GENERAL NOTES 2

SHEET NUMBER

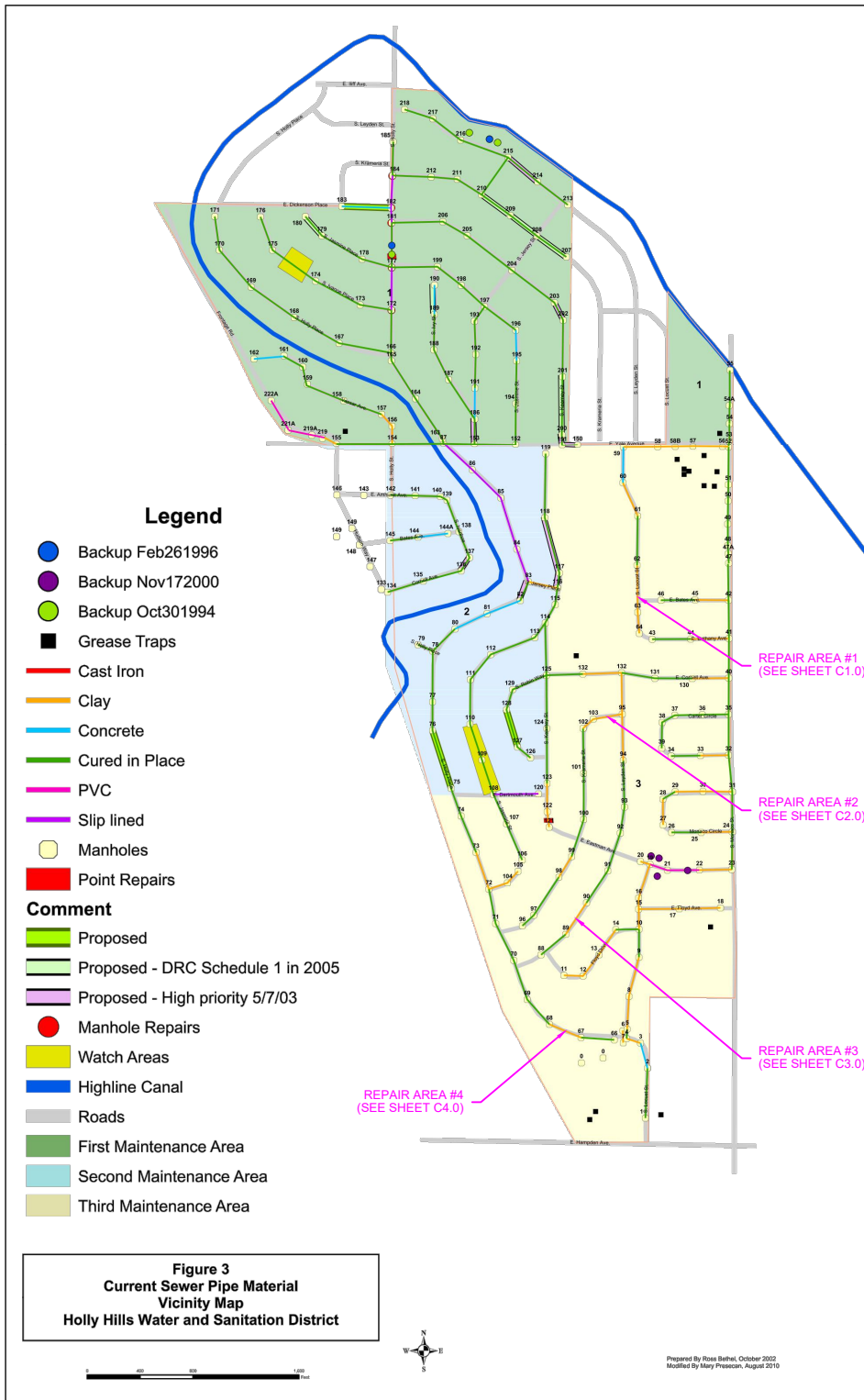
C0.3

ARAPAHOE COUNTY
CASE NO.
EE22-###



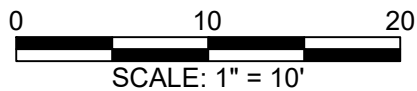
2022 SANITARY SEWER REPAIRS

HOLLY HILLS WATER AND SANITATION DISTRICT
DENVER, COLORADO



SEE SHEET C0.1 FOR NOTES

ARAPAHOE COUNTY
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STATUS: 100%
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VICINITY MAP

SHEET NUMBER

C0.4



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2022 SANITARY SEWER REPAIRS

HOLLY HILLS WATER AND SANITATION DISTRICT

DENVER, COLORADO

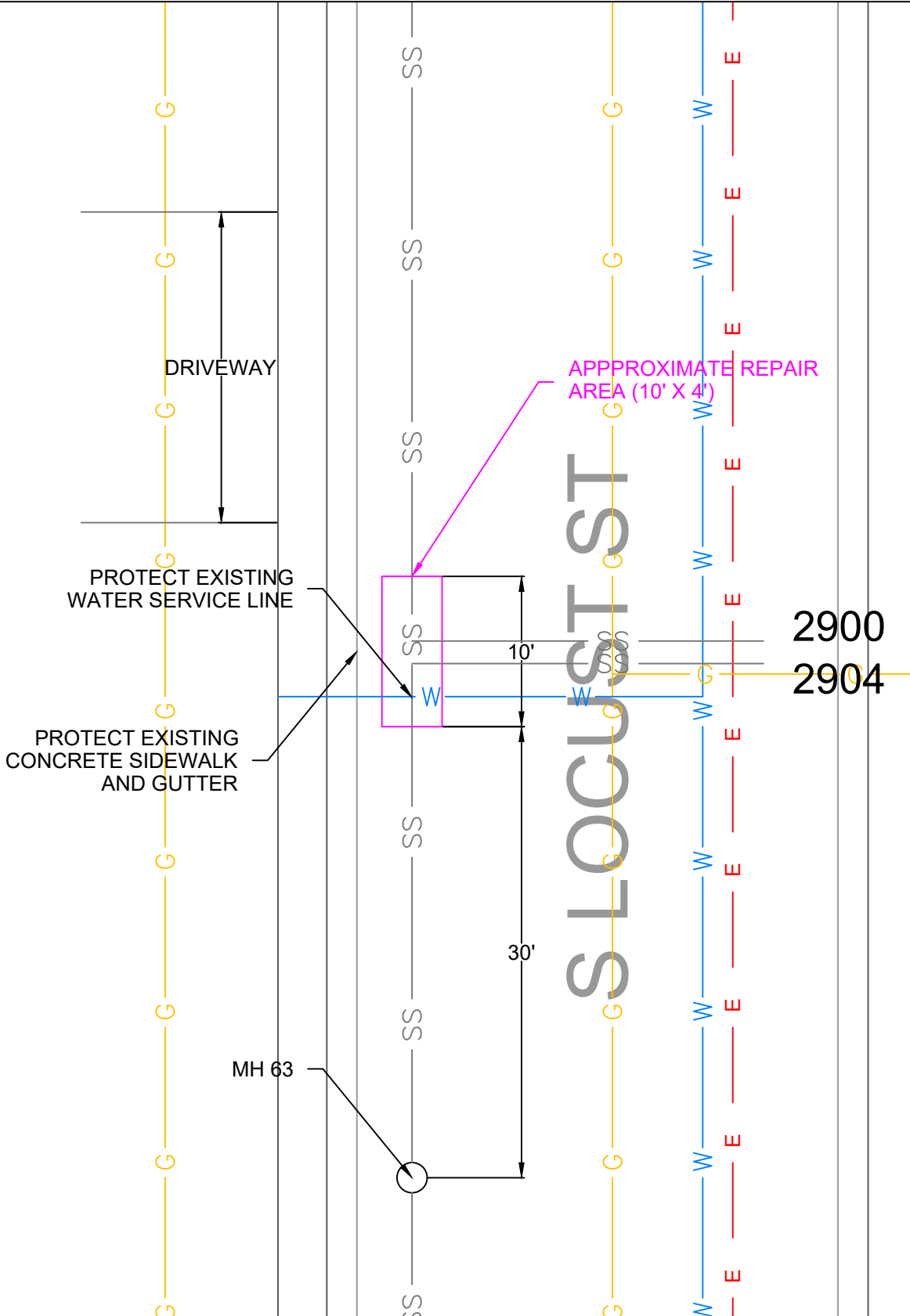
STATUS: 100%
DATE: 21 FEB 2022
BY: WAR

MH 63 TO MH 62
30' TO 40' SECTION

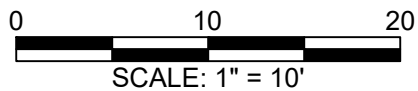
SHEET NUMBER

C1.0

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NOTE: EXCAVATION IS REQUIRED AT THIS LOCATION. EXISTING PIPE IS 8" VCP AND APPROXIMATELY 9.5' BELOW GRADE TO INVERT, WITH 2 SERVICE CONNECTIONS. ADJACENT ADDRESS IS 2897 S LOCUST ST, AND THIS LOCATION IS IN THE CITY AND COUNTY OF DENVER.





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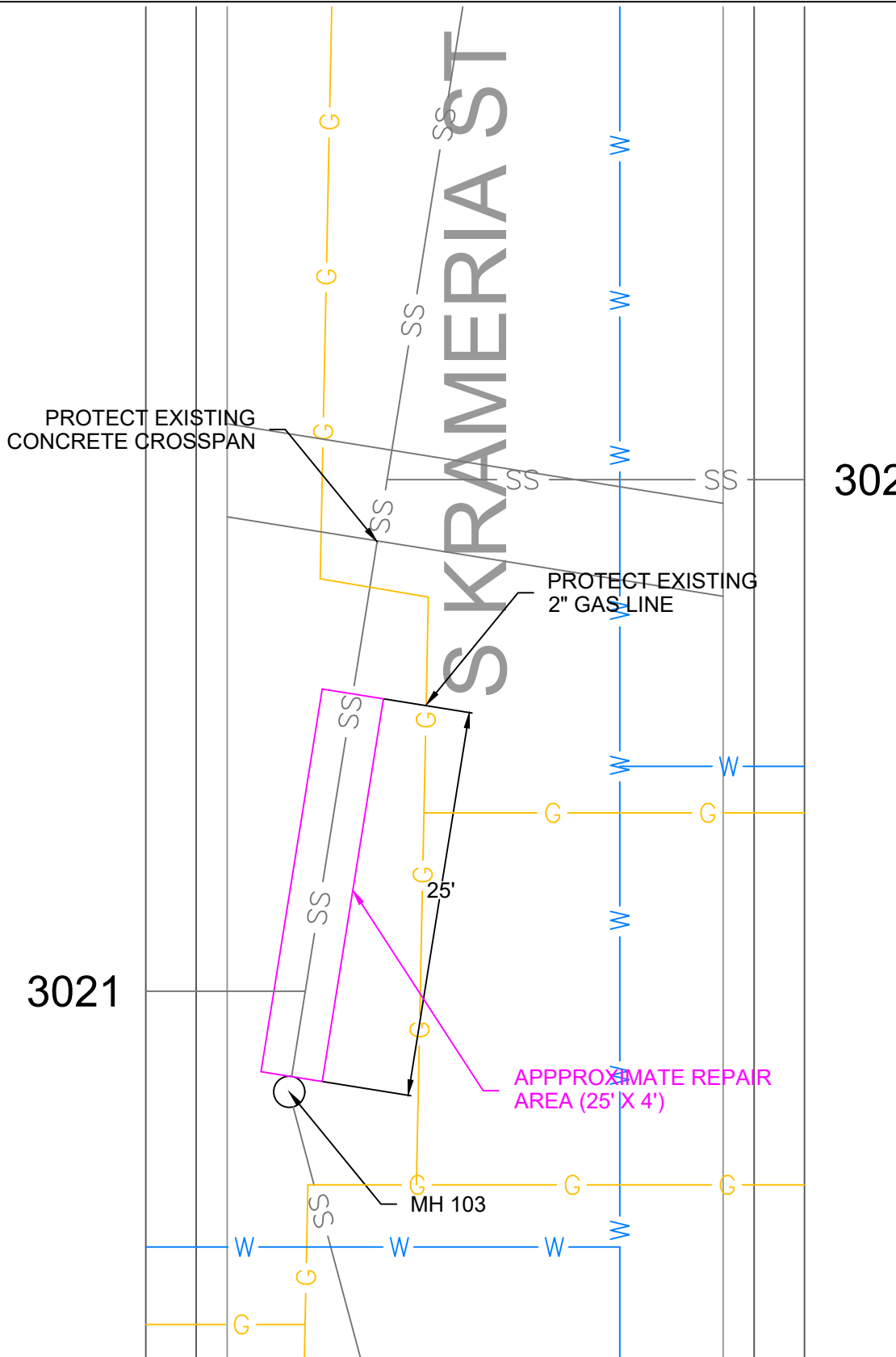
STATUS: 100%
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MH 103 TO MH 95
0' TO 25' SECTION

SHEET NUMBER

C3.0

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NOTE: EXCAVATION REQUIRED AT THIS LOCATION. EXISTING PIPE IS 8" VCP AND APPROXIMATELY 9.0' BELOW GRADE TO INVERT, WITH 1 SERVICE CONNECTION. ADJACENT ADDRESS IS 3021 S KRAMERIA ST, AND THIS LOCATION IS IN ARAPAHOE COUNTY.

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2022 SANITARY SEWER REPAIRS

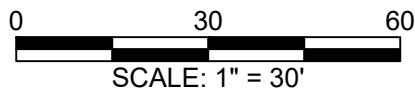
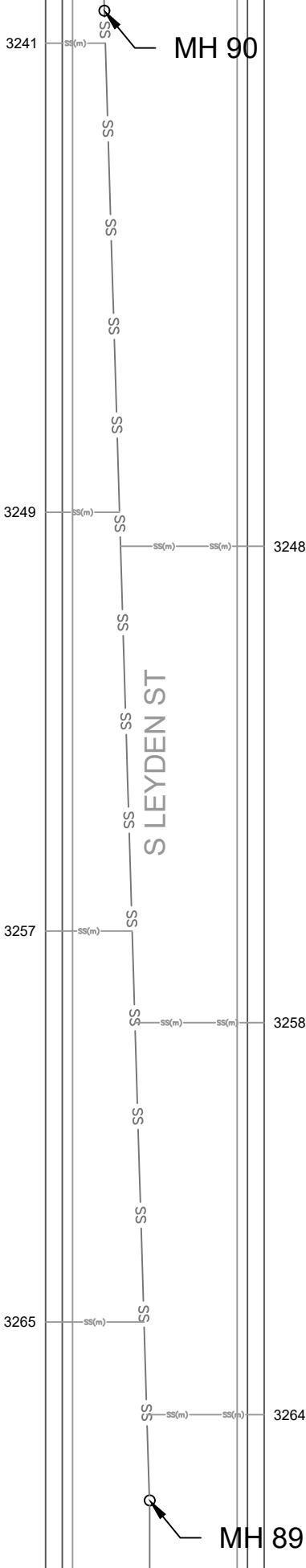
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DENVER, COLORADO

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MH 89 TO MH 90
287.6' SECTION

SHEET NUMBER
C3.0

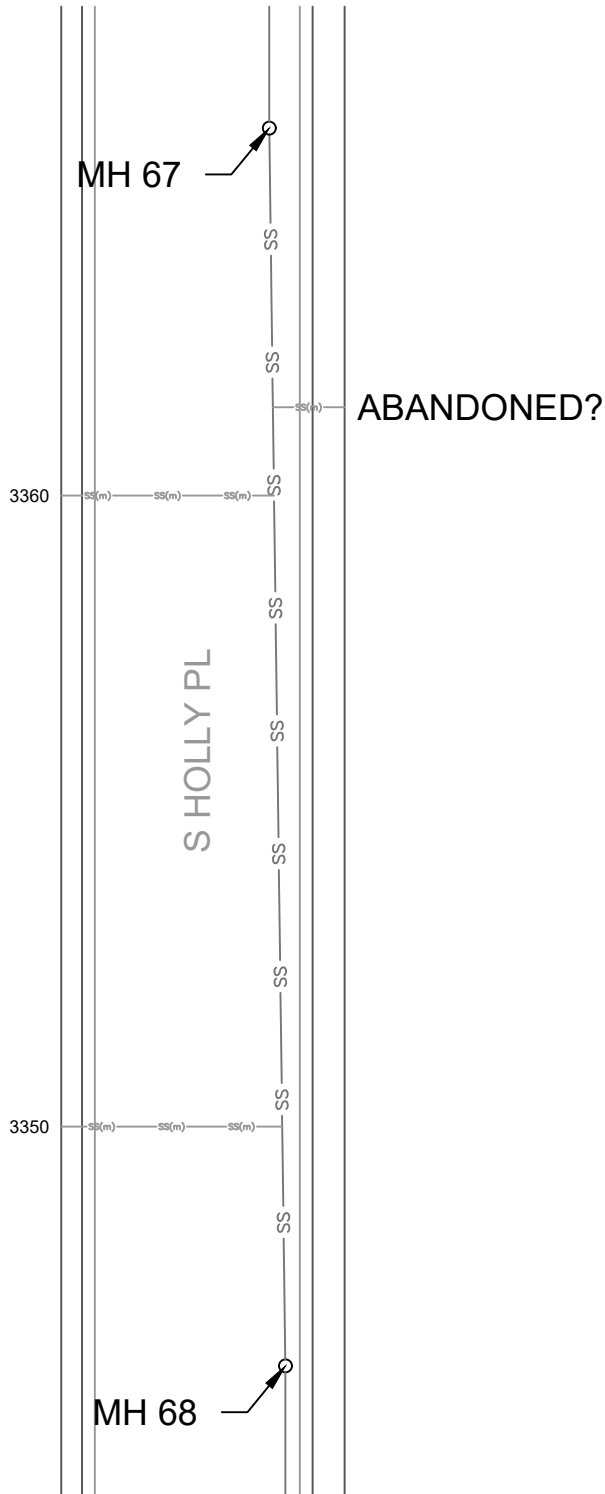
NOTE: CIPP REPAIR REQUIRED AT THIS LOCATION.
EXISTING PIPE IS 8" VCP AND APPROXIMATELY
9.5'-10.5' BELOW GRADE TO INVERT, WITH 7 SERVICE
CONNECTIONS. ADJACENT ADDRESS IS 3265 S
LEYDEN ST, AND THIS LOCATION IS IN THE CITY AND
COUNTY OF DENVER.





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NOTE: CIPP REPAIR REQUIRED AT THIS LOCATION. EXISTING PIPE IS 8" VCP AND APPROXIMATELY 9.5' BELOW GRADE TO INVERT, WITH 3 SERVICE CONNECTIONS. ADJACENT ADDRESS IS 3360 S HOLLY PL, AND THIS LOCATION IS IN THE CITY AND COUNTY OF DENVER.



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MH 67 TO MH 68
191.4' SECTION

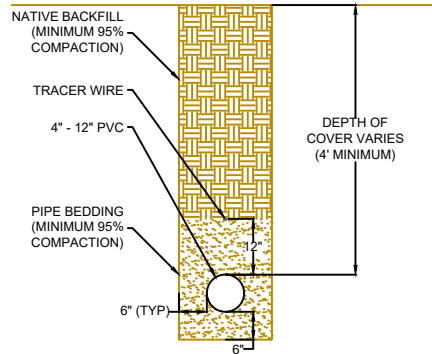
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C4.0

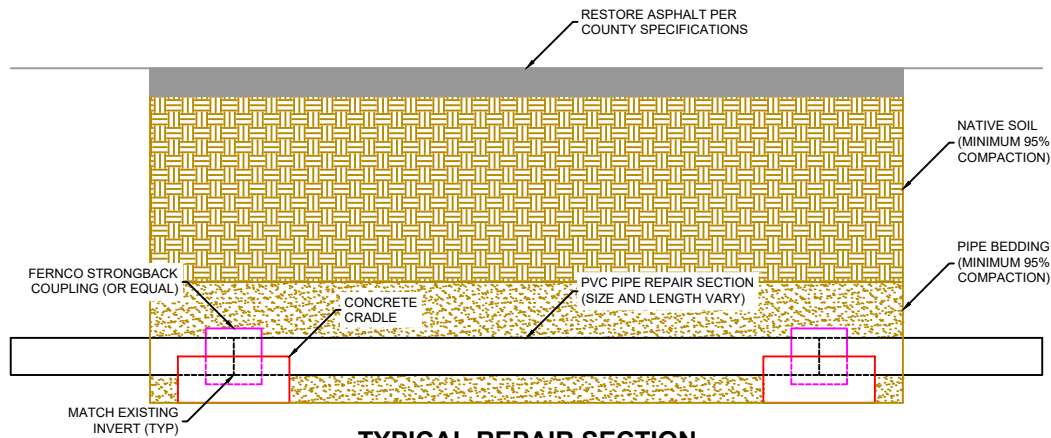




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TYPICAL TRENCH SECTION
(NOT TO SCALE)



TYPICAL REPAIR SECTION
(NOT TO SCALE)

NOTES: NATIVE SOIL, PIPE BEDDING, AND CONCRETE CRADLES MAY BE REPLACED WITH FLOWFILL. SERVICE WYES ALSO REQUIRE CONCRETE CRADLE.

SEE SHEET C0.3 FOR ADDITIONAL NOTES

2022 SANITARY SEWER REPAIRS
HOLLY HILLS WATER AND SANITATION DISTRICT
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DETAILS

SHEET NUMBER

C5.0

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UTILITY LOCATE POTHOLE REPAIR PROCEDURE POLICY

Exploratory test holes or potholes made to determine location of existing utilities are needed for companies that want to bore cables or install other utilities in Arapahoe County in order to avoid damaging existing utilities.

Permitee shall use the following procedure:

The potholes in the pavement may be temporarily repaired, meeting all applicable safety requirements for not more than seven (7) days as per Arapahoe County permit "Terms and Conditions".

I. Asphalt

All potholes in the pavement section shall be cored with a circular coring saw with a maximum diameter of ten inches (10"). The plug shall be removed carefully without damaging the saw cut edges of the asphalt.

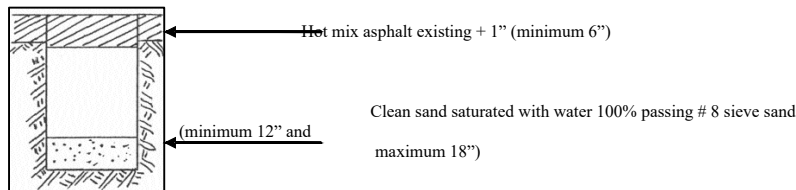
Larger exploratory holes will be reviewed on a case by case basis.

Potholes shall be backfilled with clean sand saturated with water 100% passing #8 sieve to one inch (1") below the existing thickness of the asphalt. Native material removed shall not be used to backfill the hole.

The pothole shall be patched with hot mix bituminous asphalt and compacted in a maximum of three (3) inch lifts using a pneumatic compactor (pogo stick) or equivalent compactor capable of fitting into the cored hole.

At Arapahoe County's discretion, localized infrared treatment may be required to blend the top mat of the asphalt together.

POTHOLE



II. Concrete

Damaged concrete pavement shall be removed and replaced as a full panel section extending to the existing joints. Partial section replacement shall not be permitted.

Concrete removed adjacent to asphalt pavements shall be saw cut along the material interface prior to removal. The concrete shall then be removed carefully without damaging the saw cut edge of asphalt.

The concrete (Class P), reinforcing, doweling and other materials shall be in accordance with CDOT standards. New concrete should meet or exceed original pavement strength.

Weather protection shall be provided in compliance with the CDOT Standards Specification Section 601.

III. Native Soil

Potholes made in native soil should meet the compaction requirements in accordance with Chapter 8.2 of Arapahoe County Infrastructure Design and Construction Standards.

ULPR-1

REV. 12/27/06

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ARAPAHOE COUNTY
DETAIL ULPR-1

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C6.0

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Any damaged landscaping, lawns, shrubbery, trees hedges, walls, fences, etc. shall be replaced or restored prior to seven days after the completion of the job at the contractors expense to the condition existing prior to the excavation.

Note:
Permittee is responsible for researching and locating all underground utility lines including storm sewer systems and related drainage facilities.

ULPR-2 REV. 12/27/06

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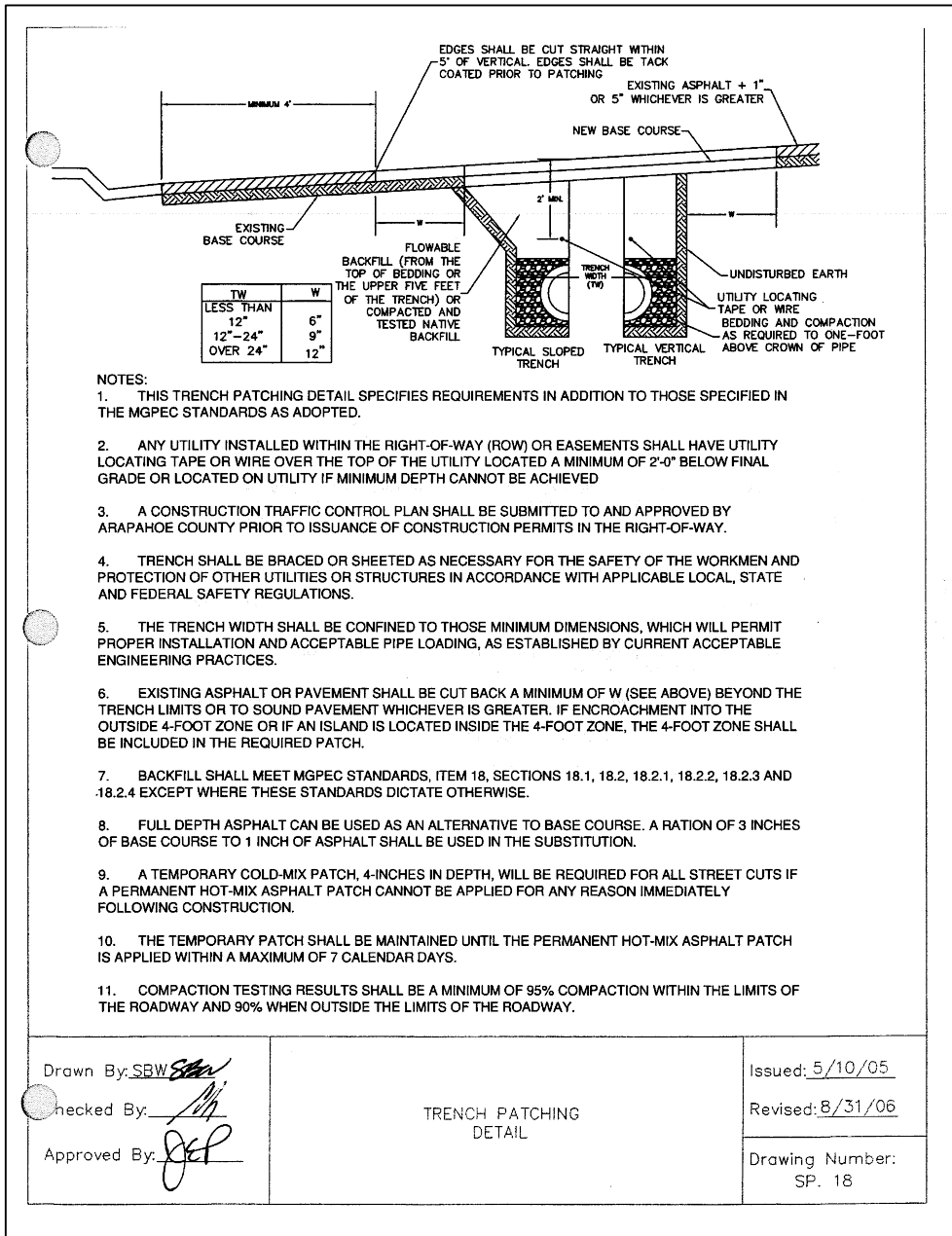
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DETAIL ULPR-2

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TRENCH PATCHING
DETAIL

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