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NOTE: EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES AS DIRECTED BY THE CITY

EROSION LOG AND BLANKET BARRIER

RESIDENTIAL INSTALLATION
INLET PROTECTION INSTALLATION NOTES:
1. INLET PROTECTION SHALL BE INSTALLED WITHIN 48 HOURS OF CONSTRUCTING THE INLET.
2. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
3. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.
4. GRAVEL SOCKS SHALL BE PLACED AROUND THE CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED IN ACCORDANCE WITH THE ROCK SOCK DESIGN DETAIL.
NOTES:

1) SOCKS WILL BE USED UPGRADE OF THE INLET AND FLUSH WITH THE CURB.

2) NO LESS THAN TWO 10 INCH DIAMETER SOCKS MUST BE USED IN SEQUENCE, SPACED NO MORE THAN FIVE FEET APART. NO LESS THAN SIX SOCKS SHALL BE USED IF THE 4 INCH SOCK IS USED, ALSO SPACED AT NO MORE THAN 5 FEET APART.

3) ALIGN AT 30 DEGREES FROM PERPENDICULAR, OPPOSITE THE DIRECTION OF FLOW (SEE DETAIL 2.

4) EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES AS DIRECTED BY THE CITY.
INLET PROTECTION INSTALLATION NOTES:

1. INLET PROTECTION AFTER INLET CONSTRUCTION OF AFTER PAVEMENT SHALL BE INSTALLED WITHIN 48 HOUR AFTER INLET CONSTRUCTION OR PAVING IS COMPLETED.

2. STRAW WATTLE/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS, INSTALL PER SEDIMENT CONTROL LOG DETAIL.

INLET PROTECTION MAINTENANCE NOTES:

1. THE SWMP MANAGER SHALL INSPECT INLET PROTECTION WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY. INSPECT MORE FREQUENTLY DURING WINTER CONDITIONS DUE TO FREEZE/THAW PROBLEMS. REPAIR AS NEEDED.

2. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK BERM IS WITHIN 2-1/2 INCHES OF THE CREST.

3. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS THE CITY APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.

4. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY.
NOTES
1. All rock to be removed upon completion of construction.
2. Public roadway to be kept clean and free of mud, dirt and debris at all times.

SECTION A-A

NOTES ON ROOF BEHIND BUILDING
- EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES AS DIRECTED BY THE CITY ENGINEER.
- CRUSHED CONCRETE NOT ALLOWED.
- 8-INCH (MINI) DEPTH
- 4-INCH BALLAST
- INSTALL ROCK FLUSH WITH TOP/WALK
- COMPACTED SUBGRADE

NOTE: SECTION A-A

DATE: 8/15/14
CONCRETE WASHOUT AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATIONS OF CONCRETE WASHOUT AREA.

2. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.

3. VEHICLE TRACKING CONTROL IS REQUIRED AT THE ACCESS POINT.

4. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT ARE TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.

CONCRETE WASHOUT AREA MAINTENANCE NOTES

1. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.

2. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AND APPROVED WASTE SITE.

3. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, DRILL SEED AND CRIMP MULCH, OR OTHERWISE STABILIZE IN A MANNER APPROVED BY THE CITY.

4. INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.

5. PORTABLE ROLLOFF TYPE OF CONCRETE WASHOUT FACILITIES WILL ALSO BE ALLOWED.
REINFORCED CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CHECK DAMS.
   - CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".

2. CHECK DAMS INDICATED ON THE INITIAL SWMP SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.

3. REINFORCED CHECK DAMS, GABIONS SHALL HAVE GALVANIZED TWISTED WIRE NETTING WITH A MAXIMUM OPENING DIMENSION OF 4-1/2 " AND A MINIMUM WIRE THICKNESS OF 0.10". WIRE "HOG RINGS" AT 4" SPACING OR OTHER APPROVED MEANS SHALL BE USED AT ALL GABION SEAMS AND TO SECURE THE GABION TO THE ADJACENT GABION.

4. THE CHECK DAM SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'-6".

5. EROSION BLANKET SHALL BE PLACED IN THE REINFORCED CHECK DAM TRENCH EXTENDING A MINIMUM OF 1'-6" ON BOTH THE UPSTREAM AND DOWNSTREAM SIDES OF THE REINFORCED CHECK DAM.

REINFORCED CHECK DAM MAINTENANCE NOTES

1. THE SWMP MANAGER SHALL INSPECT CHECK DAMS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.

2. SEDIMENT ACCUMULATED UPSTREAM OF CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CHECK DAM IS WITHIN 1/2 OF THE HEIGHT OF THE CREST.

3. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE CITY.

4. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACKFILL. ANY DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY.
### Sizing Information for Standard Sediment Basin

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<td>2</td>
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Minimum Bottom Width and diameter of outlet plate holes based on 2,700 cu. ft. / acre of tributary area and 72 hour drain time.

### Sediment Basin Installation Notes

1. SEE PLAN VIEW AND SECTIONS FOR:
   - LOCATION OF SEDIMENT BASIN.
   - TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).
   - FOR STANDARD BASIN, BOTTOM WIDTH, "W", CREST LENGTH, "CL", AND HOLE DIAMETER, "HD".
   - FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT, "H", NUMBER OF COLUMNS, "N", HOLE DIAMETER, "D", AND PIPE DIAMETER "D".

2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.

3. SEDIMENT BASINS INDICATED ON INITIAL SWMP PLAN SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY.

4. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.

5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D 698.

6. PIPE SCH 40 OR GREATER SHALL BE USED.

7. THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) IDENTIFIED ON THE SWMP PLAN VIEW DRAWINGS USED FOR DRAINAGE AREAS LESS THAN 15 ACRES, SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES.

### Sediment Basin Maintenance Notes

1. THE SWMP MANAGER SHALL INSPECT SEDIMENT BASIN WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.

2. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED WHEN SEDIMENT DEPTH IS ONE FOOT (I.E., 2 FEET BELOW THE SPILLWAY CRESTM.

3. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE CITY.

4. WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY THE CITY.

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**City of Fort Lupton**

**SEDIMENT BASIN SIZING & NOTES**

**EC 12**

**DATE:** 8/15/14
SEDIMENT TRAP INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.

2. SEDIMENT TRAPS INDICATED ON INITIAL EROSION CONTROL PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.

3. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D699.

4. RIPRAP OUTLET SHALL BE CONSTRUCTED WITH D50 =12’ RIPRAP (TYPE M, SEE TABLE MD-7, MAJOR DRAINAGE, VOL. 1, URBAN DRAINAGE AND FLOOD CONTROL DISTRICT CRITERIA MANUAL.

5. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6” HIGHER THAN THE TOP OF THE RIPRAP OUTLET STRUCTURE.

6. THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL BE MINIMUM OF 6” HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

SEDIMENT TRAP MAINTENANCE NOTES

1. THE SWPPM MANAGER SHALL INSPECT SEDIMENT TRAPS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.

2. SEDIMENT ACCUMULATED UPSTREAM OF RIPRAP SHALL BE REMOVED WHEN THE UPSTREAM DEPTH IS WITHIN 1/2 THE HEIGHT OF THE RIPRAP OUTLET STRUCTURE.

3. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVERAGE IS APPROVED BY THE CITY.

4. WHEN SEDIMENT TRAPS ARE REMOVED THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, DRILLED SEEDED AND CRIMP MULCHED OR STABILIZED IN A MANNER APPROVED BY THE CITY.
SLOPE DRAIN - PROFILE

SLOPE DRAIN - SECTION B

TERMINATION OF RIPRAP LINED SLOPE DRAIN - DETAIL

TERMINATION OF RIPRAP LINED SLOPE DRAIN - DETAIL

SLOPE DRAIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF SLOPE DRAIN.
   - PIPE DIAMETER, "D", AND RIPRAP SIZE, "Dso".

2. SLOPE DRAIN DIMENSIONS SHALL BE CONSIDERED MINIMUM DIMENSIONS; CONTRACTOR MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO SLOPE OR SLOPE DRAIN DURING RUNOFF EVENTS SHALL BE THE DEVELOPER'S RESPONSIBILITY.

3. SLOPE DRAINS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.

4. FOR TEMPORARY SLOPE DRAINS, PIPE MAY BE INSTALLED ON TOP OF SLOPE; HOWEVER, 12" MIN. COVER AT TOP OF SLOPE SHALL BE PROVIDED. PLASTIC-LINED OR RIPRAP-LINED TRENCHES MAY BE USED INSTEAD OF PIPE.

5. A RIPRAP PAD SHALL BE PLACED AT THE OUTFALL OF THE SLOPE DRAIN.

SLOPE DRAIN MAINTENANCE NOTES

1. THE SWMP MANAGER SHALL INSPECT SLOPE DRAINS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.

2. TEMPORARY SLOPE DRAINS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED. BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION. WHEN SLOPE DRAINS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY.
SILT FENCE INSTALLATION

-NTS-

NOTE: EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL LANDSCAPING IS COMPLETED, OR AS DIRECTED BY THE CITY.

SECTION

-NTS-

FABRIC MATERIAL (ANCHORED IN TRENCH)

4"x4" TRENCH

COMPACTED BACKFILL

FLOW

1/2H (12" MIN)

POST ANCHORED TO FABRIC
SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.

2. SEDIMENT CONTROL LOGS INDICATED ON INITIAL SWMP PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.

3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.

4. NOT FOR USE IN CONCENTRATED FLOW AREAS.

5. THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2".

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. THE SWMP MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.

2. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN 1/2 THE HEIGHT OF THE CREST OF LOG.

3. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY.
Type of blanket as indicated in plan view. In all disturbed areas of streams and drainage channels to depth “D” above channel invert. Blanket shall generally be oriented parallel to flow direction. Staking pattern shall match blanket type.

At pipe outlet areas of streams and drainage channels - Detail A

Per manufacturer spec. or type 2 or 3 staking (match specified blanket type) see the staking patterns detail on next sheet.

The blanket shall be extended to the top of channel.

In diversion ditch or small ditch drainage way - Detail B

Blanket shall be 100% straw min.

Stagger overlaps.

Overlapping joint, see detail on this sheet.

Perimeter anchor trench see detail on this sheet.

Outside of streams and drainage channels - Detail C

Perimeter anchor trench, typ.

Joint anchor trench, typ.

Joint anchor trench, typ.

Compacted subgrade.

Undisturbed soil.

Design Standards

Erosion Blanket Details

Standard Drawing

EC 17

Date: 8/15/14
STAKING PATTERNS

SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION. IF NO MANUFACTURER'S SPECIFICATION IS AVAILABLE USE THE ACCEPTABLE STAKING PATTERN (AS SHOWN ABOVE)

EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF PERIMETER OF EROSION CONTROL BLANKET.
   - TYPE OF BLANKET (STRAW, STRAW-COCONUT, COCONUT, OR EXCELSIOR).
   - AREA "A" IN SQUARE YARDS OF EACH TYPE OF BLANKET.

2. ALL EROSION CONTROL BLANKETS AND NETTING SHALL BE MADE OF 100% NATURAL AND BIODEGRADABLE MATERIAL; NO PLASTIC OR OTHER SYNTHETIC MATERIALS, EVEN IF PHOTO DEGRADABLE, SHALL BE ALLOWED.

3. IN AREAS WHERE EROSION CONTROL BLANKET IS SHOWN ON THE PLANS, THE DEVELOPER SHALL PLACE TOPSOIL AND PERFORM FINAL GRAVING, SURFACE PREPARATION, AND SEEDING BELOW THE SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOWED PRIOR TO BLANKET INSTALLATION AND THE BLANKET SHALL BE IN FULL CONTACT WITH SUBGRADE, NO GAPS OR Voids SHALL EXIST UNDER THE BLANKET.

4. PERIMETER ANCHOR TRENCH SHALL BE USED AT OUTSIDE PERIMETER OF ALL BLANKET AREAS.

5. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL BLANKETS EXCEPT STRAW, WHICH MAY USE AN OVERLAPPING JOINT.

6. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE-HALF THE ROLL LENGTH FOR COCONUT AND EXCELSIOR BLANKETS.

7. THE OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER FOR BLANKETS ON SLOPES.

8. MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKET SHALL CONFORM TO TABLE 7.1.

9. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKET SHALL BE RESEEDED AND MULCHED.

10. DETAILS ON DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION WILL GOVERN IF DIFFERENT FROM ONES SHOWN HERE

<table>
<thead>
<tr>
<th>TABLE 7.1 – EROSION CONTROL BLANKET TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
</tr>
<tr>
<td>STRAW*</td>
</tr>
<tr>
<td>STRAW-COCONUT</td>
</tr>
<tr>
<td>COCONUT</td>
</tr>
<tr>
<td>EXCELSIOR</td>
</tr>
</tbody>
</table>

* FOR OUTSIDE OF STREAMS AND DRAINAGE CHANNELS

EROSION CONTROL BLANKET MAINTENANCE NOTES

1. THE SWMP MANAGER SHALL INSPECT EROSION CONTROL BLANKETS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.

2. EROSION CONTROL BLANKET IS TO BE LEFT IN PLACE UNLESS DIRECTED TO BE REMOVED BY THE CITY.

3. ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE RE-INSTALLED, ANY SUBGRADE AREAS BELOW THE BLANKET THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET REINSTALLED.
ROCK SOCK SECTION

1 1/2" (MINUS) CRUSHED ROCK ENCLOSED IN WIRE MESH
WIRE TIE ENDS
0" ON BEDROCK OR HARD SURFACE, 2" IN SOIL
GROUND SURFACE

ROCK SOCK PLAN

4" TO 6" MAX. AT CURBS, OTHERWISE 6" - 10" DEPENDING ON EXPECTED SEDIMENT LOADS

ANY GAP AT JOINT SHALL BE FILLED WITH AN ADEQUATE AMOUNT OF 1 1/2" (MINUS) CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO THE ENDS OF THE ROCK REINFORCED SOCK. AS AN ALTERNATIVE TO FILLING JOINTS BETWEEN ADJOINING ROCK SOCKS WITH CRUSHED ROCK AND ADDITIONAL WIRE WRAPPING, ROCK SOCKS CAN BE OVERLAPPED (TYPICALLY 12 - INCH OVERLAP) TO AVOID GAPS.

ROCK SOCK JOINTING

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION OF ROCK SOCKS.

2. CRUSHED ROCK SHALL BE 1 1/2" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (11/2" MINUS).

3. WIRE MESH SHALL BE FABRICATED OD 10 GAGE POULTRY MESH OR EQUIVALENT WITH A MAXIMUM OPENING OF 1/2", RECOMMENDED MINIMUM ROLL WIDTH OF 48".

4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

GRADATION TABLE

<table>
<thead>
<tr>
<th>SIEVE SIZE</th>
<th>MASS PERCENT PASSING SQUARE MESH SIEVES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>NO. 4</strong></td>
</tr>
<tr>
<td>2&quot;</td>
<td>100</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>90 - 100</td>
</tr>
<tr>
<td>1&quot;</td>
<td>20 - 55</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>0 - 15</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>0 - 5</td>
</tr>
</tbody>
</table>

MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.

DESIGN STANDARDS

ROCK SOCK DETAIL

EC 19

DATE: 8/15/14
100' BUILDING FACE TO BUILDING FACE SETBACK

- PARKING ALLOWED ON BOTH SIDES OF STREET
- UTILIZED IN SINGLE FAMILY RESIDENTIAL AREAS

101' BUILDING FACE TO BUILDING FACE SETBACK

- PARKING ALLOWED ON BOTH SIDES OF STREET
- UTILIZED IN SINGLE FAMILY RESIDENTIAL AREAS

LOCAL W/ DETACHED WALK
- PROVIDE WIDENING AT INTERSECTIONS FOR LEFT TURN LANES AND ACCEL/DECEL LANES RIGHT-OF-WAY WIDTH TO BE INCREASED TO 105' IN THESE AREAS.

- NO PARKING ALLOWED

- UTILIZED IN AREAS WHERE THERE IS LIMITED ACCESS AND PROJECTED TRAFFIC VOLUMES ARE GREATER THAN 10,000 VEHICLES PER DAY.

**MAJOR COLLECTOR**

- PARKING ALLOWED

- UTILIZED IN INDUSTRIAL, COMMERCIAL, MULTI-FAMILY, AND SINGLE-FAMILY RESIDENTIAL AREA'S WHERE ON-STREET PARKING IS REQUIRED.

- 80' AVERAGE RIGHT-OF-WAY (ROW) IS EXTENDED TO PROVIDE VARING FENCE ALIGNMENTS ALONG ROW LINE.

**MINOR COLLECTOR**

---

**DESIGN STANDARDS**

**MAJOR & MINOR COLLECTORS TYPICAL SECTION**

<table>
<thead>
<tr>
<th>STANDARD DRAWING</th>
<th>DATE: 6/16/15</th>
</tr>
</thead>
</table>
- No parking allowed.
- Provide accel/decel lanes at intersections.
- Provide accel/decel lanes and double turn lanes at major intersections as necessary.

**Major Arterial (6-Lane)**

- No parking allowed.
- Provide accel/decel lanes at intersections.
- Provide accel/decel lanes and double left turn lanes at major intersections as necessary.

**Major Arterial (4-Lane)**

- No parking allowed.
- Median may be painted or curved.

**Minor Arterial**

- No parking allowed.
- Median may be painted or curved.

* At major intersections the R.O.W. width shall be 188'.

* At major intersections the R.O.W. width shall be 163'.

---

**City of Fort Lupton**

**Design Standards**

**Major & Minor Arterial**

**Typical Section**

**Standard Drawing**

**R3**

**Date:** 6/16/15
NO ON-STREET PARKING ALLOWED WHEN MEDIAN ISLAND IS USED.

<table>
<thead>
<tr>
<th>STREET WIDTH</th>
<th>CURVE 1</th>
<th>CURVE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>△</td>
<td>CURB</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>34</td>
<td>39°26'57&quot;</td>
<td>40.0'</td>
</tr>
<tr>
<td>D1</td>
<td>D2</td>
<td>D3</td>
</tr>
<tr>
<td>57.39'</td>
<td>43.72'</td>
<td>84.59'</td>
</tr>
</tbody>
</table>

DESIGN STANDARDS

CUL-DE-SAC DETAIL

STANDARD DRAWING

R5

DATE: 8/15/14
A) If farside of intersection, distance should be a minimum of 50'-0" from curb line of cross street.

B) If nearside of intersection, distance should be a minimum of 50'-0" from curb line of cross street.

* See Table 6.24.01 for lengths
SECTION X-X

NOTE:
* COARSE BROOM FINISH ON RAMP.
* SPECIAL DESIGNS ARE REQUIRED WHEN GRADES ARE OVER 4% OR WHERE THE ANGLE OF THE INTERSECTION IS LESS THAN 78 DEGREES OR MORE THAN 105 DEGREES.
* MAINTAIN BACK OF WALK ELEVATION AT 2.0% ABOVE TOP OF CURB.

<table>
<thead>
<tr>
<th>DESIGN STANDARDS</th>
<th>STANDARD DRAWING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURB RAMP COMBINATION</td>
<td>R9</td>
</tr>
<tr>
<td>CURB, GUTTER, AND WALK</td>
<td>DATE: 8/15/14</td>
</tr>
</tbody>
</table>
SECTION X--X

NOTE:
MIDBLOCK RAMP IS SAME AS ABOVE WITH 10 FOOT TRANSITIONS TO SIDEWALKS OF A DIFFERING DIMENSION OR A DETACHED WALK.
NOTE:
MINIMUM FACE FACE AROUND CURB
RETURNS SHALL BE 0.3 FT.

CURB, GUTTER & WALK

SECTION A-A

6"x6"x10x10 WIRE MESH, FIBER MESH OR OTHER REINFORCEMENT APPROVED BY CITY ENGINEER

CITY OF Fort Lupton
COME PAINT YOUR FUTURE WITH US

DESIGN STANDARDS
SIDEWALK RAMP WITH CROSS PAN

STANDARD DRAWING
R11
DATE: 8/15/14
NOTE:
CONTRACTION JOINTS ARE REQUIRED AT EACH SIDE OF WARPED SECTION AND EVERY 10' (MAX) ALONG THE DRIVEWAY.

SECTION A–A
CHASE DRAIN

SECTION A–A

2'-6"

THIS SECTION REQUIRED WITH DETACHED SIDEWALK OR BICYCLE PATH

VARY

SEE TYPICAL SECTIONS

VARY

MIN. 2%

DATE: 8/15/14
SECTION B-B

SECTION C-C

DETAIL D

1/4" STEEL PLATE
NON SLIP RAISED PATTERN

PLATE FLUSH WITH TOP OF WALK

3/16" CLEARANCE

1/2"

1/4" x 3/4" F.H. MACHINE SCREWS @ 2" O.C. COUNTER SINK FLUSH WITH PLATE

11/2" x 11/2" x 1/4" ANGLE IRON DRILLED & TAPPED FOR 1/4" MACHINE SCREWS

3 REBAR 6" LONG WELD TO ANGLE 18" O.C.

MULTIPLE CHASE

SEE SECT. C-C 12" SEE SECT. C-C

DESIGN STANDARDS

CHASE DRAIN DETAILS

STANDARD DRAWING

R15

DATE: 8/15/14
PAY LIMITS (SQ. FT.)
MEDIAN COVER MATERIAL (PATTERNED CONCRETE)
VARIES (SEE ROADWAY PLANS)

CURVED TRANSITION
4"

12 : 1-1/2 SLOPE

COMPACTED SUBGRADE

PLACE JOINT SEALER IN JOINT
BETWEEN PATTERNED CONCRETE
ABUTTING CONCRETE (TYP). JOINT
SEALER TO BE PEARL WHITE
SIKAFLEX-2C OR APPROVED
EQUAL COST OF JOINT SEALER
TO BE INCLUDED IN ITEM 610 –
PATTERNED CONCRETE.

PATTERNED CONCRETE – RUNNING BOND
BRICK PATTERN DAVIS "SPANISH GOLD"
COLOR FINISH WITH CLEAR CURING
COMPOUND. CONTROL JOINT SPACED EVERY
10’. MINIMUM DEPTH 1”. REFER TO
PERSPECTIVE DETAIL SHOWING PATTERNED
CONCRETE MEDIAN AT RAISED MEDIAN.

SECTION VIEW

CURB & GUTTER TYPE 2
(SECTION 1-B)

CURB & GUTTER TYPE 2
(SECTION 1-B)

PLAN VIEW

CURB AND GUTTER
TYPE 2
(SECTION 1-B)

JOINT SEALER

PATTERNED
CONCRETE
MEDIAN EDGING
(PATTERNED CONCRETE)

Curb & Gutter
Joint Sealer
Topsoil
Compacted Subgrade

Median Edging (Patterned Concrete)

Pay Limits (Lin. Ft.)
Median Edging (Patterned Concrete)

Raised Median Edging Continuous Around Full Width Median.

24 1/2"
24"
21"
3"
15.62"
12.62"
3"
3"

Topsoil, 4" Minimum Depth To Within 3" of Top of Median Edge

1/2 Cu. Ft. – 3/4" Gravel at Pipe End Contained by Filter Cloth (Typ.)

Weep Hole with 3/4" PVC Pipe Constructed at 20' Spacing

Centers with 1/2 Cu. Ft. Gravel Pack, Cost of All Materials to Be Included in Median Edging (Patterned Concrete)

Place Weep Holes Under All Raised Median Edging That Abuts Curbing.

Place Joint Sealer in Joints Between Patterned Concrete

Design Standards

Standard Drawing

City of Fort Lupton

Come Paint Your Future With Us

Median Edging (Patterned Concrete)

R17

Date: 8/15/14
USE SLEEVE WHERE TRAFFIC SIGN POST IS TO BE PLACED IN MEDIAN ISLAND WITH PATTERNED CONCRETE. INCLUDE COST IN ITEM 614—STEEL SIGN POST. (LOCATION AS DIRECTED BY ENGINEER.)

EXPANSION JOINT ALL AROUND PIPE W/ JOINT SEALER

1/2"

4"

PATTERNED CONCRETE JOINT SEALER (TYPICAL)

6" DIA. P.V.C. PIPE

COMPACTED SUBGRADE

CURB & GUTTER TYPE 2 (SECTION I-B)

SLEEVE DETAIL
N.T.S.

CURB & GUTTER TYPE 2 (SECTION I-B)
<table>
<thead>
<tr>
<th>Minor Street</th>
<th>Major Street</th>
<th>Local</th>
<th>Minor Collector</th>
<th>Major Collector</th>
<th>Minor Arterial</th>
<th>Major Arterial</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL</td>
<td></td>
<td>L</td>
<td>95'</td>
<td>100'</td>
<td>100'</td>
<td>125'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>MINOR</td>
<td></td>
<td>L</td>
<td>--</td>
<td>100'</td>
<td>120'</td>
<td>150'</td>
</tr>
<tr>
<td>COLLECTOR</td>
<td></td>
<td>G</td>
<td>--</td>
<td>4%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>MAJOR</td>
<td></td>
<td>L</td>
<td>--</td>
<td>--</td>
<td>120'</td>
<td>150'</td>
</tr>
<tr>
<td>COLLECTOR</td>
<td></td>
<td>G</td>
<td>--</td>
<td>--</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>MINOR</td>
<td></td>
<td>L</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>200'</td>
</tr>
<tr>
<td>ARTERIAL</td>
<td></td>
<td>G</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2%</td>
</tr>
<tr>
<td>MAJOR</td>
<td></td>
<td>L</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>200'</td>
</tr>
<tr>
<td>ARTERIAL</td>
<td></td>
<td>G</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2%</td>
</tr>
</tbody>
</table>

**Design Standards**

**Maximum Permissible Intersection Grade**

**Standard Drawing**: R19

**Date**: 8/15/14
**SANITARY SEWER STANDARD MANHOLE**

**DESIGN STANDARDS**

24" 400# C.I. MH FRAME AND COVER AS PER SPECIFICATIONS

FINISH GRADE

24" MAX. TO FIRST STEP

CONCRETE RINGS TO GRADE
MAXIMUM OF 3 RINGS

PRECAST CONCRETE

STEPS 12" MIN.
16" O.C. MAX.

SEAL ALL JOINTS WITH RANNEK OR APPROVED EQUAL AS DETERMINED BY THE CITY ENGINEER, AND GROUT INSIDE AND OUTSIDE (TYP.) MAC WRAP OUTSIDE JOINT SEALER TO BE PLACED AT ALL JOINTS

FORMED CONCRETE BASE

NOTES:
1. MANHOLE INVERTS WILL BE FORMED AS INDICATED BELOW TO ENSURE SMOOTH FLOW THROUGH MANHOLE.
2. ALL MANHOLE BASES TO BE PLACED ON 2" MINIMUM 3/4" CRUSHED ROCK.

**STANDARD DRAWING**

SS1

DATE: 8/15/14
1. All joints to be set in flexible butyl resin sealing compound and plastered with mortar 5/8" thick and extending 4" each side of joint inside and outside.

2. Mortar on riser rings is acceptable.

3. Manholes installed outside of street right-of-way shall have locking covers.

4. "Sewer" to be imprinted on cover.

Typical Manhole Section

With Eccentric Cone

4" - 0" Dia. (Pipe 15" & smaller)
5" - 0" Dia. (Pipe 18" through 27")
6" - 0" (Pipe 30" & larger)

11 - #5 bars hooked at each end

Aluminum steps or plastic covered steps (M.A. Inc. Inc. PS-2-PF-S) Cast into sections at 12" - 16" vertical spacing and aligned

4 wire hoops cast into each section as shown

18" Max.

18" Max.

5" Max.

6" Min.

48" Max.

24" or 30" dia.

4" Min.

4" Min.

5" Min.

6" Min.

5" Min.

5" Min.

6" Min.

5" Min.

6" Min.

VARIABLE

DENVER STANDARD PATTERN

PLAN

ALTERNATE FLAT TOP

REBAR

4 wire hoops cast into each section as shown

4" - 0" dia.
5" - 0" dia. or
6" - 0" dia. M.H.

5" for 6" dia.
6" for 6" dia.

18" Max.

3" Min.

1/2" Min.

1/2" Min.

18" Max.

5" Max.

Cement Mortar

DO NOT PLACE STEPS OVER PIPE

Precast Manhole Risers

Eccentric Cone

Notes:

City of Fort Lupton
Come Paint Your Future With Us

Design Standards

Manhole Barrels and Alternate Tops

Standard Drawing

SS2

Date: 8/15/14
NOTES:
1. BASES SHALL BE REINFORCED WHEN THE DISTANCE FROM INVERT TO TOP OF COVER WILL EXCEED 15 FT., AND IN ANY CASE WHEN INTERIOR DIA. OF MANHOLE IS 5' AND LARGER.

2. SQUARE BASES ARE ACCEPTABLE.
NOTES:

1. THIS MANHOLE IS REQUIRED WHEN A SEWER ENTERS A MANHOLE AT AN INVERT ELEVATION OF 24" OR MORE ABOVE THE INVERT OF THE MANHOLE (SEE DESIGN STDS. 4.33.02).

2. JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND GROUTED WITH MORTAR INSIDE AND OUTSIDE.
**NOTES:**

1. All joints to be set in flexible butyl resin sealing compound and plastered with mortar 5/8" thick and extending 4" each side of joint inside and outside.

**ATTACH HINGE TO GRATING WITH (2) 3/8" DIA. BOLTS X 1" O.C. W/HEX NUTS. ATTACH HINGE TO PLATFORM WITH (2) 3/8 DIA. X 3" LG. RED HEADS OR EQUAL.**

**ALUMINUM GRATING, 3/16" x 1 1/4" BEARING BARS.**

ALIGN STEPS ABOVE & OPPOSITE PLATFORM OPENING AS SHOWN TO TOP OF MANHOLE

SAFETY HANDHOLD TO PLATFORM

STANDARD PRECAST FLAT TOP WITH 4X4, 4/4 MESH

TO BE USED WHEN THE DISTANCE FROM INVERT TO TOP OF COVER EXCEEDS 17 FT.
CLASS A
CONCRETE CRADLE

TYPICAL CONCRETE ENCASEMENT

CLASS B
GRANULAR BEDDING

NOTES:
1. THIS DETAIL IS TO BE USED UNDER NORMAL CONDITIONS. WHERE EXCESSIVE GROUND WATER IS PRESENT AN ALTERNATE DESIGN WILL BE REQUIRED.

DESIGN STANDARDS

STANDARD DRAWING

TYPICAL PIPE BEDDING

SS6

DATE: 8/15/14
CENTER OF WYE BRANCH TO BE PLACED IN UPPER THIRD OF MAIN

MINIMUM GRADE 1/4" / 1'

1/8 BEND

CENTER OF WYE BRANCH TO BE PLACED IN UPPER THIRD OF MAIN

MINIMUM GRADE 1/4" / 1'

1/8 BEND

CONCRETE COLLAR

TAP TO BE MACHINE DRILLED

1/8 BEND CONNECTION TO TEE

1/8 BEND & SADDLE CONNECTION

FACTORY PREPARED A.S.T.M.
C-425 COMPRESSION TYPE JOINTS ONLY OR APPROVED EQUIVALENT.

BELL SHOULD NOT TOUCH SIDES
OR BOTTOM OF BELL HOLE.

4" MINIMUM BEDDING ABOVE AND BELOW PIPE.

ACCEPTABLE BEDDING

PROPERTY LINE

SEWER MAIN

SEWER STUB TO PROPERTY LINE

SIDWALK

MARKED CURB WITH "X"

H2O

MIN.

TYPICAL WATER METER LOCATION

DATE: 8/15/14

CITY OF
FORT LAYTON
COME PAINT YOUR FUTURE WITH US

DESIGN STANDARDS

TYPICAL HOUSE SERVICE LOCATION

STANDARD DRAWING

SS7
CONCRETE COLLAR TO BE USED IN UNPAVED AREAS ONLY

PLAN VIEW

CONCRETE COLLAR
CLEAN OUT SHALL BE AN IRON BODY FERRULE WITH BRASS SCREW PLUG

NOTE:
ENTIRE WYE SECTION TO BE ENCASED IN CONCRETE

ELEVATION

CONCRETE ENCASEMENT TRENCH WIDTH

SERVICE LINE

BEDDING MATERIAL

SECTION A–A

DESIGN STANDARDS

STANDARD CLEAN-OUT DETAIL

DATE: 8/15/14

STANDARD DRAWING
MANHOLE BASE

45° BEND

WYE

TRACER WIRE

DEFLECT 6" UNDERDRAIN AROUND MANHOLE BASE

UNDERDRAIN TO BE ENCASED IN FABRIC SOCK

COIL 2' OF TRACER WIRE IN TOP OF BOX

SEE DETAIL SHEET SS13

4" P.V.C. RISER

EXPANSION JOINT MATERIAL PLACED BETWEEN RISER & MANHOLE BARREL

RISER TO BE STRAPPED TO MANHOLE BARREL PRIOR TO BACKFILL

TRACER WIRE

45° BEND

6" SOLID WALL P.V.C. UNDERDRAIN

WYE

TRACER WIRE BURIED IN PIPE TRENCH

SIDE VIEW

DESIGN STANDARDS

TYPICAL UNDERDRAIN CLEAN-OUT DETAIL

SS10

DATE: 8/15/14
### Storm or Sanitary Sewer Crossing Under Water Main

If $d_3 > 18''$, encasement not required.

#### Notes:

1. Concrete collar around storm sewer joints may be accepted with written approval by the city engineer and only for pipe 30'' or larger.
2. Concrete to be cast against undisturbed soil or shoring.
3. Length of encasement shall extend at least 10-feet each side of water main.
4. Unless otherwise noted on plan/profile drawings, encasements need not be reinforced.
5. Filler material between conduits to be:
   a) Approved compressible material such as styrofoam, etc., if $d_4 \leq 6''$.
   b) Compacted backfill, if $d_4 > 6''$.
6. Shoring or sheeting, if used, to be cut off at top of encasement.

### Storm or Sanitary Sewer Crossing Over Top of Water Main

Encasement required regardless of dimension $d_3$ (see note 1 for special cases).

<table>
<thead>
<tr>
<th>Design Standards</th>
<th>Standard Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENCASEMENT FOR CONDUIT CROSSING</td>
<td>SS11</td>
</tr>
</tbody>
</table>

**DATE:** 8/15/14
TOP OF COVER

23 7/8” DIA. [606mm]
3” [76mm]
5/8” [16mm]
7 1/4” [184mm]
20 11/16” DIA. [525mm]

BOTTOM OF COVER

3/8” [10mm]

SECTION OF COVER

COVER: GRAY IRON ASTM A48 CL35 B
LOAD RATING: H-20
COVER: 135 LBS 61kg
PRODUCT NUMBER 00240561
✓ MACHINED SURFACE
EAST JORDAN IRON WORKS #2405A
PRODUCT #240562

DESIGN STANDARDS

SANITARY SEWER MANHOLE LID

STANDARD DRAWING

SS12

DATE: 8/15/14
C.I. FRAME NEENAH R-7514 WITH "S" CAST IN LID

ASPHALT THICKNESS VARIES

FINISH GRADE

1" 4"

4" CLEANOUT ADAPTER FITTINGS WITH THREADED PLUG

TRACER WIRE (COIL 2" IN BOX)

BEDDING MATERIAL

8" MIN CONCRETE

30" MIN ROUND OR SQUARE

8" OPENING

4" CLEANOUT

DESIGN STANDARDS

UNDERDRAIN CLEANOUT COVER

STANDARD DRAWING

SS13

DATE: 8/15/14
SECTION B–B

NOTES:

1. JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND GROUTED WITH MORTAR INSIDE AND OUTSIDE.

2. BASES SHALL BE REINFORCED WHEN THE DISTANCE FROM INVERT TO TOP OF COVER WILL EXCEED 15 FT. REINFORCING TO BE APPROVED BY CITY ENGINEER.

3. SQUARE BASES ARE ACCEPTABLE.

4. FOR PIPE 36" AND LARGER, OR WHERE CONDITIONS SUCH AS MULTIPLE PIPES WARRANT, A CONCRETE BOX BASE WILL BE REQUIRED. (SEE CDOT STANDARD DRAWING M–604–20)

SECTION A–A

4'-0" DIA. (PIPE 15" AND SMALLER)
5'-0" DIA. (PIPE 18" THROUGH 27")
6'-0" DIA. (PIPE 30" THROUGH 36")

FLEXIBLE BUTYL RESIN SEALING COMPOUND

SLOPE 2" PER FOOT

8" MIN.

2" MIN.

FLEXIBLE BUTYL RESIN SEALING COMPOUND

DESIGN STANDARDS

STANDARD MANHOLE BASE

STANDARD DRAWING

ST1

DATE: 8/15/14
NOTES:

1. ALL JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND PLASTERED WITH MORTAR 5/8" THICK AND EXTENDING 4" EACH SIDE OF JOINT INSIDE AND OUTSIDE.

2. MORTAR ON RISER RINGS IS ACCEPTABLE.

3. MANHOLES INSTALLED OUTSIDE OF STREET RIGHT-OF-WAY SHALL HAVE LOCKING COVERS.

4. "SEWER" TO BE IMPRINTED ON COVER.

5. FOR PIPE 36" AND LARGER, OR WHERE CONDITIONS SUCH AS MULTIPLE PIPES WARRANT, A CONCRETE BOX BASE WILL BE REQUIRED. (SEE CDOT STANDARD DRAWING M-604-20)

ALUMINUM STEPS OR PLASTIC COVERED STEPS (MA. INC. INC. PS-2-PF-S) CAST INTO SECTIONS AT 12"-16" VERTICAL SPACING AND ALIGNED

4 WIRE HOOPS CAST INTO EACH SECTION AS SHOWN

18" MAX.

48" MAX.

24" OR 30" DIA.

4 WIRE HOOPS CAST INTO EACH SECTION AS SHOWN

4"-0" DIA. (PIPE 15" & SMALLER)
5"-0" DIA. (PIPE 18" THROUGH 27")
6"-0" (PIPE 30" THROUGH 36")

4-0" DIA.
5-0" DIA. OR
6-0" DIA. M.H.

5 FOR 6" DIA. FOR 6" DIA.

5" 6" 6" 4"

5-0" DIA.

3" MIN.

1/2" MAX.

4-10"

2"

11-#5 BARS HOOKED AT EACH END

DENVER STANDARD PATTERN

TYPICAL MANHOLE SECTION WITH ECCENTRIC CONE

ALTERNATE FLAT TOP

REBAR

6" MIN.

6" FOR 6" DIA.

4/10" DIA.

5/10" DIA. OR

6/10" DIA. M.H.
ATTACH HINGE TO GRATING WITH (2) 3/8" DIA. BOLTS x 1" O.C. W/HEX NUTS. ATTACH HINGE TO PLATFORM WITH (2) 3/8 DIA. x 3" LG. RED HEADS OR EQUAL.

ALUMINUM GRATING, 3/16" x 1 1/4" BEARING BARS.

NOTE:
1. ALL JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND PLASTERED WITH MORTAR 5/8" THICK AND EXTENDING 4" EACH SIDE OF JOINT INSIDE AND OUTSIDE.

SAFETY HANDHOLD TO PLATFORM

STANDARD PRECAST FLAT TOP WITH 4X4, 4/4 MESH

TO BE USED WHEN THE DISTANCE FROM INVERT TO TOP OF COVER EXCEEDS 17 FT.
NOTES:

1. THIS DETAIL IS TO BE USED UNDER NORMAL CONDITIONS. WHERE EXCESSIVE GROUND WATER IS PRESENT AN ALTERNATE DESIGN WILL BE REQUIRED.
ADDITONAL MANHOLE RING AND COVER
REQUIRED WHEN L=4.5 m AND H>2 m

* WHEN A TYPE R INLET IS USED WITH MOUNTABLE CURB AND GUTTER, 1.5 m TRANSITION SHALL BE REQUIRED.

TYPICAL PLAN VIEW

SECTION A-A REGULAR INLET

SECTION A-A INLET WITH DROP BOX ~ H>5'
### TABLE ONE ~ BAR LIST FOR CURB INLETS, TYPE "R"

<table>
<thead>
<tr>
<th>MARK</th>
<th>DIA</th>
<th>O.C. SPACING</th>
<th>TYPE</th>
<th>ALL INLETS</th>
<th>INLETS, H ≤ 5'</th>
<th>INLETS, H ≥ 5'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NO. REQ'D</td>
<td>LENGTH (in-ft)</td>
<td>NO. REQ'D</td>
</tr>
<tr>
<td>401</td>
<td>11&quot;</td>
<td>II</td>
<td>15</td>
<td>7</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>402</td>
<td>11&quot;</td>
<td>II</td>
<td>7</td>
<td>13</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>403</td>
<td>9&quot;</td>
<td>II</td>
<td>4</td>
<td>13</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>405</td>
<td>6&quot;</td>
<td>III</td>
<td>11</td>
<td>10-10</td>
<td>31-10-10</td>
<td>11</td>
</tr>
<tr>
<td>406</td>
<td>6&quot;</td>
<td>III</td>
<td>7</td>
<td>10-10</td>
<td>18-10</td>
<td>7</td>
</tr>
<tr>
<td>407</td>
<td>2&quot;</td>
<td>II</td>
<td>3</td>
<td>11-10</td>
<td>16-10</td>
<td>3</td>
</tr>
<tr>
<td>408</td>
<td>8&quot;</td>
<td>II</td>
<td>6</td>
<td>10-10</td>
<td>15-10</td>
<td>6</td>
</tr>
<tr>
<td>410</td>
<td>11&quot;</td>
<td>III</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>411</td>
<td>11&quot;</td>
<td>II</td>
<td>5</td>
<td>2-3</td>
<td>2-3</td>
<td>5</td>
</tr>
<tr>
<td>413</td>
<td>9&quot;</td>
<td>II</td>
<td>7</td>
<td>10-10</td>
<td>15-10</td>
<td>7</td>
</tr>
<tr>
<td>501</td>
<td>5 1/2&quot;</td>
<td>IX</td>
<td>11</td>
<td>3-4</td>
<td>22</td>
<td>3-4</td>
</tr>
<tr>
<td>502</td>
<td>5 1/2&quot;</td>
<td>II</td>
<td>5 1/2</td>
<td>11</td>
<td>11-10</td>
<td>11</td>
</tr>
<tr>
<td>503</td>
<td>5 1/2&quot;</td>
<td>II</td>
<td>5</td>
<td>3-6</td>
<td>16</td>
<td>3-6</td>
</tr>
<tr>
<td>504</td>
<td>5 1/2&quot;</td>
<td>II</td>
<td>5</td>
<td>8-4</td>
<td>5</td>
<td>8-4</td>
</tr>
<tr>
<td>501</td>
<td>3 1/2&quot;</td>
<td>II</td>
<td>2</td>
<td>8-10</td>
<td>2</td>
<td>8-10</td>
</tr>
<tr>
<td>501</td>
<td>3 1/2&quot;</td>
<td>II</td>
<td>1</td>
<td>10-10</td>
<td>1</td>
<td>10-10</td>
</tr>
<tr>
<td>501</td>
<td>3 1/2&quot;</td>
<td>II</td>
<td>1</td>
<td>15-10</td>
<td>1</td>
<td>15-10</td>
</tr>
</tbody>
</table>

**TABLE TWO ~ BARS AND QUANTITIES VARIABLE WITH "H"**

<table>
<thead>
<tr>
<th>&quot;H&quot;</th>
<th>LENGTH (in-ft)</th>
<th>NO. REQ'D</th>
<th>DROP BOX</th>
</tr>
</thead>
<tbody>
<tr>
<td>401</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>402</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>403</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>407</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>408</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>409</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>410</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>501</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>502</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>503</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>504</td>
<td>12-3-2-1-4</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>

**NOTE:** FOR L = 5', L = 10' AND L = 15'

**REGULAR INLETS:** TOTAL QUANTITIES NEEDED ARE OUTSIDE OF THE HEAVY BLACK LINE.

**DROP BOX INLETS:** TOTAL QUANTITIES NEEDED ARE INSIDE OF THE HEAVY BLACK LINE.

**STEEL WEIGHTS DO NOT INCLUDE STRUCTURAL STEEL.**

---

**BAR BENDING DIAGRAMS ~ (Dimensions are Out-to-Out of bar)**

---

**DESIGN STANDARDS**

**STANDARD DRAWING**

**CURB INLET TYPE R**

**DATE:** 8/15/14
COVER: GRAY IRON ASTM A48 CL35 B
LOAD RATING: H-20
COVER: 135 LBS 61kg
PRODUCT NUMBER 00240562
✓ MACHINED SURFACE
EAST JORDAN IRON WORKS #2405A
PRODUCT #240562
STORM OR SANITARY SEWER CROSSING UNDER WATER MAIN

IF $d_3 > 18''$, ENCASEMENT NOT REQUIRED

NOTES:

1. CONCRETE COLLAR AROUND STORM SEWER JOINTS MAY BE ACCEPTED WITH WRITTEN APPROVAL BY THE CITY ENGINEER AND ONLY FOR PIPE 30" OR LARGER.

2. CONCRETE TO BE CAST AGAINST UNDISTURBED SOIL OR SHORING.

3. LENGTH OF ENCASEMENT SHALL EXTEND AT LEAST 10 FEET EACH SIDE OF WATER MAIN.

4. UNLESS OTHERWISE NOTED ON PLAN/PROFILE DRAWINGS, ENCASEMENTS NEED NOT BE REINFORCED.

5. FILLER MATERIAL BETWEEN CONDUITS TO BE:
   a) APPROVED COMPRESSIBLE MATERIAL SUCH AS STYROFOAM, ETC. IF $d_4 < 6''$.
   b) COMPACTED BACKFILL, IF $d_4 > 6''$.

6. SHORING OR SHEETING, IF USED, TO BE CUT OFF AT TOP OF ENCASEMENT

STORM OR SANITARY SEWER CROSSING OVER TOP OF WATER MAIN

ENCASEMENT REQUIRED REGARDLESS OF DIMENSION $d_3$
(SEE NOTE 1 FOR SPECIAL CASES)
NOTES
PARKING DIMENSIONS ARE NOTED IN SECTION 8.13.00 "PARKING"
<table>
<thead>
<tr>
<th>DESIGN STANDARDS</th>
<th>STANDARD DRAWING</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPICAL SIGN POST</td>
<td>T2</td>
</tr>
<tr>
<td>ANCHOR DETAIL</td>
<td></td>
</tr>
<tr>
<td>DATE: 8/15/14</td>
<td></td>
</tr>
</tbody>
</table>
8" NOMINAL STRAIGHT SECTION REFORMED TO 2.38" O.D.

"R"

DETAIL 1

DETAIL 2

DETAIL 3

DETAIL 4

DETAIL 5

DETAIL 6 OR 7

DETAIL 8

DETAIL 9

END OF ARM SLOPE TO BE A MINIMUM OF 1 DEGREE AFTER LOADS HAVE BEEN APPLIED.

<table>
<thead>
<tr>
<th>FOR THIS INFORMATION</th>
<th>SEE TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLE AND SIGNAL ARM DATA</td>
<td>1</td>
</tr>
<tr>
<td>MATERIAL DATA</td>
<td>2</td>
</tr>
<tr>
<td>LUMINAIRE ARM DATA</td>
<td>3</td>
</tr>
<tr>
<td>POLE LENGTHS</td>
<td>4</td>
</tr>
</tbody>
</table>

T3

DATE: 8/15/14
# Table 1: Pole and Signal Arm Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Designation</th>
<th>Pole Tube</th>
<th>Pole Base</th>
<th>Anchor Bolt</th>
<th>Signal Arm Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Length (FT)</td>
<td>Gauge or Thick (IN)</td>
<td>Square Circle Thickness (IN)</td>
<td>Hole &quot;Z&quot; (IN)</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>20.0</td>
<td>6 THRU 15</td>
<td>13.0</td>
<td>3</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>25.0</td>
<td>6 THRU 15</td>
<td>13.0</td>
<td>3</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>30.0</td>
<td>6 THRU 15</td>
<td>13.0</td>
<td>3</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>35.0</td>
<td>6 THRU 15</td>
<td>13.0</td>
<td>3</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>40.0</td>
<td>6 THRU 15</td>
<td>15.5</td>
<td>0.25</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>45.0</td>
<td>6 THRU 15</td>
<td>15.5</td>
<td>0.25</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>50.0</td>
<td>6 THRU 15</td>
<td>15.5</td>
<td>0.25</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>55.0</td>
<td>6 THRU 15</td>
<td>16.0</td>
<td>0.25</td>
</tr>
<tr>
<td>WESTMINSTER</td>
<td>1 OR 2</td>
<td>60.0</td>
<td>6 THRU 15</td>
<td>16.0</td>
<td>0.25</td>
</tr>
</tbody>
</table>

## Table 4

LUMINAIRE ARM SPAN (0', 6', 8', 10', 12', 15')

SIGNAL ARM SPAN (20', 25', 30', 35', 40', 45', 50', 55', 60')

POLE TYPE (1=21'-0" POLE LENGTH, 2=32'-6" POLE LENGTH)

WESTMINSTER, COLORADO POLE SERIES

**Designation Example:**

WM - 2 - 30 - 15

DATE: 8/15/14

**Colorado Pole System Design Standards**

**Drawing Standard:**

T4
### Table 2: Material Data

<table>
<thead>
<tr>
<th>Component</th>
<th>ASTM Designation</th>
<th>Min. Yield (ksi)</th>
<th>Component</th>
<th>ASTM Designation</th>
<th>Min. Yield (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Gauge–Pole Shaft</td>
<td>A595 Gr. A</td>
<td>55</td>
<td>Mast Arm Attachment</td>
<td>A36</td>
<td>36</td>
</tr>
<tr>
<td>3 Gauge–Pole Base</td>
<td>A36</td>
<td>36</td>
<td>Mast Arm Conn. Bolt</td>
<td>A325</td>
<td>–</td>
</tr>
<tr>
<td>0.25&quot; Wall–Pole Shaft</td>
<td>A572 Gr. 69</td>
<td>65</td>
<td>Luminaire Arm Attach</td>
<td>A36</td>
<td>36</td>
</tr>
<tr>
<td>0.25&quot; Wall–Pole Base</td>
<td>A572 Gr. 42</td>
<td>42</td>
<td>Lum. Connection Bolt</td>
<td>SAE Gr. 5</td>
<td>–</td>
</tr>
<tr>
<td>Mast Arm Shaft</td>
<td>A595 Gr. A</td>
<td>55</td>
<td>Galvanizing Hardware</td>
<td>A153</td>
<td>–</td>
</tr>
<tr>
<td>Luminaire Arm</td>
<td>A595 Gr. A</td>
<td>55</td>
<td>Anchor Bolts AA6HT  M314 Gr. 55</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

**Finish Notes:**
- Finish coat: TGIC or Urethane Polyester powder
- Valmont Spec: F-264T
- Color: Federal Green #14056

### Table 4: Pole Lengths

<table>
<thead>
<tr>
<th>Pole Type</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pole Length</td>
<td>21'-0&quot;</td>
<td>32'-6&quot;</td>
</tr>
<tr>
<td>Luminaire Mounting Height</td>
<td>None</td>
<td>35'-0&quot;</td>
</tr>
</tbody>
</table>

### Table 3: Luminaire Arm Data

<table>
<thead>
<tr>
<th>Arm Span (FT)</th>
<th>Fixed End Dia. (IN)</th>
<th>Free End Dia. (IN)</th>
<th>GA.</th>
<th>Rise Height &quot;R&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>3.39</td>
<td>2.38</td>
<td>11</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>8</td>
<td>3.63</td>
<td>2.38</td>
<td>11</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>10</td>
<td>3.89</td>
<td>2.38</td>
<td>11</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>12</td>
<td>4.16</td>
<td>2.38</td>
<td>11</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>15</td>
<td>4.58</td>
<td>2.38</td>
<td>11</td>
<td>3'-0&quot;</td>
</tr>
</tbody>
</table>

### Design Standards

- CPS Tables 2, 3, $4

### Standard Drawing

- T5

**Date:** 8/15/14
MAX. LOADING INFORMATION

<table>
<thead>
<tr>
<th>DEVICE</th>
<th>DESCRIPTION</th>
<th>Proj. Area (ft²)</th>
<th>Weight (LBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SIGNAL 12&quot;-5 SECTION WITH BACKPLATE</td>
<td>12.40</td>
<td>105</td>
</tr>
<tr>
<td>B</td>
<td>SIGN REGULATORY 3.0' X 3.0'</td>
<td>9.00</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>SIGNAL 12&quot;-3 SECTION WITH BACKPLATE</td>
<td>8.67</td>
<td>75</td>
</tr>
<tr>
<td>D</td>
<td>SIGN STREET NAME 2.0' X 6.0'</td>
<td>12.00</td>
<td>40</td>
</tr>
<tr>
<td>E</td>
<td>SIGNAL DUAL 12&quot;-3 SECTION</td>
<td>8.90</td>
<td>130</td>
</tr>
<tr>
<td>F</td>
<td>SIGNAL DUAL-PEDESTRIAN SIGNAL</td>
<td>3.56</td>
<td>40</td>
</tr>
</tbody>
</table>

NOTES:

ALL STRUCTURES ARE DESIGNED TO THE 1985 (90 MPH) AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS.

MAST ARMS 50 FEET OR LESS IN LENGTH SHALL BE ONE PIECE CONSTRUCTION, BUTT-END WELDS SHALL NOT BE ACCEPTED.
DETAIL 1  POLE TOP

DETAIL 2  LUMINAIRE ARM ATTACHMENT

DETAIL 3  SIGNAL ARM ATTACHMENT

DETAIL 4  SIGNAL ARM SLIP JOINT

POLE BASE DIA.  "A"  "B"  "C"  "D"  "E"  "F"
13.00" 16.25" 15.00" 11.00" 12.25" 1.50" 1.50" X 3.50"
15.50" 17.25" 16.00" 12.00" 13.25" 1.75" 1.50" X 4.00"
18.00" 17.75" 17.00" 13.00" 13.50" 2.00" 1.50" X 4.25"

END SECTION WITH
HOLE FOR 0.63" BOLT

BASE SECTION WITH
FIELD DRILLED HOLE
FOR 0.63" BOLT

FIELD ASSEMBLED TO ACHIEVE
A SNUG TIGHT JOINT (MIN.
OVERLAP NOT LESS THAN 1.5
TIMES THE I.D. OF THE END
SECTION)
**POLE SHAFT WALL**

Handhole rims for 3 ga. poles formed from 6" black pipe, all other rims formed from 0.75" O.D. x 0.50" wall (70 KSI min.) d.o.m. tubing.

0.19" (0.19)" WALL
0.34" FOR 3 GA. POLES

**SECTION A-A**

Handhole cover 11 gauge h.r.m.s.

0.50" Nut holder with fasteners for grounding not required on upper handholes.

<table>
<thead>
<tr>
<th>POLE WALL</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 GAUGE</td>
<td>7.56&quot;</td>
<td>5.19&quot;</td>
<td>0.280&quot;</td>
</tr>
<tr>
<td>0.25&quot;</td>
<td>7.56&quot;</td>
<td>5.50&quot;</td>
<td>0.500&quot;</td>
</tr>
</tbody>
</table>

**DETAIL 5**

Handhole

0.25" x 1.52" Stainless steel hex bolt

0.25" threaded insert

NUT COVER

Base plate

**INSTALLATION INSTRUCTIONS:**

1. Anchor bolt projection above top of base plate must be between 3" min. and 4" max.
2. Place cover over anchor bolt and secure in place with the 1/4-20 UNC x 1 1/2" long stainless steel hex head bolt. Required on 16.00" diameter poles only.

**DETAIL 6**

NUT COVER

**DETAIL 7**

Nut cover

Hex head bolt into tube wall

**DETAIL 8**

Pole base

Tube thk. +0.06" "M" "Y" "S" "Z"

Pole base dia. +0.06"

**DETAIL 9**

Anchor bolt

(4) Anchor bolts with (2) hex nuts and (2) washers per bolt with threaded end galvanized at least 12".

**DETAIL 10**

**RADIAL INDEX**

180°

Gunshot arm luminaire

Anchor bolt 45°

Handholes

All angles measured clockwise from handhole as viewed from small end of pole.

**CITY OF FORT LAYTON**

COME PAINT YOUR FUTURE WITH US

**DESIGN STANDARDS**

TRAFFIC SIGNALS CPS DETAILS

**STANDARD DRAWING**

T8

**DATE:** 8/15/14
TYPICAL TRAFFIC SIGNAL POLE FOOTING
FOR MAST ARM POLES GREATER THAN 50 FEET

NOTES

1. CONCRETE F. C. = CLASS A OR B
   REINFORCED STEEL PER AASHTO M31 SPECIFICATION, GRADE 60 FOR #9 & #4 BARS, AND GRADE 40 FOR #3 BARS.

2. SHAFT FOR CONCRETE FOUNDATION TO BE DRILLED BY MECHANICAL AUGER. Casing IF USED IN PLACING CONCRETE SHALL BE REMOVED UPON COMPLETING POUR.

3. FOUNDATION DESIGN REQUIRES THAT THE SHAFT BE FOUND IN COMPACT SAND, CLAY, OR SANDY CLAY. THE ALLOWABLE SAFE LATERAL BEARING CAPACITY OF SOIL (AROUND SHAFT) TO BE 1,300 LBS./SQ. FT. MINIMUM AT DEPTH OF 4.0 FT. BELOW TOP OF FOUNDATION. THE AVERAGE FRICIONAL RESISTANCE OF THE SOIL (AROUND THE SHAFT) TO BE 460 LBS./SQ. FT. MINIMUM ALLOWABLE UNDER WIND LOADING (TORISION). IF THE SOIL INVESTIGATION (CONDUCTED PRIOR TO CONSTRUCTION) INDICATES THE ABOVE NOTED REQUIREMENTS CANNOT BE MET, OR IF "EXPANSIVE" SOIL IS AN EXISTING PROBLEM, THEN THE FOUNDATION DESIGN SHOWN WILL HAVE TO BE MODIFIED AND APPROVED BY THE ENGINEER.

4. SHOULD ROCK BE ENCOUNTERED, THE SHAFT SHOULD EXTEND 6 FT. MINIMUM INTO ROCK. THE ALLOWABLE SAFE LATERAL BEARING CAPACITY OF ROCK TO BE 4,300 LBS./SQ. FT. THE SOIL (INCLUDING ROCK) SURROUNDING THE SHAFT SHOULD BE INVESTIGATED TO ENSURE IT WILL RESIST THE TORSONAL MOMENT OF 93,435 FT. LBS.

5. CONCRETE SHALL BE POURED IN LIFTS NOT EXCEEDING 3 FEET IN DEPTH. AT THE POURING OF EACH LIFT, CONCRETE SHALL BE MECHANICALLY VIBRATED TO REMOVE AIR POCKETS.

DESIGN STANDARDS

MAST ARM POLE FOUNDATION DETAILS

STANDARD DRAWING

T9

DATE: 8/15/14
TYPICAL TRAFFIC SIGNAL POLE FOOTING
FOR MAST ARM POLES LESS THAN OR EQUAL TO 50 FEET

NOTES:

1. CONCRETE: f' = CLASS A OR CLASS B
   REINFORCED STEEL: PER AASHTO M31 SPEC., GRADE 60 FOR #9 & #4 BARS, AND GRADE 40 FOR #3 BARS.

2. SHAFT FOR CONCRETE FOUNDATION TO BE DRILLED BY MECHANICAL AUGER. CASING, IF USED IN PLACE OF CONCRETE, SHALL BE REMOVED UPON COMPLETING POUR.

3. FOUNDATION DESIGN REQUIRES THAT THE SHAFT BE FOUND IN COMPACT SAND, CLAY, OR SANDY CLAY. THE ALLOWABLE SAFE LATERAL BEARING CAPACITY OF SOIL (AROUND THE SHAFT) TO BE 1,300 LBS./SQ. FT. MINIMUM AT DEPTH OF 4.0' BELOW TOP OF FOUNDATION. THE AVERAGE FRICTIONAL RESISTANCE OF THE SOIL (AROUND THE SHAFT) TO BE 460 LBS./SQ. FT. MINIMUM ALLOWABLE, UNDER WIND LOADING (TORSION). IF THE SOIL INVESTIGATION (CONDUCTED PRIOR TO CONSTRUCTION) INDICATES THE ABOVE NOTED REQUIREMENTS CANNOT BE MET, OR IF "EXPANSIVE" SOIL IS AN EXISTING PROBLEM, THEN THE FOUNDATION DESIGN SHOWN WILL HAVE TO BE MODIFIED AND APPROVED BY THE ENGINEER.

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CITY OF
FORT LIVINGSTON
COME PAINT YOUR FUTURE WITH US

DESIGN STANDARDS
MAST ARM FOUNDATION DETAILS

STANDARD DRAWING
T10
DATE: 8/15/14
PUSH BUTTON FOR
R10-4b
9" x 12"
SIGN SHALL BE LABEL (STICK-ON) TYPE

PUSHBUTTON WITH 2-1/2"
POLE TOP MOUNTING FOR
5" X 7" SIGN

2-1/2" STD. GALV.
STEEL PIPE

3/8" X 12" ANCHOR
BOLTS, TOT. 4

1" CONDUIT

ELEVATION

NOTE:
CONDUIT SHALL PROTRUDE 2" MAX ABOVE
FINISHED SURFACE FOUNDATION.

4-1/2" BC
CUT HOLE TO FIT PIPE
3/4" DIA. HOLES

BASE PLATE

CITY OF
FORT LAUPTON
COME PAINT YOUR FUTURE WITH US

DESIGN STANDARDS

PEDESTRIAN PUSH BUTTON
POST & SIGN

STANDARD DRAWING

T11

DATE: 8/15/14
KEY
C = 2 inch pipe coupling
D = Cable guide. 2 inch pipe shown. Remove all burrs and sharp edges.

CABLE GUIDE NEEDED ON ENTRANCE BRACKET ONLY

B-1 FOR WOOD POLES
B-2 FOR STEEL POLES
B-2 FOR ALUMINUM POLES

B-4 (ALTERNATIVE)

WIRING DIAGRAM
GENERAL NOTES:

1. PIPE COUPLINGS FOR SIGNAL BRACKETS SHALL BE EITHER 1-1/2 OR 2 INCH DEPENDING UPON THE SIGNAL HEAD TO BE INSTALLED. SIGNAL BRACKETS SHALL BE FURNISHED BY THE MANUFACTURER OF THE SIGNAL HEADS.

2. UNLESS OTHERWISE SPECIFIED, ALL TRAFFIC SIGNALS MOUNTED ABOVE THE ROADWAY SHALL HAVE A HEIGHT OF 17'-6". ALL SIDE MOUNTED TRAFFIC SIGNALS SHALL HAVE A HEIGHT OF 10', AND PEDESTRIAN SIGNALS AT A HEIGHT OF 8' AS MEASURED TO THE BOTTOM OF THE SIGNAL HEAD HOUSING OR BRACKET.

3. ALL SIGNAL HEADS SHALL BE MOUNTED IN SUCH A MANNER AS TO BE EASILY REMOVED FROM THEIR SUPPORTING STRUCTURE.

4. GASKET SEALING COMPOUND SHALL BE USED IN ADDITION TO ANY LEAD WASHERS REQUIRED FOR CREATING A WATER-TIGHT CONNECTION BETWEEN THE SIGNAL HEAD AND MOUNTING BRACKET.

5. SIGNAL HEADS SHALL BE SECURELY AFFIXED BY THE USE OF A SERRATED COUPLING OR OTHER ACCESSORIES RECOMMENDED BY THE SIGNAL MANUFACTURER.

6. WIRING FROM INSIDE MAST ARM THROUGH 1" FIELD DRILLED HOLE IN ARM, SHALL BE BROUGHT THROUGH THE MOUNTING SUPPORT TUBE AND LOWER ARM (AS SHOWN). FIELD DRILLED HOLES SHALL HAVE RUBBER GROMMETS INSTALLED.

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**S.P. & MAST ARM MOUNTING DETAILS**

<table>
<thead>
<tr>
<th>DESIGN STANDARDS</th>
<th>STANDARD DRAWING</th>
</tr>
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<tbody>
<tr>
<td>MA 5-1 MOUNTING HARDWARE</td>
<td>T13</td>
</tr>
<tr>
<td>MA 5 ADJUSTABLE MAST ARM MOUNTING HORIZONTAL OR VERTICAL INSTALLATION</td>
<td>DATE: 8/15/14</td>
</tr>
</tbody>
</table>
NOTES ON PULL BOX INSTALLATION:

1. PULL BOX WILL HAVE AT LEAST TWO 1" DIA. HOLES DRILLED OR TORCHED 3" FROM TOP TO ACCEPT 6" OF 1" GALVANIZED RIGID CONDUIT.

2. 4" MIN. SLACK IS TO BE PROVIDED SO THAT ALL TESTING AND SPLICING CAN BE DONE OUTSIDE OF THE PULL BOX.

3. PULL BOX LID IS TO BE SEALED WATER TIGHT BY CAULKING.

4. PULL BOX IS TO BE LOCATED IN AN AREA OF THE STREET NOT HEAVILY TRAVELED, IF POSSIBLE, AND CENTERED A MINIMUM OF 12" FROM THE CONCRETE GUTTER PAN.

5. COST OF THE PORTLAND CEMENT CONCRETE SHALL BE INCLUDED IN THE INSTALLATION OF THE PULL BOXES.

6. THE PULL BOX LID SHALL HAVE THE WORD "TRAFFIC" CAST INTO THEM.
LEAD-IN FROM LOOP DETECTOR PULL-BOX TO CONTROLLER CABINET SHALL BE CANOGA 30003 43 #18 AWG OR APPROVED EQUAL.

Pole Foundation

3/4" Conduit

Existing Pavement

Soft Plug to Prevent Cement From Flung Conduit

Detector Loop Wire (Number of Turns as Specified at Each Location)

SECTION A-A

NOTE: FINISHED LOOP MUST SHOW NO SHORTED TURNS NO BROKEN WIRE AND 15 MEGOHMS (MINIMUM) TO GROUND, MEASURED WITH A QUALITY MEGOHM METER (SEE GENERAL NOTES).

3M or Approved Equal Saw-Cut Filler

Top of Existing Pavement

2" Min. for Asphalt Surfaced Roads

Detector Loop Wire 1/4" Min.

SECTION B-B

3" Max. Will Be Permitted in Asphalt and in Vicinity of Expansion Joints to Allow for Required Clear Distance to Tubing.

Loops Shall Be Size Shown Unless Otherwise Stated on Plans

2" Bore

GENERAL NOTES FOR TD-5 DETECTORS:

1. LOOP SIZE AND LOCATION SHALL BE AS SHOWN IN THE PLANS.

2. THE NUMBER OF TURNS OF WIRE SHALL BE AS INDICATED IN THE PLANS OF THE SPECIFIC INSTALLATION OR AS OTHERWISE SPECIFIED BY THE EQUIPMENT MANUFACTURER SUPPLYING THE LOOP DETECTOR AMPLIFIERS AND APPROVED BY THE TRAFFIC ENGINEERING DIVISION. ALL LOOP WIRE IN ADJACENT LOOPS SHALL BE Laid EITHER IN A CLOCKWISE OR COUNTER-CLOCKWISE DIRECTION AND THE LEADS TAGGED AT THE TIME OF INSTALLATION TO CLEARLY IDENTIFY THEIR DIRECTION.

3. IMMEDIATELY BEFORE LAYING THE LOOP CABLE, THE SAW CUT SHALL BE THERMOPLASTIC, CLEANED, AND DRIED WITH HIGH PRESSURE COMPRESSED AIR.

4. THE WIRE SHALL BE POSITIONED BY USE OF A BLUNT INSTRUMENT SO AS TO MINIMIZE THE CHANCE OF DAMAGE TO THE CABLE INSULATION. (THE USE OF A SCREWDRIVER, SAW BLADE, ETC. WILL NOT BE PERMITTED.)

5. LOOP WIRE SHALL BE CONTINUOUS (NO SPLICERS PERMITTED) FROM THE PULL BOX OR FOUNDATION THROUGHOUT THE LOOP CONFIGURATION.

6. AFTER THE LOOP WIRE IS INSTALLED, 3M OR APPROVED EQUAL SAW-CUT SEALER SHALL BE USED TO COVER THE SAW CUT BEFORE MOISTURE OR DIRT CAN ACCUMULATE. LOOP INSTALLATION MAY BE RESTRICTED DUE TO ADVERSE WEATHER CONDITIONS (DAMPNESS, DUST, ETC.)

7. SPLICES TO THE LOOP LEAD-IN CABLE SHALL BE WATERPROOFED WITH 3M SPLICE KITS OR APPROVED EQUAL.

8. ELECTRICAL CONTINUITY TESTS SHALL BE PERFORMED FOR EACH LOOP:

A. BEFORE ANY LOOP SEALER IS INSTALLED
B. AFTER LOOP SEALER IS PLACED BUT PRIOR TO CONNECTION TO LEAD-IN CABLE
C. AFTER LEAD-IN CABLE IS SPLICED AND TRAILED TO THE CONTROLLER.

IN ADDITION, "RESISTANCE-TO-GROUND" AND "INDUCTANCE" OF EACH LOOP SHALL BE MEASURED AND RECORDED FOR EACH OF THE THREE TESTS PERFORMED TO THE LOOP DETECTOR.
TYPICAL PULL BOX

PLASTIC PULL BOX DETAIL
FOR USE IN GRASS/GROUND AREAS

FIBERGLASS REINFORCED POLYMERS CONCRETE DESIGNED FOR
FULL VEHICULAR TRAFFIC (HEX LOADING)

TWO BOXES
AND EXTENSION

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>DIMENSIONS (IN.)</th>
<th>TO BE USED AT</th>
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<tbody>
<tr>
<td>LARGE 18X30</td>
<td>A 122 B 172 C 18 D 6 E 4 F 16 G 28 H 12 J 1 K 11 1/4</td>
<td>CONTROLLER CABINET</td>
</tr>
<tr>
<td>2 BOXES &amp; EXT</td>
<td>A 120 B 161/2 C 18 D 6 E 4 F 16 G 28 H 12 J 1 K 11 1/4</td>
<td>TRAFFIC SIGNAL POLE</td>
</tr>
<tr>
<td>MEDIUM 12X18</td>
<td>A 112 B 161/2 C 8 D 6 E 4 F 121/4 G 171/4 H 3/8 J 11 1/4</td>
<td>TRAFFIC SIGNAL POLE</td>
</tr>
<tr>
<td>2 BOXES &amp; EXT</td>
<td>A 120 B 161/2 C 8 D 6 E 4 F 121/4 G 171/4 H 3/8 J 11 1/4</td>
<td>TRAFFIC SIGNAL POLE</td>
</tr>
<tr>
<td>SMALL 12X12</td>
<td>A 12 B 7/8 C 8 D 6 E 4 F 14 G 14 H 12 3/4 J 10 1/2 K 12</td>
<td>UPSTREAM DETECTOR</td>
</tr>
<tr>
<td>SINGLE BOX</td>
<td>A 12 B 7/8 C 8 D 6 E 4 F 14 G 14 H 12 3/4 J 10 1/2 K 12</td>
<td>SPOKES, INTERCONNECT</td>
</tr>
</tbody>
</table>

PRECAST PULL BOX FOR USE IN CONCRETE/ASPHALT/
SIDWALK AREAS BEHIND CURB
SEE CONTRACT DOCUMENTS FOR MATERIAL SPECIFICATIONS.
TRAFFIC SIGNAL PLAN: GENERAL INSTALLATION NOTES

1. All cabinet dimensions are nominal.
2. Cabinet shall be bonded to the ground rod.
3. Cabinets shall be fiberglass.
4. If telephone interconnect is specified, a minimum of 5 inches clear vertical space shall be left beneath all other equipment inside the cabinet.
5. All stranded wires terminated in the cabinet under a binder head screw shall be equipped with a solderless, pressure type spade connector with a pre-insulated shank. Only one wire shall be used with each spade connector. No more than three conductors shall be connected to any one terminal on the terminal board provided in the cabinet.
6. Controllers and relays shall be located to permit safe and easy removal.
7. If the cabinet is located in an unpaved area, a raised concrete pad shall be provided.
8. All concrete shall be per City of Westminster standard specifications for design and construction.
9. The ends of the spare conductors shall not be cut back. Spare conductors shall be neatly coiled and taped for possible future use. All cables shall be clearly identified in the cabinet by means of metal or durable plastic tags.
10. Work shall be neat, uncluttered “first-class” workmanship and shall conform to applicable sections of the National Electric Code, current edition, and any local regulations.
11. Aluministic or caulking compound shall be used wherever the cabinet comes in contact with the base to insure weather tightness. Aluministic compound will be required if the cabinet is constructed from aluminum.
12. The items traffic signal-light pole and traffic signal-light span wire pole shall include the extension of the pole and the mast arm for the mounting of the luminaire.
13. All reinforcing steel shall be City of Westminster standard specifications for design and construction.
1. The cabinet shall be constructed of 0.125 minimum thickness bare aluminum. Cabinets shall be braced internally or by folded seams in order to provide sufficient rigidity to withstand normal handling and transport to the field location without deforming.

2. The main door shall have a self-locking, key, tumblers lock with two keys. Hinges shall be mounted on the cabinet in such a way that interchangeability of doors is possible between cabinets of like size and manufacturer. Hinge pins shall be stainless steel. Doors shall have neoprene gaskets of sufficient thickness to provide a rain-tight and dust-tight seal.

3. In addition to the main door, and auxiliary door shall be provided equipped with a lock and key. This auxiliary door shall provide access to the panel which shall contain:
   A. A switch to change from normal to flash operation.
   B. A signal on/off switch which will not affect controller operation.
   C. Any additional equipment which may be required by the special provisions.

4. All cabinets shall have a suitable designed vent to allow any explosive atmosphere to escape from the cabinet interior.

5. The cabinet shall be furnished complete including two mounting tables, capable of supporting 75 pounds each.

6. A lamp receptacle and convenience outlet, wired for 120 volt, 60 Hz, shall be provided in all cabinets.

7. The cabinet shall be provided with all necessary openings for mounting and connections of equipment specified for the particular job.

8. All connections of incoming conductors shall be neat and firm and made to a terminal board provided in the cabinet. The terminal board shall be located at least three inches from the bottom of the cabinet and arranged for adequate clearance between the terminals and side walls. The board shall provide at least:
   A. A terminal for circuit breaker for power supply line.
   B. A terminal (unused), for the neutral side of supply line.
   C. Terminals for detector cables.
   D. Terminals for signal light cables, at least one for each signal circuit and associated common conductors.

9. Connections between the terminal board and the controller (including all associated equipment) shall be made by using multi-terminal plug receptacle incorporated with the controller, or other apparatus.

10. The same polarity shall be maintained with the traffic signal circuits as the power supply leads. Provision for grounding the cabinet to the ground side of the power supply shall be made.

11. A radio interference suppressor consisting of choke coils and/or condensers shall be provided with all flasher contacts.

12. Mounting brackets and hardware shall be placed so as to locate all equipment within easy access of the cabinet door opening.

**FIBERGLASS CABINET BASE**

NO SCALE

---

**MATERIALS**

**RESIN**

To be a virgin and not a distressed polyester thermosetting resin. The material shall be tested for flammability under ASTM-D635 with a rating to be self-extinguishing and with an extent of burning not to be over 12.5mm nor average time burned any seconds on test. Shall also meet UL-90 classification and shall have a V-0 rating.

**FIBERGLASS**

FiberGlass shall be a combination of chopped glass with a minimum of one layer throughout of 18 ounce woven roving so as to form a continuous filament from top to bottom and from one side to the other for maximum strength. The overall laminate shall be a minimum of 1/4 inch.

**SEALCOAT**

The exterior surface shall be coated with a polyester base sealcoat or a surfacelcoat that will provide maximum protection from UV light and weathering. Test data results from DRIE laboratories using the Canada test method with the results of the equivalent of two standard ultra-violet light years showing no change in fiber snow or fiber bloom and no worse than a "good" rating on general appearance and color change.

An alternate test for UV resistance can be the ASTM-G-70 test method with a maximum of change of 2.3 MacAdam units after one one thousand hours of exposure in a model 650WATLAS WEATHEROMETER.
FRONT VIEW
40”x60” SIGN TO BE
SUPPLIED BY THE CITY
AND INSTALLED BY CONTRACTOR

TYPICAL 12” YELLOW SIGNAL
HEAD SECTION-POLYCARBONATE
WITH TUNNEL VISOR
AND BLACK HOUSING

SCHOOL

SPEED LIMIT
20

WHEN FLASHING

MOUNTING BOLT

FLAShING SEQUENCE SHALL BE:

PLACEment NOTES:

1. ROADWAY WITH ONE THROUGH LANE: SIGN AND FLASHER
   ASSEMBLY CENTERED ON THROUGH LANE.

2. ROADWAY WITH TWO THROUGH LANES: SIGN AND FLASHER
   ASSEMBLY CENTERED ON LANE LINE BETWEEN THROUGH LANES.

3. ROADWAY WITH THREE THROUGH LANES: SIGN AND FLASHER
   ASSEMBLY CENTERED ON CENTER THROUGH LANE.
CABINET AND FLASHER

DETAIL

3/4" BANDING STRAP

SIGN MOUNTING BRACKET-DRILL CARNET FOR BOLT ATTACHMENT

CAST OR POLISHED ALUMINUM CABINET WITH BUILT-IN LOCK. HOUSES FLASHERS AND TIME SWITCH

BACK VIEW

SIGNAL HEAD SECTION TO BE MOUNTED AGAINST EDGE OF SIGN

ASTRO-BRAC TUBES AND ARMS

SUPPORT ARM

SEE DETAIL "A"

8" POLYCARBONATE SIGNAL SECTION WITH TUNNEL VISOR AND SLACK HOUSING. FLASH SEQUENCE PER AN ADJACENT 12" SECTION.

1 1/2"

17" MINIMUM

ROAD SURFACE

SIGN OUTSIDE EDGE

ASTRO-BRAC TUBE

SIGN CLAMP

SIGN FACE

DETAIL "A"

DESIGN STANDARDS

SCHOOL FLASHING BEACON / OVERHEAD

STANDARD DRAWING

T21

DATE: 8/15/14
TYPICAL TRENCH SECTION

TRENCH WIDTH

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>MINIMUM WIDTH</th>
<th>MAXIMUM WIDTH</th>
</tr>
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<tr>
<td>4&quot;</td>
<td>1’-4”</td>
<td>2’-4”</td>
</tr>
<tr>
<td>6&quot;</td>
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<td>2’-6”</td>
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<tr>
<td>8&quot;</td>
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<td>2’-8”</td>
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<tr>
<td>12&quot;</td>
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<td>16&quot;</td>
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<tr>
<td>24&quot;</td>
<td>4’-0”</td>
<td>5’-0”</td>
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</tbody>
</table>

NOTES:

1. TRENCHES 5 FT DEEP OR GREATER REQUIRE A "PROTECTIVE SYSTEM" AS DEFINED BY OSHA. TRENCHES 20 FT DEEP OR GREATER REQUIRE THAT THE PROTECTIVE SYSTEM BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER.

2. OSHA'S STANDARDS REQUIRE THAT TRENCHES BE INSPECTED DAILY AND AS CONDITIONS CHANGE BY A "COMPETENT PERSON" (AS DEFINED BY OSHA) PRIOR TO WORKER ENTRY TO ENSURE ELIMINATION OF EXCAVATION HAZARDS. FOR ADDITIONAL INFORMATION REGARDING OSHA REQUIREMENTS CALL 1-800-321-OSHA.

3. MINIMUM COVER OVER PIPE TO BE BELOW OFFICIAL STREET GRADE.

4. FOR PIPE BEDDING REQUIREMENTS REFER TO CHAPTER 9 OF THE STANDARDS AND SPECIFICATIONS.

5. PIPE BEDDING SHALL BE PLACED AGAINST UNDISTURBED SOIL IN THE TRENCH BOTTOM, HOWEVER, WHERE ADVERSE SOIL IS ENCOUNTERED IN THE TRENCH BOTTOM, SOIL SHALL BE REMOVED AND TRENCH STABILIZATION MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.

---

DESIGN STANDARDS

TYPICAL TRENCH SECTION

PIPE PROTECTION

STANDARD DRAWING

W1

DATE: 8/15/14
NOTES:

1. ALL FITTINGS, DI PIPE, AND HYDRANT BARREL SHALL BE POLYETHYLENE WRAPPED PER AWWA C-105. PROVIDE PERFORATION AT HYDRANT DRAIN HOLES.

2. PRIOR TO PUTTING INTO SERVICE THE FOLLOWING SHALL BE PERFORMED: NOZZLE THREADS SHALL BE GREASED, OIL RESERVOIR SHALL BE FILLED, AND HYDRANTS SHALL BE BRUSH PAINTED FIRE ENGINE RED (#7407).

3. THE ENTIRE PIPING ASSEMBLY (HYDRANT SHOE TO CONNECTION AT MAIN) SHALL BE FULLY RESTRAINED.

---

**City of Fort Lepton**

**FIRE HYDRANT INSTALLATION DETAIL**

**W2**

**DATE:** 8/15/14
**NOTES:**

1. BEARING SURFACES SHOWN IN CHART ARE MINIMUM.
2. BEARING SURFACES ARE BASED ON 150 PSI INTERNAL PIPE PRESS PLUS WATER HAMMER.
   - 4”, 6”, 8” AND 12” WATER HAMMER = 110 PSI
   - 16”, 20” AND 24” WATER HAMMER = 70 PSI
3. BEARING SURFACE CALCULATIONS ARE BASED ON 900 PSF SOIL BEARING CAPACITY.
4. ALL DUCTILE IRON AND CAST IRON PIPE AND FITTINGS SHALL BE WRAPPED IN POLYETHYLENE AND SECURELY TAPED PRIOR TO PLACING TRUST BLOCKS.
5. NO COMPACTATION SHALL BE ALLOWED ABOVE THRUST BLOCKS FOR A MINIMUM OF 24 HOURS AFTER PLACEMENT. CONCRETE MUST CURE A MIN. OF 48 HOURS PRIOR TO FILLING LINES.
### Minimum Dimensions for Thrust Blocks

<table>
<thead>
<tr>
<th>Fitting Size</th>
<th>Tees &amp; Plugs</th>
<th>90° Bend</th>
<th>45° Bends &amp; Wyes</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
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<tr>
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<tr>
<th>Fitting Size</th>
<th>Reducers &amp; 22 1/2° Bends</th>
<th>11 1/4° Bends</th>
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<td></td>
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<td>24&quot;</td>
<td>4'–6&quot;</td>
<td>3'–0&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>4'–9&quot;</td>
<td>4'–6&quot;</td>
</tr>
</tbody>
</table>

**General Notes:**

1. Bearing surface areas shown in chart are minimum.
2. Based on 150 P.S.I. Internal pipe pressure.
4. All fittings to be wrapped with polyethylene (minimum 8 mil.).

**City of Fort Lupton**

**Design Standards**

**Typical Trench Block Dimensions**

**Standard Drawing**

**W4**

**Date:** 8/15/14
NOTES:
1. SIZE OF BLOCK TO BE A MINIMUM OF 18" THICK.
2. ALL BLOCKING TO BE ON UNDISTURBED MATERIAL.
FIELD INSTALLATION—POLYETHYLENE WRAP

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

**STEP-2**
PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH 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 COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF THE PIPE AND TAPED IN PLACE.

**NOTE:** POLYETHYLENE SHALL BE MINIMUM 8-MIL THICKNESS
TEST STATION BOX SHALL BE LOCATED BEHIND EACH FIRE HYDRANT.
(NON-LOCKING COVER 6" ID x 18" SHAFT LENGTH)
PROVIDE AMPLE TRACER WIRE AT TEST STATION
FOR REMOVING COVER AND TESTING

6" FIRE HYDRANT LATERAL (TYP)

RUN DOUBLE TRACER WIRES FROM MAIN
AND ALONG HYDRANT BRANCH TO TEST
STATION BOX

GATE VALVE

TAPE TRACER WIRE TO PVC PIPE
W/ 2" WIDE PVC TAPE (TYPICAL 4
PLACES
PER 20' OF PIPE)

SWIVEL TEE OR TAPPING SLEEVE

SPlice TRACER WIRES W/ "3M" TYPE
D8Y-6 LOW VOLTAGE DIRECT BURY SPlice,
OR EQUAL. INSTALL PER MANUFACTURER
INSTRUCTIONS.
NOTES:

1. UPSIZING OF SERVICE PIPES AFTER THE METER REQUIRES THE APPROVAL OF THE BUILDING DEPARTMENT. FOR SERVICE PIPES UPRIZED FROM 3/4" TO 1", A REDUCER SHALL BE INSTALLED AS SHOWN ON THIS DETAIL.

2. ONLY COMPRESSION FITTINGS WILL BE ALLOWED ON COPPER SERVICE PIPES. FOR APPROVED MANUFACTURERS AND MODEL NUMBERS OF FITTINGS, REFER TO CHAPTER 3 OF THE CITY STANDARDS.

3. THIS DETAIL IS NOT INTENDED FOR INSTALLATION IN STREETS, DRIVEWAYS, OR CONCRETE AREAS.

4. METER PIT SHALL BE LOCATED IN A SOD OR MULCH AREA WITH A 10' MIN. WIDTH UTILITY EASEMENT. NO TREES, SHRUBS, OR STRUCTURES SHALL BE LOCATED IN THE EASEMENT.

5. SERVICE LINES TO THE METER PIT SHALL BE INSTALLED PERPENDICULAR TO THE WATER MAIN.

6. FOR 3/4" RESIDENTIAL METER INSTALLATIONS. NEWLY INSTALLED SERVICE LINES FROM MAIN SHALL BE 1". EXISTING 3/4" SERVICE LINES MUST BE REVIEWED AND APPROVED FOR CONFORMANCE WITH RESIDENTIAL FIRE SPRINKLER SYSTEM REQUIREMENTS.

7. PROPER METER SETTERS SHALL BE INSTALLED TO ACCOMMODATE SERVICE LINE SIZES FROM MAIN AND TO CUSTOMER. REFER TO SECTION 3.63.08 OF THE CITY WATER SYSTEM STANDARDS FOR ACCEPTABLE SETTER MODEL NUMBERS.
GENERAL NOTES

1. NOT FOR INSTALLATION IN ROADWAYS, DRIVEWAYS, PARKING AREAS, SIDEWALKS, OR CONCRETE. EDGE OF METER PIT LID SHALL NOT BE CLOSER THAN 4’ FROM EDGE OF DRIVEWAY.

2. IF SURFACE IS NOT TO OFFICIAL GRADE WHEN THE METER IS INSTALLED, THE OWNER MUST RAISE OR LOWER THE PIT, METER SETTER AND ALL OTHER APPURTENANCES TO THE FINAL APPROVED GRADE.

3. METER SHALL BE SET WITHIN PUBLIC R.O.W OR PUBLIC EASEMENT.

4. NO CONCRETE FLOOR TO BE LAID IN METER PIT.

5. METER PIT SHALL BE CONSTRUCTED OF MODIFIED HI-DENSITY POLYETHELENE.

6. ADJUSTMENT RINGS SHALL BE 2”, 3”, 4” OR 6” IN HEIGHT AND SHALL BE INSERTED ABOVE THE POLYETHYLENE METER PIT.

7. FOR WATER SERVICE LINES 1” AND LARGER: IF THE METER PIT IS NOT INSTALLED WITHIN THE PUBLIC R.O.W. THEN A CURB STOP AND BOX SHALL BE INSTALLED WITHIN THE PUBLIC R.O.W.

<table>
<thead>
<tr>
<th>DESIGN STANDARDS</th>
<th>STANDARD DRAWING</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot; &amp; 1&quot; METER NOTES</td>
<td>W9</td>
</tr>
<tr>
<td>DATE: 8/15/14</td>
<td></td>
</tr>
</tbody>
</table>
NOTES:
1. UPSIZING OF SERVICE PIPES AFTER THE METER REQUIRES THE APPROVAL OF THE BUILDING DEPT. FOR SERVICE PIPES
   UPSIZED FROM 1" TO 1 1/2", 1 1/2" TO 2" OR 2" TO 3" A REDUCER SHALL BE INSTALLED AS SHOWN ON THIS DETAIL.
2. FOR APPROVED MANUFACTURERS AND MODEL NUMBERS OF FITTINGS, REFER TO CHAPTER 3 OF THE CITY STANDARDS.
3. METER MANHOLE SHALL BE SURVEYED SO THAT THE COVER CAN BE PROPERLY LOCATED 2" ABOVE FINISHED GRADE PRIOR
   TO BACKFILLING.
4. A BYPASS IS REQUIRED TO BE INSTALLED ON POTABLE WATER SETTINGS.
5. ONLY COMPRESSION FITTINGS WILL BE ALLOWED ON COPPER SERVICE PIPES.
6. MANHOLE STEPS SHALL BE PLACED 12" ON CENTER AND 18" MAX. FROM THE TOP OF THE FRAME TO THE FIRST STEP.
7. METER MANHOLE AND CURB STOP SHALL BE LOCATED IN A SOD OR MULCH AREA WITH A 10" MIN. WIDTH UTILITY
   EASEMENT. NO TREES, SHRUBS OR STRUCTURES SHALL BE LOCATED IN THE EASEMENT.
8. THIS MANHOLE IS NOT INTENDED FOR INSTALLATION IN STREETS, DRIVEWAYS OR CONCRETE AREAS.
9. SERVICE LINES SHALL BE INSTALLED PERPENDICULAR TO THE WATER MAIN.

<table>
<thead>
<tr>
<th>DESIGN STANDARDS</th>
<th>STANDARD DRAWING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2&quot; AND 2&quot; DOMESTIC METER SETS (ALSO FOR SERVICE PIPES UPSIZED FROM 1&quot; TO 1-1/2&quot; AND 2&quot; TO 3&quot;)</td>
<td>W10</td>
</tr>
<tr>
<td>DATE: 8/15/14</td>
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</table>
1. For all 3" and 4" meter settings, 4" PVC service pipe shall be required from the main to the vault as shown on this detail. For 3" meter settings, a reducer shall be required before the meter and also on the bypass as shown (see Note 2 for exception).

2. Upsizing of the service pipe after the meter requires the approval of the building dept. For a service pipe upsized from 3" to 4", a reducer shall be installed after the meter as shown (reducer is not required on bypass in this case).

3. In general, PVC pipe shall be used on the service line outside the vault, except where the DI pipe stubs through the vault walls, and DI pipe shall be used inside the vault. Fittings inside the vault shall be flanged, unless otherwise noted. Fittings outside the vault shall be mechanical joint.

4. For approved manufacturers and model numbers of fittings, refer to Chapter 3 of these standards and specifications.

5. Meter vault shall be surveyed so that the cover can be properly located 2" above finished grade prior to backfilling.

6. A bypass is required to be installed on all potable water settings.

7. Manhole steps shall be placed 12" on center and 18" max. from finished grade to the first step.

8. Service pipes larger than 4" will require shop drawing submittal and approval by utility operations.

9. Compound meters shall have strainers upstream of the 15" pipe segment. Turbo meters shall have integral strainers.

10. Steel pipe stands shall be required: 3 for main line and 2 for bypass line (minimum).

11. Meter vault and curb stop shall be located in a sod or mulch area with a 10' min. width utility easement. No trees, shrubs or structures shall be located in the easement.

12. This vault is not intended for installation in streets, driveways or concrete areas.

13. Service lines shall be installed perpendicular to the water main.

14. Note: Vault roofing, nuts and wall plates must be stainless steel.

15. All service pipe and fittings outside of the vault shall be restrained for a min. distance of 20' upstream and downstream of the bypass tees.
36" MANHOLE RING WITH DOUBLE COVER (36" & 24")

SECTION A-A

SECTION B-B

METER VAULT—INSIDE DIMENSION SCHEDULE

<table>
<thead>
<tr>
<th>METER SIZE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>WALL THICKNESS</th>
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<tbody>
<tr>
<td>3”</td>
<td>8'-0&quot;</td>
<td>7'-0&quot;</td>
<td>7'-0&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>4”</td>
<td>10'-0&quot;</td>
<td>7'-0&quot;</td>
<td>7'-0&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>6”</td>
<td>12'-0&quot;</td>
<td>9'-0&quot;</td>
<td>7'-0&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>8”</td>
<td>12'-0&quot;</td>
<td>9'-0&quot;</td>
<td>7'-0&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>12”</td>
<td>12'-0&quot;</td>
<td>10'-0&quot;</td>
<td>8'-0&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>
TYPICAL CONC. METER SUPPORTS
FOR 3", 4", 6", 8", & 10" METERS

TYPICAL CONC. METER SUPPORT
FOR F.M.—M.C.T. OR TURBINE

NOTES:
1. SOLID CONCRETE BASE
   EXTENDS UNDER THE
   F.M.—C.T. METER BYPASS
   FOR 6", 8" & 10".

2. SOLID CONCRETE BASE
   MAY BE PRECAST.

SIZE OF CONCRETE SUPPORT
6" F.M.—C.T. W=3'-9" L=3'-0"
8" F.M.—C.T. W=4'-5" L=3'-8"
10" F.M.—C.T. W=5'-8" L=4'-8"

W13

DATE: 8/15/14
REFLECTIVE TAPE — 3M OR APPROVED EQUAL — 1" FROM TOP OF POST

MARKER POST — 4" CARSONITE FLEXIBLE MARKER, BLUE IN COLOR WITH 1" STENCILED LETTERS PAINTED BLACK — LABEL ACTUAL DISTANCE TO WATER VALVE. BURY DEPTH = 2' WITH 4’ OF MARKER EXPOSED. MARKER POST SHALL FACE THE WATER VALVE. MARKER POSTS ARE ONLY REQUIRED FOR VALVES IN UNPAVED AREAS.

UNPAVED AREAS

PAVED AREAS

5 7/8" MIN DIA. CAP W/ WORD "WATER" ON COVER

FLUSH TO 1/4" (MAX.) BELOW FINISHED GRADE

NEW PAVEMENT SECTION

VALVE BOX TO BE PLUMB AND THE BASE SHALL NOT REST ON THE PIPE.

SEE TRENCH DETAIL W1

30" SQ. X 6" THICK CONCRETE COLLAR (EXCEPT IN PAVEMENT) W/ #4 REBAR @ 3" FROM OUTSIDE PERIMETER OR USE FIBROUS CONCRETE.

SEE NOTE #1

MJ X MJ GATE VALVE

NOTES:
1. CARE SHALL BE TAKEN WHEN INSTALLING VALVES TO ASSURE PROPER SUPPORT OF THE VALVE. THE CITY ENGINEER MAY REQUIRE 3/4" CRUSHED ROCK TO BE INSTALLED UNDER THE VALVE TO PROVIDE PROPER SUPPORT.
2. VALVES SHALL NOT BE PLACED IN CONCRETE SIDEWALKS, CROSS PANS, CUTTERS, OR OTHER DRAINAGE WAYS.
4. GATE VALVE SHALL BE POLYETHYLENE WRAPPED (8 MIL).
5. CONCRETE COLLARS & MARKER POSTS ARE REQUIRED WHEN VALVE IS LOCATED IN AN UNPAVED AREA.
6. VALVE BOXES ARE TO BE BROUGHT UP TO GRADE AT THE TIME OF PAVEMENT PLACEMENT OR OVERLAY. VALVE BOX ADJUSTING RINGS ARE NOT ALLOWED.

DESIGN STANDARDS

VALVE BOX

STANDARD DRAWING

W1

DATE: 8/15/14

2. ALL 2" FITTINGS AND PIPE SHALL BE BRASS.

3. ALL IRON PIPE AND FITTINGS SHALL BE WRAPPED IN POLYETHYLENE AND SECURELY TAPED PRIOR TO PLACING THRUST BLOCKS.
MOA = MACHINED OVER ALL.
MEE = MACHINED EACH END.
MJ = MECHANICAL JOINT.
MJ-B = MECHANICAL JOINT-BELL ADAPTER.

NOTE:
THE CONTRACTOR SHALL
POTHOLE THE HOST PIPE AND
MEASURE THE OUTSIDE DIAMETER PRIOR TO
ORDERING PARTS OR CUTTING THE PIPE.

TYPES OF COUPLINGS
1 - ROUGH BARREL TO D.I.
2 - MOA TO D.I.
3 - ROUGH BARREL TO ROUGH BARREL.
4 - MEE TO ROUGH BARREL.
NOTES:

1. SEWER LINES CROSSING ABOVE WATER MAINS SHALL BE PVC C900 PRESSURE PIPE AND EXTEND 9' EACH SIDE OF CROSSING (MIN.).

2. MECHANICAL JOINT RERAINTS SHALL BE PROVIDED AT ALL JOINTS IN THE LOWERING AND FOR THE SPECIFIED DISTANCE BACK FROM THE LOWERING AS DESIGNED BY THE ENGINEER OF RECORD.

3. WATER MAINS CROSSING CULVERTS THAT ARE EXPOSED TO THE ELEMENTS SHOULD BE EVALUATED FOR FREEZE POTENTIAL.

4. A BORED CROSSING MAY BE REQUIRED FOR THE WATERMAIN.

5. CATHODIC PROTECTION MAY BE REQUIRED FOR THE DUCTILE IRON WATER MAINS AS SPECIFIED BY THE ENGINEER.
NOTES:
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF VAULT LAYOUT AND FITTINGS FOR APPROVAL BY THE CITY ENGINEER.
2. AIR VALVES SHALL BE SIZED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. FOR APPROVED MANUFACTURER'S AND MODEL NUMBERS OF FITTINGS, REFER TO CHAPTER 3 OF THE ENGINEERING STANDARDS.
4. ISOLATION VALVES SHALL BE FULL PORT BRONZE BALL STYLE WITH HAND LEVER. TWO INCH VALVES SHALL BE CORPORATION TYPE AND THREE INCH AND LARGER VALVES SHALL INCORPORATE FLANGE FITTINGS TO MATE WITH FLANGED AIR VALVES.
5. ALL COMPONENTS OF MANHOLE STRUCTURE SHALL MEET AASHTO H20 LOAD RATING.
6. CHECK HEIGHT OF AIR VALVE AND ASSOCIATED PLUMBING AND ENSURE PROPER CLEARANCES FROM VAULT PRIOR TO ESTABLISHING HOST PIPE DEPTH.

DESIGN STANDARDS

STANDARD DRAWING

COMBINATION AIR VALVE INSTALLATION

DATE: 8/15/14
NOTES:
1. CONTRACTOR SHALL SUBMIT PIPE LAYOUT DRAWINGS AND DIMENSIONING IN VAULT FOR APPROVAL BY THE CITY ENGINEER. FOR DIP ALTERNATIVE, BFV SHALL BE FLANGED WITH A DISMANTLING JOINT OR SHALL BE MJ WITH A SOLID SLEEVE AND PIPE Stub. FOR STEEL PIPE THE BFV AND DISMANTLING JOINT SHALL BE FLANGED.
2. THE VAULT STRUCTURE SHALL BE DESIGNED FOR HS20 LOADING CRITERIA.
3. PIPE PENETRATIONS SHALL BE SEALED WITH LINK SEAL AND JOINTS SHALL BE SEALED WITH RAM-NEK RN101 OR APPROVED EQUAL.
4. ALL AIR VALVE PIPING AND FITTINGS SHALL BE BRASS.
5. PIPING SHALL BE FULLY RESTRAINED THROUGH THE VAULT AND ON BOTH SIDES OF THE VALVE FOR THE DISTANCE SPECIFIED BY THE DESIGN ENGINEER.
6. COAT THE EXTERIOR OF THE VAULT WITH BITUMASTIC 300M DAMP PROOFING OR APPROVED EQUAL.
7. FOR VALVES BURIED GREATER THAN 7 FEET DEEP AT THE OPERATING NUT ADD AN EXTENSION AND SUPPORT AS SHOWN. PIN THE EXTENSION THROUGH THE VALVE NUT.
8. ISOLATION VALVES SHALL BE FULL PORT BRONZE BALL STYLE WITH HAND LEVER. TWO INCH VALVES SHALL BE CORPORATION TYPE AND THREE INCH AND LARGER VALVES SHALL HAVE A FLANGE ADAPTOR ON THE OUTLET SIDE TO MATE WITH FLANGED AIR VALVES.

DESIGN STANDARDS

STANDARD DRAWING

W20

DATE: 8/15/14
"A" - STRAIGHT LINE
CUL-DE-SAC:
LAY PIPE TO 32' BEYOND
THE CENTER (RADIUS
POINT) OF CUL-DE-SAC.

"B" - OFFSET CUL-
DE-SAC:
LAY PIPE TO 5' BEYOND
CENTER (RADIUS POINT)
OF CUL-DE-SAC.
THE NUMBER OF RUNNERS ON EACH SPACER DEPENDS ON THE PIPE DIAMETER, THE GAP ON THE TOP SPACERS SHALL NOT EXCEED 3/4"

NEOPRENE, EPDM RUBBER OR PVC SPACERS SHALL BE ELECTRICALLY ISOLATED FROM THE CASING PIPE

STEEL CASING PIPE (SEE TABLE FOR WALL THICKNESS)

WATERTIGHT TYPE C PULL-ON OR TYPE W WRAP AROUND END SEAL (TYP.)

SECTION VIEW

TRACER WIRE

EACH END OF JOINT 1' 1'

CARRIER PIPE SHALL BE RESTRAINED THROUGH THE CASING PIPE USING BELL RESTRAINT HARNESSES, LOCKING JOINT DI PIPE, OR FUSEABLE PVC PIPE, AS APPROVED

CARRIER PIPE
MIN OD  MIN WALL THICKNESS

<table>
<thead>
<tr>
<th>NOMINAL #</th>
<th>MIN OD</th>
<th>MIN WALL THICKNESS</th>
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</thead>
<tbody>
<tr>
<td>4”</td>
<td>12”</td>
<td>0.188”</td>
</tr>
<tr>
<td>6”</td>
<td>16”</td>
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<tr>
<td>8”</td>
<td>18”</td>
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</tr>
<tr>
<td>12”</td>
<td>22”</td>
<td>0.344”</td>
</tr>
<tr>
<td>16”</td>
<td>28”</td>
<td>0.406”</td>
</tr>
<tr>
<td>20”</td>
<td>32”</td>
<td>0.469”</td>
</tr>
</tbody>
</table>

NOTE:
THE ANNULAR SPACE BETWEEN THE CASING AND CARRIER PIPES SHALL NOT BE FILLED WITH ANY MATERIAL.

SIDE VIEW

CITY OF Fort Lupton
COME PAINT YOUR FUTURE WITH US

DESIGN STANDARDS

BORING DETAIL

STANDARD DRAWING

W22

DATE: 8/15/14
NOTES:
1. ALL COMPONENTS OF THE MANHOLE STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING.
2. PIPE PENETRATIONS SHALL BE SEALED WITH LINK SEAL AND MANHOLE JOINTS SHALL BE SEALED WITH RAM—NEK RN101 OR APPROVED EQUAL.
3. COAT THE EXTERIOR OF THE STRUCTURE WITH BITUMASTIC JOOM DAMP PROOFING OR APPROVED EQUAL.
4. THIS BLOW-OFF INSTALLATION SHALL BE REPLACED WITH A FIRE HYDRANT WHEN DIRECTED BY THE CITY ENGINEER, SUCH AS IN AREAS OF HIGH GROUNDWATER.
5. FOR VALVES DEEPER THAN 7’ AN EXTENSION AND SUPPORT SHALL BE INSTALLED AND PINNED TO THE OPERATING NUT.
6. CLAY CUTOFF WALLS SHALL BE INSTALLED ON BOTH SIDES OF THE MAINLINE TEE TO PREVENT INFILTRATION INTO THE VAULT.

---

**DESIGN STANDARDS**

**STANDARD DRAWING**

**TRANSMISSION MAIN BLOW-OFF INSTALLATION**

**DATE:** 8/15/14
2" DIAMETER
RECESSED HOLE IN
CENTER FOR
TRANSPONDER.

COVER TOP

23 7/8" DIA.
[606mm]

11/16" DIA.
[22mm]

7 1/4" [184mm]

2 1/2" [64mm]

1 1/2" (38mm) LETTERING
(RECESSED FLUSH)

COVER BOTTOM

3/8" [10mm]

PICKSLOT DETAIL

COVER: GRAY IRON ASTM A48 CL35 B
LOAD RATING: HS-20
COVER: 135 LBS 61kg
√ MACHINED SURFACE

WATER VAULT LID

DESIGN STANDARDS

STANDARD DRAWING

W24

DATE: 8/15/14
NOTES:
1. THE CITY SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO TAPPING. THE CITY’S REPRESENTATIVE SHALL BE ON SITE DURING TAPPING.
2. ALL CAST IRON / DUCTILE IRON FITTINGS TO RECEIVE DOUBLE POLY WRAP PRIOR TO BACKFILL OR POURING OF CONCRETE KICKERS.
STORM OR SANITARY SEWER CROSSING UNDER WATER MAIN

IF \( d_b > 18" \) AN ENCASEMENT IS NOT REQUIRED

NOTES:
1. CONCRETE TO BE CAST AGAINST UNDISTURBED SOIL OR SHORING.
2. LENGTH OF ENCASEMENT SHALL EXTEND AT LEAST 9-FEET EACH SIDE OF WATER MAIN.
3. FILLER MATERIAL BETWEEN CONDUITS TO BE APPROVED COMPRESSIBLE MATERIAL SUCH AS STYROFOAM, ETC. IF \( d_4 \leq 6" \), COMPACTED BACKFILL, IF \( d_4 > 6" \).
4. SHORING OR SHEETING, IF USED, TO BE CUT OFF AT TOP OF ENCASEMENT
5. A REINFORCED ENCASEMENT IS REQUIRED FOR ALL CONDUITS CROSSING OVER WATERMAINS BUT ENCASEMENTS ARE NOT REQUIRED TO BE REINFORCED IF CROSSING UNDER WATERMAINS.

STORM OR SANITARY SEWER CROSSING OVER TOP OF WATER MAIN

REINFORCED ENCASEMENT REQUIRED REGARDLESS OF DIMENSION \( d_3 \)
#4 @ 12” (TYP)

PIPE I.D. | NO. OF LONGITUDINAL BARS & LOCATION
---|---
6” TO 8” | 4 - #4 BARS 1 EACH CORNER
10” TO 18” | 8 - #4 BARS 3 EACH SIDE
21” TO 33” | 12 - #4 BARS 4 EACH SIDE
36” | 16 - #4 BARS 5 EACH SIDE

SECTION A - A

PIPE O.D. + 4” (TYP. EACH LEG)

2” CLEARANCE MIN - TYP

DESIGN STANDARDS

CONCRETE ENCASEMENT REINFORCEMENT DETAIL

STANDARD DRAWING
W27

DATE: 8/15/14
NOTE:

1. LOCATE VENT OUT OF TRAFFIC AREAS AND AS APPROVED BY THE CITY.

2. FOR VENTS LOCATED IN A FIELD CONDITION OR AREAS THAT MAY REQUIRE A MORE VISIBLE INSTALLATION, REFER TO DETAIL W19B

3. VENTS SHALL HAVE FINE MESH SCREEN INSTALLED IN INTERIOR TO PREVENT INSECTS ENTERING THE VENT PIPE.
NEW CONSTRUCTION RESIDENTIAL
FIRE SPRINKLER PROTECTION SYSTEM

NOTES:
1. WATER TAP TO BE 1" WITH 1" CURB STOP & BOX
2. TEE OFF 1" PIPE FOR FIRE PROTECTION LINE.
3. REDUCE TO 3/4" LINE WITH 3/4" METER FOR DOMESTIC SERVICE.

<table>
<thead>
<tr>
<th>DESIGN STANDARDS</th>
<th>STANDARD DRAWING</th>
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<tr>
<td>SINGLE WATER TAP FOR FIRE LINE</td>
<td>W29</td>
</tr>
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<td>DATE: 8/15/14</td>
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