# Wastewater Less Table of Contents

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NOTE: ALL DETAIL DRAWINGS NOT TO SCALE (NTS) UNLESS OTHERWISE NOTED.

**LEGEND**

- EASEMENT LINE
- EXISTING ROW/PROPERTY LINE
- EXISTING CURB LINE
- EXISTING WATER
- PROPOSED WATER
- PROPOSED WASTEWATER
- VALVE (PROPOSED)
- VALVE (EXISTING)
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- EXISTING/PROPOSED METER PIT
NOTES FOR APPLYING STREET CROSS SECTION TEMPLATES

DRAWINGS 1 THROUGH 10 ARE INTENDED TO GIVE THE DEVELOPMENT COMMUNITY ADDITIONAL DESIGN OPTIONS TO ASSIST IN CONSTRUCTING MAINTAINABLE STREETS AND UTILITIES. THESE DRAWINGS ARE MEANT TO BE USED IN CONJUNCTION WITH THE LATEST VERSION OF THE CITY OF COLORADO SPRINGS TRAFFIC DESIGN MANUAL AND REPRESENT LAYOUTS THAT CAN BE APPROVED IF DESIGNED AS SHOWN ON THESE DRAWINGS. VARIATIONS FROM THESE SECTIONS FOR UTILITY MAIN SIZE OR HORIZONTAL AND/OR VERTICAL LOCATION WILL BE REVIEWED AND APPROVED BY COLORADO SPRINGS UTILITIES ON A CASE BY CASE BASIS. THE FOLLOWING ABBREVIATIONS APPLY TO ALL DRAWINGS:  W=WATER   WW= WASTEWATER.

PHILOSOPHIES IN INTERPRETING THE DRAWINGS:

1. THE DEPTH OF WW IS SHOWN TO BE BETWEEN 10 FEET AND 12 FEET. HOWEVER, THE DEPTH OF THE WW LINE WILL VARY AND WILL NOT BE INSTALLED EXACTLY AT THE DEPTH SHOWN IN THE DRAWINGS.
2. THE STORM SEWER PIPE IS SHOWN 1 FOOT OFF THE EDGE OF PAVEMENT AND 24 INCHES BELOW SUBGRADE. HOWEVER, THE STORM SEWER DEPTH WILL VARY DEPENDING ON TOPOGRAPHY AND PIPE GRADES.
3. FOR A TYPICAL REPAIR, SHORING SHOWN ON THE DRAWINGS IS ASSUMED TO BE 8 FEET IN WIDTH AND LOCATED 4 FEET FROM THE TOP OF THE PAVEMENT TO ALLOW CROSSING OF GAS AND ELECTRIC SERVICES AND MAINS. A 6 INCH OVER DIG IS ASSUMED ON EITHER SIDE OF THE SHORING.
4. FOR FUTURE OPERATION AND MAINTENANCE, THE STORM SEWER SHALL BE LOCATED A MINIMUM OF 10 FEET FROM THE WW MAIN, OUTSIDE DIAMETER TO OUTSIDE DIAMETER.
5. STORM SEWER MATERIALS SHALL CONFORM TO THE CITY OF COLORADO SPRINGS STANDARDS AND SPECIFICATIONS. IN CASES WHERE THE STORM SEWER IS LOCATED LESS THAN 10 FEET FROM THE WW MAIN OUTSIDE DIAMETER TO OUTSIDE DIAMETER, THE MATERIAL OF THE STORM SEWER WILL BE EVALUATED ON A CASE BY CASE BASIS. REVIEWS WILL BE CONDUCTED BY CITY ENGINEERING AND COLORADO SPRINGS UTILITIES.
6. STORM SEWER SIZES OVER 48 INCHES WILL NEED TO BE REVIEWED BY COLORADO SPRINGS UTILITIES SO THE IMPACT ON THE DESIGN OF ELECTRIC CROSSINGS CAN BE PROPERLY COORDINATED WITH COLORADO SPRINGS UTILITIES FIELD ENGINEERING.
7. SHORING TO BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER AND INSPECTED BY A COMPETENT PERSON IN ACCORDANCE WITH OSHA REQUIREMENTS.

THE CROSS SECTIONS SHOW ACCEPTABLE DESIGNS FOR UTILITY LOCATIONS IN THE STREETS. THESE STREET CROSS SECTIONS DO NOT MEET EVERY REQUIREMENT OF THE APPLICABLE COLORADO SPRINGS UTILITIES LESS, BUT WILL BE ACCEPTABLE IF CONSTRUCTED IN THE CORRIDORS SHOWN IN THE ATTACHED DRAWINGS. IN USING THE DRAWINGS, THE FOLLOWING LOGIC SHOULD BE APPLIED WHEN USING THE CROSS SECTION TEMPLATES:

A. THE SEPARATION OF THE WATER MAIN FROM THE EDGE OF PAVEMENT VARIES DEPENDING ON THE WIDTH OF THE STREET AND HOW THE PLACEMENT OF THE WATER MAIN AFFECTS THE PLACEMENT OF OTHER UTILITIES. IN ORDER TO MAKE BEST USE OF LIMITED SPACE AND ALLOW THE WW LINE TO BE BUILT IN THE CENTER OF THE ROAD, SOME OF THE NARROW STREETS SHOW THE WATER MAIN CLOSER TO THE EDGE OF PAVEMENT, BUT WOULD REQUIRE THE WATER MAIN TO BE CONSTRUCTED OF PVC OR HDPE PIPE AND LIMITED TO 12 INCH DIAMETER OR SMALLER. CARE MUST BE TAKEN TO ENSURE THE HYDRANT VALVE BOX IS INSTALLED OUTSIDE THE CONCRETE CURB AND GUTTER PAN AND MAY REQUIRE THE USE OF AN ANCHOR TEE TO ELIMINATE THE 30 INCH SPACER PIPE.
B. WHILE THE DEPTH OF THE WW MAINS WILL VARY, THEY ARE GENERALLY SHOWN AT A MAXIMUM DEPTH OF 12 FEET TO SHOW A SOLUTION FOR MORE TYPICAL PROJECTS.
C. THE WW LINE SHALL NOT BE INSTALLED DEEPER THAN 20 FEET, UNLESS SPECIAL CIRCUMSTANCES EXIST. THOSE DESIGNS WILL REQUIRE A MORE DETAILED REVIEW AND SPECIFIC APPROVAL BY COLORADO SPRINGS UTILITIES.
D. THE PREFERRED LOCATION OF THE STORM SEWER MAIN IS SHOWN ON THE DRAWINGS BUT THE LOCATION MAY VARY DEPENDING ON MULTIPLE DESIGN FACTORS. THE FINAL LOCATION OF THE STORM SEWER MAIN WILL BE APPROVED BY CITY ENGINEERING.
E. SPACE IS ALLOWED ON EITHER SIDE OF THE ROAD FOR GAS AND ELECTRIC LINES AS SHOWN ON THE CROSS SECTIONS. THE TELECOMMUNICATIONS LINES CAN BE INSTALLED BETWEEN THE SIDEWALK AND THE GAS AND ELECTRIC LINES.
NOTES:

1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, A MINIMUM OF 6 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE.

2. THE WASTEWATER MAIN SHALL BE INSTALLED IN THE MIDDLE OF THE DRIVE LANE DEPICTED ABOVE, WITH A MAXIMUM COVER OF 20 FT OVER THE PIPE.

3. GAS AND ELECTRIC MAINS ARE USUALLY INSTALLED IN A JOINT TRENCH BEHIND THE CURB. WHEN THE GAS PRESSURE IS GREATER THAN 60 PSI THE GAS LINE IS INSTALLED, AT A DEPTH OF 4 FT, 10 FT FROM THE EDGE OF THE STORM SEWER MAIN.


5. THE STORM SEWER MAY BE LOCATED IN THE MEDIAN FOR SHORT RUNS BETWEEN INLETS IF THIS LEADS TO A MORE EFFICIENT DESIGN. IF THIS LOCATION IS PROPOSED, THE DESIGN REQUIREMENTS FOR MATERIAL, SIZE AND SEPARATION FROM WASTEWATER WOULD BE THE SAME AS ON DETAIL DRAWING C1-5.

6. IN THE CASE THAT THE STORM SEWER IS REQUIRED TO BE 60" OR LARGER, IT MUST BE COORDINATED WITH COLORADO SPRINGS UTILITIES-FIELD ENGINEERING. SMALLER SIZES ARE REVIEWED ONLY BY CITY ENGINEERING.
NOTES:

1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, A MINIMUM OF 6 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE.

2. THE WASTEWATER MAIN SHALL BE INSTALLED IN THE MIDDLE OF THE DRIVE LANE DEPICTED ABOVE, WITH A MAXIMUM COVER OF 20 FT OVER THE PIPE.

3. GAS AND ELECTRIC MAINS ARE USUALLY INSTALLED IN A JOINT TRENCH BEHIND THE CURB. WHEN THE GAS PRESSURE IS GREATER THAN 60 PSI, THE GAS LINE IS INSTALLED AT A DEPTH OF 4 FT, 10 FT FROM THE EDGE OF THE STORM SEWER MAIN.


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1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, A MINIMUM OF 6 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE.

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6. IN THE CASE THAT THE STORM SEWER IS REQUIRED TO BE 60" OR LARGER, IT MUST BE COORDINATED WITH COLORADO SPRINGS UTILITIES - FIELD ENGINEERING, SMALLER SIZES ARE REVIEWED ONLY BY CITY ENGINEERING.
NOTES:

1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, THE CENTERLINE SHOULD BE 3 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE. THE TYPICAL WATER MAIN INSTALLED IS 8" OR 12" AND CONSTRUCTED OF PVC OR HDPE. ANCHOR TEES MUST BE USED FOR HYDRANT TEES, ELIMINATING THE 30" SPACER PIPE, TO KEEP THE HYDRANT VALVE OUT OF THE GUTTER PAN.

2. THE WASTEWATER MAIN SHALL BE INSTALLED IN THE CENTER OF PAVEMENT AS DEPICTED ABOVE, WITH A MAXIMUM COVER OF 20 FT OVER THE PIPE.

3. IF STORM SEWER IS LOCATED LESS THAN 10 FT FROM THE WASTEWATER MAIN OUTSIDE DIAMETER TO OUTSIDE DIAMETER, THE MATERIAL OF THE STORM SEWER WILL BE EVALUATED ON A CASE BY CASE BASIS. REVIEWS WILL BE CONDUCTED BY CITY ENGINEERING AND COLORADO SPRINGS UTILITIES.
NOTES:

1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, THE CENTERLINE SHOULD BE 5 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE.
2. THE WASTEWATER MAIN SHALL BE INSTALLED IN THE CENTER OF PAVEMENT AS DEPICTED ABOVE, WITH A MAXIMUM COVER OF 20 FT OVER THE PIPE.
3. IF STORM SEWER IS LOCATED LESS THAN 10 FT FROM THE WASTEWATER MAIN OUTSIDE DIAMETER TO OUTSIDE DIAMETER, THE MATERIAL OF THE STORM SEWER WILL BE EVALUATED ON A CASE BY CASE BASIS. REVIEWS WILL BE CONDUCTED BY CITY ENGINEERING AND COLORADO SPRINGS UTILITIES.
NOTES:

1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, THE CENTERLINE SHOULD BE 4 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE.

2. THE WASTEWATER MAIN SHALL BE INSTALLED IN THE CENTER OF PAVEMENT AS DEPICTED ABOVE, WITH A MAXIMUM COVER OF 20 FT OVER THE PIPE.

3. ATTACHED AND DETACHED SIDEWALK ARE SHOWN VISUALLY ON OPPOSITE SIDES OF THE STREET. THE CURB TYPE AND THE LOCATION OF THE SIDEWALK HAS NO IMPACT ON THE LOCATION OF THE WET UTILITY MAINS.

4. IF THE STORM SEWER IS LOCATED LESS THAN 10 FT FROM THE WASTEWATER MAIN OUTSIDE DIAMETER TO OUTSIDE DIAMETER, THE MATERIAL OF THE STORM SEWER WILL BE EVALUATED ON A CASE BY CASE BASIS. REVIEWS WILL BE CONDUCTED BY CITY ENGINEERING AND COLORADO SPRINGS UTILITIES.

5. DETAIL DRAWING C1-9 MAY BE APPLIED TO THIS STREET CROSS SECTION WHEN STORM SEWER IS NOT PRESENT.
NOTES:

1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, THE CENTERLINE SHOULD BE 3 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE. THE TYPICAL WATER MAIN INSTALLED IS 8" OR 12" AND CONSTRUCTED OF PVC OR HDPE. ANCHOR TEES MUST BE USED FOR HYDRANT TEES, ELIMINATING THE 30" SPACER PIPE, TO KEEP THE HYDRANT VALVE OUT OF THE GUTTER PAN.

2. THE WASTEWATER MAIN SHALL BE INSTALLED IN THE CENTER OF PAVEMENT AS DEPICTED ABOVE, WITH A MAXIMUM COVER OF 20 FT OVER THE PIPE.

3. IF THE STORM SEWER IS LOCATED LESS THAN 10 FT FROM THE WASTEWATER MAIN OUTSIDE DIAMETER TO OUTSIDE DIAMETER, THE MATERIAL OF THE STORM SEWER WILL BE EVALUATED ON A CASE BY CASE BASIS. REVIEWS WILL BE CONDUCTED BY CITY ENGINEERING AND COLORADO SPRINGS UTILITIES.

4. DETAIL DRAWING C1-9 MAY BE APPLIED TO THIS STREET CROSS SECTION WHEN STORM SEWER IS NOT PRESENT.
NOTES:

1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, THE CENTERLINE SHOULD BE A MINIMUM OF 4 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE.
2. THE WASTEWATER MAIN SHALL BE INSTALLED 6 FT FROM THE EDGE OF PAVEMENT, AS DEPICTED ABOVE, WITH A MAXIMUM COVER OF 20 FT OVER THE PIPE.
3. THE STORM SEWER LOCATION WILL BE EVALUATED ON A CASE BY CASE BASIS BY CITY ENGINEERING AND COLORADO SPRINGS UTILITIES.
4. THIS DETAIL DRAWING MAY BE APPLIED TO THE STREET CROSS SECTIONS ON DETAIL DRAWINGS C1-7 AND C1-8 WHEN STORM SEWER IS NOT PRESENT.
NOTES:

1. THE WATER MAIN SHOULD BE INSTALLED ON THE NORTH OR EAST SIDE OF THE STREET, THE CENTERLINE SHOULD BE A MINIMUM OF 6 FT FROM THE EDGE OF PAVEMENT WITH 5 FT TO 6 FT OF COVER OVER THE PIPE.
2. THE WASTEWATER MAIN SHALL BE INSTALLED IN THE CENTER OF PAVEMENT AS DEPICTED ABOVE, WITH A MAXIMUM COVER OF 20 FT OVER THE PIPE.
3. GAS AND ELECTRIC MAINS ARE USUALLY INSTALLED IN A JOINT TRENCH BEHIND THE CURB. WHEN THE GAS PRESSURE IS GREATER THAN 60 PSI THE GAS LINE IS INSTALLED, AT A DEPTH OF 4 FT, 10 FT FROM THE EDGE OF THE STORM SEWER MAIN.
4. IF THE STORM SEWER IS LOCATED 10 FT OR LESS FROM THE WASTEWATER MAIN OUTSIDE DIAMETER TO OUTSIDE DIAMETER, THE MATERIAL OF THE STORM SEWER SHALL BE EVALUATED ON A CASE BY CASE BASIS, BASED ON SOIL TYPES AND LOCATION OF GROUNDWATER, BY CITY ENGINEERING AND COLORADO SPRINGS UTILITIES.
MANDATORY DESIGN REQUIREMENTS:

1. All drive aisles and utility installations shall be in accordance with city specifications and the Colorado Springs Utilities’ line extension & service standards.
2. The gas main may be centered in the drive aisle as directed by Colorado Springs Utilities Field Engineers.
3. Electric conduit is required for all secondary service conductors. The developer/contractor shall provide and install the secondary services with the approval and inspection by Colorado Springs Utilities Field Engineers.
4. Adequate space for transformers shall be provided outside the drive aisle and the location of the transformer must be approved by Colorado Springs Utilities Field Engineers. Reference the electric line extension & service standards.
5. Bollards are required for the protection of gas meters and transformers. Reference the gas line extension & service standards.

WASTEWATER:

1. The diameter of the wastewater main shall not be greater than 8 inches.
2. The maximum depth of the wastewater main shall not be greater than 14 feet measured from final grade (pavement) to the wastewater pipe invert.
3. Colorado Springs Utilities-approved, load-rated, slip type valve box top sections are required over standard wastewater service line cleanouts. Valve box tops to be marked with “sewer”. Cleanout lids shall be recessed 3-4” below final grade. See detail below.

WATER:

1. The diameter of the water main shall be not greater than 8 inches.
2. Colorado Springs Utilities-approved, load-rated, slip type valve box top sections are required over standard water stop boxes. Curb stop lid shall be recessed 3-4 inches below final grade. Valve box tops to be marked with “water”. See detail below.

NOTE:

1. The utility service plan for the proposed townhouse development shall show the project-specific location of all utilities and appurtenances shown on drawings C1-12 and C1-13. Approval shall be on a case by case basis.
NOTES:

THE DRIVE AISLE RESTRICTIONS:

1. NO STORM DRAIN FACILITIES
2. NO SIDEWALKS
3. NO STREET LIGHTS
4. NO TRANSFORMERS
5. NO PARKING
6. NO EDIFICE (BUILDING) PROJECTIONS IN THE UTILITY EASEMENT, (I.E. DECKS) WITH THE EXCEPTION FOR THE ROOF SOFFITT.
7. THE CURB STOP SHALL BE LOCATED WITHIN THE ASPHALT, A MINIMUM OF 2 FEET FROM THE EDGE OF ASPHALT.

TO BE READ IN CONJUNCTION WITH NOTES ON SHEET C1-11 AND C1-13
**NOTES:**

1. GAS AND ELECTRIC LOCATED IN JOINT TRENCH PER CROSS SECTIONS.
2. THE MINIMUM HORIZONTAL CLEARANCE BETWEEN THE WATER SERVICE AND GAS OR ELECTRIC SERVICE LINE MUST BE 3 FEET.
3. WHERE THE DRIVEWAY IS LESS THAN 14 FEET, THE CURB STOP SHALL BE LOCATED IN THE DRIVE AISLE, A MINIMUM OF 2 FEET FROM THE EDGE OF ASPHALT OR THE BACK OF CURB AND GUTTER.
4. THE CURB STOP SHALL BE LOCATED WITHIN THE ASPHALT A MINIMUM OF 2 FEET FROM THE EDGE OF ASPHALT.

**TYPICAL DESIGN FOR SERVICES FOR A TOWNHOUSE PUD**

**UTILITIES PLAN VIEW**

**TO BE READ IN CONJUNCTION WITH NOTES ON SHEET C1-11 AND C1-12**
NOTE:

1. TRENCH BACKFILL SHALL CONFORM TO THE SPECIFICATIONS OF THE AUTHORITY HAVING JURISDICTION AND ASTM D2321.
NOTES:

1. COLORADO SPRINGS UTILITIES USES A 1.25 SAFETY FACTOR FOR DIP SLIP JOINT DEFLECTION FROM THE MANUFACTURER'S ALLOWABLE DEFLECTION.
2. SDR 35 PVC SHALL NOT BE DEFLECTED WITHOUT THE USE OF FABRICATED 3' BENDS.
3. MINIMUM RADIUS FOR DIP AND SDR 35 PVC SHALL BE 100'.

<table>
<thead>
<tr>
<th>PIPE SIZE AND MATERIAL</th>
<th>ALLOWABLE DEFLECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; - 12&quot; DIP</td>
<td>4'00'</td>
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<tr>
<td>4&quot; - 36&quot; SDR 35 PVC</td>
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<tr>
<td></td>
<td>100'</td>
</tr>
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</table>

MINIMUM RADIUS FOR DIP AND PVC PIPE
TRACER WIRE TO BE ACCESSIBLE FOR TESTING FROM MANHOLE LID

INSTALL TRACER WIRE BETWEEN RING AND CONE SECTION

TRACER WIRE TO BE TAPE ON OUTSIDE OF EVERY SECTION

TRACER WIRE; MUST BE TAPED TO TOP OF PIPE EVERY 3-4 FEET

WASTEWATER SERVICE LINE

TRACER WIRE

WASTEWATER MAIN

SPLIT BOLT WIRE NUT AT SPLICES ALONG WASTEWATER MAINS AND AT WASTEWATER SERVICE LINES

TRACER WIRE ON PVC OR HDPE PIPE

DATE: 5/2015
NOTES:

1. THE DESIGN ENGINEER SHALL VERIFY THAT THE SIZE OF THE CASING PIPE WILL MEET THE NEEDS OF THE PROJECT.
2. CASING WALL THICKNESS BASED ON E80 LOADING.
3. CASING SHALL BE STEEL PIPE WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI.
4. SEE DETAIL DRAWING C2-5 FOR CASING SPACER DETAILS.
5. WHERE THE WASTEWATER MAIN CROSSES ABOVE A WATER MAIN, SEE SECTION 2.5.F.3.
6. WHERE THE WASTEWATER MAIN CROSSES UNDER A RAILWAY OR MAJOR ROADWAY, THE LENGTH OF CASING AND ITS PROPERTIES SHALL BE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.
CARRIER PIPE:
1. CARRIER PIPE SHALL BE CENTERED WITHIN CASING BY USE OF APPROVED CASING SPACERS. (SEE CHAPTER 4)

PLACEMENT OF SPACERS ON CARRIER PIPE:
1. CASING SPACERS SHALL BE PLACED MAX. 2' FROM EACH END OF CASING AND ON EITHER SIDE OF EACH BELL. WHEN CARRIER PIPE IS PVC, CASING SPACER SHALL BE PLACED AT THE HOME MARK TO PREVENT OVER-BELLING. SPACERS SHALL ALSO BE PLACED HALF WAY BETWEEN PIPE ENDS, OR IN ACCORDANCE WITH PIPE MANUFACTURERS RECOMMENDATIONS.

END SEALS:
1. END SEALS SHALL BE USED TO ENSURE A WATER TIGHT SEAL ON EITHER END OF THE CASING.

CATHODIC PROTECTION:
1. CASING SHALL BE CATHODICALLY PROTECTED USING A 17 LB HIGH POTENTIAL ANODE AND AN APPROVED COATING. SEE SECTION 2.5.6.
DETAIL A

SADDLE TO SUPPORT EXISTING/PROPOSED UTILITY (1/2" MIN. THICKNESS)

12"x12" PIER CAP

ANCHOR ADAPTER

WELDS

UTILITY

HELICAL PIER

CATHODICALLY PROTECT BETWEEN DISSIMILAR METALS WITH A COATING OR WRAPPER SECTION PER SECTION 2.5.G.

EXISTING/PROPOSED UTILITY MAIN

FLOWFILL REQUIRED WHEN LESS THAN 18"

UTILITY MAIN

HELICAL PIER

INSTALLED UNTIL REQUIRED TORQUE & HOLDING CAPACITY IS OBTAINED

ENLARGED DETAIL OF SUPPORT

NOTE: HELICAL PIERS SHALL BE DESIGNED BY DESIGN ENGINEER.

DETAIL B

FINAL GRADE

UTILITY OR DRAINAGE STRUCTURE

FLOWFILL REQUIRED WHEN LESS THAN 18"

UTILITY MAIN

ANCHOR ADAPTER

HELICAL PIER (SINGLE/DUAL ANCHOR)

INSTALL 17 LB ANODE FOR EACH METALLIC BRIDGING SUPPORT

INSTALLED UNTIL REQUIRED TORQUE & HOLDING CAPACITY IS OBTAINED

NOTES:
1. ALL METALLIC STRUCTURE AND PIPE SHALL BE CATHODICALLY PROTECTED PER SECTION 2.5.G.
FLOWFILL DETAIL
(WHEN VERTICAL CLEARANCE IS LESS THAN 18")

PLACE POLYETHYLENE TUBING BETWEEN PIPE AND CONCRETE

SELECT BEDDING

SELECT BEDDING

18" MIN. INTO UNDISTURBED SOIL

*FLOWFILL REQUIRED WHEN LESS THAN 18"

CONCRETE W/#6 REBAR 12" O.C.

NOTES:
1. NO JOINTS OF UTILITY MAIN SHALL BE ALLOWED BETWEEN CONCRETE BRIDGING BLOCKS.
2. CONCRETE AND REINFORCEMENT MATERIALS SHALL BE IN ACCORDANCE WITH CHAPTER 4.

LIMITS OF FLOWFILL

PLACE POLYETHYLENE TUBING BETWEEN PIPE AND CONCRETE

FLOWFILL TO SPRINGLINE OF UPPER UTILITY & FLOWFILL TO SUPPORT LOWER UTILITY

FLOOR FILL DETAIL (WHEN VERTICAL CLEARANCE IS LESS THAN 18")

NOTES:
1. ALL FLOWABLE-FILL SHALL BE IN CONFORMANCE WITH CHAPTER 4.
2. SEE SECTION 2.5.F.3 FOR UTILITY CROSSING REQUIREMENTS.
CONCRETE ENCASEMENT DETAIL WITH CAISSON

TYPICAL STREAM CROSSING CROSS SECTION

SLOPE ENCASEMENT AT 1.0% TOWARD CENTER (TYP)

MIN. 1' OF CREEK BED

FLOW

CAISSON CROSS SECTION

PROPOSED STREAM IMPROVEMENTS SHALL MAINTAIN A MINIMUM CREEK BED OF 1' ABOVE THE ENCASEMENT

SEE DETAIL DRAWING C2-9 FOR CONCRETE ENCASEMENT DETAIL

CAISSON REBAR, SPACING, SIZE AND MATERIAL SHALL BE SPECIFIED BY STRUCTURAL ENGINEER

NOTES:
1. EXAMPLE CAN VARY DUE TO SITE CONDITIONS AND COLORADO SPRINGS UTILITIES’ REQUIREMENTS.
2. ALL STREAM CROSSINGS SHALL BE REVIEWED AND APPROVED BY THE CITY ENGINEER.
L Bracket Detail

The low point of the encasement shall be located at the center of the channel base width.

Slope Encasement toward channel CL @ 1%

Proper corrosion protection required.

Cut away to reveal rebar detail.

#6 Stirrups perpendicular to main reinforcement on 12" centers lap min. 12"

Cut away to reveal rebar detail.

#6 Min. Steel reinforcement bars parallel to pipeline, entire length of concrete encasement on 6" centers, number of bars varies depending upon the dia. of the pipe. Overlap shall be 36 x's the bar dia.

Concrete Encasement Detail

Without Caisson

#6 Bar welded to 4"x4" L Bracket @ 12" o.c.
(1/2" anchor bolt may be used)

Lined steel or ductile iron pipe polywrapped and bonded prior to placement of concrete.

#6 Rebar set on 12" centers

#6 Rebar set on 6" centers

Dimension equal to pipe O.D.

12" min. (height varies)

12" min.

12" min.

12" min.
NOTES:

1. EXAMPLE CAN VARY DUE TO SITE CONDITIONS AND COLORADO SPRINGS UTILITIES’ REQUIREMENTS.
2. SEE CHAPTER 2 FOR COMPUTATION OF FREEBOARD.
3. ALL PIPES SHALL BE LOCATED ABOVE THE 100-YEAR WATER SURFACE ELEVATION PLUS THE COMPUTED FREEBOARD.
4. AERIAL CROSSINGS ABOVE A DRAINAGE WAY SHALL ALSO BE REVIEWED AND APPROVED BY CITY ENGINEERING.
5. ALL EXPOSED STEEL SHALL BE COATED WITH 25 MILS OF A POLYURETHANE COMPLYING WITH AWWA C-222 AND 3–6 MILS OF AN ALIPHATIC COATING THAT MATCHES THE SURROUNDING ENVIRONMENT.

TYPICAL AERIAL PIPELINE CROSSING
TYPICAL ACCESS ROAD
CROSS SECTION

TEEE OR Y CONFIGURATION
REQUIRED IF ACCESS ROAD
EXCEEDS 200' IN LENGTH

16' (TYP.)
60' MIN.
16'

30'R
(TYP.)

30' ACCESS
EASEMENT

7' CLEAR
(TYP.)

16' ACCESS
DRIVE

STREET

WASTEWATER MAIN

VARIES WITH SITE
REQUIREMENTS

DRIVING SURFACE SHALL BE
CONSTRUCTED TO CARRY
HS-20 LOADING

ACCESS FROM STREET NEEDS
TO BE APPROVED BY THE
AUTHORITY HAVING JURISDICTION

16' ACCESS RD

30' EASEMENT

ROAD SLOPE
VARIES

ALTERNATE "Y"
CONFIGURATION
FOR TURNAROUND

120 Degrees
60' MIN.

30'R
(TYP.)

TYPICAL ACCESS ROAD
CROSS SECTION
NOTES:

1. EXAMPLE CAN VARY DUE TO SITE CONDITIONS AND COLORADO SPRINGS UTILITIES INSPECTORS' DIRECTIONS.
2. IF A BY-PASS SYSTEM PLAN OR FLOW MANAGEMENT PLAN IS NEEDED, IT SHALL BE REVIEWED AND APPROVED BY COLORADO SPRINGS UTILITIES, PRIOR TO DESIGN APPROVAL. THE CONTRACTOR SHALL HAVE 100% REDUNDANT PUMPING CAPACITY WITH 24 HOUR SUPERVISION DURING ALL PUMPING OPERATIONS.
3. SEE CHAPTER 5 FOR ADDITIONAL INFORMATION ON BYPASS SYSTEM REQUIREMENTS.
8" SDR 35 PIPE  
MAXIMUM SAG DEPTH

12" SDR 35 PIPE  
MAXIMUM SAG DEPTH
NOTES:

1. DRAWING IS FOR SCHEMATIC PURPOSES ONLY. SEE CHAPTER 7 FOR ADDITIONAL DETAILS.
2. SUBMERSIBLE PUMPS MAY BE CONSIDERED BY COLORADO SPRINGS UTILITIES ON A CASE BY CASE BASIS FOR PUBLIC LIFT STATIONS THAT RECEIVE LESS THAN 250,000 GALLONS PER DAY.
NOTES:

1. APPROVED METHODS OF RESTRAINED PIPE SHALL BE IN ACCORDANCE WITH CHAPTER 4.
THE MANHOLE OPENING SHALL BE CENTERED OVER THE OUTLET PIPE

RIM ELEVATION SHALL MATCH FINAL GRADE EXCEPT IN NON–TRAFFIC AREAS, WHERE IT SHALL BE 6" ABOVE FINAL GRADE

GRADE ADJUSTMENT RINGS SHALL NOT EXCEED 8"

12" OR 16" MANHOLE ADJUSTMENT RING REQUIRED FOR ALL PRECAST MANHOLE CONES, TONGUE AND GROOVE SECTION

RAM NEK OR EQUAL FOR SEALING ALL SECTIONS, GRADE RINGS, MANHOLE RINGS AND COVER

WALL THICKNESS VARIES WITH MANHOLE DIAMETER

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<tr>
<th>DIAM</th>
<th>MIN. WALL THICKNESS</th>
<th>MIN. BASE THICKNESS (A)</th>
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<tbody>
<tr>
<td>4'</td>
<td>4&quot;</td>
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<tr>
<td>5'</td>
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<td>8&quot;</td>
</tr>
<tr>
<td>6'</td>
<td>6&quot;</td>
<td>8&quot;</td>
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</tbody>
</table>

MANHOLE BENCHING SHALL BE TO CROWN OF PIPE, SLOPE BENCHING NOT LESS THAN 1/2" PER FOOT OR MORE THAN 1−1/2" PER FOOT

WIDTH SHALL PREVENT BUOYANCY

#4 REBARS, 12" O.C. EACH WAY

COMPACTED BASE MATERIAL

NOTES:

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI @ 28 DAYS AND DESIGNED FOR HS−20 LOADING CONDITIONS.
2. ALL CONCRETE SHALL BE MECHANICALLY VIBRATED.
3. FOR CAST IN PLACE MANHOLES, DO NOT DROP CONCRETE A DISTANCE OF MORE THAN 5' UNLESS APPROVED BY COLORADO SPRINGS UTILITIES.
4. 3/4" CRUSHED ROCK REQUIRED UNDER BASE TO A DEPTH OF 6" UP TO SPRINGLINE OF PIPE, 2'−3' RADIUS AROUND BASE.
5. ALL STEPS SHALL BE REMOVED FOLLOWING CONSTRUCTION. SEE SECTION 4.2.H.1.
6. STRUCTURAL REINFORCEMENT SHALL COMPLY TO ASTM C−478. ASTM C−478 SHALL BE STAMPED ON THE OUTSIDE OF THE MANHOLE.
TYPICAL INTERSECTING PIPE MANHOLE LAYOUTS

NOTES:
1. SEE DETAIL DRAWING C3-1 FOR MANHOLE REQUIREMENTS.
2. LAYOUTS SHOWN ARE FOR 8”-12” PIPES; LAYOUTS FOR LARGER DIAMETER PIPELINES AND MANHOLES SHALL BE
   DESIGNED BY THE DESIGN ENGINEER AND APPROVED BY COLORADO SPRINGS UTILITIES.
3. TO BE READ IN CONJUNCTION WITH CHAPTER 2, MANHOLE SIZES.
NOTES:

1. SEE DETAIL DRAWING C3-1 FOR MANHOLE REQUIREMENTS.

CORE DRILLING INTO AN EXISTING MANHOLE
If stub-out is abandoned, the pipe shall be removed and the hole sealed with a watertight/airtight mechanical plug or non-shrink grout.

Mechanical plug shall be tethered and bolted to the wall of the manhole. Mechanical plugs shall bear the name of the contractor.

Watertight/airtight mechanical plug or non-shrink grout until upstream manhole is installed.

Future extension of stub-out.
NOTES:

1. SEE DETAIL DRAWING C3-1 FOR MANHOLE REQUIREMENTS.
2. STRAIGHT THROUGH MANHOLES THAT HAVE A PIPE COMING IN AT 15% OR MORE REQUIRE TALL BENCHING ON BOTH SIDES.

HIGH VELOCITY PROTECTION
FOR INCOMING SLOPES;
15% OR GREATER
NOTES:

1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.
2. DROP MANHOLES ARE NOT ALLOWED ON 10" AND LARGER PIPELINES. DROP MANHOLES SHALL BE REVIEWED AND APPROVED ON A CASE BY CASE BASIS BY WASTEWATER PLANNING AND ENGINEERING STAFF.
3. ALL INTERIOR CONCRETE SURFACES SHALL BE EPOXY COATED. CONCRETE SHALL BE FULLY CURED PRIOR TO COATING (TYPICAL 30 DAYS).
4. MINIMUM SIZE FOR A DROP MANHOLE IS 5' DIAMETER MANHOLE.
5. MANHOLES WITH 8' OR LESS OF INTERNAL DROP SHALL HAVE ONE STRAP AT THE TOP AND ONE AT THE BOTTOM OF THE DROP SECTION.
6. 1/4" – 2" STRAPS TO BE ANCHORED WITH 1/2" GALVANIZED LUG BOLTS IN TO WALL (TYP).
NOTES:

1. SEE DETAIL DRAWING C3-1 FOR MANHOLE REQUIREMENTS.
NOTES:
1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.
2. FLUME SHALL BE PALMER–BOWLUS STYLE AND SHALL BE INSTALLED PER MANUFACTURER INSTRUCTIONS.

C3–8
NOTES:

1. SEE CHAPTER 4 FOR ADDITIONAL INFORMATION AND SPECIFIC DIMENSIONS.
NOTES:

1. SEE CHAPTER 4 FOR ADDITIONAL INFORMATION AND SPECIFIC DIMENSIONS.
2. BOLT DOWN AND LOCKING MANHOLE RING AND COVERS SHALL ONLY BE INSTALLED IN LOCATIONS APPROVED BY COLORADO SPRINGS UTILITIES.
3. LOCKDOWN BOLTS PROVIDED BY COLORADO SPRINGS UTILITIES.

COLORADO SPRINGS UTILITIES
IT'S NOT JUST ALL NATURAL

BOLT DOWN AND LOCKING MANHOLE RING AND COVER IN TRAFFIC AREAS

DATED 5/2015
HINGED MANHOLE RING AND COVER
IN NON TRAFFIC AREAS

NOTES:

1. SEE CHAPTER 4 FOR ADDITIONAL INFORMATION AND SPECIFIC DIMENSIONS.
2. COVER TO BE MARKED WITH THE WORD "WASTEWATER".
3. HINGED MANHOLE RING AND COVER MAY VARY FROM DETAIL DRAWING, REFERENCE APPROVED MANUFACTURER'S SPECIFICATIONS.
RESTAURANT CONNECTION SCHEMATIC

NOTES:

1. SIZE OF GREASE INTERCEPTOR TO BE DETERMINED BY DESIGN ENGINEER AND APPROVED BY COLORADO SPRINGS UTILITIES.
2. TO BE READ IN CONJUNCTION WITH CHAPTER 2.
3. TO BE READ IN CONJUNCTION WITH THE INTERNATIONAL PLUMBING CODE.
4. THE GREASE INTERCEPTOR SHALL BE INSTALLED A MAXIMUM OF 50' FROM THE LAST FIXTURE.

COLORADO SPRINGS UTILITIES
It's how we're all connected

DATED 1/2017
NOTES:
1. TO BE READ IN CONJUNCTION WITH CHAPTER 2.
2. TO BE READ IN CONJUNCTION WITH INTERNATIONAL PLUMBING CODE.
3. WHENEVER PRACTICAL, THE TWO VENTS SHALL BE RUN UNDERGROUND TO THE BUILDING AND UP THROUGH THE ROOF. VENTS SHALL BE LOCATED AWAY FROM BUILDING AIR INTAKES.
4. INTERIOR PIPING TO BE STRAPPED AT TOP AND BOTTOM WITH GALVANIZED CLAMPS OR EQUAL.
5. SIZE OF GREASE INTERCEPTOR TO BE DETERMINED BY DESIGN ENGINEER AND APPROVED BY COLORADO SPRINGS UTILITIES.
6. UNLESS SPECIFICALLY NOTED HERE, GREASE INTERCEPTORS SHALL CONFORM TO ASTM C1613.
7. RING AND COVER SHALL BE PROVIDED EVERY 10' FOR GREASE INTERCEPTORS LONGER THAN 20'.
PLAN OF TOP SECTION

ISOMETRIC VIEW OF INTERCEPTOR

TYPICAL GREASE INTERCEPTORS

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<tr>
<th>SIZE GALLONS</th>
<th>USE</th>
<th>LENGTH</th>
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APPROX. SIZE OF GREASE INTERCEPTORS
CHECK WITH MANUFACTURER FOR CORRECT DIMENSIONS AND INVERTS

NOTES:
1. TO BE READ IN CONJUNCTION WITH CHAPTER 2.
2. TO BE READ IN CONJUNCTION WITH INTERNATIONAL PLUMBING CODE.
GREASE TRAP TO BE ABANDONED IN-PLACE

INTERIOR FLOOR LEVEL

WATER TIGHT PLUG (TYP.)

NOTE:
GREASE TRAP TO BE ABANDONED IN-PLACE TO BE CLEANED AND PIPES PLUGGED, THEN FILLED WITH GRAVEL, SEE CHAPTER 2

GREASE TRAP TO BE ABANDONED

FINAL GRADE

REMOVE AND DISPOSE OF THE EXISTING REINFORCED ROOF SLAB

THE EXISTING VAULT INTERIOR SHALL BE FILLED COMPLETELY WITH PEA GRAVEL

WIDTH AND DEPTH VARIES

GREASE INTERCEPTOR TO BE ABANDONED

NOTES:
1. TO BE READ IN CONJUNCTION WITH CHAPTER 2.
2. TO BE READ IN CONJUNCTION WITH INTERNATIONAL PLUMBING CODE.
EXAMPLE OF A NON-TRAFFIC RATED SAND/OIL INTERCEPTOR

NOTES:
1. IF THE TOP OF THE SAND & OIL INTERCEPTOR IS MORE THAN 12” BELOW FINISHED GRADE, A 4’ DIAMETER MANHOLE BARREL SECTION(S) WILL BE REQUIRED TO BRING RING AND COVER TO GRADE.
2. SIZE OF SAND/OIL INTERCEPTOR TO BE DETERMINED BY THE DESIGN ENGINEER AND APPROVED BY COLORADO SPRINGS UTILITIES.
3. INTERIOR PIPING TO BE STRAPPED AT THE BOTTOM WITH GALVANIZED CLAMPS, UNISTRUT, OR EQUAL.
4. WHENEVER PRACTICAL, THE TWO VENTS SHALL BE RUN UNDERGROUND TO THE BUILDING AND UP THROUGH THE ROOF. VENTS SHALL BE LOCATED AWAY FROM BUILDING AIR INTAKE.
5. VENTS SHALL BE CONSTRUCTED ON THE OUTSIDE OF THE TANK.
6. TO BE READ IN CONJUNCTION WITH CHAPTER 2 OF THE WASTEWATER LINE EXTENSION AND SERVICE STANDARDS.
7. RING AND COVER SHALL BE PROVIDED EVERY 10’ FOR SAND/OIL INTERCEPTORS LONGER THAN 20’.

THE INFLOW PIPE SHALL BE A MINIMUM OF 2” OR A MAXIMUM OF 4” ABOVE THE EFFLUENT PIPE ELEVATION PER ASTM C1613

IF BAFFLE IS TALLER THAN LIQUID DEPTH, IT SHALL INCLUDE AN OPENING OF 50 SQUARE INCHES OR MORE.
**Alternate Backwater Valve Manhole**

1. Car wash recycle/sand-oil interceptor to be read in conjunction with Chapter 2.
2. Backwater (backflow) valve for wastewater service line, see Chapter 4.
SINGLE/AUTO BAY UNIT

CATCH BASIN

CLEANOUTS

SAND/OIL INTERCEPTOR, SEE DETAIL DRAWING C4–5

SAMPLE TEE

CLEANOUTS

BACKWATER VALVE, SEE DETAIL DRAWING C4–6

DOMESTIC WASTEWATER SERVICE LINE, (IF APPLICABLE) AFTER BACKWATER VALVE

WASTEWATER MAIN

NOTES:

1. DRAWING IS JUST A SCHEMATIC AND CONFIGURATION OF CAR–WASH LAYOUT MAY VARY FROM THIS DRAWING.
NOTES:
1. DRAWING IS JUST A SCHEMATIC AND CONFIGURATION OF CAR-WASH LAYOUT MAY VARY FROM THIS DRAWING.
2. WATER RECYCLING EQUIPMENT AND PUMP SIZES TO BE DETERMINED BY MECHANICAL CONTRACTOR/PLUMBING SUPPLIER/VENDOR.
FIELD INSTALLATION OF POLYETHYLENE TUBING FOR DIP PIPE AND FITTINGS

STEP 1:
PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO TRENCH.

<table>
<thead>
<tr>
<th>TABLE 1</th>
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<tbody>
<tr>
<td>SUITABLE CONDUCTOR SIZES FOR JOINT BONDING OF DUCTILE IRON PIPE</td>
</tr>
<tr>
<td>PIPE SIZE (IN)</td>
</tr>
<tr>
<td>8 TO 14</td>
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<tr>
<td>16 TO 36</td>
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<tr>
<td>42 TO 64</td>
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</tbody>
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STEP 2:
INSTALL BONDING STRAP OR WIRE AT EVERY JOINT OF PIPE PRIOR TO WRAPPING. PULL TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO END AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

STEP 3:
OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL FOLDED ON TOP OF PIPE AND TAPED IN PLACE.

NOTES:
1. ANY TEARS OR HOLES SHALL BE REPAIRED WITH POLYETHYLENE TUBING AND TAPE.
2. WHEN WORKING AROUND EXISTING POLY WRAPPED PIPE, ANY TEARS AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED.
3. WHEN WORKING AROUND EXISTING BONDED PIPE, ANY BROKEN BONDS AS A RESULT OF CONSTRUCTION, SHALL BE REPAIRED.
NOTES:

1. THERMITE WELD ANODE TO PIPE WITH A 15 GRAM CHARGE. INSTALL A COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
2. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
3. PACKED ANODE SHOULD BE COVERED WITH FINE SOIL CONTAINING NO ROCKS OR DIRT CLUMPS AND SHALL BE HAND TAMPED TO THE BOTTOM OF THE PIPE FOR COMPACTION.
4. ANODE WITH BROKEN BAGS SHALL NOT BE USED.
5. ANODES SHALL BE REMOVED FROM PLASTIC PACKAGING.
6. IT IS NOT NECESSARY TO WET THE ANODES.
7. DIP PIPE SHALL BE ENCASED IN POLYETHYLENE TUBING PER DETAIL DRAWING C5-1.
**INSULATOR INSTALLATION**

**C5-3**

Dated 5/2015

**INSULATED MECHANICAL COUPLING**

- **Unprotected Pipe**
- **Insulating Gasket**
- **Pipe Joint**
- **Mechanical Coupling**
- **Polystyrene Tubing** secured with plastic tape.
- **Nut**
- **Zinc End Cap**

**INSULATED MECHANICAL COUPLING (WITH APPROVAL OF COLORADO SPRINGS UTILITIES)**

- **One Piece Plastic Bolt Insulator**
- **Zinc End Cap**
- **Flange Lug**
- **Nut**
- **Steel Washer** (See Note 5)

**NOTES:**

1. Provide insulating kit for applicable flange type and pressure rating.
2. Install double insulating washer set for vault or exposed flanges.
3. Install single insulating washer set for buried or submerged flanges with insulators or wrap on unprotected side of flange.
4. Coat buried or immersed insulating flanges for 12-inches minimum on each side of flange.
5. For pipe less than 36-inches diameter, do not install inner steel washers.
6. Test completed joint for electrical isolation and repair as required.
7. Care should be taken to insure that the tie-back bolts do not, along their length, contact any part of the pipe appurtenances.
8. Insulation kits shall be installed per manufacturer recommendations.
9. Continuity testing shall be accomplished prior to final acceptance.
10. Test stations shall be installed at insulating couplings per detail drawing C5-4.
11. Fill interior gap between flanges with dielectric filler of sealant compatible with specified pipe lining.
12. Extend specified pipe lining to face of flange and coat interior of mortar lined pipe for two pipe diameters with NSF approved epoxy at 20 mils DFT.
NOTES:
1. THE CONTRACTOR SHALL COORDINATE WITH COLORADO SPRINGS UTILITIES TO WIRE THE TERMINAL BOARD.
2. THERMITE WELD WIRES TO PIPE WITH A 15 GRAM CHARGE. INSTALL A COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
3. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
4. THE CONTRACTOR SHALL VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.
TYPICAL DETAIL FOR TEST STATION WITH STEEL SLEEVE INSTALLATION

NOTES:

1. THE CASING SHALL BE CATHODICALLY PROTECTED UNDER THE DIRECTION OF THE COLORADO SPRINGS UTILITIES INSPECTOR. SEE SECTION 2.5.G.
2. EXAMPLE CAN VARY DUE TO SITE CONDITIONS AND COLORADO SPRINGS UTILITIES INSPECTORS' DIRECTION.
3. SEE STANDARD DETAIL DRAWING C2-4 - STEEL CASING INSTALLATION.
4. CONTRACTOR TO COORDINATE W/ COLORADO SPRINGS UTILITIES TO WIRE TERMINAL BOARD.
5. THERMITE WELD WIRES TO PIPE W/ 15 GRAM CHARGE. INSTALL COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
6. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
7. CONTRACTOR TO VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.
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4. THE CONTRACTOR SHALL VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.
5. REMOVE MAGNETIC SWITCH FOR A REMOTE TERMINAL UNIT (RTU).
NOTES:
1. THE CONTRACTOR SHALL COORDINATE WITH COLORADO SPRINGS UTILITIES TO WIRE TERMINAL BOARD.
2. THERMITE WELD WIRES TO PIPE WITH A 15 GRAM CHARGE. INSTALL A COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
3. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
4. THE CONTRACTOR SHALL VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.
5. COLOR CODE WIRE INSULATION AS SHOWN IN APPLICABLE TEST STATION DETAILS. CONNECT EACH TEST WIRE TO SEPARATE TERMINAL.
6. WIRE CONFIGURATION FOR FLUSH MOUNT STYLE TEST STATIONS SIMILAR TO POST MOUNT STYLE TEST STATIONS.
7. PROVIDE 18 INCHES SLACK IN TEST WIRES, MINIMUM.

NOTES:
1. TERMINALS SHALL BE 1/4" STAINLESS STEEL W/LOCKING WASHER, TWO FLAT WASHERS, AND DOUBLE NUTS.
2. ALL WIRE CONNECTIONS TO BE W/RING TONGUE COMPRESSION TERMINALS.
3. WIRES ON TEST STATIONS TO BE PERMANENTLY LABELED WITH PIPE IDENTIFICATION (i.e. 12" DIP) USING NYLON WIRE MARKER TAGS.
WASTEWATER MAIN
6" UNDERDRAIN LINE
FLOW

TRENCH DAM
ACTIVE UNDERDRAIN
PASSIVE UNDERDRAIN
10'-0" ACTIVE UNDERDRAIN
FULL SIZE CLEAN-OUT WITH SCREW CAP
TRANSITION FROM PASSIVE TO ACTIVE UNDERDRAIN

MANHOLE
WASTEWATER MAIN
FLOW
12"

45° BENDS (TYP.)

PASSIVE UNDERDRAIN

TRANSITION FROM PASSIVE TO ACTIVE UNDERDRAIN

FINAL GRADE
18" BELOW FINAL GRADE, IRON BODY CLEAN-OUT WITH THREADED PLUG

PROFILE VIEW

WASTEWATER MAIN
6" UNDERDRAIN
MANHOLE BASE

PLAN VIEW
NOTES:

1. TRENCH DAMS ARE REQUIRED AT THE TRANSITION FROM ACTIVE UNDERDRAINS TO PASSIVE UNDERDRAINS.
ACTIVE UNDERDRAIN PIPE

SEE DETAIL DRAWING C2-1 FOR TRENCH BACKFILL

ENGINEERING FABRIC MIRAFI 160N OR EQUAL
GRANULAR FILL ¾" ROCK CONSOLIDATED WITH PLATE TAMPER
WASTEWATER MAIN
FOUNDATION MATERIAL (IF REQUIRED)
6" ACTIVE UNDERDRAIN PERFORATED, SDR 35 PVC OR SCH 40 PVC

PASSIVE UNDERDRAIN PIPE

SEE DETAIL DRAWING C2-1 FOR TRENCH BACKFILL

WASTEWATER MAIN
FOUNDATION MATERIAL (IF REQUIRED)
6" PASSIVE UNDERDRAIN NON-PERFORATED, SDR 35 PVC OR SCH 40 PVC

NOTES:

1. ACTIVE UNDERDRAIN PIPE REQUIRED FOR 10' DOWNSTREAM OF EACH MANHOLE WHERE UNDERDRAINS ARE INSTALLED.
1. DIMENSIONS SHOWN ARE TYPICAL UNLESS OTHERWISE NOTED ON PLANS.
2. EITHER CENTER-OF-LOT INSTALLATION OR SIDE-OF-LOT INSTALLATION ARE ACCEPTABLE AND AT THE ENGINEERS DISCRETION. WATER/WASTEWATER SERVICE LINES SHALL BE PLACED OUT OF THE DRIVEWAY WHEN THE CENTER-OF-LOT CONFIGURATION IS CHOSEN, AND A MINIMUM OF 15' FROM SIDE-LOT-LINE WITH APPLICABLE SEPARATION CRITERIA.
EXAMPLE WASTEWATER SERVICE CONNECTION DETAIL
WITH OPTIONAL BENDS

NOTE: WHEN IT IS KNOWN THAT THE WASTEWATER MAIN IS DEEP AND YOU NEED TO REACH THE CORRECT SERVICE LINE ELEVATION, PLACE ELEVATION CORRECTION BENDS AT EARLIEST POINT FROM THE WASTEWATER MAIN.

EXAMPLE WASTEWATER SERVICE CONNECTION DETAIL
WITHOUT OPTIONAL BENDS

NOTE: SERVICE STUBS DEEPER THAN 12' MAY NEED TO BE EXTENDED AN ADDITIONAL 3' BEYOND THE MINIMUM 9' FROM THE PROPERTY LINE TO ALLOW FOR SAFE EXCAVATION OF THE STUB

NOTES:
1. SERVICE LINE MAY VARY IN DEPTH DUE TO SITE CONDITIONS OR THE CONSTRUCTION OF CRAWL SPACE/BASEMENT UNDER THE HOUSE.
2. DEPTH OF SERVICE LINE TO BE LABELED ON CONSTRUCTION PLANS WHEN KNOWN.
3. DIMENSIONS MAY VARY ACCORDING TO WIDTH OF RIGHT OF WAY (ROW).
CLEAN-OUT CAPS WITH THREADED PLUGS FLUSH WITH FINAL GRADE, TO BE INSTALLED APPROX. 2' FROM FOUNDATION OR PORCH, SEE DETAIL DRAWING D1-4

NOTES:

1. SEE CHAPTER 2 FOR MINIMUM SLOPES OF WASTEWATER SERVICE LINES.
2. TO BE READ IN CONJUNCTION WITH DETAIL DRAWINGS D1-1 AND D1-2.
3. A BEND MAY BE USED TO EXTEND THE SERVICE LINE UPWARD, DEPENDING ON BUILDING FINISHED FLOOR OR BASEMENT ELEVATION AND PER PROPERTY OWNER/DEVELOPERS' DISCRETION.
5. SLOPING, BENCHING AND SHORING SHALL BE PERFORMED FOR ALL EXCAVATIONS IN COMPLIANCE WITH OSHA REGULATIONS.
6. WHERE UNDERDRAIN SERVICE LINES ARE INSTALLED WITH THE WASTEWATER SERVICE LINE, BOTH SHALL BE BROUGHT TO THE SAME ELEVATION ONCE ENTERING THE PROPERTY.
TWO-WAY CLEAN-OUT INSTALLATION

CLEAN-OUT INSTALLATION IN PAVEMENT

NOTES:
1. SINGLE CLEAN-OUT TO BE PLACED AT 100' INTERVALS, TWO-WAY CLEAN-OUTS AT 200' INTERVALS (100' EACH WAY CLEANING).
2. TRACER WIRE TO BE CONTINUOUSLY CONNECTED FROM THE MAIN LINE TO THE CLEAN-OUT LOCATED AT THE BUILDING.
ALTERNATE 1

SEE DETAIL DRAWING C2-1 FOR TRENCH BACKFILL

WATER SERVICE LINE

WASTEWATER SERVICE LINE
(DIP OR SCH 40 PVC)

6" MIN.

3" UNDERDRAIN (OPTIONAL)

12" MIN.

ALTERNATE 2

SEE DETAIL DRAWING C2-1 FOR TRENCH BACKFILL

WATER SERVICE LINE

WASTEWATER SERVICE LINE
(DIP, SCH 40 PVC OR SDR 35 PVC)

3" UNDERDRAIN (OPTIONAL)

12" MIN.

6" MIN.

12" MIN.
NOTES:

1. WHEN THE WASTEWATER MAIN IS VCP, USE THE SDR 35 PVC SADDLE WITH A LARGER SKIRT. SADDLE SHALL BE ONE NOMINAL SIZE LARGER THAN THE WASTEWATER MAIN.
2. PIPE WILL BE CUT WITH AN O.D. HOLE SAW OR TAPPING MACHINE. A 4-1/2" O.D. HOLE SAW SHALL BE USED FOR 4" TAPS AND A 6-1/2" O.D. HOLE SAW SHALL BE USED FOR 6" TAPS.
3. ONLY 4" AND 6" TAP SIZES ARE ALLOWED.
4. WASTEWATER TAPPING SADDLES SHALL HAVE A CENTERING RING.
5. A GASKET SHALL BE USED TO ENSURE AN AIRTIGHT SEAL BETWEEN THE SADDLE AND THE PIPE.
RUBBER GASKET SADDLE - 4" & 6"

RUBBER GASKET NOTE:

1. ALL ELASTOMERIC SEALS (RUBBER GASKETS) SHALL COMPLY WITH ASTM F477.
2. PIPE WILL BE CUT WITH AN O.D. HOLE SAW OR TAPPING MACHINE. A 4-1/2" O.D. HOLE SAW SHALL BE USED FOR 4" TAPS AND A 6-1/2" O.D. HOLE SAW SHALL BE USED FOR 6" TAPS.

3 PIECE TAPPING SERVICE CONNECTION

3 PIECE TAP NOTES:

1. 3 PIECE TAPS MAY BE ALLOWED ON WASTEWATER MAINS WITH APPROVAL FROM COLORADO SPRINGS UTILITIES. 3 PIECE TAPS SHOULD ONLY BE USED FOR WASTEWATER MAINS GREATER THAN 12".
2. THE CONTRACTOR SHALL ENSURE THAT THE CORRECT 3 PIECE TAP HAS BEEN ORDERED TO FIT THE MATERIAL AND DIAMETER OF THE MAIN AND THE MATERIAL AND DIAMETER OF THE TAP. THE 3 PIECE TAP SHALL BE PROVIDED TO THE INSPECTOR FOR APPROVAL PRIOR TO INSTALLATION.
3. 3 PIECE TAPS FOR WASTEWATER MAINS 12" AND LESS WILL REQUIRE THAT THE SERVICE BE CCTV'D AFTER BACKFILL OF THE SERVICE LINE. IF THE INSERT PROTRUDES INTO THE WASTEWATER MAIN GREATER THAN 1/4", THEN THE TAP WILL BE REJECTED AND WILL NEED TO BE REMOVED, REINSTALLED AND RE-CCTV'D.
PVC SERVICE LINE TO HDPE WASTEWATER MAIN

4" OR 6" HDPE SERVICE LINE TO HDPE WASTEWATER MAIN

OPTION FOR 6" HDPE SERVICE LINE TO HDPE WASTEWATER MAIN

NOTES:
1. CONNECTION FROM HDPE TO HDPE CAN BE ACCOMPLISHED USING BUTT FUSION OR ELECTROFUSION COUPLINGS.
HDPE SERVICE LINE TO PVC/DIP/VCP WASTEWATER MAIN

TRANSITION COUPLING, SEE CHAPTER 6

WHEN USING AN ELECTROFUSION COUPLING, FUSE HDPE TO COUPLING

PVC STREET
45° BEND

FLOW

PVC SADDLE

PVC/DIP/VCP WASTEWATER MAIN

D1-9

DATE: 5/2015
SINGLE CLEAN-OUT INSTALLATION

CLEAN-OUT INSTALLATION IN PAVEMENT

NOTES:

1. SINGLE CLEAN-OUT TO BE PLACED AT 100' INTERVALS, TWO-WAY CLEAN-OUTS AT 200' INTERVALS (100' EACH WAY CLEANING).
2. TRACER WIRE TO BE CONTINUOUSLY CONNECTED FROM THE MAIN LINE TO THE CLEAN-OUT LOCATED AT THE BUILDING.
3. SEE CHAPTER 2 FOR MINIMUM SLOPES OF HDPE WASTEWATER SERVICE LINES.
1. If the flexible coupling is "shielded" variety per Chapter 4, no concrete is required around the coupling.
NOTES:

1. THIS DRAWING IS FOR RESIDENTIAL HOME OWNERS WHO WANT TO HAVE A CONNECTION TO THEIR SERVICE LINE.
HOLDING TANK DISPOSAL INSTRUCTIONS
CONNECT HOSE TO HOLDING TANK—PLACE END SECURELY IN DRAIN OPENING WHILE HOLDING COVER OPEN WITH FOOT—OPEN TRAILER TANK VALVE—FLUSH TANK WITH WATER HOSE—FLUSH AWAY ANY SPILLAGE IN TO DRAIN.

SIGN "A"

POUR TO LIP OF HATCH TO ALLOW EASY WASH-DOWN OF CONCRETE PAD

SECTION B-B
DRAIN HATCH-DETAIL

NOTES:
1. WITH APPROVAL OF COLORADO SPRINGS UTILITIES.
NOTES:
1. THIS SCHEMATIC CAN BE APPLIED TO RESIDENTIAL OR COMMERCIAL DEVELOPMENTS.
2. PRESSURIZED WASTEWATER SERVICE LINES MAY DISCHARGE TO A GRAVITY WASTEWATER MAIN OR PRESSURIZED WASTEWATER MAIN.

MIXED GRAVITY AND PRESSURIZED WASTEWATER SYSTEM SCHEMATIC
NOTES:
1. CORP STOP AND CURB STOP SHALL BE STAINLESS STEEL.
2. OTHER APPURTENANCES MAY BE REQUIRED BY THE PRIVATE PUMP SYSTEM MANUFACTURER.
NOTES:
1. CORP STOP AND CURB STOP ARE NOT REQUIRED WHEN CONNECTING TO A GRAVITY WASTEWATER MAIN.

PRESSURIZED WASTEWATER SERVICE LINE CONNECTION TO A GRAVITY WASTEWATER MAIN
NOTES:

1. THIS DETAIL DRAWING APPLIES TO A SINGLE PLATTED LOT WITH MULTIPLE DWELLING UNITS, WHERE EACH UNIT IS CONNECTED AND METERED SEPARATELY. IF THE PROPERTY IS SUBDIVIDED, INDIVIDUAL SERVICE LINES SHOULD BE INCLUDED ON THE INDIVIDUALLY PLATTED LOT. IN THE ALTERNATIVE A PRIVATE EASEMENT SHOULD BE PROVIDED TO ACCOMMODATE WATER SERVICE LINES THAT MAY CROSS ANOTHER PLATTED LOT.
1. This detail drawing applies to a single platted lot with multiple dwelling units and one water service line connection to the water main. If the property is subdivided, individual service lines shall be provided by the owner/developer for each individually platted lot.

2. For single taps providing water service to multiple units, a backflow prevention assembly is required directly after the master meter and/or before the first branch line. Please see the definition of multi-family connection and section 2.7.L of the water less for backflow prevention requirements.

3. Units can be submetered by the customer after the master meter.