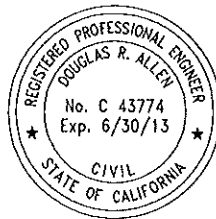


# *Wy'east Engineering*

Consulting Civil Engineers



## STANDARD SPECIFICATIONS AND STANDARD PLANS

Standard Plans

August 2012

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## STANDARD PLANS AND DETAILS

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## UTILITY MARKING SYSTEMS

PRODUCT	COLOR	EQUIVALENT COLOR STANDARD		
		Ameron	Carboline	Rust-Oleum
Raw Water	Light Machine Gray	GR-2	2713	V2183
Potable Water	OSHA Safety Blue	BL-6	S150	V2124
Recycled Wastewater	OSHA Safety Purple			V2167
Backwash Water	Tan	BR-3	G243	V2171
Chlorine, Sodium Hypochlorite, Mixed Oxidants	Bright Green	GN-5	2369	V2134
Caustic (NaOH)	Industrial Yellow	YE-4	5607(LF)	V2147
Meta-Bisulfite (H2SO2)	Semi-Flat Black	BK-2	C900	V2177
Poly Orthophosphate (PO)	Gloss White	WH-2	S800	V2192
Gaseous Product (Gas, Oil, Diesel, Steam, Chemical)	OSHA Safety Yellow	YE-3	S625	V2143
Electric Power	OSHA Safety Red	RD-2	S525	V2163
Communications (Telephone, CATV, Fiber Optic, Signal)	OSHA Safety Orange	OR-2	S401	V2155
Wastewater, Storm Drain	OSHA Safety Green	GR-6	S375	V2133
Compressed Air (LF = Lead Free)	Almond	YE-2	0857(LF)	V2170
Fire Hydrant Head or Bonnet	Reflective Hydrant Paint (Color per Flow Code)			
Fire Hydrant Flow Code				
Class AA (1,500-gpm or greater)	OSHA Safety Blue	BL-6	S150	V2124
Class A (1,000-1,500 gpm)	OSHA Safety Green	GR-6	S375	V2133
Class B (500-1,000 gpm)	OSHA Safety Orange	OR-2	S401	V2155
Class C (less than 500-gpm)	OSHA Safety Red	RD-2	S525	V2163
Public Fire System Hydrant Barrel	OSHA Safety Yellow	YE-3	S625	V2143
Private Fire System Hydrant Barrel	OSHA Safety Red	RD-2	S525	V2163
Reflective Coatings shall be Seymour Reflective Hydrant Spray Paint, Rust-oleum Specialty Fluorescent or Ames Research Laboratories Reflective Safety Paint				

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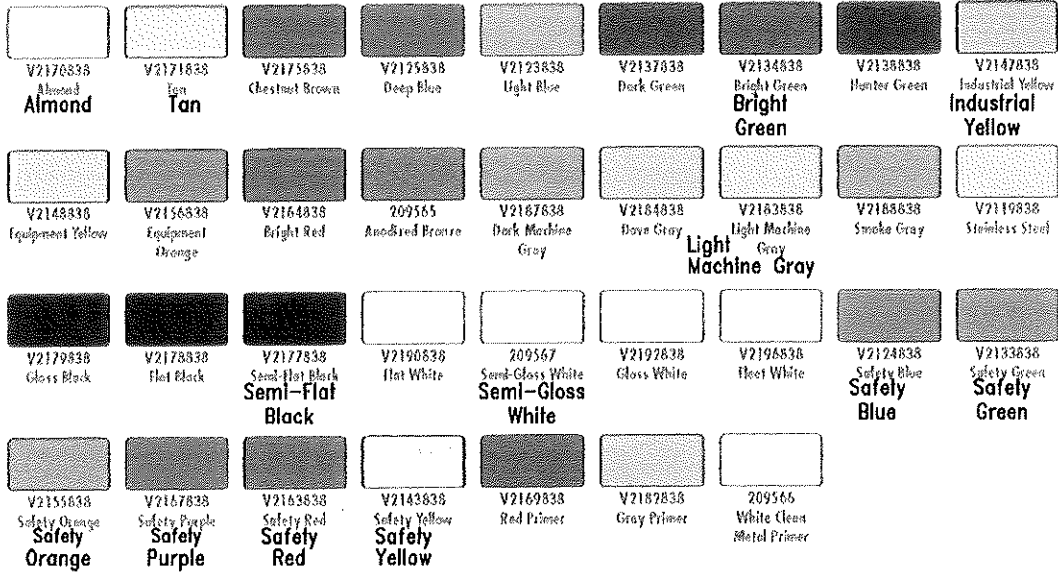
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## UTILITY MARKING SYSTEMS

Standard Plan No. 2-01.01

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**NOTES**

1. This color chart is provided solely as a reference and as a convenience to the Contractor.
2. Wy'east Engineering makes no endorsement or warranty, expressed or implied, as to the adequacy, sufficiency, applicability or suitability of any coating manufacturer by providing this reference.
3. The Contractor shall be solely responsible for providing coatings of the type and color suitable for the work and shall submit color samples and material data sheets in accordance with Section 1-07.10, Submittals of the Wy'east Engineering Standard Plans and Standard Specifications.

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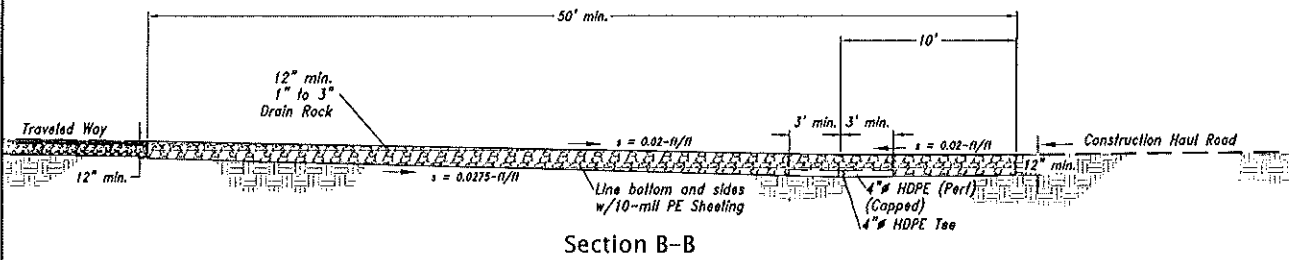
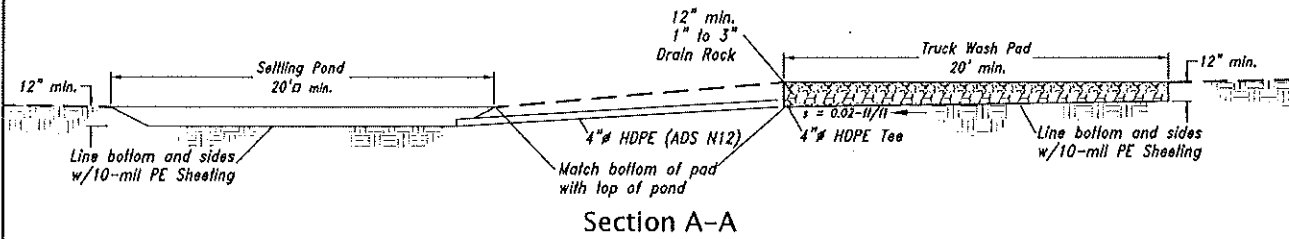
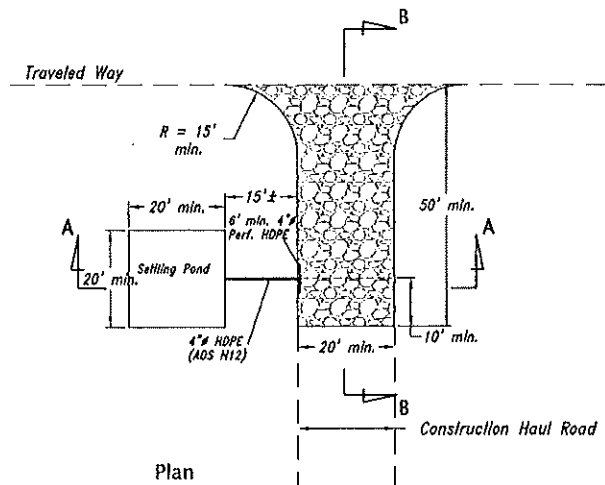
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**NOTES**

1. The Contractor shall construct a truck wash pad at the exit of each haul route noted on the Project Plans or in the Contractor's SWPPP;
2. The Contractor shall construct the pad to the dimensions shown hereon unless specific dimensions are provided on the Project Plans;
3. The Contractor may submit the installation of a cattle guard in lieu of constructing the wash pad shown hereon. Said cattle guard shall be capable of supporting an H20, H20S or H25 axle load. Cattle guards shall be constructed over a closed concrete structure to capture all material washed or otherwise removed from the vehicle crossing the truck wash pad;
4. The settling pond shall be sized to contain a minimum of 200-gallons of wash water;
5. The Contractor shall maintain the truck wash pad and settling pond and shall ensure that any material washed or removed from vehicles will be routed to the settling pond;
6. Prior to any precipitation event predicted by the US Weather Service, the Contractor shall examine and, as necessary, remove accumulated material from the settling pond and ensure that the pad will drain to the settling pond;
7. The Contractor shall maintain a source of water to wash material from vehicles prior to the vehicle entering the traveled way;
8. Washdown facilities may be hydrant connections or tanker trucks with pumps and hoses capable of washing material from the vehicles;
9. Upon completion of all work, the Contractor shall remove the truck wash pad and settling pond in their entirety and dispose of all materials in accordance with the provisions of Section 2-02, "Clearing and Grubbing" of the Wy'east Engineering Standard Specifications and Standard Plans.



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## CONSTRUCTION ENTRANCE

Standard Plan No. 2-02

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ALL CONSTRUCTION SITES

1. Delineate clearing limits, sensitive or critical areas, trees, drainage courses and buffer zones to prevent excessive or unnecessary disturbance and exposure of soil;
2. Identify all storm drains, drainage swales and creeks located near the construction site and make sure all subcontractors are aware of their locations to prevent pollutants from entering
3. Preserve existing vegetation, where required and when feasible to the maximum extent
4. Phase grading operations, to the extent possible, to limit areas of disturbance and time of
5. Avoid and/or minimize impacts of excavation and grading during wet weather and immediately preceding expected wet weather;  
Minimize cuts and fills;
6. Implement measures to minimize erosion, manage storm water runoff and prevent pollutants generated by construction activities from entering storm drains;
7. Align temporary and permanent roads and driveways along slope contours;
8. Wash vehicles at an appropriate off-site facility. If equipment must be washed on site, use wash down areas developed for specific site requirements and approved by the Agency of Jurisdiction. Do not use soaps, solvents, degreasers or steam cleaning equipment and prevent wash water from entering storm drains.

MINIMIZE SOIL MOVEMENT

1. Stockpiled soil and materials shall be covered and stabilized with tarps, geotextile fabric, hydroseeding and/or erosion control blankets;
2. Create a berm and/or install silt fencing around stockpiled materials to prevent storm water runoff from transporting sediment offsite;
3. As appropriate, use the applicable standards of the Agency of Jurisdiction for erosion control seeding, planting, mulching, geotextile fabric and/or erosion control blankets to stabilize disturbed soil and reduce the potential for erosion;
4. Use other soil stabilizers as approved by the Agency of Jurisdiction.

STRUCTURES TO CONTROL AND CONVEY RUNOFF

1. Convey runoff by the use of earthen dikes, drainage swales and/or ditching where feasible;
2. Use slope drains to collect and convey water for discharge below slopes where feasible;
3. Use velocity dissipation devices, flared culvert end section and/or check dams to reduce runoff velocity and mitigate erosion where feasible.

SEDIMENT CAPTURE

1. Use terracing, riprap, sand bags, rocks, approved temporary vegetation and/or other approved BMPs on slopes to reduce runoff velocity and trap sediments. Asphalt rubble or other demolition debris shall not be used for this purpose;
2. Protect storm drain inlets from sediment-laden runoff. Storm drain inlet protection devices shall include but not be limited to, gravel filled sand bags, filter fences and block and gravel filters.



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## EROSION CONTROL - BEST MANAGEMENT PRACTICES

General Notes ~ Minimize Soil Movement

Structures to Control and Convey Runoff ~ Sediment Capture  
Standard Plan No. 2-04.01



**OTHER RUNOFF CONTROLS**

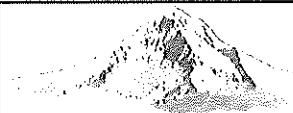
1. Other approvable runoff controls shall include but not be limited to:

- Temporary sediment basins;
- Sediment trap;
- Brush or rock filters;
- Silt fencing;
- Sand or gravel bag barriers.

**TRACKING CONTROL**

1. Implement measures as necessary to minimize tracking of soil offsite;  
Use dry sweeping methods when cleaning sediments from streets, driveways and paved areas by
2. When using mechanical sweepers, use a fine water spray to reduce dust and improve sediment removal while minimizing runoff.
3. Cleaning paint brushes and/or rinsing paint containers shall be done in such a manner as to prevent entry of pollutants into a street, gutter, storm drain or stream course;
4. For water-based paints, paint out brushes, rollers and other application equipment to the extent possible and rinse to a drain connected to a sanitary sewer;
5. For oil-based paints, paint out brushes, rollers and other application equipment to the extent possible, insofar as possible recover and reuse solvents and thinners and dispose of unusable thinners and thinners as a hazardous waste;
6. Non-hazardous paint chips and dust from dry stripping and sand blasting may be swept up, vacuumed or collected on plastic drop clothes and disposed of as trash;
8. Chemical paint stripping residue and chips and dust from marine paints and/or paints and coating containing lead or tributyl shall be disposed of as a hazardous material;
9. Tin shall be disposed of as a hazardous material;
10. When stripping or cleaning of building exteriors with high-pressure water, all storm drain inlets shall be covered or protected by berms to prevent runoff of pollutants into storm drains;
11. Collect all residual water from such cleaning operations by vacuuming, mopping or such other methods as may be feasible and dispose of appropriately for the materials in the residual
12. All unused water-based (latex) paints shall be returned to the supplier or recycled to projects requiring such materials;
13. Dried water-based (latex) paint may be disposed of as trash.

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**EROSION CONTROL – BEST MANAGEMENT PRACTICES**

Other Runoff Controls ~ Tracking Control

Standard Plan No. 2-04.02

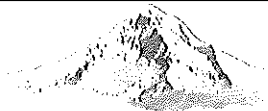
**CEMENT AND CONCRETE WORK**

1. Avoid mixing excessive amounts of fresh concrete, mortar or other cementitious materials
2. Store dry and wet concrete, mortar, and other cementitious materials under cover and protected from rainfall and runoff;
3. Wash out concrete transit mix trucks, buggies, wheelbarrows and other concrete or mortar covered materials in a designated washout area;
4. Whenever possible, recycle washout by pumping back into mixers for reuse;
5. Washout shall not be allowed to enter streets, storm drains, drainage ditches or stream courses;
6. Designated washout areas shall be maintained to prevent overflow;
7. Whenever possible, return surplus contents of transit mix trucks to the supplier for disposal;
8. Dispose of small amounts of excess concrete, mortar and cementitious materials as non-hazardous trash.

**ROADWORK AND PAVEMENT**

1. Construct concrete and asphalt pavements and pavement seal coats during dry weather to prevent contaminants from washing into storm drains or stream courses;
2. All storm drain inlets and manholes shall be covered or otherwise protected to prevent paving or seal coat materials from entering storm drains and, ultimately, stream courses;
3. All vehicles and equipment shall be parked or stored in such a manner or location that any leaks from tanks, oil pans, hydraulic equipment and similar sources shall be fully contained and properly disposed of. Approved methods shall include but be limited to, drip pans, absorbent pads and enclosed areas with full control of drainage to prevent loss of such fluids to storm drains and stream courses;
4. The minimum amount of water shall be used during sawcutting and all runoff from sawcutting shall be prevented from entering storm drains or stream courses;
5. All residue from sawcutting shall be collected and removed from the site;  
Exposed aggregate surfaces shall be washed down in such a manner that all wash water routes to an unimproved dirt area; a bermed surface from which the wash water and sediment can be pumped and disposed of properly; or, other catchment from which the wash water, with sediment can be pumped and disposed of properly;
6. If allowed by the local Agency of Jurisdiction, wash water may be ponded to permit settlement of solids and then pumped to a sanitary sewer. Residual solids shall then be disposed of
7. Residual solids shall be collected and disposed of in an aggregate stockpile or disposed of as
8. All broken concrete and asphalt, including grindings, shall be recycled.

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**EROSION CONTROL – BEST MANAGEMENT PRACTICES**  
Cement and Concrete Work ~ Roadwork and Pavement

Standard Plan No. 2-04.03

HAZARDOUS MATERIAL SPILL PREVENTION, SPILL REPORTING AND RESPONSE

1. All hazardous materials shall be so stored that they are protected from inclement weather, inadvertent loss or vandalism;
2. Motor vehicles shall not be fueled on-site;
3. Spill containment measures shall be implemented as appropriate when fueling equipment other than over-road vehicles;
4. Vehicle and equipment repairs other than emergency repairs shall not be performed on-site;
5. Spills greater than 1-quart shall be immediately reported to the Agency of Jurisdiction and diked or otherwise contained to prevent loss of hazardous materials to storm drains or stream
6. Spills of less than 5-gallons shall be absorbed using appropriate materials and disposed of as hazardous materials in an approved site;
7. Any contaminated soils shall be removed and disposed of as hazardous materials;
8. Contaminated soils shall be replaced with clean native materials as necessary;
9. All spill response shall be carried out by appropriately trained personnel using approved practices. Where spill exceed the capabilities of the contractor, a state licensed hazardous waste contractor shall be retained to conduct all spill response activities.

GOOD HOUSEKEEPING PRACTICES

1. Pavement or surfaces where silt has been deposited or other materials spilled shall be cleaned using dry methods;
2. Berms or other approved temporary measures shall be used to prevent contaminating clean runoff from areas adjacent to the work site;
3. As appropriate, clean runoff from adjacent sites shall be routed around the works site by the use of ditching, pipelines, pumping or other methods as approved by the Agency of Jurisdiction;
4. Cover all exposed stockpiles of soils, construction materials and waste materials with plastic sheeting or temporary covered structures prior to any anticipated precipitation event and maintain such cover throughout such events;
5. All surfaces shall be thoroughly swept and cleaned to prevent introduction of materials into storm drains or stream courses prior to an anticipated precipitation event;
6. Trash receptacles shall be strategically placed throughout the work site for disposal of non-hazardous materials;
7. Said trash receptacles shall be emptied into non-hazardous disposal containers such as dumpsters periodically as necessary;
8. All materials that cannot be reused or recycled shall be transported to an appropriate landfill;
9. All hazardous materials shall be collected and disposed of as appropriate for the materials;
10. All trash containers, both non-hazardous and hazardous, shall be covered to prevent introduction of precipitation or distribution of materials by wind and maintained throughout the course of the work;
11. All employees shall be trained in these Best Management Practices and all subcontractors shall be informed of, and, as necessary, trained in, these Best Management Practices.

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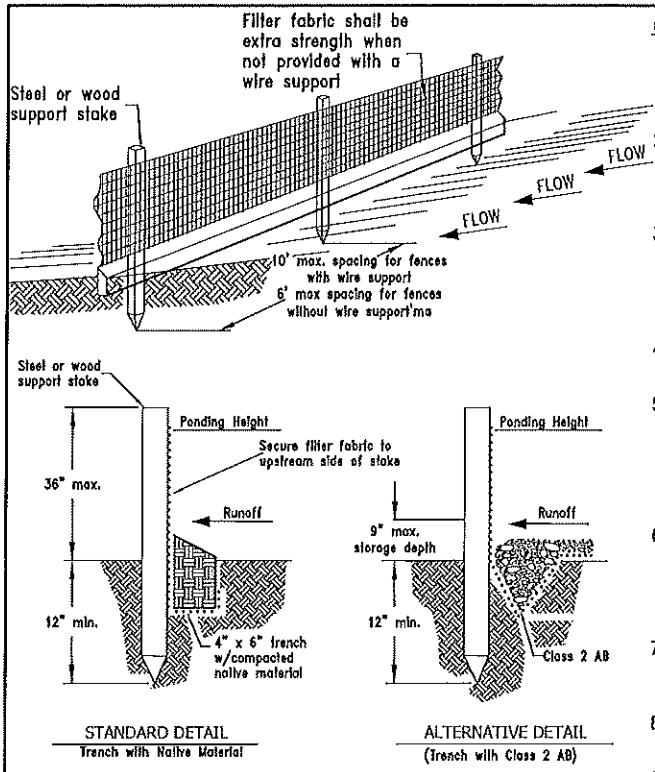


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**EROSION CONTROL – BEST MANAGEMENT PRACTICES**  
 Hazardous Material Spill Prevention, Spill Reporting and Response  
 Good Housekeeping Practices  
 Standard Plan No. 2-04.04



**Construction Specifications**

1. The height of a silt fence shall not exceed 36 inches. Storage height shall never exceed 18". The fence line shall follow the contour as closely as possible.
2. If possible, the filter fabric shall be cut from a continuous roll to avoid the use of joints. When joints are necessary, filter cloth shall be spliced only at a support post, with a minimum 6-inch overlap and both ends securely fastened to the post.
3. Posts shall be spaced a maximum of 10 feet apart and driven securely into the ground (minimum of 12 inches). When extra strength fabric is used without the wire support fence, post spacing shall not exceed 6 feet. Turn the ends of the fence uphill.
4. A trench shall be excavated approximately 4 inches wide and 6 inches deep along the line of posts and upslope from the barrier.
5. When standard-strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least 1 inch long, the wires or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 36 inches above the original ground surface.
6. The standard-strength filter fabric shall be stapled or wired to the fence, and 6 inches of the fabric shall extend into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
7. When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts.
8. The trench shall be backfilled and the soil compacted over the toe of the filter fabric.
9. Silt fences placed at the toe of a slope shall be set at least 6 feet from the toe in order to increase ponding volume.
10. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized, and any sediment stored behind the silt fence has been removed.

**Inspection and Maintenance Notes**

1. Inspect and repair fence weekly and after each storm event and remove accumulated sediment as necessary to prevent damage to the fence;
2. Accumulated sediment shall be removed whenever it reaches a height of 1/3 the fence height or 9" whichever is the lesser; and method as may be appropriate;
3. Removed sediment shall be incorporated into non-structural earthwork on-site or such other location and method as may be appropriate;
4. The silt fence shall be placed on slope contours in such a manner as to maximize ponding efficiency.

REVISIONS	



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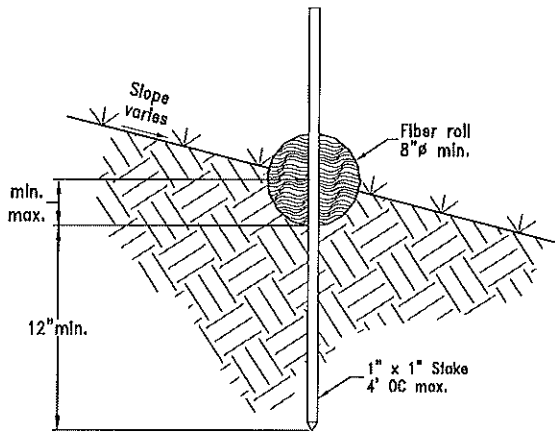
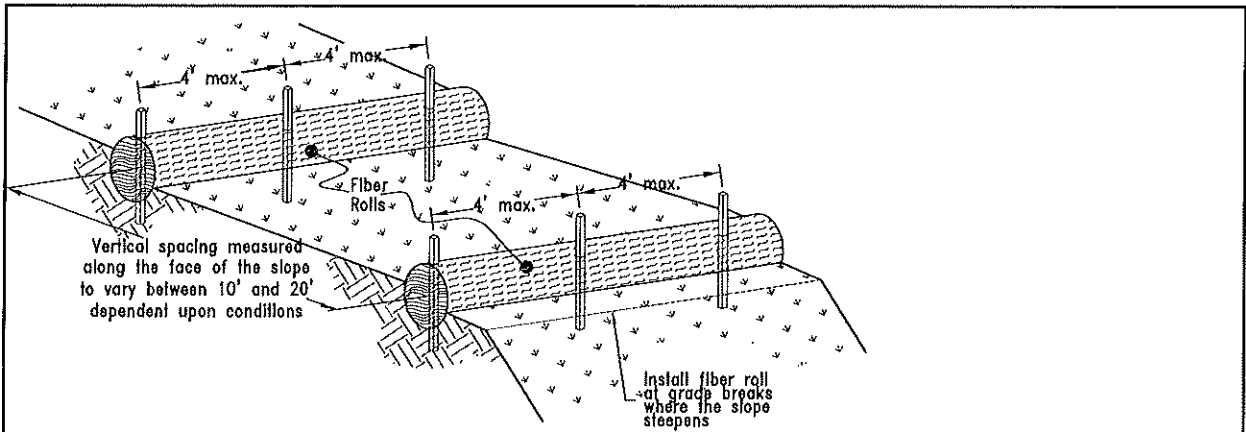
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## EROSION CONTROL - SILT FENCING

Standard Plan No. 2-05

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**CONSTRUCTION SPECIFICATIONS**

1. Locate fiber rolls on level contours spaced as follows:
  - Slope inclination of 4 :1 (H:V) or flatter:  
Fiber rolls shall be placed at a maximum interval of 20 ft.;
  - Slope inclination between 4:1 and 2:1 (H:V):  
Fiber rolls shall be placed at a maximum interval of 15 ft.;
  - Slope inclination of 2:1 (H:V) or greater:  
Fiber rolls should be placed at a maximum interval of 10 ft.
2. The ends of the fiber roll shall be turned up slope to prevent runoff from going around the end of the roll;
3. Fiber rolls shall be staked into a 2 to 4 in. deep trench with a width equal to the diameter of the fiber roll;
4. Fiber rolls shall be staked at the end of each fiber roll and spaced 4 ft maximum on center;
5. Wood stakes shall be a minimum nominal dimension of 1" x 1" and a minimum length of 24";
6. If more than one fiber roll is placed in a single row, the rolls should be overlapped, not abutted;
7. Promptly repair or replace split, torn, unravelling, slumping or otherwise damaged fiber rolls.
9. If the fiber roll is used as a sediment capture device or as an erosion control device to maintain sheet flows, accumulated sediment shall be removed periodically to maintain effectiveness;
10. Sediment shall be removed when sediment accumulation reaches one-half the design sediment storage depth typically one-half the distance between the top of the fiber roll and the adjacent ground surface;
11. Sediment removed during maintenance may be incorporated into non-structural earthwork on the site or disposed of earthwork on the site or disposed of at an off-site disposal site in an appropriate location and manner.

REVISIONS	



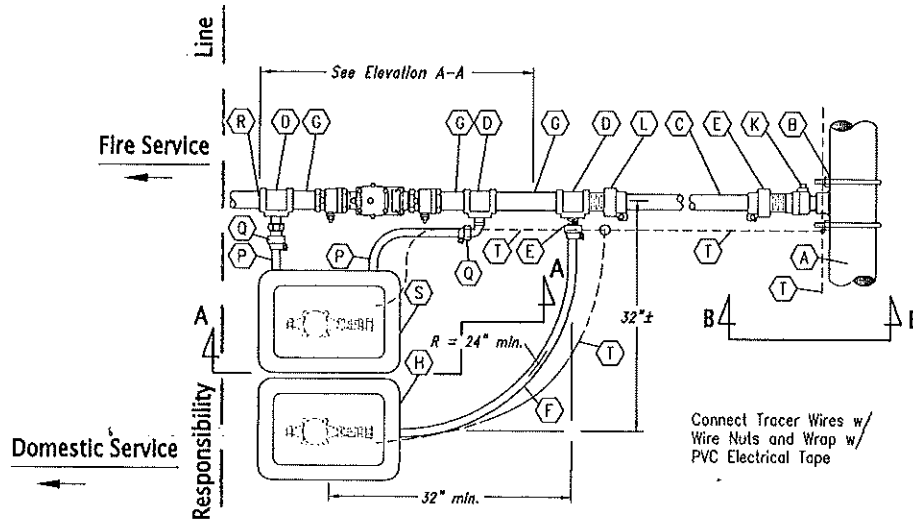
# Wy'east Engineering

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## EROSION CONTROL - FIBER ROLLS (WATTLES)

DESIGN:	DRA	DATE:	1/15
CAD:	DRA	DATE:	1/15
CHECK:	DRA	DATE:	1/15
APPROVED:	DRA	DATE:	1/15

Standard Plan No. 2-06



**Note:**  
For elevations shown hereon, see  
Std. Plan No. 3-01.03, Standard Domestic  
Service Elevations

### MECHANICAL SCHEDULE

(ID)	DESCRIPTION
A <sup>1</sup>	Water Main
B <sup>1</sup>	2"Ø Bronze Service Saddle (Ford Series 202B or 202BSS - 2"Ø FIPT Outlet)
C	2"Ø Service Tubing (PET or Cu Type K)
D	2"Ø x 2"Ø x 2"Ø Brass Tee w/Bushings as Required or 2"Ø x 2"Ø x Size Brass Tee
E	Coupling (Ford C84-44-NL (1"Ø PJ x 1" MIPT))
F	1"Ø Service Tubing (PET or Cu Type K)
G	2"Ø Brass Nipple (Length as Required - 4" min.)
H	5/8"Ø x 3/4"Ø Domestic Meter Installation per Standard Plan No. 3-02
J	2"Ø Brass Ball Valve or Ball Valve Curb Stop (Ford B11-777 (FIPT x FIPT))
K	2"Ø Ball Type Corporation Stop (Ford FB1100-7-NL (MIPT Inlet x FIPT Outlet))
L	Coupling (Ford C84-44-NL (2"Ø PJ x 2" MIPT))
M	3/4"Ø Angle Valve Curb Stop (Ford BA43-332W (PJ x 5/8"/3/4" Meter))
N	3/4"Ø Angle Cartridge Dual Check Valve (Meter Swivel x PJ - Ford HHCA34-323)
O	2"Ø Double Check Valve (Watts 007 QT, Febco 805/807 or approved substitute) Remove 1/4"Ø Sample Cocks and Plug with 1/4"Ø Brass Pipe Plugs
P	3/4"Ø Service Tubing (PET or Cu Type K)
Q	Coupling (3/4"Ø PJ x 3/4" MIPT) Ford C84-3-NL or L84-34-NL)
R	2"Ø PVC Pipe Plug Hand Tight Until Service Is Extended
S	Meter Box (Christy B9) w/5/8" x 3/4" Meter; Location per Standard Plan No. 3-02
T	#14AWG Cu Tracer Wire (THHN or THWN)
U	5/8"Ø x 3/4"Ø Meter (Supplied and Installed by Water Agency)

**NOTES**

- Field verify pipe size and type;
- All buried fillings shall be liberally coated with a bitumastic compound (T. Christy HD50);
- Overall length to fit;
- All work left of the Responsibility Line shall be the responsibility of the Customer to install and maintain in accordance with Agency Standards.

**REVISIONS**

NO.	DESCRIPTION



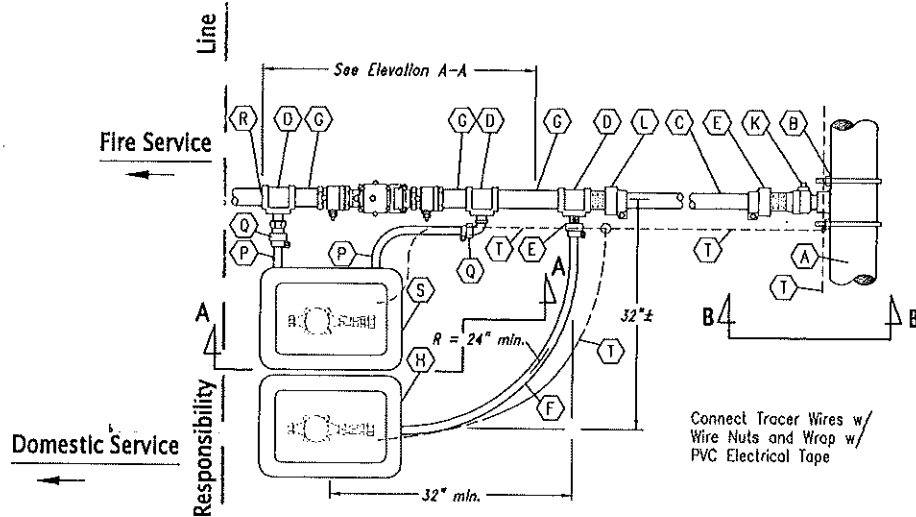
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## STANDARD DOMESTIC COMBINATION SERVICE

2-inch Fire and Domestic Combined Installation  
Buried Backflow Device Installation  
Standard Plan No. 3-01.01



Connect Tracer Wires w/  
Wire Nuts and Wrap w/  
PVC Electrical Tape

**Note:**  
For elevations shown hereon, see  
Std. Plan No. 3-01.03, Standard Domestic  
Service Elevations

MECHANICAL SCHEDULE	
(ID)	DESCRIPTION
A	Water Main
B	2"Ø Bronze Service Saddle (Ford Series 202B or 202BSS - 2"Ø FIPT Outlet)
C	2"Ø Service Tubing (PET or Cu Type K)
D	2"Ø x 2"Ø x 2"Ø Brass Tee w/Bushings as Required or 2"Ø x 2"Ø x Size Brass Tee
E	Coupling (Ford C84-44-NL (1"Ø PJ x 1" MIPT))
F	1"Ø Service Tubing (PET or Cu Type K)
G	2"Ø Brass Nipple (Length as Required - 4" min.)
H	5/8"Ø x 3/4"Ø Domestic Meter Installation per Standard Plan No. 3-02
J	2"Ø Brass Ball Valve or Ball Valve Curb Stop (Ford B11-777 (FIPT x FIPT))
K	2"Ø Ball Type Corporation Stop (Ford FB1100-7-NL (MIPT Inlet x FIPT Outlet))
L	Coupling (Ford C84-44-NL (2"Ø PJ x 2" MIPT))
M	3/4"Ø Angle Valve Curb Stop (Ford BA43-332W (PJ x 5/8"/3/4" Meter))
N	3/4"Ø Angle Cartridge Dual Check Valve (Meter Swivel x PJ - Ford HHCA34-323)
O	2"Ø Double Check Valve (Watts 007 QT, Febco 805/807 or approved substitute)
	Remove 1/4"Ø Sample Cocks and Plug with 1/4"Ø Brass Pipe Plugs
P	3/4"Ø Service Tubing (PET or Cu Type K)
Q	Coupling ( (3/4"Ø PJ x 3/4" MIPT) Ford C84-3-NL or L84-34-NL)
R	2"Ø PVC Pipe Plug Hand Tight Until Service is Extended
S	Meter Box (Christy B9) w/5/8" x 3/4" Meter; Location per Standard Plan No. 3-02
T	#14AWG Cu Tracer Wire (THHN or THWN)
U	5/8"Ø x 3/4"Ø Meter (Supplied and Installed by Water Agency)

**NOTES**

- Field verify pipe size and type;
- All buried fittings shall be liberally coated with a bitumastic compound (T. Christy HD50);
- Overall length to fit;
- All work left of the Responsibility Line shall be the responsibility of the Customer to install and maintain in accordance with Agency Standards.

REVISIONS	

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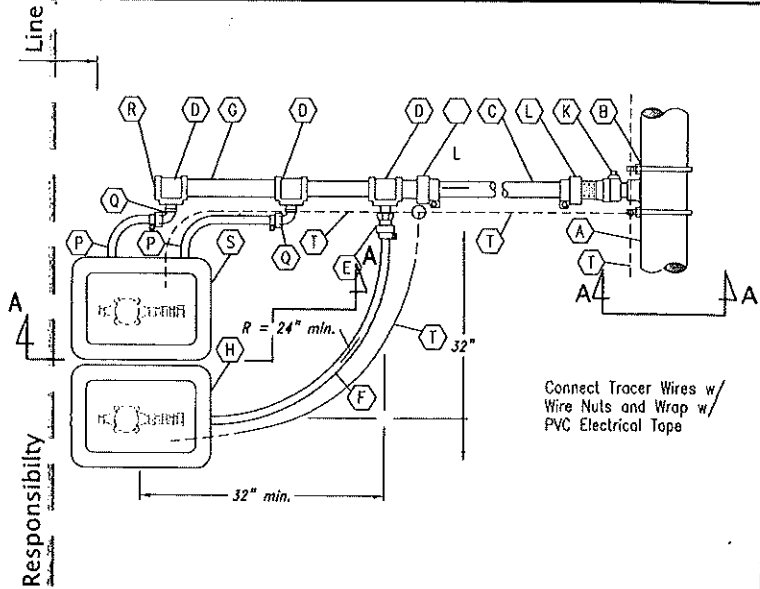
## STANDARD DOMESTIC COMBINATION SERVICE

2-inch Fire and Domestic Combined Installation  
Buried Backflow Device Installation  
Standard Plan No. 3-01.01

Backflow Device  
As Shown on Project Plans  
per Std. Plan No. 3-03

Fire Service

Domestic Service



**Note:**  
For elevations shown hereon, see  
Std. Plan No. 3-01.03, Standard Domestic  
Service Elevations

### MECHANICAL SCHEDULE

ID	DESCRIPTION
A <sup>1</sup>	Water Main
B <sup>1</sup>	2"Ø Bronze Service Saddle (Ford Series 202B or 202BSS - 2"Ø FIPT Outlet)
C	2"Ø Service Tubing (PET or Cu Type K)
D	2"Ø x 2"Ø x 2"Ø Brass Tee w/Bushings as Required or 2"Ø x 2"Ø x Size Brass Tee
E	Coupling (Ford C84-44-NL (1"Ø PJ x 1" MIPT))
F	1"Ø Service Tubing (PET or Cu Type K)
G	2"Ø Brass Nipple (Length as Required - 4" min.)
H	5/8"Ø x 3/4"Ø Domestic Meter Installation per Standard Plan No. 3-02
J	2"Ø Brass Ball Valve or Ball Valve Curb Stop (Ford B11-777 (FIPT x FIPT))
K	2"Ø Ball Type Corporation Stop (Ford FB1100-7-NL (MIPT Inlet x FIPT Outlet))
L	Coupling (Ford C84-44-NL (2"Ø PJ x 2" MIPT))
M	3/4"Ø Angle Valve Curb Stop (Ford BA43-332W (PJ x 5/8"Ø/3/4" Meter))
N	3/4"Ø Angle Cartridge Dual Check Valve (Meter Swivel x PJ - Ford HHCA34-323)
O	2"Ø Double Check Valve (Watts 007 QT, Febco 805/807 or approved substitute)
	Remove 1/4"Ø Sample Cocks and Plug with 1/4"Ø Brass Pipe Plugs
P	3/4"Ø Service Tubing (PET or Cu Type K)
Q	Coupling (3/4"Ø PJ x 3/4" MIPT) Ford C84-3-NL or L84-34-NL)
R	2"Ø PVC Pipe Plug Hand Tight Until Service is Extended
S	Meter Box (Christy B9) w/5/8" x 3/4" Meter; Location per Standard Plan No. 3-02
T	#14AWG Cu Tracer Wire (THHN or THWN)
U	5/8"Ø x 3/4"Ø Meter (Supplied and Installed by Water Agency)

**NOTES**

- Field verify pipe size and type;
- All buried fittings shall be liberally coated with a bitumastic compound (T. Christy HD50);
- Overall length to fill;
- All work left of the Responsibility Line shall be the responsibility of the Customer to install and maintain in accordance with Agency Standards.

REVISIONS

# Wy'east Engineering

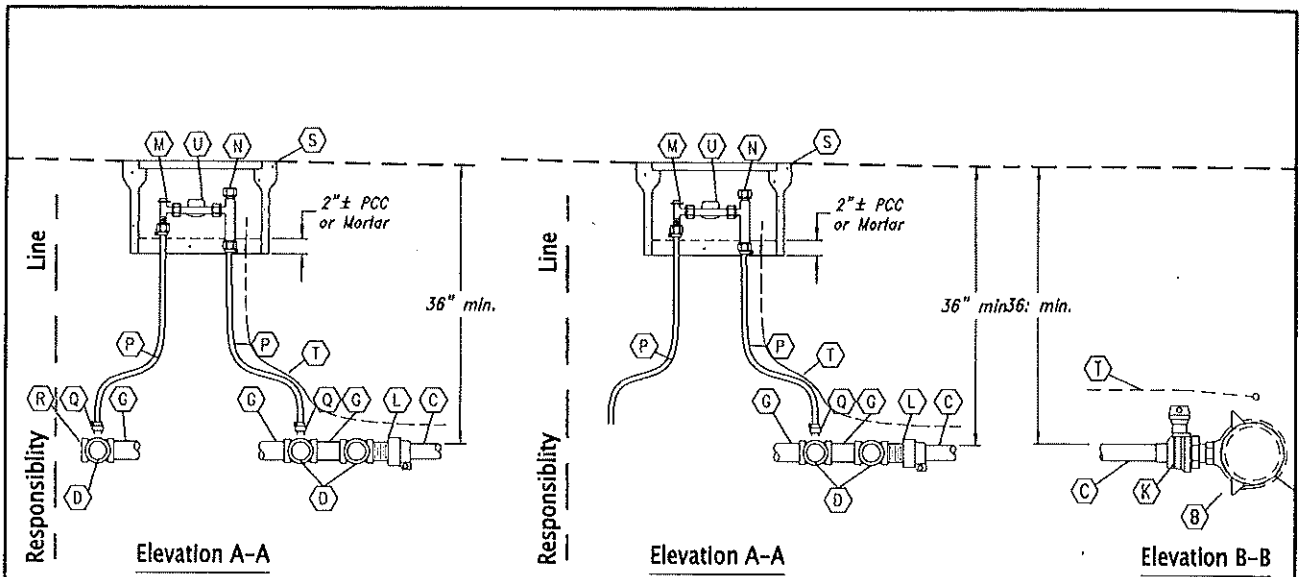
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## STANDARD DOMESTIC COMBINATION SERVICE

2-inch Fire or Irrigation and Domestic Combined Installation  
Above Grade Backflow Device Installation  
Standard Plan No. 3-01.02





MECHANICAL SCHEDULE	
(ID)	DESCRIPTION
A	Water Main
B	2"Ø Bronze Service Saddle (Ford Series 202B or 202BSS - 2"Ø FIPT Outlet)
C	2"Ø Service Tubing (PET or Cu Type K)
D	2"Ø x 2"Ø x 2"Ø Brass Tee w/Bushings as Required or 2"Ø x 2"Ø x Size Brass Tee
E	Coupling (Ford C84-44-NL (1"Ø PJ x 1" MIPT))
F	1"Ø Service Tubing (PET or Cu Type K)
G	2"Ø Brass Nipple (Length as Required - 4" min.)
H	5/8"Ø x 3/4"Ø Domestic Meter Installation per Standard Plan No. 3-02
J	2"Ø Brass Ball Valve or Ball Valve Curb Stop (Ford B11-777 (FIPT x FIPT))
K	2"Ø Ball Type Corporation Stop (Ford FB1100-7-NL (MIPT Inlet x FIPT Outlet))
L	Coupling (Ford C84-44-NL (2"Ø PJ x 2" MIPT))
M	3/4"Ø Angle Valve Curb Stop (Ford BA43-332W (PJ x 5/8"/3/4" Meter))
N	3/4"Ø Angle Cartridge Dual Check Valve (Meter Swivel x PJ - Ford HHCA34-323)
O	2"Ø Double Check Valve (Watts 007 QT, Febco 805/807 or approved substitute)
	Remove 1/4"Ø Sample Cocks and Plug with 1/4"Ø Brass Pipe Plugs
P	3/4"Ø Service Tubing (PET or Cu Type K)
Q	Coupling ( (3/4"Ø PJ x 3/4" MIPT) Ford C84-3-NL or L84-34-NL)
R	2"Ø PVC Pipe Plug Hand Tight Until Service is Extended
S	Meter Box (Christy B9) w/5/8" x 3/4" Meter; Location per Standard Plan No. 3-02
T	#14AWG Cu Tracer Wire (THHN or THWN)
U	5/8"Ø x 3/4"Ø Meter (Supplied and Installed by Water Agency)

**NOTES**

- Field verify pipe size and type;
- All buried fittings shall be liberally coated with a bitumastic compound (T. Christy HD50);
- Overall length to fit;
- All work left of the Responsibility Line shall be the responsibility of the Customer to install and maintain in accordance with Agency Standards.

REVISIONS



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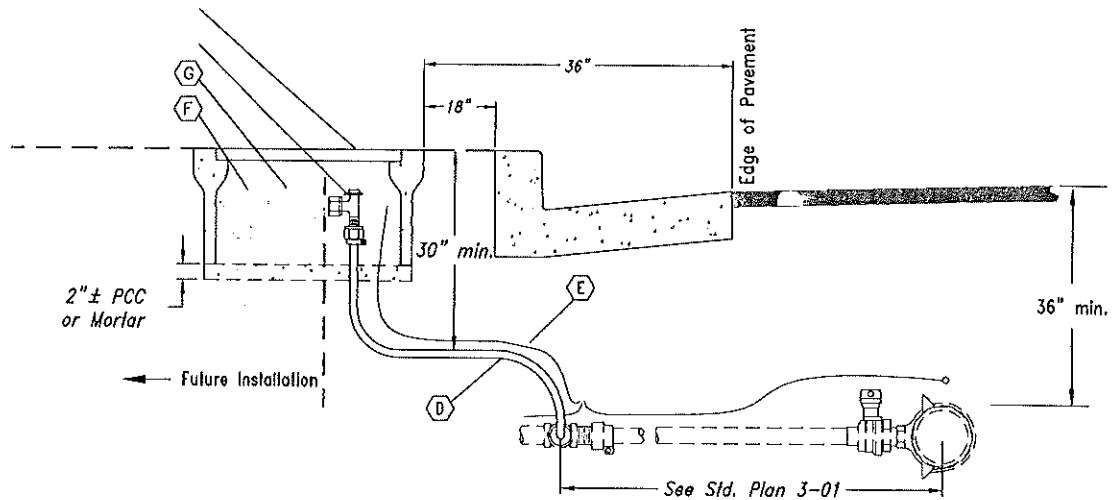
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## STANDARD DOMESTIC COMBINATION SERVICE

2-inch Fire or Irrigation and Domestic Combined Installation  
Above Grade and Below Grade Backflow Device Installation Elevations  
Standard Plan No. 3-01.03

DESIGN:	DRA	DATE:	8/11
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MECHANICAL SCHEDULE	
(ID)	DESCRIPTION
A	Water Main (New or Existing) per Std. Plan No. 3-01
B	Tapping Saddle per Std. Plan 3-01
C	2" $\phi$ Corporation Stop per Std. Plan 3-01
D	1" $\phi$ Service Tubing
E	#14 AWG Tracer Wire - THHN, THWN
F	1" $\phi$ Angle Meter Stop w/Ford A24-NL Adapter
G	Future Water Meter
H1	Meter Box - Chrisly B9

APPROVED FITTINGS									
Condition	Service Tubing		Tapping Saddle			Corporation Stop		Angle Meter Stop	
	PET	Type K Copper	Ford 101B	Ford 101BS	Ford 202BS	Ford F1100-4-NL	Ford FB700-4-NL	Ford KV43-342W-NL	Ford KV23-342W-NL
Standard Domestic Service	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	
Service Pressure > 150-psi		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**NOTES**

- Meter Box shall be set within the sidewalk wherever practical;
- All PET services using Pack Joint fittings shall be equipped with stainless steel inserts at all fittings;
- A Ford A24-NL adapter shall be installed at the meter stops;
- When installing a new service at an existing location, the customer plumbing shall be replumbed as necessary to conform with this plan;
- Irrigation meters shall be equipped with a backflow device in accordance with Wy'east Engineering Std. Plan No. 3-03;
- New installations at existing service locations shall be relocated into the Right-of-Way;
- Minimum bending radius for PET (SDR 9) shall be 20 x D where D = PET nominal diameter;
- Minimum bending radius for copper tubing (Type K, L) shall be 6";
- Copper tubing shall be bent using a tube bending device as recommended by the Copper Development Association, Copper Tubing Handbook. Free hand bending will not be permitted;
- Copper or PET tubing evidencing crimping as a result of bending shall be removed and replaced at the Contractor's expense.

REVISIONS	



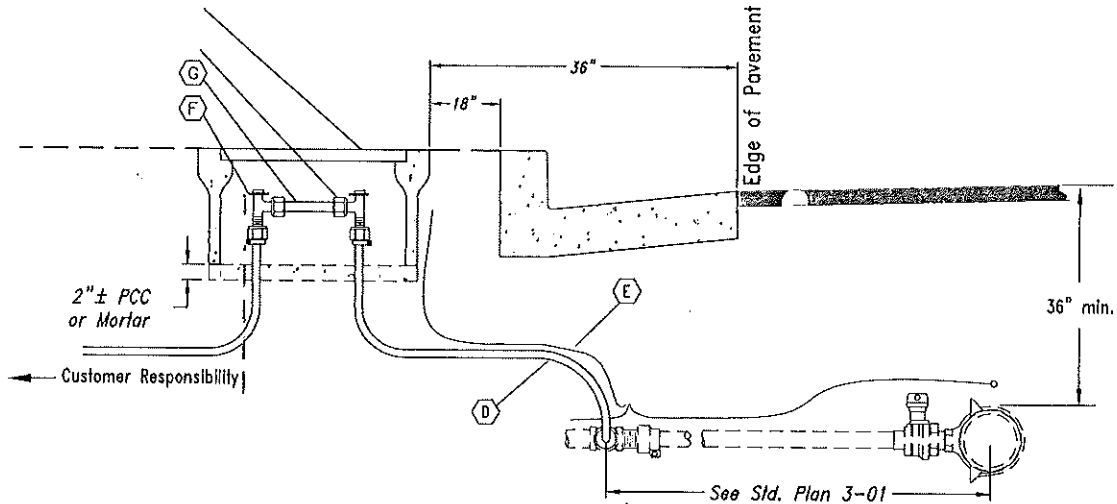
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## STANDARD DOMESTIC SERVICE

Installation for Future Domestic Service  
Standard Plan No. 3-02.01



MECHANICAL SCHEDULE	
(ID)	DESCRIPTION
A	Water Main (New or Existing) per Std. Plan No. 3-01
B	Tapping Saddle per Std. Plan 3-01
C	2"∅ Corporation Stop per Std. Plan 3-01
D	1"∅ Service Tubing
E	#14 AWG Tracer Wire - THHN, THWN
F	1"∅ Angle Meter Stop w/Ford A24-NL Adapter
G	Install Meter Idler Spool (Ford Idler - 2)
H <sup>1</sup>	Meter Box - Christy B9

APPROVED FITTINGS									
Condition	Service Tubing		Tapping Saddle			Corporation Stop		Angle Meter Stop	
	PET	Type K Copper	Ford 101B	Ford 101BS	Ford 202BS	Ford F1100-4-NL	Ford F8700-4-NL	Ford KV43-342W-NL	Ford KV23-342W-NL
Standard Domestic Service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Service Pressure > 150-psi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**NOTES**

- Meter Box shall be set within the sidewalk wherever practical;
- All PET services using Pack Joint fittings shall be equipped with stainless steel inserts at all fittings;
- A Ford A24-NL adapter shall be installed at the meter stops;
- When installing a new service at an existing location, the customer plumbing shall be replumbed as necessary to conform with this plan;
- Irrigation meters shall be equipped with a backflow device in accordance with Wy'east Engineering Std. Plan No. 3-03;
- New installations at existing service locations shall be relocated into the Right-of-Way;
- Minimum bending radius for PET (SDR 9) shall be 20 x D where D = PET nominal diameter;
- Minimum bending radius for copper tubing (Type K, L) shall be 6";
- Copper tubing shall be bent using a tube bending device as recommended by the Copper Development Association, Copper Tubing Handbook. Free hand bending will not be permitted;
- Copper or PET tubing evidencing crimping as a result of bending shall be removed and replaced at the Contractor's expense.

REVISIONS	



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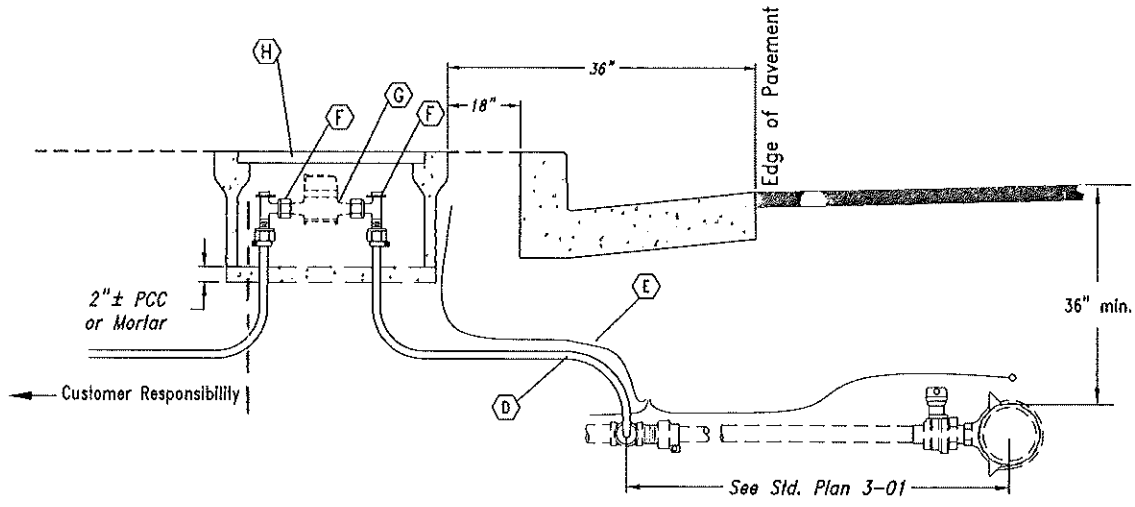
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## STANDARD DOMESTIC SERVICE

Unmetered Installation

Standard Plan No. 3-02.02



MECHANICAL SCHEDULE	
(ID)	DESCRIPTION
A	Water Main (New or Existing) per Std. Plan No. 3-01
B	Tapping Saddle per Std. Plan 3-01
C	2"Ø Corporation Stop per Std. Plan 3-01
D	1"Ø Service Tubing
E	#14 AWG Tracer Wire - THHN, THWN
F	1"Ø Angle Meter Stop w/Ford A24-NL Adapter
G	Water Meter (Supplied and Installed by Agency)
H'	Meter Box - Christy B9

APPROVED FITTINGS									
Condition	Service Tubing		Topping Saddle			Corporation Stop		Angle Meter Stop	
	PET	Type K Copper	Ford 101B	Ford 101BS	Ford 202BS	Ford F1100-4-NL	Ford FB700-4-NL	Ford KV43-342W-NL	Ford KV23-342W-NL
Standard Domestic Service	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	
Service Pressure > 150-psi		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**NOTES**

- Meter Box shall be set within the sidewalk wherever practical;
- All PET services using Pack Joint fittings shall be equipped with stainless steel inserts at all fittings;
- A Ford A24-NL adapter shall be installed at the meter stops;
- When installing a new service at an existing location, the customer plumbing shall be replumbed as necessary to conform with this plan;
- Irrigation meters shall be equipped with a backflow device in accordance with Wy'east Engineering Std. Plan No. 3-03;
- New installations at existing service locations shall be relocated into the Right-of-Way;
- Minimum bending radius for PET (SDR 9) shall be 20 x D where D = PET nominal diameter;
- Minimum bending radius for copper tubing (Type K, L) shall be 6";
- Copper tubing shall be bent using a tube bending device as recommended by the Copper Development Association, Copper Tubing Handbook. Free hand bending will not be permitted;
- Copper or PET tubing evidencing crimping as a result of bending shall be removed and replaced at the Contractor's expense.

REVISIONS	

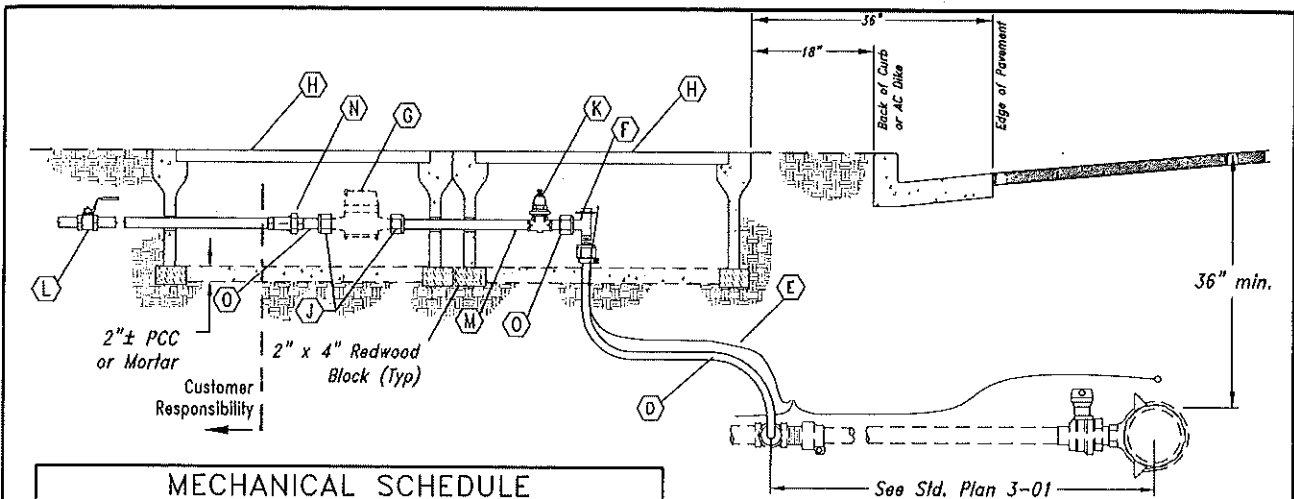
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**STANDARD DOMESTIC SERVICE**  
 Standard Installation  
 Standard Plan No. 3-02.03

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MECHANICAL SCHEDULE	
ID	DESCRIPTION
A	Water Main (New or Existing) per Std. Plan No. 3-01
B	Tapping Saddle per Std. Plan 3-01
C	2" Corporation Stop per Std. Plan 3-01
D	1" Service Tubing
E	#14 AWG Tracer Wire - THHN, THWN
F	1" Angle Meter Stop w/Ford A24-NL Adapter
G	Water Meter (Supplied and Installed by Agency)
H	Meter Box - Christy B9
J	1" Meter Swivel Nut x FIPT (Ford C31-23-NL)
K	1" Pressure Reducing Valve - Watts 25 AUB
M	1" x 12" Brass Nipple
L	Customer Master Valve (Required)
N	1" Cartridge Dual Check Valve (Ford HHC11-444-NL)
O	1" x 2-1/2" Brass Nipple

APPROVED FITTINGS									
Condition	Service Tubing		Tapping Saddle			Corporation Stop		Angle Meter Stop	
	PET	Type K Copper	Ford 101B	Ford 101BS	Ford 202BS	Ford F1100-4-NL	Ford F8700-4-NL	Ford KV43-342W-NL	Ford KV23-342W-NL
Standard Domestic Service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Service Pressure > 150-psi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**NOTES**

- Meter Box shall be set within the sidewalk wherever practical;
- All PET services using Pack Joint fittings shall be equipped with stainless steel inserts at all fittings;
- A Ford A24-NL adapter shall be installed at the meter stops;
- When installing a new service at an existing location, the customer plumbing shall be replumbed as necessary to conform with this plan;
- Irrigation meters shall be equipped with a backflow device in accordance with Wyeast Engineering Std. Plan No. 3-03;
- New installations at existing service locations shall be relocated into the Right-of-Way;
- Minimum bending radius for PET (SDR 9) shall be 20 X D where D = PET nominal diameter;
- Minimum bending radius for copper tubing (Type K, L) shall be 6";
- Copper tubing shall be bent using a tube bending device as recommended by the Copper Development Association, Copper Tubing Handbook. Free hand bending will not be permitted;
- Copper or PET tubing evidencing crimping as a result of bending shall be removed and replaced at the Contractor's expense.



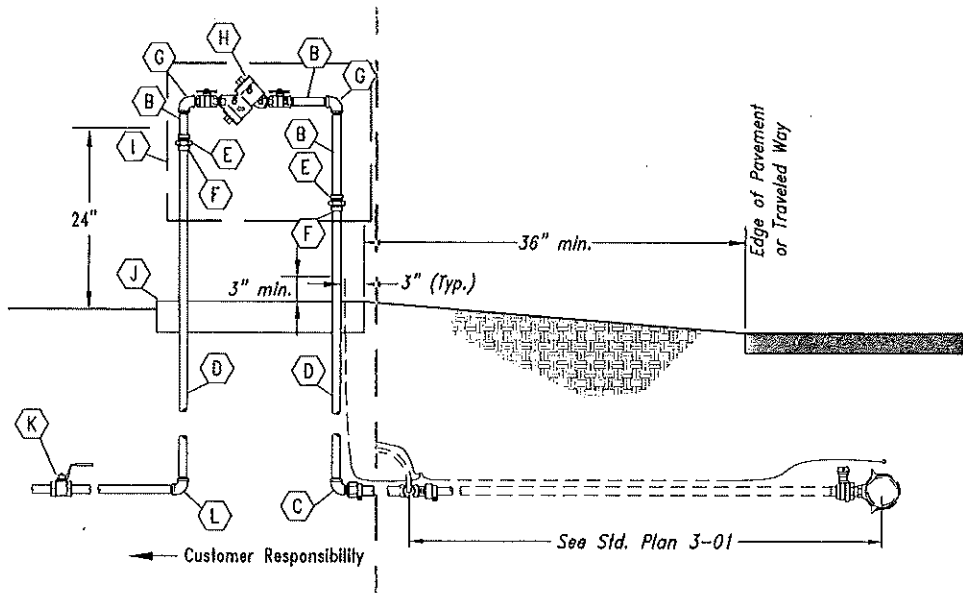
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## STANDARD DOMESTIC SERVICE

Installation with Pressure Reducing Valve  
Standard Plan No. 3-02.04



MECHANICAL SCHEDULE	
(ID)	DESCRIPTION
A	2"∅ Service otherwise per Std. Plan 3-01.01
B	2"∅ Brass Nipple
C	2"∅ x 90° PJ x PJ - Ford L44-77
D	2"∅ Copper Tubing (Type M)
E	2"∅ Brass Union
F	2"∅ Coupling PJ x MIPT - Ford C84
G	2"∅ x 90° Brass
H	2"∅ Double Detector Check Valve - FEBCO 805Y or Wilkins/Zurn Model 950XL
I	Protective Cover - Weatherguard Blanket
J	4" PCC Slab (18" x 36"±)
K	2"∅ Customer Master Valve (Required)
	2"∅ x 90° PJxMIPT - Ford L14-77

**NOTES**

1. Field verify pipe size and type;
2. If size is increased, use equivalent components;
3. Padlock supplied by District;
4. All buried fittings shall be liberally coated with a bitumastic compound (T. Christy HD50, 3M Underseal or approved substitute);
5. Allow bitumastic to cure sufficiently to prevent rub off during backfill;
5. Overall length to fit;
6. Where called for, enclosure shall be GuardShack by BPD, Inc. in accordance with Standard Plan No. 3-17.

REVISIONS	



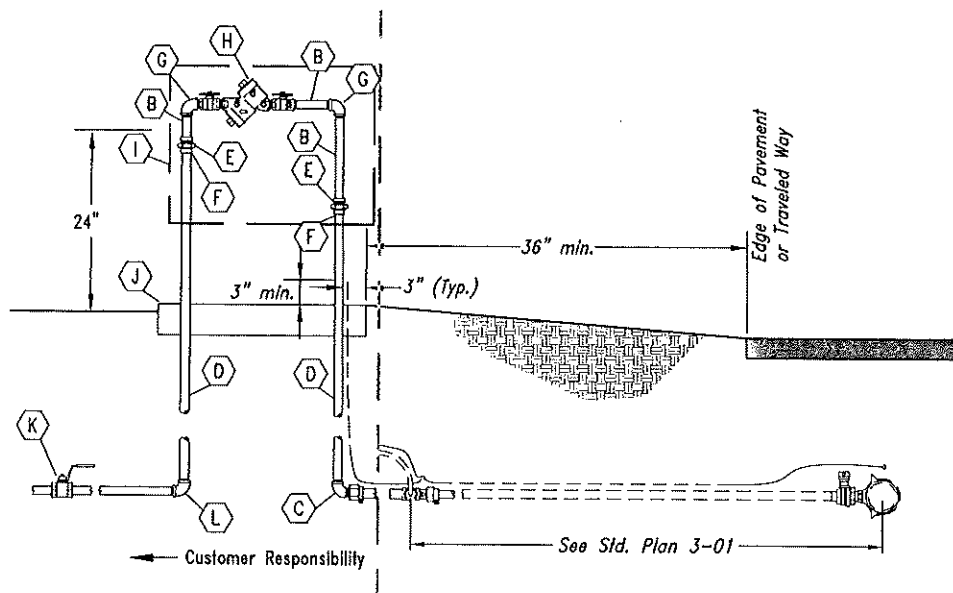
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## STANDARD DOMESTIC FIRE SERVICE

~  
With Pressure Reducing Valve  
Standard Plan No. 3-03



MECHANICAL SCHEDULE	
①	DESCRIPTION
A	2"∅ Service otherwise per Std. Plan 3-01.01
B	2"∅ Brass Nipple
C	2"∅ x 90° PJ x PJ - Ford L44-77
D	2"∅ Copper Tubing (Type M)
E	2"∅ Brass Union
F	2"∅ Coupling PJ x MIPT - Ford C84
G	2"∅ x 90° Brass
H	2"∅ Double Detector Check Valve - FEBCO 805Y or Wilkins/Zurn Model 950XL
I	Protective Cover - Weatherguard Blanket
J	4" PCC Slab (18" x 36"±)
K	2"∅ Customer Master Valve (Required)
	2"∅ x 90° PJxFIPT - Ford L14-77

**NOTES**

1. Field verify pipe size and type;
2. If size is increased, use equivalent components;
3. Padlock supplied by District;
4. All buried fillings shall be liberally coated with a bitumastic compound (T. Christy HD50, 3M Underseal or approved substitute);
5. Allow bitumastic to cure sufficiently to prevent rub off during backfill;
5. Overall length to fit;
6. Where called for, enclosure shall be GuardShack by BPD, Inc. in accordance with Standard Plan No. 3-17.

REVISIONS	



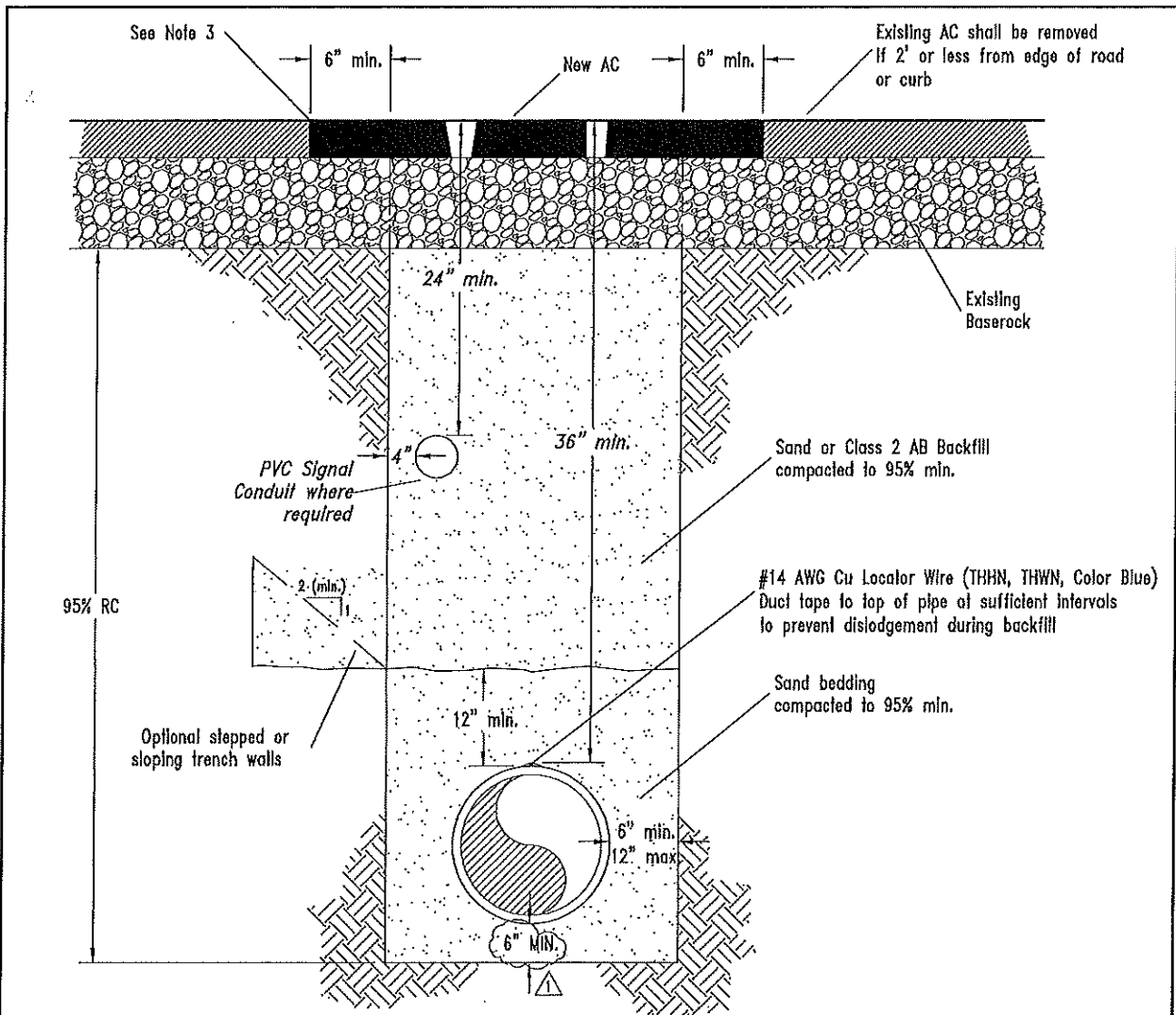
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## STANDARD DOMESTIC FIRE SERVICE

With Pressure Reducing Valve  
Standard Plan No. 3-03

DESIGN:	DRA	DATE:	8/11
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**NOTES:**

1. Pavement shall be replaced in kind however, the minimum standards are as follows:
  - A. Paved roads: 3" Type A AC over 6" prime coated Class 2 AB
  - B. Non-paved roads: Single seal coat over 6" Class 2 AB within trench area, single seal coat entire road surface

Class 2 AB may be continued to 12" above pipe with sand bedding as shown;

2. Minimum paving standards provided are applicable to private road construction only. All work in public right of way shall meet the requirements of the agency of jurisdiction;
3. Sawcut existing pavement to produce a straight, vertical face and apply tack coat prior to paving;
4. All trenches within a paved area or road Right-Of-Way shall be backfilled as shown above;
5. Trenches outside a paved area or road Right-Of-Way shall be constructed in accordance with Standard Plan 3-03.02.

REVISIONS	
11/14	Revise Bedding to 6"; Revise Note 5



# Wy'east Engineering

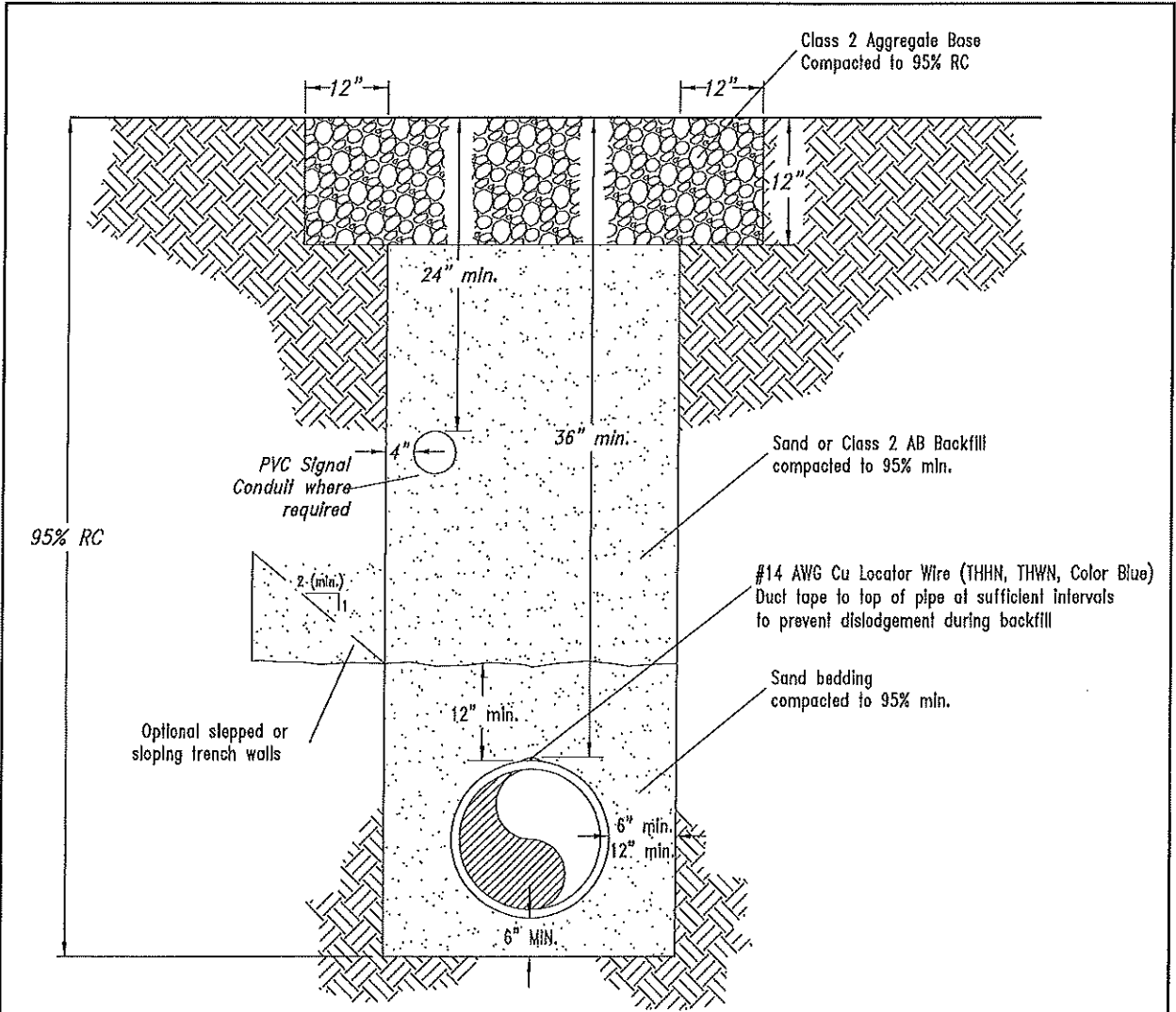
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## TRENCH DETAIL - SAND BACKFILL

Paved and Traveled Areas  
Standard Plan No. 3-04.01





**NOTES:**

1. Trench construction standards are applicable to private property construction only. Within a public right of way or parcel, the requirements of the Agency of Jurisdiction may supercede these standards;
2. Class 2 AB may be continued to 12" above pipe with sand bedding as shown;
3. Trenches within a paved area or road Right-Of-Way shall be constructed in accordance with Standard Plan 3-03.01.

REVISIONS	



# Wy'east Engineering

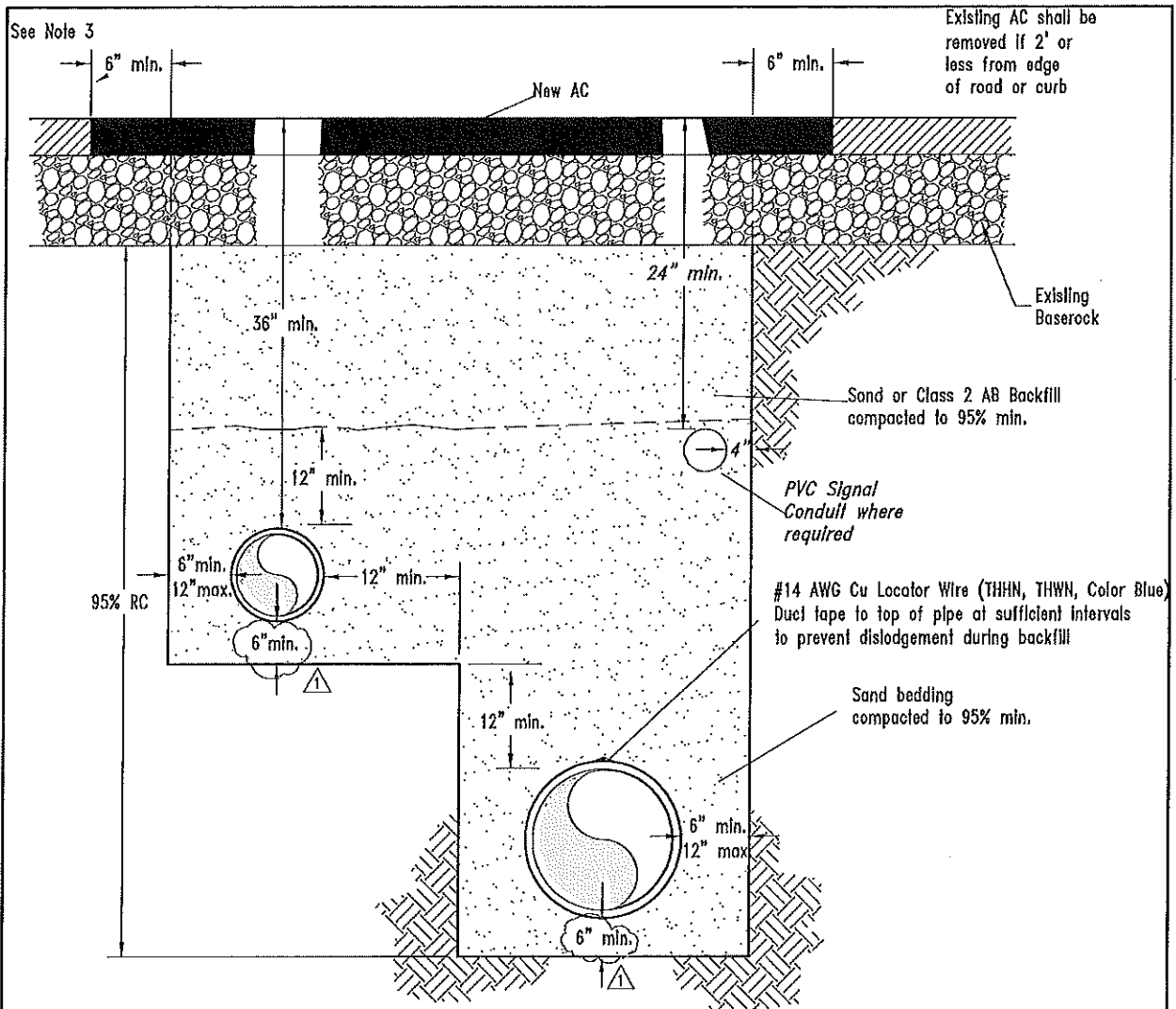
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## TRENCH DETAIL - SAND BACKFILL

Unpaved Areas

Standard Plan No. 3-04.01B

DESIGN:	DRA	DATE	11/14
CAD:	DRA	DATE	11/14
CHECK:	DRA	DATE	11/14
APPROVED:	DRA	DATE	11/14



**NOTES:**

1. Pavement shall be replaced in kind however, the minimum standards are as follows:
  - A. Paved roads: 3" Type A AC over 6" prime coated Class 2 AB
  - B. Non-paved roads: Single seal coat over 6" Class 2 AB within trench area, single seal coat entire road surface

Class 2 AB may be continued to 12" above pipe with sand bedding as shown;

2. Minimum paving standards provided are applicable to private road construction only. All work in public right of way shall meet the requirements of the agency of jurisdiction;
3. Sawcut existing pavement to produce a straight, vertical face and apply tack coat prior to paving;
4. All trenches within a paved area or road Right-Of-Way shall be backfilled as shown above;
5. Trenches outside a paved area or road Right-Of-Way shall be constructed in accordance with Standard Plan 3-03.02.

REVISIONS	
11/14	Revise Bedding to 6"; Revise Note 5



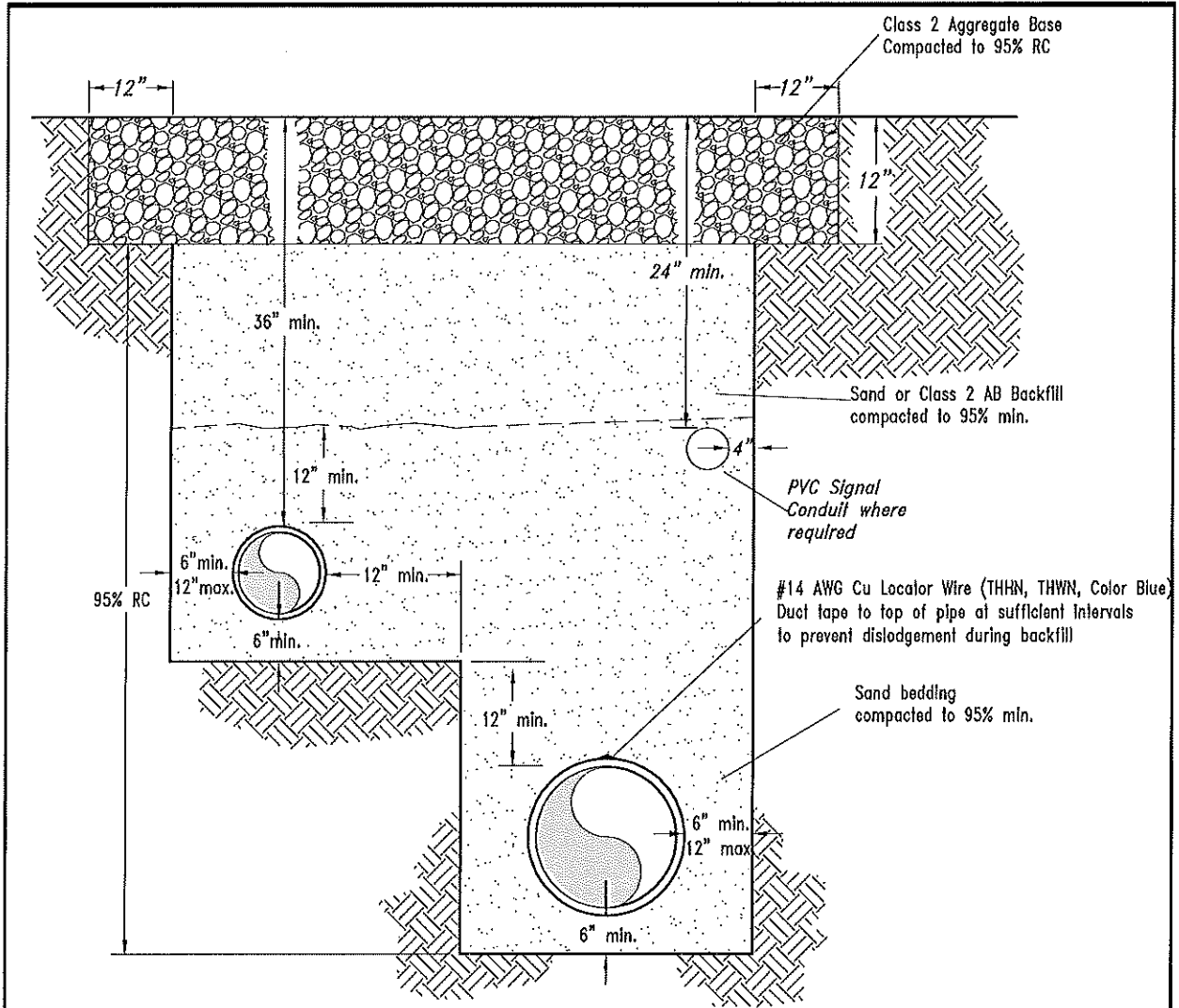
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## JOINT TRENCH - SAND BACKFILL

Standard Plan No. 3-04.02



**NOTES:**

1. Trench construction standards are applicable to private property construction only. Within a public right of way or parcel, the requirements of the Agency of Jurisdiction may supercede these standards;
2. Class 2 AB may be continued to 12" above pipe with sand bedding as shown;
3. Trenches within a paved area or road Right-Of-Way shall be constructed in accordance with Standard Plan 3-03.01.

REVISIONS	



# Wy'east Engineering

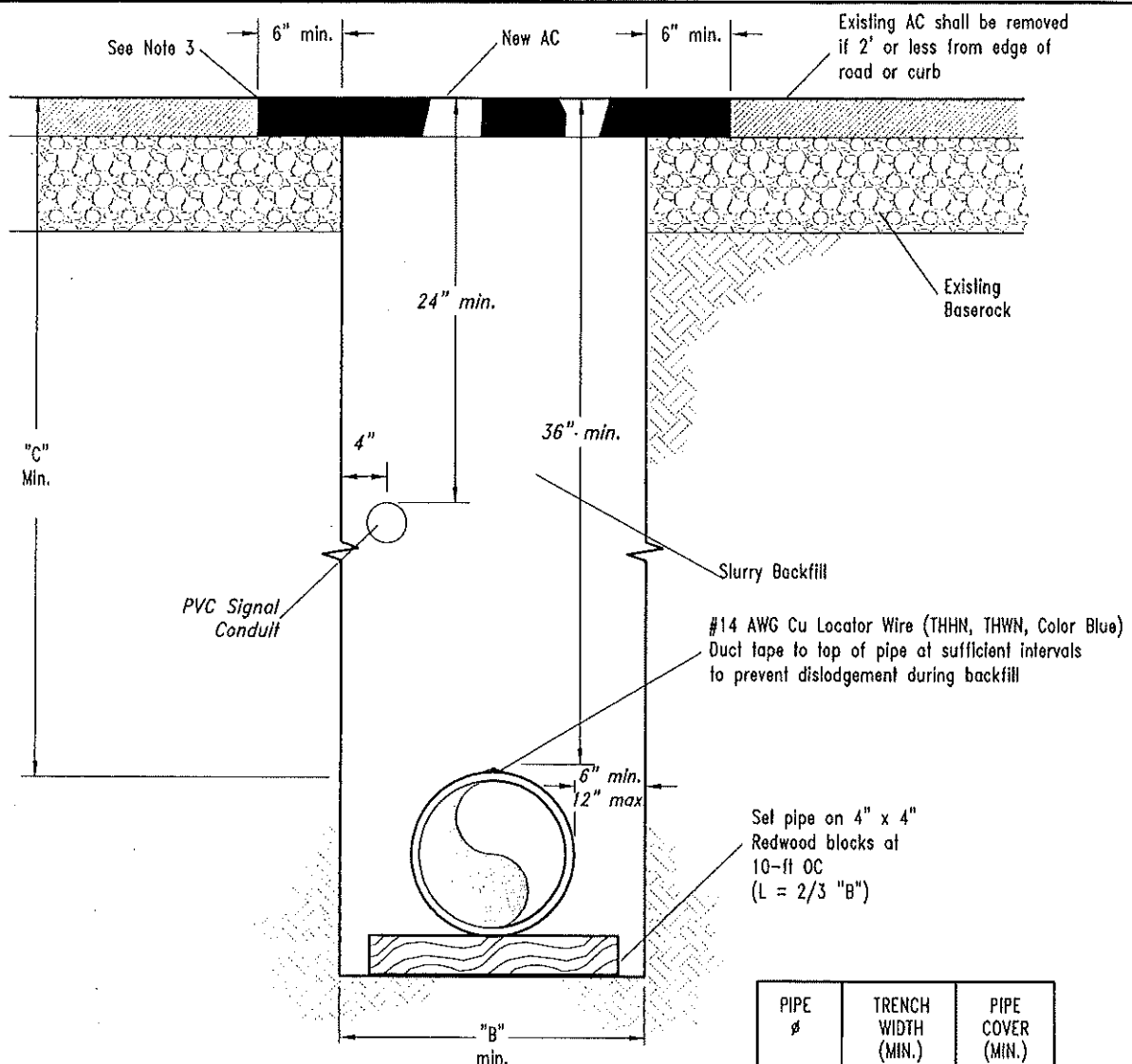
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## JOINT TRENCH DETAIL - SAND BACKFILL

Unpaved Areas

Standard Plan No. 3-04.02B



**NOTES:**

- Pavement shall be replaced in kind however, the minimum standards are as follows:
  - Paved roads: 3" Type A AC
  - Non-paved roads: Single seal coat
- Minimum paving standards provided are applicable to private road construction only. All work in public right of way shall meet the requirements of the agency of jurisdiction;
- Sand/cement slurry may be brought to final grade and removed to the depth of pavement prior to paving or left at or below the final depth of surface pavement to be placed;
- Sawcut existing pavement to produce a straight, vertical face and apply tack coat prior to paving;
- The pipe shall be filled with water or otherwise restrained to prevent floating during placement of sand/cement slurry backfill.
- Sand/cement slurry shall be allowed to cure no less than 5-days after placement prior to placing final pavement;
- Sand/cement slurry shall be placed in such a manner so as to prevent dislodgement of the pipe during placement and consolidation.

REVISIONS	

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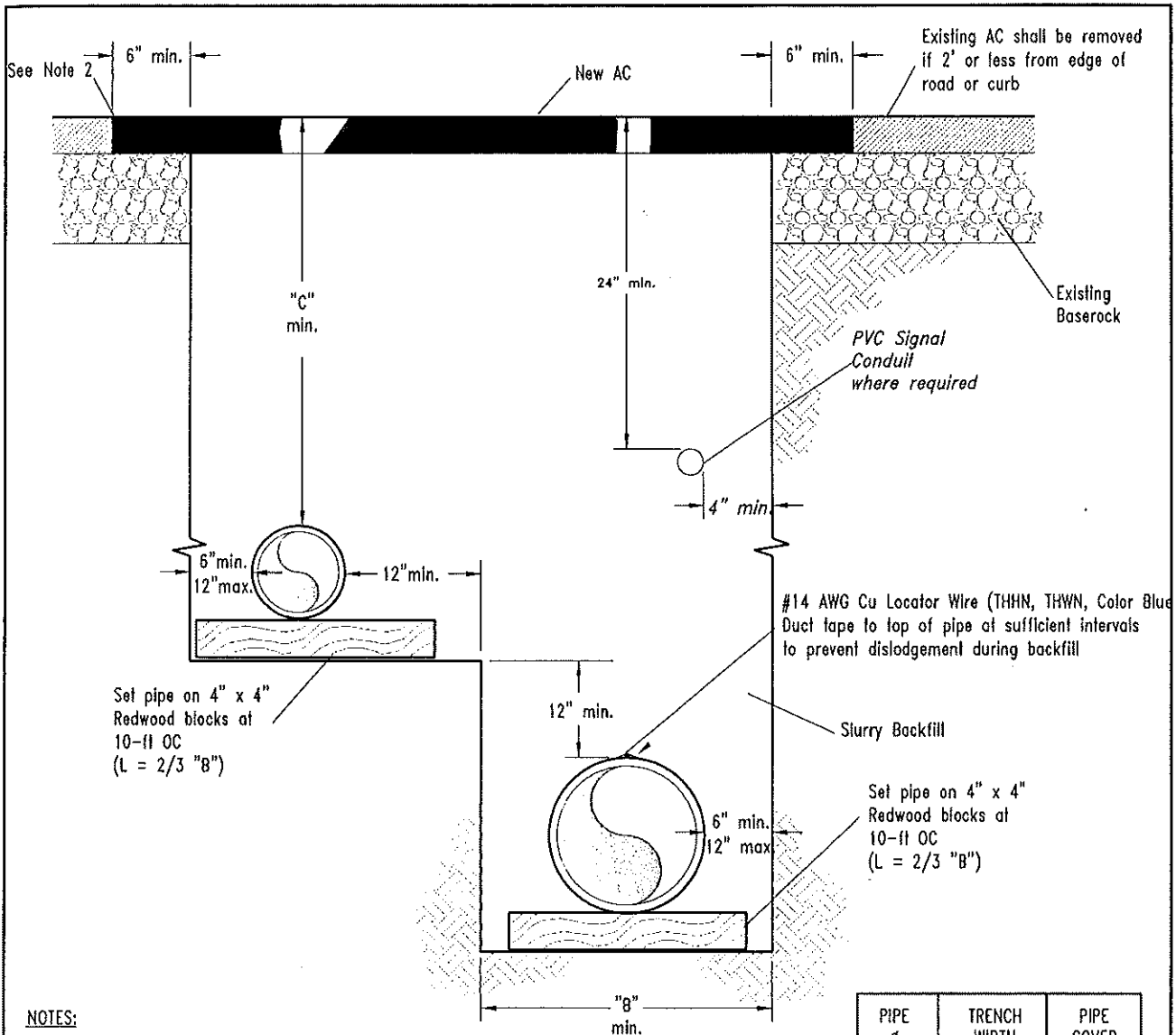
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## TRENCH DETAIL - SAND/CEMENT SLURRY BACKFILL

Standard Plan No. 3-04.03

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**NOTES:**

1. Pavement shall be replaced in kind however, the minimum standards are as follows:
  - A. Paved roads: 3" Type A AC
  - B. Non-paved roads: Single seal coat
2. Minimum paving standards provided are applicable to private road construction only. All work in public right of way shall meet the requirements of the agency of jurisdiction;
3. Sand/cement slurry may be brought to final grade and removed to the depth of pavement prior to paving or left at or below the final depth of surface pavement to be placed;
4. Sawcut existing pavement to produce a straight, vertical face and apply tack coat prior to paving;
5. The pipe shall be filled with water or otherwise restrained to prevent floating during placement of sand/cement slurry backfill.
6. Sand/cement slurry shall be allowed to cure no less than 5-days after placement prior to placing final pavement;
7. Sand/cement slurry shall be placed in such a manner so as to prevent dislodgement of the pipe during placement and consolidation.

PIPE Ø	TRENCH WIDTH (MIN.)	PIPE COVER (MIN.)
"A"	"B"	"C"
6"	18"	36"
8"	20"	42"
12"	24"	42"

REVISIONS	



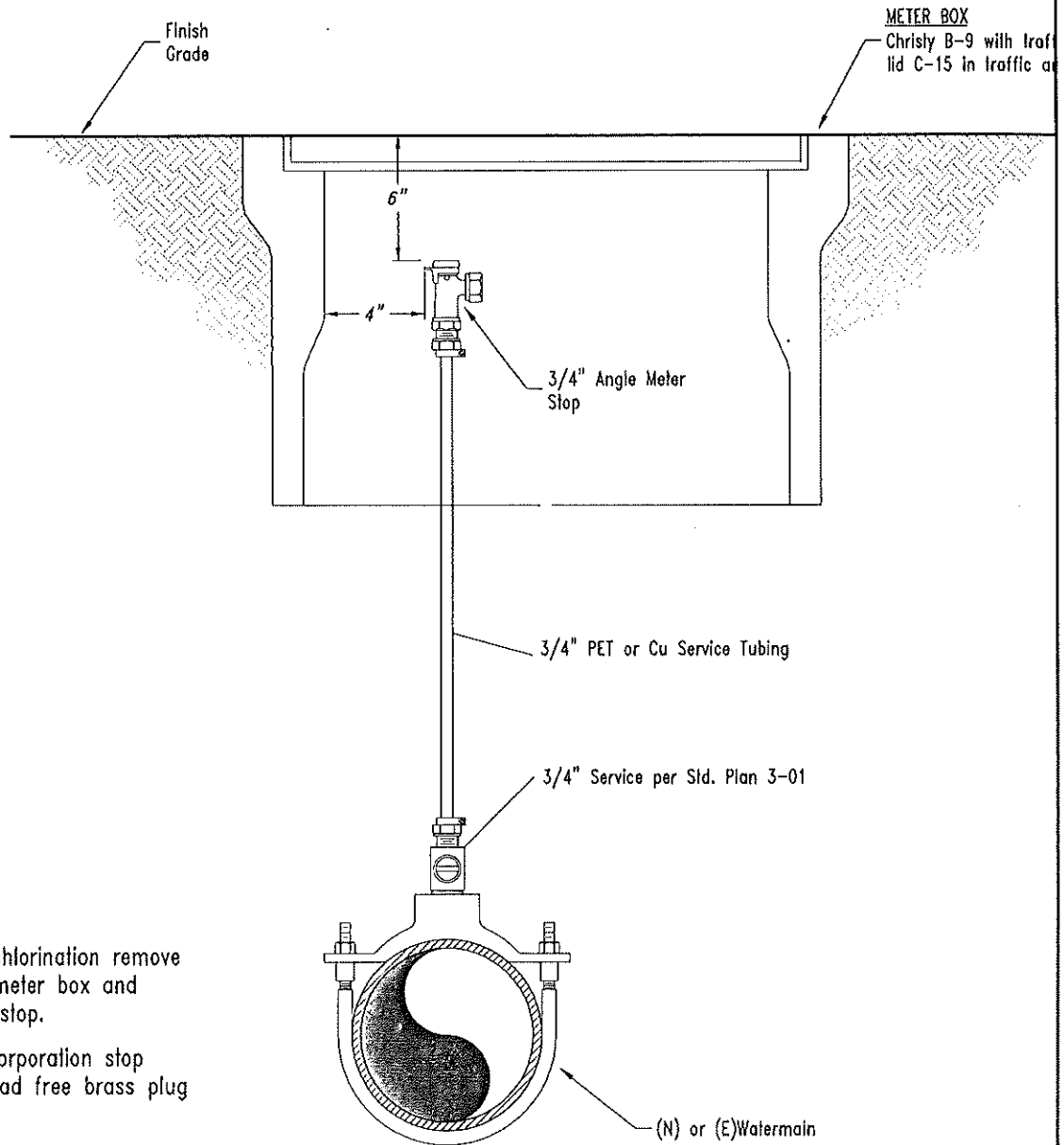
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## JOINT TRENCH DETAIL - SAND/CEMENT SLURRY BACKFILL

Standard Plan No. 3-04.04



**NOTE:**

1. After chlorination remove pipe, meter box and meter stop.
2. Plug corporation stop with lead free brass plug

REVISIONS	



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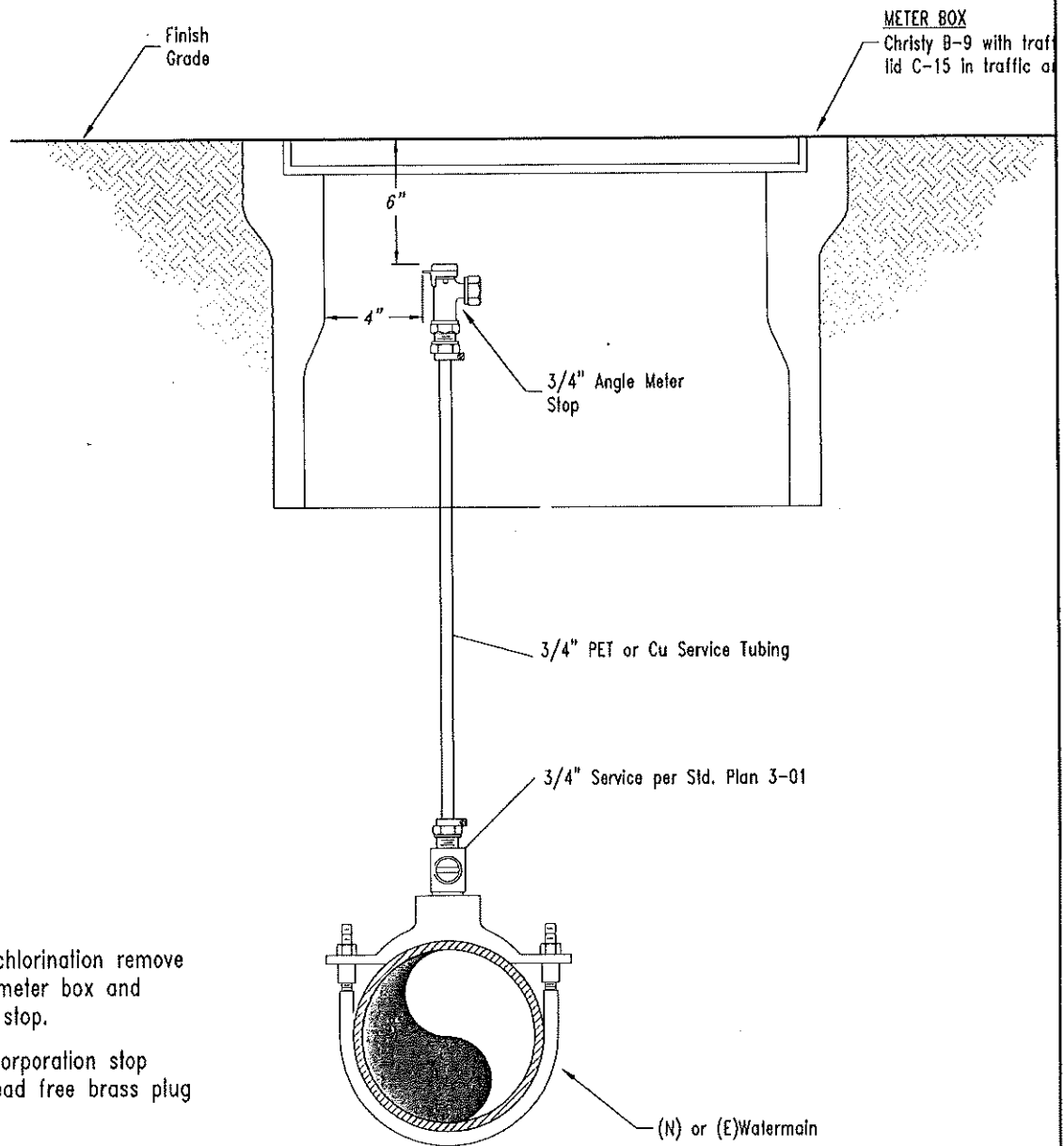
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## CHLORINATION TAP

Standard Plan No. 3-05

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**NOTE:**

1. After chlorination remove pipe, meter box and meter stop.
2. Plug corporation stop with lead free brass plug

REVISIONS



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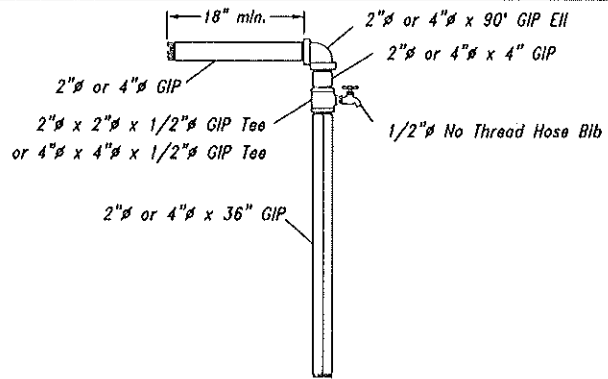
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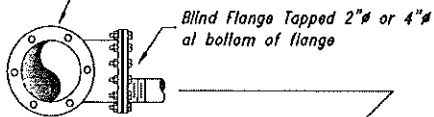
## CHLORINATION TAP

Standard Plan No. 3-05

**Blow Off Nozzle Detail**



Tee (MJ x MJ x FL)  
Branch and Run same size

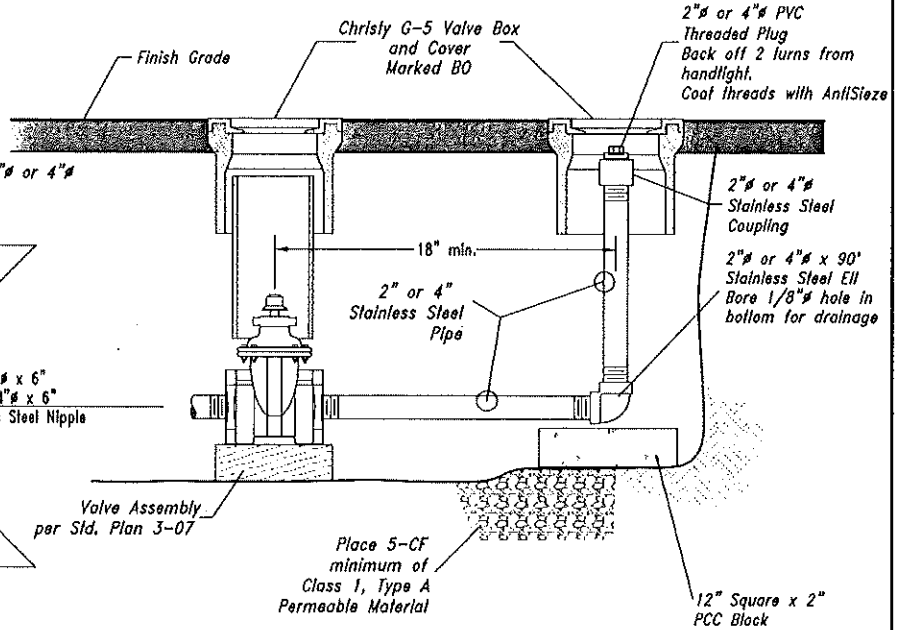


**IN-LINE APPLICATION**

EBBA Iron Series 1100 PV  
Retainer Gland w/  
MJ Cap or Plug  
Tapped 2 inch or 4 inch  
at bottom of cap  
or plug



**END-OF-MAIN APPLICATION**



Note:  
Thrust block per Wy'east  
Std. Plan No. 3-10.01  
for plugged or capped ends  
on existing pipelines only

**NOTES:**

1. All blow off pipe and fittings shall be Type 304 Stainless Steel. The Contractor may substitute fabricated fittings of stainless steel or epoxy coated steel in lieu of threaded fittings;
2. Backfill shall be that of the adjacent pipeline trench;
3. On mains 10 inch and larger, the blow off shall be 4 inch;
4. Valves shall be threaded ends unless using fabricated, flanged piping per Note 1 above;
5. Thrust restraint on new pipelines shall in accordance with Std. Plan No. 3-10.02;
6. Thrust restraint on existing pipelines shall in accordance with Std. Plan No. 3-10.01.

REVISIONS	

# Wy'east Engineering

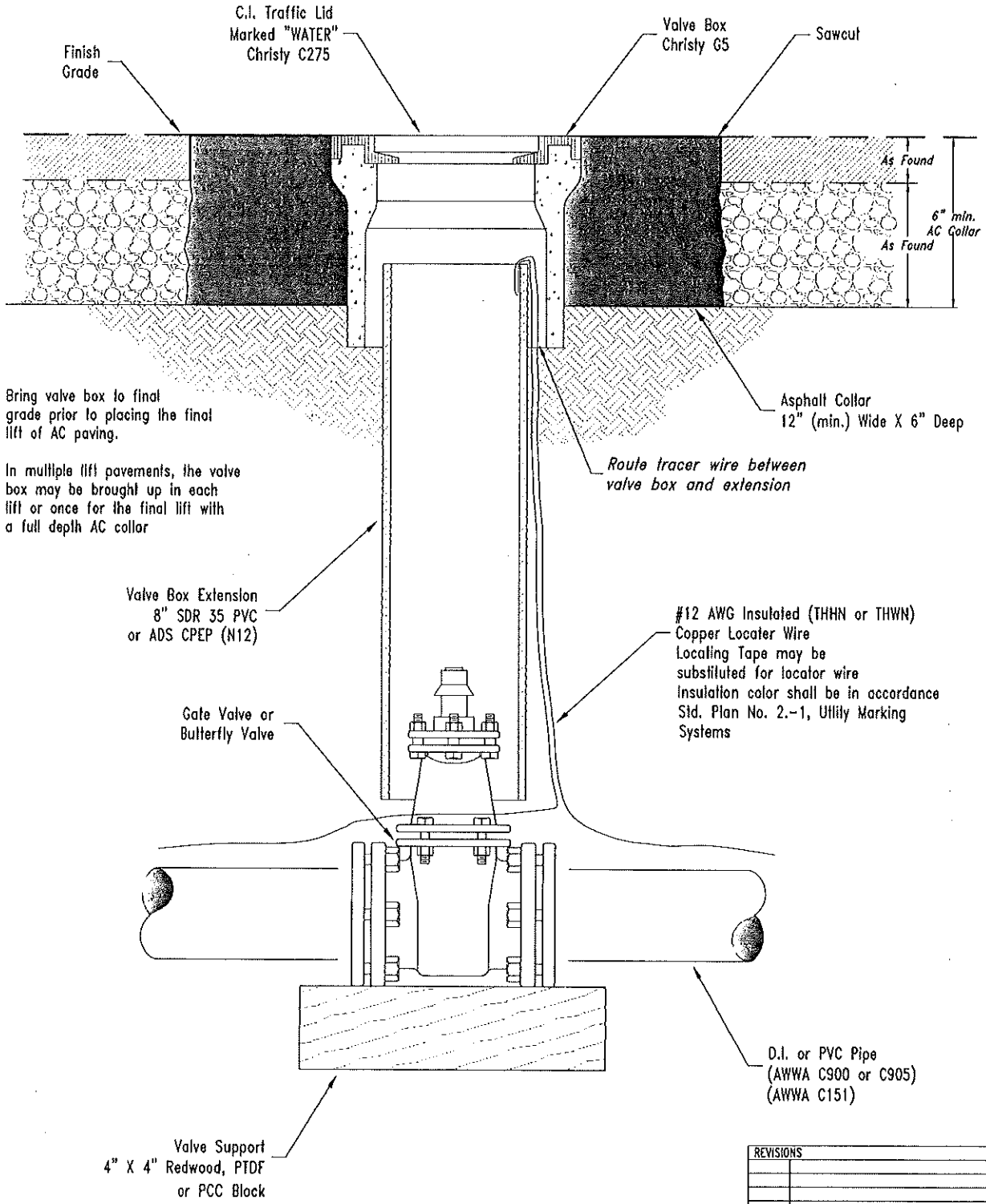
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## BLOW-OFF ASSEMBLY

Standard Plan No. 3-06





Bring valve box to final grade prior to placing the final lift of AC paving.

In multiple lift pavements, the valve box may be brought up in each lift or once for the final lift with a full depth AC collar

Valve Box Extension  
8" SDR 35 PVC  
or ADS CPEP (N12)

Gate Valve or  
Butterfly Valve

Valve Support  
4" X 4" Redwood, PTDF  
or PCC Block

Route tracer wire between  
valve box and extension

Asphalt Collar  
12" (min.) Wide X 6" Deep

#12 AWG Insulated (THHN or THWN)  
Copper Locator Wire  
Locating Tape may be  
substituted for locator wire  
insulation color shall be in accordance  
Std. Plan No. 2.-1, Utility Marking  
Systems

D.I. or PVC Pipe  
(AWWA C900 or C905)  
(AWWA C151)

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# Wy'east Engineering

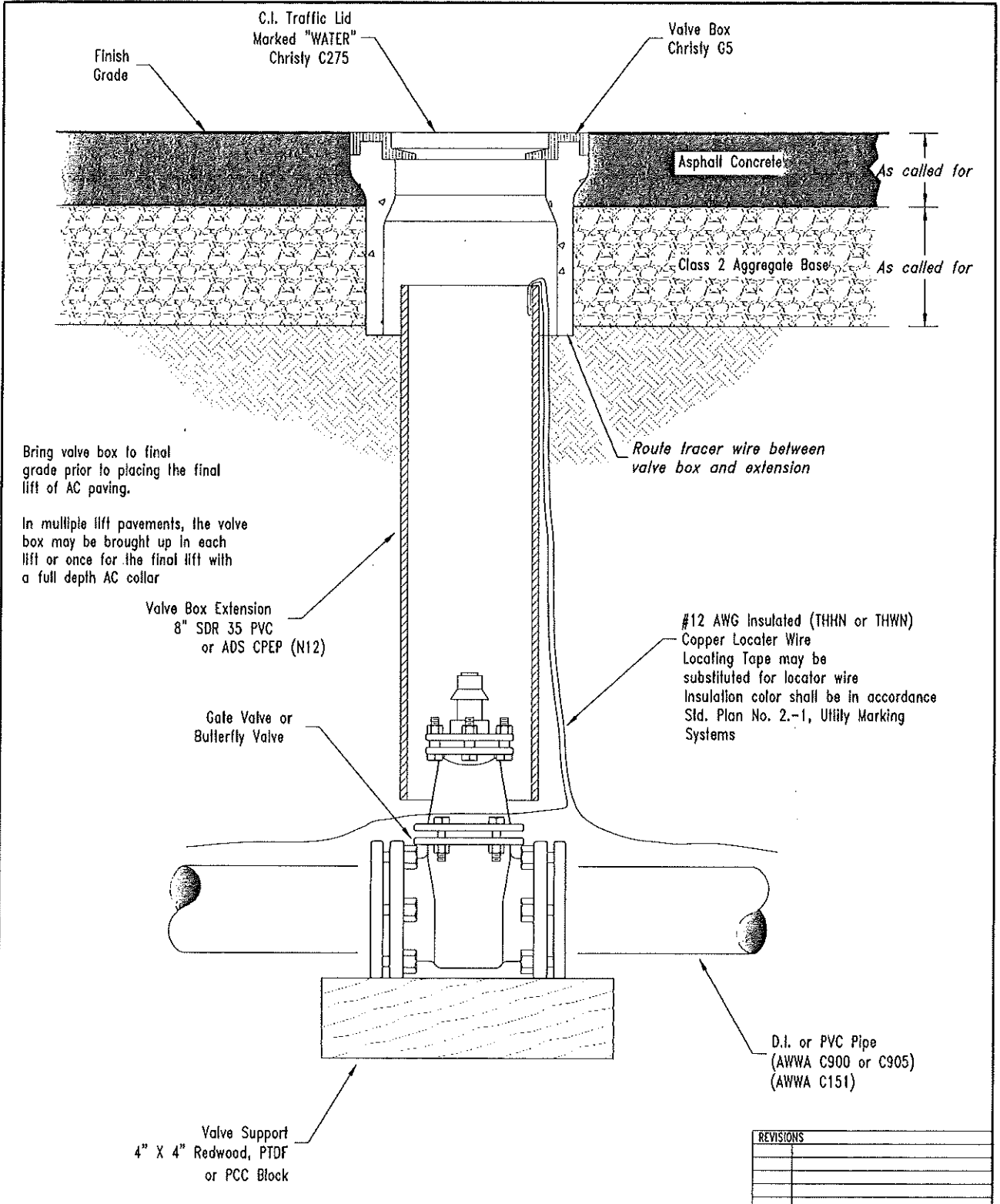
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## BURIED VALVE ASSEMBLY

Existing Pavement Installation  
Standard Plan No. 3-07.01

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Bring valve box to final grade prior to placing the final lift of AC paving.

In multiple lift pavements, the valve box may be brought up in each lift or once for the final lift with a full depth AC collar

Valve Box Extension  
8" SDR 35 PVC  
or ADS CPEP (N12)

Gate Valve or  
Butterfly Valve

Valve Support  
4" X 4" Redwood, PTDF  
or PCC Block

Route tracer wire between  
valve box and extension

#12 AWG Insulated (THHN or THWN)  
Copper Locator Wire  
Locating Tape may be  
substituted for locator wire  
Insulation color shall be in accordance  
Std. Plan No. 2-1, Utility Marking  
Systems

D.I. or PVC Pipe  
(AWWA C900 or C905)  
(AWWA C151)

REVISIONS	

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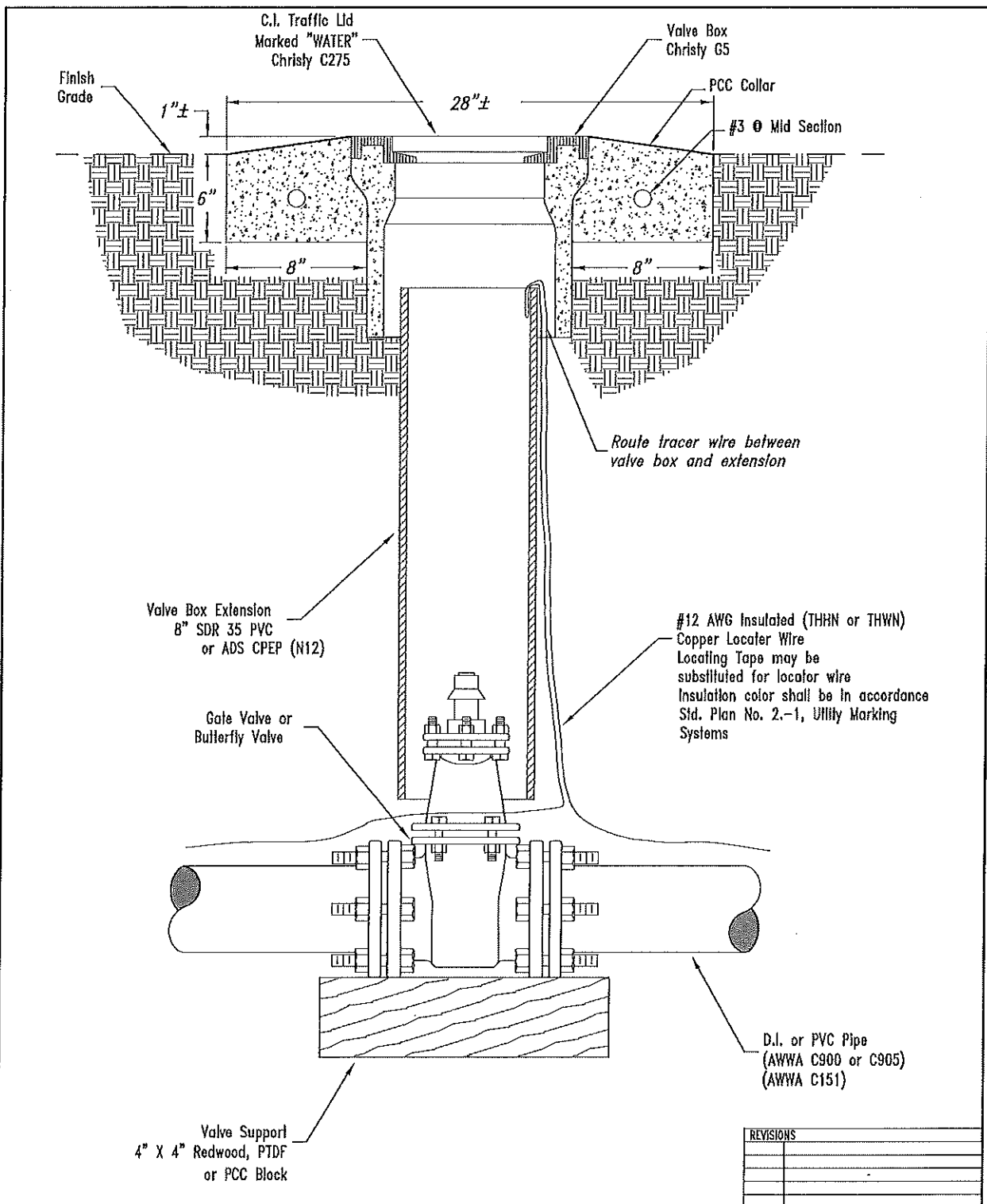
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## BURIED VALVE ASSEMBLY

New Pavement Installation  
Standard Plan No. 3-07.02

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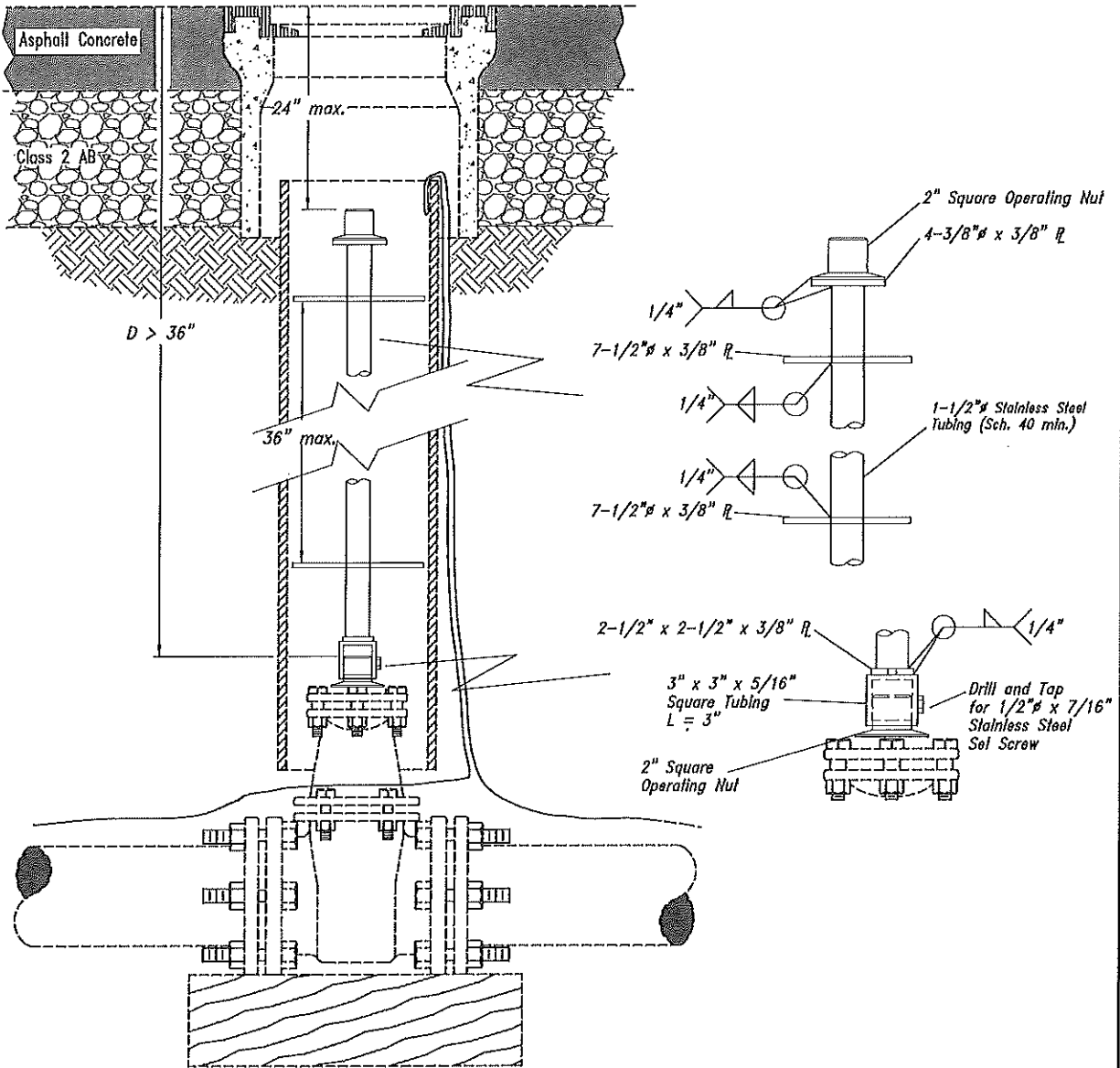
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**BURIED VALVE ASSEMBLY**

~  
 Unpaved Installation  
 Standard Plan No. 3-07.03

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Valve Box Assembly  
Per Standard Plan No. 3-07.1 thru 3



**NOTES**

1. Valve box assembly per Standard Plans 3-9.01 through 3-9.04;
2. Where the depth to the top of the valve operating nut exceeds 36", an extension shall be fabricated in accordance with this Standard Plan 3-09.04;
3. The Contractor shall field verify the dimensions prior fabrication;
4. The extension assembly shall be fabricated of Type 304 or Type 316 stainless steel

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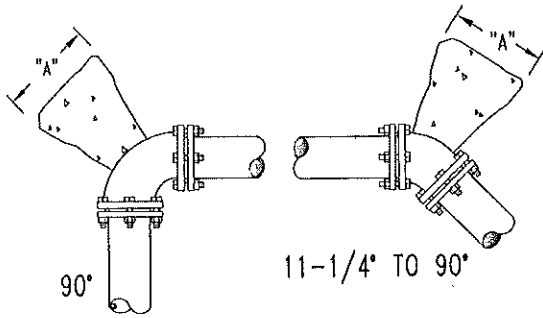
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## BURIED VALVE ASSEMBLY

~  
Valve Operator Extension Assembly  
Standard Plan No. 3-07.04

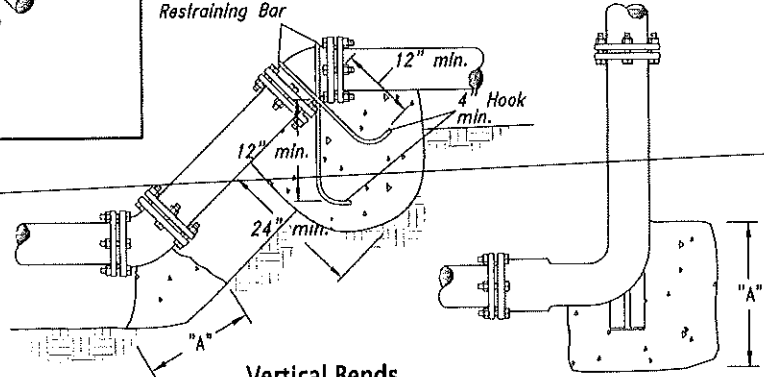


Size	45° Vertical Offset					Bar
	Minimum Volume (CF)					
	Test PSI					
4"	150	200	250	300	(Gr. 40)	4
6"	9	12	15	18		4
8"	20	27	33	40		4
10"	36	47	59	71		6
12"	56	74	93	111		6
12"	80	107	133	160		8

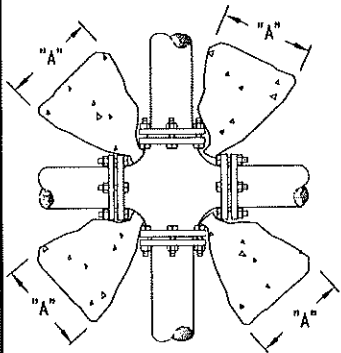
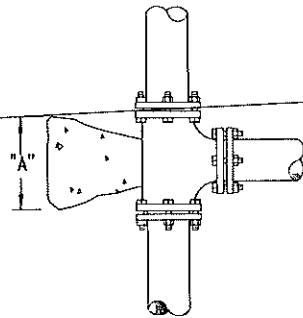
**Notes**

1. Bars shall be cold bent;
2. Coat and wrap restraining bars 2-inches into PCC;
3. Double wrap with 10-mil PVC pipe tape prior to coating;
4. Allow coating to cure before wrapping.

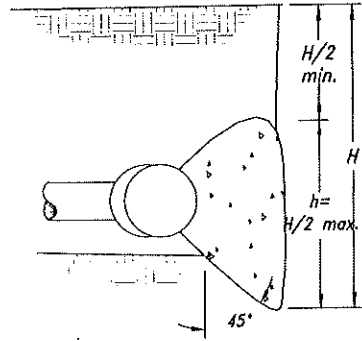
**Restraining Bar**



**Vertical Bends**



**Horizontal Bends and Fittings**



Block Width  
 $h < W < 2h$

**Typical Block Dimensions and Notes**

**Assumptions and Notes**

1. Thrust blocks shall only be used when connecting to existing piping systems where existing thrust restraint cannot be verified;
2. Assumed Soil bearing = 2,000-psf;
3. All thrust blocks shall bear on undisturbed earth;
4. Concrete shall be Class 2 min.;
5. Concrete shall not cover fitting bolts;
6. Fitting bolts shall be coated with bitumastic prior to casting thrust block;
7. Adjust minimum bearing area based on project specific allowable soil bearing load.
8. The dimensions shown hereon shall be considered the minimum area required.

**MINIMUM BEARING AREA (A-SqFt)**

Size	4" #				6" #				8" #				10" #				12" #				
	150	200	250	300	150	200	250	300	150	200	250	300	150	200	250	300	150	200	250	300	
<b>Fitting</b>																					
90°	1.5	1.8	2.2	2.7	3.0	4.0	5.0	6.0	5.3	7.1	8.9	10.7	8.3	11.1	13.9	16.7	12.0	16.0	20.0	24.0	
45°	1.5	1.5	1.5	1.5	1.6	2.2	2.7	3.3	2.9	3.9	4.8	5.8	4.5	6.0	7.5	9.0	6.5	8.7	10.8	13.0	
22-1/2°	1.5	1.5	1.5	0.8	1.5	1.5	1.5	1.7	1.5	2.0	2.5	3.0	2.3	3.1	3.8	4.6	3.3	4.4	5.5	6.6	
11-1/4°	1.5	1.5	1.5	0.4	1.5	1.5	1.5	0.9	1.50	1.5	1.5	1.5	1.5	1.5	1.9	2.3	1.7	2.2	2.8	3.4	
<b>Cross*</b>	1.5	1.5	1.5	2.7	3.0	4.0	5.0	6.0	2.89	7.1	8.9	10.7	8.3	11.1	13.9	16.7	12.0	16.0	20.0	24.0	
<b> Tee*</b>	1.5	1.5	1.5	2.7	3.0	4.0	5.0	6.0	2.89	7.1	8.9	10.7	8.3	11.1	13.9	16.7	12.0	16.0	20.0	24.0	
<b> Dead End</b>	1.5	1.5	1.6	1.9	2.1	2.8	3.5	4.3	5.4	5.0	6.3	7.6	5.9	7.9	9.8	11.8	8.5	11.3	14.1	17.0	

\*Note: Unbalanced crosses shall be restrained as tees, 90° bends or dead ends as appropriate

\*Note: Unbalanced tees shall be restrained as 90° bends or dead ends as appropriate

**SOIL BEARING STRENGTH FACTOR**

Bearing Strength	1000-psf	1,500-psf	2,000-psf	2,500-psf	3,000-psf
Factor	2.00	1.33	1.00	0.80	0.67

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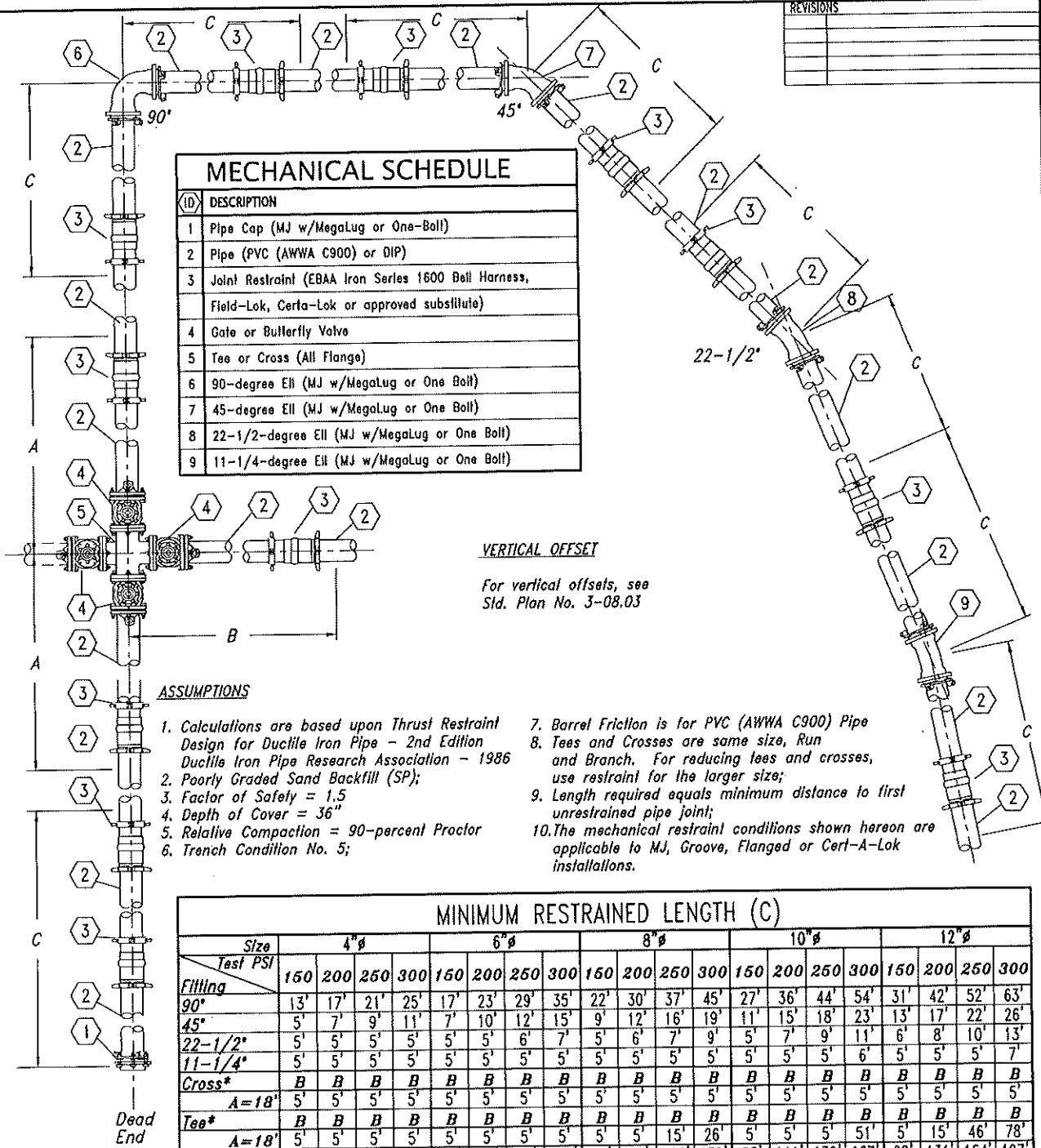
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## THRUST BLOCKING DETAILS

Standard Plan No. 3-08.01

REVISIONS	



ID	DESCRIPTION
1	Pipe Cap (MJ w/MegaLug or One-Bolt)
2	Pipe (PVC (AWWA C900) or DIP)
3	Joint Restraint (EBAA Iron Series 1600 Bell Harness, Field-Lok, Certa-Lok or approved substitute)
4	Gate or Butterfly Valve
5	Tee or Cross (All Flange)
6	90-degree Ell (MJ w/MegaLug or One Bolt)
7	45-degree Ell (MJ w/MegaLug or One Bolt)
8	22-1/2-degree Ell (MJ w/MegaLug or One Bolt)
9	11-1/4-degree Ell (MJ w/MegaLug or One Bolt)

**VERTICAL OFFSET**

For vertical offsets, see Std. Plan No. 3-08.03

**ASSUMPTIONS**

- Calculations are based upon Thrust Restraint Design for Ductile Iron Pipe - 2nd Edition Ductile Iron Pipe Research Association - 1986
- Poorly Graded Sand Backfill (SP);
- Factor of Safety = 1.5
- Depth of Cover = 36"
- Relative Compaction = 90-percent Proctor
- Trench Condition No. 5;
- Barrel Friction is for PVC (AWWA C900) Pipe
- Tees and Crosses are same size, Run and Branch. For reducing tees and crosses, use restraint for the larger size;
- Length required equals minimum distance to first unrestrained pipe joint;
- The mechanical restraint conditions shown hereon are applicable to MJ, Groove, Flanged or Cert-A-Lok installations.

		MINIMUM RESTRAINED LENGTH (C)																			
Size		4" Ø				6" Ø				8" Ø				10" Ø				12" Ø			
Test PSI		150	200	250	300	150	200	250	300	150	200	250	300	150	200	250	300	150	200	250	300
Filling	90°	13'	17'	21'	25'	17'	23'	29'	35'	22'	30'	37'	45'	27'	36'	44'	54'	31'	42'	52'	63'
	45°	5'	7'	9'	11'	7'	10'	12'	15'	9'	12'	16'	19'	11'	15'	18'	23'	13'	17'	22'	26'
	22-1/2°	5'	5'	5'	5'	5'	5'	6'	7'	5'	6'	7'	9'	5'	7'	9'	11'	6'	8'	10'	13'
	11-1/4°	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	6'	5'	5'	5'	7'
Cross*		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	A=18'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'
Tee*		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	A=18'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	15'	26'	5'	5'	5'	51'	5'	15'	46'	78'
Dead End		38'	50'	63'	76'	53'	70'	88'	106'	69'	92'	116'	139'	83'	111'	139'	167'	98'	131'	164'	197'
Vertical Offset		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	D	6'	7'	9'	11'	8'	10'	12'	15'	10'	13'	16'	19'	12'	15'	19'	23'	13'	18'	22'	26'
		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
		16'	21'	26'	32'	22'	30'	37'	44'	29'	39'	48'	58'	35'	46'	58'	69'	41'	55'	68'	82'

\*Note: Unbalanced crosses shall be restrained as tees or 90° bends  
 \*Note: Unbalanced tees shall be restrained as 90° bends

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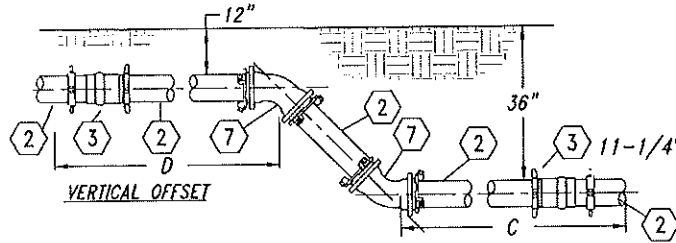
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## THRUST RESTRAINT

Mechanical Restraint - Horizontal Alignment  
 Minimum Required Restrained Length  
 Standard Plan No. 3-08.02

## MECHANICAL SCHEDULE

(ID)	DESCRIPTION
1	Pipe Cap (MJ w/MegaLug or One-Bolt)
2	Pipe (PVC (AWWA C900) or DIP)
3	Joint Restraint (EBAA Iron Series 1600 Bell Harness, Field-Lok, Certa-Lok or approved substitute)
4	Gate or Butterfly Valve
5	Tee or Cross (All Flange)
6	90-degree Ell (MJ w/MegaLug or One Bolt)
7	45-degree Ell (MJ w/MegaLug or One Bolt)
8	22-1/2-degree Ell (MJ w/MegaLug or One Bolt)
9	11-1/4-degree Ell (MJ w/MegaLug or One Bolt)



### MINIMUM RESTRAINED LENGTH (C)

Size Test PSI	4"φ				6"φ				8"φ				10"φ				12"φ			
	150	200	250	300	150	200	250	300	150	200	250	300	150	200	250	300	150	200	250	300
Filling	13'	17'	21'	25'	17'	23'	29'	35'	22'	30'	37'	45'	27'	36'	44'	54'	31'	42'	52'	63'
90°	5'	7'	9'	11'	7'	10'	12'	15'	9'	12'	16'	19'	11'	15'	18'	23'	13'	17'	22'	26'
45°	5'	5'	5'	5'	5'	5'	6'	7'	5'	6'	7'	9'	5'	7'	9'	11'	6'	8'	10'	13'
22-1/2°	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'
11-1/4°	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Cross*	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
A=18'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'	5'
Tee*	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
A=18'	5'	5'	5'	5'	5'	5'	5'	5'	5'	15'	26'	5'	5'	5'	5'	51'	5'	15'	46'	78'
Dead End	38'	50'	63'	76'	53'	70'	88'	106'	69'	92'	116'	139'	83'	111'	139'	167'	98'	131'	164'	197'
Vertical	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Offset	6'	7'	9'	11'	8'	10'	12'	15'	10'	13'	16'	19'	12'	15'	19'	23'	13'	18'	22'	26'
	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	16'	21'	26'	32'	22'	30'	37'	44'	29'	39'	48'	58'	35'	46'	58'	69'	41'	55'	68'	82'

\*Note: Unbalanced crosses shall be restrained as tees or 90° bends  
 \*Note: Unbalanced tees shall be restrained as 90° bends

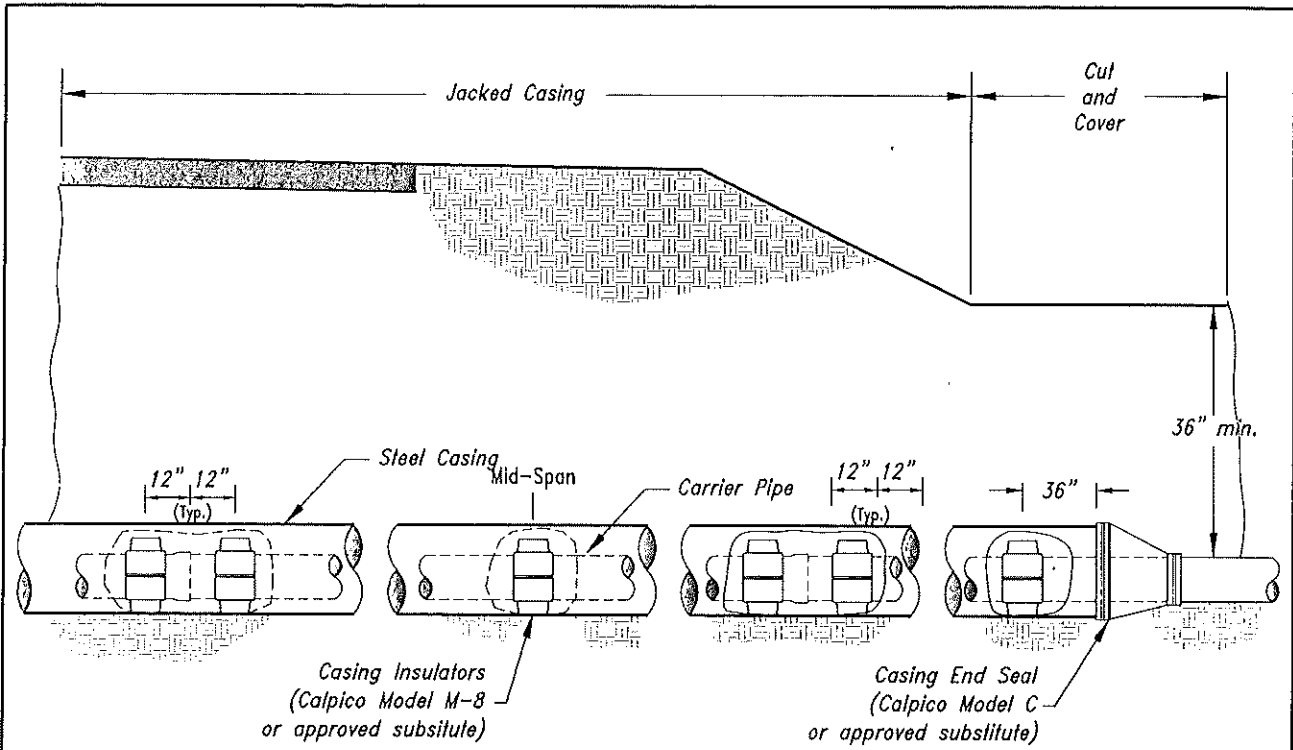
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**THRUST RESTRAINT**  
 Mechanical Restraint - Vertical Offset  
 Minimum Required Restrained Length  
 Standard Plan No. 3-08.03



PIPE		MINIMUM CASING SIZE
SIZE	TYPE	
6"	DI	12" $\phi$ x 1/4"
	PVC	
8"	DI	15" $\phi$ x 1/4"
	PVC	
10"	DI	15" $\phi$ x 1/4"
	PVC	18" $\phi$ x 3/8"
12"	DI	18" $\phi$ x 3/8"
	PVC	20" $\phi$ x 3/8"

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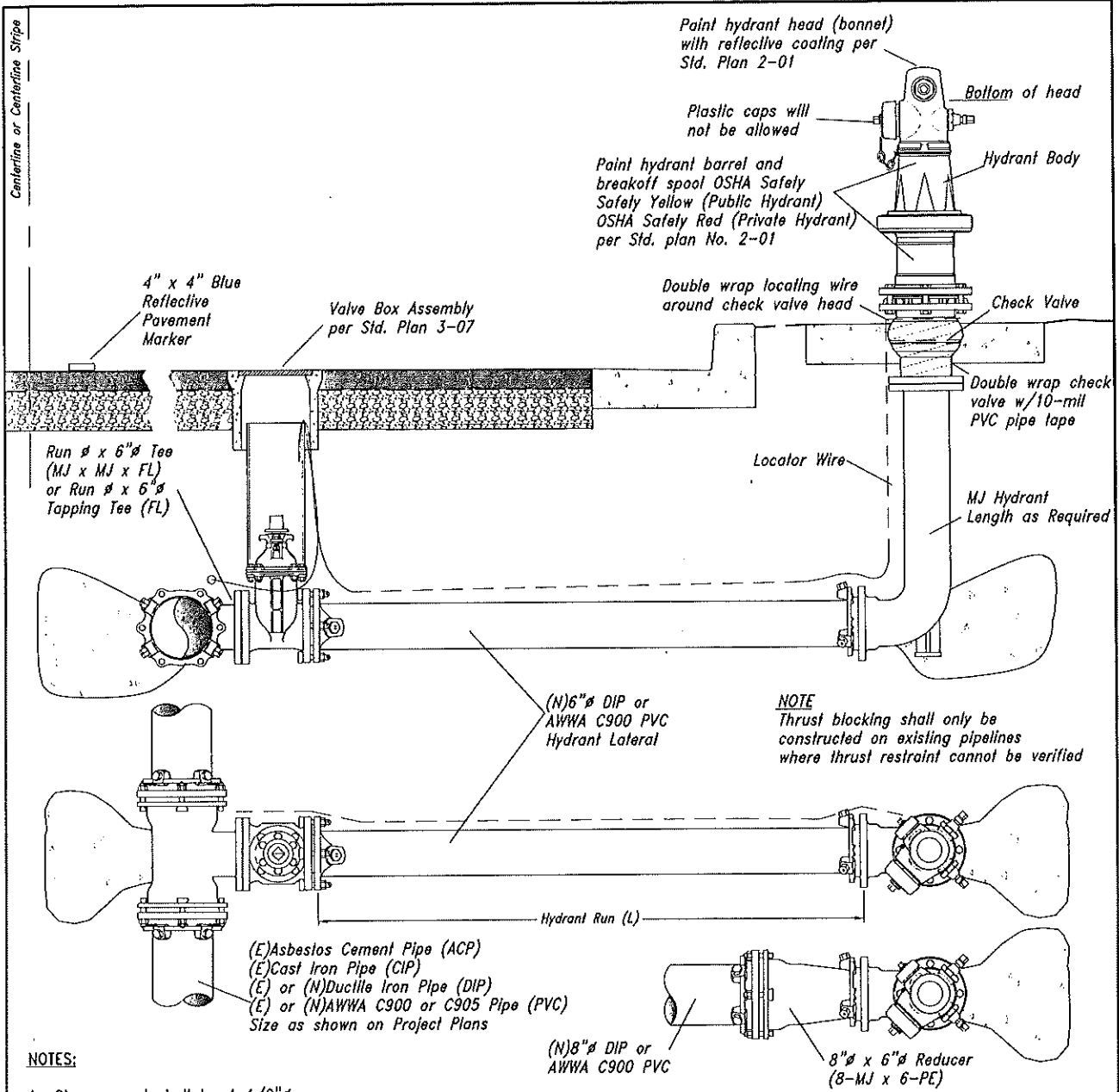
## CASING INSTALLATION

Standard Plan No. 3-09

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Centerline or Centerline Stripe



**NOTES:**

1. Steamer port shall be 4-1/2"Ø or as directed by the Fire Agency of Jurisdiction;
2. Where the local Fire Agency of Jurisdiction has a color standard or coding system, the hydrant color, including reflective section shall be painted in accordance with that standard. Clear reflective coating may be substituted for colored reflective coatings in any installation;
3. Hydrant shall be covered with a burlap sack or bag marked NOT IN SERVICE until put into service;
4. Where the length of run (L) exceeds 20'-ft, increase lateral run to 8"Ø and reduce of hydrant.

- For Placement and Clearances (Plan) See Std. Plan 3-10.02
- For Placement and Clearances (Elevation) See Std. Plan 3-10.03
- For Wharf Head Hydrants See Std. Plan 3-10.04
- For Dry Barrel Hydrants See Std. Plan 3-10.05

MANUFACTURER	HYDRANT TYPE	
	6" Steamer	
OUTLETS	1 - 2-1/2"	2 - 2-1/2"
Clow	2050	2060
Jones	J-3740	J-3760
Long Beach	B125	B130
Mueller	A481	A481
CHECK VALVES		
Jones	J5000	
Clow	#400	

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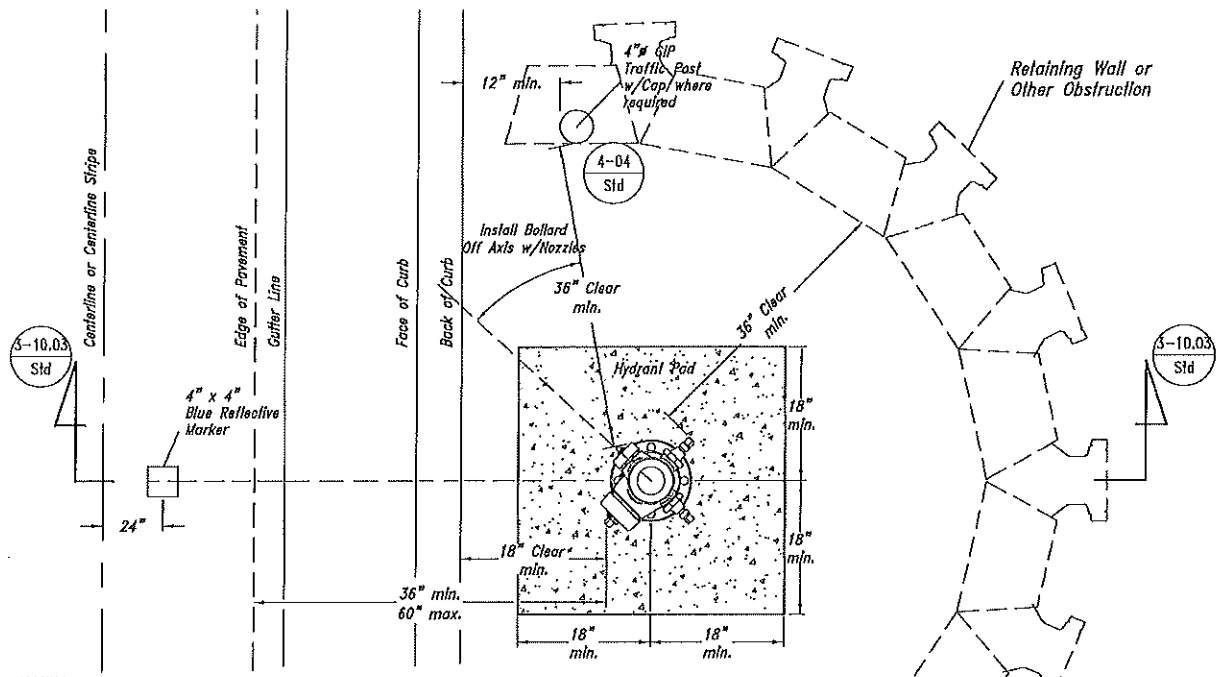
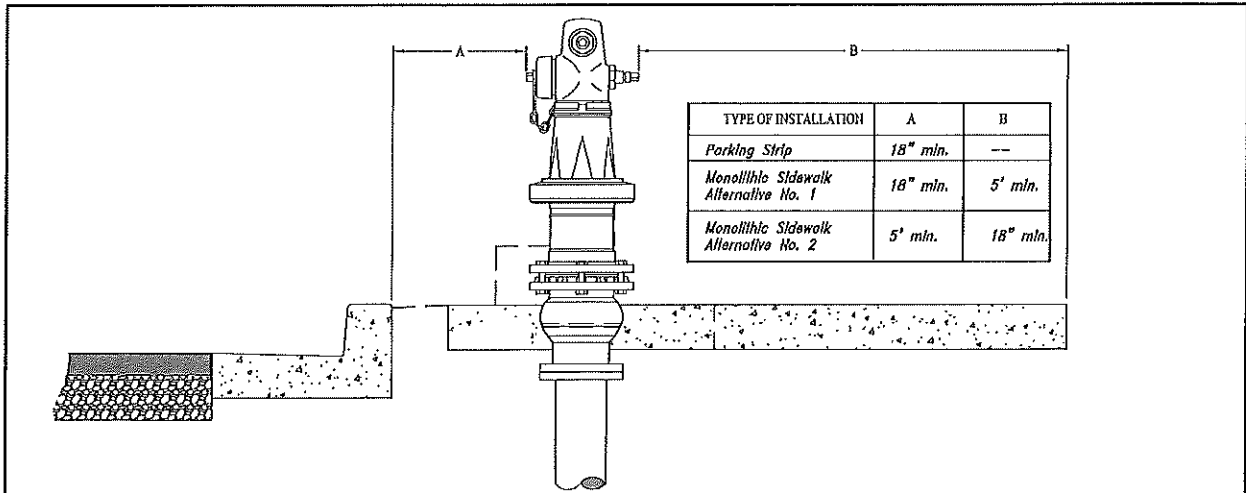
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## GENERAL FIRE HYDRANT ASSEMBLY DETAILS

Wet Barrel Hydrant Assemblies  
General Details and Notes  
Standard Plan No. 3-10.01



**NOTES:**

1. Steamer port shall be 4-1/2"  $\phi$  or as directed by the Fire Agency of Jurisdiction;
2. Where the local Fire Agency of Jurisdiction has a color standard or coding system, the hydrant color, including reflective section shall be painted in accordance with that standard. Clear reflective coating may be substituted for colored reflective coatings in any installation;
3. Hydrant shall be covered with a burlap sack or bag marked NOT IN SERVICE until put into service;
4. Where the length of run (L) exceeds 20'-if, increase lateral run to 8"  $\phi$  and reduce at hydrant.

REVISIONS	
10/14	Revised Clearances



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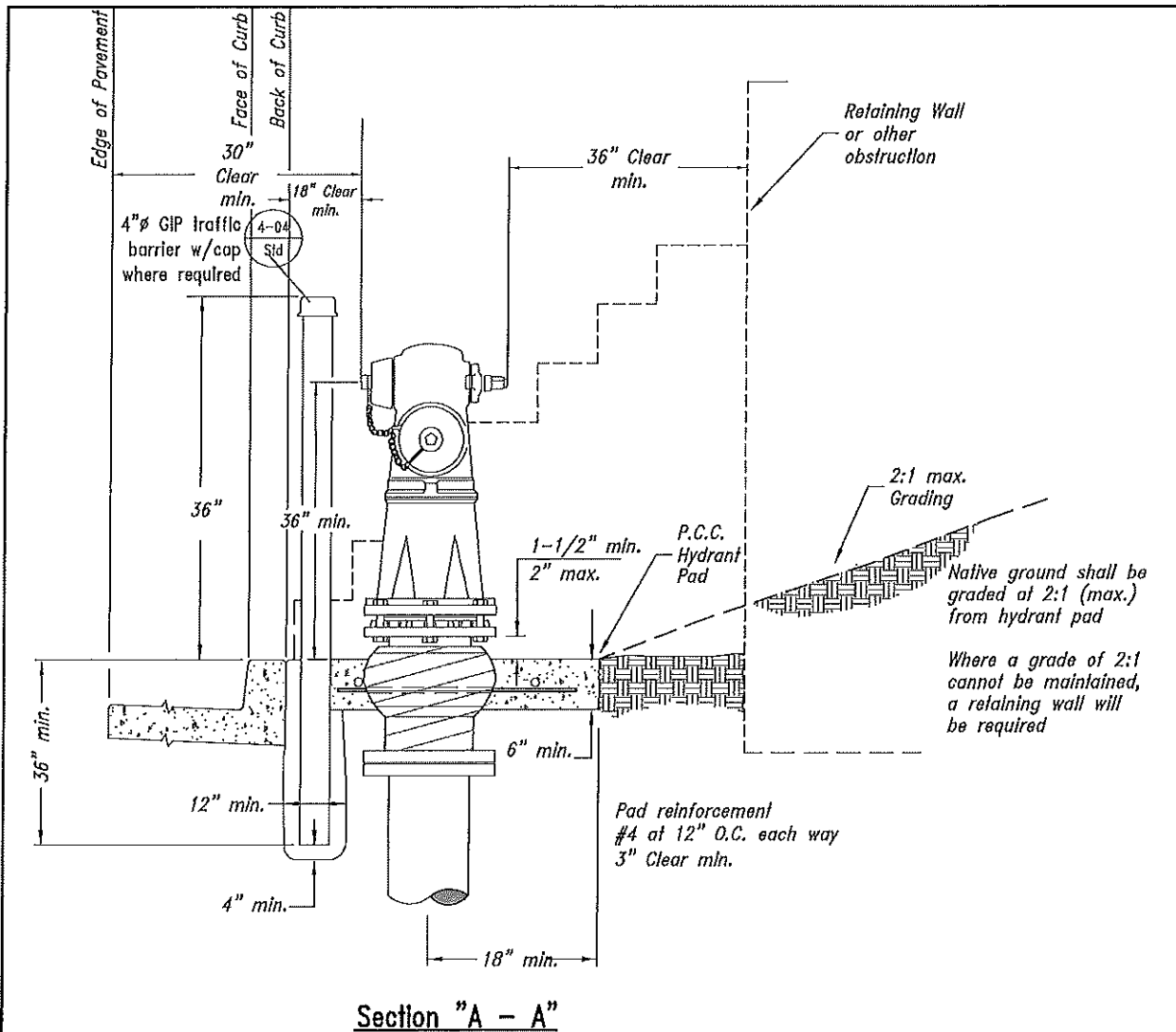
## GENERAL FIRE HYDRANT ASSEMBLY DETAILS

Placements and Clearances

Plan View

Standard Plan No. 3-10.02

DESIGN:	DRA	DATE:	8/11
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**Section "A - A"**

**NOTES:**

1. Steamer port shall be 4-1/2"Ø or as directed by the Fire Agency of Jurisdiction;
2. Where the local Fire Agency of Jurisdiction has a color standard or coding system, the hydrant color, including reflective section shall be painted in accordance with that standard. Clear reflective coating may be substituted for colored reflective coatings in any installation;
3. Hydrant shall be covered with a burlap sack or bag marked NOT IN SERVICE until put into service;
4. Where the length of run (L) exceeds 20'-lf, increase lateral run to 8"Ø and reduce at hydrant.

REVISIONS	
7/13	Added Check Valve
10/14	Revised Clearances



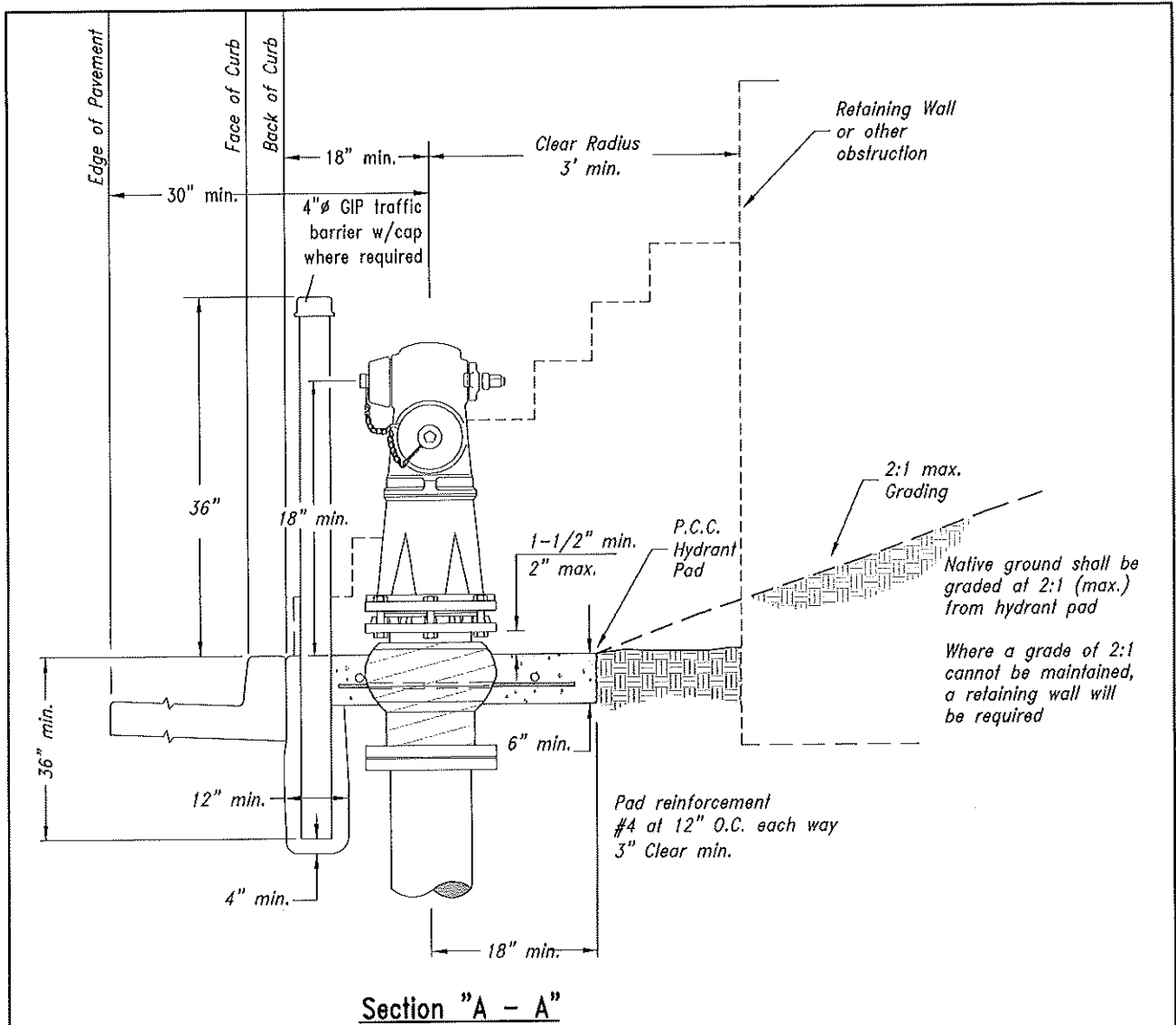
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## GENERAL FIRE HYDRANT ASSEMBLY DETAILS

Placements and Clearances  
Elevation View  
Standard Plan No. 3-10.03

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**NOTES:**

1. Steamer port shall be 4-1/2"  $\phi$  or as directed by the Fire Agency of Jurisdiction;
2. Where the local Fire Agency of Jurisdiction has a color standard or coding system, the hydrant color, including reflective section shall be painted in accordance with that standard. Clear reflective coating may be substituted for colored reflective coatings in any installation;
3. Hydrant shall be covered with a burlap sack or bag marked NOT IN SERVICE until put into service;
4. Where the length of run (L) exceeds 20'-lf, increase lateral run to 8"  $\phi$  and reduce at hydrant.

REVISIONS	
7/13	Added Check Valve



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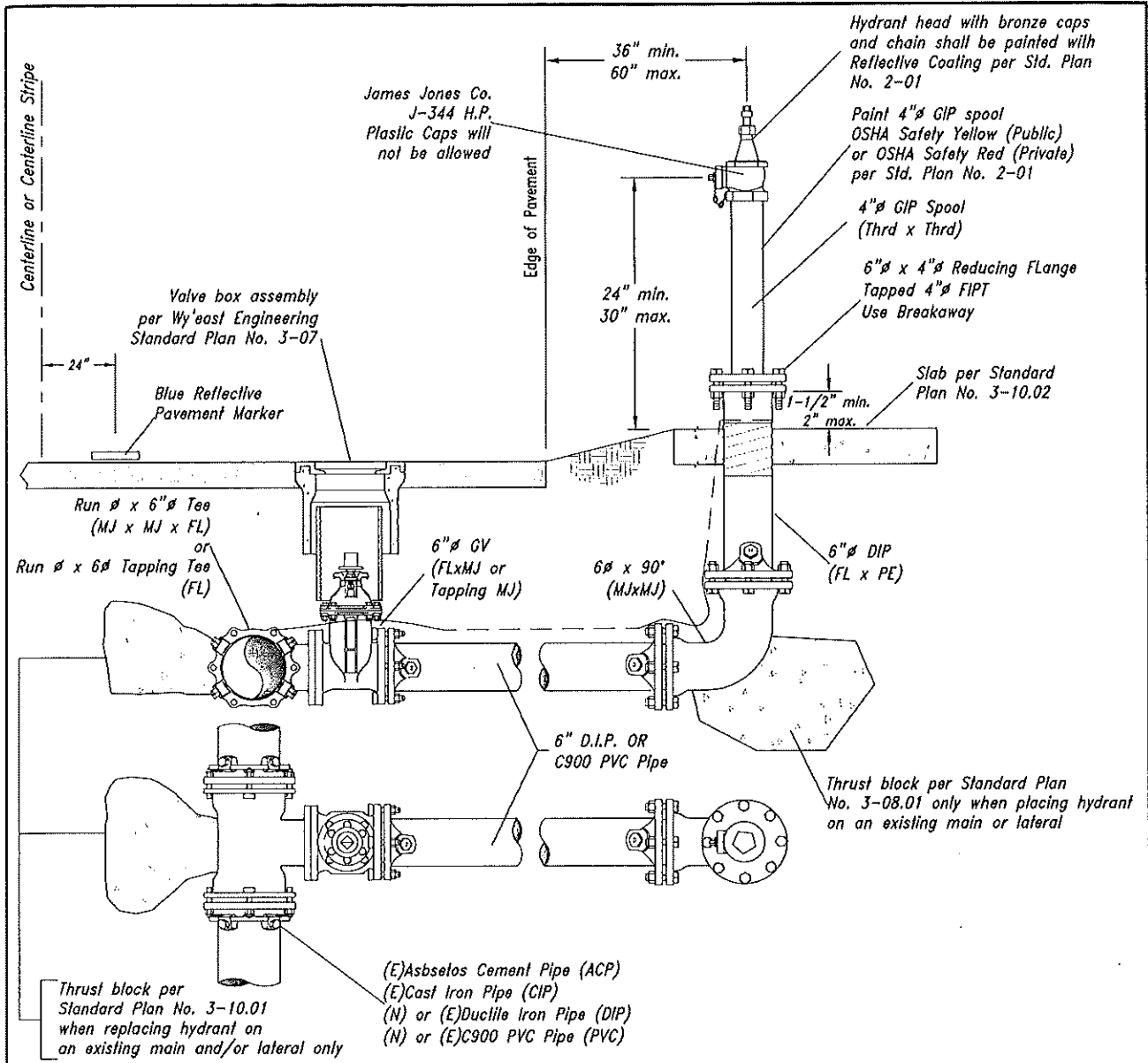
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## GENERAL FIRE HYDRANT ASSEMBLY DETAILS

Placements and Clearances

Elevation View

Standard Plan No. 3-10.03



**NOTES:**

- Wharf head hydrants shall only be constructed with the prior approval of the Fire Agency of Jurisdiction;
- Where the local Fire Agency of Jurisdiction has a color standard or coding system, the hydrant color, including reflective section shall be painted in accordance with that standard. Clear reflective coating may be substituted for colored reflective coatings in any installation;
- Hydrant shall be covered with a burlap sack or bag marked NOT IN SERVICE until put into service;
- Where the length of run (L) exceeds 20'-11", increase lateral run to 8"Ø and reduce at hydrant.
- Wharf head hydrants shall be constructed in general conformance with Std. Plan 3-10, Sheets 1 through 3 and this Sheet 4;
- MJ fittings shall be restrained by the use of MegaLug Series 1100 or 2000 restraining glands except for installations on existing lines.
- Bollards shall be installed in accordance with Std. Plan 3-10 in installations without curbs or as otherwise directed or shown on the Project Plans.

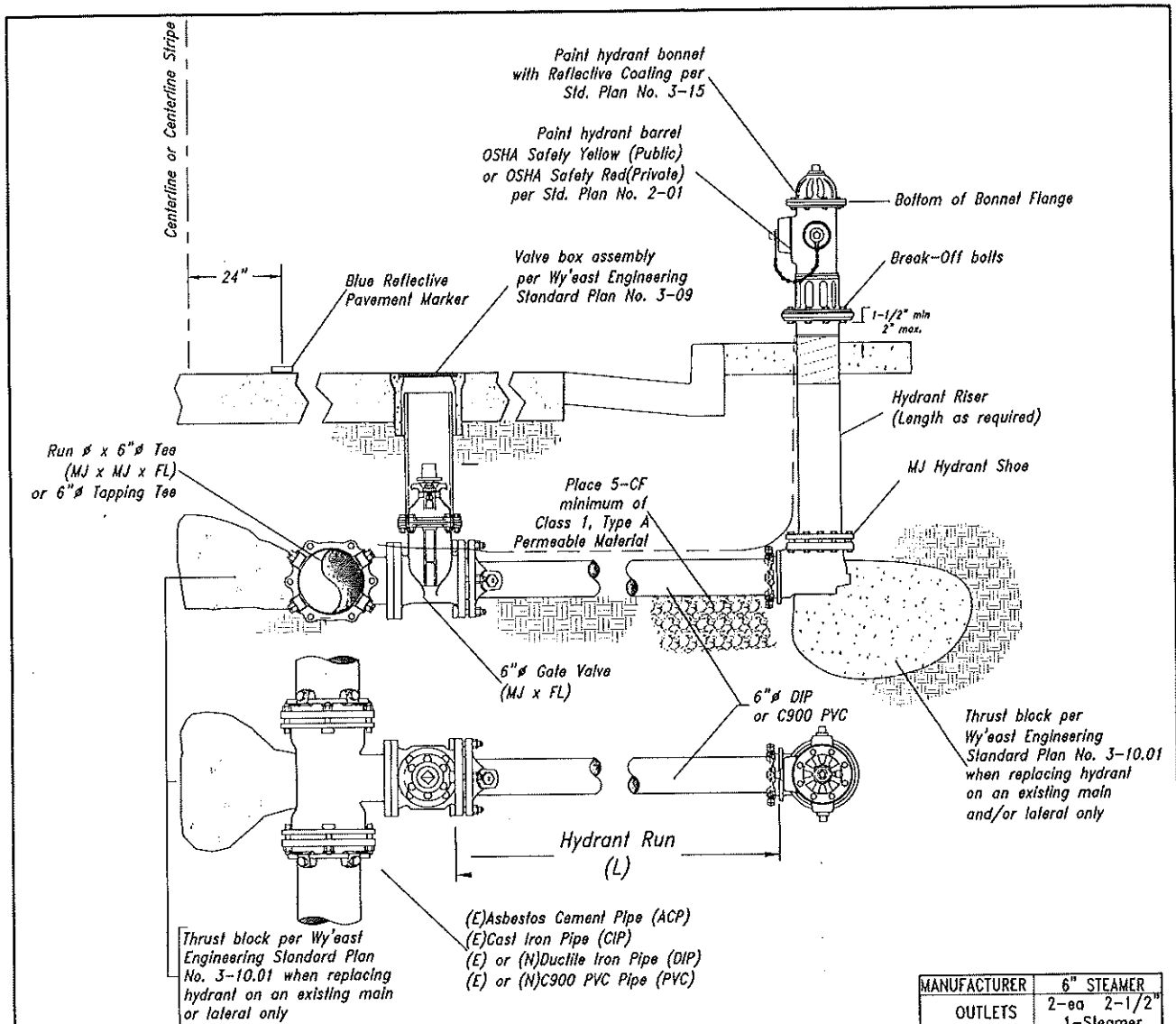
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## GENERAL FIRE HYDRANT ASSEMBLY DETAILS

Wharf Head Hydrants  
Standard Plan No. 3-10.04



**NOTES:**

1. Steamer port shall be 4-1/2"  $\phi$  or as directed by the Fire Agency of Jurisdiction;
2. Where the local Fire Agency of Jurisdiction has a color standard or coding system, the hydrant color, including reflective section shall be painted in accordance with that standard. Clear reflective coating may be substituted for colored reflective coatings in any installation;
3. Hydrant shall be covered with a burlap sack or bag marked NOT IN SERVICE until put into service;
4. Where the length of run (L) exceeds 20'-If, increase lateral run to 8"  $\phi$  and reduce at hydrant;
5. Dry barrel hydrants shall be constructed in general conformance with Std. Plan 3-10, Sheets 1 Through 3 and this Std. Plan No. 3-10.05.

MANUFACTURER	6" STEAMER
OUTLETS	2-ea 2-1/2" 1-Steamer
Mueller*	Centurian
M&H	129
Clow	Medallion
U.S. Pipe	Sentinel 250

\* AquaGrip shoe may be substituted for the restrained MJ shoe

REVISIONS

# Wy'east Engineering

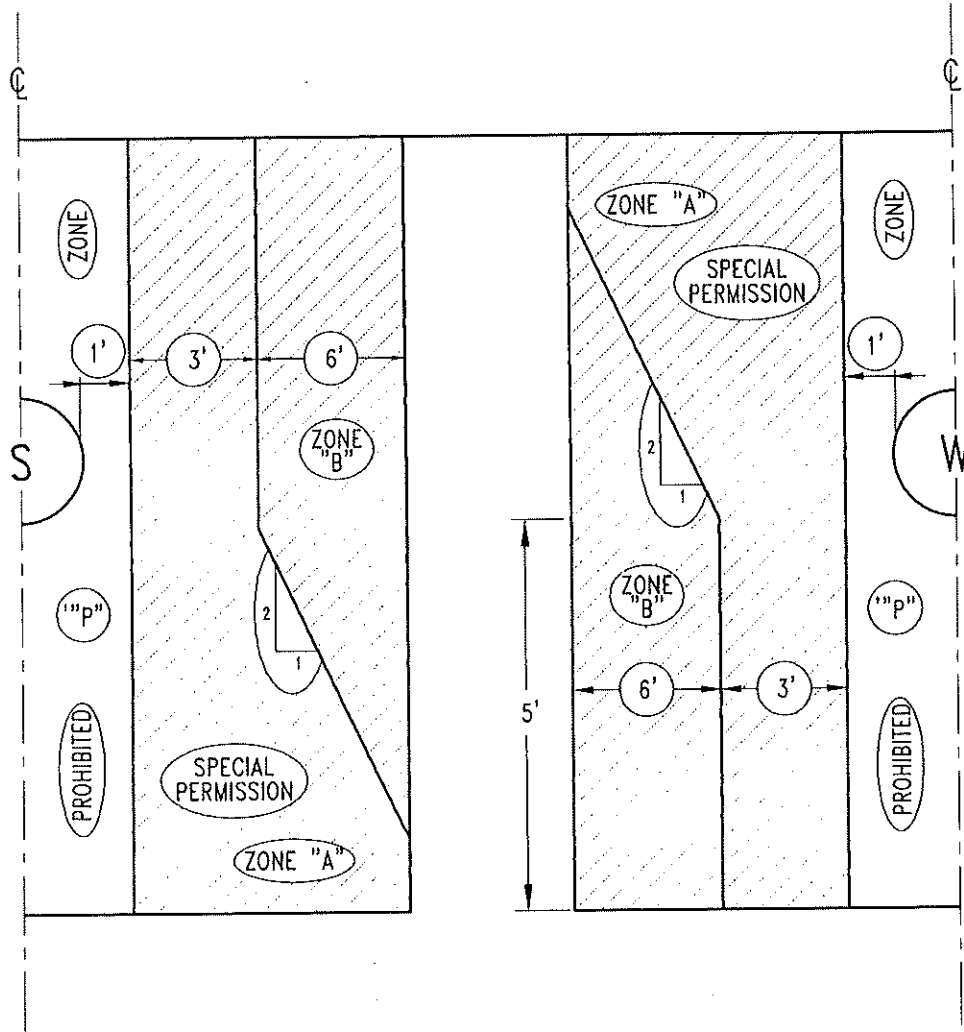
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## GENERAL FIRE HYDRANT ASSEMBLY DETAILS

Dry Barrel Hydrants  
 Standard Plan No. 3-10.05





**NOTES:**

1. See Wy'east Engineering Standard Plan No. 3-12.02 for crossing installations;
2. See Wy'east Engineering Standard Plan No. 3-12.03 for pipe materials to be used in each zone shown on Wy'east Engineering Standard Plans 3-12.01 and 3-12.02.

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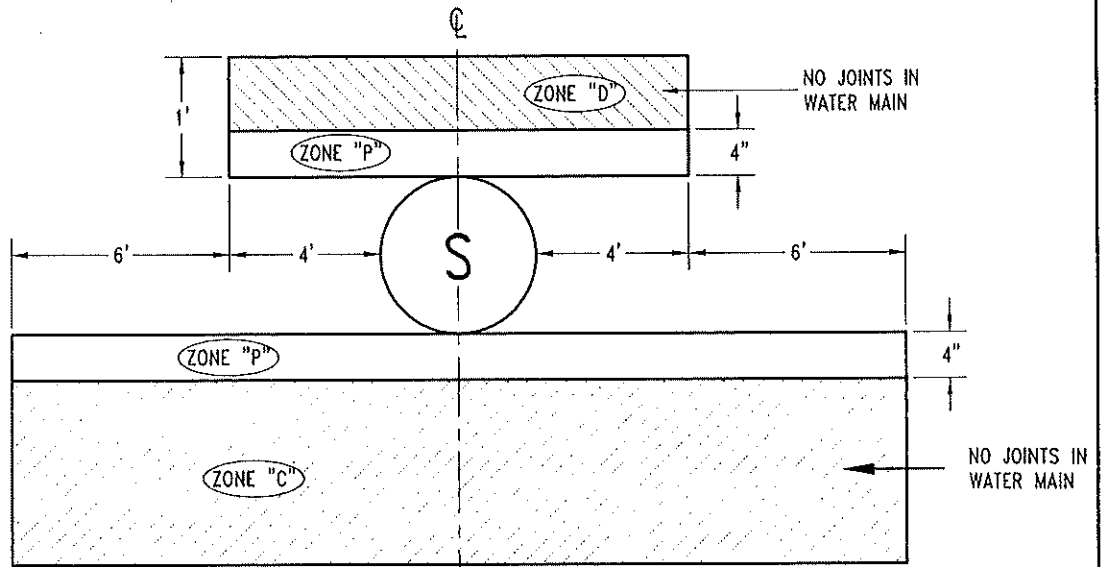
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**CRITERIA FOR SEPARATION OF MAINS**  
 Water, Wastewater, Recycled Wastewater, and Stormwater  
 Parallel Construction  
 Standard Plan No. 3-12.01



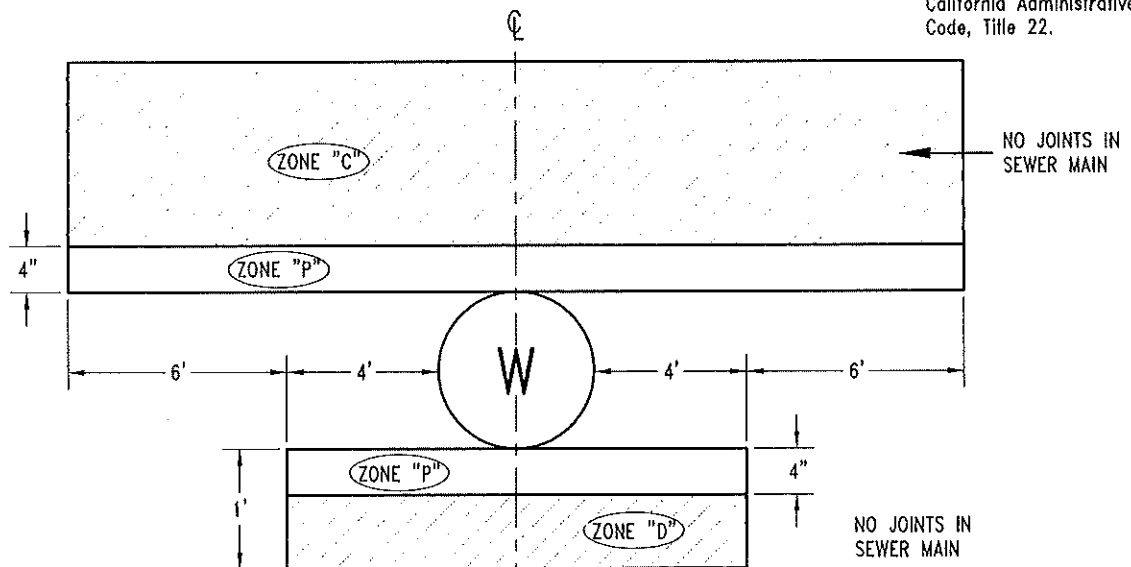
CASE 1

NEW WATER MAIN



CASE 2

NEW SEWER



Zone "p" is a prohibited construction zone per Section 64630 (e) (2) California Administrative Code, Title 22.

NOTES:

1. See Wy'east Engineering Standard Plan No. 3-12.01 for parallel installations;
2. See Wy'east Engineering Standard Plan No. 3-12.03 for pipe materials to be used in each zone shown on Wy'east Engineering Standard Plans 3-12.01 and 3-12.02.

REVISIONS	

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**CRITERIA FOR SEPARATION OF MAINS**  
 Water, Wastewater, Recycled Wastewater, and Stormwater  
 Crossing Construction  
 Standard Plan No. 3-12.02

WHEN WATER AND SEWER MAINS MUST BE CONSTRUCTED WITH LESS THAN 10-LF OF SEPARATION, THE FOLLOWING MATERIALS SHALL BE USED FOR THE NEW MAIN CONSTRUCTION.

CONSTRUCTION		PARALLEL		CROSSING	
CASE	ZONE	A	B	C	D
<b>CASE 1</b> <b>NEW WATER MAIN</b>		SPECIAL PERMISSION ONLY	PVC AWWA - C900 CLASS 305	PVC AWWA - C900 CLASS 305	PVC AWWA - C900 CLASS 305
			DUCTILE IRON PIPE AWWA - C151 CLASS 50	DUCTILE IRON PIPE AWWA - C151 CLASS 50	
<b>CASE 2</b> <b>NEW SEWER MAIN</b>		SPECIAL PERMISSION ONLY	PVC AWWA - C900 CLASS 305	PVC AWWA - C900 CLASS 305 (20'-LF CENTERED)	PVC AWWA - C900 CLASS 305 (20'-LF CENTERED)
			DUCTILE IRON PIPE AWWA - C151 CLASS 50	PVC AWWA - C900 CLASS 305 (20'-LF CENTERED)	PVC AWWA - C900 CLASS 305 (20'-LF CENTERED)
			VITRIFIED CLAY PIPE EXTRA-STRENGTH	CASING INSTALLATION (20'-LF CENTERED)	CASING INSTALLATION (20'-LF CENTERED)
					CAP 10' X 10' X 4" CLASS "B" PCC

**NOTES:**

1. See Wy'east Engineering Standard Plan No. 3-12.02 for crossing installations;
2. See Wy'east Engineering Standard Plan No. 3-12.03 for pipe materials to be used in each zone shown on Wy'east Engineering Standard Plans 3-12.01 and 3-12.02.

REVISIONS	

# Wy'east Engineering

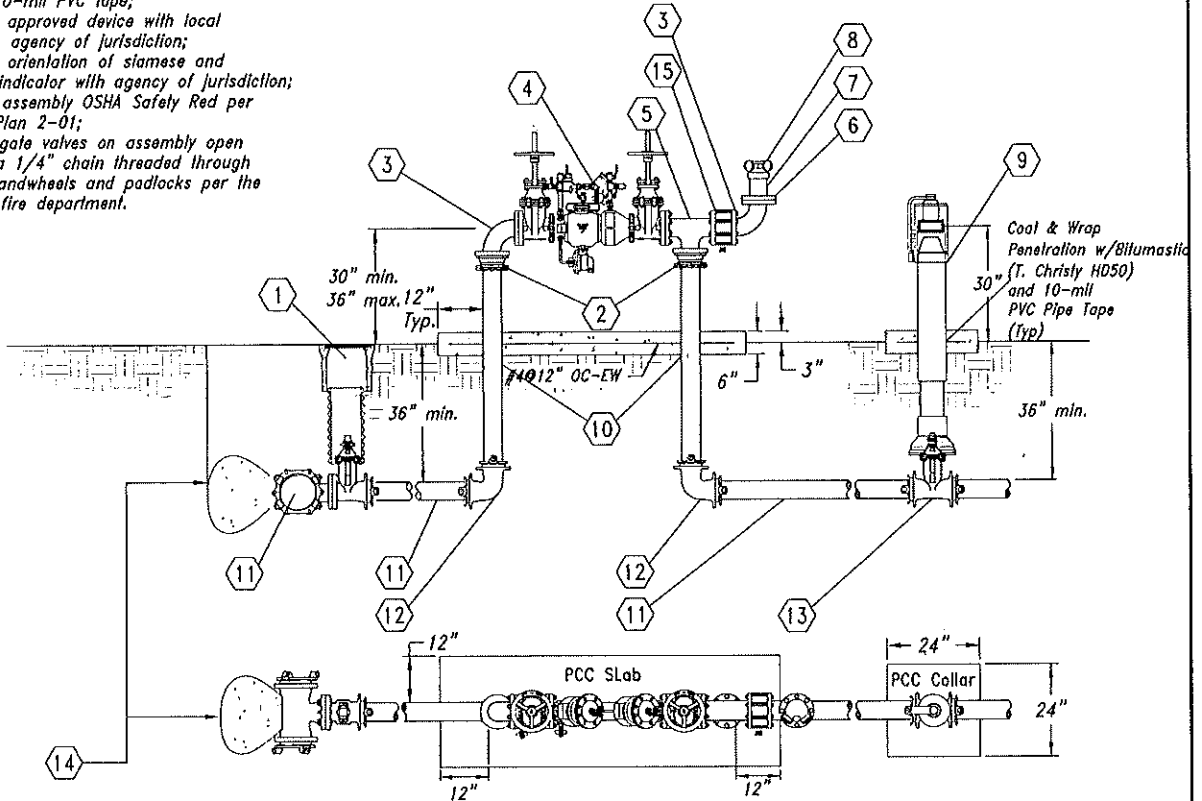
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**CRITERIA FOR SEPARATION OF MAINS**  
 Water, Wastewater, Recycled Wastewater, and Stormwater  
 Material Selection  
 Standard Plan No. 3-12.03

**NOTES**

1. Coat and wrap pipe where penetrating the PCC slab or collar with bitumastic and 10-mil PVC tape;
2. Verify approved device with local health agency of jurisdiction;
3. Verify orientation of siamese and post-indicator with agency of jurisdiction;
4. Paint assembly OSHA Safety Red per Std. Plan 2-01;
5. Lock gate valves on assembly open with a 1/4" chain threaded through the handwheels and padlocks per the local fire department.
6. The assembly shall be electronically monitored by the fire sprinkler control system.



**MECHANICAL SCHEDULE**

ID	DESCRIPTION
1	Valve Assembly per Standard Plan No. 3-09
2	Flange Coupling Adapter (EBAA Iron Series 2100 MegaFlange)
3	Size x 90° (FL x FL)
4	Reduced Pressure Detector Backflow Prevention Assembly (Wilkins Model 375ADA)
5	Size Tee (All FL)
6	Reducing Companion Flange Threaded 4"ø FIPT
7	4"ø x 6" GIP Nipple
8	2-1/2"ø x 2-1/2"ø x 4"ø Siamese Clapper Snoot (Kilde Fire 6704 or approved substitute)
9	Post Indicator Valve (Size as called for on Project Plans)
10	Ductile Iron Pipe (Size as provided for on Project Plans)
11	PVC Pipe (AWWA C900 - Size as provided for on Project Plans)
12	Size x 90° (MJ x MJ w/MegaLug Restraining Gland)
13	Gate Valve (MJ x MJ w/MegaLug Restraining Glands)
14	Thrust Block per Standard Plan No. 3-10 on Existing Pipelines only
15	Silent (Spring Check) Valve (APCO Series 300, ClaVal Series 581 or approved substitute)
16	~

**Wy'east Engineering**

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**FIRE SERVICE ASSEMBLY - 4"ø AND LARGER**

~  
Reduced Pressure Zone Installation  
Standard Plan No. 3-15

PRESSURE TESTING

1. The pressure test shall be conducted in such a manner as to bring the pipeline to the test pressure gradually without generating a water hammer in the pipeline. The pressure test shall be conducted in accordance with the provisions of Section 3-02.05E, "Hydrostatic Testing" of the Wy'east Engineering Standard Specifications;
2. Allowable Leakage - The allowable leakage will be calculated by the following formula:

$$La = [LD*(P^{1/2})]/133,200$$

where: La = Allowable leakage (gallons/hour)  
 L = Length of the pipe run (ft)  
 D = Nominal diameter of the pipe (in)  
 (P<sup>1/2</sup>) = Square root of test pressure (psi)

ALLOWABLE LEAKAGE per 1,000-LF									
Avg. Test Pressure	Nominal Pipe Diameter (In.)								
	4	6	8	10	12	14	16	18	20
150-psi	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84
175-psi	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.99
200-psi	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12
225-psi	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25
250-psi	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37
275-psi	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49
300-psi	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60
325-psi	0.54	0.81	1.08	1.35	1.62	1.89	2.17	2.44	2.71
350-psi	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81



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## HYDROSTATIC PRESSURE TESTING

Standard Plan No. 3-14

FLUSHING AND DISINFECTION NOTES

1. Flushing and disinfection of pipelines shall be in accordance with AWWA C651, "Disinfecting Water Mains" and the Wy'east Engineering Standard Specifications and Standard Plans;
2. All pipelines shall be flushed at a minimum velocity of 2.5-fps;
3. Disposal of flushing water shall be routed to a safe discharge point. The Contractor shall be responsible for controlling the discharge of flushing water to a safe discharge point including but not limited to, energy dissipators, diking, berms, and erosion control;
4. Disposal of chlorinated water shall include neutralizing the water by the use of sodium ascorbate, ascorbic acid or other approved means prior to release to receiving waters;
5. The water in the pipeline shall be brought to a concentration of 25-mg/l;
6. Slug disinfection shall only be used with the express prior written permission of the Engineer;
7. The Contractor shall be responsible for providing a means of injecting disinfectant to the pipelines including but not limited to, tablet chlorination or direct feed hypochlorite injection.
8. If the Contractor opts for direct feed of hypochlorite, the Contractor shall a chlorination tap in accordance with Std. Plan No. 3-05, Chlorination Tap of the Wy'east Engineering Standard Specifications and Standard Plans;
9. The chlorinated solution shall be held in the pipeline a minimum of 24-hours and a maximum of 48-hours with the permission of the Engineer;
10. Upon completion of the residence time, the pipeline shall be thoroughly flushed prior to sampling for bacteriological analysis;
11. Flushing and disinfection shall be so scheduled that samples may be taken by the Engineer no later than 1200 for delivery to the laboratory;
12. No samples will be taken for analysis after 1200, Thursday except for emergency conditions;
13. The pipeline shall not be put into service until a satisfactory result is obtained from laboratory analysis.

REVISIONS	

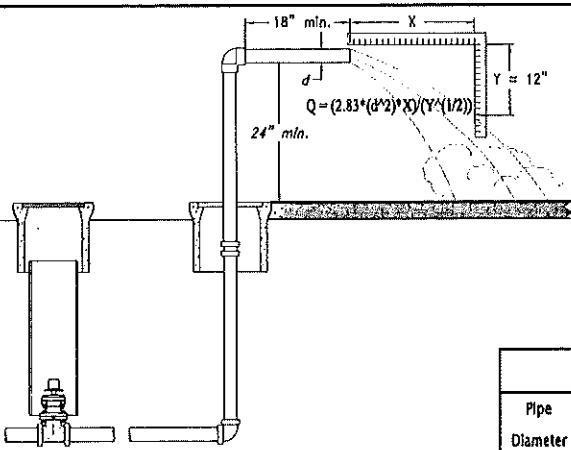


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**FLUSHING AND DISINFECTION**  
 Notes  
 ~  
 Standard Plan No. 3-15.01



APPROXIMATE FLOW (GPM) Y = 12-inches													
Pipe Diameter (inches)	X (inches)												
	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"
2	39	46	52	59	65	72	78	85	91	98	105	111	118
4	157	183	209	235	261	288	314	340	366	392	418	444	471
6	353	412	471	529	588	647	706	765	823	882	941	1,000	1,059
8	627	732	837	941	1,046	1,150	1,255	1,359	1,464	1,569	1,673	1,778	1,882
10	980	1,144	1,307	1,471	1,634	1,797	1,961	2,124	2,287	2,451	2,614	2,778	2,941
12	1,412	1,647	1,882	2,118	2,353	2,588	2,823	3,059	3,294	3,529	3,765	4,000	4,235

DISINFECTANT REQUIRED PER 100-lf OF PIPE (25-mg/l)											
Pipe Diameter (inches)	5-Gr Tablets	Disinfectant Concentration (Percent)									
		12.5		5.25		1.0		0.8		0.4	
		Gal.	Liter	Gal.	Liter	Gal.	Liter	Gal.	Liter	Gal.	Liter
4	1	0.0128	0.0485	0.0305	0.1155	0.1600	0.6057	0.2000	0.7571	0.4000	1.5142
6	1	0.0288	0.1090	0.0686	0.2597	0.3600	1.3627	0.4500	1.7034	0.9000	3.4069
8	2	0.0520	0.1968	0.1238	0.4686	0.6500	2.4605	0.8125	3.1892	1.6250	6.1513
10	3	0.0816	0.3089	0.1943	0.7355	1.0200	3.8611	1.2750	4.8264	2.5500	9.6528
12	4	0.1152	0.4361	0.2743	1.0383	1.4400	5.4510	1.8000	6.8137	3.6000	13.6275
16	7	0.2080	0.7874	0.4952	1.8745	2.6000	9.8421	3.2500	12.3026	6.5000	24.6052

\* Tablets/20-lf pipe spool based on 3.25-g available Cl per tablet

ASCORBIC ACID NEUTRALIZER REQUIRED PER 100-LF													
Pipe Diameter (inches)	Flushing (2.5-fps) (gpm)	Disinfectant Concentration (Percent)											
		1.0		2.0		5.0		10.0		25.0		50.0	
		Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)
4	100	0.0128	0.04	0.0305	0.07	0.0305	0.18	0.1600	0.37	0.1600	0.92	0.1600	1.83
6	220	0.0288	0.08	0.0686	0.16	0.0686	0.40	0.3600	0.81	0.3600	2.02	0.3600	4.03
8	400	0.0520	0.15	0.1238	0.29	0.1238	0.73	0.6500	1.47	0.6500	3.67	0.6500	7.33
10	625	0.0816	0.23	0.1943	0.46	0.1943	1.15	1.0200	2.29	1.0200	5.73	1.0200	11.46
12	900	0.1152	0.33	0.2743	0.66	0.2743	1.65	1.4400	3.30	1.4400	8.25	1.4400	16.50
16	1600	0.2080	0.59	0.4952	1.17	0.4952	2.93	2.6000	5.87	2.6000	14.67	2.6000	29.33

SODIUM ASCORBATE NEUTRALIZER REQUIRED PER 100-LF													
Pipe Diameter (inches)	Flushing (2.5-fps) (gpm)	Disinfectant Concentration (Percent)											
		1.0		2.0		5.0		10.0		25.0		50.0	
		Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)	Lb/100-lf	Feed (gpm)
4	100	0.0128	0.04	0.0305	0.09	0.0305	0.22	0.1600	0.43	0.1600	1.08	0.1600	2.17
6	220	0.0288	0.10	0.0686	0.19	0.0686	0.48	0.3600	0.95	0.3600	2.38	0.3600	4.77
8	400	0.0520	0.17	0.1238	0.35	0.1238	0.87	0.6500	1.73	0.6500	4.33	0.6500	8.67
10	625	0.0816	0.27	0.1943	0.54	0.1943	1.35	1.0200	2.71	1.0200	6.77	1.0200	13.54
12	900	0.1152	0.39	0.2743	0.78	0.2743	1.95	1.4400	3.90	1.4400	9.75	1.4400	19.50
16	1600	0.2080	0.69	0.4952	1.39	0.4952	3.47	2.6000	6.93	2.6000	17.33	2.6000	34.67

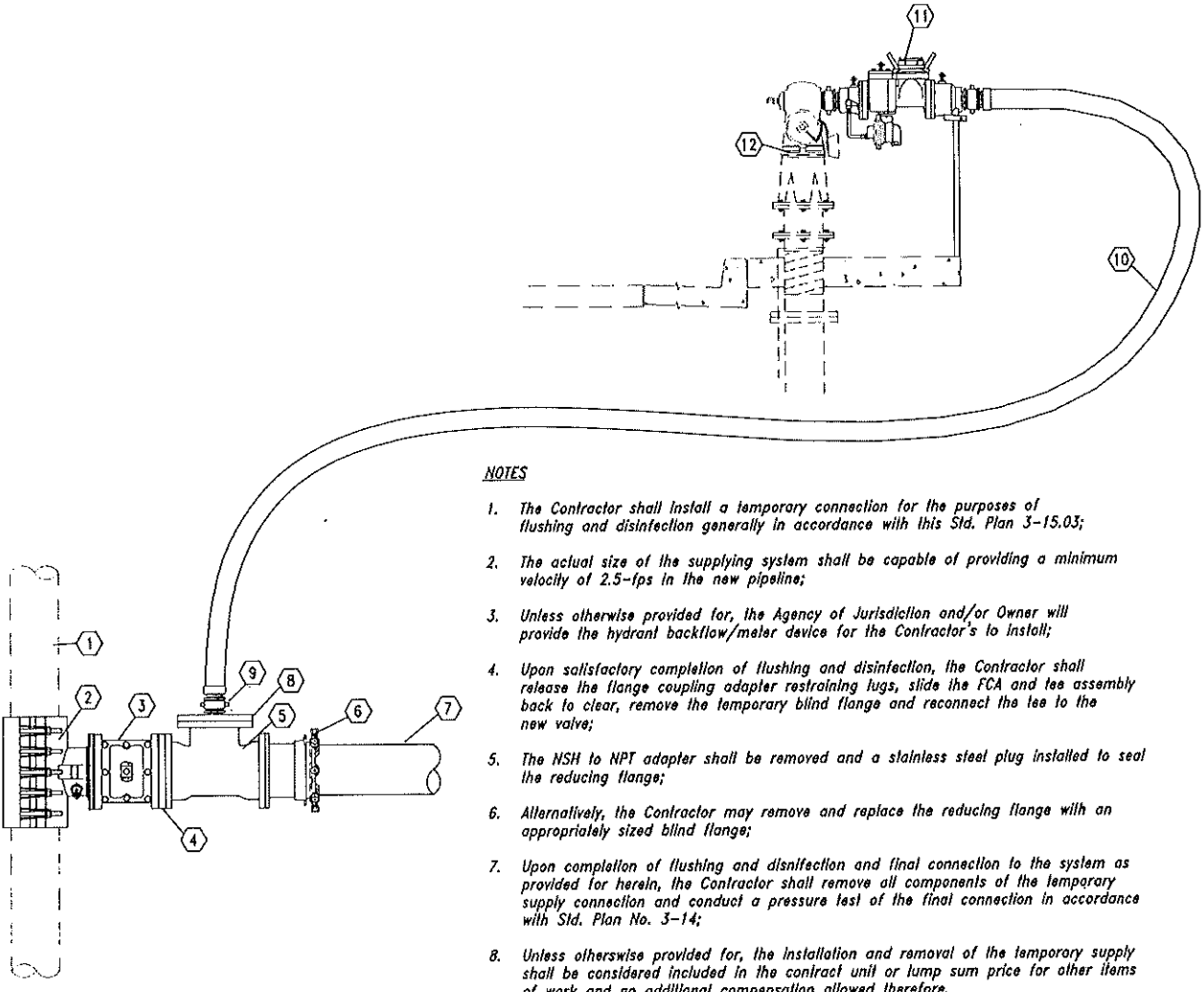
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DESIGN:	DRA	DATE:	8/11	<h2>FLUSHING AND DISINFECTION</h2> <p>Tables</p> <p>~</p> <p>Standard Plan No. 3-15.02</p>
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**NOTES**

1. The Contractor shall install a temporary connection for the purposes of flushing and disinfection generally in accordance with this Std. Plan 3-15.03;
2. The actual size of the supplying system shall be capable of providing a minimum velocity of 2.5-fps in the new pipeline;
3. Unless otherwise provided for, the Agency of Jurisdiction and/or Owner will provide the hydrant backflow/meter device for the Contractor's to install;
4. Upon satisfactory completion of flushing and disinfection, the Contractor shall release the flange coupling adapter restraining lugs, slide the FCA and tee assembly back to clear, remove the temporary blind flange and reconnect the tee to the new valve;
5. The NSH to NPT adapter shall be removed and a stainless steel plug installed to seal the reducing flange;
6. Alternatively, the Contractor may remove and replace the reducing flange with an appropriately sized blind flange;
7. Upon completion of flushing and disinfection and final connection to the system as provided for herein, the Contractor shall remove all components of the temporary supply connection and conduct a pressure test of the final connection in accordance with Std. Plan No. 3-14;
8. Unless otherwise provided for, the installation and removal of the temporary supply shall be considered included in the contract unit or lump sum price for other items of work and no additional compensation allowed therefore.

MECHANICAL SCHEDULE	
ID	DESCRIPTION
1	(E)Waterline (Size as shown on Project Plans)
2	AWWA Tee, Hot Top Tee or Saddle Tee
3	New valve (gate or butterfly) as provided for on the Project Plans
4	Temporary Blind Flange
5	New tee (Size as shown on Project Plans - All Flange)
6	(N)Flange Coupling Adapter (Size as shown on Project Plans - Romac Series RFCA or approved substitute)
7	(N)Waterline (Size as shown on Project Plans)
8	Reducing Flange (Size as shown on Project Plans)
9	(N)NSH to NPT adapter
10	Temporary Fire Hose Connection (3" min.)
11	Hydrant backflow device and meter (Supplied by Agency of Jurisdiction)
12	(C)Fire Hydrant

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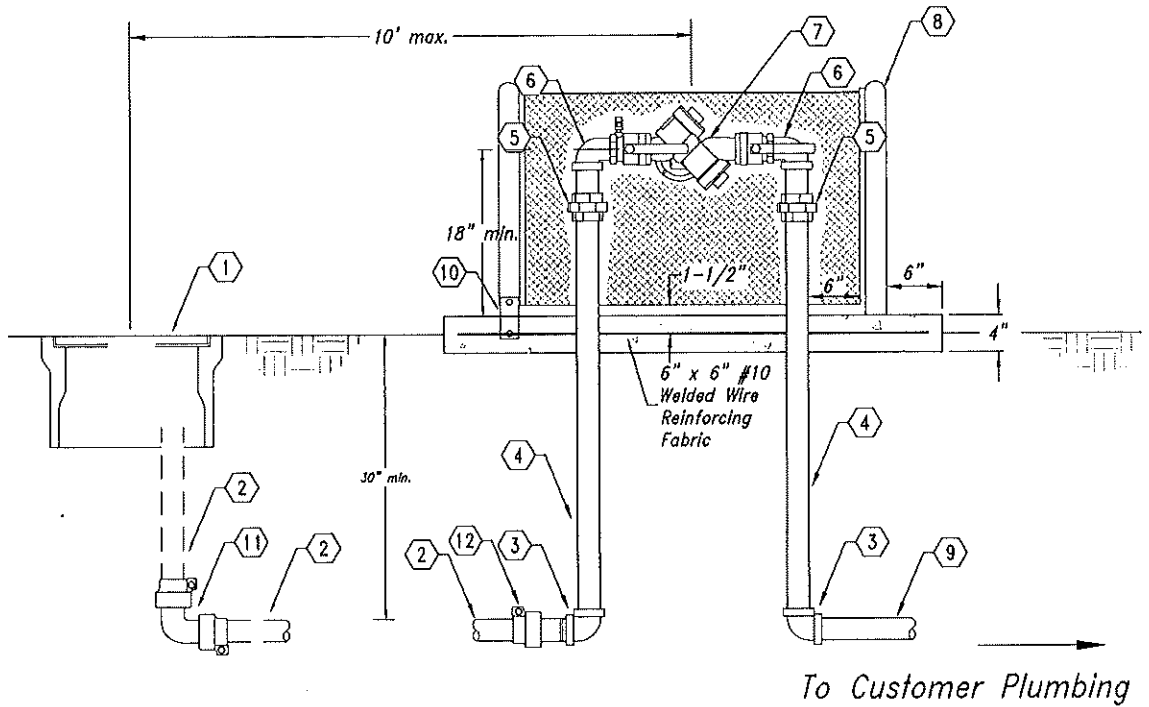
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**FLUSHING AND DISINFECTION**  
 Temporary Supply Connection for Flushing and Disinfection  
 ~  
 Standard Plan No. 3-15.03

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### MECHANICAL SCHEDULE

ID	DESCRIPTION
1	Standard Domestic Water Service per Standard Plan No. 3-01
2	Polyethylene tubing (SDR 9) (Size as shown on Project Plans)
3	90° Bronze Ell (Size as shown on Project Plans)
4	Brass or bronze pipe (GIP Size) (Size as shown on Project Plans)
5	Bronze union (GIP Size) (Size as shown on Project Plans)
6	90° bronze street ell (GIP Size) (Size as shown on Project Plans)
7	Reduced pressure principle backflow prevention assembly (FEBCO 825Y or approved substitute)
8	GuardShack Enclosure (GS-3) with FrostGuard blanket
9	Customer plumbing
10	Hinge detail as shown on Standard Plan No. 3-18, Sheet 2 of 2
11	90° Pack Joint Ell (Ford L66 Series)
12	Pack Joint Coupling (PJxMIPT) (Ford C68 Series)

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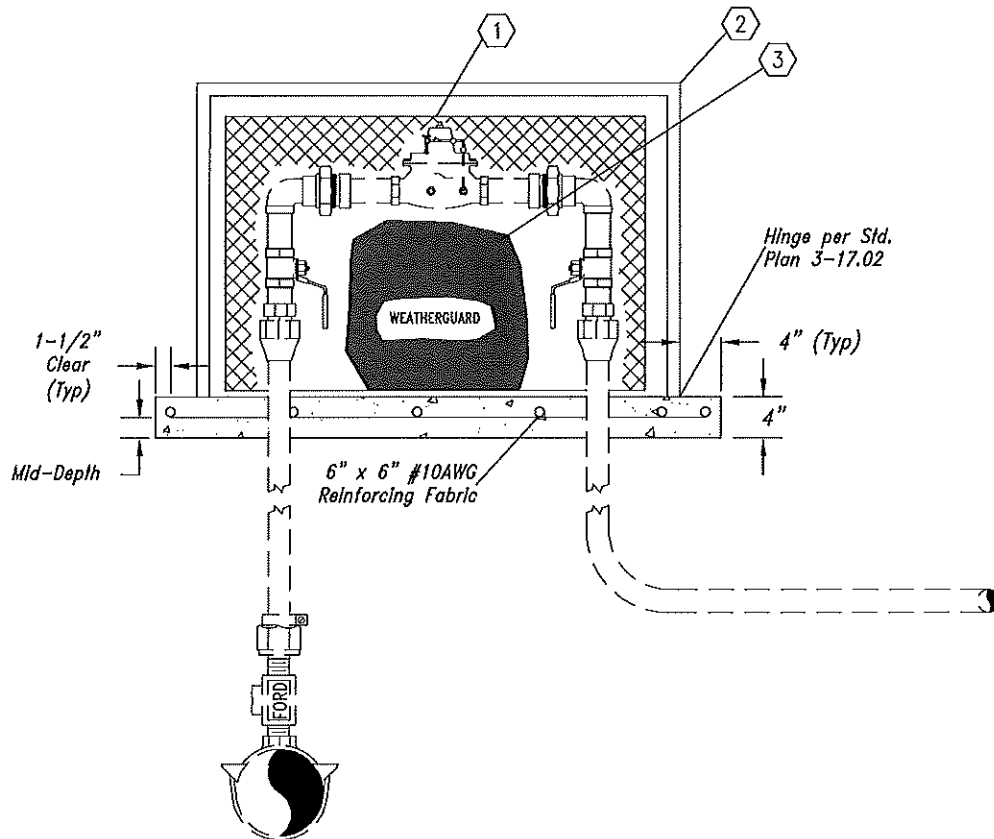
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## 3/4-INCH TO 2-INCH REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY

Standard Plan No. 3-16





### MECHANICAL SCHEDULE

ID	DESCRIPTION
1	Pipe Assembly (PRV, Backflow Prevention, Meter, etc.)
2	Pipe Assembly Enclosure (GuardShack Model as required)
3	Weatherguard Insulating Blanket

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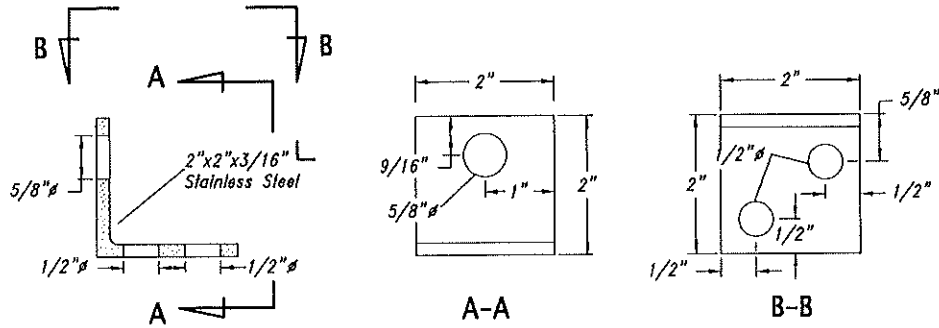
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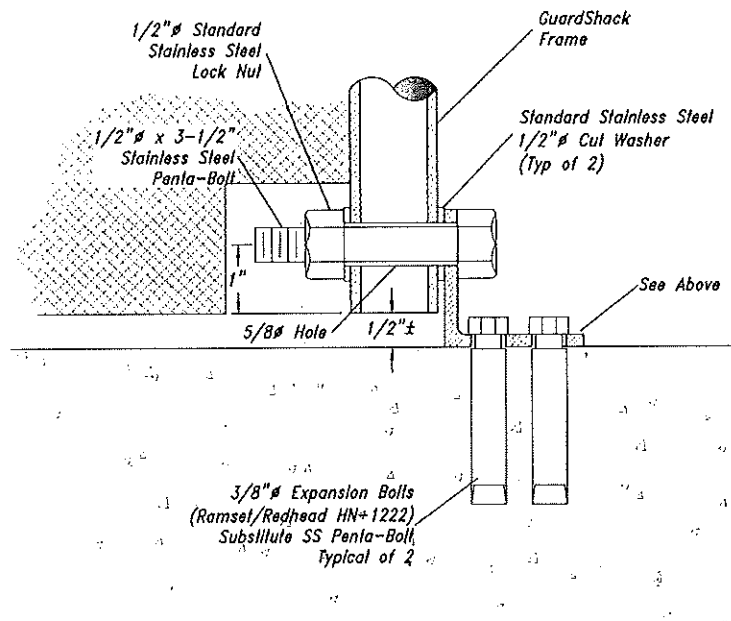
## PIPE ASSEMBLY ENCLOSURE

General Layout and Dimensions

Standard Plan No. 3-17.01



HINGE BRACKET DETAIL



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## PIPE ASSEMBLY ENCLOSURE

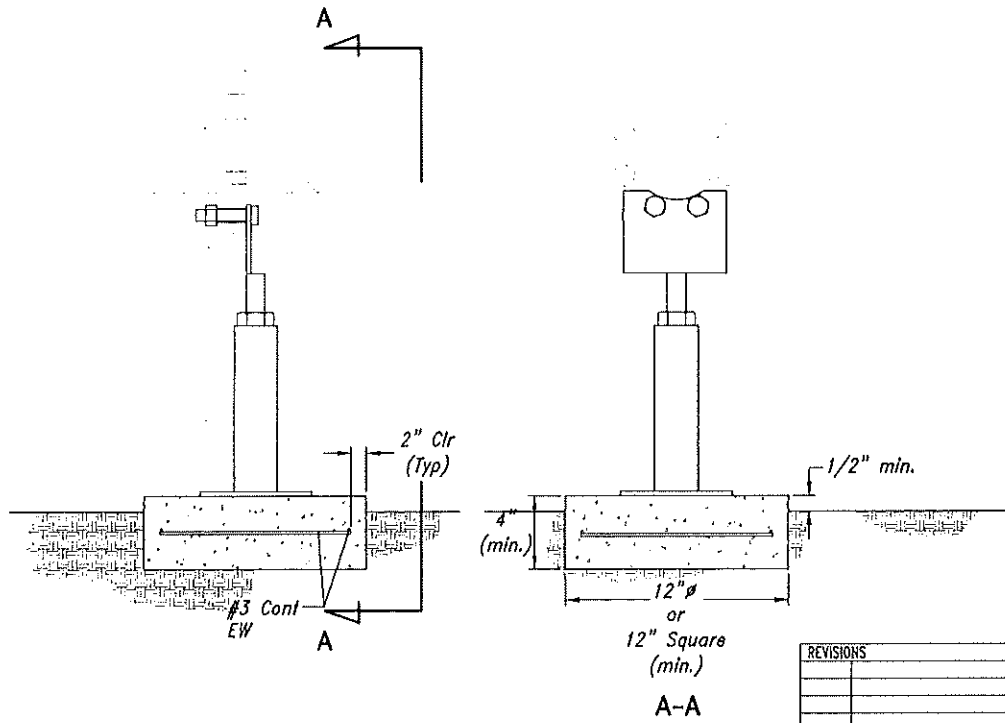
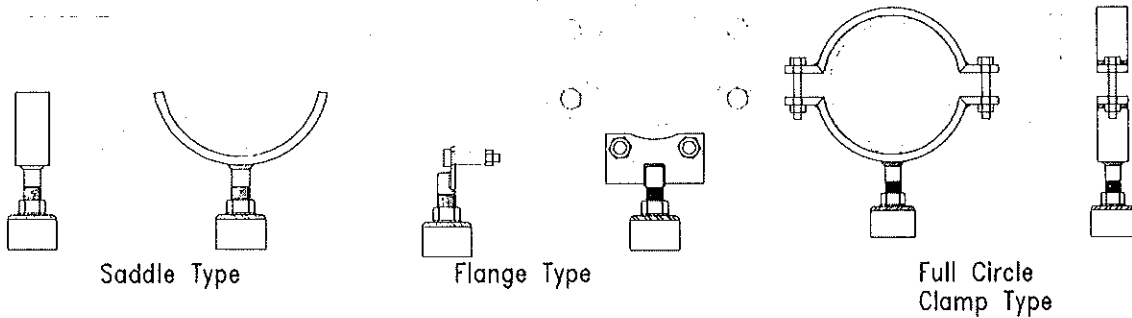
Hinge Details

Standard Plan No. 3-17.02

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**NOTES**

1. The type of pipe support shall be as provided for on the Project Plans;
2. Pipe supports shall be factory fabricated;
3. No field fabricated supports shall be used;
4. Unless otherwise specified, all materials shall be A36 galvanized steel designed and tested to a minimum compressive load of 10,000-lbs;
5. Risers shall be fabricated of 2"Ø Galvanized Iron Pipe;
6. Stainless steel (Type 304) may be substituted for GIP pipe, fillings and galvanized plate wherever shown hereon;
7. The pipe support shall be bolted to the concrete slab or pad with 4-ea. 3/8"Ø stainless steel expansion anchors (Red Head WW-3825)
8. The pipe support may be painted to match the assembly being supported.



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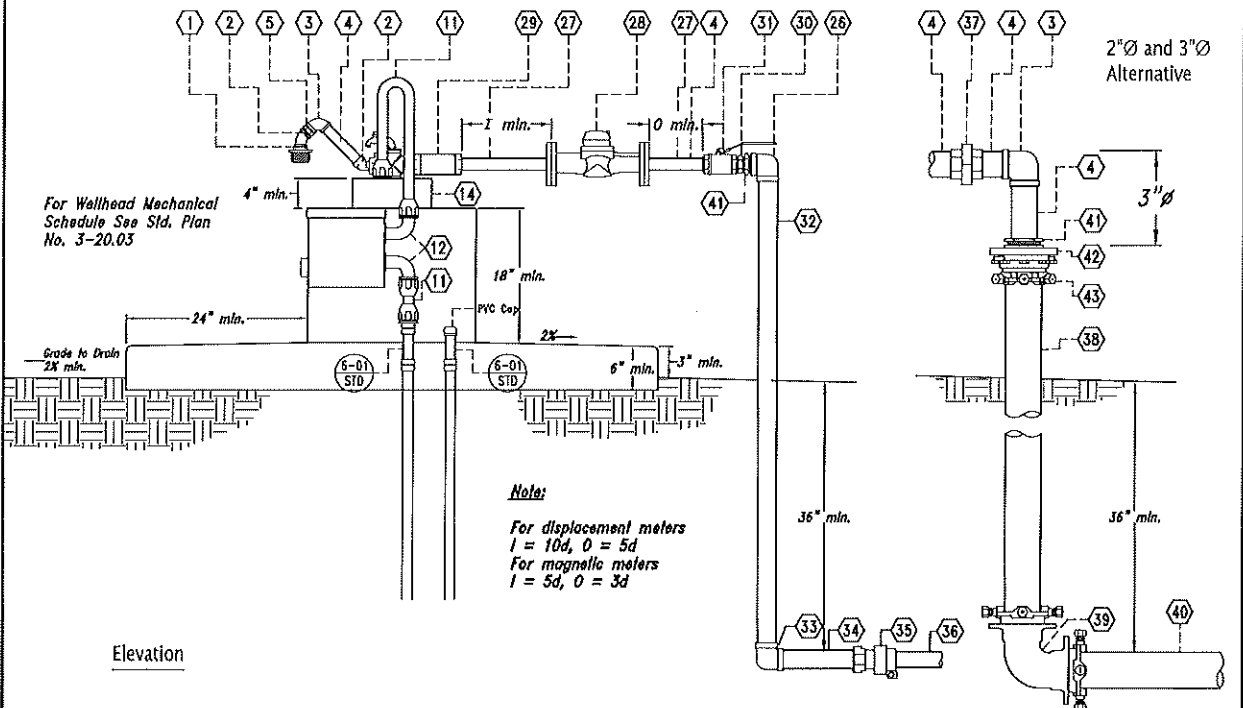
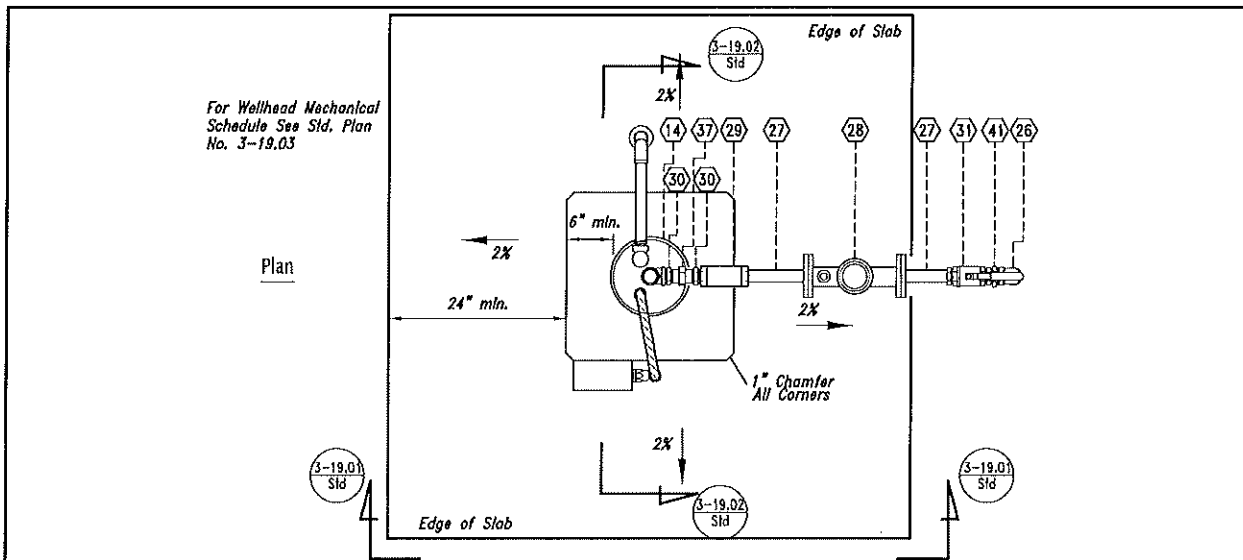
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## PIPE SUPPORT DETAILS

Standard Plan No. 3-18



REVISIONS	
2/15	Relocated Ball Valve



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DESIGN:	DRA	DATE:	8/11	<h2 style="margin: 0;">WELLHEAD DETAILS</h2> <p style="margin: 0;">Plan and Elevation</p> <p style="margin: 0;">Standard Plan No. 3-19.01</p>
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Section B-B

For Wellhead Mechanical  
Schedule See Std. Plan  
No. 3-19.03

#4 Equally Spaced  
(12" OC max. EW)

Thoroughly clean  
surface and place  
concrete adhesive  
prior to pouring  
base and pedestal  
concrete

1 2 3 4 5 6 7 Detail - Sheet

2" Ctr.

2-1/2"

14

17

19

12

13

4" min

1" Chamfer all around

#4 Equally Spaced  
(12" OC max. EW)

11

12

6-01  
STD

Sanitary Seal

21

25

12" max.

24

3"  $\phi$  Epoxy Coated  
Welded Steel Drop  
Pipe  
Detail - D  
Detail - Sheet

6"  $\phi$  PVC (SDR21)  
Casing and Screens

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## WELLHEAD DETAILS

Cross Section B-B

Standard Plan No. 3-19.02

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**NOTES**

1. All work on wells shall be in accordance with the State of California Department of Water Resources Bulletin 74-81 and Bulletin 74-90, the California Electrical Code, and the Wy'east Engineering Standard Specifications and Standard Plans;
2. Specific details of well construction, pump selection and related piping and electrical components shall be determined upon completion of well construction or upon review of existing well construction;
3. The Contractor shall ensure that the surface of the sanitary seal is thoroughly cleaned of all deleterious material and that a firm bond can be made between the sanitary seal and the pedestal concrete;
4. Dimensions shown hereon shall be considered the minimum acceptable;
5. No entry to the well including but not limited to the well casing vent, the top of the well casing extension, the well casing seal or the electrical piping penetrations of the well casing seal shall be less than 18-inches above finish grade;
6. The finish grade surrounding the well shall be graded to drain away from the well and sheet flow from adjacent areas shall be directed away from the well;
7. Livestock shall be kept a minimum of 100-feet from the well at all times.

**MECHANICAL SCHEDULE**

(ID)	DESCRIPTION
1	Well Vent Screen (MIPT - Size as Indicated - 1" min.) (Hytech or approved substitute)
2	45' Stainless Steel EI (Sch. 40, Type 304 min. - Size as Indicated, 1" min.)
3	90' Stainless Steel EI (Sch. 40, Type 304 min. - Size as Indicated, 1" min.)
4	Stainless Steel Nipple (Sch. 40, Type 304 min. - Size as Indicated, Length as required)
5	Stainless Steel Nipple or Hex Nipple (Sch. 40, Type 304 min. - Size as Indicated, 1" min.)
6	Stainless Steel Tee (Sch. 40, Type 304 min. - Size as Indicated, 1" min. Weld to Casing Seal (No. 13))
7	Stainless Steel Pipe Plug (Sch. 40, Type 304 min. - Size as Indicated)
8	Stainless Steel Tee (Sch. 40, Type 304 min. - Size to match Column Pipe w/3/4" Stainless Steel bushing)
9	3/4" x 90' Stainless Steel EI (Sch. 40, Type 304 min.) with 1/2" PVC Reducer Bushing (Sch. 80)
10	1/2" No Thread, Loose Key Hose Bib (Arrowhead Model 301LKNT, Malco-Norca FY691 or approved substitute)
11	Flexible, Non-Metallic PVC Conduit (Size as Indicated) Corflex or Approved Substitute
12	Liquid-tite Non-Metallic Conduit Male Adaptor (Size as Indicated) Corflex Series LT43 or Approved Substitute
13	10" Well Casing Seal w/Penetrations as Required
14	10" Steel Well Casing
15	HEMA JR Junction Box w/Bus Bar (8" x 8" x 4" min.) Cooper B-Line 884 RTSC or Approved Substitute
	Attach to Pedestal w/4-eo, 3/8" x 2" Stainless Steel Expansion Bolts
16	Conduit Riser per Stand Plan No. 6-01
17	PVC Coupling (Slip x MIPT - Size as Indicated, 1" min.)
18	PVC Pump Column Pipe (Sch. 120 w/Stainless Steel Coupling) Size As Shown on Project Plans
19	3/8" x 2" Stainless Steel Eye Bolt
20	Polypropylene Tag Line (Size as Indicated - 3/8" min.) L = Pump Depth + 10' min.
21	PVC Sounding Tube (Sch. 10 - Size As Indicated, 1" min.) bore two 1/4" Holes at 10' Intervals max.
22	Well Casing (Size and Material as Indicated)
23	PVC Cap (Sch. 10 - Slip) Size as Indicated, 1" min.
24	Submersible Pump (As Specified)
25	Attach Sounding Tube and Power Conductors to Pump Column Pipe with Cable Ties at 10' Intervals (max.) (Thomas and Bells Heavy Duty L-14-120-9-C min. or approved substitute)
26	2" x 90' Stainless Steel EI w/Bushing as Required Sch. 40, Type 304 min.)
27	Stainless Steel Nipple (Sch. 40, Type 304 min. - Size as Indicated - MIPT x Meter Flange)
28	Water Meter - Size and Model As Indicated on Project Plans
29	Slow Closing Check Valve - Size as shown on Project Plans
	Idiflex 2633 CloVal Series 580/581 Silent Check
	CloVal 81-02/681-02 or approved substitute
	APCO Series 300 or 600
30	Stainless Steel Nipple or Hex Nipple (Sch. 40, Type 304 min.) Size As Indicated on Project Plans
31	Stainless Steel Ball Valve - Size As Indicated on Project Plans
32	2" Stainless Steel (Sch. 40, Type 304 min.)
33	2" x 90' Stainless Steel EI (Sch. 40, Type 304 min.)
34	2" PVC Nipple (Sch. 80 - MIPT x MIPT) L = 6" min., 12" max.
35	2" Brass Coupling (FIPT x PJ - Ford C14-67)
36	2" PET (SDR 9)
37	Stainless Steel Union (Sch. 40, Type 304 min. - Size as Shown on Project Plans)
38	4" DIP (FL x PE)
39	4" x 90' EI (MJ x MJ w/MegaLug 2004)
40	4" PVC (AWWA C900, Class 235 min.)
41	Stainless Steel Reducing Bushing (Sch. 40, Type 304 min. - Size as Indicated on Project Plans)
42	4" Stainless Steel Companion Flange (Sch. 40, Type 304 min.)
43	4" Flange Coupling Adapter (EBAA Iron MegaFlange 2104)
44	3/4" x 4" Stainless Steel Nipple (Type 304 min.)

REVISIONS

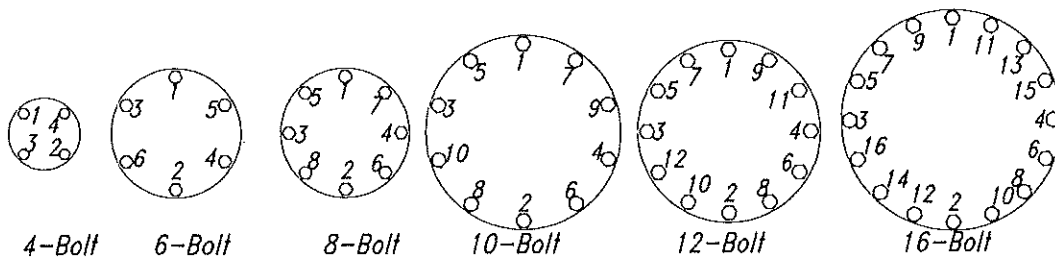
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**WELLHEAD DETAILS**  
Notes and Mechanical Schedule  
Standard Plan No. 3-19.03

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AWWA C600 Mechanical Joint T-Bolts			
Pipe Size	Bolt $\phi$	Number	Torque (ft-lb)
3" $\phi$	5/8" $\phi$	4	45-60
4" $\phi$	3/4" $\phi$	4	75-90
6" $\phi$	3/4" $\phi$	6	85-100
8" $\phi$	3/4" $\phi$	6	45-60
10" $\phi$	3/4" $\phi$	8	45-60
12" $\phi$	3/4" $\phi$	8	45-60
14" $\phi$	3/4" $\phi$	10	75-90
16" $\phi$	3/4" $\phi$	10	85-100

Flange Bolt Torque ( $P_{max} = 350\text{-psi}$ )			
Pipe Size	Bolt	Number	Torque (ft-lb)
2-3" $\phi$	5/8" $\phi$	4	100
4-8" $\phi$	3/4" $\phi$	8	150
10-14" $\phi$	7/8" $\phi$	12	200
16" $\phi$	7/8" $\phi$	16	250

**NOTES**

1. Fitting bolts shall be tightened in opposing succession following the pattern shown above;
2. Fitting bolts shall be tightened sequentially in 20 ft-lb $\pm$  increments until the desired torque is achieved;
3. Fitting bolts shall not be brought to full torque in one operation;
4. Flange bolt kits shall be Type 304 or Type 316 Stainless Steel unless otherwise noted;
5. Mechanical joint bolts shall be manufactured in accordance with AWWA C111
6. All buried bolts and nuts and those otherwise specified shall be coated with a rubberized bitumastic compound prior to backfilling;
7. Rubberized bitumastic compounds may be Permatex 81833, 3M 3584 T. Christy H50 or approved substitute;
8. Bitumastic compounds shall be allowed to cure to tack free before initiating backfilling operations.

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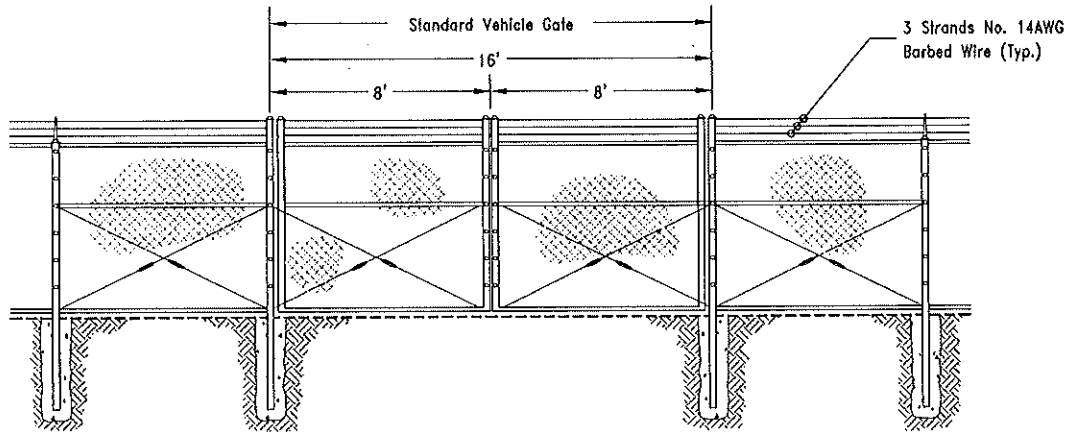
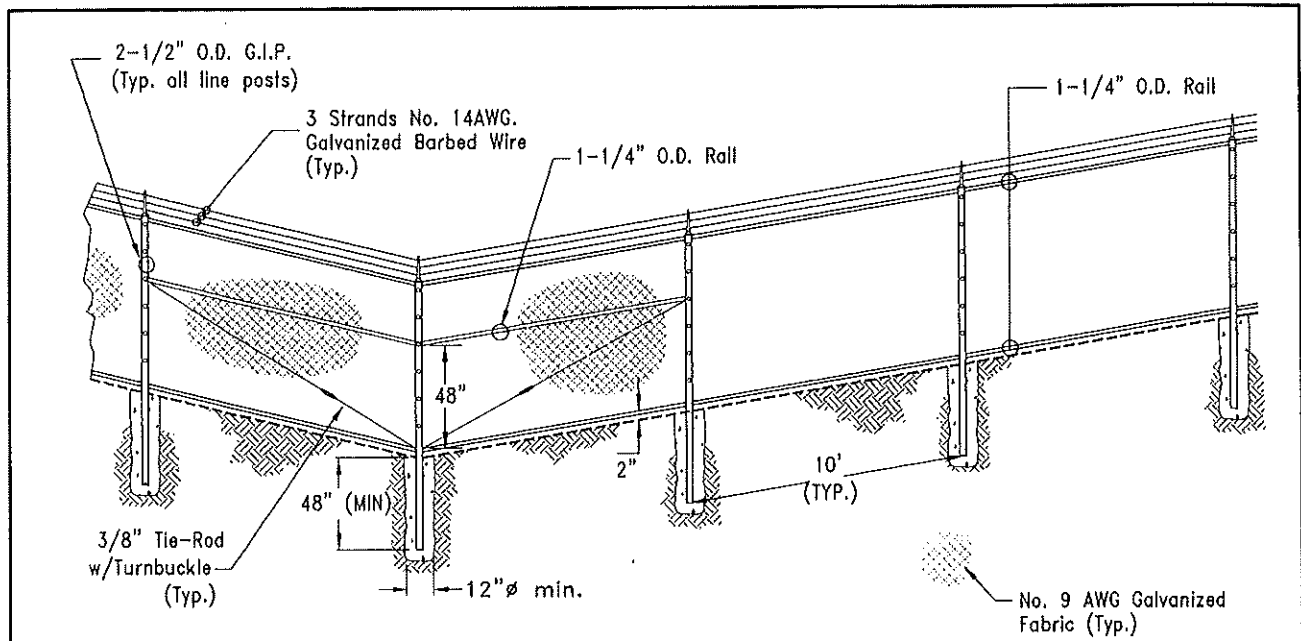
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## BOLTING OPERATIONS

Mechanical Joint and Flanged Joint

Standard Plan No. 3-20



**NOTES:**

1. All work shall be in accordance with the provisions of Section 4-06, "Chain Link Fencing" of the Wy'east Engineering Standard Specifications and Standard Plans;
2. Gate posts shall be 3-1/2" O.D. GIP;
3. Gate frame shall be 1-7/8" O.D. GIP;
4. Line posts and corner posts shall be 2-1/2" O.D. GIP;
5. Top and bottom rails shall be 1-1/4" O.D. GIP;
6. Fabric shall be No. 9 AWG galvanized w/2" mesh opening;
7. Where provided for on the Project Plans or in the Project Special Provisions, fabric shall be PVC coated;
8. Where provided for on the Project Plans or in the Project Special Provisions, privacy screening shall be provided within the fabric.

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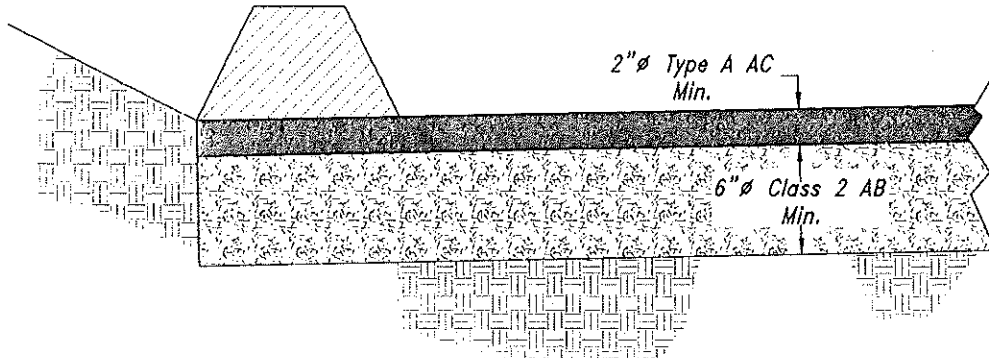
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## 6-FOOT CHAIN LINK FENCE

Standard Plan No. 4-01





NOTES

1. The combined aggregate grading for asphalt concrete placed on miscellaneous areas shall conform to that specified for the asphalt concrete placed on the traveled way, unless otherwise directed by the Engineer.
2. The amount of asphalt binder used in the asphalt concrete placed in dikes, gutters, gutter flares, overside drains and aprons at the ends of drainage structures, unless otherwise directed by the Engineer, shall be increased one percent by weight of the aggregate over the amount of asphalt binder used in the asphalt concrete placed on the traveled way.
3. The asphalt concrete placed in miscellaneous areas may be spread in one layer. The material shall be compacted to the required lines, grades and cross section.
4. Dikes shall be shaped and compacted with an extrusion machine or other equipment capable of shaping and compacting the material to the required cross section.

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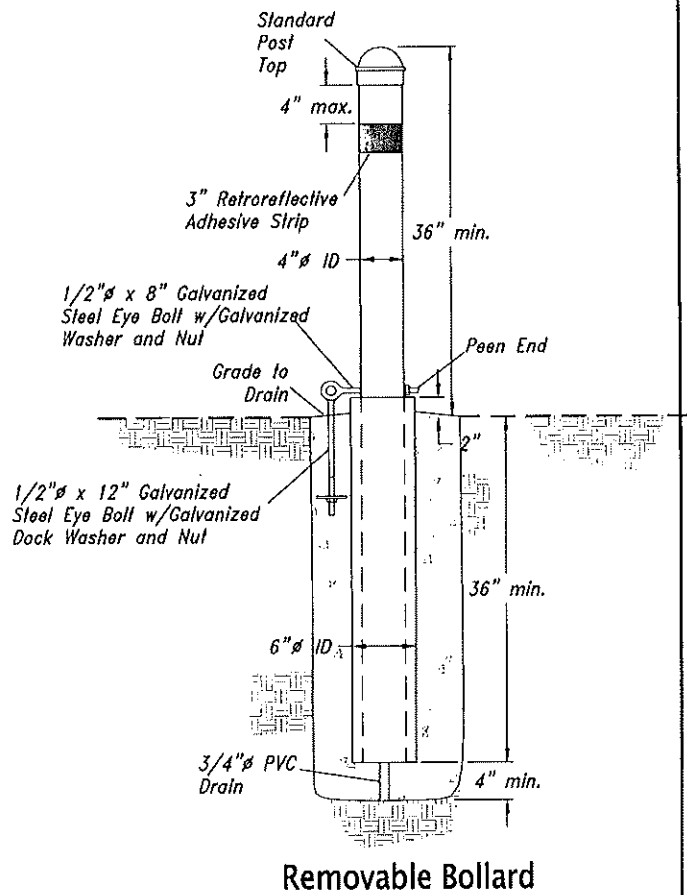
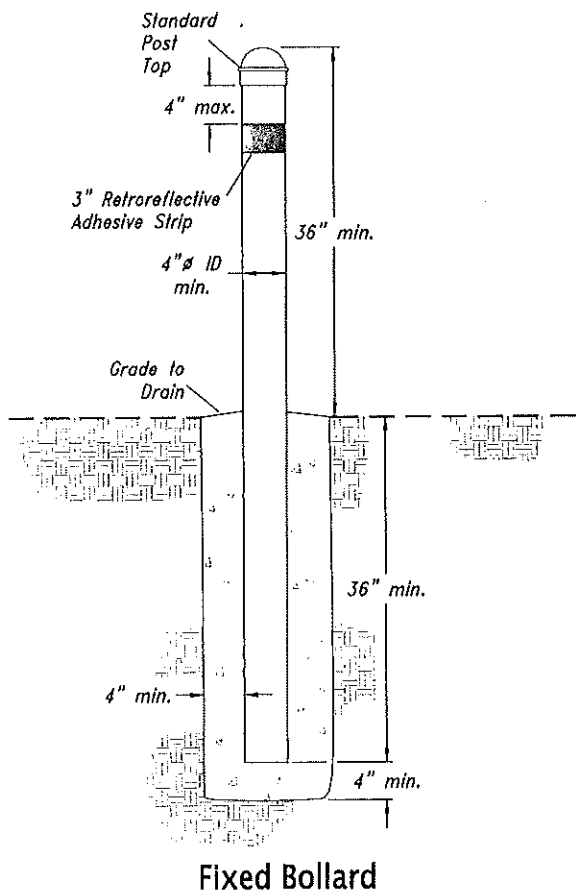
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## MISCELLANEOUS ASPHALTIC PAVING

~  
Miscellaneous Areas and Dikes  
Standard Plan No. 4-02

**NOTES**

1. *Bollard shall be fabricated from galvanized iron pipe (GIP), Sch. 40 steel pipe or ductile iron pipe;*
2. *Bollard shall be a minimum of 4"  $\phi$  inside diameter*
3. *Bollards shall be provided with a standard, malleable iron post top;*
4. *Bollard shall be set a minimum of 36" into concrete post footing;*
5. *Bollard shall be filled with concrete prior to installing post cap. Removable bollards shall not be concrete filled;*
6. *Concrete shall be classed as Minor Concrete in accordance with Section 90-1.01, "Description" of the CalTrans Standard Specifications.*
7. *Bollard shall be painted OSHA Safety Yellow in accordance with Wy'east Engineering Standard Plan 2-01, "Utility Marking Systems";*
8. *Where provided for in the Contract Documents, the bollard shall be coated with a reflective coating otherwise conforming with said Standard Plan 2-01;*
9. *Alternatively, where provided for in the Contract Documents, a retroreflective stripe shall be placed around the top of the bollard within 4-inches of the cap and of the color provided for;*
10. *Where a removable bollard is called for, the Owner will provide a padlock to secure the bollard to the anchor eye bolt.*



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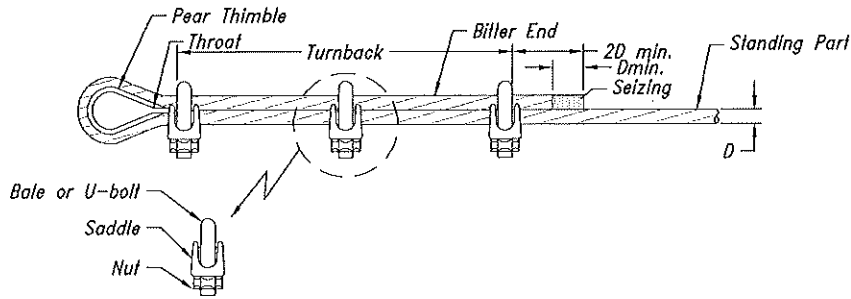
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## STANDARD TRAFFIC BOLLARD

Standard Plan No. 4-04

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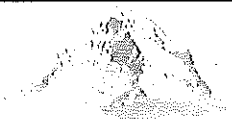
CLIP DATA				
SIZE	Minimum Number of Required	Minimum Torque (lbs.-ft) Required*	Minimum Turnback (inches) Required	Seizing Gauge
1/8"	2	4.5	3-1/4	22
3/16"	2	7.5	3-3/4	22
1/4"	2	15	4-3/4	22
5/16"	2	30	5-1/4	20
3/8"	2	45	6-1/2	20
7/16"	3	65	7	18
1/2"	3	65	11-1/2	18
9/16"	3	95	12	18
5/8"	3	95	12	18
3/4"	4	130	18	16
7/8"	4	225	19	16
1"	5	225	26	14
1-1/8"	6	225	34	14
1-1/4"	7	360	44	12
1-3/8"	8	360	44	12
1-1/2"	8	360	54	12
1-3/4"	8	590	61	12
2"	8	750	71	10

\*Based on clean, lubricated threads

**NOTES**

1. The data provided herein shall be considered the minimum requirement to achieve the maximum holding power;
2. The Contractor shall verify the requirements herein with the wire rope manufacturer prior to installation;
3. Wire rope clips shall be drop forged unless otherwise specified;
4. Wire rope clips shall not be used for running rigging including but not limited to hoists and slings;
5. Wire rope clips may be used for standing rigging only;
6. Thimbles for wire rope shall be heavy duty galvanized unless otherwise specified;
7. The bale or U-bolt shall always be placed across the bitter end and the saddle across the standing part;
8. The U-bolt nuts shall be tightened alternately until the specified torque is achieved;
9. Under no conditions shall the standing part or the bitter end be deformed in any manner. Distortion including but not limited to, crushing and twisting, shall be cause for rejection;
10. The bitter end shall be seized with galvanized wire prior to initiating the installation of wire rope clips;
11. The first clip shall be installed on the end of the bitter end followed by the clip at the throat followed by the intermediate clips which shall be evenly spaced along the turnback;
12. All clips shall be evenly spaced and tightened sequentially until the proper torque is achieved.

REVISIONS	
7/13	Added Seizing Data



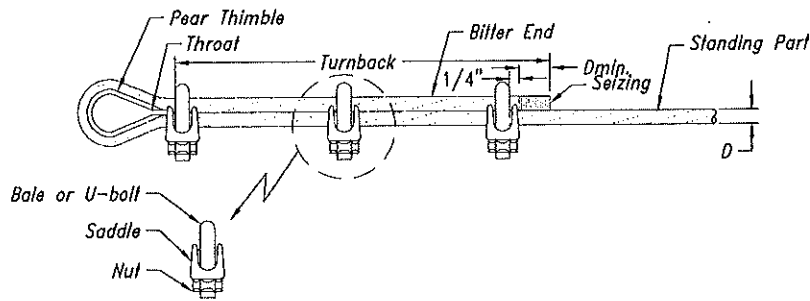
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## MISCELLANEOUS WIRE ROPE DETAILS

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Standard Plan 4-05



CLIP DATA			
SIZE	Minimum Number of Required	Minimum Torque (lbs.-ft) Required*	Minimum Turnback (Inches) Required
1/8"	2	4.5	3-1/4
3/16"	2	7.5	3-3/4
1/4"	2	15	4-3/4
5/16"	2	30	5-1/4
3/8"	2	45	6-1/2
7/16"	3	65	7
1/2"	3	65	11-1/2
9/16"	3	95	12
5/8"	3	95	12
3/4"	4	130	18
7/8"	4	225	19
1"	5	225	26
1-1/8"	6	225	34
1-1/4"	7	360	44
1-3/8"	8	360	44
1-1/2"	8	360	54
1-3/4"	8	590	61
2"	8	750	71

\*Based on clean, lubricated threads

**NOTES**

1. The data provided herein shall be considered the minimum requirement to achieve the maximum holding power;
2. The Contractor shall verify the requirements herein with the wire rope manufacturer prior to installation;
3. Wire rope clips shall be drop forged unless otherwise specified;
4. Wire rope clips shall not be used for running rigging including but not limited to hoists and slings;
5. Wire rope clips may be used for standing rigging only;
6. Thimbles for wire rope shall be heavy duty galvanized unless otherwise specified;
7. The bale or U-bolt shall always be placed across the bitter end and the saddle across the standing part;
8. The U-bolt nuts shall be tightened alternately until the specified torque is achieved;
9. Under no conditions shall the standing part or the bitter end be deformed in any manner. Distortion including but not limited to, crushing and twisting, shall be cause for rejection;
10. The bitter end shall be seized with galvanized wire prior to initiating the installation of wire rope clips;
11. The first clip shall be installed on the end of the bitter end followed by the clip at the throat followed by the intermediate clips which shall be evenly spaced along the turnback;
12. All clips shall be evenly spaced and tightened sequentially until the proper torque is achieved.



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## MISCELLANEOUS WIRE ROPE DETAILS

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Standard Plan 4-05

# ELECTRICAL SYMBOLS

<p>○ ○ NORMALLY OPEN CONTACT</p> <p>● ● NORMALLY CLOSED CONTACT</p> <p> TORQUE SWITCH (SPECIFY WHEN OPEN)</p> <p> NORMALLY OPEN LIMIT SWITCH</p> <p> NORMALLY CLOSED LIMIT SWITCH</p> <p> FLOAT TYPE LIQUID LEVEL SWITCH, CLOSING ON RISING LEVEL.</p> <p> FLOAT TYPE LIQUID LEVEL SWITCH, OPENING ON RISING LEVEL.</p> <p> VACUUM OR PRESSURE SWITCH, CLOSING ON RISING PRESSURE.</p> <p> VACUUM OR PRESSURE SWITCH, OPENING ON RISING PRESSURE.</p> <p> TEMPERATURE ACTUATED SWITCH, CLOSING ON RISING TEMPERATURE.</p> <p> TEMPERATURE ACTUATED SWITCH, OPENING ON RISING TEMPERATURE.</p> <p> FLOW SWITCH (AIR, WATER, ETC.) CLOSING ON FLOW INCREASE.</p> <p> FLOW SWITCH (AIR, WATER, ETC.) OPENING ON FLOW INCREASE.</p> <p> NORMALLY OPEN PUSHBUTTON, MOMENTARY CLOSE.</p> <p> NORMALLY CLOSED PUSHBUTTON, MOMENTARY OPEN.</p> <p> SWITCH 2 POSITION NORMALLY OPEN</p> <p> SWITCH 2 POSITION NORMALLY CLOSED</p> <p> SWITCH HAND-OFF-AUTO</p> <p> INDICATOR LIGHT, PUSH-TO-TEST TRANSFORMER</p> <p> INDICATOR LIGHT, PUSH-TO-TEST</p> <p> SINGLE POLE TOGGLE SWITCH ("ON-OFF", ETC.)</p> <p> GROUND CONNECTION.</p> <p>OVERLOAD RELAY CONTACTS (MAGNETIC).</p> <p><b>TIMED CONTACTS</b> CONTACT ACTION DELAYED AFTER COIL IS :</p> <p> NORMALLY OPEN WITH TIME DELAY CLOSING.</p> <p> NORMALLY CLOSED WITH TIME DELAY OPENING.</p> <p> NORMALLY OPEN WITH INSTANT CLOSING AND TIME DELAY OPENING.</p> <p> NORMALLY CLOSED WITH INSTANT OPENING AND TIME DELAY CLOSING.</p>	<p> NAMEPLATE</p> <p>FUSE</p> <p> RESISTOR (FIXED)</p> <p>ELAPSED TIME METER</p> <p>HEATER</p> <p>CURRENT TRANSFORMER</p> <p>COIL/INDUCTOR</p> <p>TRANSFORMER</p> <p>EDGE CONNECTORS</p> <p> INTERNAL H.O. CONTACT</p> <p>INTERNAL N.C. CONTACT</p> <p> INTERNAL N.C. &amp; H.O. CONTACT</p> <p>BATTERY</p> <p>CAPACITOR</p> <p>SOLENOID</p> <p>RESISTOR</p> <p>DIODE</p> <p>METAL OXIDE VARISTOR</p> <p> CROSSING OF CONDUCTORS - NOT CONNECTED.</p> <p> CONNECTION OF CONDUCTORS, FITTING AS REQUIRED.</p> <p> INDICATING FUSE HOLDER AMPERE SIZE SHOWN</p> <p> LIGHTNING ARRESTER</p> <p>FIELD WIRING</p> <p>PANEL WIRING</p> <p>COMMUNICATIONS</p> <p>BOUNDARY</p>	<p>WHM WATT HOUR METER AND SOCKET</p> <p>PFR PHASE FAILURE RELAY</p> <p> TM ELAPSED TIME METER</p> <p> M METER &amp; CURRENT TRANSFORMER</p> <p>TR XX TIME DELAY RELAY (DELAY ON DE-ENERGIZATION)</p> <p>TDE XX TIME DELAY RELAY (DELAY ON ENERGIZATION)</p> <p>LR XX LATCHING RELAY</p> <p>CR XX CONTROL RELAY</p> <p>ISR XX INTRINSICALLY SAFE RELAY</p> <p>FIELD TERMINATION (SWITCH)</p> <p>TERMINATION IN MCC SECTION</p> <p>DEVICE TERMINAL CONNECTION</p> <p>TERMINATION IN CP AND LCP</p> <p>INSTRUMENT CONNECTION</p> <p> I/O POINT REFERENCE PLC, I/O RACK, OR ANNUNCIATOR PANEL</p> <p>SHEET NOTE TAG</p> <p>DRAWING REFERENCE</p> <p>■ ◆ ▲ LOCATION SYMBOL</p> <p>M MOTOR STARTER CONTACTOR COIL</p> <p> S MOTOR, HORSEPOWER SIZE NOTED</p> <p>EDGE CONNECTOR</p> <p>INSTRUMENTATION (SEE ISA LEGEND)</p> <p style="text-align: center;">ALL CONTROLS ARE SHOWN DE-ENERGIZED.</p>
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### ELECTRICAL SYMBOLS AND ABBREVIATIONS

Symbols

Standard Plan No. 6-01.01

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## ELECTRICAL ABBREVIATIONS

A AMPERES	ICP INSTRUMENTATION CONTROL PANEL	PCB PRINTED CIRCUIT BOARD
AM AMMETER	ISR INTRINSICALLY SAFE RELAY	PC PROGRAMMABLE CONTROLLER
AC ALTERNATING CURRENT	I, IND INDICATOR	PLC PROGRAMMABLE LOGIC CONTROLLER
AC AMPS INTERRUPTING CAPACITY	INST INSTANTANEOUS	PL-1 PILOT LIGHT 1
BAT BATTERY	KV KILOVOLT	PRR PHASE/POWER FAIL RELAY
BC BATTERY CHARGER	KVA KILOVOLT AMPERES	PHL PANEL
C COMMON	KW KILOWATT	POT POTENTIOMETER
CB CIRCUIT BREAKER	LED LIGHT EMITTING DIODE	PR PAIR CABLE
CNTR CONTROL	LCD LIQUID CRYSTAL DISPLAY	PS PRESSURE SWITCH
CPT CONTROL POWER TRANSFORMER	LA LIGHTNING ARRESTER	PT POTENTIAL TRANSFORMER
CP CONTROL PANEL	LCP LOCAL CONTROL PANEL	PIT PUSH TO TEST
CR CONTROL RELAY	LPU LIGHTNING PROTECTION UNIT	PVC POLYVINYL CHLORIDE
CT CURRENT TRANSFORMER	LOS LOCK OUT STOP	PAR POWER
CC DIRECT CURRENT	LR LATCH RELAY	RR RUN RELAY
(E) EXISTING	LS LOAD SPLITTER	RVSS REDUCED VOLTAGE SOLID-STATE STARTER
EC EDGE CONNECTOR	mA MILLIAMPERES	RVAT REDUCED VOLTAGE AUTOTRANSFORMER
EF EXHAUST FAN	MB MAIN BREAKER	SS SELECTOR SWITCH
ETM ELAPSED TIME METER	MCC MOTOR CONTROL CENTER	SP SURGE PROTECTOR
F FUSE	MCP MOTOR CIRCUIT PROTECTOR	SV SOLENOID VALVE
FB FUSE BLOCK	MOT MOTOR OVERTEMPERATURE	SABD SWITCHBOARD
(FUTURE) FUTURE	MMS MOTOR MOISTURE SENSOR	TB TERMINAL BLOCK
FLTR FILTER	MS MOTOR STARTER	TDD, TDE TIME DELAY RELAY
FS FLOAT SWITCH	N NEUTRAL	TC TIMECLOCK
FVR FULL VOLTAGE NON REVERSING	NA NON AUTOMATIC	TM THERMAL MAGNETIC
FVR FULL VOLTAGE REVERSING	(N) NEW	TS TEMPERATURE SWITCH
G, G-D GROUND	NIC NOT IN CONTRACT	TSP TWISTED SHIELDED PAIR
GFI GROUND FAULT CIRCUIT INTERRUPTER	NP NAMEPLATE	TWP TWISTED PAIR
HPS HIGH PRESSURE SODIUM	OT OVERTEMPERATURE	TYP TYPICAL
HS HAND SWITCH	O/L OVERLOAD DEVICE	UG UNDERGROUND
	PB PUSHBUTTON	V VOLTS, VOLTAGE
		VM VOLTMETER
		VFD VARIABLE FREQUENCY DRIVE
		WP WEATHERPROOF
		TR, TRFR TRANSFORMER
		XP EXPLOSION PROOF

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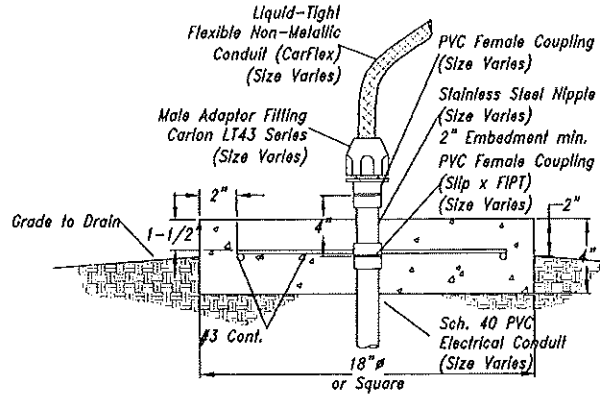
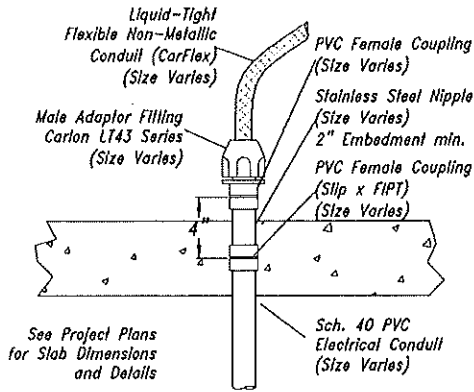
### ELECTRICAL SYMBOLS AND ABBREVIATIONS

Abbreviations

Standard Plan No. 6-01.02

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#### CONDUIT RISER NOTES

1. All work shall be done in accordance with the California Electrical Code, the California Building Code, the Wy'east Engineering Standard Specifications and Standard Plans and these details;
2. Liquid Tight Flexible Metallic Conduit (Type LFMC) with appropriate fittings shall be substituted for Liquid Tight Non-metallic Conduit (Type LFNC) in installations where the conduit is exposed to an increased risk of damage;
3. Stainless steel nipples shall be a minimum of Type 304;
4. These conduit riser details shall be used for both electrical power and signal conductor installations connecting equipment and instrumentation as provided for on the Project Plans.
5. Conduit riser construction shall be considered as incidental to other unit or lump sum items of work unless otherwise specified. The cost of fittings, adaptors, nipples, pad construction, conduit and conductors shall be considered as included in and incidental to the contract unit or lump sum price for other items of work and no additional compensation will be allowed therefore unless otherwise specified.

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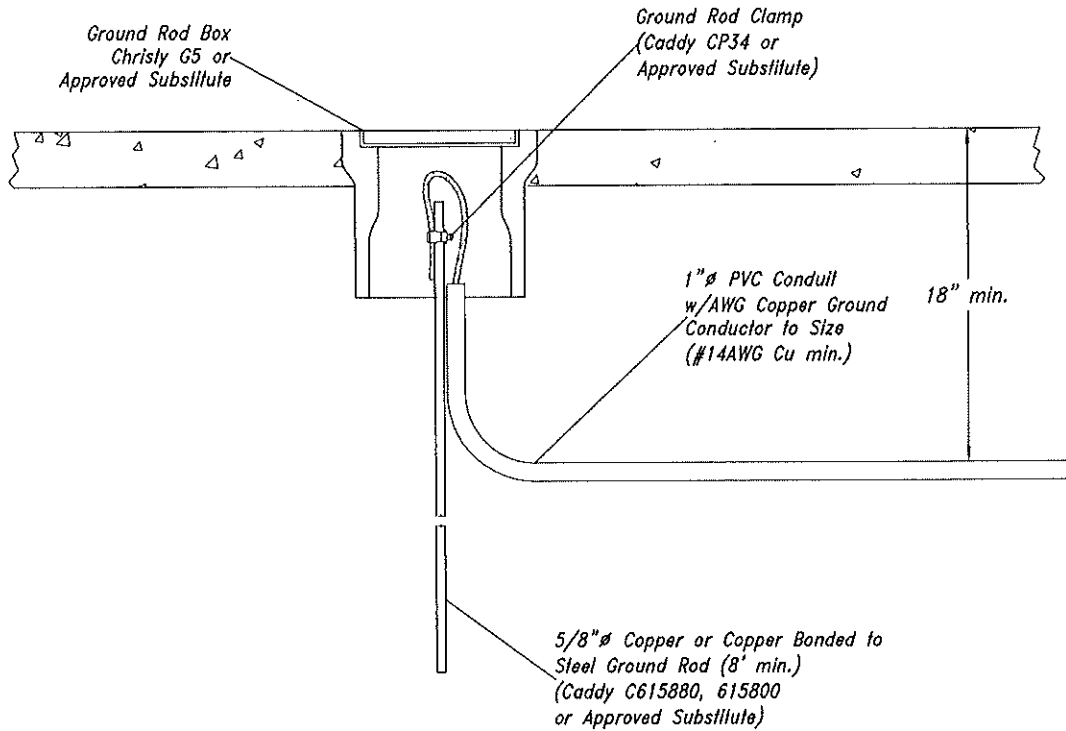
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### CONDUIT RISER DETAILS

Standard Plan No. 6-02

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**GROUND ROD NOTES**

1. All work shall be done in accordance with the California Electrical Code, the California Building Code, the Wy'east Engineering Standard Specifications and Standard Plans and these details;
2. Where local grounding is required for equipment or instrumentation, grounding shall be constructed in accordance with this Standard Plan No. 6-02;
3. Minimum grounding conductor size shall be #14AWG Cu.
4. Ground rod construction shall be considered as incidental to other unit or lump sum items of work unless otherwise specified. The cost of ground rods, boxes, conductors, conduit and clamps shall be considered as included in and incidental to the contract unit or lump sum price for other items of work and no additional compensation will be allowed therefore unless otherwise specified.

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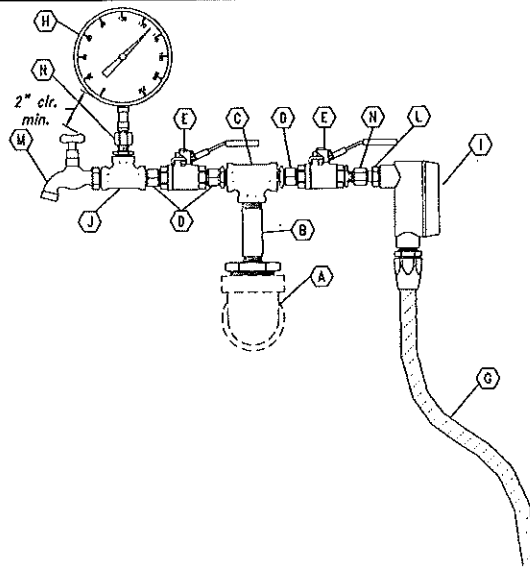
784 Northridge Center, Suite 229 - Salinas, CA 93906 - (831)443-5514 (FAX)444-9490

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## GROUND ROD DETAIL

Standard Plan No. 6-03





MECHANICAL SCHEDULE		TRANSDUCER AND GAUGE SCHEDULE		
	DESCRIPTION	APPLICATION	GAUGE RANGE	TRANSDUCER
A	Process Connection w/Stainless Steel Bushings As Required	1 Gravity Tank H = 0-10'	0-15 psig/0-35 ft*	626-06-CH-E5-S1
B	3/4" Stainless Steel Nipple (Hex Nipple or Length to Fit)	2 Gravity Tank H = 0-35'	0-15 psig/0-35 ft*	626-07-CH-E5-S1
C	3/4" Stainless Steel Tee w/Stainless Steel Bushings As Required	3 Gravity Tank H = >35'	Range As Specified**	626-**-CH-E5-S1
D	1/2" Stainless Steel Nipple (Hex Nipple or Length to Fit)	4 System Pressure P = 0-50 psig	0-50 psi	626-10-CH-E5-S1
E	1/2" Stainless Steel Ball Valve w/1/4" Bushing	5 System Pressure P = 0-100 psig	0-150 psi	626-10-CH-E5-S1
F	1/4" x 90° Stainless Steel Ell	6 System Pressure P = 0-150 psig	0-150 psi	626-11-CH-E5-S1
G	1/2" Liquid-Tight Flexible Conduit	7 System Pressure P = 0-200 psig	0-200 psi	626-12-CH-E5-S1
H	Liquid-Filled Pressure Gauge per Schedule	8 System Pressure P = 0-300 psig	0-300 psi	626-13-CH-E5-S1
I	Pressure Transducer per Schedule	* Gauges for monitoring gravity tank levels shall be equipped with a dual reading dial marked in psig and feet of water		
J	1/2" Stainless Steel Tee w/Bushings as Required	** Range As Provided for on Project Plans		
K	1/4" Stainless Steel Ball Valve	Gauges for use in tank levels shall be WIKA model 233.34, Ashcroft 1279AS or approved substitute		
L	1/4" Stainless Steel Nipple (Hex Nipple or Length to Fit)	Gauges for use in monitoring system pressure shall be WIKA model 21X.53, Ashcroft 1010 or approved substitute		
M	1/2" No Thread Hose Bib (Exterior Locations - Loose Key Model) (Arrowhead 301N1LK, Malco-Norca FY-691)	Pressure transducers shall be Dwyer Series 626 with conduit body and 1/4" FIPT process connection or approved substitute.		
N	1/4" Stainless Steel Pressure Snubber (Ashcroft 25-112BS 0.0025-inch pore opening) (Wektiser SW 42 0.0025-inch pore opening)			

**Notes**

- The configuration shown hereon may be adapted to fit field conditions;
- Installations on pumping equipment shall be equipped with mechanical snubbers to dampen pressure fluctuations;
- All materials in contact with potable water shall be Lead Free and NSF 61 certified;
- Sampling hose bib or tubing shall not have threads on the outlet;
- Connection to process equipment including tanks shall include such bushings, adapters and fittings as may be required. The cost of pressure transducer assemblies and such bushings, adapters and fittings shall be considered as included in and incidental to the contract price for other items of work and no additional compensation will be allowed therefore unless otherwise specified.

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## PRESSURE TRANSDUCER ASSEMBLIES

Gravity Tank and System Pressure Installations

Standard Plan No. 6-04