

STANDARD PRESSURIZED IRRIGATION DETAILS

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**PRESSURIZED
IRRIGATION
DETAILS**

DATE:
JANUARY 2015

DRAWING NAME:
PI-0

DRAWN BY:
ETL

CHECKED: APPROVED:

REVISIONS

| REV | DATE | BY | COMMENTS |
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**SARATOGA
SPRINGS CITY**

1307 N. COMMERCE DR.
#200, SARATOGA SPRINGS,
UT 84045
PHONE: 801-766-9793
FAX: 801-766-9794



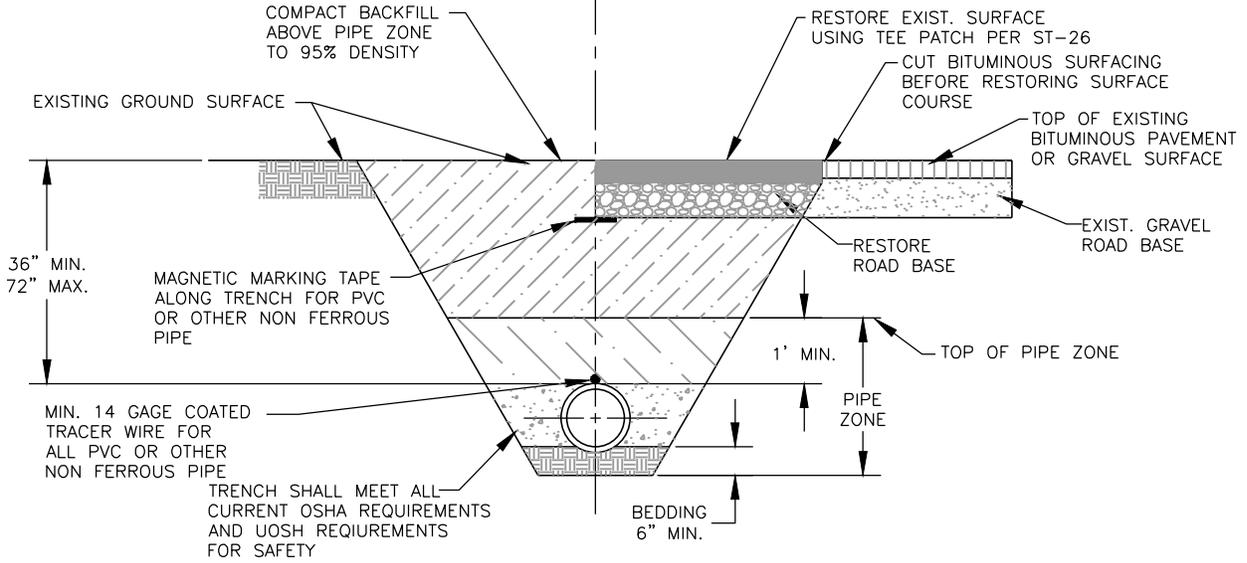
STANDARD DETAILS

PRESSURIZED IRR

PI-0

UNIMPROVED AREAS

ROADWAYS



CROSS-SECTION: TYPICAL TRENCH

NOTES:

1. WATER LINES 12 INCHES AND LARGER SHALL BE DUCTILE IRON CLASS-51.
2. WATER LINES 10 INCHES AND SMALLER SHALL BE PVC AWWA C900 CLASS 200.
3. VALVES 12 INCHES AND LARGER SHALL BE BUTTERFLY VALVES.
4. WHENEVER POSSIBLE "HOT TAP" CONNECTIONS REQUIRED. HOT TAP VALVE TO BE SUPPORTED DURING CONNECTION. CONTRACTOR TO NOTIFY CITY 24 HOURS IN ADVANCE OF MAKING CONNECTION.

5. PIPE ZONE SHALL BE BACKFILLED WITH BEDDING MATERIAL, OR OTHER ACCEPTABLE MATERIAL.
6. TRACING WIRE TO BE BROUGHT OUTSIDE OF BOTTOM PORTION OF VALVE BOX AND INSIDE TOP TO SURFACE.
7. FURNISH AND INSTALL POLY-WRAP ON DUCTILE IRON PIPE. POLY-WRAP MAY BE DELETED WHERE DIRECTED BY CITY ENGINEER.
8. WHERE COLLAPSIBLE SOILS ARE ENCOUNTERED, FURNISH, PLACE AND COMPACT IMPORTED BACKFILL MATERIALS AS REQUIRED AND AS DIRECTED.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL OF THE REQUIREMENTS ESTABLISHED FOR SAFE TRENCHING. (SEE OSHA AND UOSH REQUIREMENTS, LATEST EDITIONS).
2. MINIMUM COVER OVER TOP OF PIPE SHALL BE 36-INCHES BELOW THE FINISHED GRADE. THIS DEPTH MAY BE INCREASED AS REQUIRED TO MISS UNDERGROUND UTILITIES, STORM DRAINS, OR OTHER OBSTRUCTIONS, OR WHERE INDICATED ON THE DRAWINGS.
3. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES BEFORE LAYING PIPE WITHIN 200 FEET OF UTILITY CROSSINGS SHOWN ON THE DRAWINGS, OR AS "BLUE-STAKED."
4. SEWER MAINS, WATER MAINS, GAS MAINS AND OTHER UTILITIES ARE SHOWN ON THE PLANS IN A GENERAL SCHEMATIC WAY ACCORDING TO INFORMATION RECEIVED FROM OTHERS AND SOMETIMES FROM FIELD MEASUREMENTS. THE ACCURACY OR COMPLETENESS OF THE LOCATIONS SHOWN IS NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE ACTUAL LOCATION OF EXISTING SERVICE CONNECTIONS AND UTILITIES AND TAKE THE NECESSARY STEPS TO AVOID THEM.
5. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S SOLE EXPENSE.
6. THE CONTRACTOR MAY, AT HIS DISCRETION, USE SLOPING WALLS IN UNIMPROVED TERRAIN.

**TRENCH
DETAIL**

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| DRAWING NAME: PI-1 |
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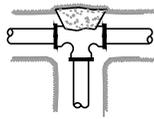
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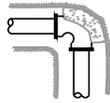
STANDARD DETAILS

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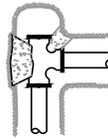
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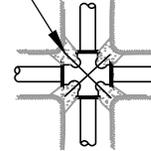
TEE



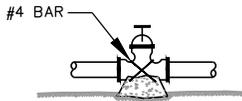
90° ELBOW



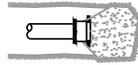
TEE WITH CAP



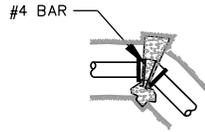
CROSS



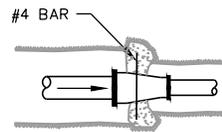
VALVE



CAP OR PLUG



ELBOW



REDUCER

SAFE BEARING LOADS

| SOIL TYPE | SAFE BEARING LOAD (lb/ft ²) |
|----------------------------------|---|
| SAND | 1000 |
| SAND & GRAVEL | 1500 |
| SAND & GRAVEL CEMENTED WITH CLAY | 2000 |
| SHALE | 5000 |

SAFE BEARING LOAD FORMULA

$$\frac{\text{THRUST BLOCK AREA AGAINST TRENCH WALL (SQ. FEET)}}{\text{THRUST ON FITTING}} = \frac{\text{SAFE BEARING LOAD OF SOIL}}{\text{SAFE BEARING LOAD OF SOIL}}$$

NOTES:

1. REINFORCING BARS SHALL BE EPOXY COATED
2. RESIDENT PROJECT ENGINEER WILL CALCULATE QUANTITIES OF CONCRETE REQ'D AND SPECIFY PLACEMENT METHODS & REQUIREMENTS; WHICH SHALL BE APPROVED BY CITY ENGINEER
3. CONCRETE SHALL BE 4000 PSI MIN.
4. POUR CONCRETE AGAINST UNDISTURBED SOIL

THRUST ON FITTINGS

POUNDS @ 1 POUND PER SQUARE INCH OF WATER PRESSURE*

| PIPE SIZE | TEES/PLUGS | 90° BENDS | 45° BENDS | 22.5° BENDS |
|-----------|------------|-----------|-----------|-------------|
| 4" | 18.5 | 26.1 | 14.2 | 7.2 |
| 6" | 38 | 53.7 | 29.1 | 14.7 |
| 8" | 65.8 | 93 | 50.4 | 25.5 |
| 10" | 107.5 | 152 | 82.4 | 41.7 |
| 12" | 153.1 | 216.4 | 117.2 | 59.4 |
| 14" | 215.5 | 304.7 | 164.9 | 84 |
| 16" | 281.5 | 398.1 | 215.4 | 109.8 |
| 18" | 356.3 | 503.8 | 272.6 | 139 |
| 20" | 439.8 | 622 | 336.6 | 171.6 |
| 24" | 633.3 | 895.6 | 484.7 | 247.1 |

*MULTIPLY THRUST BY MAXIMUM WATER PRESSURE

*PIPE SIZES LARGER THAN 24" SHALL BE THRUST BLOCKED AS PER ENGINEER RECOMMENDATION

THRUST BLOCK AREA AGAINST TRENCH WALL (SQ. FEET)

ASSUMING SAND AND MAX PRESSURE OF 150 PSI
SIZE MAY BE REDUCED WITH AN ENGINEERED SUBMITTAL
AND AS APPROVED BY THE CITY ENGINEER

| PIPE SIZE | TEES/PLUGS | 90° BENDS | 45° BENDS | 22.5° BENDS |
|-----------|------------|-----------|-----------|-------------|
| 4" | 2.8 | 3.9 | 2.1 | 1.1 |
| 6" | 5.7 | 8.1 | 4.4 | 2.2 |
| 8" | 9.9 | 14.0 | 7.6 | 3.8 |
| 10" | 16.1 | 22.8 | 12.4 | 6.3 |
| 12" | 23.0 | 32.5 | 17.6 | 8.9 |
| 14" | 32.3 | 45.7 | 24.7 | 12.6 |
| 16" | 42.2 | 59.7 | 32.3 | 16.5 |
| 18" | 53.4 | 75.6 | 40.9 | 20.9 |
| 20" | 66.0 | 93.3 | 50.5 | 25.7 |
| 24" | 95.0 | 134.3 | 72.7 | 37.1 |

CONCRETE THRUST BLOCKS

DATE:
JANUARY 2015

DRAWING NAME:
PI-2

DRAWN BY:
ETL

CHECKED: APPROVED:

| REVISIONS | |
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SARATOGA SPRINGS CITY

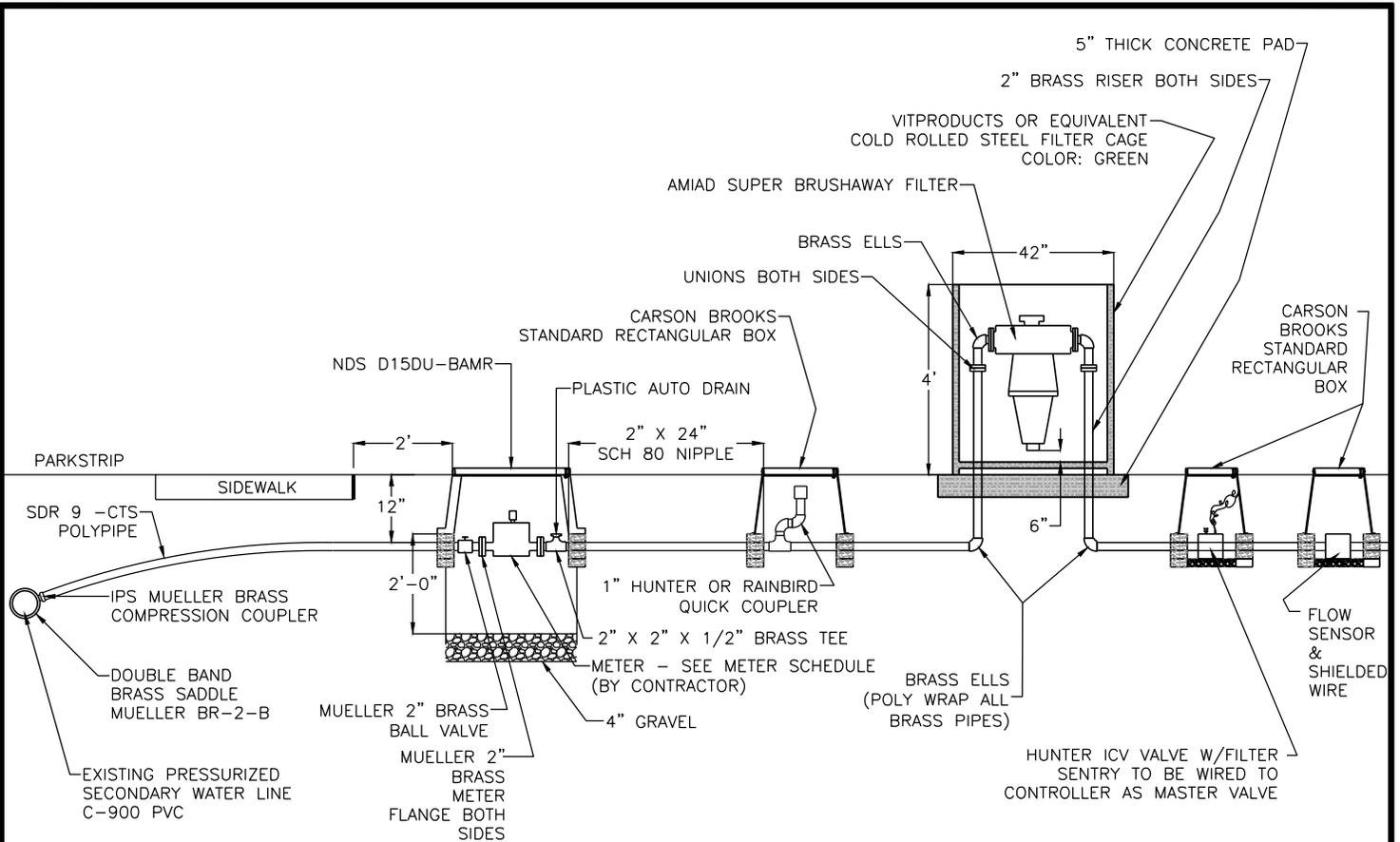
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STANDARD DETAILS

PRESSURIZED IRR

PI-2



PUBLIC PARKS & OPEN SPACE SECONDARY WATER CONNECTION (2" & SMALLER P.O.C.)

NOTES:

1. MINIMUM SURFACE RESTORATION SHALL BE 3" BITUMINOUS OVER 8" ROADBASE COMPACTED TO 95%. AT MAJOR STREETS, CITY ENGINEER WILL PROVIDE PAVEMENT DESIGN.
2. SERVICES MAY BE TUNNELED OR JETTED UNDER CURB AND GUTTER, DRIVEWAYS, OR SIDEWALKS. OTHER STRUCTURES SHALL BE OPEN CUT WITH SURFACE RESTORATION AT THE ENGINEERS DIRECTION.
3. IF TAPPING SADDLES ARE USED, METHOD OF SAWING/DRILLING TAP HOLES, TYPE OF SADDLE, PROCEDURES MUST BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
4. ALL PIPE AND FITTINGS UPSTREAM OF FILTER TO BE SCH 80 UNLESS SPECIFIED AS BRASS.
5. SCH 40 PIE AND FITTINGS ALLOWED DOWNSTREAM OF FILTER.
6. NO MALE ADAPTERS.
7. 18" BURY TO TOP OF PIPE.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL OF THE REQUIREMENTS ESTABLISHED FOR SAFE TRENCHING. (SEE OSHA REQUIREMENTS)
9. ALL CONSTRUCTION SHALL MEET CURRENT SARATOGA SPRINGS CITY STANDARDS, SPECIFICATIONS, & ORDINANCES.
10. STAINLESS STEEL LINER INSERTS WILL BE REQUIRED INSIDE OF TUBING AT COMPRESSION FITTINGS.
11. ALL FITTINGS SHALL BE COMPATIBLE WITH SERVICE SIZE.
12. SEE STANDARD FOR PRESSURIZED IRRIGATION SERVICE BOX, 2" PRESSURIZED IRRIGATION SERVICE, AND 4" PRESSURIZED IRRIGATION SERVICE.
13. SERVICE LATERAL SHALL SLOPE TOWARDS PRESSURIZED IRRIGATION MAIN.
14. SPRINKLER SLEEVE SHALL NOT BE IN LINE WITH ANY UTILITY BOXES.
15. SEE SERVICE DETAILS FOR BOX DESCRIPTIONS & TYPES
16. ALL PIPES TO BE BURIED WITH 14 GAUGE STRANDED THHN TRACE WIRE AND MARKING TAPE.

**CONNECTION FOR
PUBLIC PARKS
& OPEN SPACE**

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| DATE: JANUARY 2015 |
| DRAWING NAME: PI-4 |
| DRAWN BY: ETL |
| CHECKED: APPROVED: |

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SPRINGS CITY**

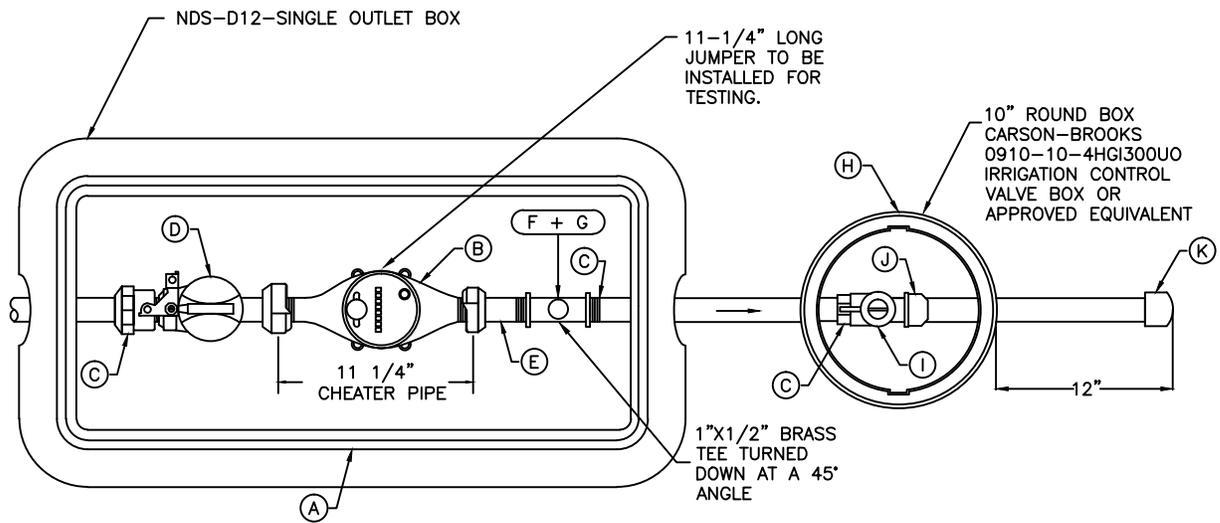
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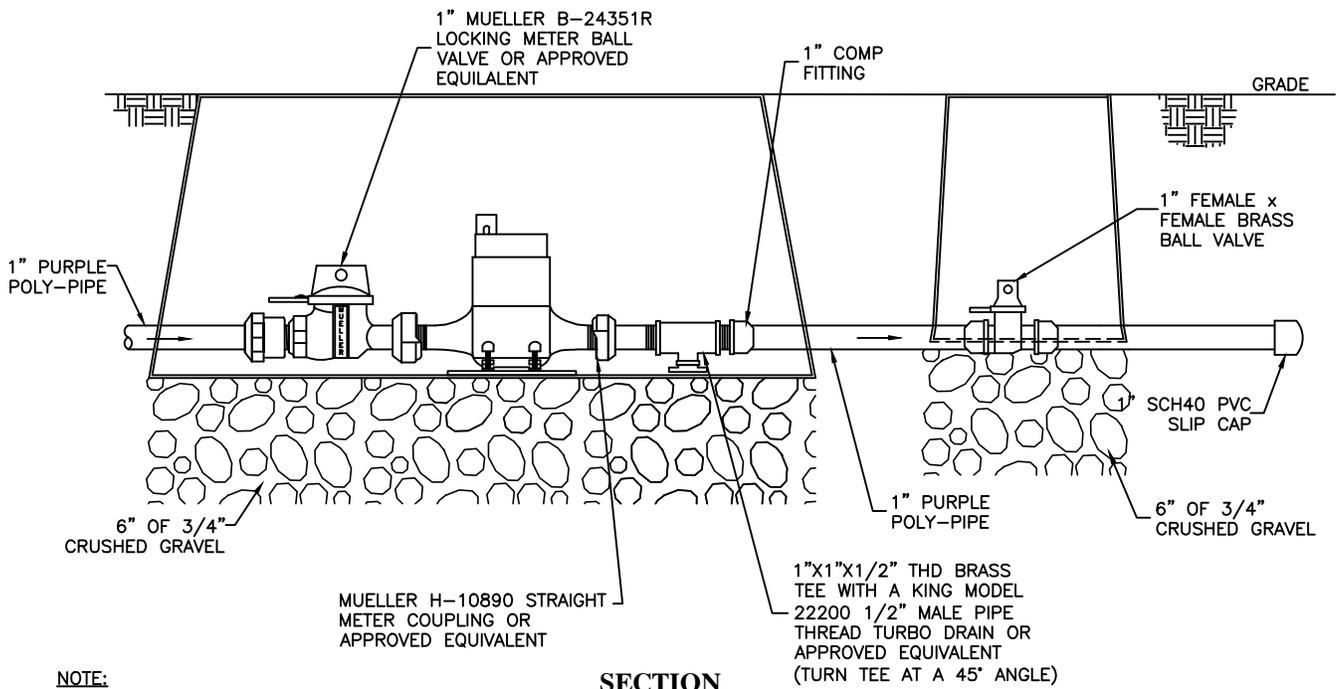
STANDARD DETAILS

PRESSURIZED IRR

PI-4



PLAN



SECTION

NOTE:

1. 1" METERS PROVIDED BY CITY
2. ALL PIPES SHALL BE BURIED WITH 14 GAUGE STRANDED THHN TRACE WIRE
3. CHEATER PIPE TO BE EXACTLY 11' 1/4" FROM FACE TO FACE

1" SINGLE SERVICE LATERAL BOX

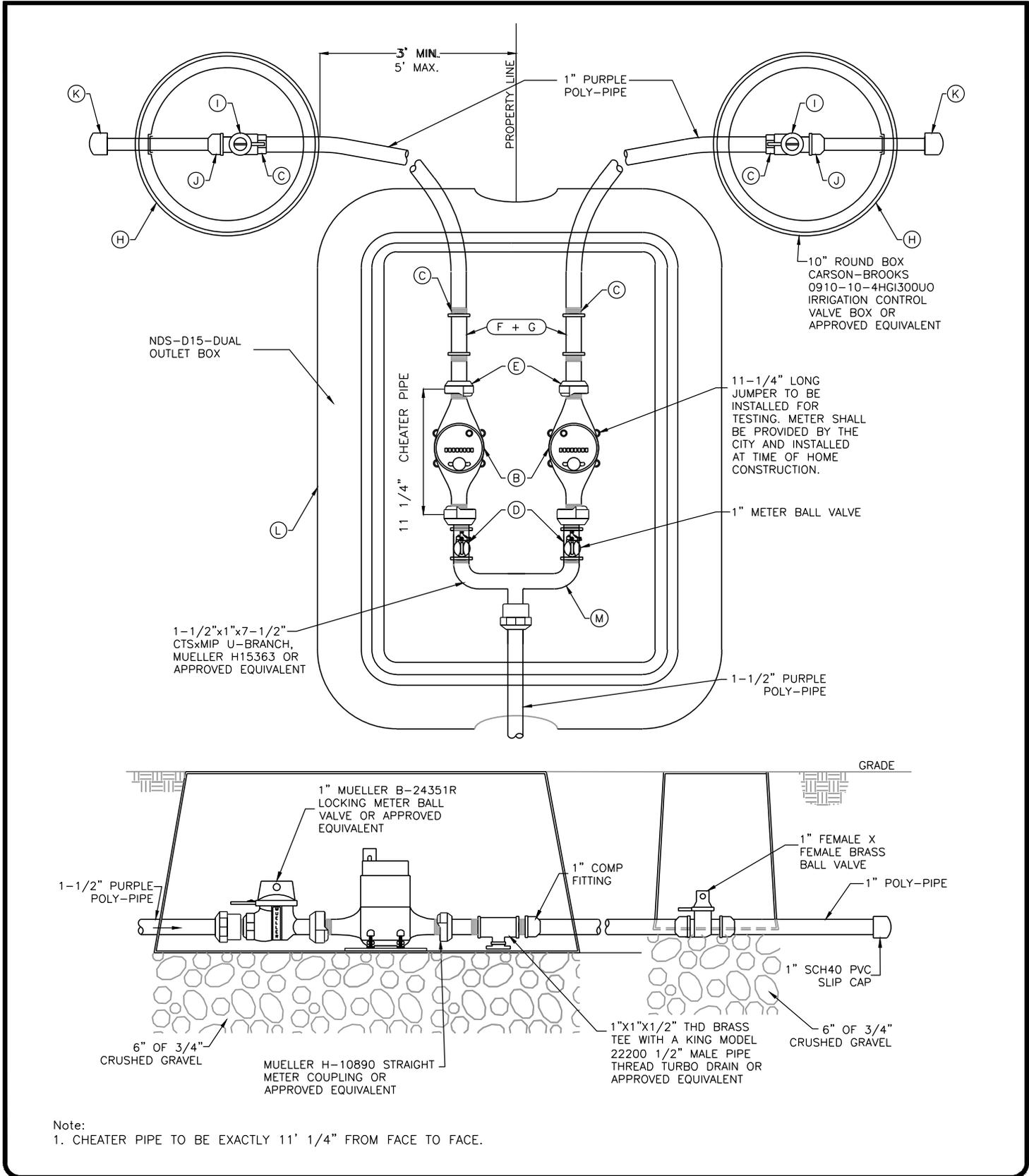
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| DRAWN BY: ETL | | |
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STANDARD DETAILS

PRESSURIZED IRR

PI-5A



1 1/2" DUAL SERVICE LATERAL BOX

| | | | |
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| DATE: JANUARY 2015 | | REVISIONS | |
| DRAWING NAME: PI-5B | | REV | DATE |
| DRAWN BY: | | B | 1/21/05 |
| CHECKED: | APPROVED: | C | 4-6-06 |
| | | BY | COMMENTS |
| | | inc | Concrete Block |
| | | MH | WR WHITE REDLINES |
| SARATOGA SPRINGS CITY | | | |
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STANDARD DETAILS

PRESSURIZED IRR

PI-5B

SCHEDULE OF PLUMBING MATERIAL FOR WATER METER BOXES

1" SINGLE SERVICE CONNECTION

| <u>ITEM</u> | <u>QUANTITY</u> | <u>DESCRIPTION</u> |
|-------------|-----------------|---|
| A | 1ea | 14"x19"x12" METER BOX W/ SINGLE OUTLET |
| B | 1ea | 1" METER (SUPPLIED AND INSTALLED BY CITY) |
| C | 3ea | 1" COUPLER CCT/MIPT H15428 |
| D | 1ea | 1" STR BALL METER VALVE B24351R |
| E | 1ea | 1" STR METER COUPLER H10890 |
| F | 1ea | 1"x1/2" BRASS TEE |
| G | 1ea | 1/2" MALE PIPE THREAD AUTO DRAIN |
| H | 1ea | 10" IRRIGATION VALVE BOX |
| I | 1ea | 1" BRASS BALL VALVE 600 WOG |
| J | 1ea | 1" MALE ADAPT SXM1PT SCH 40 |
| K | 1ea | 1" SLIP CAP SHC 40 |

1 1/2" TO DUAL 1" SERVICE CONNECTION

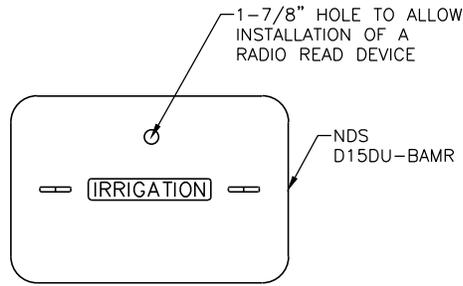
| <u>ITEM</u> | <u>QUANTITY</u> | <u>DESCRIPTION</u> |
|-------------|-----------------|--|
| L | 1ea | 13"x20"x12" JUMBO METER BOX W/ DOUBLE OUTLET |
| B | 2ea | 1" METER (SUPPLIED AND INSTALLED BY CITY) |
| M | 1ea | 1.5"x7.5" CTSxMIP U-BRANCH H15363 |
| D | 2ea | 1" STR BALL METER VALVE B24351R |
| E | 2ea | 1" STR METER COUPLER H10890 |
| F | 2ea | 1"x1/2" BRASS TEE |
| G | 2ea | 1/2" MALE PIPE THREAD AUTO DRAIN |
| C | 4ea | 1" COUPLER CCT/MIPT H15428 |
| I | 2ea | 1" BRASS BALL VALVE 600 WOG |
| H | 2ea | 10" IRRIGATION VALVE BOX |
| J | 2ea | 1" MALE ADAPT SXM1PT SCH 40 |
| K | 2ea | 1" SLIP CAP SHC 40 |

**PARTS LIST FOR
SINGLE AND DUAL
SERVICE LATERAL
BOXES**

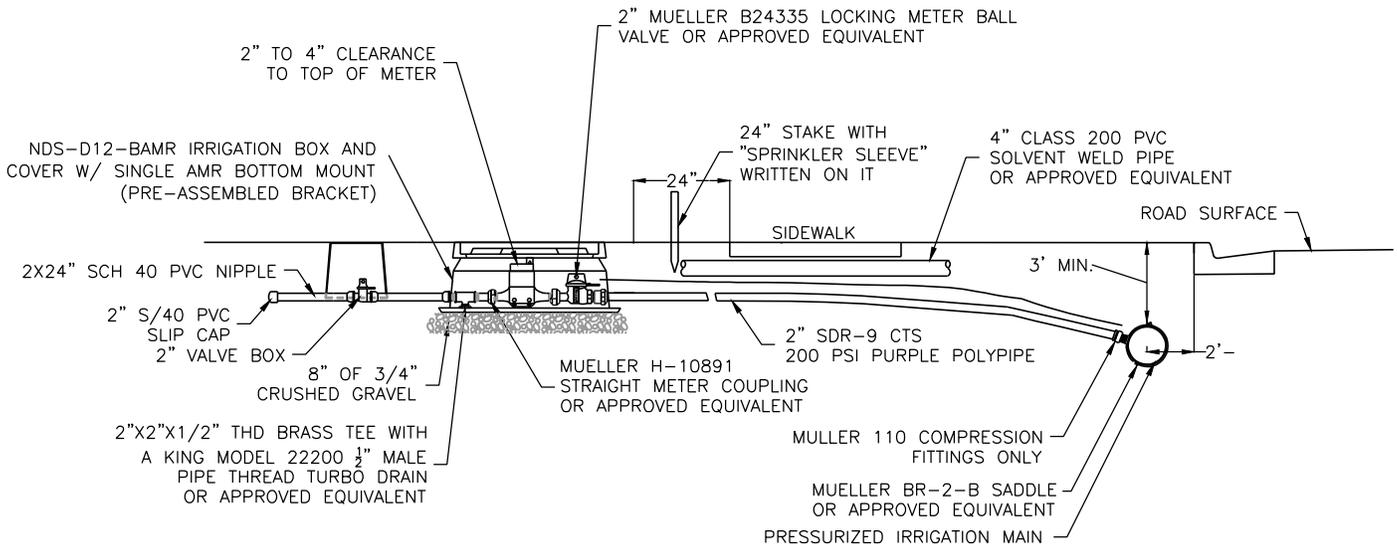
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| STANDARD DETAILS |
| PRESSURIZED IRR |
| PI-5C |



IRRIGATION BOX



SECTION

NOTES:

1. ADJUST ALL APPURTENCES TO AN EQUIVALENT 1 1/2" SIZE FOR 1 1/2" SERVICES.
2. SPRINKLER SLEEVE SHALL NOT BE IN LINE WITH ANY UTILITY BOXES.
3. ALL PIPES SHALL BE BURIED WITH 14 GAUGE STRANDED THHN TRACE WIRE AND MAGNETIC MARKING TAPE.

2" SERVICE LATERAL

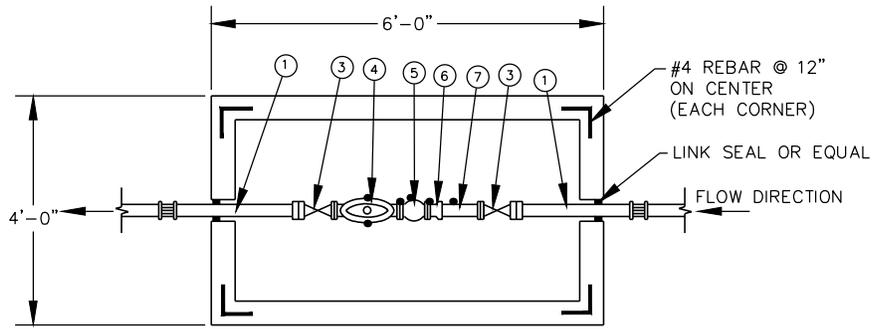
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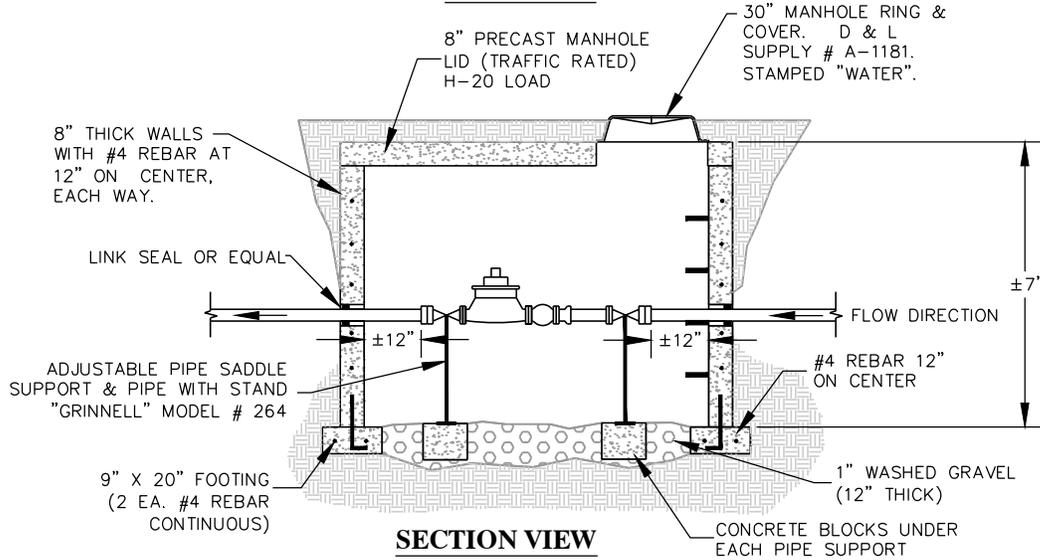
STANDARD DETAILS

PRESSURIZED IRR

PI-6



PLAN VIEW



SECTION VIEW

NOTES:

1. INSPECTION: METER BOX AND SERVICE LINE SHALL BE INSPECTED BY CITY PRIOR TO BACKFILLING.
2. BACKFILL: INSTALL BACKFILL IN LIFTS NOT EXCEEDING 8" AFTER COMPACTION. COMPACT EACH LIFT TO AN AVERAGE DRY DENSITY OF 97% WITH NO DENSITY TEST RESULT LESS THAN 92%.
3. ALL 4" INTERIOR FITTINGS TO BE FLANGED.
4. WATER METERS SHALL BE PROVIDED BY CONTRACTOR.
5. PLACEMENT: ALL METERS ARE TO BE INSTALLED IN THE PARK STRIP OR WITHIN 7 FEET OF THE PROPERTY LINE (STREET SIDE) AND MUST BE PLACED NEAR MIDPOINT OF THE LOT AND MUST NOT BE LOCATED IN A DRIVEWAY, OR IN A SIDEWALK.
6. CONTRACTOR SHALL SUPPLY ALL MATERIALS AND LABOR.
7. ALL PIPES SHALL BE BURIED WITH 14 GAUGE STRANDED THHN TRACE WIRE AND MARKING TAPE.

| 4" PIPE SCHEDULE | | |
|------------------|-----|-------------------------------------|
| # | QTY | DESCRIPTION |
| 1 | 1 | FLxPE D.I. SPOOL LENGTH = ±48" |
| 3 | 1 | 4" FLxFL GATE VALVE (MUELLER)* |
| 4 | 1 | 4" FLxFL METER |
| 5 | 1 | FLANGED METER STRAINER |
| 6 | 1 | 4" FLANGED COUPLING ADAPTER |
| 7 | 1 | FLxPE D.I. SPOOL (LENGTH AS NEEDED) |

* GATE VALVE SHALL BE FURNISHED WITH A HANDWHEEL.

**4 INCH
METER VAULT**

DATE:
JANUARY 2015

DRAWING NAME:
PI-7

DRAWN BY:
ETL

CHECKED: APPROVED:

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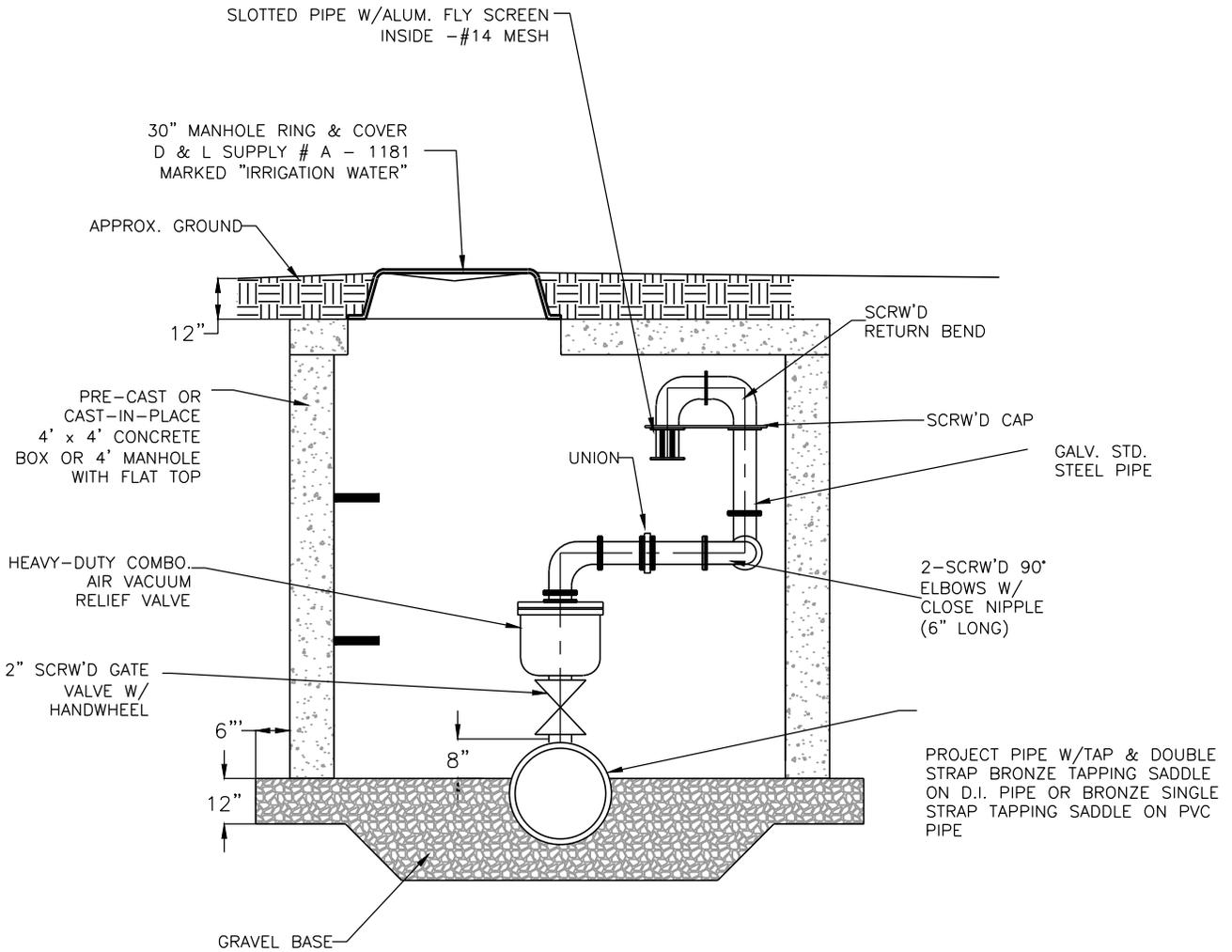
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STANDARD DETAILS

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PI-7



NOTE:

1. SIZE OF AIR-VACUUM RELIEF VALVE & PIPING SHALL BE AS DETERMINED BY PROJECT ENGINEER; AND APPROVED BY CITY ENGINEER.
2. LOCATE RISER IN LANDSCAPED AREA BEHIND CURB & GUTTER OR APPROX. 2 FT. FROM R/W LINE, AS DIRECTED BY CITY ENGINEER.
3. PROVIDE BOLLARDS OR OTHER PROTECTION FOR RISER IF AND AS DIRECTED BY CITY INSPECTOR.

**AIR VACUUM
RELIEF VALVE**

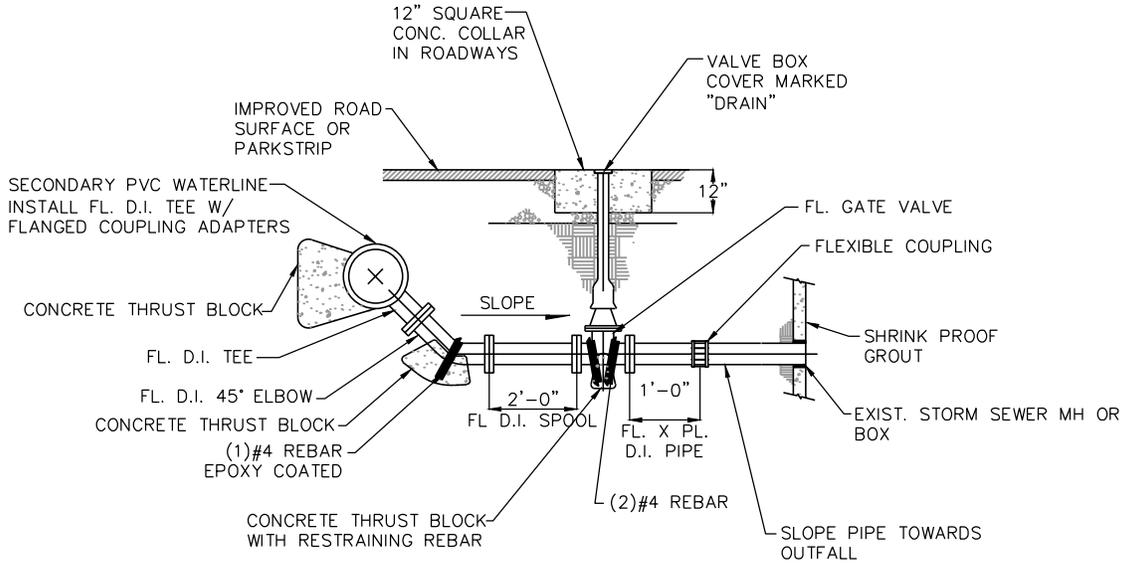
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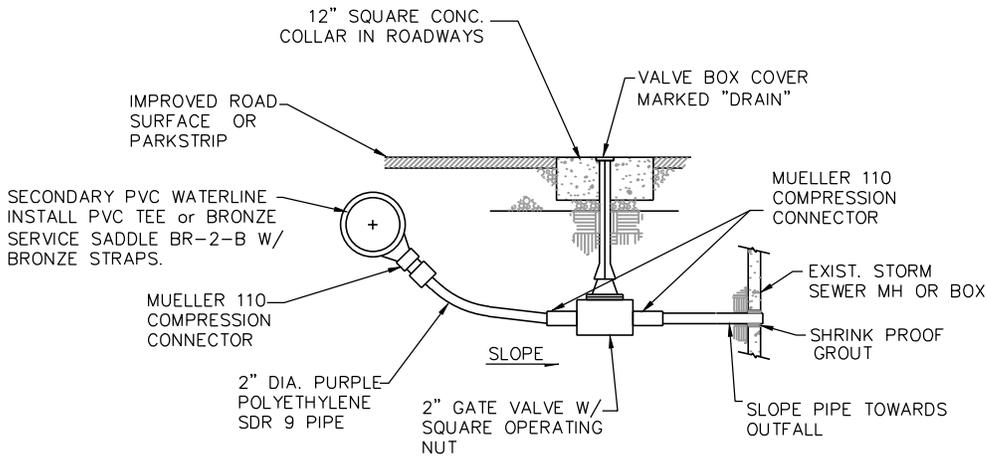
STANDARD DETAILS

PRESSURIZED IRR

PI-8



4" DRAIN VALVE DETAIL



2" DRAIN VALVE DETAIL

NOTES:

1. USE 2" DRAINS ON 6" AND SMALLER PIPE LINES
2. USE 4" DRAINS ON 8" AND LARGER PIPE LINES
3. MARK "D" FOR DRAIN IN CONCRETE CURB

2" & 4" DRAIN VALVES

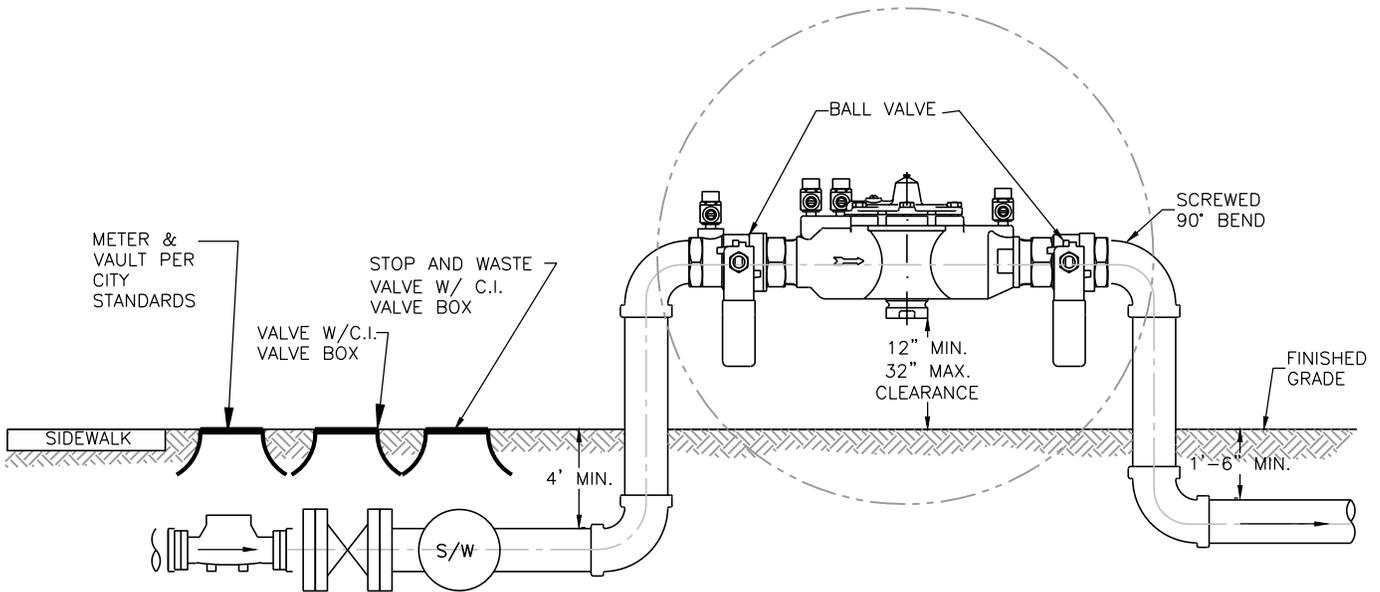
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| | | | |



STANDARD DETAILS

PRESSURIZED IRR

PI-9



NOTES:

1. TO BE USED WHEN SECONDARY SERVICE IS CONNECTED TO THE CULINARY SYSTEM.
2. RPZ VALVE ASSEMBLY & PIPES TO MATCH SECONDARY LATERAL SIZE.
3. ABOVE GROUND FITTINGS TO BE EPOXY PAINTED.
BLUE ON CULINARY SIDE, PURPLE ON SECONDARY SIDE
4. SHOP DRAWINGS TO BE SUBMITTED TO SARATOGA SPRINGS CITY ENGINEER FOR APPROVAL PRIOR TO SHIPMENT.
5. THE RPZ ASSEMBLY DETAIL SHALL BE VERIFIED PER MANUFACTURER RECOMMENDATIONS
6. PROVIDE BOLLARDS OR OTHER PROTECTION IF AND AS DIRECTED BY CITY INSPECTOR.

**RPZ BACKFLOW
PREVENTER
FOR SERVICE LATERALS**

| | |
|-------------------------------|-----------|
| DATE: JANUARY 2015 | |
| DRAWING NAME: PI-10 | |
| DRAWN BY: ETL | |
| CHECKED: | APPROVED: |

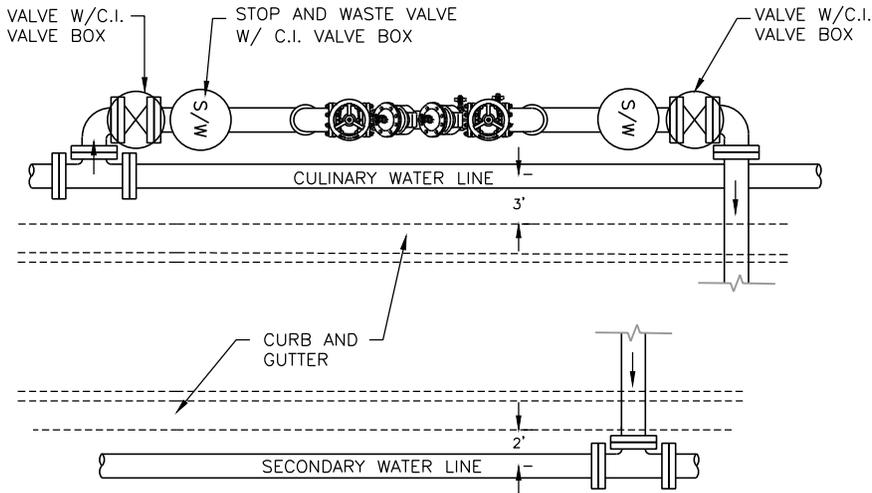
| REVISIONS | |
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**SARATOGA
SPRINGS CITY**

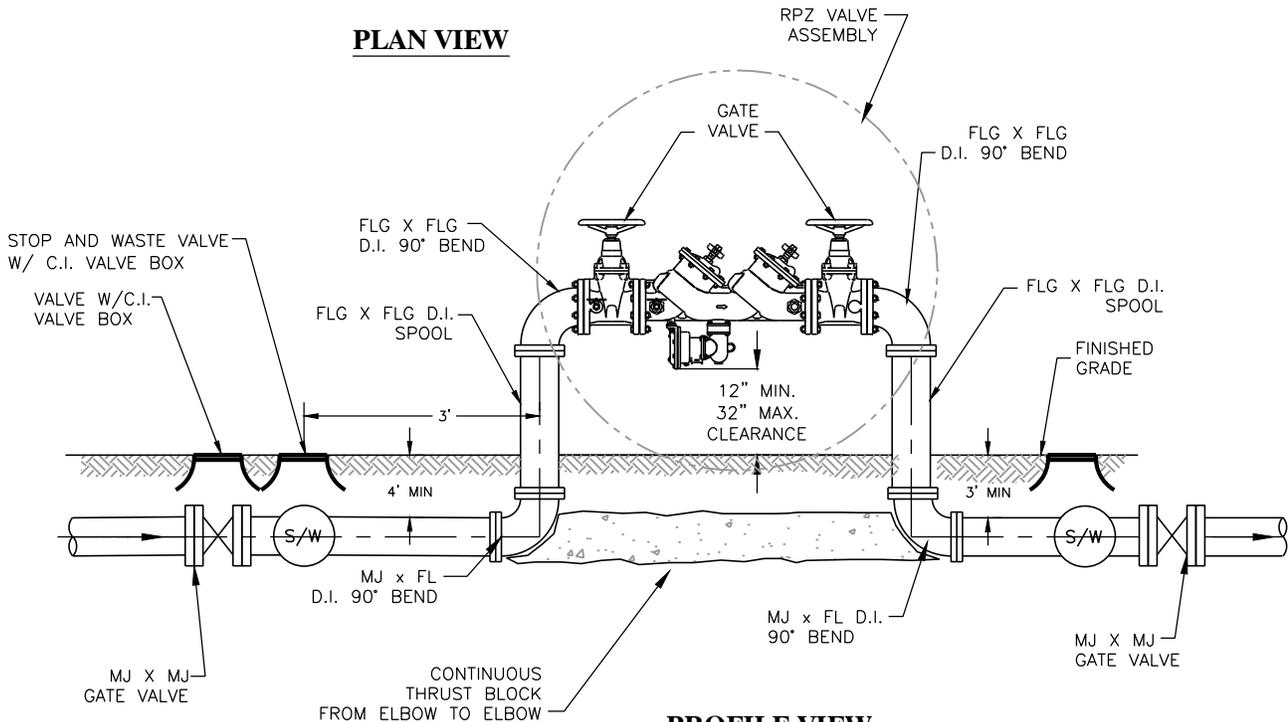
1307 N. COMMERCE DR.
#200, SARATOGA SPRINGS,
UT 84045
PHONE: 801-766-8793
FAX: 801-766-9794



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| STANDARD DETAILS |
| PRESSURIZED IRR |
| PI-10 |



PLAN VIEW



PROFILE VIEW

NOTES:

1. TO BE USED WHEN CHARGING THE SECONDARY SYSTEM WITH CULINARY WATER.
2. RPZ VALVE ASSEMBLY & PIPES TO MATCH SECONDARY MAIN SIZE.
3. ABOVE GROUND FITTINGS TO BE EPOXY PAINTED. BLUE ON CULINARY SIDE, PURPLE ON SECONDARY SIDE
4. SHOP DRAWINGS TO BE SUBMITTED TO SARATOGA SPRINGS CITY ENGINEER FOR APPROVAL PRIOR TO SHIPMENT.
5. THE RPZ ASSEMBLY SHALL BE VERIFIED PER MANUFACTURERS RECOMMENDATIONS.
6. PROVIDE BOLLARDS OR OTHER PROTECTION IF AND AS DIRECTED BY CITY INSPECTOR.

RPZ BACKFLOW PREVENTER FOR WATER MAINS

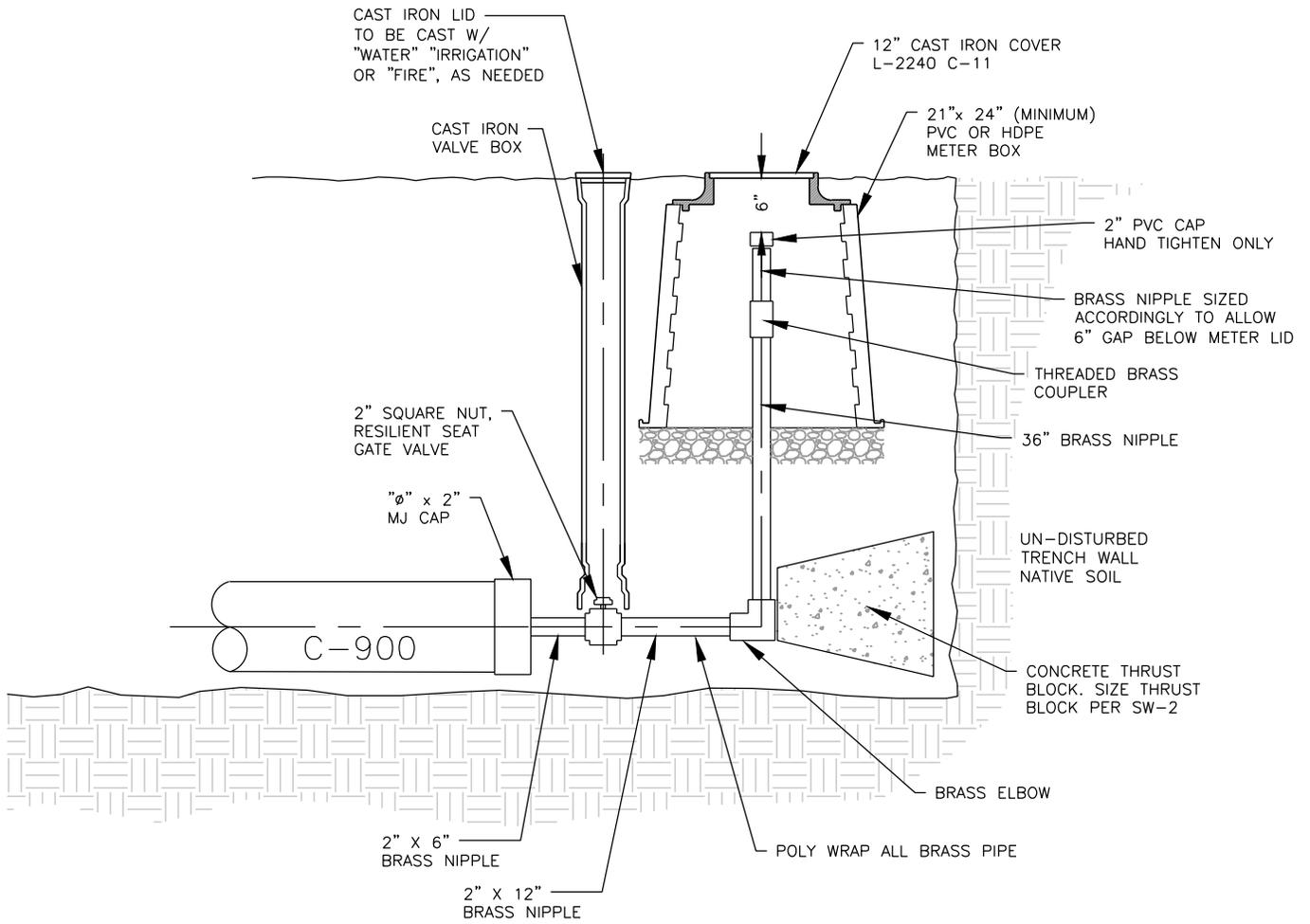
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| DATE: JANUARY 2015 |
| DRAWING NAME: PI-11 |
| DRAWN BY: ETL |
| CHECKED: APPROVED: |

| REVISIONS | |
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SARATOGA SPRINGS CITY
 1307 N. COMMERCE DR.
 #200, SARATOGA SPRINGS,
 UT 84045
 PHONE: 801-766-9793
 FAX: 8017669794



STANDARD DETAILS
 PRESSURIZED IRR
PI-11



2 INCH BLOW-OFF VALVE

DATE:
JANUARY 2015

DRAWING NAME:
PI-12

DRAWN BY:
ETL

CHECKED: APPROVED:

REVISIONS

| REV | DATE | BY | COMMENTS |
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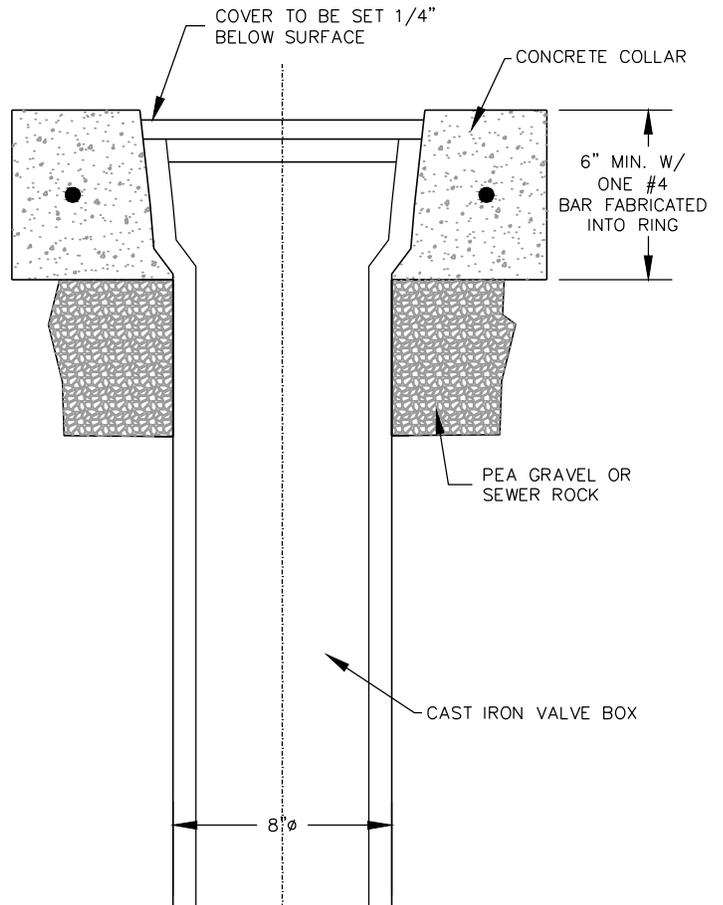
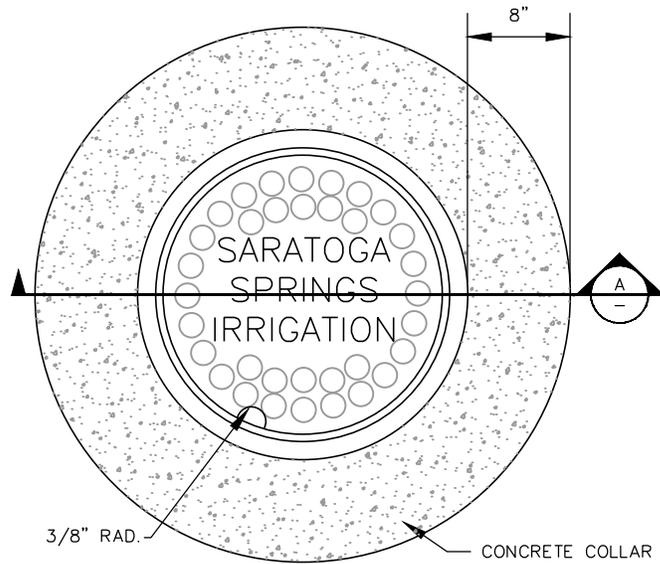
**SARATOGA
SPRINGS CITY**

1307 N. COMMERCE DR.
#200, SARATOGA SPRINGS,
UT 84045
PHONE: 801-766-9793
FAX: 801-766-9794

STANDARD DETAILS

PRESSURIZED IRR

PI-12



NOTES:

1. ALL WORK SHALL CONFORM TO APWA STANDARDS UNLESS OTHERWISE APPROVED BY CITY ENGINEER

CONCRETE COLLAR FOR WATER VALVES

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|-------------------------------|-----------|--|------------------|
| DATE: JANUARY 2015 | | REVISIONS | |
| DRAWING NAME: PI-13 | | REV | DATE BY COMMENTS |
| DRAWN BY: ETL | | | |
| CHECKED: | APPROVED: | SARATOGA SPRINGS CITY <small>1307 N. COMMERCE DR. #200, SARATOGA SPRINGS, UT 84045 PHONE: 801-766-9793 FAX: 801-766-9794</small> | |
| | | | |



STANDARD DETAILS

PRESSURIZED IRR

PI-13