TETER
BAKERSFIELD OFFICE
1200 DISCOVERY DR. 160 | BAKERSFIELD, CA 93309
661.843.8400 T | 661.843.8448 F
ARCHITECTS ENGINEERS CONNECTED

ADDENDUM NO. 02

PROJECT:

College of the Sequoias
Tulare Campus CTE
4999 Bardsley Avenue
Visalia, CA 93274

Date: **12/13/2022**

TETER Project No.: **21-12032.00**

CLIENT:

College of the Sequoias
915 S. Mooney Blvd.
Visalia, CA 93277

Client Project No.: **N/A**
DSA File No.: **54-C2**
DSA Appl. No.: **02-120265**

The following additions, deletions and revisions to the plans, specifications and Addenda shall become a part of the plans and specifications. It is the responsibility of the General Contractor to submit the information contained in this addendum to all subcontractors and suppliers. The Bidder shall acknowledge receipt of the Addendum in the Bid Proposal.

Bid RFI Deadline Extended to End of Day Wednesday 12/14/2022

Pre-Bid RFI Responses:

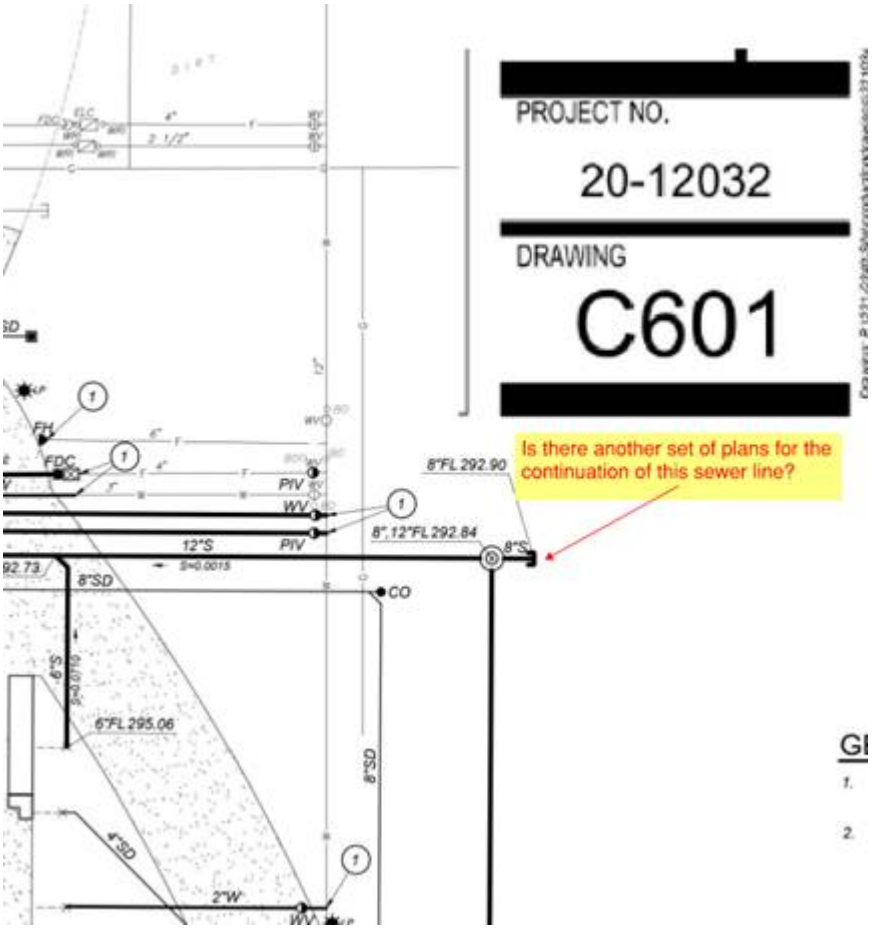
1. Please provide the following documents: Bid Forms, Provided Specs for all owner furnished contractor installed equipment.

   a. Bid Forms are included in the Project Manual that was on the link sent out with the bid documents.
   b. Please see response to question #10 below for additional information on shop equipment.

2. Waterproofing Details: Wall Section Building D and F Entry Tower on A434 shows a section of Aggregate Base and Fluid Applied Waterproofing. Building D and F appear to be surrounded by site concrete per C401. Where does this section occur? Where does section 071326 Self-Adhering Sheet Waterproofing apply?

   a. The Wall Section shown on A434 is taken at the front of the towers where the planter occurs.
   b. Waterproofing per 071326 is intended for below grade moisture protection on concrete and CMU walls where retaining earth.

3. Please see screen shot below of Plan Sheet No. C601. Is the continuation of this sewer line going to be part of this project?



a. There is no continuation. This is a stub out for future.

4. A couple of questions regarding temp facilities, the specifications require the GC to provide temporary power including a meter and to use a meter for water service. Can't we just use Power that is available on site instead of having to deal with SCE on getting temp power? Can we use the water that is available from the site Fire Hydrants?

a. GC will be able to connect to the existing power on site.
b. For water connection GC to work with city of Tulare to have a meter off a city hydrant along Bardsley Avenue for all water truck and large fills.
c. GC to be able to use small hose bibs at existing building C for smaller fills on construction site.

5. On sheet A120 note 32.75 asks for a bike rack that will hold a minimum of 6 bikes, then is says 4 minimum, does this mean you want 4 bike racks? If yes, I do not see where the other 3 are located.

a. No, to clarify the bike rack needs to be able to hold a minimum of 4 bikes. Not 4 separate racks. There is one bike rack with a capacity of 6 bikes, so it exceeds the minimum requirement of 4 bikes.

6. On sheet A824 detail 20 you show the composite wood but do not provide a size, the specifications have 3 sizes listed.

a. Contractor to use 52mm x 100mm section for detail 20/A824.

7. Can you please clarify your intent on detail 22 on A850, the detail is calling for butcher block 16GA, stainless steel or metal top 2 sides? Confused as to what you want here.

a. Provide a 2" thick hardwood butcher block countertop with eased edges on top of the dust collection chase for the full length of the chase.

8. Also, same detail you are asking for 2 each on each side removable panels, are those simply screwed on, or do they have an attachment and or flush pull handles?

a. They are simply screwed on plywood panels. Use #10 oval head SMS at 8" O.C. into metal stud walls/blocking around openings.

9. The interior elevations are showing high pressure magnetic markerboards, the dimension is 10-3-1/2 inches, can we use 10-0 to not have to by 12-0 sheets of markerboard material and plywood backing.

a. It is acceptable to use 10'-0" lengths. Markerboard to be aligned to the top of the plywood wall panels in all the lab spaces making bottom of markerboard 3-1/2" higher A.F.F. to make up the difference.

10. Drawings C401, 12/A805 - Specification #110113, 111100 - Please consider releasing an Equipment Schedule to clarify contractors' responsibilities and model numbers, please confirm: 1. Vehicle lifts are CFCI. 2. Dust Collectors are CFCI. 3. Pressure Washers are CFCI. 4. Storage Shed relocation if OFOI. 5. AG Mechanics Irrigation Trainers is CFCI. 6. Industrial Automation Trainers are OFOI. Please provide Model numbers and makes. Please indicate any other Shop Equipment that may be required.

- See equipment confirmations below:
  a. Vehicle Lifts are CFCI. (Model #'s noted in Addendum #01)
  b. Dust Collector is CFCI. (Model # as noted on Mechanical Schedule)
  c. Pressure Washers in yard are OFOI.
  d. Existing Storage Sheds relocation and re-installation are OFOI.
  e. AG Mechanics Irrigation Trainer in yard is CFCI. (See Civil for concrete vault, and see Plumbing Schedule for pump model #)
  f. Industrial Automation Trainers are OFOI. (Wall mounted in Industrial Automation Technology Lab 'E1' – 'NIMS Electrical Trainer')
  g. Welding Booths are OFOI, but all utility/exhaust connections to booths are CFCI.
  h. All other Miscellaneous Shop Equipment at buildings and noted by gray squares per the floor plan legend are to be OFOI.
  i. All Mechanical, Plumbing and Electrical equipment is to be CFCI.

11. Specification #122413 - Roller Window Shades - 1. Section 122413 Roller Window Shades, 1.2 Summary, A, 1, specifies Manually operated roller shades with single rollers with a Light-blocked fabric (Part 2 Products, 2.1, A, 3), As indicated on drawings (Part 3 Execution, 3.2, B). After reviewed Architectural Drawings Floor Plans, RCP, Sheet A701 Windows Schedule, A710 Finish Schedule, Window head details, and interior elevation sheets, there is not legend, note, keynote that show shades on the project. Please clarify and specify locations.

a. Roller Window Shades are Not in Contract (NIC). Please disregard spec section.

12. A200, A210, A220: Equipment Anchorage - Under the Legend Section on A200-A220 list the following: Misc. Shop Equipment where Anchorage is required see 22/A200. None of the gray boxes show anchorage. Detail 22/A200 does not list specific equipment that will require anchorage. Several of the gray boxes do not match the dimensions shown in detail 22/A200. Please confirm none of the gray shaded boxes on plans require anchorage to be provided by the general contractor. If any equipment does require anchorage, please provide an equipment schedule with the required anchorage.

a. All Misc. Shop Equipment shown as a solid gray box on the plans is OFOI.

13. Please let me know what type of base comes in restrooms – Metal Cove Base or Tile Base? Base not mentioned in Finish Schedule.

a. Base to be Ceramic Tile (CT) at all restrooms.

14. As we have accent wall tile, but pattern for wall tile was not provided. Please let me know the pattern for wall tile in restrooms.

a. Pattern for wall tile in restrooms is TBD and final tile colors/pattern will be chosen during construction.

15. For Room F27 Dean's Office, Wall Tile is asked in finish schedule at West Wall. But no wall tile shown on interior elevation. Please let me know wall tile comes in Room F27 or not.

a. No wall tile in the Dean’s Office F27. West Wall to match other walls in the office with Gypsum Board (GB) and Paint Eggshell (P-E).

16. Specification #320190, states that a consulting Arborist is required. Please confirm who is responsible for the consulting Arborist. Is the Owner contracting them or the Contractor?

a. Contractor to provide consulting Arborist if necessary to protect existing trees to remain during the course of construction.

17. Specification # 323314, please confirm section 323314 Bike Lockers is not part of this project. If we are to have bike lockers, please confirm the location.

a. No Bike Lockers on this project, disregard spec section.

18. Specification # 323113, please confirm that 323113 Chain Link Fences and Gates are not used on this project.

a. Chain Link Fences and Gates are not used on this project, disregard spec section.

Revised Drawings (DSA Backcheck Revisions):

DRAWINGS, SHEET C601 – PARTIAL UTILITY PLAN revise as follows:

A. Revised location of fire hydrant at the east side of the site.

DRAWINGS, SHEET L101 – IRRIGATION PLAN, revise as follows:

A. Revised Irrigation in one planter on the east side of the site to coordinate utilities.

DRAWINGS, SHEET L102 – IRRIGATION PLAN, revise as follows:

A. Revised Irrigation in planters on the south side of the site to coordinate utilities.

DRAWINGS, SHEET L201 – PLANTING PLAN, revise as follows:

A. Revised Planting in one planter on the east side of the site to coordinate the fire hydrant location.

DRAWINGS, SHEET L202 – PLANTING PLAN, revise as follows:

A. Revised Planting in planters on the south side of the site to coordinate the fire hydrant locations

DRAWINGS, SHEET L203 – PLANTING PLAN, revise as follows:

A. Revised Planting counts due to revised planting plans.

DRAWINGS, SHEET A431 – WALL SECTIONS, revise as follows:

A. Section 20, moved fire sprinkler down to be below bi-fold door in open position.

DRAWINGS, SHEET FP107 – FIRE PROTECTION – PUMP HOUSE AND PUMP PLAN, revise as follows:

A. Pump Room Sprinkler Layout – 1, Added Hydraulic Information, and added a PAV to the plan.
B. Pump Room Pump Equipment – 2, Added Sprinkler Schedule, floor drain (already shown on plumbing drawings) and general note.
C. Pump Room Section – 4, Added Pump Information.

DRAWINGS, SHEET FP501 – FIRE PROTECTION - DETAILS, revise as follows:

A. System Riser Keynotes – 4, Revised keynote #9.

END OF ADDENDUM NO. 02

Jon Coulter
Architect of Record

Attachments:

- Final DSA Fire Protection Technical Submittals
- Sheet C601 – Revised as noted
- Sheet L101 – Revised as noted
- Sheet L102 – Revised as noted
- Sheet L201 – Revised as noted
- Sheet L202 – Revised as noted
- Sheet L203 – Revised as noted
- Sheet A431 – Revised as noted
- Sheet FP107 – Revised as noted
- Sheet FP501 – Revised as noted

CORDINER CONSULTING
FIRE PROTECTION DESIGN SPECIALISTS

June 21, 2022

Tulare Campus CTE
College of the Sequoias
4999 E. Bardsley Ave.
Tulare, CA

RE: Fire Protection Technical Submittals

Table of Contents

Material Type	Make/Model
WATERFLOW ALARM SWITCH WITH RETARD	POTTER-VSR
ELECTRIC BELL	POTTER
DOUBLE CHECK DECTECTOR ASSEMBLY	FEBCO LF856 DCDA
ANGLE VALVE	NIBCO
GLOBE VALVE	NIBCO
SPRINKLER PRESSURE GAUGE	ASHCROFT-1005P,XUL
SPRINKLER CABINET	POTTER ROEMER – 6 SPRINKLER
SPRINKLER HEADS	VICTAULIC – V2704
SPRINKLER HEADS	VICTAULIC – V3802
TRHREADED SIDE BEAM BRACKET	TOLCO – FIG 58
ALL THREAD ROD	TOLCO – FIG 100
REVERSIBLE C-TYPE BEAM CLAMPS	TOLCO – FIG 65 & FIG 66
BEAM CLAMP RETAINING STRAP	TOLCO – FIG 69
“TRIMLINE” ADJUSTABLE BAND HANGER	TOLCO – FIG 200
ADJUSTABLE BRACE ATTACHMENT TO STEEL	TOLCO – FIG 800
UNIVERSAL SWIVEL SWAY BRACE ATTACHMENT	TOLCO – FIG 980
SWAY BRACE ATTACHEMENT	TOLCO – FIG 1001
CAST IRON 90 DEGREE ELBOW	ANVIL STAR
CAST IRON REDUCING COUPLING	ANVIL STAR
CAST IRON TEE	ANVIL STAR
GROOVED ELBOW FITTINGS	VICTAULIC FIRELOCK FITTINGS
GROOVED COUPLINGS	VICTAULIC FIRELOCK COUPLINGS
IN-BUILDING RISER	AMES WATTS IBR
SPRINLKER PIPING	WHEATLAND FIRE SPRINLKER PIPE
FLEXIBLE SPRINKLER DROPS	VICFLEX
FIRE PUMP COMPONENTS	

VSR

VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

Flow Sensitivity Range for Signal:
4-10 GPM (15-38 LPM) - UL

Maximum Surge: 18 FPS (5.5 m/s)

Contact Ratings: Two sets of SPDT (Form C)
10.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive
10 mAmps min. at 24VDC

Conduit Entrances: Two knockouts provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages.

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148
Replaceable Components: Retard/Switch Assembly, stock no. 1029030

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

Important: This document contains important information on the installation and operation of the VSR waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Installation (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

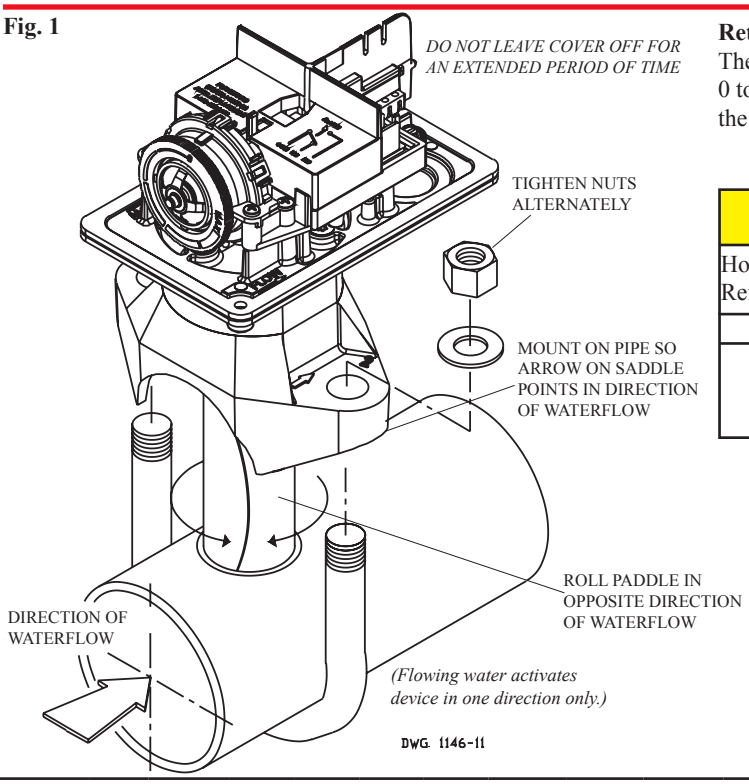
NOTE: Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

⚠ CAUTION

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a qualified technician should disable the alarm system.

Fig. 1

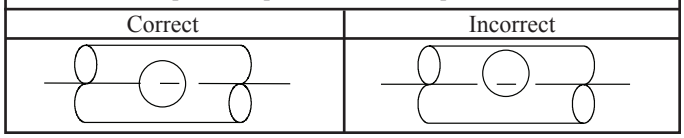


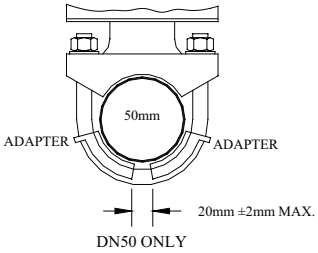
Retard Adjustment

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms

CAUTION

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.





USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

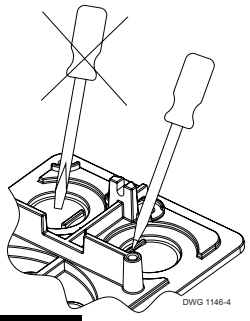
DWG# 1146-1F

Compatible Pipe/ Installation Requirements

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness										Hole Size		U-Bolt Nuts Torque	
					Lightwall		Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	.065	1.651	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 + .125/- .062	33.0 ± 2.0	20	27
VSR-2 1/2	2.5	-	2.875	73.0	.084	2.134	0.120	3.05	0.203	5.16	-	-	-	-				
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	-	-	0.142	3.6	0.102	2.6				
VSR-3	3	DN80	3.500	88.9	.083	2.108	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 ± .125	50.8 ± 2.0		
VSR-3 1/2	3.5	-	4.000	101.6	-	-	0.120	3.05	0.226	5.74	-	-	-	-				
VSR-4	4	DN100	4.500	114.3	.084	2.134	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2				
VSR-5	5	-	5.563	141.3	-	-	0.134	3.40	0.258	6.55	-	-	-	-				
VSR-6	6	DN150	6.625	168.3	.115	2.921	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0				
VSR-8	8	DN200	8.625	219.1	-	-	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5				

NOTE: For copper or plastic pipe use Model VSR-CF.

Fig. 2
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTICE
Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

Fig. 3
Break out thin section of cover when wiring both switches from one conduit entrance.

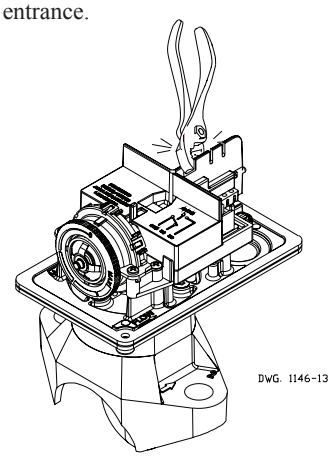
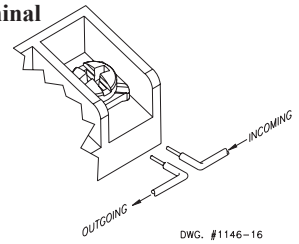


Fig. 4 Switch Terminal Connections Clamping Plate Terminal

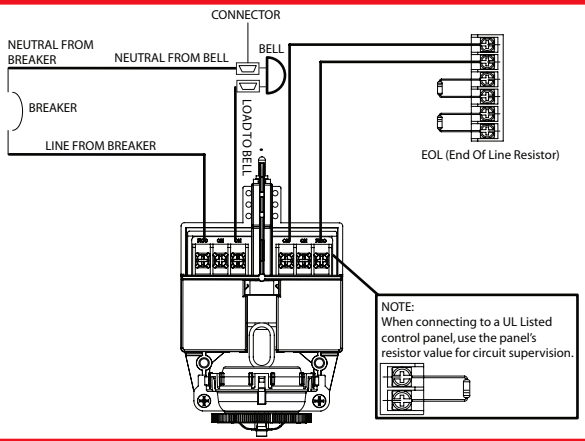


⚠ WARNING

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Fig. 5 Typical Electrical Connections



Notes:

1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).

Testing

The frequency of inspection and testing for the Model VSR and its associated protective monitoring system shall be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.
A minimum flow of 10 GPM (38 LPM) is required to activate this device.

NOTICE Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Fig. 6 Mounting Dimensions

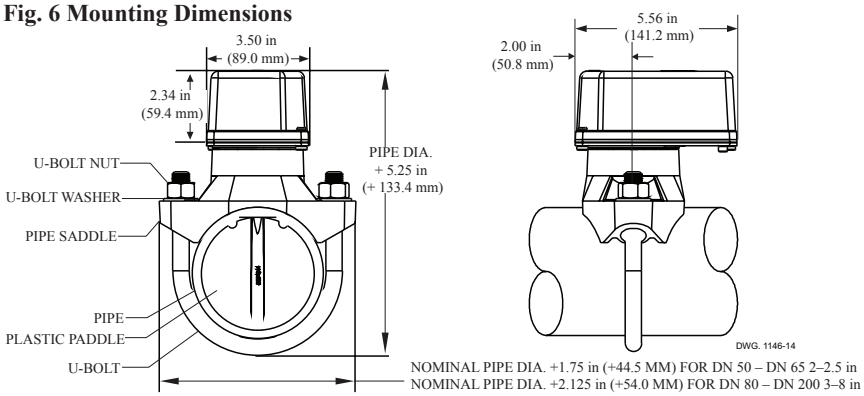
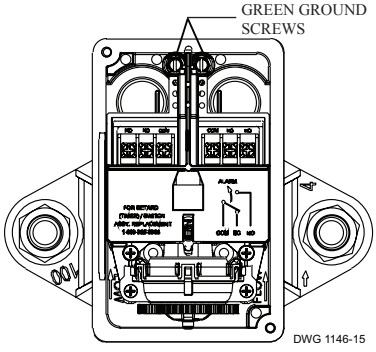


Fig. 7



Maintenance

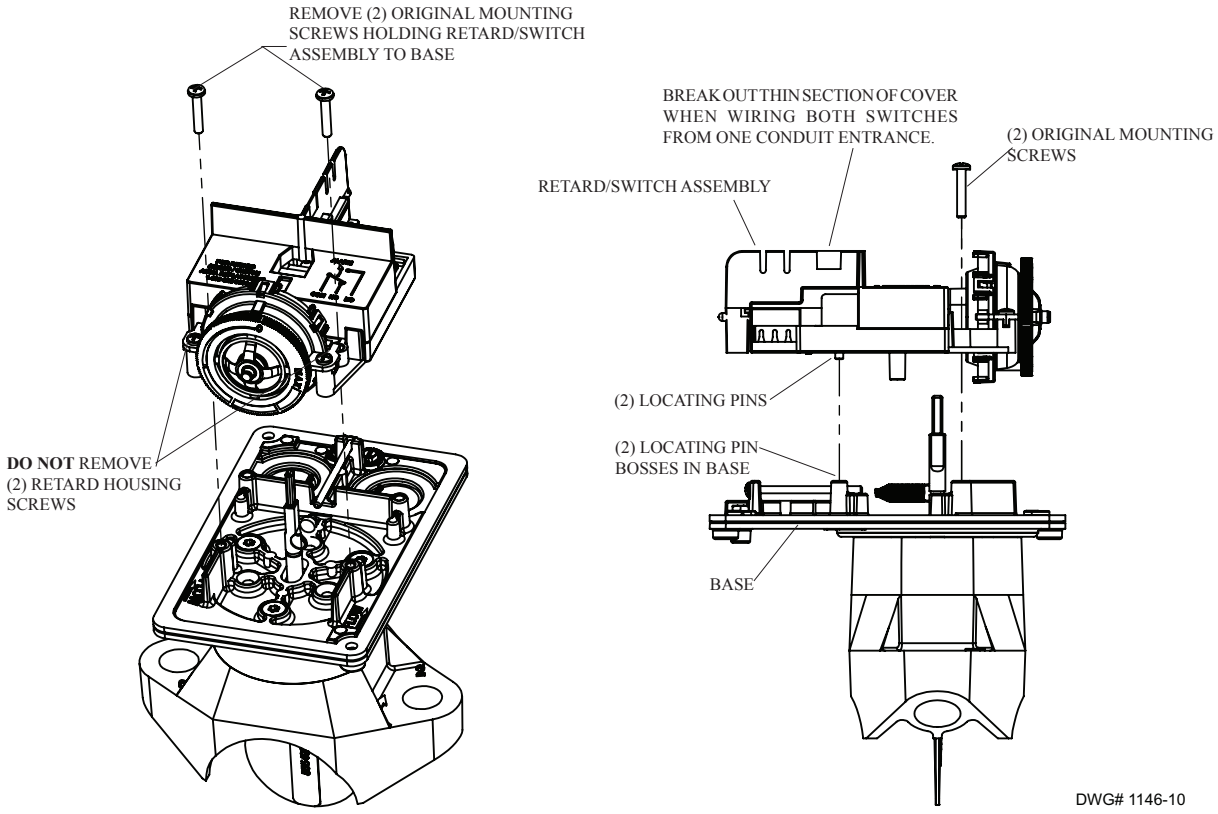
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 8). There is no maintenance required, only periodic testing and inspection.

Retard/Switch Assembly Replacement (See Fig. 8)

NOTICE The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig. 8



Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

LISTING SERVICE

LISTING No. 7770-0328:0001

CATEGORY: 7770 -- VALVES/SWITCHES

LISTEE: Potter Electric Signal Co1609 Park 370 Place, Hazelwood, MO 63042 United States
Contact: Brad Serangeli (314) 595-6900 Fax (314) 595-6999
Email: brads@pottersignal.com

DESIGN: Vane and pressure type water flow alarm switches listed below. Refer to listee's data sheet for detailed product description and operational considerations.

Vane Types:

VSR-CF	VSR-D	VSR-F	VSR-SF
VSR-FE-2	VS-SP	VS-F	VSR-SFG
VSR-SFT	VSG	VSR	VSR-S
VSR-C	VSR-ST	VSR-SG	

Pressure Type:

WFS-B	WFSR-C	WFSPD-B	PS10
PS-10A	PS-100A	WFSR-F	PS100

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number and UL or FM label.

APPROVAL: Listed as waterflow alarm switches for use with fire sprinkler systems. Vane models may be used in wet pipe systems; pressure models may be used in wet or dry systems. Model VSR-CF is for use on K, L or M copper pipe (2", 2-1/2", 3", 4") and listed CPVC pipe (2", 2-1/2", 3"). Model VSR-SF for use on 1", 1-1/4", 1-1/2" and *2" steel, copper or listed plastic pipe. Model VSG is for low flow rate. Model VSR-SFG and VSR-SFT are for use on 1", 1-1/4", 1-1/2" and *2" plastic pipe. Models VS-F, VSR-F, VSR-FE and VSR-FE-2 is for use on 2", 2-1/2", 3", 3-1/2", 4", 5", 6", 8" and 10" pipe. *Model VSR is for use on steel pipe sizes from 2" through 8". Vane type switches may be used outdoors when the outdoor temperature never falls below 40oF.

Rev*5-17-2007 jw

Date Issued: **July 01, 2021** *Listing Expires* **June 30, 2022**

Authorized By: ***DAVID CASTILLO,**, M.E., F.P.E.*

Fire Engineering Division

POTTER
The Symbol of Protection

BELLS
PBA-AC & MBA-DC

UL, ULC, and FM Approved
Sizes Available: 6" (150mm), 8" (200mm) and 10" (250mm)
Voltages Available: 24VAC
120VAC
12VDC (10.2 to 15.6) Polarized
24VDC (20.4 to 31.2) Polarized
Service Use: Fire Alarm
General Signaling
Burglar Alarm
Environment: Indoor or outdoor use (See Note 1)
-40° to 150°F (-40° to 66°C)
(Outdoor use requires weatherproof backbox.)
Termination: AC Bells - 4 No. 18 AWG stranded wires
DC Bells - Terminal strip
Finish: Red powder coating
Optional: Model BBK-1 weatherproof backbox
Model BBX-1 deep weatherproof backbox

These vibrating type bells are designed for use as fire, burglar or general signaling devices. They have low power consumption and high decibel ratings. The unit mounts on a standard 4" (101mm) square electrical box for indoor use or on a model BBK-1 weatherproof backbox or BBX-1 deep weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1, Stock No. 1500001.

Notes:
1. Minimum dB ratings are calculated from integrated sound pressure measurements made at Underwriters Laboratories as specified in UL Standard 464. UL temperature range is -30° to 150°F (-34° to 66°C).
2. Typical dB ratings are calculated from measurements made with a conventional sound level meter and are indicative of output levels in an actual installation.
3. ULC only applies to MBA DC bells.

Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	MBA-6-12	1750070	.12A	85	76
8 (200)	12VDC	MBA-8-12	1750080	.12A	90	77
10 (250)	12VDC	MBA-10-12	1750060	.12A	92	78
6 (150)	24VDC	MBA-6-24	1750100	.06A	87	77
8 (200)	24VDC	MBA-8-24	1750110	.06A	91	79
10 (250)	24VDC	MBA-10-24	1750090	.06A	94	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

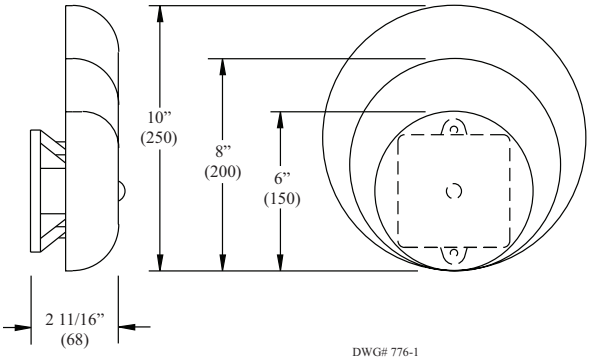
All DC bells are polarized and have built-in transient protection.
* Does not have ULC listing.

⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or BBX-1. Standard electrical boxes will not provide a weatherproof enclosure. If the bell and/or assembly is exposed to moisture, it may fail or create an electrical hazard.

Potter Electric Signal Company, LLC • St. Louis, MO, • Phone: 866-572-3005/Canada 888-882-1833 • www.pottersignal.com

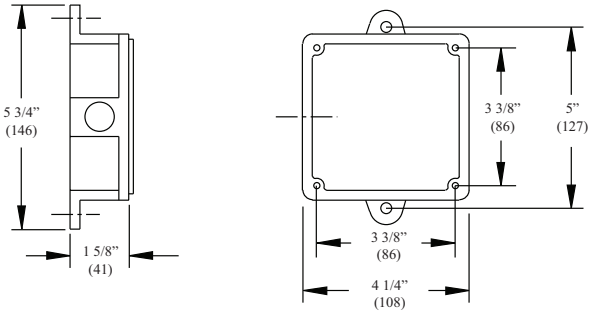
Bells Dimensions Inches (mm)
Fig. 1



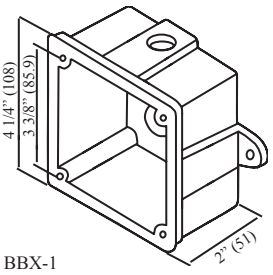
DWG# 776-1

Weatherproof Backbox Dimensions Inches (mm)
Fig. 2

Box has one threaded 1/2" conduit entrance

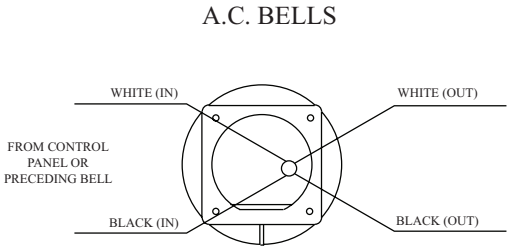


DWG# 776-2



BBX-1

Wiring (rear view)
Fig. 3

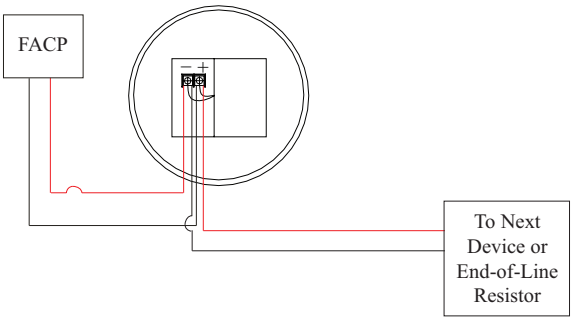


CAUTION:
WHEN ELECTRICAL SUPERVISION IS REQUIRED USE IN AND OUT LEADS AS SHOWN.

NOTES:

1. WHEN USING AC BELLS, TERMINATE EACH EXTRA WIRE SEPARATELY AFTER LAST BELL.
2. END-OF-LINE RESISTOR IS NOT REQUIRED ON AC BELLS.

DWG# 776-3



Installation

1. The bell shall be installed in accordance with NFPA 13, 72, or local AHJ. The top of the device shall be no less than 90" AFF and not less than 6" below the ceiling.
2. Remove the gong.
3. Connect wiring (see Fig. 3).
4. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
5. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
6. Test all bells for proper operation and observe that they can be heard where required (bells must be heard in all areas as designated by the authority having jurisdiction).

⚠ WARNING

Failure to install striker down will prevent bell from operating.

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

LISTING SERVICE

LISTING No. 7135-0328:0119

CATEGORY: 7135 -- AUDIBLE DEVICES

LISTEE: Potter Electric Signal Co1609 Park 370 Place, Hazelwood, MO 63042 United States
Contact: Brad Serangeli (314) 595-6900 Fax (314) 595-6999
Email: brads@pottersignal.com

DESIGN: Models SB624-153075, SB624-75110, PBA246, PBA248, PBA2410, PBA1206, PBA1208, PBA12010, *PBD-126, *PBD-128, *PBD-1210, *PBD-246, *PBD-248, * PBD-2410 vibrating bells. Suitable for outdoor use when used with Model BBK-1 backbox. Models are AC or DC powered and available in 6", 8" and 10". Models MBA-6, -8 and -10 bells, suitable for outdoor use when used with Model BBX-1 backbox. Refer to listee's data sheet for detailed product description and operational considerations.

RATING:
PBA-246, -248, -2410: 24 VAC
PBA-1206, -1208, -12010: 120 VAC
MBA-6, -8, -10: 12 or 24 VDC
*PBD-126, -128, -1210: 12VDC, .12A
*PBD-246, -248, -2410: 24VDC, .06A

INSTALLATION: In accordance with listee's printed installation instruction, applicable codes & ordinances, and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number and UL label.

APPROVAL: Listed as audible devices for use with separately listed compatible fire alarm control units. If this appliance is required to produce a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 2002 Edition, the appliance must be used with a fire alarm control unit that can generate the temporal pattern signal. Refer to manufacturer’s Installation Manual for details.

*Revision 01-31-2017 dcc

Date Issued: **July 01, 2021** *Listing Expires* **June 30, 2022**

Authorized By: ***DAVID CASTILLO,**, M.E., F.P.E.*

Fire Engineering Division

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

MasterSeries® LF856

Double Check Detector Backflow Prevention Assemblies (Type II)

Size: 2½" - 10"

The FEBCO MasterSeries LF856 Double Check Detector Assemblies are designed to protect drinking water supplies from dangerous cross-connections in accordance with national plumbing codes and water authority requirements for non-health hazard non-potable service applications such as irrigation, fire line, or industrial processing. This Backflow Assembly is primarily used for protection of drinking water systems and fire sprinkler systems, where Local Governing Code mandates protection from non-potable quality water being pumped or siphoned back into the potable water system. The coating on this backflow assembly uses ArmorTek™ technology to resist corrosion due to microbial induced corrosion (MIC) or exposed metal substrate.

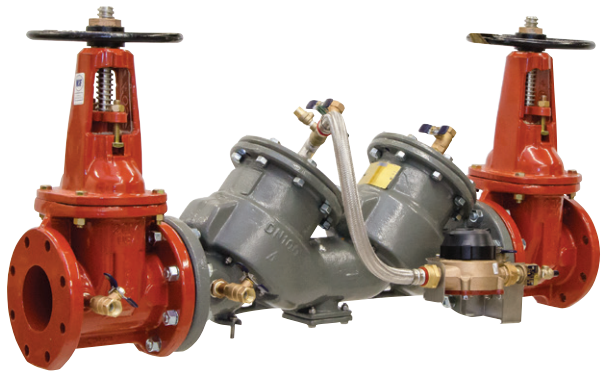
Features

Main Valve:

- Inline Serviceable Assembly
- No Special Tools Required for Servicing
- Captured Modular Spring Assembly
- Reversible & Replaceable Discs
- Field Replaceable Seats
- Ductile Iron Valve Body Design
- Stainless Steel Check Components
- Utilizes advanced ArmorTek™ coating technology to resist corrosion of internals
- Winterization feature with disc retainers and valve body drain ports
- Clapper Check Assembly
- Commonality between 1st & 2nd Check Components
- Captured O-ring Design

Auxiliary Bypass:

- Compact Bypass Design; Remains within Main Valve Assembly Profile
- Inline Serviceable ¾" Check Assembly
- No Special Tools Required for Servicing
- Field Replaceable Seat & Disc
- Detect Potential Underground Water Leaks
- Detect Unauthorized Water Usage



Model LF856 Double Check Detector Assembly

Specifications

The FEBCO MasterSeries LF856 Double Check Detector Valve Assembly shall be installed on the potable water supply and at each point of cross-connection to protect against possible backpressure and backsiphonage conditions for non-health hazard (i.e., pollutant) applications. The assembly shall consist of a main line valve body composed of two (2) independently acting approved clapper style check modules with replaceable seats and disc rubbers. Servicing of both check modules does not require any special tools and are accessed through independent top entry covers. This assembly shall be fitted with approved UL/FM inlet/outlet resilient seated shutoff valves and contain four (4) properly located resilient seated test cocks as specified by AWWA Standard C510. The auxiliary bypass line contains a ⅝"x ¾" (16 x 19mm) Water Meter that complies with ANSI/AWWA Standard C700 coupled with an approved check assembly. The bypass line is designed to detect leaks or unauthorized water usage of the water system while protecting against possible backpressure and backsiphonage conditions for non-health hazard (i.e., pollutant) application. The valve body shall utilize a coating system with built in electrochemical corrosion inhibitor and microbial inhibitor. Flow and pressure loss performance parameters shall meet the requirements of AWWA Standard C510.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

FEBCO®

A WATTS Brand

Options - Suffix

OSY: UL/FM Approved OS&Y Gate Valves (ANSI/AWWA C515 Compliant)

CFM: Totalizing Cubic feet/min 5/8" x 3/4" Water Meter (ANSI/AWWA C700 Compliant)

GPM: Totalizing Gallons/min 5/8"x 3/4" Water Meter (ANSI/AWWA C700 Compliant)

LG: Less Shutoff valves; This is NOT an APPROVED ASSEMBLY

Example Ordering Descriptions:

4" LF856-OSY-GPM - Valve Assembly fitted with OS&Y Shutoff Valves & Gallon Feet per Minute Water Meter

4" LF856-OSY-CFM - Valve Assembly fitted with OS&Y Shutoff Valves, Cubic feet per Minute Water Meter

Assembly Flow Orientation:

- Horizontal & Vertical Up (2½" – 10") - Approved by FCCCHR-USC, ASSE, cULus, FM, IAPMO

Materials

Below is a general material list of the Model LF856. All assemblies' size 2½" through 10" is similar in materials and construction. Please contact your local FEBCO Representative if you require further information.

Main Valve Body:	Ductile iron Grade 65-45-12
Coating:	Fusion epoxy coated internal and external AWWA C550
Shutoff Valves:	OS&Y resilient wedge gate valves AWWA C515 (UL/FM)
Check Seats:	Stainless Steel
Disc Holder:	Stainless Steel
Elastomer Disc	Silicone
Spring:	Stainless Steel
Clamp:	AWWA C606 (10" Only)

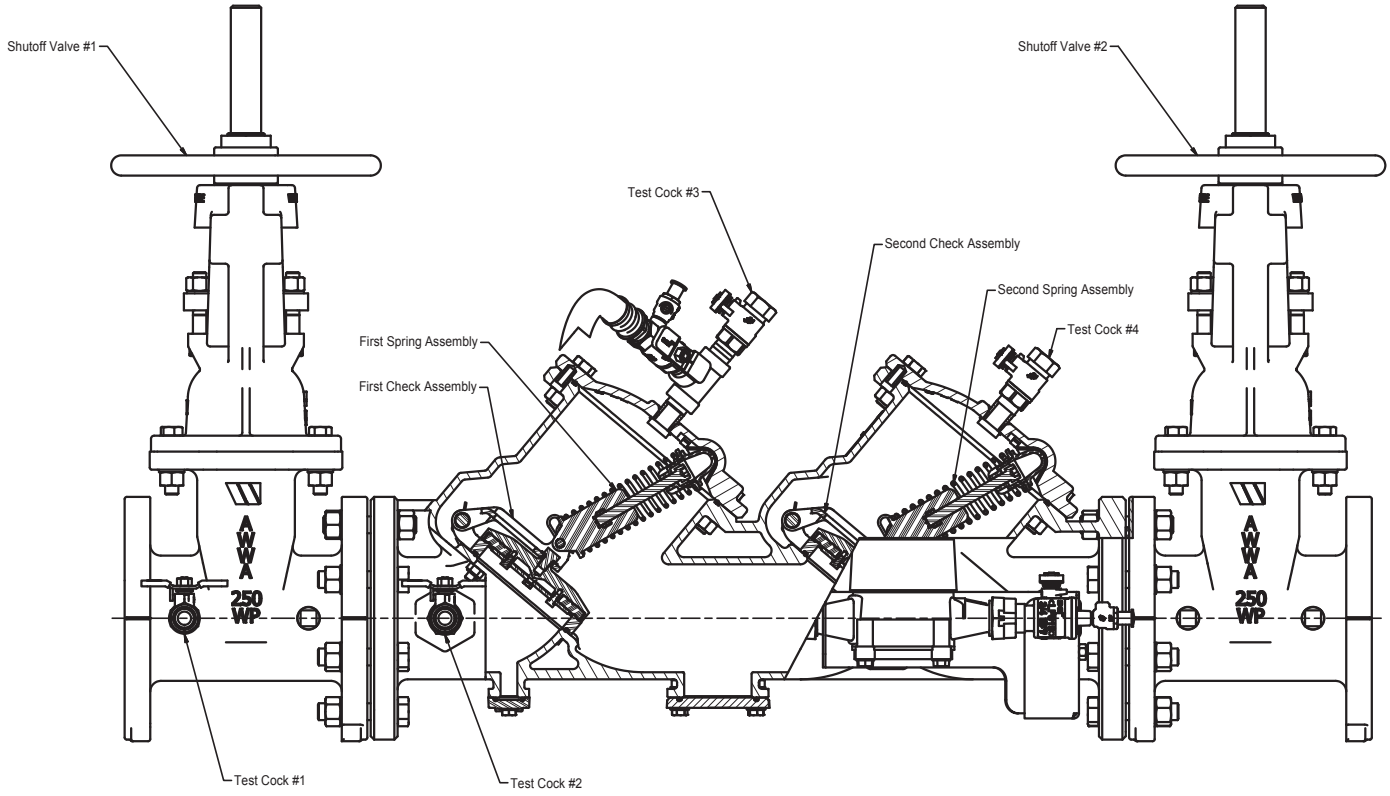
Approvals

- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at The University of Southern California (FCCCHR-USC)
- ASSE 1048 Listed
- **UL Classified (US & Canada)
- **FM Approved
- IAPMO
- AWWA Standard C510 Compliant
- End Connections: Compliant to ASME B16.1 Class 125 & AWWA Class D Flange

**Assembly configured with UL/FM Approved OS&Y RW Gate Valves. Less gate valve assemblies are not UL/FM approved configurations.

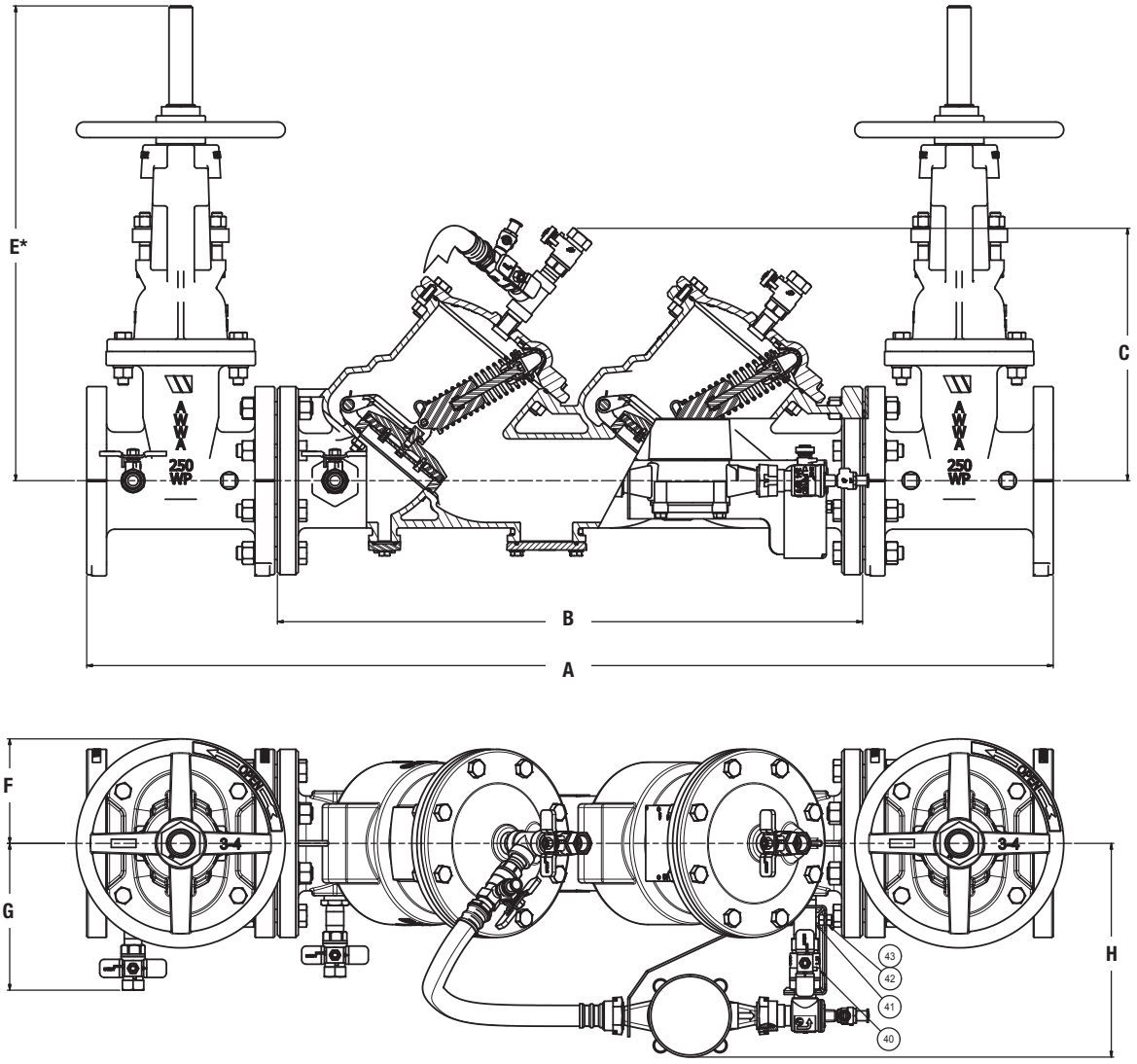
Pressure - Temperature

Max. Working Pressure:	175 psi (12.1 bar)
Min. Working Pressure:	10 psi (0.7 bar)
Hydrostatic Test Pressure:	350 psi (24.1 bar)
Hydrostatic Safety Pressure:	700 psi (48.3 bar)
Temperature Range:	33°F - 140°F (0.5°C- 60°C) Continuous



Dimensions & Weights

Below are the nominal dimensions and physical weights for the Model LF856 size 2½" through 10". Allowances must be made for normal manufacturing tolerances. Please visit our website to download a copy of this product's installation instructions, or contact your local FEBCO Representative for more information.



Model LF856 Assemblies

SIZE	DIMENSIONS														WEIGHT***	
	A		B		C		E**		F		G		H		OSY	
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kg.*
2½	40¾	1035	25½	648	10	254	16⅜	416	4½	114	7⅛	181	13⅜	340	245	111
3	41⅞	1064	25⅝	651	10	254	22⅐	565	4½	114	7⅜	187	13⅜	340	271	123
4	46¼	1175	28	711	10⅛	257	23¼	591	5½	140	8⅛	206	14	356	338	153
6	56	1422	34¾	883	12¾	324	30⅛	765	6½	165	9⅞	251	15	381	515	234
8	65	1651	41¾	1061	15⅝	397	37¾	959	7	178	11⅛	283	15¾	400	826	375
10	72⅝	1845	46⅜	1178	15⅝	397	48	1219	9	229	12⅜	314	15¾	400	1234	560

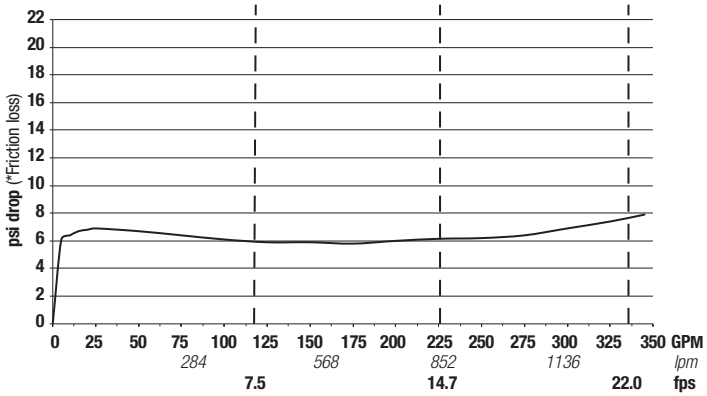
** Indicates nominal dimensions with OSY Gate Valves (Full Open Position)
*** Indicates weight of complete Backflow Assemblies with specified Gate Valves

Performance

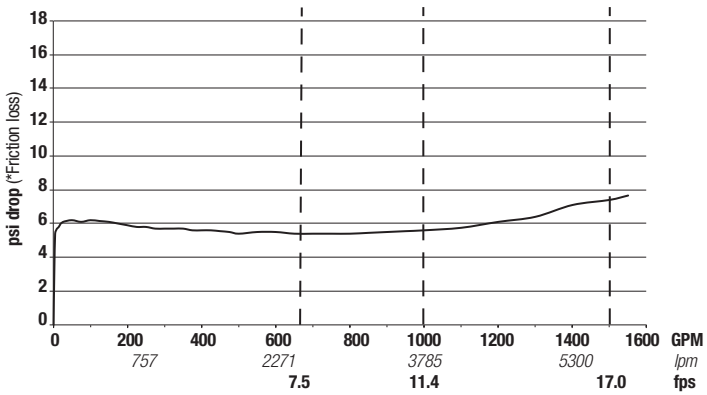
Flow capacity chart identifies valve performance based upon rated water Velocity up to 20fps.

- Maximum service flow rate is determined by maximum rated Velocity of 7.5fps.
- AWWA Manual M-22 (Appendix C) recommends that the maximum water Velocity in the services be not more than 10fps.
- UL flow rate is determined by typically rated Velocity of 15 feet/sec.

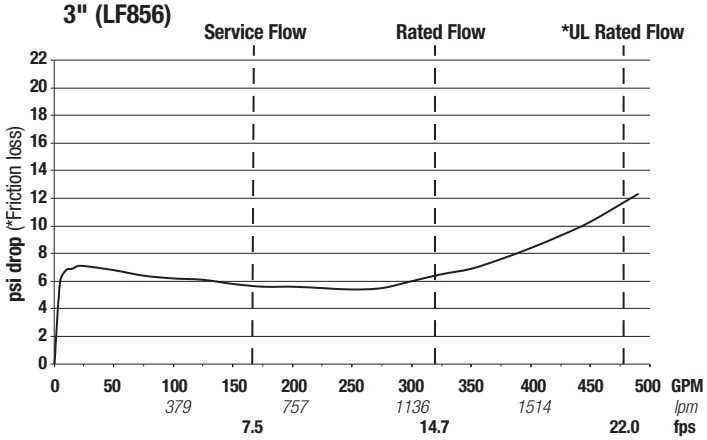
2½" (LF856)



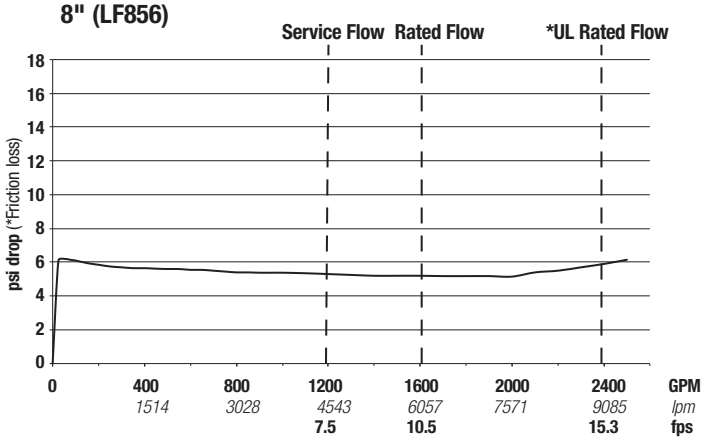
6" (LF856)



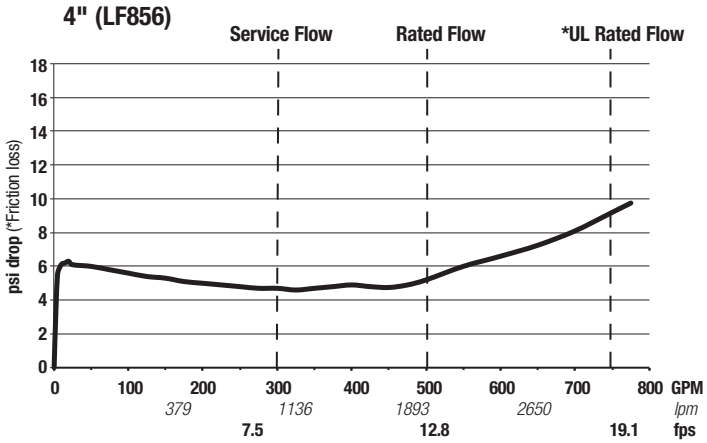
3" (LF856)



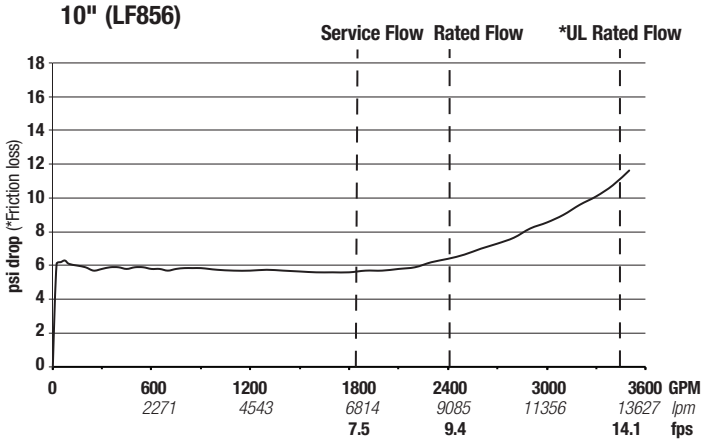
8" (LF856)



4" (LF856)



10" (LF856)



FEBCO®

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Latin America: (52) 55-4122-0138 • FEBCOonline.com

Class 125 Bronze Angle Valves

Screw-in Bonnet • Integral Seat • Renewable Seat Disc

125 PSI/8.6 Bar Saturated Steam to 353° F/178° C
200 PSI/13.8 Bar Non-Shock Cold Working Pressure

Dezincification Resistant

T-311-Y
Threaded

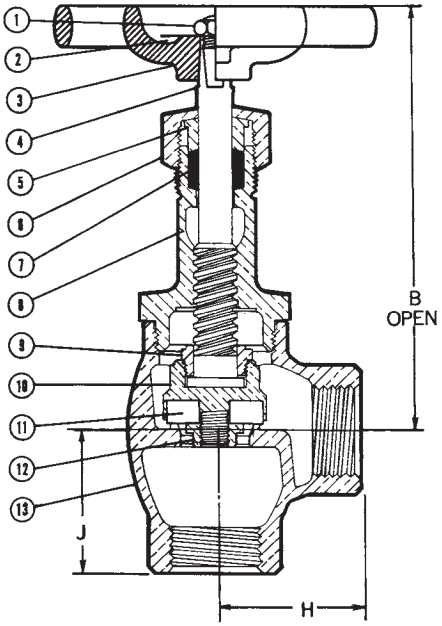
S-311-Y
Solder

CONFORMS TO MSS SP-80

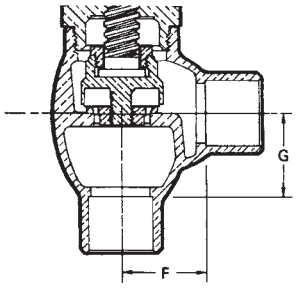
MATERIAL LIST

	PART	SPECIFICATION
1.	Handwheel Nut	300 Series Stainless Steel
2.	Identification Plate	Aluminum
3.	Handwheel	Malleable Iron ASTM A 47
4.	Stem	Silicon Bronze ASTM B 371 Alloy C69400/C69430
5.	Packing Gland	Bronze ASTM B 62 or ASTM B 584 Alloy C84400 or Brass ASTM B 16
6.	Packing Nut	Bronze ASTM B 62 or ASTM B 584 Alloy C84400 or Brass ASTM B 16
7.	Packing	Aramid Fibers with Graphite
8.	Bonnet	Bronze ASTM B 62
*9.	Disc Holder Nut	Bronze ASTM B 62 or B 140 Alloy C31400
10.	Disc Holder	Bronze ASTM B 62
11.	Seat Disc	Steam (PTFE) (Y)
12.	Seat Disc Nut	Bronze ASTM B 62 w/SS Washer
13.	Body	Bronze ASTM B 62

*** 2½" and 3" are ASTM B 61**



T-311-Y
NPT x NPT



S-311-Y
C x C

DIMENSIONS—WEIGHTS—QUANTITIES

Size		Dimensions B		F & G		H & J		T-311		S-311		Master
In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.	Lbs.	Kg.	Ctn. Qty.
*¼	8	3.50	89	.94	24	1.19	30	0.98	0.44	0.82	0.37	50
*⅜	10	3.50	89	.88	22	1.19	30	0.93	0.42	0.82	0.37	50
*½	15	3.50	89	.88	22	1.31	33	1.01	0.46	0.95	0.43	30
¾	20	4.94	126	1.13	29	1.56	40	1.70	0.77	1.71	0.78	20
1	25	5.75	146	1.44	37	1.88	48	2.82	1.28	2.79	1.27	10
1¼	32	6.13	156	1.50	38	2.19	51	3.76	1.70	3.77	1.71	10
1½	40	7.25	179	1.75	45	2.38	60	5.79	2.63	4.70	2.13	6
2	50	8.13	206	2.16	55	2.81	72	8.76	3.97	8.73	3.96	4
2½	65	10.56	268	2.69	68	3.19	81	16.13	7.32	16.13	7.32	2
3	80	11.19	284	3.25	83	3.88	99	21.72	9.85	21.32	9.67	2

*** Stem and Disc or Disc Holder are integral. No packing gland, packing only in these sizes.**

FREEZING WEATHER PRECAUTION: Subsequent to testing a piping system, valves should be left in an open position to allow complete drainage.

◆ For detailed Operating Pressure, refer to Pressure Temperature Chart on page 113.

NIBCO INC. WORLD HEADQUARTERS • 1516 MIDDLEBURY ST. • ELKHART, IN 46516-4740 • USA • PH: 1.800.234.0227
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Class 125 Bronze Globe Valves

Screw-in Bonnet • Integral Seat • Renewable Seat Disc

125 PSI/8.6 Bar Saturated Steam to 353° F/178° C
200 PSI/13.8 Bar Non-Shock Cold Working Pressure

Dezincification Resistant

T-211
Threaded

S-211
Solder

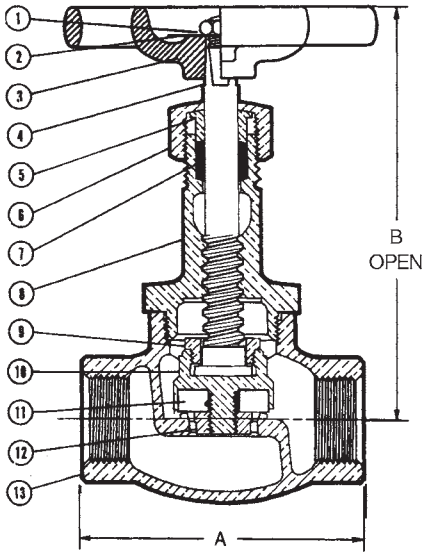
CONFORMS TO MSS SP-80

MATERIAL LIST

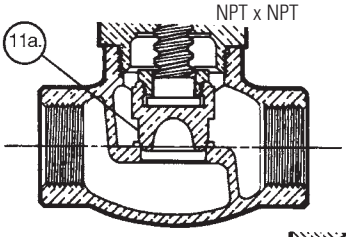
	PART	SPECIFICATION
1.	Handwheel Nut	300 Series Stainless Steel
2.	Identification Plate	Aluminum
3.	Handwheel	Malleable Iron ASTM A 47
4.	Stem	Silicon Bronze ASTM B 371 Alloy C69400/C69430
5.	Packing Gland	Bronze ASTM B 62 or ASTM B 584 Alloy C84400 or Brass ASTM B 16
6.	Packing Nut	Bronze ASTM B 62 or ASTM B 584 Alloy C84400 or Brass ASTM B 16
7.	Packing	Aramid Fibers with Graphite
8.	Bonnet	Bronze ASTM B 62
9.	Disc Holder Nut	Bronze ASTM B 140 Alloy C31400 or B 62
*10.	Disc Holder	Bronze ASTM B 62
*11.	Seat Disc	Water, Oil or Gas Steam (PTFE) (Y)
*11a.	Seat Disc	Bronze ASTM B 62 (B)
*12.	Disc Nut	Bronze ASTM B 62/ASTM B 98 Alloy C65100 w/SS Washer
13.	Body	Bronze ASTM B 62

Note: S-211 not available with (B) Disc.

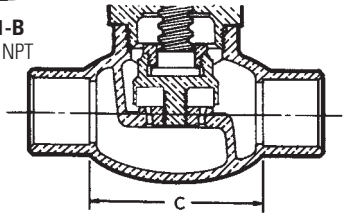
*** The Bronze Disc does not require a Disc Nut. When converting from (B) Disc to (Y) Disc, order Disc Nut (12) and Disc Holder (10) and proper disc (11).**



T-211-Y
NPT x NPT



T-211-B
NPT x NPT



S-211-Y
C x C

DIMENSIONS—WEIGHTS—QUANTITIES

Size		Dimensions A		B		C		T-211		S-211		Master Ctn. Qty.	
In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.	Lbs.	Kg.	T-211	S-211
*⅛†	6	2.38	60	3.38	86	1.81	46	1.01	0.46	0.98	0.44	50	50
*¼†	8	2.38	60	3.38	86	1.81	46	1.00	0.45	0.94	0.43	50	50
*⅜†	10	2.38	60	3.38	86	1.81	46	0.98	0.45	0.93	0.42	50	50
*½†	15	2.56	65	3.38	86	1.69	43	1.03	0.47	0.95	0.43	50	50
¾	20	3.06	78	4.88	124	2.25	57	1.73	0.79	1.80	0.82	30	30
1	25	3.69	94	5.69	145	2.81	72	2.85	1.29	2.87	1.30	20	20
1¼	32	4.31	110	6.13	156	3.06	78	3.79	1.72	3.55	1.61	10	10
1½	40	4.69	119	7.38	187	3.56	91	5.90	2.68	5.70	2.58	10	10
2	50	5.63	143	7.94	202	4.44	113	8.68	3.94	8.91	4.04	6	4
2½	65	6.63	168	10.19	259	5.25	133	15.40	6.98	15.92	7.22	2	2
3	80	7.75	197	11.19	284	6.50	165	22.44	10.18	21.32	9.67	2	2

*** Stem and Disc (or Disc Holder) are integral.**

† No packing gland, packing only in these sizes.

FREEZING WEATHER PRECAUTION: Subsequent to testing a piping system, valves should be left in an open position to allow complete drainage.

◆ For detailed Operating Pressure, refer to Pressure Temperature Chart on page 113.

NIBCO INC. WORLD HEADQUARTERS • 1516 MIDDLEBURY ST. • ELKHART, IN 46516-4740 • USA • PH: 1.800.234.0227
TECH SERVICES PH: 1.888.446.4226 • FAX: 1.888.234.0557 • INTERNATIONAL OFFICE PH: +1.574.295.3327 • FAX: +1.574.295.3455
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ASHCROFT®
Trust the shield.™

Type 1005P, XUL Fire Protection Sprinkler Service Gauge

Shown with Optional Rubber Boot

FEATURES

- *Underwriters Laboratory listed and Factory Mutual approved*
- *Corrosion-resistant ABS case*
- *Heat-resistant polycarbonate push-in window*
- *Patented PowerFlex™ movement with polyester segment*
- *True Zero™ indication, a unique safety feature*

Ashcroft® fire protection sprinkler gauges are Underwriters Laboratory listed and Factory Mutual approved for fire protection sprinkler service. The case material on Type 1005P, XUL gauges is ABS. The 0-300 psi pressure range is used on "wet" systems where water is available to the sprinkler heads. The 0-80 retard to 250 psi pressure range is used on dry systems where the lines are filled with air pressure until system activation. The 0-600 psi gauge is available for systems requiring higher pressures.

Due to global demands for fire protection sprinkler gauges, Ashcroft offers UL listed, triple scale (bar, kPa, psi) dial gauges.

The patented PowerFlex™ movement with polyester segment is designed to provide unequalled shock and vibration resistance resulting in superior performance and extended gauge life.

True Zero™ indication, a standard feature on these gauges, reduces the potential risk of installing a damaged gauge on your equipment.

PRODUCT SPECIFICATIONS

Ashcroft® Model No.:	1005P, XUL
Accuracy:	ASME B 40.100 Grade B (±3-2-3% of span)
Size:	3½″
Case:	ABS (Polycarbonate blend)
Ring:	None
Window:	Polycarbonate, push-in
Dial:	Black figures on white background
Pointer:	Black, aluminum
Bourdon tube:	"C" shaped bronze
Movement:	Patented Power*Flex™* with polyester segment
Socket:	Brass
Restrictor:	None
Connection:	¼ NPT lower
Ranges:	Single, dual or triple scale 0-300 psi (water) 0-80 retard to 250 psi (air) 0-600 psi
Operating temperature:	–40°F to 150°F; –40°C to 65°C

UL 393 Listed, UL of Canada Listed and FM approved. Equivalent (single or dual scale) metric scales are available

OPTIONAL FEATURES

Customized dials
Other UL listed ranges on application
Black Rubber Gauge Boot

HOW TO ORDER (Typical example)

35	W	1005	P	H	02L	XUL	300#

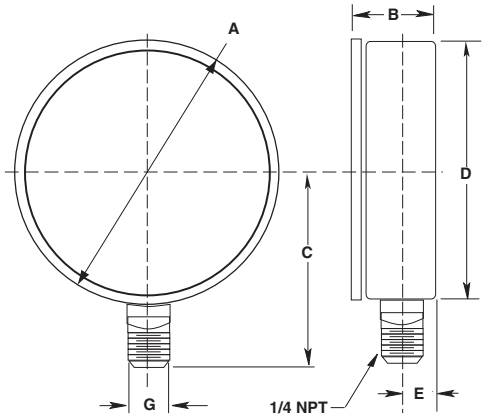
Dial Size: 3½″
Movement: Patented Power*Flex*™
Case Type Number: 1005P
Case Material: ABS
Socket Material: Brass
Connection Size/Location: ¼ NPT Lower
Listing: UL listed, FM approved
Range: 0/300 psi

ISO 9001
REGISTERED FIRM
BULLETIN CSG-3

Ashcroft Inc., 250 East Main Street, Stratford, CT 06614 USA
Tel: 203-378-8281 • Fax: 203-385-0408
email: info@ashcroft.com • www.ashcroft.com

Type 1005P, XUL Fire Protection Sprinkler Service Gauge

DIMENSIONS



SIZE/TYPE	A	B	C	D	E	G	Weight
3½″ 1005P, XUL	3.70	1.14	2.72	3.61	0.47	0.56	5.36 oz
	(94)	(29)	(69)	(92)	(11.9)	(14.2)	0.152 kg

Ashcroft Inc., 250 East Main Street, Stratford, CT 06614 USA
Tel: 203-378-8281 • Fax: 203-385-0408
email: info@ashcroft.com • www.ashcroft.com

POTTER ROEMER FIRE PRO™
Member of Morris Group International™

SPECIALTY ITEMS
AUTOMATIC SPRINKLER SYSTEM ACCESSORIES

Model/Series No.
6160-6184 SERIES

SPECIFICATIONS

GUARD
Cadmium plated wire cage used for sprinkler head protection.

SPARE HEAD BOX
Red glossy polyester coated steel box used to store sprinklers for emergency replacement. Will accommodate up to twelve 1/2" or 3/4" heads and sprinkler wrench.

BAFFLE
Galvanized 18" x 18" steel, used to prevent open sprinkler from cooling adjoining sprinklers when spaced less than 6' apart.

LINE TESTER
Forged brass body, 1" female N.P.T. inlet x 1/2" female outlet (sprinkler head) x 1" N.P.S.H. drain outlet with cap and chain and wrench operated shutoff. Used to install the last sprinkler head on system branch lines, controls water flow fo flushing or testing of the system.

PITOT TUBE
Chrome plated 16-1/2" long tube with rubber grip. 3-1/2" pressure gauge with recalibration adjustment. Used to conduct residual pressure and flow tests on standpipe and sprinkler systems. Furnished with computation table.

TEST GAUGES
Used to conduct pressure tests on standpipe or sprinkler systems. Size and type as selected by model number.

MODEL SELECTION

- ❑ **6160** Guard
- ❑ **6162** Spare Head Box
- ❑ **6165** Baffle
- ❑ **6175** Line Tester
- ❑ **6177** Pitot Tube
- ❑ **6181** 1-1/2" Adapter Type Test Gauge
- ❑ **6182** 2-1/2" Adapter Type Test Gauge
- ❑ **6183** 1-1/2" Cap Type Test Gauge
- ❑ **6184** 2-1/2" Cap Type Test Gauge

PRODUCT OPTIONS

OPTION: (Model 6177 Only)

❑ -C White glossy polyester coated carrying case with foam lining

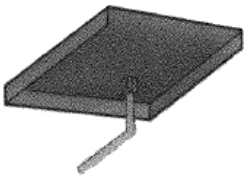
PITOT TUBE

MODEL 6177 (Shown)

MODELS

GUARD
MODEL 6160

SPARE HEAD BOX
MODEL 6162



BAFFLE
MODEL 6165

LINE TESTER
MODEL 6175

TEST GAUGES
MODEL 6181-6182

TEST GAUGES
MODEL 6183-6184

6160-6184 SERIES Date: 09/20/18

MEMBERSHIP

POTTER ROEMER/FIRE PRO
Headquarters:
P.O. Box 3527
City of Industry, CA
91744 U.S.A.
Los Angeles Area
800-366-3473
626-855-4890

Also in:
New York (800) 526-4592
Chicago (800) 547-3473
Atlanta (800) 762-0542
Miami (866) 961-3473
Dallas (866) 644-3473

www.potterroemer.com

FireLock® V27, K5.6
Models V2703, V2707, V2704, V2708

40.10

V2703/V2704
Upright

V2707/V2708
Pendent

V2707/V2708
Recessed Pendent

V2707/V2708
Pendent w/V9

V2703/V2704
Upright w/V9

1.0 PRODUCT DESCRIPTION

Models: V2703, V2704, V2707, V2708

Style: Pendent, Upright or Recessed Pendent

Nominal Orifice Size: 1/2"/13 mm

K Factor: 5.6 Imp./8.1 S.I.[1]

Nominal Connection Size: 1/2" NPT/20 mm BSPT/IGS Grooved

Max. Working Pressure:

- 175 psi/1200 kPa (FM)
- 250 psi/1725 kPa (UL)

Factory Hydrostatic Test: 100% @ 500 psi/3450 kPa

Min. Operating Pressure:

- 7 psi/48 kPa
- 0.35 bar/5 psi (VdS for upright only)

Temperature Rating: See chart

[1] For K-Factor when pressure is measured in Bar, multiply S.I. units by 10.0.

2.0 CERTIFICATION/LISTINGS

c UL us LISTED · FM · LPCB · VdS · CE 0786

Threaded and IGS connections have different approvals/listings. See tables on pages 2 and 3.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

2.0 CERTIFICATION/LISTINGS (CONTINUED)

Threaded Sprinkler Approvals/Listings:

APPROVALS/LISTINGS	Model					
	V2703	V2707	V2707	V2704	V2708	V2708[3]
Orifice Size (inches)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Orifice Size (mm)	13	13	13	13	13	13
Nominal K Factor Imperial	5.6	5.6	5.6	5.6	5.6	5.6
Nominal K Factor S.I.[2]	8.1	8.1	8.1	8.1	8.1	8.1
Response	Standard	Standard	Standard	Quick	Quick	Quick
Deflector Type	Upright	Pendent	Recessed Pendent	Upright	Pendent	Recessed Pendent
Approved Temperature Ratings	**F°/C°**					
cULus	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C 500°F/260°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C 500°F/260°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
FM	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
NYC/MEA 62-99-E	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
CSFM 7690-0531:112	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
LPCB	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	None	None	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C	None	None
CCC	ZSTZ 155°F/68°C 200°F/93°C	ZSTX 155°F/68°C 200°F/93°C	None	K-ZSTZ 155°F/68°C 200°F/93°C	K-ZSTZ 155°F/68°C 200°F/93°C	None
VdS	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	None	None	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	None	None
CE	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	None	None	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	None	None

[2] For K Factor when pressure is measured in Bar, multiply S.I. units by 10.0

[3] FM Approved with ½" adjustment escutcheon only - quick response

NOTE

- Listings and Approvals as of printing. All are approved open.

2.0 CERTIFICATION/LISTINGS (CONTINUED)

IGS Sprinkler Approvals/Listings

APPROVALS/LISTINGS	Model			
	V2703	V2707	V2704	V2708
Orifice Size (inches)	1/2"	1/2"	1/2"	1/2"
Orifice Size (mm)	13	13	13	13
Nominal K-Factor Imperial	5.6	5.6	5.6	5.6
Nominal K-Factor S.I.[2]	8.1	8.1	8.1	8.1
Response	Standard	Standard	Quick	Quick
Deflector Type	Upright	Pendent	Upright	Pendent
Adjustment				
Approved Temperature Ratings	**F°/C°**			
cULus	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C 500°F/260°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C 500°F/260°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C
FM	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C 360°F/182°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C

[2] For K-Factor when pressure is measured in bar, multiply S.I. units by 10.0

NOTE

- Listings and Approvals as of printing. All are approved open.

3.0 SPECIFICATIONS – MATERIAL

Upright Deflector: Bronze

Pendent Deflector: Bronze

Bulb: Glass with glycerin solution

Bulb Nominal Diameter:

- ☐ Standard: 5.0 mm
- ☐ Quick Response: 3.0 mm

Load Screw: Bronze

Pip Cap: Bronze

Spring: Beryllium nickel

Seal: PTFE tape

Frame: Die cast brass

Lodgement Spring: Stainless steel

Installation Wrench:

- ☐ Open End: V27
- ☐ Recessed: V27-2
- ☐ 3/16 Hex Bit: V9 coupling

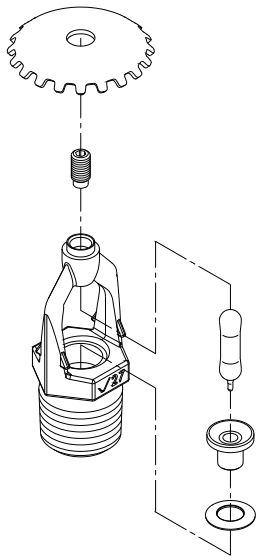
Sprinkler Finishes:

- ☐ Plain Brass[4]
- ☐ Chrome plated
- ☐ White polyester coated[5]
- ☐ Black painted[5]
- ☐ Custom painted[5]
- ☐ VC-250[6]

4 Plain Brass is only available for the V9 coupling.

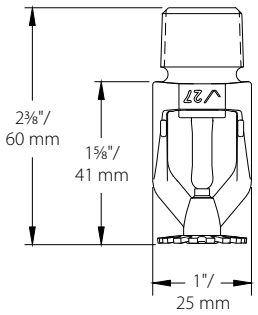
5 UL Listed for corrosion resistance.

6 UL Listed and FM Approved for corrosion resistance.

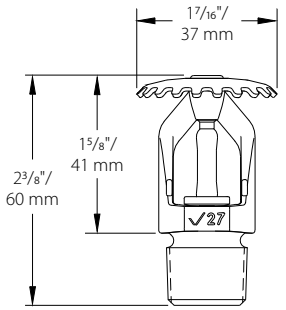


Exaggerated for clarity

4.0 DIMENSIONS



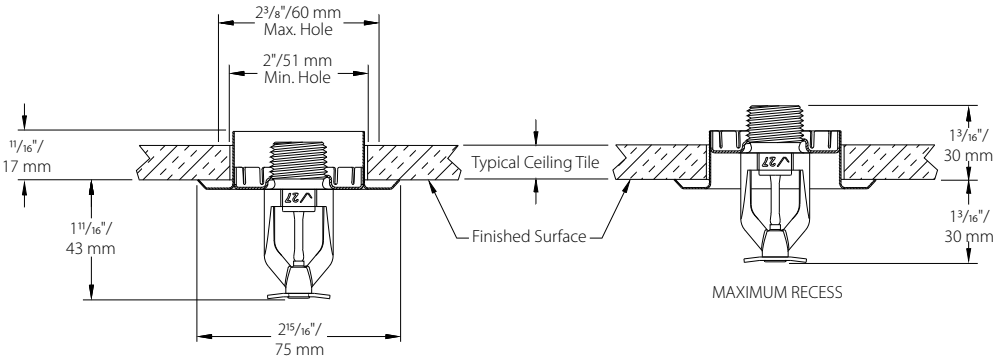
Standard Pendent with/without standard V9 coupling – V2707, V2708



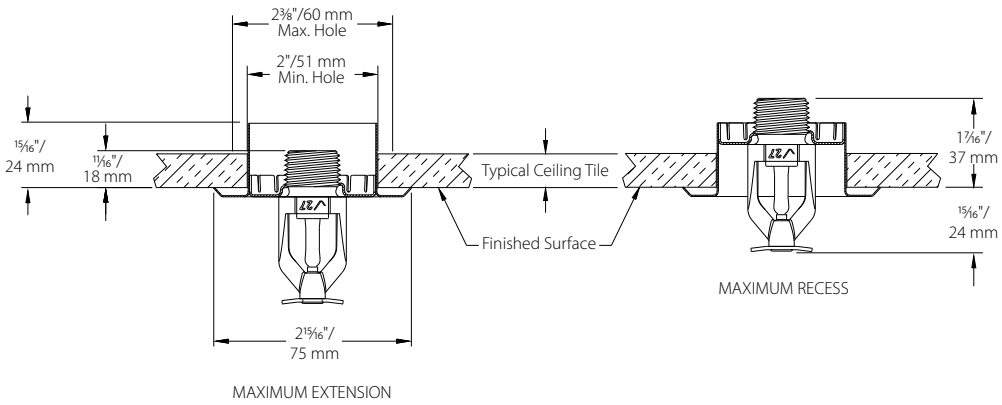
Standard Upright with/without standard V9 coupling – V2703, V2704

NOTE:

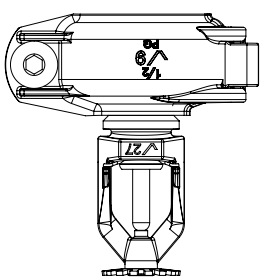
- V27, K5.6 sprinklers with Style V9 coupling dimensions are the same as threaded sprinkler dimensions.



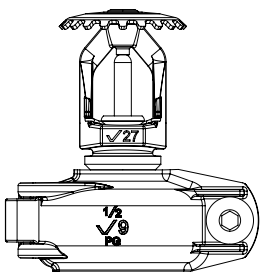
½" Adjustment Recessed – V2707, V2708 (drawing not to scale)



¾" Adjustment Recessed – V2707, V2708 (drawing not to scale)



Standard Pendent with V9 Sprinkler Coupling – V2707, V2708



Standard Upright with V9 Sprinkler Coupling – V2703, V2704

NOTE:

- IGS options are not available for recessed applications.

5.0 PERFORMANCE

Sprinkler is to be installed and designed as per NFPA, FM Datasheets, or any local standards.

6.0 NOTIFICATIONS

⚠ WARNING

- **Always read and understand installation, care, and maintenance instructions, supplied with each box of sprinklers, before proceeding with installation of any sprinklers.**
- **Always wear safety glasses and foot protection.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Installation rules, especially those governing obstruction, must be strictly followed.**
- **Painting, plating, or any re-coating of sprinklers (other than that supplied by Victaulic) is not allowed.**

Failure to follow these instructions could result in serious personal injury and/or property damage.

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to the current National Fire Protection Association pamphlet that describes care and maintenance of sprinkler systems. In addition, the authority having jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

If you need additional copies of this publication, or if you have any questions about the safe installation of this product, contact Victaulic World Headquarters: P.O. Box 31, Easton, Pennsylvania 18044-0031 USA, Telephone: 001-610-559-3300.

7.0 REFERENCE MATERIALS

Ratings

All glass bulbs are rated for temperatures from –65°F/–54°C to those shown in table below.

Sprinkler Temperature Classification	Victaulic Part Identification	Temperature – °F/°C		Glass Bulb Color
		Nominal Temperature Rating	Maximum Ambient Temperature Allowed	
Ordinary	A	135°F/57°C	100°F/38°C	Orange
Ordinary	C	155°F/68°C	100°F/38°C	Red
Intermediate	E	175°F/79°C	150°F/65°C	Yellow
Intermediate	F	200°F/93°C	150°F/65°C	Green
High	J	286°F/141°C	225°F[8]/107°C	Blue
Extra High[7]	K	360°F/182°C	300°F/149°C	Purple
–	M	Open	–	No bulb
Ultra High[7]	N	500°F/260°C	475°F/246°C	Black

[7] Standard response only.

Available Wrenches:

Sprinkler Type	V27-2 Recessed	V27 Open End	Hex-Bit
V2707, V2708 Pendent	✓	✓	–
V2707, V2708 Recessed Pendent	✓	–	–
V2703, V2704 Upright	–	✓	–
V2703, V2704 Upright w/V9	–	–	✓
V2707, V2708 Pendent w/V9	–	–	✓

NOTE

- 3/16-inch hex bit provided with V9 coupling shipment.

29.01: Victaulic Terms and Conditions of Sale

I-40: Victaulic FireLock™ Automatic Sprinklers

I-V9: Style V9 Victaulic FireLock™ IGS™ Installation-Ready™ Sprinkler Coupling Installation Instructions

FireLock™ V38, K5.6
Models V3801, V3802

40.50

V3801 and V3802

1.0 PRODUCT DESCRIPTION

Models: V3801 and V3802

Style: Adjustable Concealed, Ordinary Hazard and Light Hazard

K Factor: 5.6 Imp./8.1 S.I.[1]

Nominal Thread Size: ½" NPT/15 mm BSPT

Max. Working Pressure: 175 psi/1207 kPa/12 bar

Factory Hydrostatic Test: 100% @ 500 psi/3447 kPa/34 bar

Min. Operating Pressure: 7 psi/48 kPa/0.5 bar

Temperature Rating: See chart in section 2.0

[1] For K-Factor when pressure is measured in bar, multiply S.I. units by 10.0.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

2.0 CERTIFICATION/LISTINGS

c UL us LISTED FM CE 0832 LPCB 104-1a/02 CCC

Approvals/Listings

Approvals/Listings	Model	
	V3801	V3802
Orifice Size (mm)	13	13
Nominal K Factor Metric S.I.[2]	8.1	8.1
Deflector Type	Concealed Pendent	Concealed Pendent

Approved Temperature Ratings	F°/C°	
cULus	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
FM[3]	NONE	155°F/68°C 175°F/79°C 200°F/93°C
NYC/MEA[3] #62-99-E	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
CSFM[3] #7690-0531:112	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C
LPCB	155°F/68°C Sprinkler/138°F/59°C Cover 175°F/79°C Sprinkler/165°F/74°C Cover 200°F/93°C Sprinkler/165°F/74°C Cover	155°F/68°C Sprinkler/138°F/59°C Cover 175°F/79°C Sprinkler/165°F/74°C Cover 200°F/93°C Sprinkler/165°F/74°C Cover
VNIIPO	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C	135°F/57°C 155°F/68°C 175°F/79°C 200°F/93°C 286°F/141°C
CCC	ZSTDY 155°F/68°C	K ZSTDY 155°F/68°C 200°F/93°C

[2] For K-Factor when pressure is measured in bar, multiply S.I. units by 10.0.

[3] Recognized by FM as standard response only.

NOTE

- Listings and approvals as of printing. All are approved open.

3.0 SPECIFICATIONS – MATERIAL

Deflector: Bronze

Cover Plate: Fusible solder

Bulb: Glass with glycerin solution

Bulb Nominal Diameter:

- ☐ Standard: 5,0 mm
- ☐ Quick Response: 3,0 mm

Load Screw: Bronze

Pip Cap: Bronze

Spring: Beryllium Nickel

Seal: Teflon[4] tape

Frame: Brass

Pins: Stainless steel

Cup: Cold rolled steel, zinc chrome plated

Cover/Escutcheon: Brass

Lodgement Spring: Stainless steel

Protective Cap: Polyethylene

Installation Wrench:

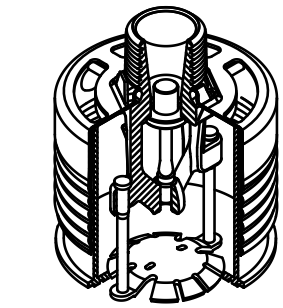
- ☐ Concealed: V38-4 or V38-5

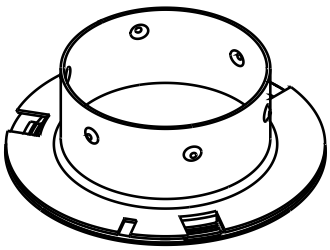
Sprinkler Finishes:

- ☐ Plain Brass (only)

Cover Finishes:

- ☐ Chrome Plated
- ☐ White painted[5]
- ☐ Flat Black Painted[5]
- ☐ Custom Painted[5]

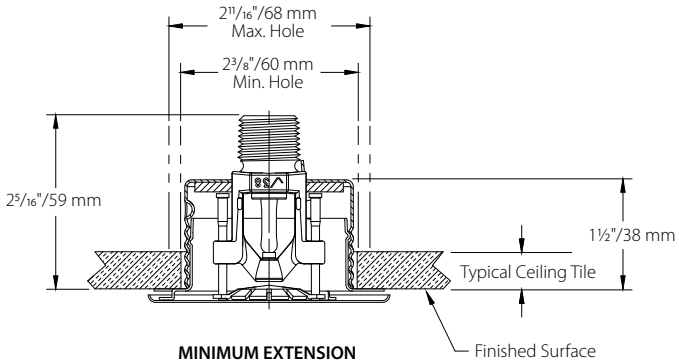




[4] Teflon is a registered trademark of Dupont Co.

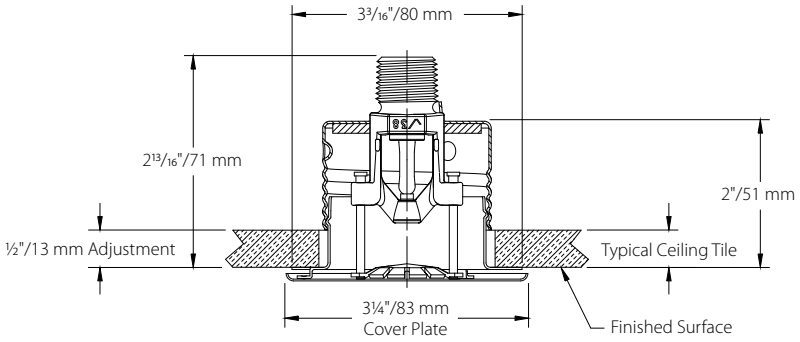
[5] UL Listed for corrosion resistance.

4.0 DIMENSIONS



MINIMUM EXTENSION

(drawings not to scale)



MAXIMUM EXTENSION

(drawings not to scale)

5.0 PERFORMANCE

Sprinkler is to be installed and designed as per NFPA, FM Datasheets, or any local standards.

6.0 NOTIFICATIONS

⚠ WARNING

- **Always read and understand installation, care, and maintenance instructions, supplied with each box of sprinklers, before proceeding with installation of any sprinklers.**
- **Always wear safety glasses and foot protection.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**
- **Installation rules, especially those governing obstruction, must be strictly followed.**
- **Painting, plating, or any re-coating of sprinklers (other than that supplied by Victaulic) is not allowed.**

Failure to follow these instructions could result in serious personal injury and/or property damage.

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to the current National Fire Protection Association pamphlet that describes care and maintenance of sprinkler systems. In addition, the authority having jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

If you need additional copies of this publication, or if you have any questions about the safe installation of this product, contact Victaulic World Headquarters: P.O. Box 31, Easton, Pennsylvania 18044-0031 USA, Telephone: 001-610-559-3300.

7.0 REFERENCE MATERIALS

Ratings:

All glass bulbs are rated for temperatures from –67°F (–55°C) up to those shown in table below.

Sprinkler	Sprinkler – V3801, V3802				Cover – V38		
		Temperature – °F/°C				Temperature – °F/°C	
Temperature Classification	Victaulic Part Identification	Nominal Temperature Rating	Maximum Ambient Temperature Allowed	Glass Bulb Color	Victaulic Part Identification	Nominal Temperature Rating	Maximum Ambient Temperature Allowed
Ordinary	A	135°F/57°C	100°F/38°C	Orange	A[6]	135°F/57°C	100°F/38°C
Ordinary	C	155°F/68°C	100°F/38°C	Red	D[7]	165°F/74°C	150°F/65°C
Intermediate	E	175°F/79°C	150°F/65°C	Yellow			
Intermediate	F	200°F/93°C	150°F/65°C	Green			
High	J	286°F/141°C	225°F/107°C	Blue			
Extra High[8]	K	360°F/182°C	300°F/149°C	Purple			
–	M	Open	–	No Bulb			

6 A For use with Standard or Quick Response Concealed Sprinkler 135°F/57°C or 155°F/68°C.

7 D For use with Standard or Quick Response Concealed Sprinkler 175°F/79°C or 200°F/93°C.

8 138°F/59°C per LPCB

NOTE

- Custom Finish – Customer to provide paint specification, allow 4 – 6 weeks for samples.

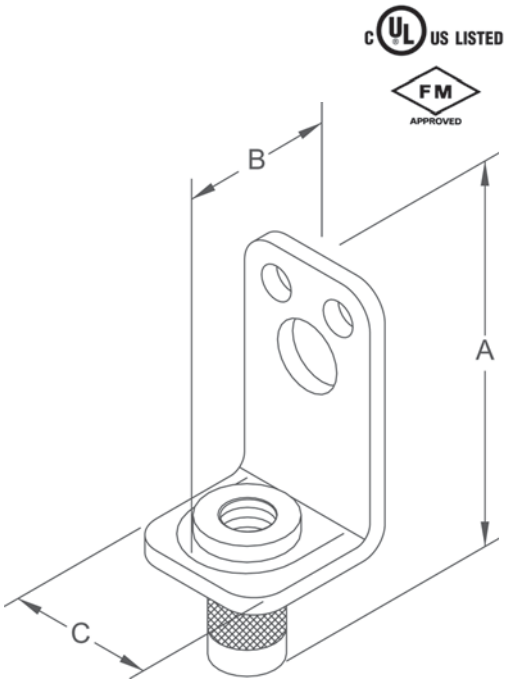
Available Wrenches:

Sprinkler Type	Recessed
Concealed Pendent – V3801, V3802	V38-4 or V38-5

29.01: Victaulic® Terms and Conditions of Sale

I-40: Victaulic® FireLock™ Automatic Sprinklers

Fig. 58 - Threaded Side Beam Bracket



Size Range — 3/8" rod, pipe sizes 1/2" thru 4"

Material — Carbon Steel

Function — Practical and economical bracket used to support piping from wood, concrete or steel beams.

Features — Unique design allows rod to be easily threaded into bracket. Offset design permits unlimited rod adjustment. Center mounting hole will accept 3/8" and 1/2" fastener bolts. Per NFPA 13: 1/2" thru 2" pipe requires 3/8" fastener, 2½" thru 4" pipe requires 1/2" fastener.*

Approvals — Underwriters' Laboratories Listed in the USA **(UL)** and Canada **(cUL)**, and Factory Mutual Engineering approved thru 4" pipe.

***Note** — Additionally **UL** has listed the Fig. 58 with fasteners as shown in table below.

Finish — Plain

Note — Available in Electro-Galvanized finish.

Order By — Figure number and finish

UL Listed Fastener Table

Pipe Size	Qty.	Fastener Type	Material
2	2	#16 x 2 Drive Screws	Wood
2	1	3/8 Lag Bolt	Wood
2½ - 4	1	1/2 Lag Bolt	Wood
3½	2	1/4 x 1½ Lag Bolt	Wood
4	2	1/4 x 2 Lag Bolts*	Wood
4	2	1/4 x 1 tek screws	14 gauge
4	2	1/4 x 1 tek screws	16 gauge

* No pre-drilling required

Dimensions • Weights

Pipe Size	Rod Size	A	B	C	Max. Rec. Load Lbs.*	Approx. Wt./100
1/2 thru 4	3/8	2¾	1½	1⅛	300	14

* With safety factor of 5.

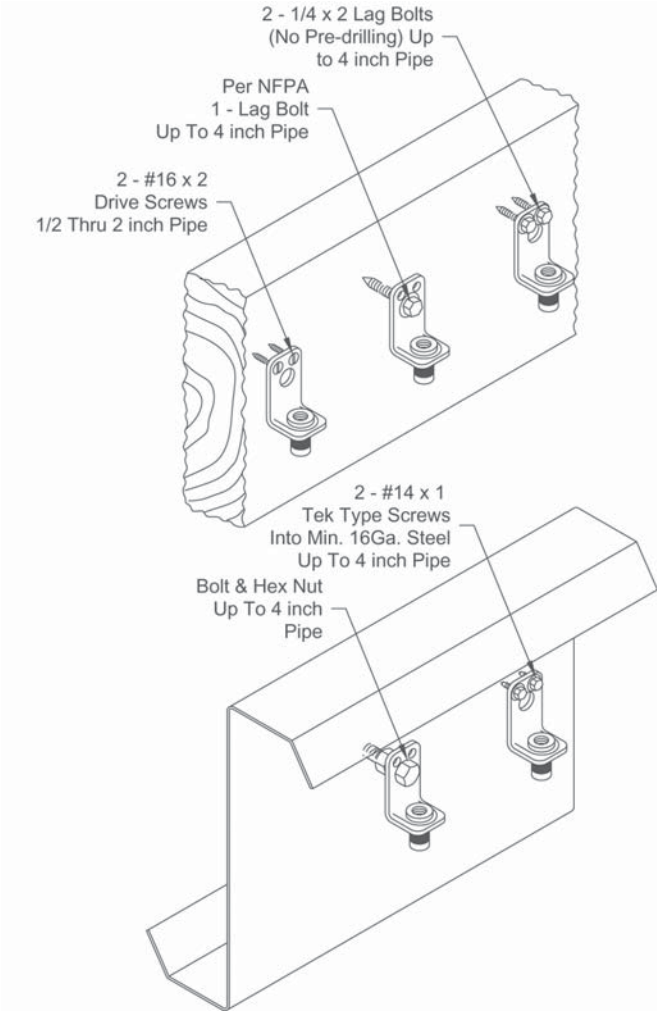
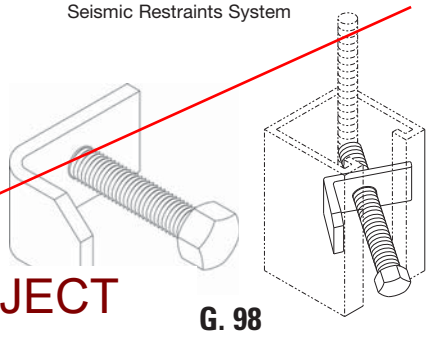


Fig. 98 - Rod Stiffener
Fig. 98B - Rod Stiffener w/Break-off Bolt Head

Component of State of California OSHPD Approved Seismic Restraints System

Size Range — Secures 3/8" thru 7/8" hanger rod
Material — Carbon Steel
Function — Secures channel to hanger rod for vertical seismic bracing.
Approvals — Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD pr Seismic Restraint Systems Guide
Finish — Electro Galvanized
Note — Available in HDG finish or Stainless Steel materials.
Order By — Figure number

NOT USED IN THIS PROJECT



G. 98

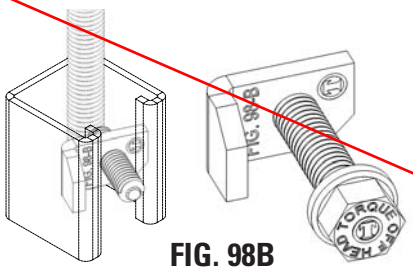
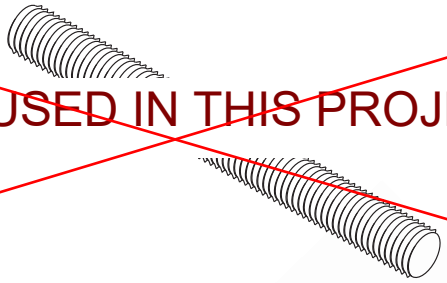


FIG. 98B

Fig. 99 - All Thread Rod Cut to Length

Size Range — Secures 3/8" thru 7/8" rod in 1" increments
Material — Carbon Steel
Maximum Temperature — 750°F
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order By — Figure number, rod diameter, rod length and finish

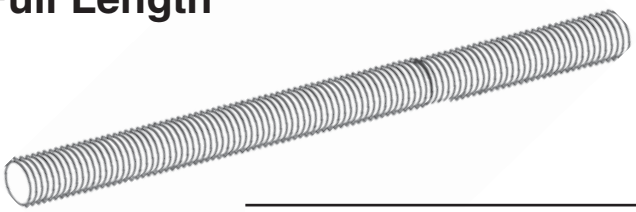
NOT USED IN THIS PROJECT



Dimensions	
Rod	Max. Rec. Load Lbs. For Service Temp 650°F
3/8	730
1/2	1350
5/8	2160
3/4	3230
7/8	4480

Fig. 100 - All Thread Rod Full Length

Size Range — Secures 3/8" thru 1½" rod in 10' lengths
Material — Carbon Steel
Maximum Temperature — 750°F
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order By — Figure number, rod diameter and finish



Dimensions • Weights		
Rod Size	Max Rec. Load Lbs. For Service Temps 650°F	Approx. Wt./100
1/4	240	12
3/8	730	29
1/2	1350	53
5/8	2160	84
3/4	3230	123
7/8	4480	169
1	5900	222
1¼	9500	360
1½	13800	510

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Fig. 65 and Fig. 66
Reversible C-Type Beam Clamps 3/4" and 1¼" Throat Openings

Component of State of California OSHPD Approved Seismic Restraints System

Size Range — (Fig. 65 and Fig. 66) 3/8", 1/2" and 5/8" rod

Material — Carbon Steel with hardened cup point set screw and jam nut

Function — Recommended for hanging from steel beam where flange thickness does not exceed 3/4" (Fig. 65) or 1¼" (Fig. 66).

Features — All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of the beam. (Beveled lip allows hanging from top flange where clearance is limited.) May be installed with set screw in up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp. Open design permits inspection of thread engagement.

Approvals — Underwriters' Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Exceeds requirements of the National Fire Protection Association (NFPA), Pamphlet 13, 3/8" rod will support 1/2" thru 4" pipe, 1/2" rod will support 1/2" thru 8" pipe. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish.

Order By — Figure number, rod size and finish

Fig. 65 Patent #4,570,885

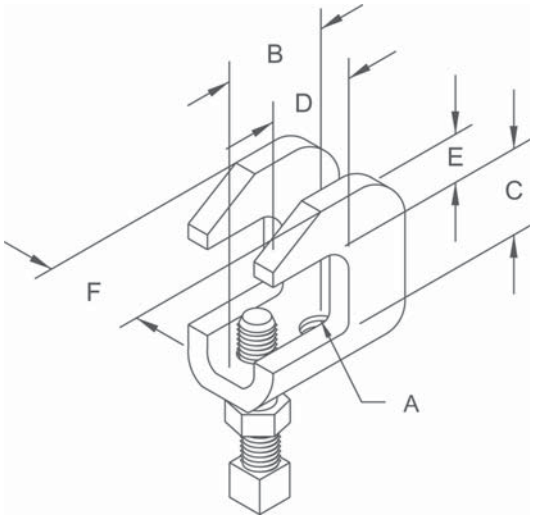


Fig. 65

Dimensions • Weights

Rod Size A	B	C	D	E	F	Max. Rec. Load Lbs.*	Approx. Wt./100
3/8	1 3/16	3/4	1	7/16	1	610	28
1/2	1½	3/4	1	9/16	1¼	1130	55
5/8	1½	3/4	1	9/16	1¼	1130	55

* Max. loads for clamp with set screw in up or down position.

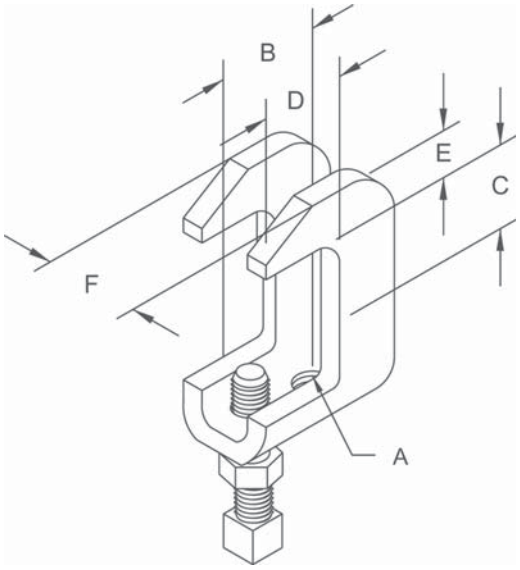


Fig. 66

Dimensions • Weights

Rod Size A	B	C	D	E	F	Max. Rec. Load Lbs.*	Approx. Wt./100
3/8	1 3/16	1¼	1	7/16	1	610	28
1/2	1½	1¼	1	9/16	1¼	1130	55
5/8	1½	1¼	1	9/16	1¼	1130	55

* Max. loads for clamp with set screw in up or down position.

Fig. 69 - Beam Clamp Retaining Strap

Component of State of California OSHPD Approved Seismic Restraints System

c UL US LISTED

Size Range — 3/8" thru 7/8" rod by 4" thru 16" length.*

Material — Pre-Galvanized Steel

Function — To offer more secure fastening of various types of beam clamps to beam where danger of movement might be expected. NFPA 13 requires the use of retaining straps with all beam clamps installed in earthquake areas. Satisfies requirements of NFPA 13 (2010) 9.3.7.1 .

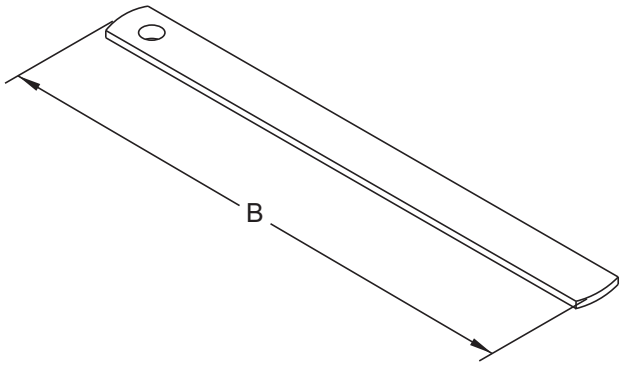
Important Note — Good installation practice of a retaining strap requires that the strap be held tightly and securely to all component parts of the assembly. Therefore a locking mechanism of some kind such as a hex nut or the beveled locking slot on the TOLCO® Fig. 69R will provide a more secure reliable installation.

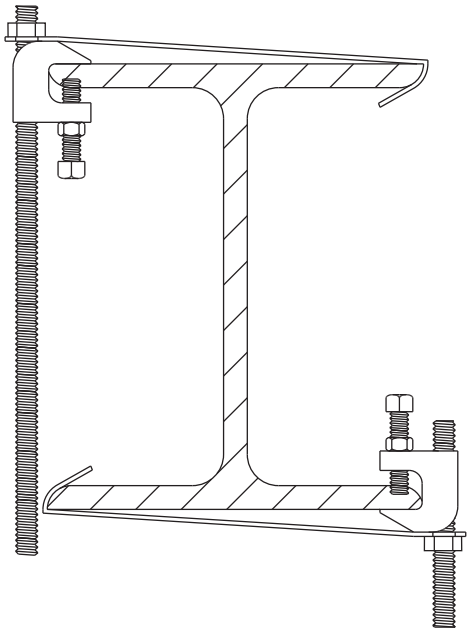
Approvals — Underwriters' Laboratories listed in the USA **(UL)** and Canada **(cUL)**. Approved for use with any listed beam clamp. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Finish — Pre-Galvanized

Order By — Figure number, type, length "B" and rod size being used with beam clamp

Note — Minimum return on Strap: 1".





Dimensions

Type	Rod Size A	Hole Size	B
1	3/8	7/16	Specify
	1/2	9/16	Specify
2	5/8	11/16	Specify
	3/4	13/16	Specify
3	3/8 - 7/8	Specify	Specify

* Longer lengths are available, consult factory.

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Fig. 200 - "Trimline" Adjustable Band Hanger
Fig. 200R (Import) - "Trimline" Adjustable Band Hanger w/Retainer Ring

c UL US LISTED
FM APPROVED

Size Range — 1/2" thru 8" pipe

Material — Carbon Steel, Mil. Galvanized to G90 specifications

Function — For fire sprinkler and other general piping purposes. Knurled swivel nut design permits hanger adjustment after installation.

Features —

- (1/2" thru 2") Flared edges ease installation for all pipe types and protect CPVC plastic pipe from abrasion. Captured design keeps adjusting nut from separating with hanger. Hanger is easily installed around pipe.
- (2½" thru 8") Spring tension on nut holds it securely in hanger before installation. Adjusting nut is easily removed.

Approvals — Underwriters' Laboratories listed (1/2" thru 8") in the USA **(UL)** and Canada **(cUL)** for steel and CPVC plastic pipe and Factory Mutual Engineering Approved (3/4" thru 8"). Conforms to Federal Specifications WW-H-171E, Type 10 and Manufacturers Standardization Society SP-69, Type 10.

Maximum Temperature — 650°F

Finish — Mil. Galvanized. Stainless Steel materials will be supplied with (2) hex nuts in place of a knurl nub.

Order By — Figure number and pipe size

Note — Figure 200R (import) with retainer ring and non-captured knurl nut.

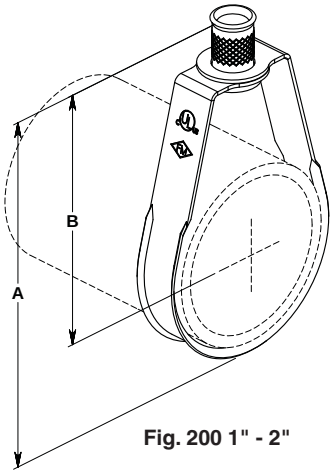


Fig. 200 1" - 2"

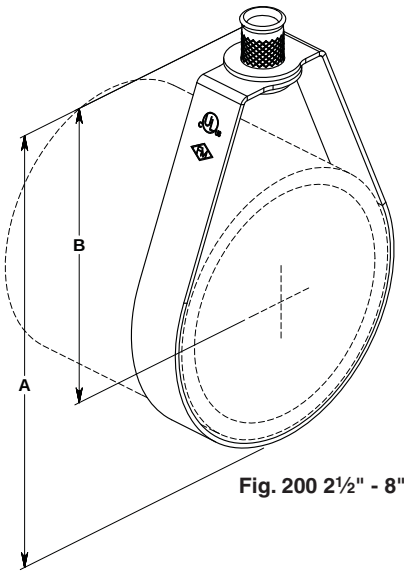


Fig. 200 2½" - 8"

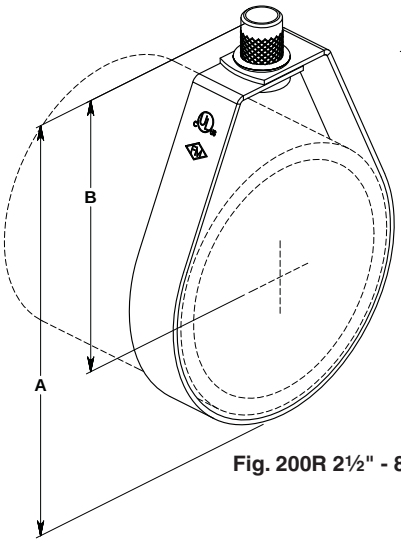


Fig. 200R 2½" - 8"

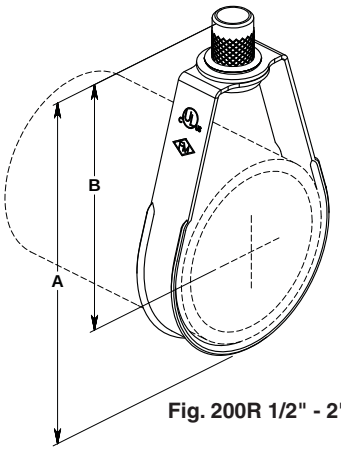


Fig. 200R 1/2" - 2"

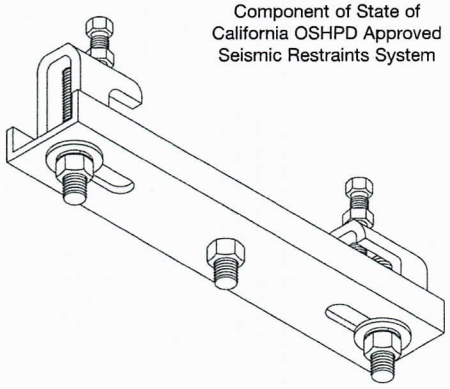
Dimensions • Weights

Pipe Size	Rod Size Inch	Rod Size Metric	A	B	Max. Rec. Load Lbs.	Approx. Wt./100
1/2	3/8	8mm or 10mm	3⅛	2⅝	400	11
3/4	3/8	8mm or 10mm	3⅛	2½	400	11
1	3/8	8mm or 10mm	3⅜	2⅝	400	12
1¼	3/8	8mm or 10mm	3¾	2⅞	400	13
1½	3/8	8mm or 10mm	3⅞	2⅞	400	14
2	3/8	8mm or 10mm	4½	3	400	15
2½	3/8	10mm	5⅝	4⅛	600	27
3	3/8	10mm	5⅞	4	600	29
3½	3/8	10mm	7⅜	5¼	600	34
4	3/8	10mm	7⅜	5	1000	35
5	1/2	12mm	9⅛	6¼	1250	66
6	1/2	12mm	10⅛	6¾	1250	73
8	1/2	12mm	13⅛	8¾	1250	136

Fig. 800 - Adjustable Sway Brace Attachment to Steel

c UL us LISTED
FM APPROVED

Component of State of California OSHPD Approved Seismic Restraints System



Size Range — 4" thru 18" beam width

Material — Carbon Steel

Function — Seismic brace attachment to steel.

Features — This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of **concentric** loading of connections and fasteners. Permits secure connection to steel where drilling and/or welding of brace connection could present structural issues.

Installation Instructions — The Fig. 800 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

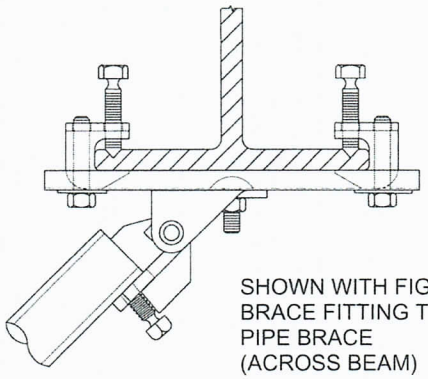
To Install — Place the Fig. 800 on the steel beam, tighten the cone point set bolts on flange until bolt heads break off. Tighten hex head bolts into clamp body until lock washers are fully flat. Attach other TOLCO transitional attachment fitting, Fig. 909, 910, 980 or 986. Transitional fitting attachment can pivot for adjustment to proper brace angle.

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

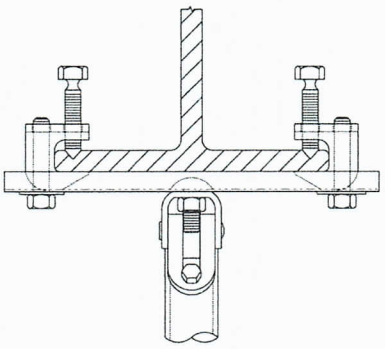
Finish — Plain

Note — Available in Electro-Galvanized and HDG finish.

Order By — Figure number, type number and size number.



SHOWN WITH FIG. 980 BRACE FITTING TO PIPE BRACE (ACROSS BEAM)



SHOWN WITH FIG. 980 BRACE FITTING TO PIPE BRACE (ALONG BEAM)

Dimensions • Weights

Size	Fits Beam Range (In.)	Max. Design Loads/Lbs. (cULus) Along Beam	Max. Design Loads/Lbs. (cULus) Across Beam	Max. Design Load Lbs. (FM)* Along Beam	Max. Design Load Lbs. (FM)* Across Beam
1	4 - 6	1265	2015	2800	2800
2	6 - 8	1265	2015	2800	2800
3	8 - 10	1265	2015	2800	2800
4	10 - 12	1265	2015	2800	2800
5	12 - 14	1265	2015	2800	2800
6	14 - 16	1265	2015	2800	2800
7	16 - 18	1265	2015	2800	2800

Dimensions • Weights

Type	Flange Thickness Max. (In.)	Max. Design Loads/Lbs. (cULus) Along Beam	Max. Design Loads/Lbs. (cULus) Across Beam	Max. Design Load Lbs. (FM)* Along Beam	Max. Design Load Lbs. (FM)* Across Beam
1	3/4	1265	2015	2800	2800
2	1¼	1265	2015	2800	2800

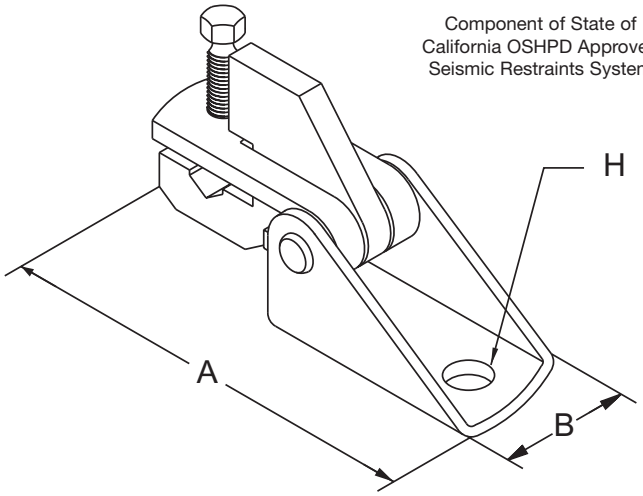
* The loads listed are axial loads on the brace. The horizontal load capacity, H, of the brace is: $H = F \times \sin\theta$, where θ is the installation angle measured from the vertical.

TOLCO® brand bracing components are desgined to be compatible **ONLY** with other TOLCO® brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does **NOT** warrant against the failure of TOLCO® brand bracing components, in the instance that such TOLCO® brand bracing components are used in combination with products, parts or systems which are not manufactured or sold under the TOLCO® brand. NIBCO shall **NOT** be liable under any circumstance for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, where non-TOLCO brand bracing components have been, or are used.

Fig. 980 - Universal Swivel Sway Brace Attachment

c UL US LISTED
FM APPROVED

Component of State of California OSHPD Approved Seismic Restraints System



Size Range — One size fits bracing pipe 1" thru 2", TOLCO 12 gauge channel, and all structural steel up to 1/4" thick.

Material — Carbon Steel

Function — Multi-functional attachment to structure or braced pipe fitting.

Features — This product's design incorporates a **concentric** attachment opening which is critical to the performance of structural seismic connections. NFPA 13 (2010) 9.3.5.8.4 indicates clearly that fastener table load values are based only on concentric loading. Mounts to any surface angle. Break off bolt head assures verification of proper installation.

Installation — The Fig.980 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO "braced pipe" attachment, Fig. 1000, 1001, 2002, 4L, 4A or 4B to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

To Install — Place the Fig. 980 onto the "bracing pipe". Tighten the set bolt until set bolt head breaks off. Attachment can pivot for adjustment to proper brace angle.

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

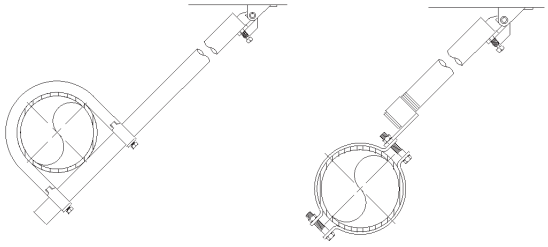
Note — The Fig. 980 Swivel Attachment and the Fig. 1001, Fig. 1000, Fig. 2002, Fig. 4A, Fig. 4B or Fig. 4L Pipe Clamp make up a sway brace system of **UL** Listed attachments and bracing materials which satisfies the requirements of Underwriters' Laboratories and the National Fire Protection Association **(NFPA)**

Finish — Plain

Note — Available in Electro-Galvanized finish.

Order By — Figure number and finish.

Pat. #6,273,372, Pat. #6,517,030, Pat. #6,953,174, Pat. #6,708,930, Pat. #7,191,987, Pat. #7,441,730, Pat. #7,669,806



Lateral Brace

Dimensions • Weights

A	B	H*	Max. Design Load Lbs. (cULus)	Max. Design Load Lbs.** (FM)	Approx. Wt./100
5¼	1⅞	17/32	2765	2800	132

* Available with hole sizes to accommodate up to 3/4" fastener. Consult factory.

** The loads listed are axial loads on the brace. The horizontal load capacity, H, of the brace is: $H = F \times \sin\theta$, where θ is the installation angle measured from the vertical.

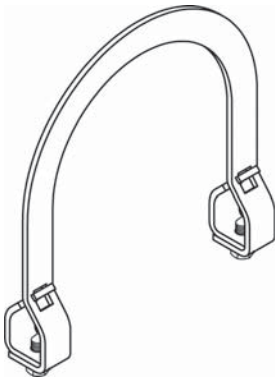
TOLCO® brand bracing components are desgined to be compatible **ONLY** with other TOLCO® brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does **NOT** warrant against the failure of TOLCO® brand bracing components, in the instance that such TOLCO® brand bracing components are used in combination with products, parts or systems which are not manufactured or sold under the TOLCO® brand. NIBCO shall **NOT** be liable under any circumstance for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, where non-TOLCO brand bracing components have been, or are used.

Fig. 1001 - Sway Brace Attachment

Component of State of California OSHPD Approved Seismic Restraints System

c UL US LISTED

FM APPROVED



Size Range — Pipe size to be braced: 2½" thru 8" IPS.* Pipe size used for bracing: 1" and 1¼" Schedule 40 IPS.

Material — Carbon Steel

Function — For bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: The Fig. 1001 is used in conjunction with a TOLCO 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

Features — Can be used to brace schedules 7 through 40 IPS. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary. Unique design requires no threading of bracing pipe. Can be used as a component of a four-way riser brace. Comes assembled and ready for installation. Fig. 1001 has built-in visual verification of correct installation. See installation note below.

Installation Note — Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Maximum Design Load
Sch. 7 - 1600 lbs.
Sch. 10 & 40 w/1" Brace Pipe - 2015 lbs.
Sch. 10 & 40 w/1¼" Brace Pipe - 2765 lbs.

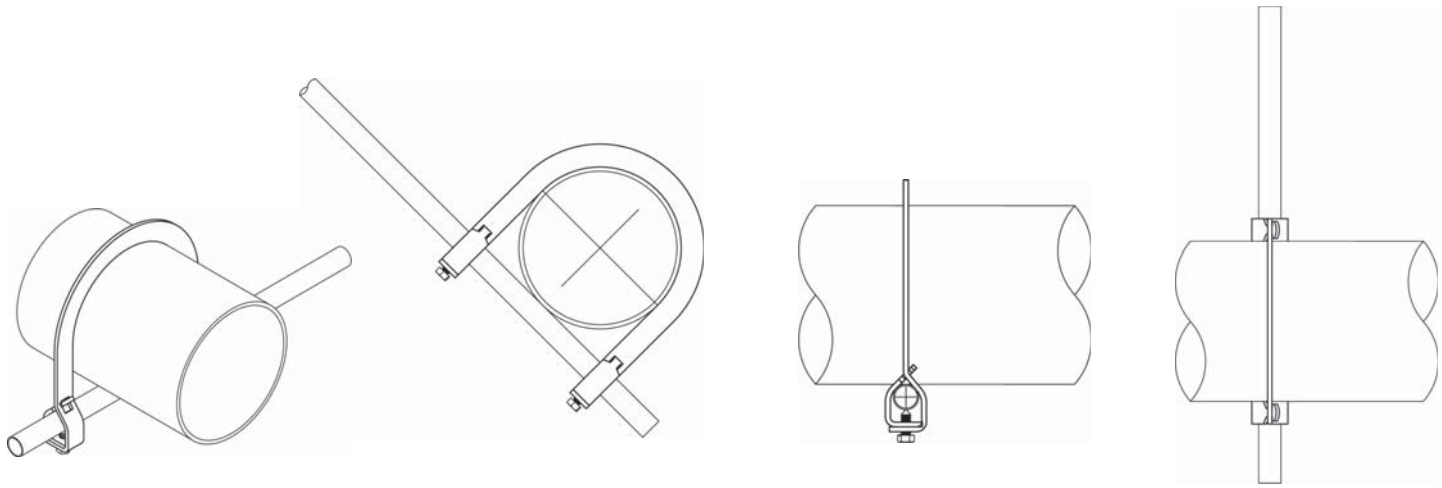
FM Approved Design Loads*
2½" - 2400 lbs.
3" - 4" - 2500 lbs.
5" - 8" - 1500 lbs.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish.

Order By — Indicate pipe size to be braced followed by pipe size used for bracing, figure number and finish.

Important Note — The Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. **To ensure performance, the UL Listing requires that the Fig. 1001 must be used only with other TOLCO bracing products. The Fig 1001 is not intended for use with the Fig. 907 4-Way Longitudinal Brace Attachment.**



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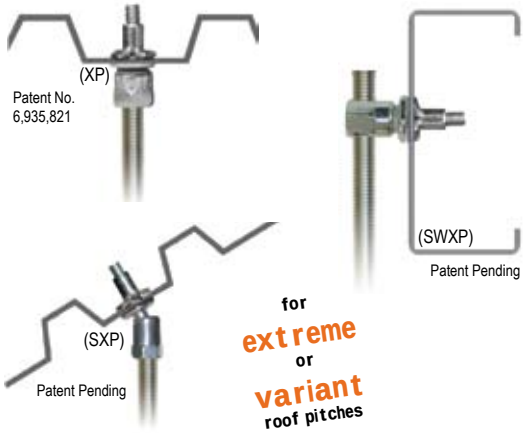
STEEL STEEL STEEL STEEL

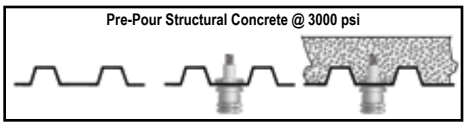
Sammy X-Press® *Installs into Metal Deck, Purlin, or Tubular Steel*

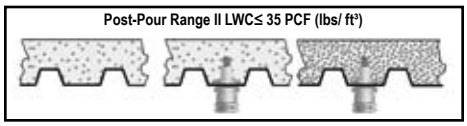


Product Features

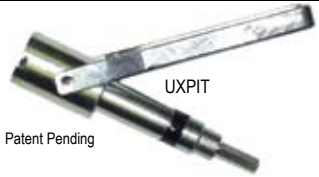
- The ***Sammy X-Press*** expands to provide direct vertical attachment in:
  - Metal Deck (22-16 gauge)
  - Z-Purlin (18-16 gauge)
- The ***Sammy X-Press Swivel*** allows you to hang plumb in extreme roof pitches:
  - 89° in Z-Purlin
  - 45° in metal deck for 12/12 pitch
- The ***Sammy X-Press Sidewinder*** expands to provide horizontal attachment in:
  - 16 ga - 3/16" steel - purlin, tubular steel.
- Installs in seconds, saving time & installation costs.
- Use in applications where access to the back of the installed fastener is prohibited. ie. metal roof deck, tubular steel, or vapor barrier fabric.
- Less jobsite material needed.
- No retaining nut required.
- Provides design flexibility.

Approvals	Rod Size	Part Number	Model	Description	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Min Thick	Max Thick	Box Qty	Case Qty	Application
VERTICAL MOUNT												
UL	1/4"	8181922	XP 200	X-Press 200	1146 (22 ga)	185 (Luminaire) 250 (Luminaire)		.027" .056"	.125"	25	125	Metal Deck
UL FM	3/8"	8150922	XP 20	X-Press 20	1146 (22 ga)	850 (2½" Pipe) 185 (Luminaire) 250 (Luminaire) 283 (Conduit & Cable)	940 (2" Pipe) 1475 (4" Pipe)	.027" .027" .056"	.125"	25	125	Metal Deck
UL FM	3/8"	8153922	XP 35	X-Press 35	1783 (16 ga)	1500 (4" Pipe) 85 (Luminaire) 250 (Luminaire) 416 (Conduit & Cable)	940 (2" Pipe) 1475 (4" Pipe)	.060" .105" .027" .056"	.125"	25	125	Purlin
UL FM	3/8"	8294922	SXP 20	Swivel X-Press 20	1061 (22 ga Vertical) 829 (45° Off Vertical)	750 (2" Pipe) 170 vertical (Luminaire) 80 @ 45° (Luminaire) 283 vertical (Conduit & Cable) 233 @ 45° (Conduit & Cable)	635 (2" Pipe)	.027"	.125"	25	125	Metal Deck
UL FM	3/8"	8295922	SXP 35	Swivel X-Press 35	1675 (16 ga Vertical) 1558 (89° Off Vertical)	1500 (4" Pipe) 250 vertical (Luminaire) 80 @ 90° (Luminaire) 500 vertical (Conduit & Cable) 333 @ 89° (Conduit & Cable)	635 (2" Pipe)	.060"	.125"	25	125	Purlin
UL	3/8"	8150922	XP 20	Sammy X-Press 20	1146 (22 ga)	850 (2½ Pipe)	Pre-Pour Structural Concrete@ 3000 psi Post-Pour Range II LWC≤ 35 PCF (lbs/ft³)			25	125	Metal Deck (Pre-Pour) Metal Deck (Post-Pour)
HORIZONTAL MOUNT												
UL	3/8"	8293957	SWXP 35	Sidewinder X-Press 35	1798 (16 ga)	1250 (3¼" Pipe) 80 (Luminaire) 416 (Conduit & Cable)		.060"	.125"	25	125	Purlin





Sammy X-Press It® INSTALLATION TOOL



Part Number	Model	Description	Each Qty
8194910	UXPIT*	Universal X-Press It Tool	1
8195910	RXPIT	Retro Socket for 8151910	1
8152910	XPDB	25/64" Drill Bit	1

*Tool Includes: Sleeve, Bit Receiver, Hex Wrench, and 25/64" Drill Bit.

To watch a video demonstration of the Sammy X-Press, visit http://www.sammysuperscrew.com/sammyxpress.htm

MADE IN U.S.A

RoHS Compliant

90° ELBOW

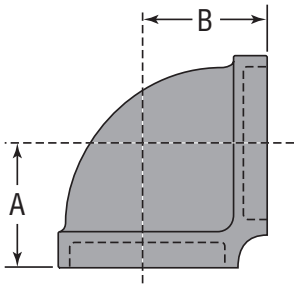
AnvilStar™
Fire Products Division of Anvil® International

SPF/ANVIL

Cast Iron - Class 125 Fittings

Submittal Sheet

90° ELBOW						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)			*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*Lbs. (kg)*
1 *25*	800000002	CB90033	300 *2065*	1.50 *38.10*	1.50 *38.10*	0.84 *0.38*
1¼ *32*	800000010	CB90044	300 *2065*	1.75 *44.45*	1.75 *44.45*	1.34 *0.61*
1½ *40*	800000028	CB90055	300 *2065*	1.94 *49.27*	1.94 *49.27*	1.80 *0.82*
2 *50*	800000036	CB90066	300 *2065*	2.25 *57.15*	2.25 *57.15*	2.90 *1.32*
2½ *65*	800000044	CB90077	300 *2065*	2.70 *68.58*	2.70 *68.58*	4.75 *2.15*



MATERIAL SPECIFICATIONS

Cast iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 300 psi service.

Gray iron per ASTM A126 Class B.

Dimensions conform to ANSI B16.4 Class 125.

Threads are NPT per ANSI/ASME B1.20.1.

UL FM ULC
APPROVED
For Listing / Approval details contact your AnvilStar™ Representative.

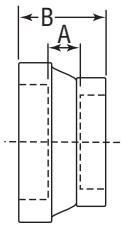
Project Information:		Approval Stamp:
Project:		
Date:	**Phone:**	
Architect / Engineer:		
Contractor:		
Address:		
Notes 1:		
Notes 2:		

For the latest UL/ULC Listed and FM Approved pressure ratings, versus pipe schedule, go to **www.anvilstar.com** or contact your local AnvilStar representative

ANVIL INTERNATIONAL, INC.

Class 125 (Standard)

☐ **FIGURE 367**
Concentric Reducer



Size				A		B*		Unit Weight Black	
NPS	*DN*	NPS	*DN*	in	*mm*	in	*mm*	lbs	*kg*
3/4	*20*	1/2	*15*	5/8	*16*	1 9/16	*40*	0.40	*0.18*
1	*25*	1/2 (Hex)	*15*	11/16	*17*	1 11/16	*43*	0.54	*0.24*
		3/4 (Hex)	*20*	7/16	*11*	1 1/2	*38*	0.63	*0.29*
1 1/4	*32*	1/2	*15*	9/16	*14*	1 5/8	*41*	0.84	*0.38*
		3/4	*20*	1	*25*	2 1/8	*54*	0.90	*0.41*
		1	*25*	15/16	*24*	2 1/8	*54*	1.07	*0.49*
1 1/2	*40*	1/2	*15*	1/2	*13*	1 5/8	*41*	1.00	*0.45*
		3/4	*20*	1/2	*13*	1 5/8	*41*	1.20	*0.54*
		1	*25*	1/2	*13*	1 3/4	*44*	1.50	*0.68*
		1 1/4	*32*	1	*25*	2 1/4	*57*	1.45	*0.66*
2	*50*	1/2	*15*	5/8	*16*	2	*51*	2.00	*0.91*
		3/4	*20*	3/4	*19*	2	*51*	1.90	*0.86*
		1	*25*	3/4	*19*	2	*51*	1.83	*0.83*
		1 1/4	*32*	13/16	*22*	2 1/8	*54*	1.78	*0.81*
		1 1/2	*40*	7/8	*22*	2 3/16	*56*	1.98	*0.90*
2 1/2	*65*	1 1/2	*40*	3/4	*19*	2	*51*	3.10	*1.41*
		2	*50*	1	*25*	2 9/16	*65*	2.98	*1.35*
3	*80*	3/4	*20*	15/16	*24*	2 1/2	*64*	4.31	*1.95*
		2	*50*	1 1/16	*27*	2 3/4	*70*	3.96	*1.80*
		2 1/2	*65*	15/16	*24*	2 13/16	*73*	4.40	*2.00*
4	*100*	2	*50*	1 3/16	*30*	2 15/16	*75*	6.50	*2.95*
		2 1/2	*65*	1 3/16	*30*	3 1/8	*79*	7.78	*3.53*
		3	*80*	1 1/16	*27*	3 1/8	*79*	7.01	*3.18*
5	*125*	4	*100*	1 1/16	*27*	3 5/16	*84*	10.48	*4.75*
6	*150*	4	*100*	1 1/8	*29*	3 7/16	*87*	13.83	*6.27*
		5	*125*	1 1/8	*29*	3 9/16	*90*	15.53	*7.04*
8	*200*	6	*150*	1 1/4	*32*	3 7/8	*98*	29.10	*13.20*

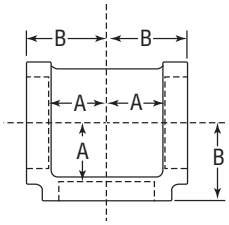
* Dimension "B" does not conform to ASME standard.

Note: See following page for pressure-temperature ratings.

PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ **Approved**
Address:	☐ **Approved as noted**
Contractor:	☐ **Not approved**
Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

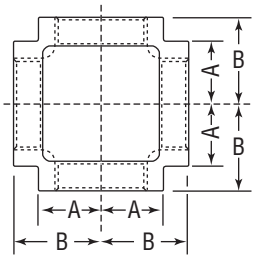
Class 125 (Standard)

FIGURE 358
Tee



Size		A		B		Unit Weight Black	
NPS	*DN*	in	*mm*	in	*mm*	lbs	*kg*
1/4	*8*	1/2	*13*	13/16	*22*	0.22	*0.10*
3/8	*10*	5/8	*16*	1	*25*	0.35	*0.16*
1/2	*15*	11/16	*17*	1 1/8	*29*	0.56	*0.25*
3/4	*20*	13/16	*22*	1 5/16	*33*	0.84	*0.38*
1	*25*	15/16	*24*	1 1/2	*38*	1.25	*0.57*
1 1/4	*32*	1 1/8	*29*	1 3/4	*44*	2.03	*0.92*
1 1/2	*40*	1 5/16	*33*	1 15/16	*49*	2.70	*1.22*
2	*50*	1 9/16	*40*	2 1/4	*57*	4.23	*1.92*
2 1/2	*65*	1 13/16	*47*	2 11/16	*68*	6.67	*3.02*
3	*80*	2 3/16	*56*	3 1/8	*79*	10.00	*4.54*
3 1/2	*90*	2 7/16	*62*	3 7/16	*87*	13.29	*6.03*
4	*100*	2 11/16	*68*	3 3/4	*95*	16.33	*7.41*
5	*125*	3 5/16	*84*	4 1/2	*114*	27.33	*12.39*
6	*150*	3 7/8	*98*	5 1/8	*130*	40.85	*18.53*
8	*200*	5 3/16	*132*	6 9/16	*167*	79.00	*35.83*

FIGURE 360
Cross



Size		A		B		Unit Weight Black	
NPS	*DN*	in	*mm*	in	*mm*	lbs	*kg*
1/2	*15*	9/16	*14*	13/16	*22*	2.80	*1.27*
3/4	*20*	13/16	*22*	1 5/16	*33*	1.03	*0.47*
1	*25*	15/16	*24*	1 1/2	*38*	1.59	*0.72*
1 1/4	*32*	1 1/8	*29*	1 3/4	*44*	2.42	*1.10*
1 1/2	*40*	1 5/16	*33*	1 15/16	*49*	3.21	*1.46*
2	*50*	1 9/16	*40*	2 1/4	*57*	5.28	*2.39*
2 1/2	*65*	1 13/16	*47*	2 11/16	*68*	8.07	*3.66*
3	*80*	2 3/16	*56*	3 1/8	*79*	11.84	*5.37*
4	*100*	2 3/4	*70*	3 13/16	*98*	19.63	*8.90*

Note: See following page for pressure-temperature ratings.

PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ **Approved**
Address:	☐ **Approved as noted**
Contractor:	☐ **Not approved**
Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

CAST IRON THREADED FITTINGS

Anvil standard and extra heavy cast iron threaded fittings are manufactured in accordance with ASME B16.4. Plugs and bushings are manufactured in accordance with ASME B16.14.

NOTE: Figure 367 Concentric Reducers do not meet the overall length requirement of ASME B16.4. All other dimensions are in compliance.

c UL us

FM APPROVED

For Listings/Approval Details and Limitations, visit our website at www.anvilintl.com or contact an Anvil Sales Representative.

Cast Iron Threaded Fittings
Pressure - Temperature Ratings

Temperature		Pressure			
		Class 125		Class 250	
(°F)	*(°C)*	psi	*bar*	psi	*bar*
-20° to 150°	*-28.9 to 65.6*	175	*12.1*	400	*27.6*
200°	*93.3*	165	*11.4*	370	*25.5*
250°	*121.1*	150	*10.3*	340	*23.4*
300°	*148.9*	140	*9.7*	310	*21.4*
350°	*176.7*	125	*8.6*	300	*20.7*
400°	*204.4*	–	–	250	*17.2*

Standards and Specifications

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
CAST IRON THREADED FITTINGS					
Class 125	ASME B16.4	ASTM A-126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.4
Class 250	ASME B16.4	ASTM A-126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.4
CAST IRON PLUGS AND BUSHINGS					
	ASME B16.14	ASTM A- 126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.14

* ASTM B 633. Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.

General Assembly of Threaded Fittings

1) Inspect both male and female components prior to assembly.
   - Threads should be free from mechanical damage, dirt, chips and excess cutting oil.
   - Clean or replace components as necessary.

2) Application of thread sealant
   - Use a thread sealant that is fast drying, sets-up to a semi hard condition and is vibration resistant. Alternately, an anaerobic sealant may be utilized.
   - Thoroughly mix the thread sealant prior to application.
   - Apply a thick even coat to the male threads only. Best application is achieved with a brush stiff enough to force sealant down to the root of the threads.

3) Joint Makeup
   - For sizes up to and including 2" pipe, wrench tight makeup is considered three full turns past handtight. Handtight engagement for 1/2" through 2" thread varies from 4 1/2 turns to 5 turns.
   - For 2 1/2" through 4" sizes, wrench tight makeup is considered two full turns past handtight. Handtight engagement for 2 1/2" through 4" thread varies from 5 1/2 turns to 6 3/4 turns.

Victaulic® FireLock™ Fittings

10.03

1.0 PRODUCT DESCRIPTION

Available Sizes

- 1 ¼ – 8"/DN32 – DN200

Maximum Working Pressure

- Pressure ratings for Victaulic FireLock™ Fittings conform to the ratings of Victaulic FireLock EZ™ Style 009N couplings (refer to publication 10.64 for more information).

Application

- FireLock™ fittings are designed for use exclusively with Victaulic couplings that have been Listed or Approved for Fire Protection Services. Use of other couplings or flange adapters may result in bolt pad interference.
- Connects pipe, provides change in direction and adapts sizes or components

Pipe Materials

- Carbon steel

2.0 CERTIFICATION/LISTINGS

EN 10311
Regulation (EU)
No. 305/2011

3.0 SPECIFICATIONS – MATERIAL

Fitting: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Fitting Coating:

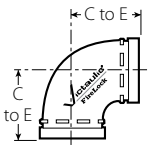
- ☐ Orange enamel.
- ☐ Red enamel in Europe, Middle East, Africa, and India.
- ☐ Optional: Hot dipped galvanized.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

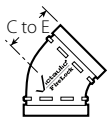
System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

4.0 DIMENSIONS



No. 001



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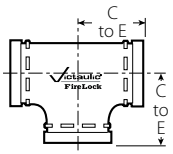


No. 002

No. 006

Nominal Size inches DN	Actual Outside Diameter inches mm	No. 001 90° Elbow C to E inches mm	No. 001 90° Elbow Approximate Weight Each lb kg	No. 003 45° Elbow C to E inches mm	No. 003 45° Elbow Approximate Weight Each lb kg	No. 002 Straight Tee C to E inches mm	No. 002 Straight Tee Approximate Weight Each lb kg	No. 006 Cap T inches mm	No. 006 Cap Approximate Weight Each lb kg
1 ¼ DN32	1.660 42.4	— —	— —	— —	— —	— —	— —	0.82 21	0.3 0.1
1 ½ DN40	1.900 48.3	— —	— —	— —	— —	— —	— —	0.82 21	0.4 0.2
2 DN50	2.375 60.3	2.75 70	1.7 0.8	2.00 51	1.8 0.8	2.75 70	2.4 1.1	0.88 22	0.6 0.3
2 ½	2.875 73.0	3.00 76	3.1 1.4	2.25 57	2.2 1.0	3.00 76	3.6 1.6	0.88 22	1.0 0.5
DN65	3.000 76.1	3.00 76	3.30 1.5	2.25 57	2.4 1.1	3.00 76	3.8 1.7	—	—
3 DN80	3.500 88.9	3.38 86	4.0 1.8	2.50 64	3.1 1.4	3.38 86	5.3 2.4	0.88 22	1.2 0.5
	4.250 108.0	4.00 102	5.7 2.6	3.00 76	5.1 2.3	4.00 102	7.5 3.4	—	—
4 DN100	4.500 114.3	4.00 102	6.7 3.0	3.00 76	5.6 2.5	4.00 102	8.7 3.9	1.00 25	2.4 1.1
5	5.563 141.3	4.88 124	12.6 5.7	3.25 83	8.3 3.8	4.88 124	15.7 7.1	1.00 25	4.1 1.9
DN125	5.500 139.7	4.88 124	12.4 5.6	3.25 82.6	8.2 3.7	4.88 124	15.4 6.9	—	—
	6.250 158.8	5.50 140	12.6 5.7	3.50 89	9.2 4.2	5.50 140	17.9 8.0	—	—
6 DN150	6.625 168.3	5.50 140	18.3 8.3	3.50 89	11.7 5.3	5.50 140	22.7 10.3	1.00 25	5.9 2.7
	6.500 165.1	5.43 140	17.6 7.9	3.50 89	11.4 5.2	5.50 140	22.0 9.9	—	—
8 DN200	8.625 219.1	6.81 173	25.5 11.6	4.25 108	20.4 9.3	6.94 176	38.7 17.6	1.13 29	12.7 5.8
	8.515 216.3	6.81 173	23.1 10.5	— —	— —	6.94 176	33.6 15.2	— —	— —

5.0 PERFORMANCE

Flow Data

Size		Frictional Resistance Equivalent of Straight Pipe[1]			
		Elbows		No. 002 Straight Tee	
Nominal Size inches DN	Actual Outside Diameter inches mm	No. 001 90° Elbow feet meters	No. 003 45° Elbow feet meters	Branch feet meters	Run feet meters
1 ¼ DN32	1.660 42.4	— —	— —	— —	— —
1 ½ DN40	1.900 48.3	— —	— —	— —	— —
2 DN50	2.375 60.3	3.5 1.1	1.8 0.5	8.5 2.6	3.5 1.1
2 ½	2.875 73.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
DN65	3.000 76.1	4.5 1.4	2.3 0.7	11.0 3.4	4.5 1.4
3 DN80	3.500 88.9	5.0 1.5	2.6 0.8	13.0 4.0	5.0 1.5
	4.250 108.0	6.4 2.0	3.2 0.9	15.3 4.7	6.4 2.0
4 DN100	4.500 114.3	6.8 2.1	3.4 1.0	16.0 4.9	6.8 2.1
5	5.563 141.3	8.5 2.6	4.2 1.3	21.0 6.4	8.5 2.6
DN125	5.500 139.7	8.3 2.5	4.1 1.3	20.6 6.3	8.3 2.5
	6.250 158.8	9.4 2.9	4.9 1.5	25.0 7.6	9.6 2.9
6 DN150	6.625 168.3	10.0 3.0	5.0 1.5	25.0 7.6	10.0 3.0
	6.500 165.1	9.8 3.0	4.9 1.5	24.5 7.5	9.8 3.0
8 DN200	8.625 219.1	13.0 4.0	5.0 1.5	33.0 10.1	13.0 4.0
	8.515 216.3	13.0 4.0	— —	33.0 10.1	13.0 4.0

[1] The flow data listed is based upon the pressure drop of Schedule 40 pipe.

6.0 NOTIFICATIONS

General Notes

NOTE: When assembling FireLock EZ™ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ™ Style 009N/009H couplings, use FireLock™ No. 006 end caps containing the “EZ” marking on the inside face or No. 60 end caps containing the “QV EZ” marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V/009H/009N couplings.

7.0 REFERENCE MATERIALS

10.64: Victaulic® FireLock™ Rigid Coupling Style 009N

10.02: Victaulic® FireLock™ Rigid Coupling Style 005H with Vic-Plus™ Gasket System

29.01: Victaulic® Terms and Conditions of Sale

Victaulic® FireLock™ Installation-Ready™ Rigid Couplings Style 009N and Style 109

10.64

Patented

Patented

1.0 PRODUCT DESCRIPTION

Available Sizes

- Style 009N: 1 ¼ – 12"/DN32 – DN300
- Style 109: 1 ¼ – 2 ½"/DN32 – 73.0 mm

Pipe Material

- Schedule 10, Schedule 40 or specialty carbon steel pipe listed in Section 5. For use with alternative materials and wall thicknesses please contact Victaulic
- Carbon Steel
- Stainless Steel
- For exceptions reference section 6.0 Notifications

Maximum Working Pressure

- Up to 365 psi/2517 kPa

Function

- Joins carbon steel pipe with grooved ends conforming to publication 25.01
- Provides a rigid pipe joint designed to restrict axial or angular movement

2.0 CERTIFICATION/LISTINGS

C104-1a/36

EN 10311
Regulation (EU)
No. 305/2011

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

3.0 SPECIFICATIONS – MATERIAL

Housing: Ductile iron conforming to ASTM A 536, Grade 65-45-12. Ductile iron conforming to ASTM A 395, Grade 65-45-15, is available upon special request.

Housing Coating: (specify choice)

- ☐ Orange enamel (North America, Asia Pacific)
- ☐ Red enamel (Europe)
- ☐ Optional for Style 009N: Hot dipped galvanized

Gasket: (specify choice)

- ☐ **Grade "E" EPDM (Type A) Vic-Plus™ Pre-lubricated Gasket**
  EPDM (Violet Color Code). Applicable for wet and dry (oil-free air) fire protection systems only. Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems at -40°F/-40°C and above. Not compatible for use with hot water services or steam services.

NOTES

- Reference should always be made to publication I-100, Victaulic Field Installation Handbook for gasket lubrication instructions.
- Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to publication 05.01, Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

Bolts/Nuts: (specify choice)

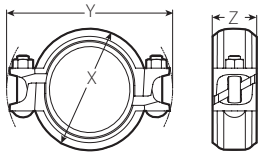
- ☐ Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (M10-M16) Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial) and ASTM A563M Class 9 (metric). Track bolts and hex nuts are zinc electroplated per ASTM B633 Fe/Zn 5, finish Type III (imperial) or Type II (metric).
- ☐ Optional for Style 009N: Stainless steel oval neck track bolts meeting the requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel Heavy Hex nuts meeting the requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling-resistant coating.[1]

[1] Optional bolts/nuts are available in imperial size only.

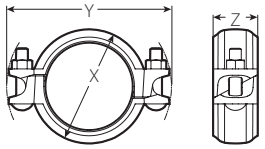
Coupling Linkage: High Strength Steel with comparable physical properties to that of the Track Bolt (ASTM A449). Linkage is zinc electroplated per ASTM B633 Fe/Zn 5, Type III Finish.

4.0 DIMENSIONS

Style 009N Two-Bolt *Installation-Ready* Coupling



Style 009N Pre-Assembled



Style 009N Joint Assembled

Size		Maximum Working Pressure[2]	Maximum End Load[2]	Allow. Pipe End Separation[3]	Bolt/Nut		Dimensions					Weight
							Pre-assembled		Joint Assembled			
Nominal inches DN	Actual Outside Diameter inches mm	psi kPa	lb N	inches mm	Qty.	Size inches mm	X inches mm	Y inches mm	X inches mm	Y inches mm	Z inches mm	Approx. (Each) lb kg
1 ¼ DN32	1.660 42.4	365 2517	790 3514	0.10 2.54	2	⅜ × 2 M10 x 51	3.13 79	5.00 127	2.75 70	5.00 127	2.00 51	1.4 0.6
1 ½ DN40	1.900 48.3	365 2517	1035 4604	0.10 2.54	2	⅜ × 2 M10 x 51	3.38 86	5.13 130	3.00 76	5.13 130	2.00 51	1.5 0.7
2 DN50	2.375 60.3	365 2517	1617 7193	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.00 102	5.63 143	3.50 89	5.63 143	2.00 51	1.9 0.9
2 ½	2.875 73.0	365 2517	2370 10542	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.50 114	6.13 156	4.00 102	6.13 156	2.00 51	2.1 1.0
DN65	3.000 76.1	365 2517	2580 11476	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.63 118	6.00 152	4.13 105	6.13 156	2.00 51	2.1 1.0
3 DN80	3.500 88.9	365 2517	3512 15622	0.12 3.05	2	⅜ × 2 ½ M10 x 63	5.13 130	6.75 171	4.63 117	6.75 171	2.00 51	2.3 1.0
4 DN100	4.500 114.3	365 2517	5805 25822	0.17 4.32	2	⅜ × 2 ½ M10 x 63	6.00 152	7.88 200	5.63 143	7.50 191	2.13 54	2.9 1.3
	4.250 108.0	365 2517	5178 23020	0.17 4.32	2	⅜ × 2 ½ M10 x 63	5.63 152	7.38 1.87	5.38 137	7.38 187	2.13 54	3.1 1.4
5	5.563 141.3	365 2517	8872 39456	0.17 4.32	2	½ × 3 M12 x 76	7.25 184	9.25 235	6.75 171	9.13 232	2.25 57	5.0 2.3
	5.250 133.0	365 2517	7901 35106	0.17 4.32	2	½ × 3 M12 x 76	6.63 168	9.00 229	6.38 162	9.00 229	2.25 57	4.8 2.2
DN125	5.500 139.7	365 2517	8672 38529	0.17 4.32	2	½ × 3 M12 x 76	6.88 175	9.25 235	6.75 171	9.13 232	2.25 57	4.9 2.2
6 DN150	6.625 168.3	365 2517	12582 44469	0.17 4.32	2	½ × 3 ¼ M12 x 83	8.38 213	10.38 264	7.88 200	10.13 257	2.25 57	6.0 2.7
	6.250 159.0	365 2517	11198 49753	0.17 4.32	2	½ × 3 ¼ M12 x 83	7.88 200	10.00 254	7.38 187	9.88 251	2.25 57	5.6 2.5
	6.500 165.1	365 2517	12112 53813	0.17 4.32	2	½ × 3 ¼ M12 x 83	8.00 203	10.25 260	7.75 197	10.13 257	2.25 57	6.0 2.7
8 DN200	8.625 219.1	365 2517	21326 94863	0.17 4.32	2	⅝ × 4 M16 x 101	10.88 276	13.38 340	10.25 260	13.13 333	2.50 64	11.4 5.2
	8.500 216.0	365 2517	20712 55968	0.17 4.32	2	⅝ × 4 M16 x 101	10.63 270	13.25 337	10.25 260	10.13 257	2.63 67	11.4 5.2
10 DN250	10.750 273.0	300 2068	27229 121121	0.25 6.4	2	⅞ × 6 ½ M22 x 165	13.75 349	17.00 432	13.25 337	17.13 435	2.75 70	22.6 10.3
12 DN300	12.750 323.9	300 2068	38303 170380	0.25 6.4	2	⅞ × 6 ½ M22 x 165	16.00 406	19.00 483	15.50 394	19.13 486	2.75 70	27.6 12.5

[2] Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

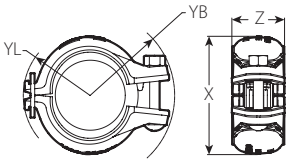
[3] The allowable pipe separation dimension shown is for system layout purposes only. Style 009N couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTES

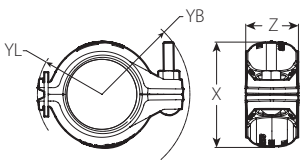
- When assembling Style 009N or Style 109 couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For Style 009N or Style 109 couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N or Style 109 couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N or Style 109 coupling. There is no interchanging of gaskets or housings between coupling styles.
- **Use Of FlushSeal Gaskets For Dry Pipe Systems** Style 009N or Style 109 couplings are supplied with Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets cannot be used with the Style 009N or Style 109 couplings.

4.1 DIMENSIONS

Style 109 One-Bolt *Installation-Ready* Coupling



Style 109 Pre-Assembled



Style 109 Joint Assembled

Size		Maximum Working Pressure[4]	Maximum End Load[4]	Pipe End Separation Allowable[5]	Bolt/Nut		Dimensions								Weight
							Pre-assembled				Joint Assembled				
Nominal	Actual Outside Diameter				Qty.	Size	YL	YB	X	Z	YL	YB	X	Z	Approx. (Each)
inches mm	inches mm	psi kPa	lb N	inches mm		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	lb kg
1 ¼ DN32	1.660 42.4	365 2517	790 3514	0.10 2.54	1	⅜ x 2 ¼ M10 x 57	1.88 48	2.50 64	3.13 79	1.88 48	1.88 48	2.63 67	2.75 70	1.88 48	1.4 0.6
1 ½ DN40	1.900 48.3	365 2517	1035 4604	0.10 2.54	1	⅜ x 2 ¼ M10 x 57	2.00 51	2.63 67	3.25 83	1.88 48	2.00 51	2.75 70	3.00 76	1.88 48	1.5 0.7
2 DN50	2.375 60.3	365 2517	1616 7193	0.12 3.05	1	⅜ x 2 ½ M10 x 63	2.25 57	2.88 73	3.88 98	2.00 51	2.25 57	3.13 79	3.50 89	2.00 51	1.8 0.8
2 ½	2.875 73.0	365 2517	2370 10542	0.12 3.05	1	⅜ x 2 ½ M10 x 63	2.50 64	3.13 79	4.38 111	2.00 51	2.50 64	3.38 86	3.88 98	2.00 51	2.1 0.9

[4] Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

[5] The allowable pipe separation dimension shown is for system layout purposes only. Style 109 couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTES

- When assembling Style 009N or Style 109 couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For Style 009N or Style 109 couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N or Style 109 couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N or Style 109 coupling. There is no interchanging of gaskets or housings between coupling styles.
- **Use Of FlushSeal Gaskets For Dry Pipe Systems** Style 009N or Style 109 couplings are supplied with Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets and cannot be used with the Style 009N or Style 109 couplings.

5.0 PERFORMANCE

Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals[6]

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approval agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus[11]		FM[11]		VdS	LPCB
Nominal inches DN	**Actual Outside Diameter** inches mm	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	psi kPa bar	psi kPa bar
1 ¼ DN32	1.660 42.4	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
1 ½ DN40	1.900 48.3	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
2 DN50	2.375 60.3	365 2517 25	365 2517 25	363 2503 25	363 2500 25	363 2500 25	363 2500 25
2 ½	2.875 73.0	365 2517 25	365 2517 25	363 2503 25	363 2500 25	363 2500 25	363 2500 25
DN65	3.000 76.1	365[7] 2517[7] 25[7]	N/A	363[8] 2503[8] 25[8]	N/A	363 2500 25	363 2500 25
3 DN80	3.500 88.9	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
4 DN100	4.500 114.3	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
	4.250 108.0	N/A	N/A	363 2503 25	363 2503 25	N/A	N/A
5	5.563 141.3	290 2000 20	365 2517 25	363 2503 25	363 2503 25	232 1600 16	363 2500 25
	5.250 133.0	N/A	N/A	363[8] 2503[8] 25	N/A	N/A	N/A
DN125	5.500 139.7	290[9] 2000[9] 20[9]	N/A	363[8] 2503[8] 25[8]	N/A	232 1600 25	363 2500 25
6 DN150	6.625 168.3	300 2068 20	365 2517 25	363 2503 25[7]	363 2503 25	232 1600 16	363 2500 25
	6.250 159.0	N/A	N/A	363[8] 2503[8] 25	N/A	N/A	N/A
	6.500 165.1	290[10] 2000[10] 20	N/A	363[8] 2503[8] 25[8]	N/A	N/A	363 2500 25

6 Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic Installation Manual I-009N for details concerning when supplemental lubrication is required.

7 cULus listed for DIN 2458 (EN 10220) 2.6 mm pipe wall.

8 FM approved for BS 1387 (EN 10255) Medium 3.6 mm pipe wall.

9 cULus listed for EN 10220 4.0 mm pipe wall.

10 cULus listed for EN 10255 4.5 mm pipe wall.

11 With optional stainless steel fasteners, cULus Listed to 175psi/1207 kPa/12 bar and FM Approved to the FM ratings shown in the above table. The stainless steel fasteners have a marking designation of "316" on the end face of the bolt.

12 cUL listed to 250 psi/1720 kPa /17 bar.

5.0 PERFORMANCE (CONTINUED)

Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals[6]

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approval agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus[11]		FM[11]		VdS	LPCB
Nominal inches DN	**Actual Outside Diameter** inches mm	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	psi kPa bar	psi kPa bar
8 DN200	8.625 219.1	300 2068 20	365 2517 25	363 2503 25	363 2503 25	232 1600 16	363 2500 25
	8.500 216.0	290 2000 20	N/A	363[8] 2503[8] 25[7]	N/A	N/A	N/A
10 DN250	10.750 273.0	300 2068 20	300 2068 20	300 2068 20	300 2068 20	N/A	N/A
12 DN300	12.750 323.9	300[12] 2068[12] 20[12]	300 2068 25	250 1720 17	300 2068 20	N/A	N/A

6 Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic Installation Manual I-009N for details concerning when supplemental lubrication is required.

7 cULus listed for DIN 2458 (EN 10220) 2.6 mm pipe wall.

8 FM approved for BS 1387 (EN 10255) Medium 3.6 mm pipe wall.

9 cULus listed for EN 10220 4.0 mm pipe wall.

10 cULus listed for EN 10255 4.5 mm pipe wall.

11 With optional stainless steel fasteners, cULus Listed to 175psi/1207 kPa/12 bar and FM Approved to the FM ratings shown in the above table. The stainless steel fasteners have a marking designation of "316" on the end face of the bolt.

12 cUL listed to 250 psi/1720 kPa /17 bar.

5.1 PERFORMANCE

Style 109 One-Bolt *Installation-Ready* Coupling Listings/Approvals[13]

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approvals agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus		FM	
Nominal inches DN	**Actual Outside Diameter** inches mm	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar	**Sch. 10** psi kPa bar	**Sch. 40** psi kPa bar
1¼ DN32	1.660 42.4	365 2517 25	365 2517 25	365 2517 25	365 2517 25
1½ DN40	1.900 48.3	365 2517 25	365 2517 25	365 2517 25	365 2517 25
2 DN50	2.375 60.3	365 2517 25	365 2517 25	365 2517 25	365 2517 25
2½	2.875 73.0	365 2517 25	365 2517 25	365 2517 25	365 2517 25

13 Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic Installation Manual I-109 for details concerning when supplemental lubrication is required.

5.2 PERFORMANCE

Specialty Pipe
Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals

Pipe Type	Size inches DN	Pressure Rating cULus psi kPa bar	Pressure Rating FM psi kPa bar
EF	1 ¼ – 4 DN32 – DN100	300 2068 20	N/A
EL	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
ET40	1 ¼ – 2 DN32 – DN50	300 2068 20	N/A
EZF	3 – 4 DN80 – DN100	300 2068 20	N/A
EZT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
FF	1 ½ – 4 DN40 – DN100	300 2068 20	N/A
GL	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MF	1 ¼ – 4 DN32 – DN100	300 2068 20	300 2068 20
	6 DN150	175 1205 12	175 1205 12
MT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MLT	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
TF	2 ½ – 4 73.0 mm – DN100	N/A	300 2068 20
WG5, WG5E, WF5, WG7, WG7E, WL7	1 ¼ – 4 DN32 – DN100	175 1205 12	300 2068 20
WLS	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20

NOTES

- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZF = EZ-Flow steel pipe manufactured by Northwest Pipe Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WG5, WG5E, WF5 = WGalweld 5, WGalweld 5E, WFlow 5 steel pipe manufactured by Wuppermann Stahl GmbH.
- WG7, WG7E, WL7 = WGalweld 7, Wgalweld 7E, WLight 7 steel pipe manufactured by Wuppermann Stahl GmbH
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.

5.3 PERFORMANCE

Specialty Pipe
Style 109 One-Bolt *Installation-Ready* Coupling Listings/Approvals

Pipe Type	Size inches DN	Pressure Rating cULus psi kPa bar	Pressure Rating FM psi kPa bar
EF	1 ¼ – 2 ½ DN32 – 73.0 mm	N/A	300 2068 20
	1 ½ – 2 ½ DN40 – 73.0 mm	300 2068 20	N/A
Easy-Flow	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
EL	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
ET40	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
EZT	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
	1 ½ – 2 DN40 – DN50	300 2068 20	N/A
FF	1 ½ – 2 ½ DN40 – 73.0 mm	300 2068 20	300 2068 20
GL	1 ¼ – 2 DN32 – DN50	N/A	300 2068
MF	1 ¼ – 2 ½ DN32 – 73.0 mm	300 2068 20	300 2068 20
MT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MLT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
TF	2 ½ 73.0 mm	N/A	300 2068 20
WG7, WG7E	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
WLS	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20

NOTES

- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- Easy-Flow = Easy-Flow steel pipe manufactured by Borusan Mannesmann Boru.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co.
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WG7, WG7E = WGalweld 7 and WGalweld 7E steel pipe manufactured by Wuppermann Stahl GmbH.
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.

6.0 NOTIFICATIONS

⚠ WARNING

- **Read and understand all instructions before attempting to install any Victaulic products.**
- **Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

- **These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.**
- **The installer shall understand the use of this product and why it was specified for the particular application.**
- **The installer shall understand common industry safety standards and potential consequences of improper product installation.**
- **It is the system designer's responsibility to verify suitability of materials for use with the intended fluid media within the piping system and external environment.**
- **The material specifier shall evaluate the effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on materials to confirm system life will be acceptable for the intended service.**

Failure to follow installation requirements and local and national codes and standards could compromise system integrity or cause system failure, resulting in death or serious personal injury and property damage.

NOTICE

- **Victaulic does not recommend the use of any furnace butt-welded pipe with sizes 2"/DN50 and smaller Victaulic gasketed joint products. This includes, but is not limited to, ASTM A53 Type F pipe.**

7.0 REFERENCE MATERIALS

05.01: Seal Selection Guide

25.01: Original Groove System (OGS) Groove Specifications

I-009N: Installation Instructions FireLock EZ™ Rigid Coupling Style 009N

I-100: Victaulic Field Installation Handbook

I-109: Installation Instructions FireLock™ One-Bolt Rigid Coupling Style 109

I-ENDCAP: Victaulic End Caps Installation Instructions

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

Series IBR

In-Building Risers Customizable

Sizes: 4" – 10"

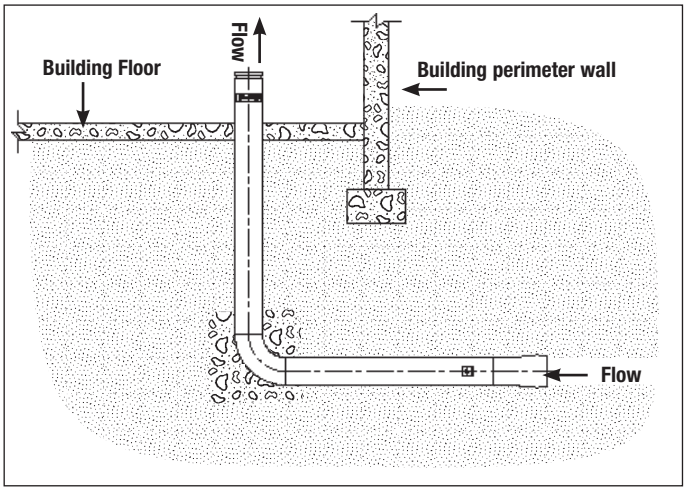
Series IBR In-Building Risers are used to connect the main fire supply to the building overhead fire system. The fitting passes under the foundation without joints and extends up through the floor. Provided with installation tabs, the unit has a CIPS (Cast Iron Pipe Size) coupler for easy connection to the underground supply (AWWA C900 PVC and Ductile Iron Pipe) and industry standard grooved-end connection (AWWA C606) on the building side for easy connection to the overhead fire sprinkler system. The IBR features Lead Free* construction to comply with Lead Free* installation requirements.

Ames In-Building Risers are precision engineered and manufactured to provide exceptional reliability and reduce installation time & labor costs associated with field assembly. In accordance with NFPA 24, the UL/FM approved In-Building Risers replace numerous fittings, elbows & spools and reduces the possibility of leaks or failure in comparison to traditional installation methods and materials. Factory tested integrity ensures the highest quality installation. The use of stainless steel significantly increases the reliability and life of the riser.

Features

- Cost savings
- Corrosion resistant stainless steel construction, type 304
- Ease of installation and light weight allows one person to position and handle the riser
- Minimal site preparation; joint restraint one-piece construction reduces time and labor; no missing parts, no leaks; easily identifiable for approvals
- Includes Test Cap and Coupler
- UL/FM approved
- Sizes: available in 4" – 10" with various lengths to meet local requirements
- Designed to meet NFPA 24
- AWWA C900 Inlet/DIP
- AWWA C606 Outlet

6'x6' standard length
(custom lengths from 3' – 20' available)



***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

AMES
FIRE & WATERWORKS
A WATTS Brand

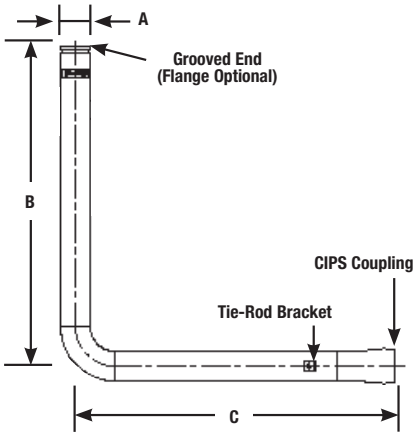
Specifications

In-Building Riser shall be installed as indicated on the plans. Riser shall be composed of a single extended 90 degree fitting of fabricated 304 stainless steel tubing, maximum working pressure 200psi (14 bar). The fitting shall have a grooved-end connection on the outlet (building) side and a CIPS coupler on the inlet (underground) side. The grooved end shall include a coupler and cap to facilitate testing of the underground piping. The In-Building Riser shall be an Ames Fire & Waterworks Series IBR.

Approvals

Fittings FM class 1920
UL HKQA (4"-10")

Dimensions – Weights



SIZE							WEIGHT	
	A (OD)		B		C			
in.	*in.*	*mm*	*ft.*	*cm*	*ft.*	*cm*	*lbs.*	*kg*
4	4½	114	6	183	6	183	71	32
4	4½	114	8'-6"	183	6	183	85	39
4	4½	114	9	274	6	183	88	40
4	4½	114	5	152	7	213	71	32
6	6⅝	168	6	183	6	183	98	44
6	6⅝	168	8'-6"	259	6	183	122	56
6	6⅝	168	9	274	6	183	127	58
6	6⅝	168	5	152	7	213	98	44
8	8⅝	219	6	183	6	183	129	59
8	8⅝	219	8'-6"	259	6	183	163	74
8	8⅝	219	9	274	6	183	170	77
8	8⅝	219	5	152	7	213	129	59
10	10¾	273	6	183	6	183	202	92
10	10¾	273	9	274	6	183	258	117
10	10¾	273	5	152	7	213	202	92

**Each B (vertical) and C (horizontal) leg is customizable from 3' to 20' with UL/FM approvals. Consult with your factory representative for details.

Standards

NFPA — Designed to allow the contractor to conform to NFPA 24

Where a riser is close to building foundations, underground fittings of proper design and type shall be used to avoid pipe joints being located under the foundations.

End Connections

Horizontal End: Mates with Ductile Iron Pipe and AWWA C900 Pipe (PVC Pipe with Ductile Iron Pipe Equivalent OD's)

Utilizes Gasket conforming to UL 157 with "Lock in" gasket configuration

SIZE	MATING PIPE OD	
in.	*in.*	*mm*
4	4.8	122
6	6.9	175
8	9.1	230
10	11.1	282

Vertical End:

Meets AWWA C-606 dimensions for roll grooved pipe
Meets AWWA C-207 class D for flanges

Ratings

Meets AWWA C-900 pressure class 200, DR 14 Pipe

Testing

Welds are 100% leak tested at the factory

NOTICE

Inquire with governing authorities for local installation requirements

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

AMES
FIRE & WATERWORKS

A **WATTS** *Brand*

USA: Backflow Tel: (978) 689-6066 • Fax: (978) 975-8350 • AmesFireWater.com
USA: Control Valves Tel: (713) 943-0688 • Fax: (713) 944-9445 • AmesFireWater.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • AmesFireWater.ca
Latin America: Tel: (52) 55-4122-0138 • AmesFireWater.com

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet

FM Approved and Fully Listed Sprinkler Pipe
Wheatland Tube's Schedule 10 and Schedule 40 steel fire sprinkler pipe is FM Approved and UL® and C-UL Listed.

Approvals and Specifications
Schedule 10 and Schedule 40 meet or exceed the following standards:

- ASTM A135, Type E, Grade A (Schedule 10, 1–8 NPS)
- ASTM A795, Type E, Grade A (Schedule 40, 1–2 NPS)
- ASTM A53, Type E, Grade B (Schedule 40, 2–8 NPS)
- ASTM A53, Type F, Grade A (Schedule 40, 1–4 NPS)
- NFPA® 13 and NFPA 14

Manufacturing Protocols
Schedule 10 and Schedule 40 are subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

Finishes and Coatings
All Wheatland black steel fire sprinkler pipe receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted, without special preparation. Schedule 10 and Schedule 40 can be ordered in black or hot-dip galvanized, to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A795 or A53.

Product Marking
Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Bar coding is acceptable as a supplementary identification method.

SUBMITTAL INFORMATION

PROJECT: _____

CONTRACTOR: _____

DATE: _____

ENGINEER: _____

SPECIFICATION REFERENCE: _____

SYSTEM TYPE: _____

LOCATIONS: _____

COMMENTS: _____

☐ BLACK

☐ HOT-DIP GALVANIZED

1 Council Avenue, P.O. Box 608
Wheatland, PA 16161
P 800.257.8182
F 724.346.7260

info@wheatland.com
wheatland.com
Follow us on Twitter:
@WheatlandTube

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Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet

SCHEDULE 10 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.097	27.9	0.109	2.77	1.405	1.814	70	2065	2360	2459	11.4
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.807	2.514	61	2315	2645	2756	7.3
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.087	3.049	61	2673	3055	3183	5.8
2	2.375	60.3	2.157	54.8	0.109	2.77	2.640	4.222	37	2051	2344	2442	4.7
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.354	5.895	30	2226	2544	2651	3.5
3	3.500	88.9	3.260	82.8	0.120	3.05	4.336	7.949	19	1730	1977	2060	2.6
4	4.500	114.3	4.260	108.2	0.120	3.05	5.619	11.789	19	2242	2562	2669	1.6
5	5.563	141.3	5.295	134.5	0.134	3.40	7.780	17.309	13	2124	2427	2529	1.5
6	6.625	168.3	6.357	161.5	0.134	3.40	9.298	23.038	10	1953	2232	2325	1.0
8	8.625	219.1	8.249	209.5	0.188	4.78	16.960	40.086	7	2493	2849	2968	2.1

SCHEDULE 40 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.055	70	2470	2822	2940	1.000
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	2.922	51	2431	2778	2894	1.000
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	3.602	44	2513	2872	2992	1.000
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.109	24	1845	2108	2196	1.000
2½	2.875	73.0	2.469	62.7	0.203	5.16	5.80	7.871	20	2436	2784	2900	1.000
3	3.500	88.9	3.068	77.9	0.216	5.49	7.58	10.783	13	2069	2365	2464	1.000
3½	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.400	10	1915	2189	2280	1.000
4	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.311	10	2268	2592	2700	1.000
5	5.563	141.3	5.047	158.2	0.258	6.55	14.63	23.262	7	2151	2458	2560	1.000
6	6.625	168.3	6.065	154.1	0.280	7.11	18.99	31.498	5	1994	2279	2374	1.000
8**	8.625	219.1	7.981	202.7	0.322	8.18	28.58	50.240	5	3001	3430	3573	1.000

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

*** 8 NPS Schedule 40 is FM Approved but not UL Listed.*

WFS-060520

1 Council Avenue, P.O. Box 608
Wheatland, PA 16161
P 800.257.8182
F 724.346.7260

info@wheatland.com
wheatland.com
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Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

Victaulic® VicFlex™ Sprinkler Fittings
Series AH1 and AH1-CC Braided Flexible Hose

10.95

Series AH1

Series AH1-CC

1.0 PRODUCT DESCRIPTION

Available Sizes by Component

Series AH1 0.8"/DN20 ID Braided Hose: 31, 36, 48, 60, 72"/790, 914, 1220, 1525, 1830 mm. Note: length includes adapter nipple and 5.75"/140 mm straight reducer.

Series AH1-CC 0.8"/DN20 ID Braided Hose: 31, 36, 48, 60, 72"/790, 914, 1219, 1525, 1830 mm. Note: length includes captured coupling and 5.75"/140 mm straight reducer.

Sprinkler Reducers

- **Sprinkler Connections:** ½ and ¾"/15 and 20 mm
- **Straight Lengths:** 5.75, 9, 13"/140, 230, 330 mm
- **90° Elbows:**
  - Short (typically used with concealed sprinklers)
  - Long (typically used with recessed pendent sprinklers)
  - Low Profile Short (for use with Style AB5, AB11, AB12, ABBA and ABMM Bracket)
  - Low Profile Long (for use with Style AB5, AB11, AB12, ABBA and ABMM Bracket)

Connections

- 1" Female CPVC Socket x 1" Grooved IGS (No. 116 CPVC Adapter)
- To adapter nipple (inlet) via
  - 1"/25.4 mm Grooved IGS
  - 1"/25.4 mm NPT or BSPT male thread
  - ¾"/20 mm BSPT male thread (VdS only)
  - 1 ¼"/32 mm BSPT male thread (LPCB only)
- To sprinkler head (outlet) via ½" or ¾"/15 mm or 20 mm

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

1.0 PRODUCT DESCRIPTION (CONTINUED)

Brackets

- Style AB1 for suspended and hard-lid ceilings, allows installation before most ceiling tiles in place
- Style AB2 for suspended and hard-lid ceilings, allows for vertical sprinkler adjustment, and installation before most ceiling tiles in place
- Style AB3 for surface mount applications, wood, metal and block walls or ceilings
- Style AB4 for hard-lid ceilings with hat furr ing channel grid systems, allows for vertical sprinkler adjustment
- Style AB5 for hard-lid ceilings, allows for vertical sprinkler adjustment
- Style AB7 for suspended and hard-lid ceilings
- Style AB7 Adjustable for suspended and hard-lid ceilings
- Style AB8 for hard-lid ceilings with CD 60/27 profile metal studs (regionally available)
- Style AB10 for Armstrong® TechZone™ ceilings
- Style AB11 for lay-in panel suspended t-grid ceilings or drywall suspended t-grid ceilings, allows for low profile installations (use only with 90° low profile elbows)
- Style AB12 for suspended and hard-lid ceilings, allows for vertical sprinkler adjustment, and allows for low profile installation down to 4"/100mm
- Style ABBA bracket for suspended, exposed, and hard-lid ceilings
- Style ABMM bracket for surface mount and stand off-mount applications, wood, metal and block walls, or ceilings and hard-lid ceilings
- Strut channel and pipe clamp, not supplied by Victaulic

Maximum Working Temperature

- 225°F/107°C
- 150°F/65°C (No. 116 CPVC Adapter)

Maximum Working Pressure

- 200 psi/1375 kPa (FM Approval)
- 175 psi/1206 kPa (cULus Listed)
- 1600 kPa/232 psi (VdS/LPCB Approved)
- 1.4 MPa (CCC Approval)
- 175 psi/1206 kPa (No. 116 CPVC Adapter)

Minimum Bend Radius

- 7"/178 mm (FM/CCC Approval)
- 3"/76.2 mm (cULus Listed)
- 3"/76.2 mm (VdS/LPCB Approved)

Maximum Allowable Sprinkler K-Factors

- FM (½"/15mm reducer) K5.6/8,1 (S.I.), (¾"/20mm reducer) K14.0/20,2 (S.I.)
- cULus (½"/15mm reducer) K8.0/11,5 (S.I.), (¾"/20mm reducer) K14.0/20,2 (S.I.)
- VdS/LPCB (½"/15mm reducer) K5.6/8,1 (S.I.), (¾"/20mm reducer) K8.0/11,5 (S.I.)

2.0 CERTIFICATION/LISTINGS

3.0 SPECIFICATIONS – MATERIAL

Series AH1

Flexible Hose: 300-series Stainless Steel
Collar/Weld Fitting: 300-series Stainless Steel
Gasket Seal: Victaulic EPDM
Isolation Ring: Nylon
Nut and Nipple: Carbon Steel, Zinc-Plated
Reducer (½ or ¾"): Carbon Steel, Zinc-Plated
Low Profile Elbows: Ductile Iron, Zinc-Plated

Brackets: Carbon Steel, Zinc-Plated

Series AH1-CC

Flexible Hose: 300-series Stainless Steel
Collar/Weld Fitting: 300-series Stainless Steel
Gasket Seal: Victaulic EPDM
Isolation Ring: Nylon
Coupling Retainer Ring: Polyethelene
Nut: Carbon Steel, Zinc-Plated
Reducer (½"/15 mm or ¾"/20 mm): Carbon Steel, Zinc-Plated
Low Profile Elbows: Ductile Iron, Zinc-Plated
Housing: Ductile iron conforming to ASTM A 536, Grade 65-45-12. Ductile iron conforming to ASTM A 395, Grade 65-45-15, is available upon special request.

Coupling Housing Coating:

- Orange enamel (North America, Asia Pacific).
- Red enamel (Europe).
- Hot dipped galvanized.

Gasket:[1]

Grade "E" EPDM (Type A)
FireLock EZ products have been Listed by Underwriters Laboratories Inc., Underwriters Laboratories of Canada Limited, and Approved by Factory Mutual Research for wet and dry (oil free air) sprinkler services within the rated working pressure.

[1] Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

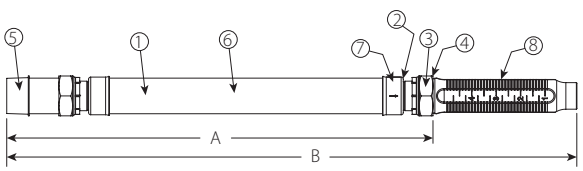
Bolts/Nut: Zinc electroplated carbon steel, trackhead meeting the physical and chemical requirements of ASTM A 449 and physical requirements of ASTM A 183.

Linkage: CrMo Alloy Steel zinc electroplated per ASTM B633 Zn/Fe 5, Type III Finish.

No. 116 Adapter Fitting: CPVC and Brass
Seal: Victaulic EPDM

4.0 DIMENSIONS

Product Details - Series AH1 Braided Hose

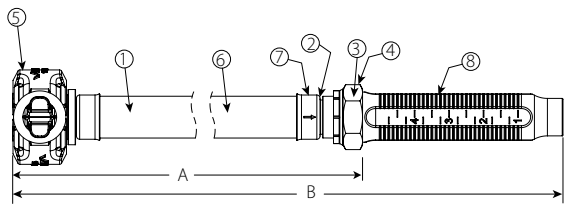


Item	Description
1	Flexible Hose
2	Isolation Ring
3	Gasket
4	Nut
5	Branch Line Nipple
6	Braid
7	Collar/Weld Fitting
8	Reducer

Hose Length Dimensions

Hose Length inches mm	A inches mm	B inches mm
31/790	25.25/641	31/790
36/915	31.25/794	36/915
48/1220	42.25/1073	48/1220
60/1525	54.25/1378	60/1525
72/1830	66.25/1683	72/1830

Series AH1-CC



Item	Description
1	Flexible Hose
2	Isolation Ring
3	Gasket
4	Nut
5	Style 108 Coupling
6	Braid
7	Collar/Weld Fitting
8	Reducer

Hose Length Dimensions

Hose Length inches mm	A inches mm	B inches mm
31/790	24.5/622	29.8/757
36/915	29.5/749	34.8/884
48/1220	41.5/1054	46.8/1189
60/1525	53.5/1359	58.8/1494
72/1830	65.5/1664	70.8/1798

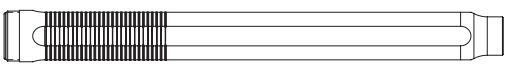
4.1 DIMENSIONS (CONTINUED)

Standard Reducer

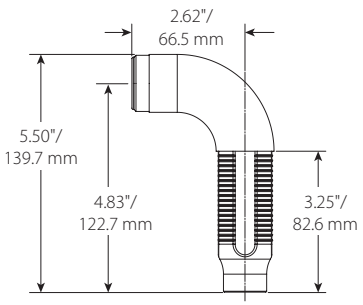
5.75"/140 mm straight reducer

Optional Reducers

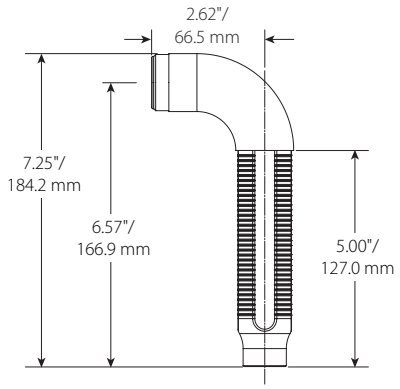
9.0"/229 mm straight reducer



13.0"/330 mm straight reducer



Short 90° elbow reducer

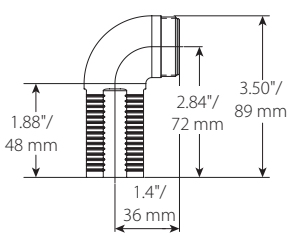


Long 90° elbow reducer

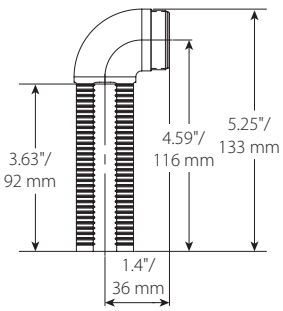
NOTE

- The Short 90° elbow reducer is typically used with concealed sprinklers while the longer 90 elbow is typically used in the installation of recessed pendent sprinklers.
- FM/VdS Approved only.

Low Profile



Short 90° elbow reducer

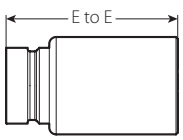


Long 90° elbow reducer

NOTE

- Style AB11: When low profiles elbows are with the Style AB11 bracket, the Low Profile Short Elbow is typically used with concealed sprinklers while the Low Profile Long Elbow is typically used in the installation of recessed pendent sprinklers.

No. 116 CPVC Adapter



NOTES

- E to E is 3.0"/76.0 mm
- The No. 116 CPVC Adapters have 2 ft (0.6 m). EQL of 1" Schedule 40 pipe

4.2 DIMENSIONS

VicFlex Brackets

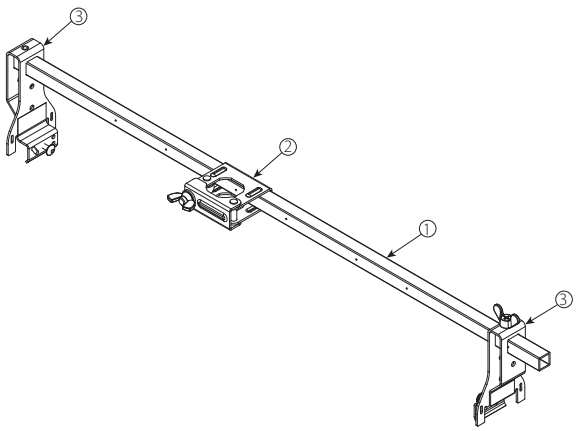
Style AB1

- Suspended Ceilings
- Hard-Lid Ceilings (FM Only)

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented Center Bracket
3	End Bracket

NOTE

- Both sizes FM/VdS/LPCB approved, cULus listed



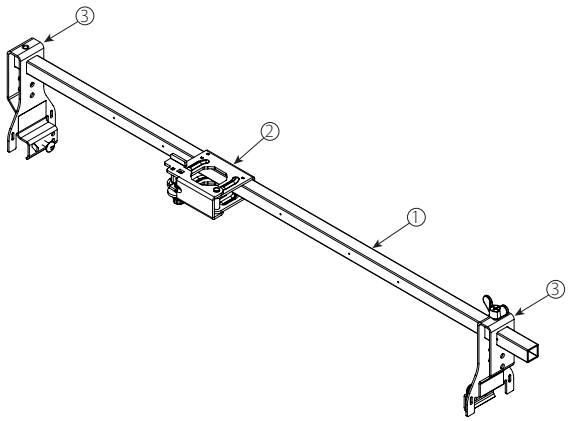
Style AB2

- Suspended Ceilings
- Hard-Lid Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented Vertically Adjustable Center Bracket
3	End Bracket

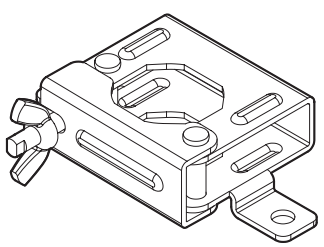
NOTE

- Both sizes FM/VdS/LPCB approved, cULus listed



Style AB3

- Surface Mount Applications
- FM/LPCB Approved



4.3 DIMENSIONS

VicFlex Brackets

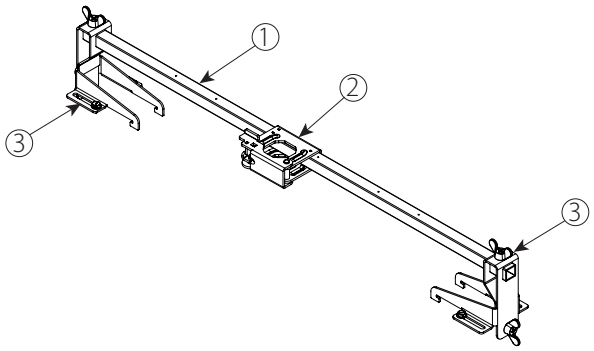
Style AB4

- Hard-Lid Ceilings with Hat furring channel grid system

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented Vertically Adjustable Center Bracket
3	End Bracket for Hat Furring Channel

NOTE

- Both sizes FM/VdS/LPCB approved, cULus listed



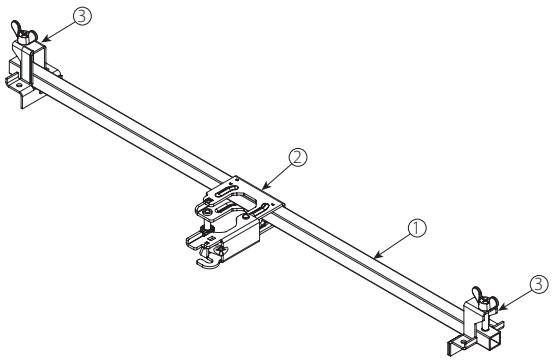
Style AB5

- Hard-Lid Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented Vertically Adjustable Center Bracket
3	End Bracket

NOTE

- Both sizes FM/VdS/LPCB approved, cULus listed



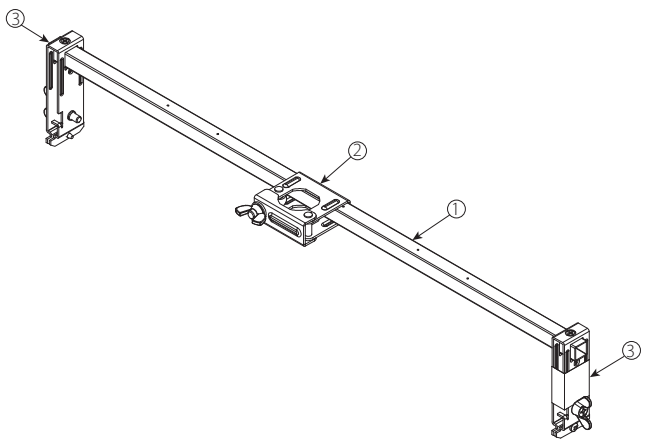
Style AB7

- Suspended Ceilings
- Hard-Lid Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented 1-Bee2® Center Bracket
3	End Bracket

NOTE

- Both sizes FM/VdS/LPCB approved.



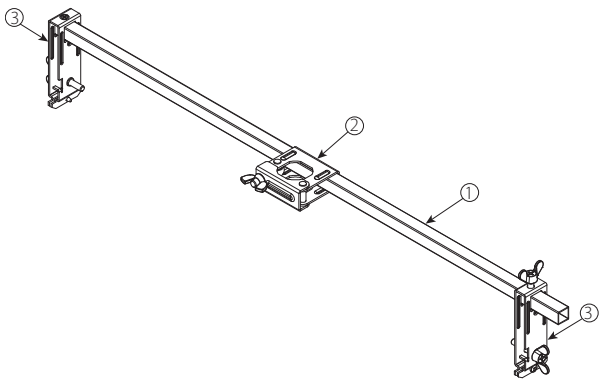
Style AB7 Adjustable

- Suspended Ceilings
- Hard-Lid Ceilings

Item	Description
1	700 mm or 1400 mm Square Bar
2	Patented 1-Bee2® Center Bracket
3	End Bracket (adjustable)

NOTE

- Both sizes FM/VdS/LPCB approved.



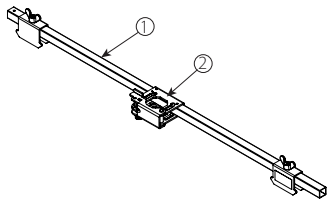
4.4 DIMENSIONS

VicFlex Brackets

Style AB8

- Hard-Lid Ceilings

Item	Description
1	700 mm or 1400 mm Square Bar*
2	Patented Vertically Adjustable Center Bracket
3	*Both sizes FM/VdS



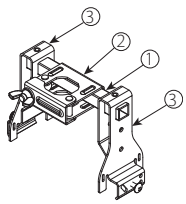
NOTE

- Both sizes FM/VdS/LPCB approved.

Style AB10

- Suspended ceilings
- Armstrong® TechZone™

Item	Description
1	6"/152 mm Square Bar*
2	Patented 1-Bee2® Center Bracket
3	End Bracket



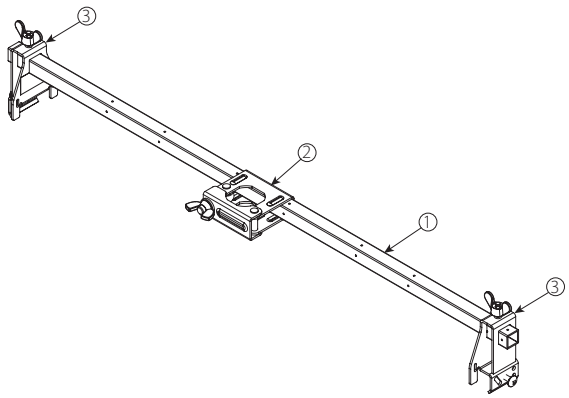
NOTE

- FM/VdS/LPCB approved, cULus listed.

Style AB11

- Suspended ceilings
- Hard-Lid ceilings

Item	Description
1	24"/610 mm or 48"/1219 mm Square Bar
2	Patented 1-Bee2® Center Bracket
3	End Bracket



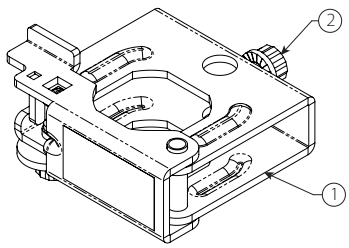
NOTE

- FM/VdS Approved, cULus listed.

Style AB12

- Suspended ceilings
- Hard-Lid ceilings

Item	Description
1	Style AB12 Bracket Body
2	#2 Square Drive Set Screw



NOTE

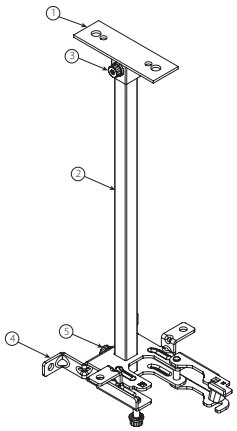
- FM/VdS Approved.

4.5 DIMENSIONS

VicFlex Brackets

Style ABBA

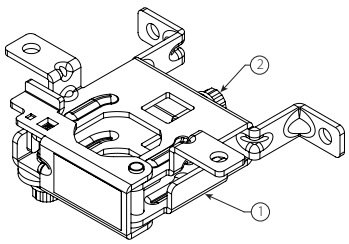
- Floor-above mount
- Cantilever mount
- Temporary mount in exposed ceilings



Item	Description
1	Style ABBA Mounting Plate
2	Style ABBA Square Bar
3	Cap Screw, Serated Flange, M6 x 1 x 20, T25 Torx Drive Recessed
4	Style ABMM Bracket Body
5	Cap Screw, Serated Flange, M6 x 1 x 15.24, T25 Torx Drive Recessed

Style ABMM

- Surface mount
- Stand-off mount



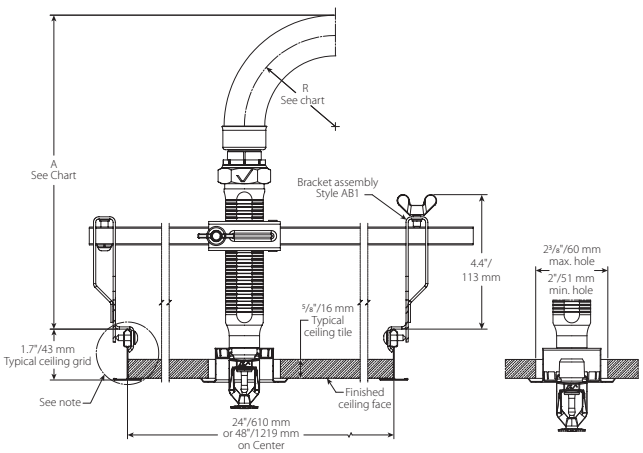
Item	Description
1	Style ABMM Bracket Body
2	Cap Screw, Serated Flange, M6 x 1 x 15.24, T25 Torx Drive Recessed

4.6 DIMENSIONS

CLEARANCES ABOVE CEILING

Series AH1 Braided Hose and Style AB1 Bracket

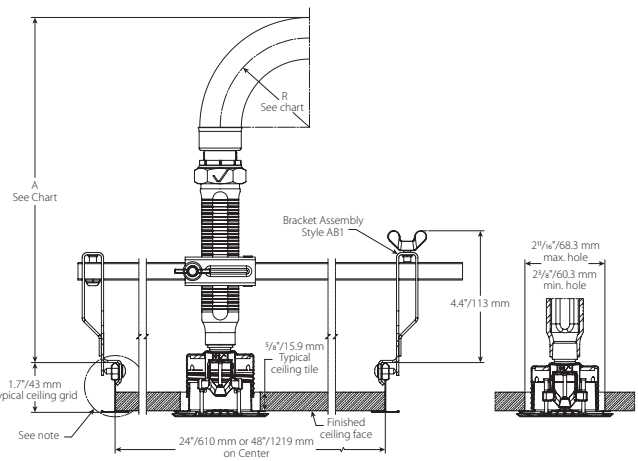
Suspended Ceiling Grid with Recessed Sprinkler



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart							
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	2 50	3 80	4 100	5 125	6 150	7 175
A	Min.	8.6 218	9.6 244	10.6 269	11.6 295	12.6 320	13.6 345

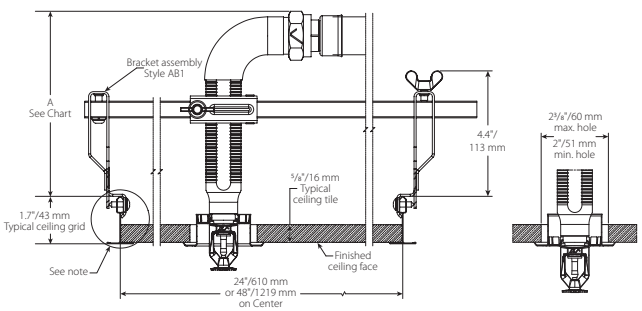
Suspended Ceiling Grid with Concealed Sprinkler



V3802 ½"/12.7mm Max. Recess

Hose Clearance Chart							
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	2 50	3 80	4 100	5 125	6 150	7 175
A	Min.	10.1 269	11.1 281	12.1 307	13.1 333	14.1 358	15.1 383

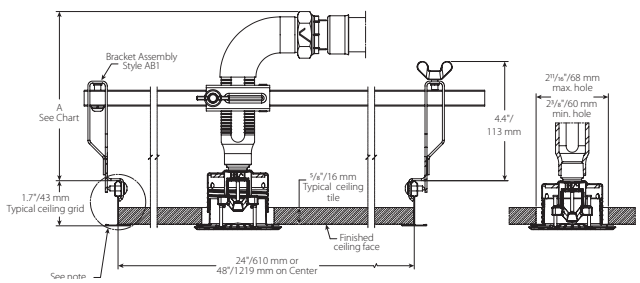
Suspended Ceiling Grid with Recessed Sprinkler with 90° Elbow (Long)



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart		
Dimension		inches mm
A	Min.	8.0 200

Suspended Ceiling Grid with Concealed Sprinkler with 90° Elbow (Short)



V3802 ½"/12.7mm Max. Recess

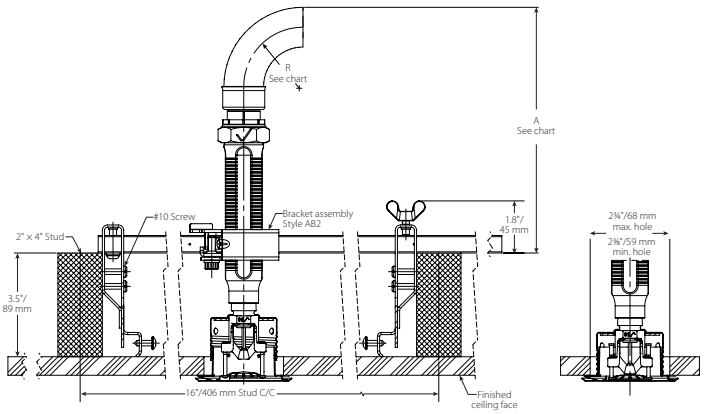
Hose Clearance Chart		
Dimension		inches mm
A	Min.	5.8 147

4.7 DIMENSIONS

CLEARANCES ABOVE CEILING

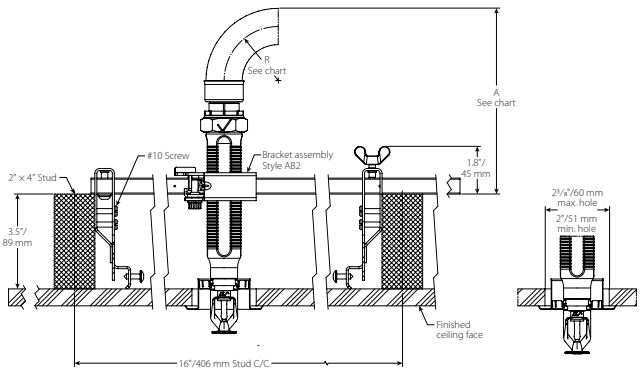
Series AH1 Braided Hose and Style AB2 Bracket

Hard-lid Ceiling with Concealed Sprinkler



V3802 ½"/12.7mm Max. Recess

Hard-lid Ceiling with Recessed Sprinkler



V2707 ¾"/19mm Max. Recess

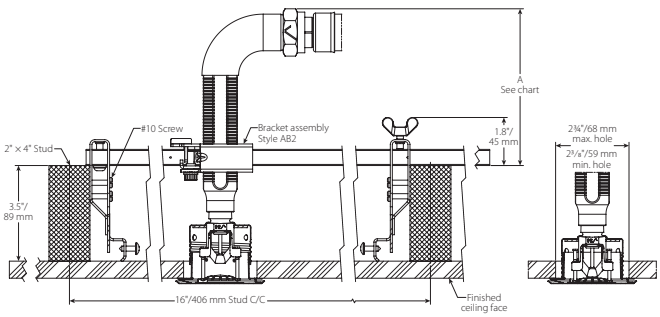
Hose Clearance Chart							
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	2 50	3 80	4 100	5 125	6 150	7 175
A	Min.	7.6 193	8.6 218	9.6 244	10.6 269	11.6 295	12.6 320

Hose Clearance Chart							
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	2 50	3 80	4 100	5 125	6 150	7 175
A	Min.	6.1 155	7.1 180	8.1 206	9.1 231	10.1 256	11.1 282

NOTE

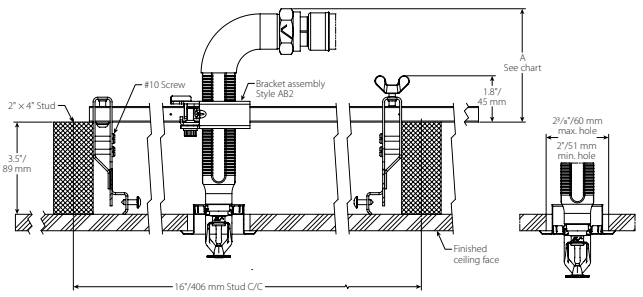
- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

Hard-lid Ceiling Grid with Concealed Sprinkler with 90° Elbow (Short)



V3802 ½"/12.7mm Max. Recess

Hard-lid Ceiling with Recessed Sprinkler with 90° Elbow (Long)



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart		
Dimension		inches mm
A	Min.	5.0 127

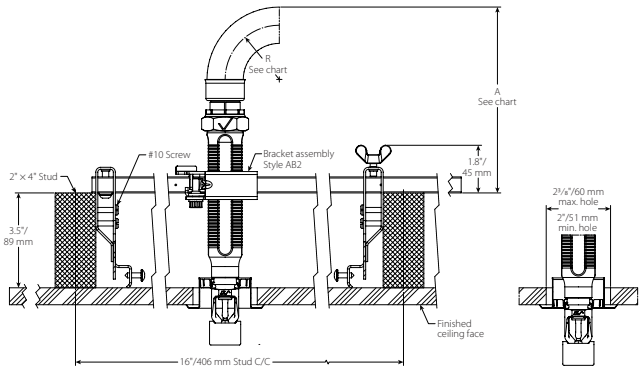
Hose Clearance Chart		
Dimension		inches mm
A	Min.	3.6 91

4.8 DIMENSIONS

CLEARANCES WITHIN SIDEWALL

Series AH1 Braided Hose and Style AB2 Bracket

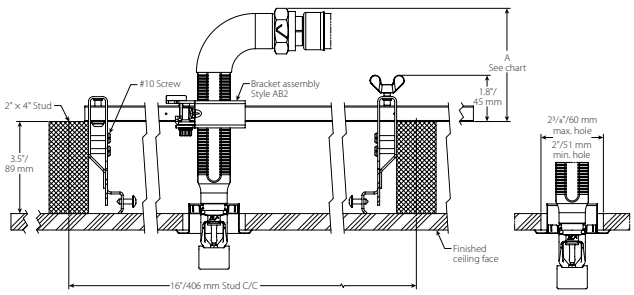
Horizontal Sidewall Sprinkler



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart							
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	2 50	3 80	4 100	5 125	6 150	7 175
A	Min.	6.1 155	7.1 180	8.1 206	9.1 231	10.1 256	11.1 282

Horizontal Sidewall Sprinkler with 90° Elbow (Long)



V2707 ¾"/19mm Max. Recess

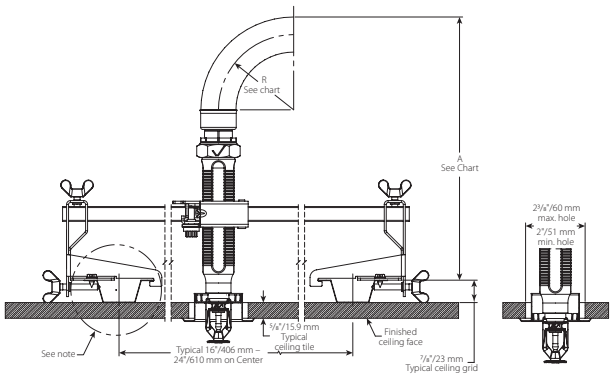
Hose Clearance Chart		
Dimension		inches mm
A	Min.	3.6 91

4.9 DIMENSIONS

CLEARANCES ABOVE CEILING

Series AH1 Braided Hose and Style AB4 Bracket

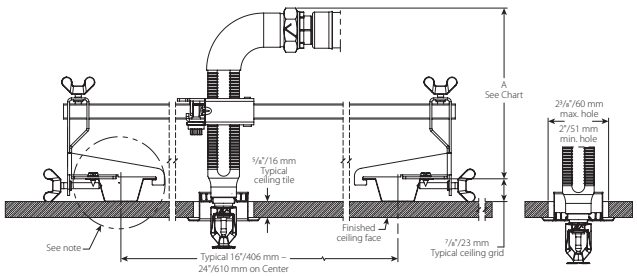
Hat Furring Channel Grid with Recessed Sprinkler



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart							
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	2 50	3 80	4 100	5 125	6 150	7 175
A	Min.	8.8 224	9.8 249	10.8 274	11.8 300	12.8 325	13.8 351

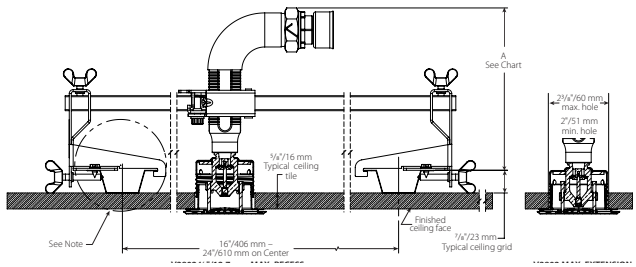
Hat Furring Channel Grid with Recessed Sprinkler with 90° Elbow (Long)



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart		
Dimension		inches mm
A	Min.	8.0 200

Hat Furring Channel Grid with Concealed Sprinkler with 90° Elbow (Short)



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart		
Dimension		inches mm
A	Min.	5.9 149

NOTE

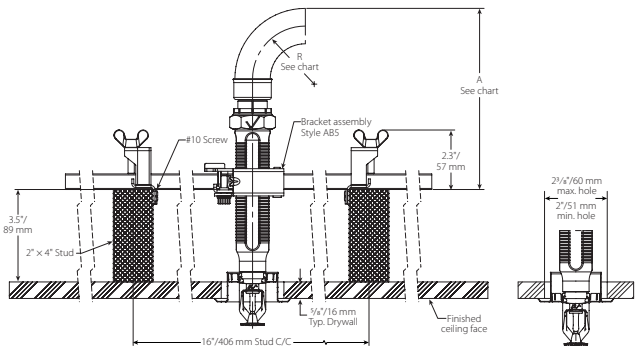
- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.10 DIMENSIONS

CLEARANCES ABOVE CEILING

Series AH1 Braided Hose and Style AB5 Bracket

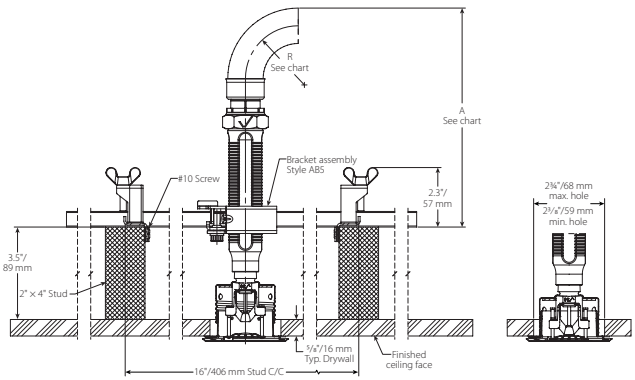
Hard-lid Ceiling with Recessed Sprinkler



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart							
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	2 50	3 80	4 100	5 125	6 150	7 175
A	Min.	6.1 155	7.1 180	8.1 206	9.1 231	10.1 256	11.1 282

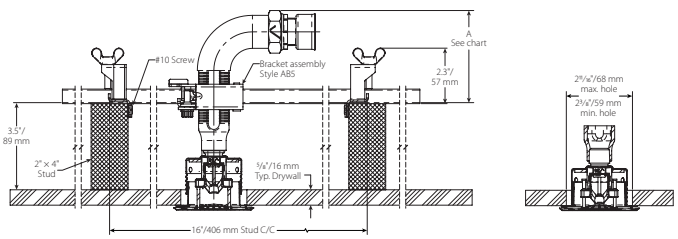
Hard-lid Ceiling with Concealed Sprinkler



V3802 ½"/13mm Max. Recess

Hose Clearance Chart							
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	2 50	3 80	4 100	5 125	6 150	7 175
A	Min.	7.6 193	8.6 218	9.6 244	10.6 269	11.6 295	12.6 320

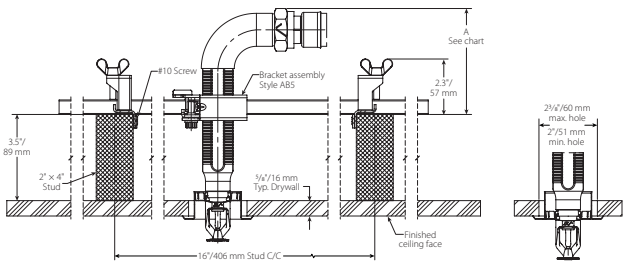
Hard-lid Ceiling with Concealed Pendent with 90° Elbow (Long)



V3802 ½"/13mm Max. Recess

Hose Clearance Chart		
Dimension		inches mm
A	Min.	3.6 91

Hard-lid Ceiling with Recessed Pendent with 90° Elbow (Short)



V2707 ¾"/19mm Max. Recess

Hose Clearance Chart		
Dimension		inches mm
A	Min.	3.3 84

NOTE

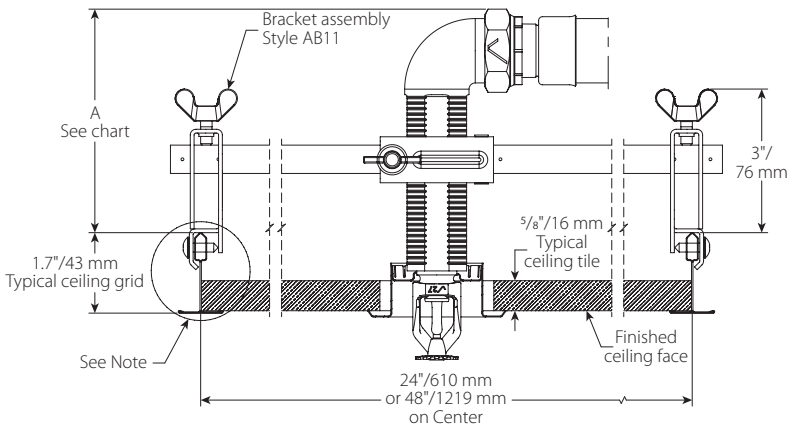
- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.11 DIMENSIONS

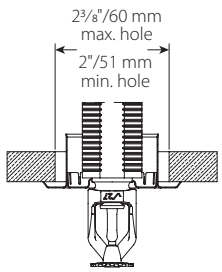
CLEARANCES ABOVE CEILING

Series AH1 Braided Hose and Style AB11 Bracket (LOW PROFILE SOLUTION)

Suspended Ceiling Grid with Recessed Sprinkler with LP 90° Elbow (Long)



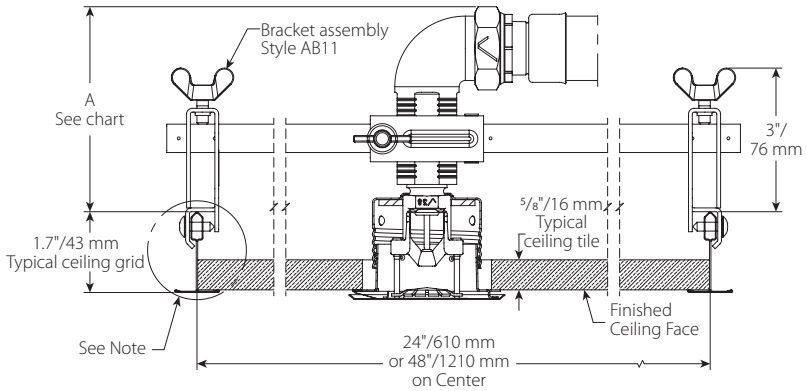
V2707 ¾"/19 mm MAX. RECESS



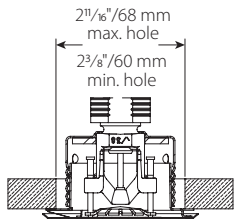
V2707 MAX. EXTENSION

Hose Clearance Chart		
Dimension		inches mm
A	Min.	4.0 100

Suspended Ceiling Grid with Concealed Pendent with LP 90° Elbow (Short)



V3802 ½"/13 mm MAX. RECESS



V3802 MAX. EXTENSION

Hose Clearance Chart		
Dimension		inches mm
A	Min.	3.9 99

NOTE

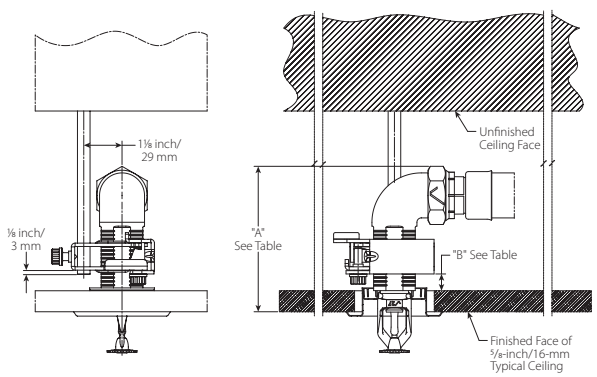
- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.12 DIMENSIONS

CLEARANCES ABOVE CEILING

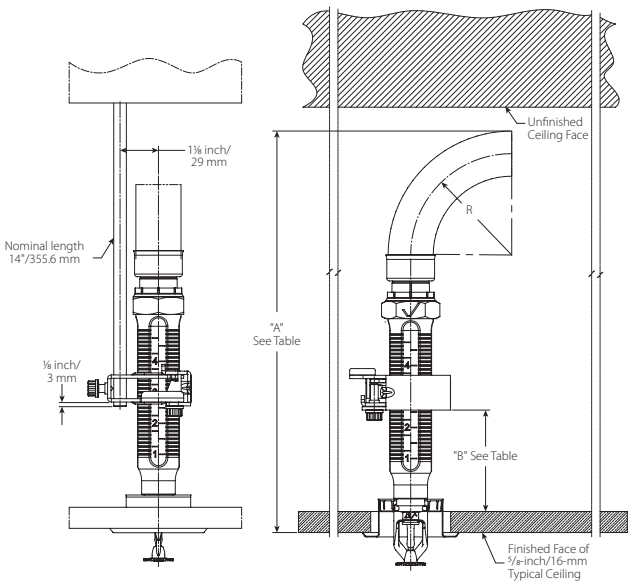
Series AH1 Braided Hose and Style AB12 and ABBA Bracket

Suspended Ceiling Grid with Recessed Sprinkler with Low Profile Short Elbow



V2707 ½"/12.7 mm MAX. RECESS

Suspended Ceiling Grid with Recessed Sprinkler and Straight 5.75"/140mm Reducer



V2707 ¾"/19 mm MAX. RECESS

Dimension		Low Profile Short Elbow		Low Profile Long Elbow		Standard Short Elbow		Standard Long Elbow		Standard Straight Reducer	
		¾"/19mm Recessed* inches mm	Concealed inches mm	¾"/19mm Recessed inches mm	Concealed inches mm	¾"/19mm Recessed inches mm	Concealed inches mm	¾"/19mm Recessed inches mm	Concealed inches mm	¾"/ 19mm Recessed inches mm	Concealed inches mm
A	Minimum Required Installation Space	4.0 101.6	5.5 139.7	5.6 142.2	7.2 182.9	5.9 149.9	7.5 190.5	7.7 195.6	9.3 236.2	15.0 381.0	16.6 421.6
B	Distance from Top of Typical Ceiling Tile to Bottom of Gate	0.5 12.7	2.0 50.8	1.5 38.1	1.5 38.1	1.5 38.1	1.5 38.1	3.0 76.2	3.0 76.2	3.0 76.2	3.0 76.2

* Adjustability will be limited

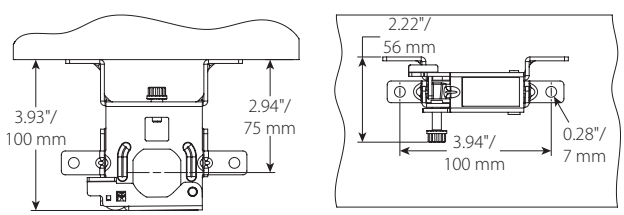
NOTE

- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.13 DIMENSIONS

Style ABMM Bracket

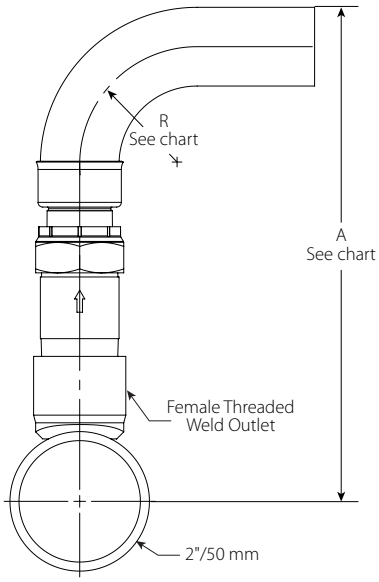
Stand-off Dimensions



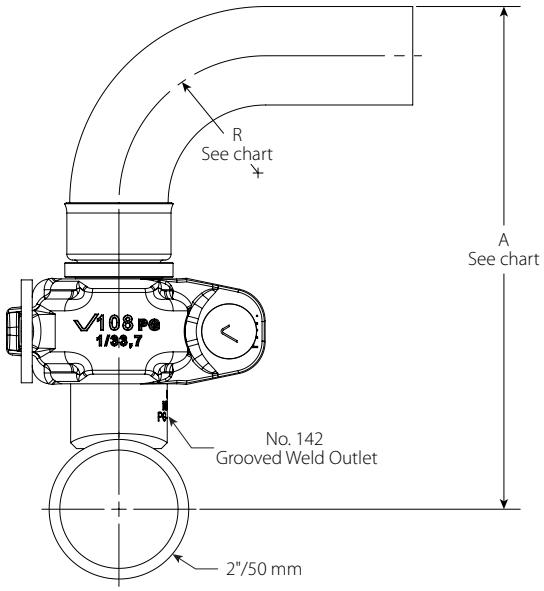
4.13 DIMENSIONS

BRANCHLINE CLEARANCES

Series AH1 Braided Hose with female threaded outlet



Series AH1-CC Braided Hose with grooved outlet



Hose Clearance Chart						
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	3 80	4 100	5 125	6 150	7 175
A	Min.	9.4 239	10.4 264	11.4 290	12.4 315	13.41 341

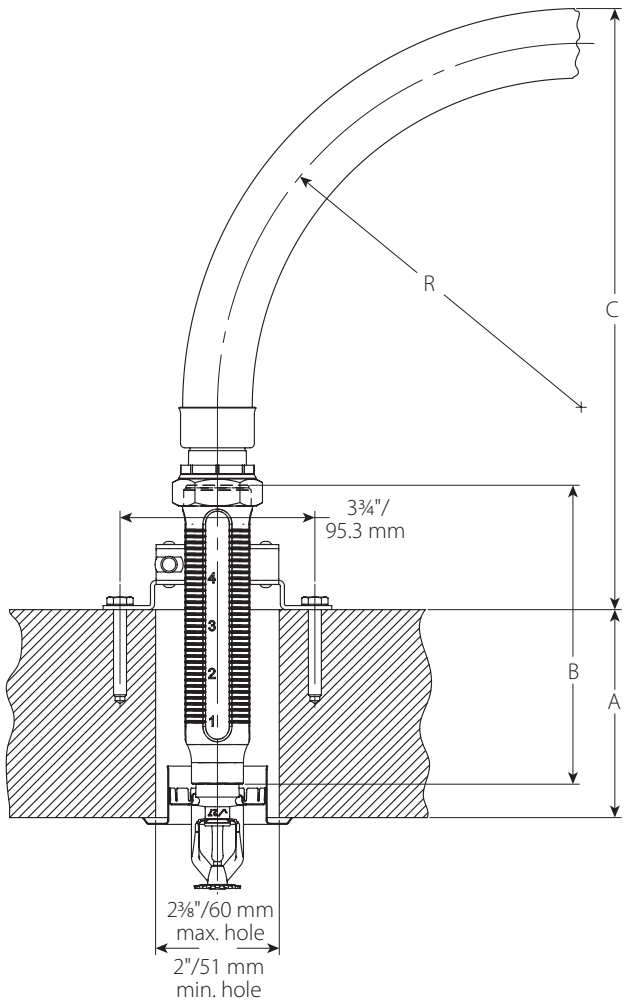
Hose Clearance Chart						
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	3 80	4 100	5 125	6 150	7 175
A	Min.	8.1 205	9.1 231	10.1 256	11.1 281	12.1 307

4.14 DIMENSIONS

CLEARANCES ABOVE CEILING

Series AH1 Braided Hose and Style AB3 and ABMM Bracket

Surface Mount Application with Recessed Sprinkler



Hose Clearances																				
Wall Thickness "A"	2 50			4 100			6 150		8 200	10 250	2 50			4 100			6 150		8 200	10 250
Outlet Length "B"	5.75 146.1	9 228.6	13 330.2	5.75 146.1	9 228.6	13 330.2	9 228.6	13 330.2	13 330.2	13 330.2	5.75 146.1	9 228.6	13 330.2	5.75 146.1	9 228.6	13 330.2	9 228.6	13 330.2	13 330.2	13 330.2
Hose Clearance "C"	11.6 294	14.8 376	18.8 478	9.6 243	12.8 325	16.8 427	10.8 275	14.8 376	12.8 325	10.8 275	12.6 319	15.8 402	19.8 503	10.6 268	13.8 351	17.8 452	11.8 300	15.8 402	13.8 351	11.8 300
Bend Radius "R"	7 175										8 200									

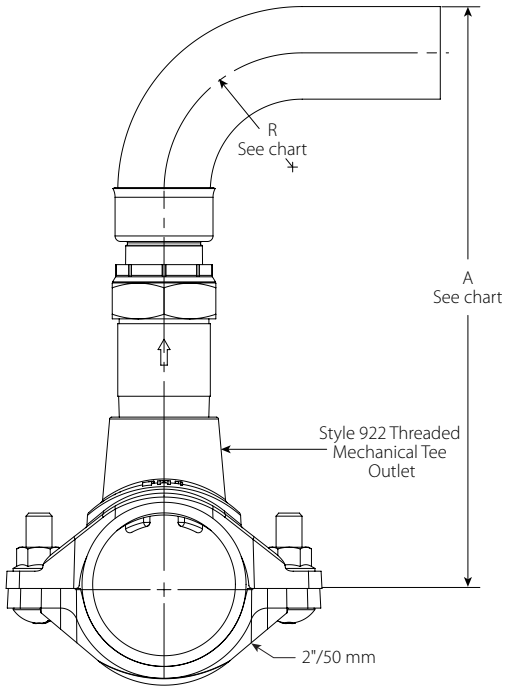
NOTE

- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.
- See installation instructions for mounting screw type and size.

4.15 DIMENSIONS

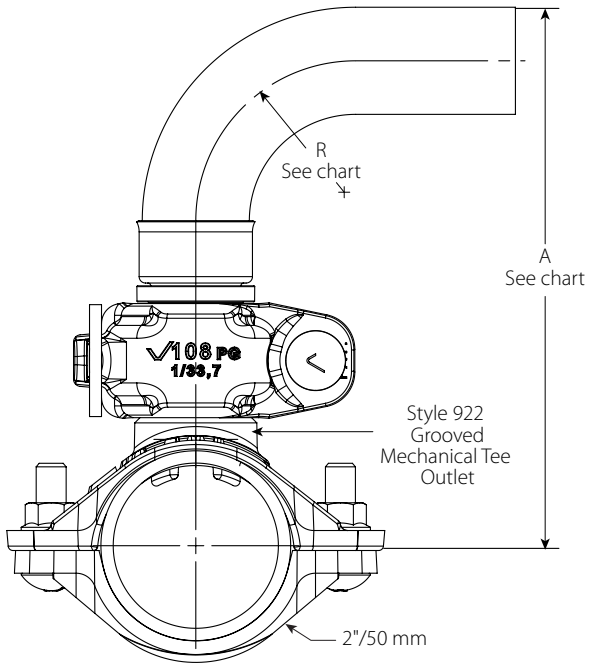
BRANCHLINE CLEARANCES

Series AH1 Braided Hose with Style 922 threaded outlet



Hose Clearance Chart						
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	3 80	4 100	5 125	6 150	7 175
A	Min.	9.4 238	10.4 263	11.4 289	12.4 314	13.4 339

Series AH1-CC Braided Hose with Style 922 grooved outlet



Hose Clearance Chart						
Dimension		inches mm	inches mm	inches mm	inches mm	inches mm
R	Minimum Bend Radius	3 80	4 100	5 125	6 150	7 175
A	Min.	7.7 197	8.7 222	9.7 247	10.7 273	11.7 298

5.0 PERFORMANCE – FRICTION LOSS DATA

Series AH1 and AH1-CC Braided Hose with Straight 5.75" Reducers Style AB1, AB2, AB4, AB5 and AB10 Brackets

Length of Stainless Steel Flexible Hose inches/mm	Outlet Size inches/mm/type	Equivalent Length of 1"/33.7 mm Sch. 40 Pipe (C=120) feet/meters	Maximum Number of 90° Bends at 3"/76.2 mm Bend Radius
31/775	½"/15/Straight	52/15.8	3
	¾"/20/Straight	55/16.8	3
36/900	½"/15/Straight	63/19.2	4
	¾"/20/Straight	66/20.1	4
48/1200	½"/15/Straight	78/23.8	4
	¾"/20/Straight	80/24.4	4
60/1500	½"/15/Straight	88/26.8	4
	¾"/20/Straight	90/27.4	4
72/1800	½"/15/Straight	112/34.1	5
	¾"/20/Straight	118/36.0	5

Series AH1 Braided Hose with 90° Low Profile Elbows Style AB11 VicFlex Bracket

Hose Length inches/mm	Outlet Size inches/mm/type	Equivalent Length of 1"/33.7 mm Sch. 40 Pipe feet/meters	Maximum Number of 90° Bends at 3"/76.2 mm Bend Radius
31/775	½"/15	63/19.2	3
	¾"/20	65/19.8	3
36/900	½"/15	76/23.2	4
	¾"/20	76/23.2	4
48/1200	½"/15	99/30.2	4
	¾"/20	98/29.9	4
60/1500	½"/15	108/32.9	4
	¾"/20	102/31.1	4
72/1800	½"/15	124/37.8	5
	¾"/20	132/40.2	5

5.0 PERFORMANCE – FRICTION LOSS DATA

Series AH1 Braided Hose Equivalent Length Design Guide

Equivalent length values at various numbers of 90 degree bends at 3"/76.2 mm center line bend radius

Length of Stainless Steel Flexible Hose inches/mm	**Outlet Size** inches/mm	**1 Bend** feet/meters	**2 Bends** feet/meters	**3 Bends** feet/meters	**4 Bends** feet/meters	**5 Bends** feet/meters
31/775	½"/15	32/9.8	42/12.8	52/15.9	N.A	N.A
	¾"/20	33/10.1	44/13.4	55/16.8	N.A	N.A
36/900	½"/15	33/10.1	43/13.1	53/16.2	63/19.2	N.A
	¾"/20	36/11.0	46/14.0	56/17.1	66/20.1	N.A
48/1200	½"/15	46/14.0	57/17.4	68/20.7	78/23.8	N.A
	¾"/20	51/15.5	60/18.3	71/21.6	88/26.8	N.A
60/1500	½"/15	56/17.1	67/20.4	77/23.5	88/26.8	N.A
	¾"/20	58/17.7	69/21.0	80/24.4	90/27.4	N.A
72/1800	½"/15	69/21.0	79/24.1	91/27.7	102/31.1	112/34.1
	¾"/20	73/22.6	84/25.6	95/29.0	106/32.3	118/36.0

NOTES:

- Values for use with 5.75" straight reducers.
- The values in this table are provided by the manufacturer for reference only. For friction loss data in accordance with the UL Certification, please refer to page 17 of this publication.

How to use this Design Guide:

- For some systems, it may be advantageous for the designer to calculate the system hydraulics using shorter equivalent lengths associated with fewer than the maximum allowable number of bends. In this case, the designer may select a design number of bends for the job and use the associated equivalent length from the design guide to determine the system hydraulics.
- It is possible that the actual installed condition of some of the flexible drops may have more bends than the designer selected. When this happens, the design guide may be used to find equivalent lengths based on the actual installed number of bends for particular sprinkler installations. The system hydraulics can be recalculated using actual equivalent lengths to verify the performance of the system.

5.0 PERFORMANCE – FRICTION LOSS DATA

Series AH1 and AH1-CC Braided Hose
Style AB1, AB2, AB3, AB4, AB5, AB7, AB7 Adj., AB8, AB10, AB12, ABBA and ABMM VicFlex Brackets

inches/mm	Imperial/S.I.	inches/mm/type	Equivalent Length of 1"/33.7mm Sch. 40 Pipe feet/meters	Maximum Number of 90° Bends at 7"/178mm Bend Radius
31/775	5.6/8.1	½"/15/Straight	53.8/16.4	2
		½"/15/90° Elbow	53.8/16.4	
36/900	5.6/8.1	½"/15/Straight	63.7/19.4	2
		½"/15/90° Elbow	63.1/19.2	
48/1200	5.6/8.1	½"/15/Straight	87.9/26.8	3
		½"/15/90° Elbow	85.8/26.1	
60/1500	5.6/8.1	½"/15/Straight	112.2/34.1	4
		½"/15/90° Elbow	108.4/33.0	
72/1800	5.6/8.1	½"/15/Straight	136.5/41.6	4
		½"/15/90° Elbow	131.1/39.9	
31/775	8.0/11.5	¾"/20/Straight	44.4/13.5	2
		¾"/20/90° Elbow	47.6/14.5	
36/900	8.0/11.5	¾"/20/Straight	55.6/16.9	2
		¾"/20/90° Elbow	57.5/17.5	
48/1200	8.0/11.5	¾"/20/Straight	82.8/25.2	3
		¾"/20/90° Elbow	81.7/24.9	
60/1500	8.0/11.5	¾"/20/Straight	110.1/24.9	4
		¾"/20/90° Elbow	105.9/32.2	
72/1800	8.0/11.5	¾"/20/Straight	137.3/41.8	4
		¾"/20/90° Elbow	130.2/39.7	
31/775	11.2/16.1	¾"/20/Straight	45.5/13.8	2
		¾"/20/90° Elbow	47.1/14.3	
36/900	11.2/16.1	¾"/20/Straight	66.3/20.2	2
		¾"/20/90° Elbow	57.5/17.5	
48/1200	11.2/16.1	¾"/20/Straight	82.7/25.2	3
		¾"/20/90° Elbow	82.8/25.2	
60/1500	11.2/16.1	¾"/20/Straight	109.1/33.2	4
		¾"/20/90° Elbow	108.1/32.9	
72/1800	11.2/16.1	¾"/20/Straight	135.5/41.3	4
		¾"/20/90° Elbow	133.4/40.6	
31/775	14.0/20.2	¾"/20/Straight	44.3/13.5	2
		¾"/20/90° Elbow	46.4/14.1	
36/900	14.0/20.2	¾"/20/Straight	55.5/16.9	2
		¾"/20/90° Elbow	56.7/17.3	
48/1200	14.0/20.2	¾"/20/Straight	83.0/25.3	3
		¾"/20/90° Elbow	82.1/25.0	
60/1500	14.0/20.2	¾"/20/Straight	110.4/33.6	4
		¾"/20/90° Elbow	107.5/32.7	
72/1800	14.0/20.2	¾"/20/Straight	137.9/42.0	4
		¾"/20/90° Elbow	132.8/40.4	

FM NOTES:

- Series AH1 has been tested and Approved by FM Global for use in wet, dry and preaction systems per NFPA 13, 13R, and 13D and FM data sheets 2-0, 2-5, and 2-8. FM 1637 and Vds standards for safety include, but are not limited to, pressure cycling, corrosion resistance, flow characterisitics, vibration resistance, leakage, mechanical and hydrostatic strength.
- EXAMPLE: A 48-inch hose installed with two 30° bends and two 90° bends is permitted and considered equivalent to the data in the table shown above. In this example, the total number of degrees is 240°, which is less than the allowable 270°.

5.0 PERFORMANCE – FRICTION LOSS DATA

Series AH1 Braided Hose with 90° Low Profile Elbows
Style AB5, AB11, AB12, ABBA and ABMM VicFlex Bracket

Length of Stainless Steel Flexible Hose inches/mm	K-Factor Imperial/S.I.	Outlet Size inches/mm	Equivalent Length of 1"/33.7mm Sch. 40 Pipe feet/meters	Maximum Number of 90° Bends at 7"/178mm Bend Radius
31/775	5.6/8.1	½"/15	49.0/14.9	2
36/900	5.6/8.1	½"/15	58.5/17.8	2
48/1200	5.6/8.1	½"/15	81.5/24.8	3
60/1500	5.6/8.1	½"/15	104.4/31.8	4
72/1800	5.6/8.1	½"/15	127.4/38.8	4
31/775	8.0/11.5	¾"/20	47.6/14.5	2
36/900	8.0/11.5	¾"/20	57.7/17.6	2
48/1200	8.0/11.5	¾"/20	81.9/25.0	3
60/1500	8.0/11.5	¾"/20	106.1/32.3	4
72/1800	8.0/11.5	¾"/20	130.5/39.8	4
31/775	11.2/16.1	¾"/20	48.6/14.8	2
36/900	11.2/16.1	¾"/20	58.2/17.7	2
48/1200	11.2/16.1	¾"/20	82.2/25.1	3
60/1500	11.2/16.1	¾"/20	104.2/31.8	4
72/1800	11.2/16.1	¾"/20	127.5/38.8	4
31/775	14.0/20.2	¾"/20	47.9/14.6	2
36/900	14.0/20.2	¾"/20	58.0/17.7	2
48/1200	14.0/20.2	¾"/20	82.2/25.1	3
60/1500	14.0/20.2	¾"/20	106.4/32.4	4
72/1800	14.0/20.2	¾"/20	130.8/39.9	4

FM NOTES:

- Series AH1 has been tested and Approved by FM Global for use in wet, dry and preaction systems per NFPA 13, 13R, and 13D and FM data sheets 2-0, 2-5, and 2-8. FM 1637 and Vds standards for safety include, but are not limited to, pressure cycling, corrosion resistance, flow characterisitics, vibration resistance, leakage, mechanical and hydrostatic strength.
- Differences in equivalent lengths are due to varying test methods, per FM 1637 and VdS standards. Refer to these standards for additional information regarding friction loss test methods.
- EXAMPLE: A 48-inch hose installed with two 30° bends and two 90° bends at a 7-inch bend radius is permitted and considered equivalent to the data in the table shown above. In this example, the total number of degrees is 240°, which is less than the allowable 270°.

5.0 PERFORMANCE – FRICTION LOSS DATA

Series AH1 and AH1-CC Braided Hose
Style AB1, AB2, AB4, AB5, AB7, AB7 Adj., AB8, AB10, AB11 and AB12 Brackets

Length of Stainless Steel Flexible Hose mm/inches	Outlet Size mm/inches/type	Equivalent Length of steel pipe according to EN 10255 DN 20 (26,9 x 2,65) meters/feet	Maximum Number of 90° Bends at 3"/76.2mm Bend Radius meters/feet
790/31	15mm/½"/Straight	4.0/12.9	3
	20 mm/¾"/Straight		
915/36	15mm/½"/Straight	4.6/15.0	3
	20 mm/¾"/Straight		
1220/48	15mm/½"/Straight	6.1/20.0	3
	20 mm/¾"/Straight		
1525/60	15mm/½"/Straight	7.6/25.0	4
	20 mm/¾"/Straight		
1830/72	15mm/½"/Straight	9.2/30.0	4
	20 mm/¾"/Straight		

VDS CEILING MANUFACTURERS LIST

AB1, AB2, AB7, AB10, AB11, AB12

1. AMF
2. Armstrong
3. Chicago Metallic
4. Dipling
5. Durlum
6. Geipel
7. Gema-Armstrong
8. Hilti
9. Knauf
10. Lafarge
11. Linder
12. Odenwald
13. Richter
14. Rigips
15. Rockfon Pagos
16. Suckow & Fischer
17. USG Donn

AB4

No specific approval

AB8

1. Hilti
2. Knauf
3. Lafarge
4. Lindner
5. Rigips

5.0 PERFORMANCE – FRICTION LOSS DATA (continued)

Series AH1 and AH1-CC Braided Hose
Style AB1, AB2, AB3, AB4, AB5, AB7, AB8 and AB10 Brackets

Length of Stainless Steel Flexible Hose mm/inches	Outlet Size mm/inches/type	Equivalent Length of steel pipe according to EN 10255 DN 25 (33,7 x 3,25) meters/feet	Maximum Number of 90° Bends at 3"/76.2mm Bend Radius
790/31	15mm/½"/Straight	12.7/41.8	2
	20 mm/¾"/Straight		
	15mm/½"/90° Elbow	13.6/44.6	2
	20 mm/¾"/90° Elbow		
915/36	15mm/½"/Straight	16.4/53.8	3
	20 mm/¾"/Straight		
	15mm/½"/90° Elbow	16.9/55.4	3
	20 mm/¾"/90° Elbow		
1220/48	15mm/½"/Straight	19.6/64.3	3
	20 mm/¾"/Straight		
	15mm/½"/90° Elbow	19.9/65.1	3
	20 mm/¾"/90° Elbow		
1525/60	15mm/½"/Straight	24.0/78.8	3
	20 mm/¾"/Straight		
	15mm/½"/90° Elbow	24.5/80.2	3
	20 mm/¾"/90° Elbow		
1830/72	15mm/½"/Straight	27.8/91.1	3
	20 mm/¾"/Straight		
	15mm/½"/90° Elbow	28.5/93.4	3
	20 mm/¾"/90° Elbow		

Series AH1 Flexible Hose Friction Loss Data

Model	Length of Flexible Hose mm inches	Equivalent Length Straight Configuration meters feet	Equivalent Length Bend Configuration meters feet
AH1-31	790 31	4.78 15.7	5.80 19.0
AH1-36	915 36	5.59 18.3	10.15 33.3
AH1-48	1120 48	9.75 32.0	16.25 53.3
AH1-60	1525 60	12.15 39.9	22.94 75.3
AH1-72	1830 72	14.26 46.8	25.98 85.2

NOTE

- Friction loss data is in accordance with GB5135.16 tested at a flow rate of 114 liters per minute (30 gallons per minute).

6.0 NOTIFICATIONS

WARNING

- **Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.**
- **Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

WARNING

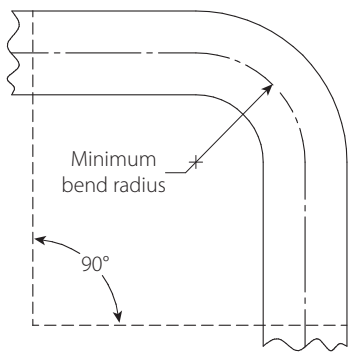
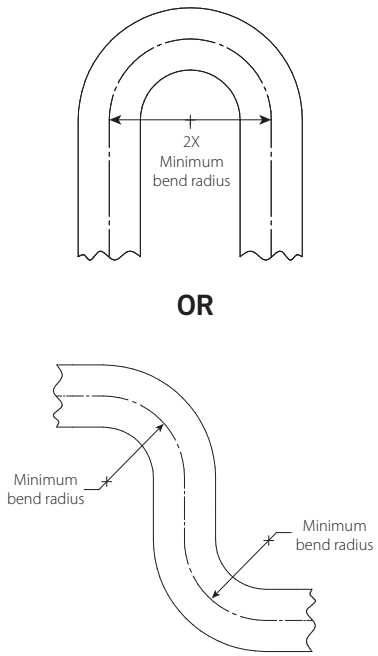
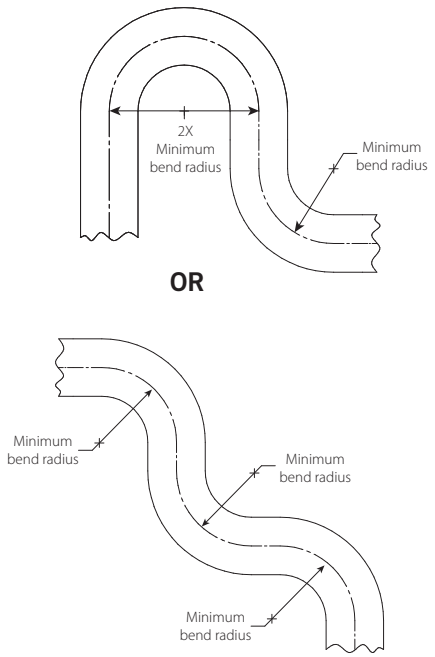
- **It is the responsibility of the system designer to verify suitability of 300-series stainless steel flexible hose for use with the intended fluid media within the piping system and external environments.**
- **The effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on 300-series stainless steel flexible hose must be evaluated by the material specifier to confirm system life will be acceptable for the intended service.**

Failure to follow these instructions could cause product failure, resulting in serious personal injury and/or property damage.

Victaulic VicFlex Series AH1 and AH1-CC Flexible Sprinkler Fittings may be painted provided the paint is compatible with stainless steel and zinc-plated carbon steel or ductile iron. Care should be taken to ensure the sprinkler and associated escutcheon or coverplate are not painted.

7.0 REFERENCE MATERIALS – CHARACTERISTICS

Flexible Hose In-Plane Bend Characteristics

One Bend	Two Bends	Three Bends
		

NOTE

- For out-of-plane (three-dimensional) bends, care must be taken to avoid imparting torque on the hose.

I-VicFlex-AB1-AB2-AB10
I-VicFlex-AB3
I-VicFlex-AB4
I-VicFlex-AB7
I-VicFlex-AB8
I-VicFlex-AB12
I-VicFlex-ABBA
I-VicFlex-ABMM
I-RES

The Brown Company

5418 Pirrone Road
Salida, CA 95368
Contractor License: CA C-16, C-61 715370
NV C41A-0085145
Ph) 510-886-5260 Fx) 510-537-7707
thebrownco.net, firepumpacademy.net

11/17/2022

Cordiner Consulting

,

Attention: Wayne Cordiner

Re: College of the Sequoias

Quote: #Q25115 LEA19091

Dear Wayne:

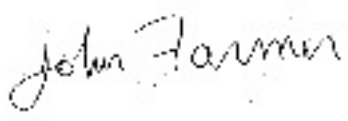
We are pleased to offer material per description below:

1000 GPM at 150 psi, 214 BHP, suction pressure at 5 (tank - estimated) psi, Driver HP: 220, site elevation of 300 (estimated) feet, site temperature of 100 (estimated) degrees fahrenheit, 1760 RPM, 12VDC/115AC Volts, 125/125# Flanges, Right-Hand Rotation

Qty	Product
1	Aurora, 6-481-18D, Fire Pump, UL Listed, FM Approved, Horizontal Splitcase fire pump, with suction and discharge gauges, air valve base mounted to a
1	Cummins, CFP7E-F40, Fire pump Engine, UL Listed, FM Approved, Heat exchanger only. This equipment is UL listed and FM approved. Engine comes with coupling, muffler, flex connector, batteries, rack and cables.
1	Tornatech, GPD-12-120, Diesel Fire Pump Controller, UL Listed, FM Approved,
1	Factory Choice, Muffler4", 4" muffler, Commercial grade, with flex connector
1	Pentair, 300 Gallon.dw, Fuel Tank, Double Walled, UL Listed, NFPA 20 and UL 142 double wall diesel fuel tank, with fittings
1	Pentair, switch.leak, Fuel Tank Leak Switch,
1	Tornatech, GSEFP10008, Low Fuel Switch,
1	Tornatech, GSEFP10010, High Fuel Switch,
1	At A Glance, tank.level, Fuel Tank Level Indicator,
1	Aurora, 6.8.con.125, Concentric Fitting, 6x8 125 lb flange, adapter
1	Aurora, 4".mrv, 4" main relief valve, UL Listed, with waste cone and sight glasses
1	Aurora, 4.6.wc, Waste Cone 4 x 6, with sight glasses
1	Aurora, As required , Jockey pump, with motor
1	Tornatech, JP3, Jockey Pump Controller, Across the line,208/ three phase

1	Aurora, 6" Grooved 300# 4 valve, Test Header, UL Listed, with required angle valves, caps, and chains
1	Global Vision, 6"-1000-G, Venturi Flowmeter, FM Approved, Grooved flowmeter for size and rated flow indicated above. Meter will read from 50% or rated flow to 200% of rated flow.
1	Crating, , Factory Skeleton Crating,
1	LTL, Ground, Delivery - Standard,
1	One startup trip, acceptance test , per NFPA 20 Ch. 14 with test report

Very Truly Yours,



John Farmer, The Brown Company, Representatives for Aurora, Fairbanks Nijhuis, and Tigerflow, CA and NV

Accepted by: _____

Accepted Name: _____

Date: _____

Item Number / Tags	001	Size / Stages	/
Quote number	25115	Pump speed	

Pump

Qty	Description
1	*Aurora - Horizontal Splitcase 6-481-18D*
	COS
	Conditions of service
	Flow: 1000 USgpm (227 m3/h)
	Pressure rated: 150 psi
	Speed: 1760 rpm
	Suction pressure: 5 psi
	Impeller diameter: 18.40625
	Shutoff head: 161 psi
	Elevation: 300 ft
	Temperature: 100° F
	Country of origin: United States
	Fire pump configuration
	Pump
	Materials of construction: Bronze fitted with Cast Iron casing
	Pump rotation: Right handed
	Flange rating (Suction/Discharge): (Suction 8 / Discharge 6) 125/125 LB
	Pump base: Structural steel base
	Pump shaft material: Carbon Steel AISI C1045
	Casing relief valve: Not required
	Driver
	Driver type
	Prep Engine for Air Freight/Shipping?: No
	Weights
	Weight / Freight
	Airfreight certification: No

Driver

Qty	Description
1	**Driver**
	Driver type
	Engine: Cummins CFP7E-F40 220HP 1760rpm 12V; Includes 3/4" Standard Cooling Loop
	Available rated power for selected engine: 214.94 HP
	Engine Cooling Loop (estimated): 3/4" Standard Cooling Loop
	Driver options
	Water jacket heater voltage: 115 Volt
	Engine battery voltage: 12 Volt DC
	Engine frequency operation: 60 Hz
	Engine Muffler Size: Standard

Fire Pump Controller

Qty	Description
1	**Fire pump controller**
	Fire pump controller
	Fire pump controller: Tornatech GPD, 12V 60Hz - Manufacturer model number GPD-12-120-, C13, D34A, D4, D7B, D8B, D32A
	Engine Voltage: 12V

Fire Pump Controller

Qty	Description
	Ship controller before pump: No
	Do you want controller to be shipped direct: Yes – Ship direct to shipping address
	Fire pump controller - alarm and indicators
	Controller voltage: 115 Volt AC
	Standard LED's
	AC power on
	Main switch in auto
	Battery 1 failure
	Battery 2 failure
	Charger 1 failure
	Charger 2 failure
	Engine low oil pressure
	Engine high oil pressure
	Engine overspeed
	Engine run
	Engine fail to start
	Fail when running
	Pump room alarm
	Deluge valve
	Weekly test
	Controller trouble
	Standard alarm contacts
	Engine run
	Engine trouble
	Controller trouble
	Pump room alarm
	Optional operational modifications
	Louver activation circuit
	Fire pump controller - additional option selections
	Enclosure: NEMA 2
	Space heater: None
	Controller Rated Temperature: Controller rated for 55°C ambient temperature
	Pressure transducer: Pressure transducer and run test solenoid valve for fresh water rated for 0-500 psi (factory calibrated)
	Low fuel level float switch: Low fuel level switch, 1.50" - fuel tank inside diameter 38"
	High fuel level float switch: High fuel level switch, 1.50" - fuel tank inside diameter 38"
	Mounting: No
	Pump control function: None
	Float switch: None
	Label language: English
	Modbus
	Modbus TCP/IP provision

Remote Alarm Panel

Qty	Description
1	**Remote Alarm Panel**
	Remote Alarm Panel
	Remote Alarm Panel: None

Jockey Pump

Qty	Description
1	**Jockey pump**
	Pump and Motor
	Pump type: Stackable cast iron
	Flow rate: 10 USgpm
	TDH: 160 psi: 160.0 psi
	Jockey Pump (price includes selected motor): PVM1-17, Stackable Cast Iron, NPT Threaded / Flanged
	Jockey Pump Motor: 2 Hp, 3 Ph, 230/460V, premium Eff. Motor
	Jockey Pump Motor frame size: 56CZ
	Motor enclosure: Totally Enclosed Fan Cooled
	Frequency: 60 Hz
	Phase: Three
	Motor Voltage: 460 Volt
	Jockey pump relief valve: None
	Jockey pump companion flange kit: None

Jockey Pump Controller

Qty	Description
1	**Jockey pump**
	Controller
	JP controller details: Tornatech Model JP3, Across-The-Line, 460V, 3 Phase, 60 Hz, 2 Hp - Manufacturer model number JP3-460/2/3/60/ , , A1, A2, A3, A7A, A4, A7A
	Manufacturer: Tornatech
	Starting method: Across-The-Line
	Voltage: 460 V
	Horsepower: 2Hp
	Jockey pump controller options
	Enclosure: NEMA 2
	Pressure switch: Standard Pressure Transducer 0-500 PSI (calibrated for 0-300 PSI)
	Wetted parts: None
	Labeling language: English
	Withstand rating: 5,000 Amp standard short circuit withstand rating
	Included lights and timers
	Minimum run period timer
	Run green pilot light
	Power on white pilot light
	Overload pilot light
	Elapsed time meter (time totalizer)

System Accessories

Qty	Description
1	**Driver**
	Driver options
	Engine Muffler Grade: Commercial Grade, 4" (Qty 1)
	Accessories
	System Accessories
	Discharge increaser: 6" x 8" increaser, 125 lb
	Hose valve header and options: Grooved 6" header / 4 valve, 300 lb
	Hose valve with caps: 2.5" valve for 6" size supply, 4 valves
	Main relief valve: 4" valve, Pilot operated, 125 lb
	Enclosed waste cone: 4X6 waste cone
	Flow meter: 6" Global Vision Venturi Flow Meter, 1000 GPM Grooved

System Accessories

Qty	Description
	Driver Accessories
	Diesel engine
	Fuel tank: 300 US gallon tank, 270 usable US gallons, Double Wall (per NFPA 20) with leak detector and 3" emergency vent

Engineering Tests

Qty	Description
1	**Testing**
	Engineering Tests
	Driver to be used for engineering tests: Calibrated test lab motor

Weight, Freight, Boxing

Qty	Description
1	**Weights**
	Shipping Skid Details
	Skid weight: 60 lb (27.22 kg)
	Weight / Freight
	Approximate total weight for Qty shown
	Fire pump weight: 1350 lb (612.35 kg)
	Driver weight: 1600 lb (725.75 kg)
	Fire pump controller weight: 250 lb (113.4 kg)
	Jockey pump weight: 106 lb (48.08 kg)
	Jockey pump controller weight: 40 lb (18.14 kg)
	Discharge increaser weight: 83 lb (37.65 kg)
	Hose valve header weight: -1 lb (-0.45 kg)
	Hose valve with caps and chains weight: 80 lb (36.29 kg)
	Main relief valve weight: 150 lb (68.04 kg)
	Waste cone weight: 70 lb (31.75 kg)
	Flow meter weight: 23 lb (10.43 kg)
	Muffler weight: 48 lb (21.77 kg)
	Fuel tank weight: 720 lb (326.59 kg)
	Skid weight: 60 lb (27.22 kg)
	Total weight: 4579 lb (2077 kg)
	Export boxing: Not required

Skid

Qty	Description
1	**Weights**
	Shipping Skid Details
	Pump and engine skid
	Pallet, 48" W x 114" L, Floor area per skid 38 sq.ft(3.53 sq.m)
	Controller skid
	Pallet 18 " W x 39 " L, Floor area per skid 4.87 sq.ft (0.45 sq.m)
	Jockey pump skid
	Pallet, 36" W x 36" L, Floor area per skid 9 sq.ft (0.84 sq.m)
	Fuel tank skid
	Pallet 50 " W x 85 " L, Floor area per skid 29.51 sq.ft (2.74 sq.m)
	Ship loose items skid
	Pallet, 36" W x 36" L, Floor area per skid 9 sq.ft (0.84 sq.m)
	Shipping comments

Skid

Qty	Description
	Pentair does not recommend stacking skids. Please use the estimated dimensions to calculate shipping container requirements, as floor load only.
	Total floor area 90.38 sq.ft (8.4 sq.m)

RedHot/QuickShip

Qty	Description
1	Shipping: Standard

The Equipment referenced in the attached quote or proposal is specifically designed and dimensioned for, and intended only to be installed in Large Scale Fixed Installations (LSFI) as that term is defined in RoHS (EU Directive 2011/65) as such Directive may be amended from time to time.

The Buyer by placing its order warrants and represents, and shall ensure that any customer of the Buyer to whom the Buyer resells or otherwise assigns the Equipment warrants and represents, that (i) the Equipment will be solely and exclusively installed in combination with other equipment, sub-systems, apparatus and/or devices which are intended to be a part of a “large scale” installation (*Examples of “large scale” installations may include but are not limited to installations which (a) are too large to be moved in an ISO 20 foot container because the total sum of its parts as transported is larger than 5,71m x 2,35m x 2,39m; (b) are too heavy to be moved by a 44 tonne road truck; (c) have a rated power greater than 375 kW; and/or (d) require cranes to be completely installed); (ii) the installation in which the Equipment will be utilized will be assembled, installed, and de-installed by professionals holding the requisite knowledge, experience, and licenses necessary to undertake and complete the work related to the installation; and (iii) the overall system in which the Equipment will be included will be used permanently in a pre-defined and dedicated location.

The Buyer further acknowledges and agrees that Pentair is relying on the above warranties and representations by Buyer as a material inducement to sell the Equipment to Buyer, and Buyer will defend, indemnify, and hold Pentair harmless from and against any and all claims, losses, fines, decrees, penalties, and/or causes of action arising out of or related to breach of the above warranties and representations, including but not limited to those brought by any governmental or quasi-governmental authority.

General Arrangement

WARNING

DO NOT OPERATE THIS MACHINE WITHOUT PROTECTIVE GUARD IN PLACE. ANY OPERATION OF THIS MACHINE WITHOUT PROTECTIVE GUARD CAN RESULT IN SEVERE BODILY INJURY.

Please Consult Application Engineering for Dimensional Drawing

NOTES:

Not for construction, installation, or application purposes unless certified.

All dimensions are in inches

Dimensions may vary ± .38" (10mm) due to normal manufacturing tolerances.

Bases are designed to be completely filled with grout.

See configuration for estimated total weight.

For additional dimensions, refer to engine manufacturer's website.

Pump Data	
Series	Horizontal Splitcase
Model	6-481-18D
Size	6x8x
Flow	1,000.0 USgpm
Rated Pressure	150.0 psi.g
RPM	1760 rpm
Rotation	Right handed
Liquid Type	Water
Discharge Size	6.00 in
Suction Size	8.00 in
Impeller Diameter	18.39 in
Connection Type	Flanged
Base Type	Structural steel base
-	-
Pump Materials of Construction	
Pump	Bronze fitted with Cast Iron casing
Shaft	Carbon Steel AISI C1045
Engine Data	
Engine Model	CFP7E-F40
Power Rated	220 hp
Power Available	215 hp
Speed	1760 rpm
Tier	T3
Manufacturer	Cummins
Cooling Type	Heat exchanger
Heater Voltage	115 Volt
Muffler Type	Commercial Grade, 4" (Qty 1)
Exhaust Connection	Threaded
Battery Type	Lead acid
Battery Voltage	12 Volt DC
Site Information	
Elevation	300.0 ft
Temperature	100.0 deg F
Estimated Weights	
Pump	1,350.0 lb
Driver	1,600.0 lb
Quote Information	
Customer	THE BROWN COMPANY INC
Customer Quote	1661202
Job Name	College of the Sequoias
Market	-

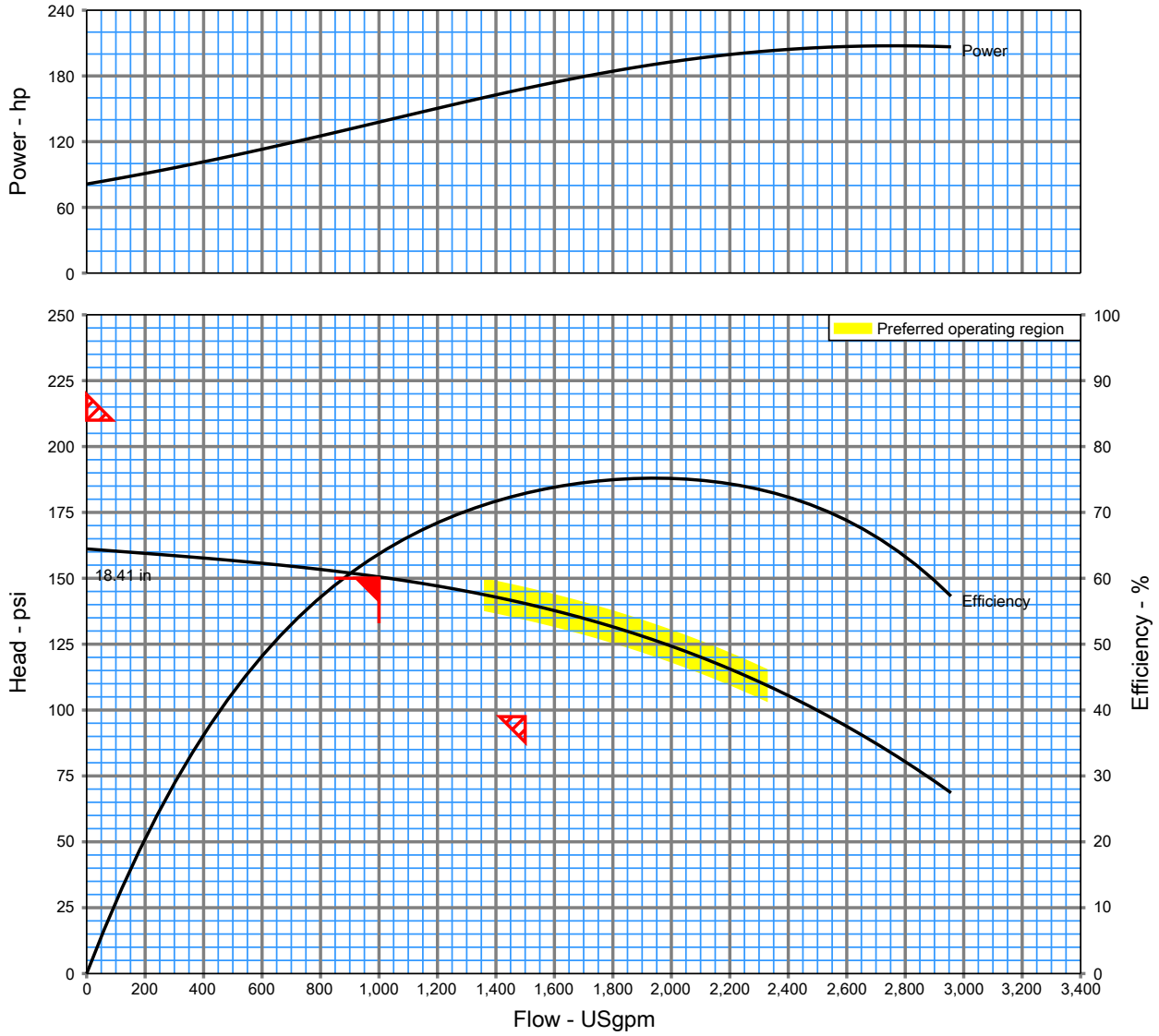
PENTAIR		
	Quote Item	001
	Quote Date	02 May 2022

Customer : THE BROWN COMPANY INC

Project name : College of the Sequoias

Pump Performance Curve

Encompass 2.0 - 22.4.0



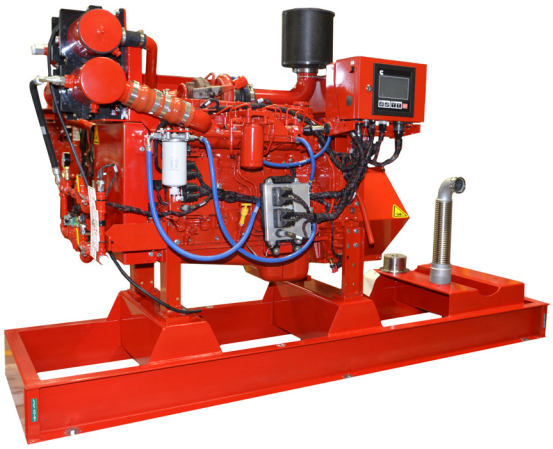
Item Number / Tags	: 001	Size	: 6-481-18D
Service	:	Stages	: 1
Quantity	: 1	Driver type	: Engine
Quote number	: 25115	Frequency	: 0 Hz
Date last saved	: 02 May 2022 9:53 AM	Speed, rated	: 1760 rpm
Flow, rated	: 1,000.0 USgpm	Based on curve number	: 6-481-18D_1770
Differential head / pressure, rated	: 150.0 psi	Efficiency	: 63.72 %
		Max working pressure, allowable	: 175.0 psi.g
Flange rating (suction / discharge)	: 125/125	Shutoffhead, Typical	: 161.2 psi
		Max suction pressure, allowable	: 13.85 psi.g
Secondary Point (150% of rated flow)	: 1,500.0 USgpm	Suction pressure, max (user specified)	: 5.00 psi.g
Secondary Point (65% of rated head)	: 97.50 psi	Pump shutoff w/ suction pressure	: 166.2 psi.g
Max Shutoff per NFPA	: 210.0 psi	Power driver, minimum	: 214 hp

Curve performance is typical. Contact factory for guaranteed performance curve.

Specification sheet

Fire pump drive engine

CFP7E-F40
~~CFP7EVS-F40~~



Description

Engine series - Cummins QSB 6.7 Series
Exhaust emissions - EPA Tier 3

When performance matters, we take notice. Our engines are an assurance of safety specifically designed to fit your needs. The Cummins CFP7E fire pump drive engine features a cast-iron parent bore block structurally designed to reduce noise and increase durability.

Features

Variable Speed Pressure Limiting Control (VSPLC) - Cummins' VSPLC-equipped fire pump drive engines are capable of maintaining a constant pump discharge pressure by controlling the engine speed down to 1200 RPM, while still maintaining T3 emissions certification. VSPLC fire pump drive engines provide design flexibility in the fire pump system for high-rise applications; compensate for varying discharge pressure; allow the system architect to apply a larger pump and/or a pump with a steeper curve; and significantly reduce water consumption during the weekly test.

Certified power - The CFP7E-F40 complies with NFPA 20 and is UL 1247 Listed and FM 1333 Approved. The CFP7EVS-F40 complies with NFPA 20 and is FM 1333 Approved.

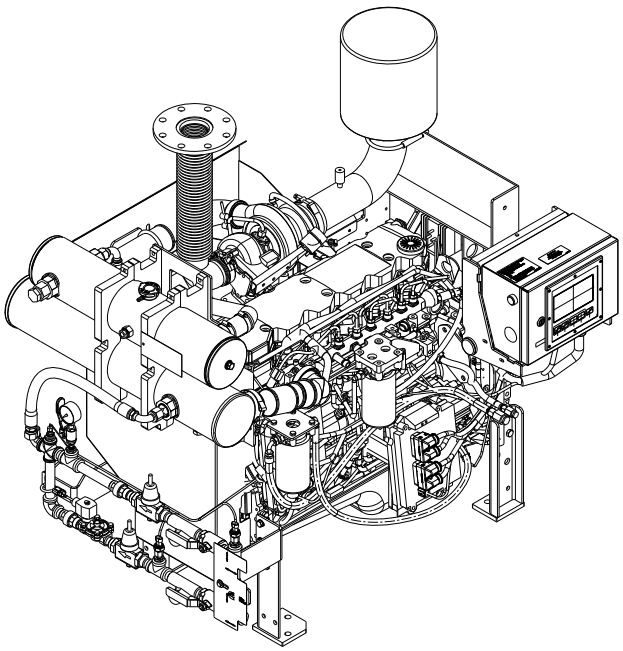
Control system - The industry-leading, state-of-the-art Fire Pump Digital Panel (FPDP) provides total fire pump drive engine system integration and intuitive operation, including:

- Color touchscreen;
- Dual microprocessors for critical signal redundancy;
- Standard J1939 parameter and Cummins fault code display;
- Engine idling;
- Electronic Control Module (ECM) self-diagnosis; and
- Optional Modbus field server remote messaging capability.

Warranty and service - Our models are backed by a comprehensive warranty and worldwide distributor network.

Ratings in HP (kW) and certifications

Operating speed (RPM)	1470		1760		1900		2100		2350		2600	
CFP7E-F40 NFPA, UL & FM	192	(143)	220	(164)	204	(152)	215	(160)	216	(161)	219	(163)
CFP7EVS-F40 NFPA & FM	192	(143)	220	(164)	204	(152)	215	(160)	216	(161)	219	(163)



General engine data	
Engine type	4 Cycle; In-Line, 6 Cylinder
Aspiration	Turbocharged and Charge-Air Cooled
Bore and stroke	4.21 x 4.88 in. (107 x 124 mm)
Displacement	409 in^3 (6.7 L)
Rotation	Counterclockwise from flywheel end
Compression ratio	17.2:1
Valves per cylinder	Intake - 2 Exhaust - 2
Fuel system	Bosch Electronic Common Rail
Maximum allowable bending moment @ rear face of block	1000 lb.-ft. (1356 N-m)
Estimated wet weight*	TBD

* Weight includes engine, cooling loop, heat exchanger, dual Electronic Control Modules (ECMs), Fire Pump Digital Panel (FPDP), standard air cleaner, standard exhaust flex, and all fluids.

Equipment	Standard	Optional
Air cleaner	Disposable; treated for high humidity, indoor service	Heavy-duty, two-stage with replaceable elements
Alternator	12V-DC, 95 amps; includes belt guard	24V-DC, 45 amps with belt guard
Cooling loop (maximum pressure of 300 PSI)	3/4" diameter for fresh water; includes alarm sensors and FM-approval	Cu Ni construction available for sea water applications; approved loops up to 1 1/4"
Cooling system	Tube and shell type, 60 PSI with NPTF connections	Radiator[1]; sea water tube and shell
Engine heater	120V-AC, 1500 watts	240V-AC, 1500 watts
Exhaust protection	Metal guards on manifolds and turbocharger	N/A
Exhaust flex connection	Steel, flanged	Stainless steel flex, NPT
Flywheel power take-off	Flywheel	Driveshaft system, stub shaft
Fuel connections	Fire-resistant flexible supply and return lines	N/A
Fuel filter	Primary and secondary	N/A
Governor, speed	Constant speed, adjustable	VSPLC[2]
Fire pump digital panel (FPDP)	7" color touchscreen; enclosure rated as Type 2/Type 4X; Imperial and metric values	Optional 316SS construction; custom gauges with digital panel expansion module (DPEM)
Lube oil cooler	Engine-water-cooled, plate type	N/A
Lube oil filter	Full-flow with by-pass valve	N/A
Lube oil pump	Gear-driven	N/A
Manual start controls	On FPDP and/or contactors	N/A
Overspeed controls	Electronic with reset and test on FPDP	N/A
Starter	12V-DC	24V-DC

[1] Not UL Listed and not FM Approved.

[2] FM Approved, but not UL Listed.

Air induction system

Maximum temperature rise between ambient air and engine air inlet	30.6 °F (17 °C)
Maximum inlet restriction with dirty filter	25 in. H_2O (635 mm H_2O)
Recommended air cleaner element - (standard)	Cummins FIltration AH1196
Recommended air cleaner element - (heavy duty)	Optional: primary element AF26124; secondary element AF26125

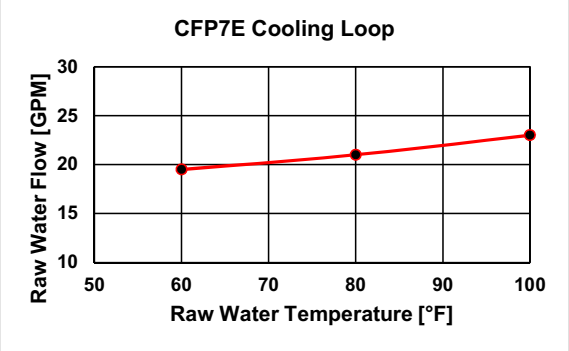
Lubrication system

Oil pressure range at rated	40-70 PSI (276-483 kPa)
Oil capacity of pan (high - low)	15-13 qt. (14.2 - 12.3 L)
Total system capacity	4 gal. (15.1 L)
Recommended lube oil filter	Cummins Filtration LF3970

Cooling system*

Raw water working pressure range at heat exchanger	60 PSI (413 kPa) MAX
Recommended minimum water supply pipe size to heat exchanger	.75 in. (19.05 mm)
Recommended minimum water discharge pipe size from heat exchanger	1.00 in. (25.40 mm)
Coolant water capacity (engine only)	3.75 gal. (14.2 L)
Standard thermostat - type	Modulating
Standard thermostat - range	180-199 °F (82-93 °C)
Normal Operating Temperature	180-212 °F (82-100 °C)
Minimum raw water flow:	
- with water temperatures to 60 °F (16 °C)	19.5 GPM (1.23 L/sec)
- with water temperatures to 80 °F (27 °C)	21 GPM (1.32 L/sec)
- with water temperatures to 100 °F (38 °C)	23 GPM (1.45 L/sec)

* A jacket water heater is mandatory on this engine. The recommended heater wattage is 1500 down to 40 °F (4 °C)



Exhaust system

Maximum allowable back pressure by complete exhaust system	40.8 in. H_2O (10.2 kPa)
Exhaust pipe size normally acceptable	4 in. (102 mm)

Noise emissions - The noise emission values are estimated sound pressure levels at 3.3 ft. (1 m).

Top	92.5 dBa
Right side	94.3 dBa
Left side	93.8 dBa
Front	92.1 dBa
Exhaust	114.2 dBa

Fuel supply/drain system

Operating speed in RPM	1470		1760		1900		2100		2350		2600	
Fuel rate - gal/hr (L/hr)	9.9	(37.6)	11.4	(43.0)	10.6	(40.0)	11.3	(42.6)	11.6	(43.8)	12.3	(46.7)

Fuel type	No. 2 diesel only
Minimum supply line size	0.5 in. (12.70 mm)
Minimum drain line size	0.375 in. (9.53 mm)
Maximum fuel height above C/L fuel pump	360 in. (9.1 m)
Recommended fuel filter - primary	Cummins Filtration FF5612
Recommended fuel filter - secondary	Cummins Filtration FS1212
Maximum restriction @ lift pump-inlet - with clean filter	5.0 in. Hg (127 mm Hg)
Maximum restriction @ lift pump-inlet - with dirty filter	10.0 in. Hg (254 mm Hg)
Maximum return line restriction - without check valves	5.9 in. Hg (150 mm Hg)
Minimum fuel tank vent capability	7.1 ft^3/hr (0.21 m^3/hr)
Maximum fuel temperature @ lift pump inlet	158 °F (70 °C)

Starting and electrical system

Minimum recommended battery capacity - cold soak at 0 °F (-18 °C) or above	12V	24V
Engine only - cold cranking amperes	1400 CCA*	900 CCA*
Engine only - reserve capacity	430 minutes*	430 minutes*
*Based on FM requirement for a minimum of 900 CCA and 430 reserve capacity minutes		

Battery cable size - minimum of 2/0 AWG and maximum cable length not to exceed 6 ft. (1.5 m)	12V	24V
Maximum resistance of starting circuit	0.001 Ohms	0.002 Ohms
Typical cranking speed	120 RPM	120 RPM
Alternator (standard), internally regulated	95 amps	70 amps

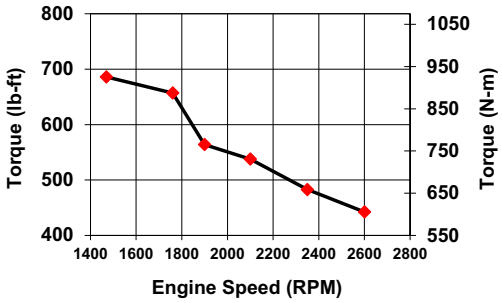
Operating conditions

Operating speed in RPM	1470		1760		1900		2100		2350		2600	
Output - BHP (kW)	192	(143)	220	(164)	204	(152)	215	(160)	216	(161)	219	(163)
Ventilation air required - CFM (litre/sec)	435	(205)	487	(230)	511	(241)	571	(270)	629	(297)	691.9	(327)
Exhaust gas flow - CFM (litre/sec)	1055	(498)	1219	(575)	1218	(575)	1363	(643)	1500	(708)	1650	(779)
Exhaust gas temperature - °F (°C)	986.7	(530)	986.7	(530)	986.7	(530)	986.7	(530)	986.7	(530)	986.7	(530)
Heat rejection to coolant - BTU/min. (kW)	3803	(67)	4186	(74)	3926	(69)	4263	(75)	4707	(83)	5178	(91)
Heat rejection to ambient - BTU/min. (kW)	1026	(18)	1091	(19)	1186	(21)	1282	(23)	1256	(22)	1231	(22)

Engine performance curve for CFP7E-F40 and CFP7EVS-F40

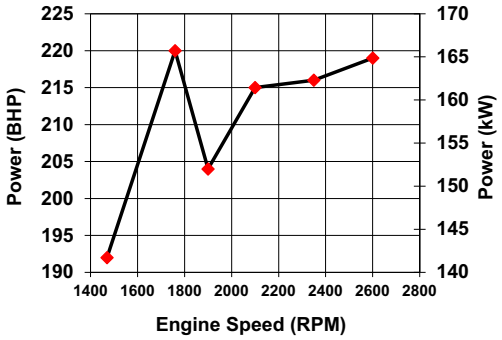
Torque Output

RPM	lb-ft	N-m
1470	686	930
1760	657	891
1900	564	765
2100	538	729
2350	483	655
2600	442	599



Horsepower Output

RPM	BHP	kW
1470	192	143
1760	220	164
1900	204	152
2100	215	160
2350	216	161
2600	219	163



All data is based on the engine operating with a fuel system, water pump, lubricating oil pump, air cleaner, and alternator. The fan, optional equipment, and driven components are not included. Data is based on operation at SAE standard J1349 conditions of 300 ft. (91.4 m) altitude, 29.61 in. (752 mm) Hg dry barometer, and 77 °F (25 °C) intake air temperature, using No.2 diesel fuel only.

Altitude above which output should be limited*:	300 ft. (91.4 m)
Correction factor per 1000 ft. (305 m) above altitude limit:	3%
Temperature above which output should be limited:	77 °F (25 °C)
Correction factor per 10 °F (11 °C) above temperature limit:	1% (2%)

* Above 5,000 feet, contact Cummins for derate information.

US EPA NSPS Tier 3 Emissions Compliance

Fuel Percentage of Sulfur	D2 Cycle Exhaust Emissions*									
	Grams per BHP - HR					Grams per kW - HR				
	NMHC	NO_x	NMHC + NO_x	CO	PM	NMHC	NO_x	NMHC + NO_x	CO	PM
15 PPM Diesel Fuel	0.062	2.475	2.537	1.193	0.111	0.083	3.319	3.402	1.600	0.149
300-4000 PPM Diesel Fuel	0.075	2.685	2.759	1.193	0.127	0.1	3.600	3.700	1.600	0.170

*The emissions values above are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB (15 ppm) fuel.

Refer to the engine data tag for the EPA Standard Engine Family.

No special options are needed to meet current regulation emissions for all fifty states.
Tests conducted using alternate test methods, instrumentation, fuel, or reference conditions can yield different results.

Diesel Fuel Specifications:

- Cetane Number: 40-48
- Reference: ASTM D975 No. 2-D

Reference Conditions:

- Air Inlet Temperature: 25 °C (77 °F)
- Fuel Inlet Temperature: 40 °C (104 °F)
- Barometric Pressure: 100 kPa (29.53 in Hg)
- Humidity: 107 g H_2O/kg (75 grains H_2O/lb) of dry air; required for NO_x correction
- Intake Restriction set to a maximum allowable limit for clean filter
- Exhaust Back Pressure set to maximum allowable limit

Fire pump digital panel (FPDP)

The Cummins FPDP is an integrated microprocessor-based control system that provides full digital technology with enhanced accuracy and built-in redundancy.

Reliable design - Designed and tested with isolated mounting to minimize vibration for longer life and durability, the Cummins FPDP proves reliable in harsh environments.

Advanced control methodology - The Cummins FPDP allows for Input/Output (I/O) expansion and remote monitoring capabilities, as well as automatic Electronic Control Module (ECM) switching for electronic engines.

Certified quality - The Cummins FPDP is UL 1247 Listed and FM 1333 Approved.

Operator panel features

Operator/display panel

- 7” TFT LCD (thin-film-transistor liquid-crystal display) - color, 24-bit, 800x480 (WVGA).
- Auto, manual, start, stop, and fault reset.
- Assembly enclosure that meets NEMA Type 2 and Type 4X design requirements and is water, corrosion, fire, and impact-resistant.

Electronic engine communications - SAE J1939 protocol.

- Comprehensive full-authority engine (FAE) data: oil pressure and temperature; coolant temperature; and intake manifold pressure and temperature.
- Cummins fault code display.
- Sensor failure indication.
- Optional RS-485 serial - Modbus RTU/Modbus TCP/IP.

Variable speed pressure limiting control (VSPLC) capabilities

- VSPLC status indication.
- Pump discharge pressure display.
- Ability to run the engine at fixed speed from the FPDP at start-up for commissioning.

Other control features

- Digital Panel Expansion Module (DPEM) for additional analog/digital inputs and configurable dry relay contact output.
- Ability to idle at start-up for commissioning of electronic engines.
- Idle cool down for electronic engines.

Functional

- Configurable display units for temperature in degrees Fahrenheit or Celsius and pressure in PSI or kPa.
- Manual ECM selector switch on electronic engines.
- Ability to crank the fire pump drive engine from Battery A, Battery B, or both.
- Fixed engine speed adjustments in +/- 10 RPM increments.
- Overspeed shutdown.

Environmental

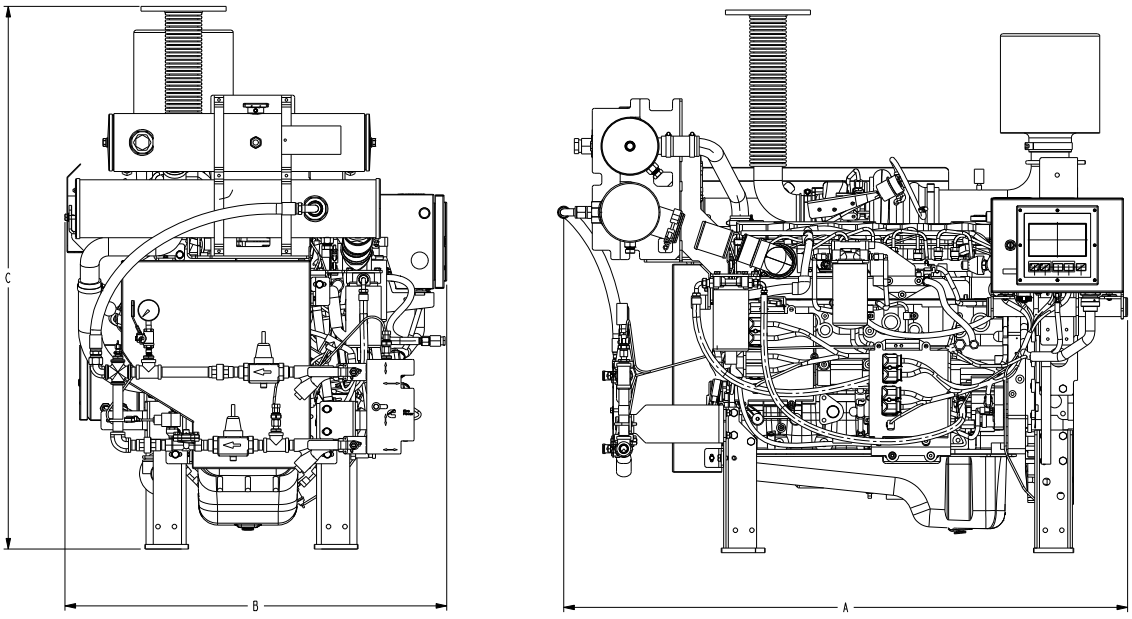
- Operating temperature: minus 4 to 140 °F (minus 20 to 60 °C).
- Storage temperature: minus 22 to 176 °F (minus 30 to 80 °C).
- Meets CISPR 11 Class B radiated emissions.

Electrical

- 8-30 VDC operating voltage.
- Reverse polarity protected.
- Spring cage terminal block interface.
- Built-in dual micro controllers for increased reliability.

Mechanical

- 1 3/8” pre-cut customer conduit knockout for easy field installation.
- Simplified internal design for efficiency and ease of customer connections.
- 16GA ASTM A366 material - 316 stainless steel optional.
- RAL3001 red powder coat finish.



This outline drawing is for reference only.
Do not use for installation design.

	Dim "A" in. (mm)	Dim "B" in. (mm)	Dim "C" in. (mm)
CFP7E	60 (1524)	40 (1016)	57 (1448)

NOTE: Consult drawings or contact the factory for additional information.

NOTE: Specifications are subject to change without notice. Codes or standards compliance may not be available with all model configurations - consult factory for availability.
For more information, contact firepumpsales@cummins.com.

FM APPROVED

c UL us LISTED

ISO 9001
BUREAU VERITAS Certification
UKAS MANAGEMENT SYSTEMS
008

This product has been manufactured under the controls established by a Bureau Veritas Certification approved management system that conforms with ISO 9001:2015.

Cummins Inc.
Box 3005
Columbus, IN 47202-3005
U.S.A.

1-800-CUMMINS™ (1-800-286-6467)
cummins.com

Printed in U.S.A.

Doc. A042J595 Rev. 3
April 2021

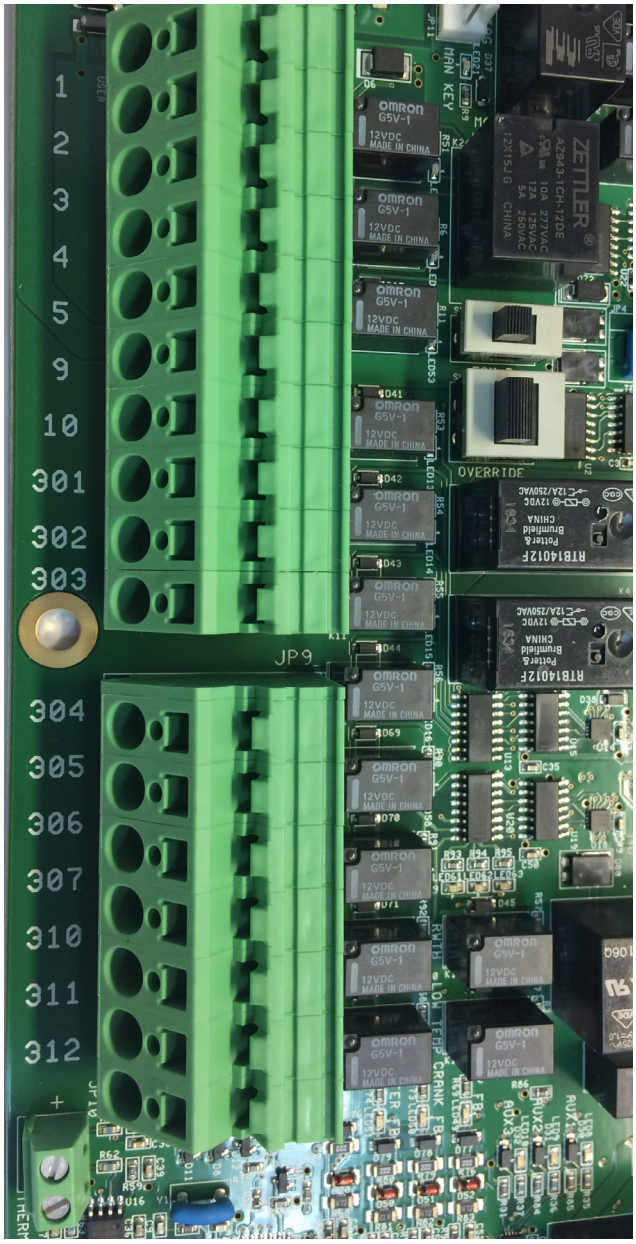
Installing conduits and wires from diesel fire pump controller to Cummins diesel fire pump engine.

Three conduits will be needed.

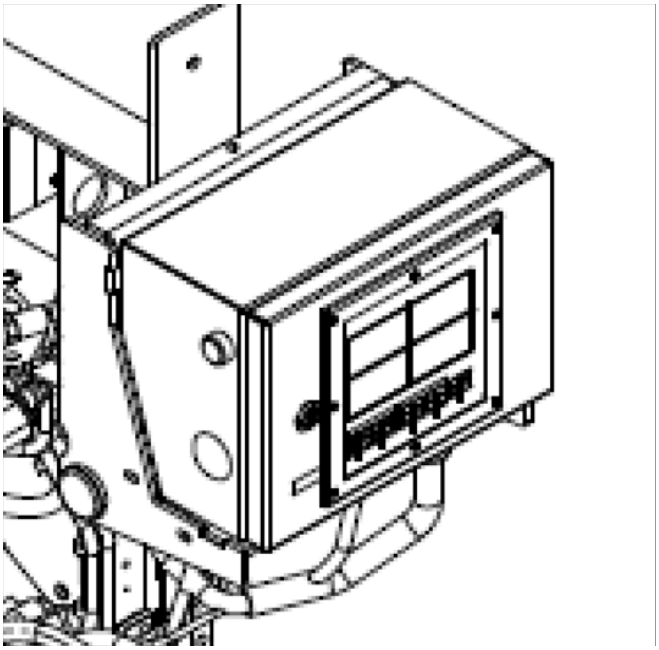
1. 120 volt ac or 230 volt ac dedicated circuit to engine block heater to breaker panel.
2. A 3/4" to 1" conduit and wires run from diesel controller to engine instrument panel. Wires 1,2,3,4,5,8,9,10,301,302,303,304,305,306,307,308,310,311,312.
3. A 3/4" counduit and wires run from diesel controller to engine battery and ground terminal box. Wires 6,8&11.

   Note: Stranded wire only. Wire size chart located in bottom of diesel fire pump controller.

Installation requires two conduits ran from diesel fire pump controller to engine, one conduit from engine instrument panel knock out to diesel fire pump controller and another conduit ran from engine battery and ground junction box to diesel fire pump controller see details.



DIESEL FIRE PUMP CONTROLLER WIRES
1,2,3,4,5,9,10,301,302,303,304 ,305,306,30 7,310,311&312 LAND HERE INSIDE ENGINE INSTRUMENT PANEL.



A third conduit will be needed from engine block heater junction box to a dedicated 120vac circuit. Note some engine block heaters may be 230vac. See detail page 3.

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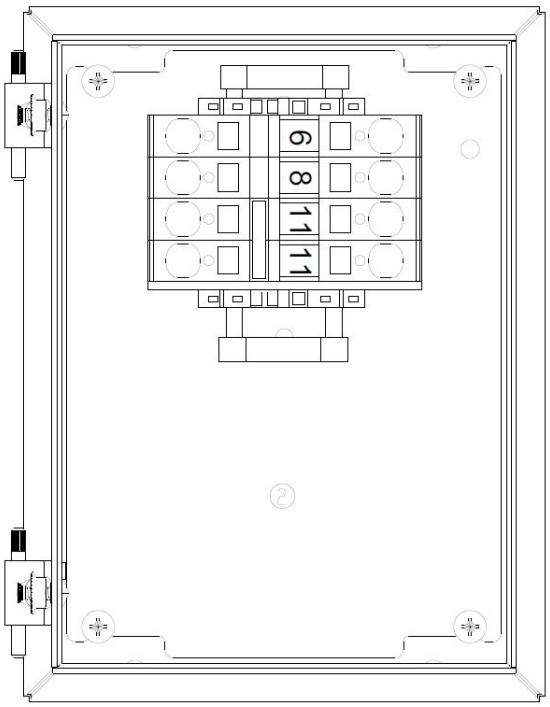
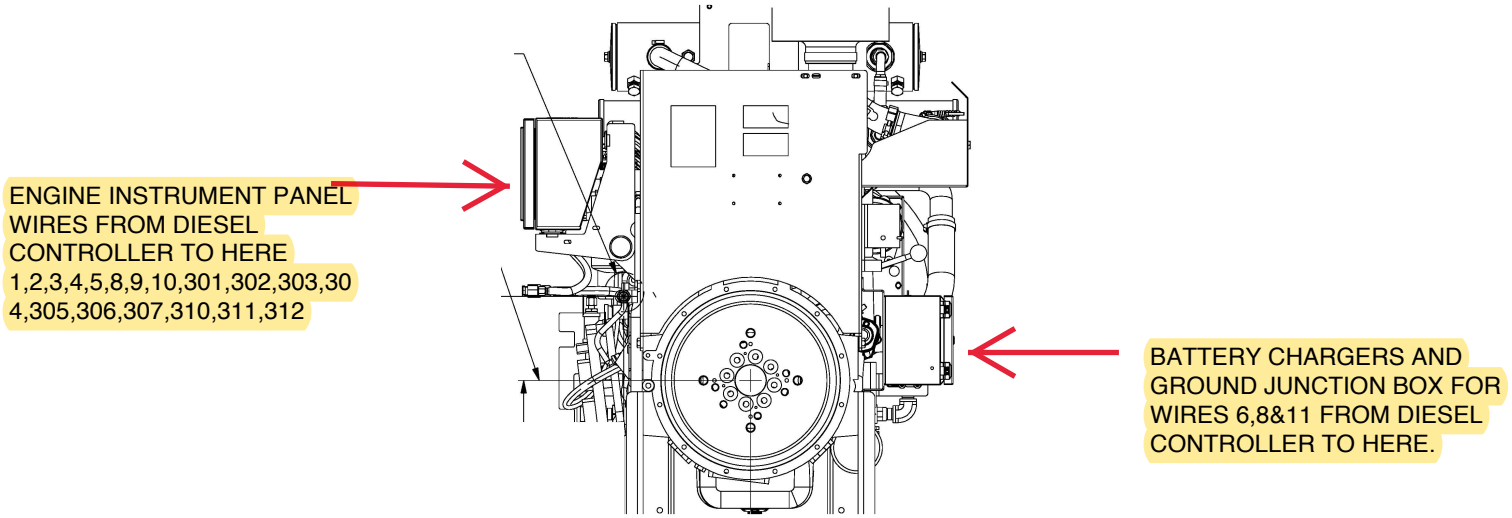
1. See decal inside bottom of diesel fire pump controller wire size requirements for each termination. Stranded wire only. Call for instructions when in doubt.

NOTE: *WIRES 6,8&11 CONNECT HERE IN JUNCTION BOX OPPOSITE SIDE OF ENGINE INSTRUMENT PANEL*

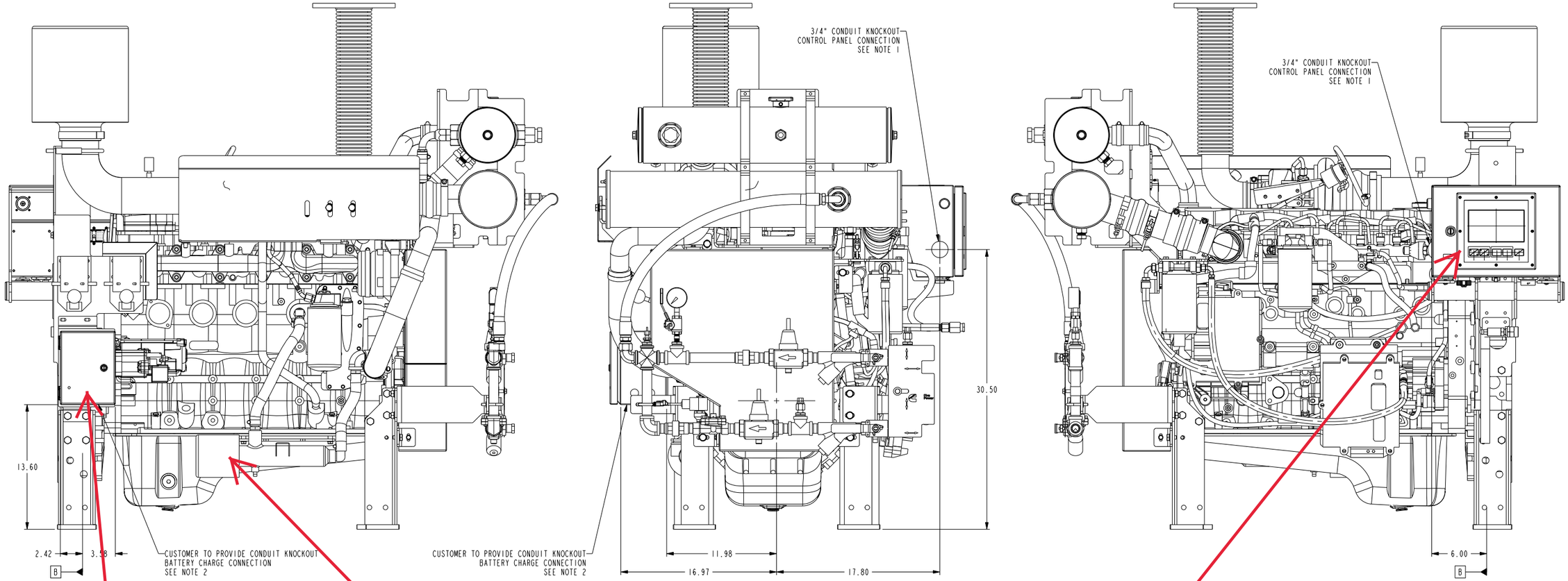


JUNCTION BOX FOR WIRES 6,8&11 FROM DIESEL FIRE PUMP CONTROLLER



LEGEND AND DATUM IDENTIFIER	
SHEET 1	INSTALLATION DRAWING
SHEET 2	GENERAL ARRANGEMENT - HORIZONTAL SPLIT CASE PUMP BASE OPTION
SHEET 3	GENERAL ARRANGEMENT - VERTICAL TURBINE PUMP BASE OPTION
SHEET 4	DRIVE LINE OPTIONS
SHEET 5	ELECTRICAL INFORMATION
DATUM "A"	FACE OF FLYWHEEL HOUSING
DATUM "B"	REAR LEG BOLT LOCATION
DATUM "C"	FLYWHEEL MOUNTING SURFACE
DATUM "D"	U-JOINT ADAPTER MOUNTING SURFACE
DATUM "EOS"	END OF PUMP SHAFT

REV	REL NO	REVISION	DWN	CKD	APVD	DATE
0	2016-668	INITIAL RELEASE	HE392	-	-	09JAN17
1	2020-021	SEE SHEET 1 FOR REVISION DETAILS	NO134	MS707	MS707	29JAN20



NOTES:
1. CONTROL PANEL TERMINAL BLOCKS
   1, 2, 3, 4, 5, 9, 10, 301, 302, 303, 304, 310, 311, 312
2. BATTERY CHARGER CONNECTION BOX TERMINAL BLOCKS
   6, 8, 11

DIMENSIONS ARE IN: INCHES [ ] ARE IN:	DO NOT SCALE PRINT	CMI DATA CLASSIFICATION Cummins Confidential	Cummins Inc.
DRAWING TOLERANCES APPLY TO PRIMARY DIMENSIONS UNLESS OTHERWISE SPECIFIED X: ± 1 IN OR 4 mm .X: ± .1 IN OR 2.5 mm .XX: ± .030 IN OR 0.25 mm .XXX: ± .010 IN OR 0.025 mm ANGULAR TOLERANCE: ± 1°	SCALE 0.188	DWN HE392 CKD - APVD - DATE 09JAN2017	ITEM NAME GENERAL ARRANGEMENT CFP7E-F10/20/30/40/50/60
THIS DOCUMENT AND THE INFORMATION SHOWN THEREON IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009	MUST CONFORM TO CES 10903	CAD SHEET 5 OF 5 · ITEM NUMBER A042J656 · REV 1

TORNATECH

Project: College of the Sequoias

Customer:

Engineer: Cordiner Consulting

Pump Manufacturer: Aurora

Technical Data
Submittal Document

Model GPD

Diesel Engine Driven Fire Pump Controller

Contents:

Note: The drawings included in this package are for controllers covered under our standard offering. Actual AS BUILT drawings may differ from what is shown in this package.

c UL us FM APPROVED N.Y.C. APPROVED CE OPTIONAL SEISMIC COMPLIANT

January 2022

Technical Data

Model GPD Diesel Fire Pump Controller

Standard, Listings, Approvals and Certifications	Built to NFPA 20 (latest edition)	
	Underwriters Laboratory (UL)	UL218 - Fire Pump Controllers
	FM Global	Class 1321/1323
	New York City	Accepted for use in the City of New York by the Department of Buildings
	Seismic Certification	See page 5 for details
	Optional	
	☐ CE Mark	Various EN, IEC & CEE directives and standards

Enclosure

Protection Rating

☑ Standard: NEMA 2

Optional

☐ NEMA 12	☐ NEMA 4X-304 sst painted	☐ IP54
☐ NEMA 3	☐ NEMA 4X-304 sst brushed finish	☐ IP55
☐ NEMA 3R	☐ NEMA 4X-316 sst painted	☐ IP65
☐ NEMA 4	☐ NEMA 4X-316 sst brushed finish	☐ IP66

Accessories
- Bottom entry gland plate
- Lifting Lugs
- Keylock handle

Paint Specifications
- Red RAL3002
- Powder coating
- Glossy textured finish

Ambient Temperature Rating

Standard

☑ 4°C to 40°C / 39°F to 104°F

Optional

☐ 4°C to 55°C / 39°F to 131°F

Controllers built in Dubai, UAE (Tornatech FZE) are supplied standard with 55°C rating.

General	AC	☑ 120V / 1ph / 60hz ☐ 208V to 240V / 1ph / 50-60hz
	DC	☑ 12VDC ☐ 24VDC
	Grounding system	• Negative
	Battery chargers	• Two independent fully automatic • 10A continuous charge • 500mA trickle charge
Electrical Reading	• Battery 1 & Battery 2 voltage • Battery 1 & Battery 2 charging amperage • Charging mode	
Pressure Reading	• Continuous system pressure display • Cut-in and cut-out pressure setting	
Pressure and Event Recorder	• Pressure readings with date stamp • Event recording with date stamp • Under regular maintained operation, events are stored in memory for the life of the controller. • Data viewable on operator interface display screen • Downloadable by USB port to external memory device	

c UL us FM APPROVED N.Y.C. APPROVED CE OPTIONAL SEISMIC COMPLIANT

Pressure sensing	• Pressure transducer and run test solenoid valve assembly for fresh water application • Pressure sensing connection 1/2” Female NPT • Drain connection 3/8” • Rated and calibrated for 0-500psi working pressure • Externally mounted with protective cover
Audible Alarm	6” alarm bell - 85 dB at 10ft. (3m)
Visual Indications	• Engine run • Main switch AUTO • Main switch in OFF • Main switch in HAND • Periodic test • Cranking Cycle • AC Power available • Pump room temperature (ºF or ºC)
Visual & Audible Alarms	Visual only • Pump room trouble • Pump on demand • AC Failure • Charger 1 & 2 Failure • Weak battery 1 & 2 • Battery 1 & 2 overvoltage • Loss of continuity 1 & 2 • High fuel level • Fuel tank leak • PLD low suction pressure • High raw water temperature • Low pump room temperature • Service required • ECM warning • Weekly test cut-in not reached • Check weekly test solenoid • Pressure transducer fault • Invalid Cut-In Visual and Audible • Engine trouble • Controller trouble • Engine low oil pressure • Engine high temperature • Engine low temperature • Engine overspeed • DC Failure • Battery 1 & 2 Failure • Engine fail to start • Low fuel level • ECM fault • ECM SS in Alternate Position • Fuel injection malfunction
Remote Alarm Contacts	DPDT-8A-250V.AC • Engine run • Common controller trouble • Charger #1 & Charger #2 failure • Pressure transducer fault • Common engine trouble • High engine temperature • Battery #1 & battery #2 failure • Overspeed • Fail to start • DC failure • Fail when running • Fuel injection malfunction** • Loss of continuity (starter) #1 and/or #2 • Low oil pressure • ECM selector switch in alternate position*** • PLD low suction pressure • Common pump room trouble (field re-assignable)* • Low fuel level • Low pump room temperature • AC Failure • High fuel level • High pump room temperature • Fuel tank leak • H-O-A selector switch in OFF or HAND • Free (field programmable)*

*Except if option C13 is ordered. Tornatech reserves the right to use any of these four alarm points for special specific application requirements
**Applicable to electronic engines only.
*** Applicable to electronic engines only. Alarms when ECM selector switch on the engine is in alternate mode.

Terminals for Field Connections for External Devices	• Low fuel level • Remote AUTOMATIC start • Water reservoir low (re-assignable) • Fuel tank leak (re-assignable) • High fuel level (re-assignable)		
ViZiTouch V2 Operator Interface	• Embedded microcomputer with software PLC logic • 7.0” color touch screen (HMI technology) • Upgradable software • Multi-language		
Operation	**Selector Switch**	• Hand-Off-Auto • Behind lockable and breakable cover	
	Automatic Start	• Start on pressure drop • Remote start signal from automatic device	
	Manual Start	• Crank 1 and Crank 2 start pushbuttons • Run test pushbutton	

	Crank Cycle	• 6 consecutive cycle attempts
		  • 3 X 15s crank from battery 1 or 2 alternatively
		  • 15s rest in between each crank attempt	

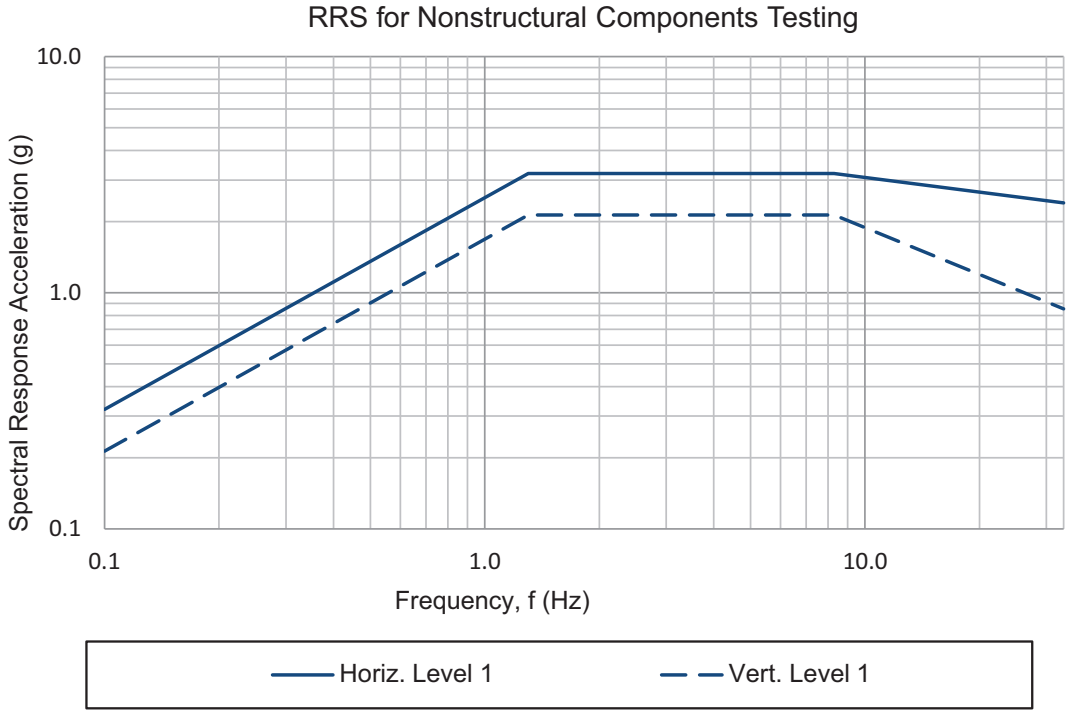
	Stopping	• Manual with Stop pushbutton • Automatic after expiration of minimum run timer ****	
	Timers	**Field Adjustable & Visual Countdown**	• Minimum run timer ****(off delay) • Sequential start timer (on delay) • Periodic test timer
	Actuation	**Visual Indication**	• Pressure • Non-pressure
	Mode		• Automatic • Non-automatic
Communication Protocol Capability	• Protocol: Modbus • Connection type: Shielded female connector RJ45 • Frame Format: TCP/IP • Addresses: See bulletin MOD-GPD		

Alarm and shutdown schedule		Automatic Start	Manual or Remote Start	Run Test or Periodic Test
	High Coolant	Alarm only	Alarm only	Shutdown
	Low Oil Pressure	Alarm only	Alarm only	Shutdown
	Overspeed	Shutdown	Shutdown	Shutdown

	Wall Mount		**Floor Mount**	
Starting Voltage	Approx. shipping dimensions in inches (mm)	Approx. Shipping Weight in Lbs (kg)	Approx. shipping dimensions in inches (mm)	Approx. Shipping Weight in Lbs (kg)
12V.DC	32" l x 29" w x 16" h (813 x 737 x 407)	85 (39)	32” l x 29” w x 26” h (813 x 737 x 661)	115 (52)
24V.DC				

**** Automatic shutdown shall be approved by the AHJ.

Seismic Certification	Seismic Certification Company	TRU Compliance, LLC A Tobalski Watkins Affiliate						TWEI Project No.: 15014			
	Mounting details	Rigid wall mounting									
	Seismic Information	Building Code	Test Criteria	Seismic Parameters	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
		IBC 2015, CBC 2016	ICC-ES AC156	ASCE 7-10 Chapter 13	2.0	1.0	1.5	3.20	2.40	1.33	0.53
					3.2	0.0	1.5	3.20	1.28	2.13	0.85



Notes:
- Components are tested in accordance with ICC-ES AC156, IBC 2015 & CBC 2016.
- OSHPD Special Seismic Certification Preapproval (OSP)

☐	A1	Periodic test alarm contact (DPDT)
☐	A2	Overspeed alarm contact (DPDT)
☐	A3	Low oil pressure alarm contact (DPDT)
☐	A4	High coolant temperature alarm contact (DPDT)
☐	A5	Failure to start alarm contacts alarm contact (DPDT)
☐	A6	Battery 1 & 2 failure alarm contact (2 x DPDT)
☐	A7	Charger 1 & 2 failure alarm contact (2 x DPDT)
☐	A8	AC failure alarm contact (DPDT)
☐	A9	System overpressure alarm contact (For engines with PLD) (DPDT)
☐	A11	Extra controller trouble alarm contact (DPDT)
☐	A12	Extra engine trouble alarm contact (DPDT)
☐	Ax	Additional engine alarm contact (DPDT) (specify function)
☐	B1	Low fuel level alarm contact (DPDT)
☐	B2	Water reservoir level low alarm contact (DPDT)
☐	B3	Water reservoir empty alarm contact (DPDT)
☐	B4	Low pump room temperature alarm contact (DPDT)
☐	B5	High fuel level alarm contact (DPDT)
☐	B6	Low system (discharge) pressure alarm contact (DPDT)
☐	B7	Low suction pressure alarm contact (DPDT)
☐	B8	Pump on demand alarm contact (DPDT)
☐	B9	Fuel tank leak alarm contact (DPDT)
☐	B10	Main relief valve open alarm contact (DPDT)
☐	B11	Flow meter loop valve open alarm contact (DPDT)
☐	B12	Water reservoir level high alarm contact (DPDT)
☐	B13	High pump room temperature alarm contact (DPDT)
☐	Bx	Additional pump room alarm contact (DPDT) (specify function)
☐	C5	CE Mark with factory certificate
☐	C6	Nickel – cadmium battery chargers (Battery data sheet required)
☐	C7	Engine block heater circuit - 3KW max (same voltage as battery charger primary)
☐	C7A	Engine block heater circuit - 6KW max (same voltage as battery charger primary) Confirm power rating of block heater
☐	C9	Non pressure actuated controller w/o pressure transducer and run test solenoid valve
☐	C13	Louver activation circuit (battery power specific)
☐	C14	Delayed automatic start on AC power failure (factory set at 15 minutes)
☐	C15	Low zone pump control function
☐	C16	Middle zone pump control function
☐	C17	High zone pump control function
☐	C19	Lockout/interlock circuit from equipment installed inside the pump room
☐	D4	Pressure transducer and run test solenoid valve for fresh water rated for 0-500psi (for factory calibration purposes only)
☐	D6	Pressure transducer and run test solenoid valve for sea water rated for 0-500PSI
☐	D7A	Low fuel level float switch supplied as separate item (1-1/4”)
☑	D7B	Low fuel level float switch supplied as separate item (1-1/2”)
☐	D8A	High fuel level float switch supplied as separate item (1-1/4”)
☑	D8B	High fuel level float switch supplied as separate item (1-1/2”)
☐	D9A	Anti-condensation heater & thermostat
☐	D9B	Anti-condensation heater & humidistat
☐	D9C	Anti-condensation heater & thermostat & humidistat
☐	D11	Low suction pressure transducer for fresh water rated at 0-300PSI with visual indication and alarm contact
☐	D11A	Low suction pressure transducer for sea water rated at 0-300PSI with visual indication and alarm contact
☐	D12	Tropicalization
☐	D25	Mounting stand
☐	D25A	Mounting stand SST- 304 painted
☐	D25B	Mounting stand SST- 304 brushed finish
☐	D25C	Mounting stand SST- 316 painted
☐	D25D	Mounting stand SST- 316 brushed finish
☐	D26	Combined low and high fuel level float switch (1-1/4”)

Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.

☐	D26A	Combined low and high fuel level float switch (1-1/2")
☐	D27	Fuel level probe (2") Level indication
☐	D28A	Field programmable I/O board - 5 Input / 5 output
☐	D30	Redundant pressure transducer for fresh water rated for 0-500PSI
☐	D31	Redundant pressure transducer for sea water rated for 0-500PSI
☐	D32	Modbus with RTU frame format and RS485 connection

☑	L01	Other language and English (bilingual)
☐	L02	French
☐	L03	Spanish
☐	L04	German
☐	L05	Italian
☐	L06	Polish
☐	L07	Romanian
☐	L08	Hungarian
☐	L09	Slovak
☐	L10	Croatian
☐	L11	Czech
☐	L12	Portuguese
☐	L13	Dutch
☐	L14	Russian
☐	L15	Turkish
☐	L16	Swedish
☐	L17	Bulgarian
☐	L18	Thai
☐	L19	Indonesian
☐	L20	Slovenian
☐	L21	Danish
☐	L22	Greek
☐	L23	Arabic
☐	L24	Hebrew
☐	L25	Chinese

Additional Options:

☐ _____

☐ _____

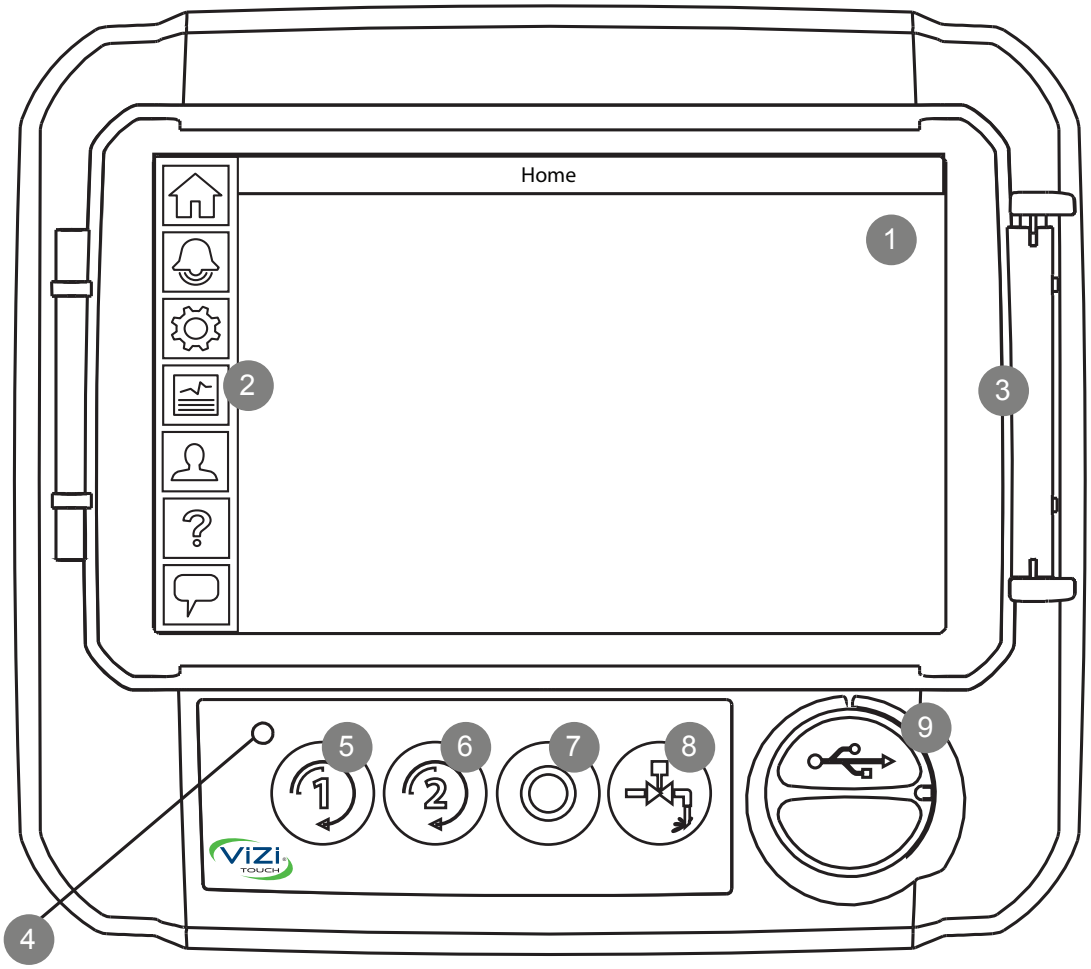
☐ _____

☐ _____

☐ _____

Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.

ViZiTouch V2 Operator Interface



1 - Color touch screen
2 - Onscreen menu
- HOME page
- ALARM page
- CONFIGURATION page
- HISTORY page
- SERVICE page
- MANUAL page
- LANGUAGES page

3 - Screen protector
4 - Power LED (3 colors)
5 - CRANK 1 button
6 - CRANK 2 button
7 - STOP button
8 - RUN TEST button
9 - USB port

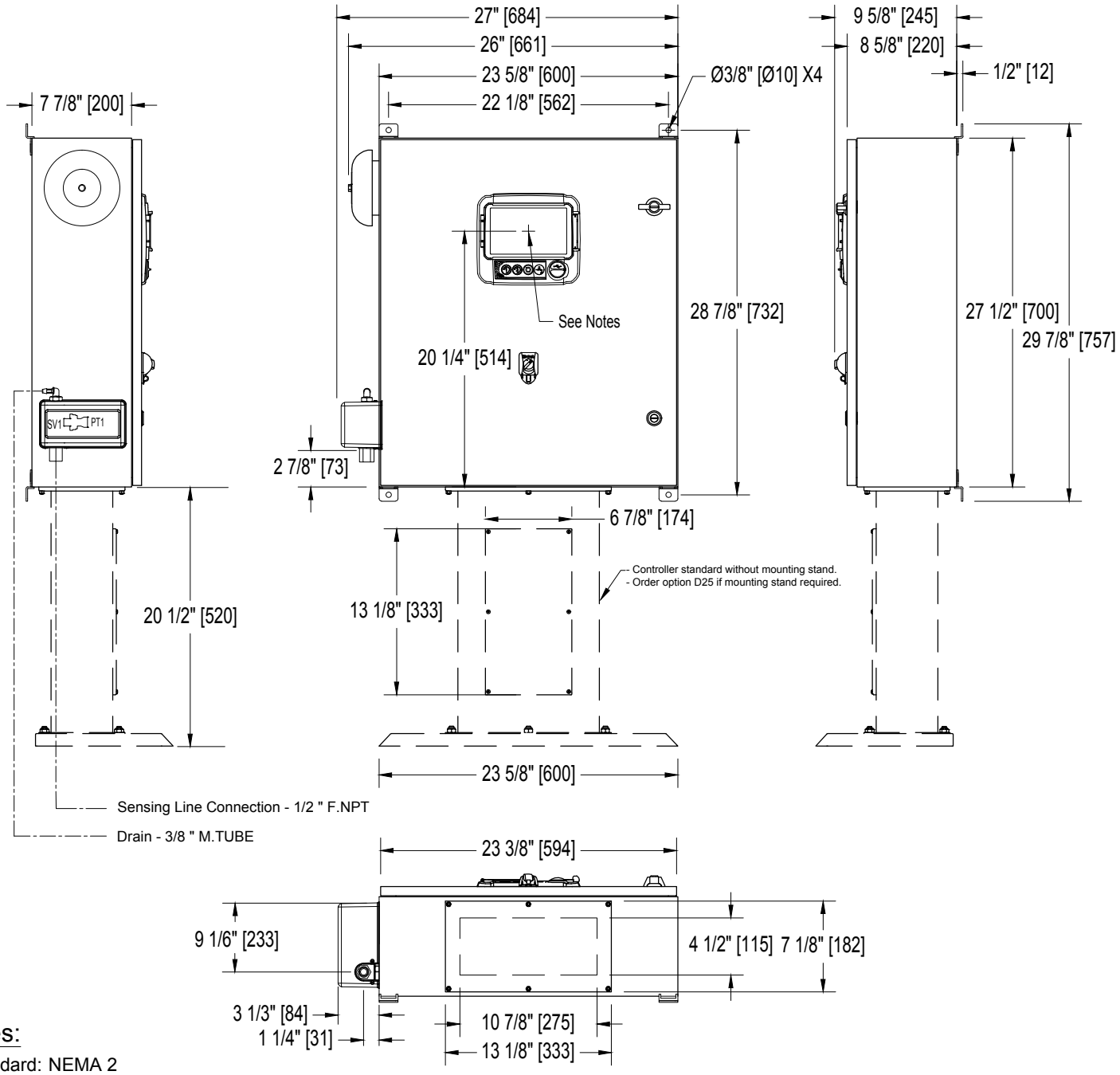
Diesel Engine Fire Pump Controller

12Vdc or 24Vdc Negative Ground

Model: GPD

Dimensions

Built to the latest edition of the NFPA 20 standard



Notes:

- Standard: NEMA 2
- Standard paint : textured red RAL 3002.
- All dimensions are in inches [millimeters].
- Center of ViZiTouch screen: 20-1/4" [514] from bottom (no feet).
- Bottom conduit entrance through removable gland plate recommended.
- Use watertight conduit and connector only.
- Protect equipment against drilling chips.
- Door swing equal to door width.
- Seismic mounting to be rigid wall only.

Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
Contact manufacturer for "As Built" drawing.

Projection

TORNATECH

SEISMIC COMPLIANT

NYC Dpt of Building Approved

REV.	DESCRIPTION	DD/MM/YY	Drawing number
			GPD-DI700 /E
1.	Revised logo	18/06/18	
0.	First issue	18/11/16	CDL

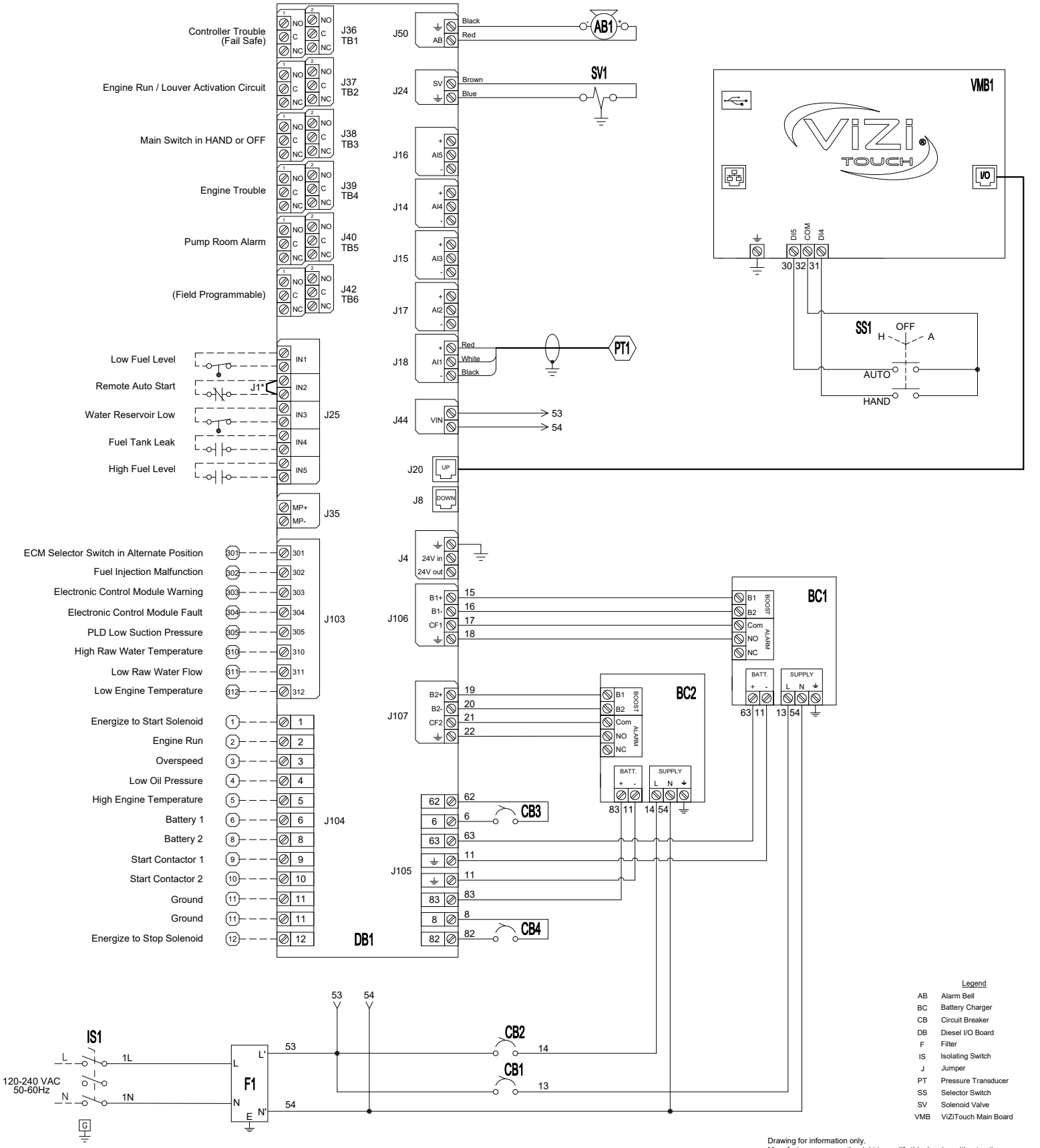
Diesel Engine Fire Pump Controller

12VDC or 24VDC Negative Ground

Wiring schematic

Model: GPD

Built to the latest edition of the NFPA 20 standard



Legend

AB	Alarm Bell
BC	Battery Charger
CB	Circuit Breaker
DB	Diesel I/O Board
F	Filter
IS	Isolating Switch
J	Jumper
PT	Pressure Transducer
SS	Selector Switch
SV	Solenoid Valve
VMB	ViZiTouch Main Board

Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
Contact manufacturer for "As Built" drawing.

* Remove jumper to use this feature

TORNATECH

SEISMIC COMPLIANT

c UL us

FM APPROVED

NYC Dpt of Building Approved

REV.	DESCRIPTION	DD/MM/YY	Drawing number
3	Water Reservoir Modified	04/04/19	GPD-WS700 /E
2	Revised logo	18/06/18	
1	Corrected SS1 inputs	16/01/17	CDL

Diesel Engine Fire Pump Controller

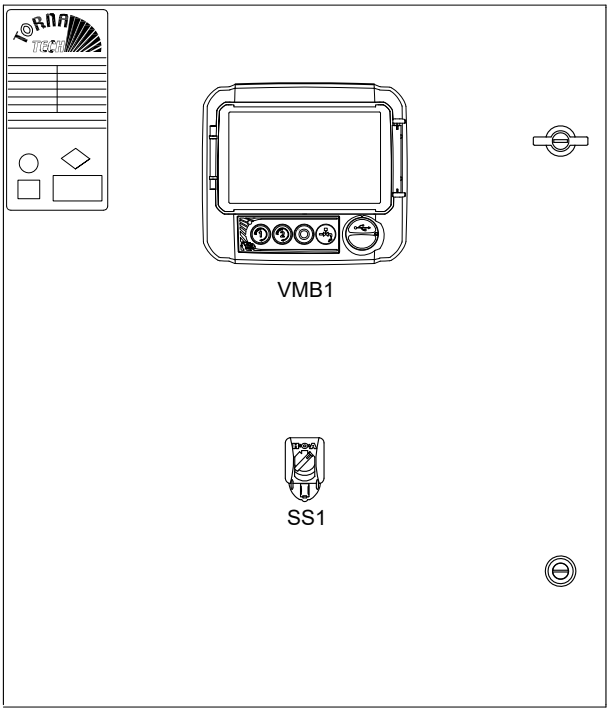
12VDC or 24VDC Negative Ground

Layout

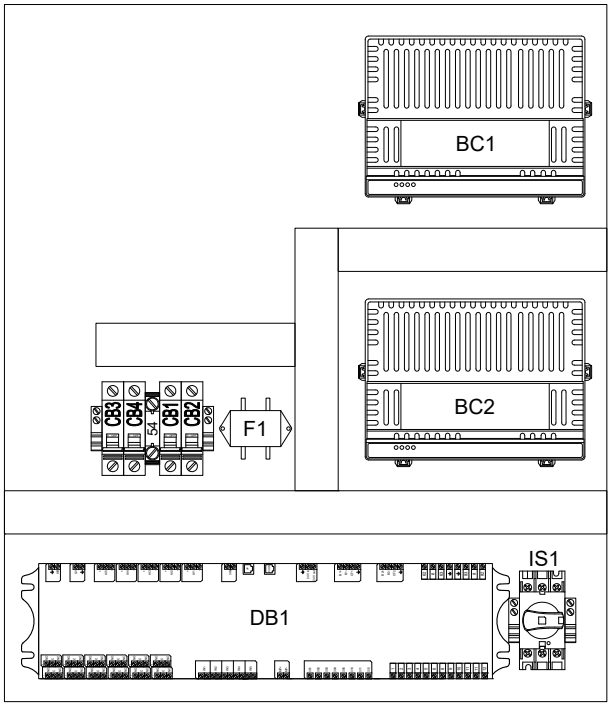
Model: GPD

Built to the latest edition of the NFPA 20 standard

Designation	Description
BC1-BC2	Battery Charger #1 and #2
CB1-2	Magnetic Breaker 1 Pole 10 A
CB3-4	Magnetic Breaker 1 Pole 16 A
DB1	I/O Diesel Board
F1	Filter
IS1	Isolating Switch
SS1	Lockable 3 Position Selector Switch
VMB1	ViZiTouch Main Board



Front Door Layout



Internal Layout

REV.	DESCRIPTION	DD/MM/YY
1	Revised logo	18/06/18
0	First issue	21/11/16 CDL

Drawing number

GPD-LY700 /E

Diesel Engine Fire Pump Controller
12VDC or 24VDC Negative Ground

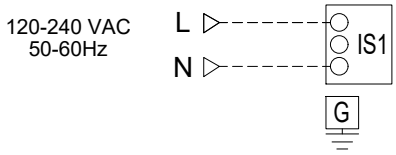
Model: GPD

Terminal Diagram

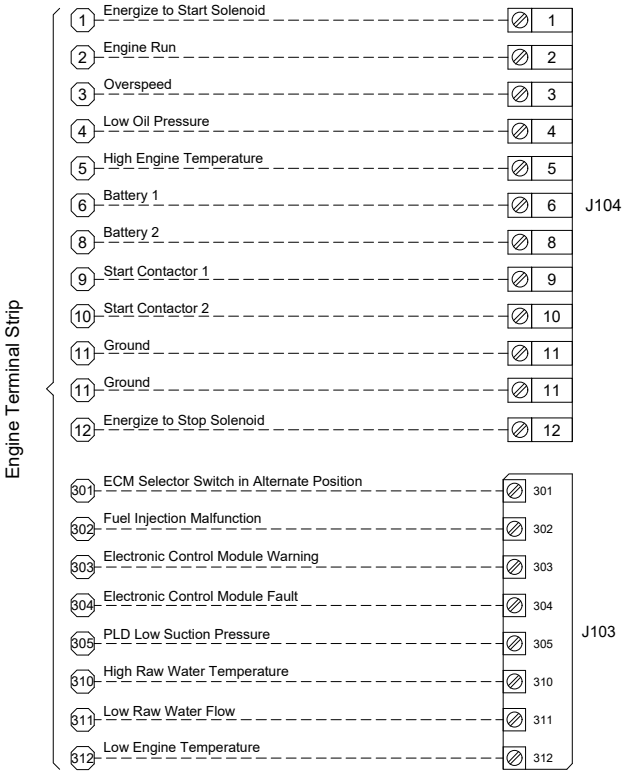
Built to the latest edition of the NFPA 20 standard

Power Supply

Terminals Wire Size:
14 - 6 AWG
3.9 Nm

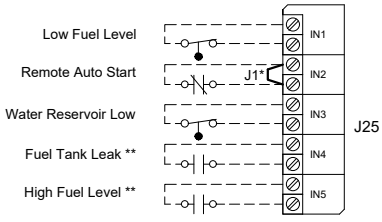


Engine Connections (DB1)



Field Connections (DB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



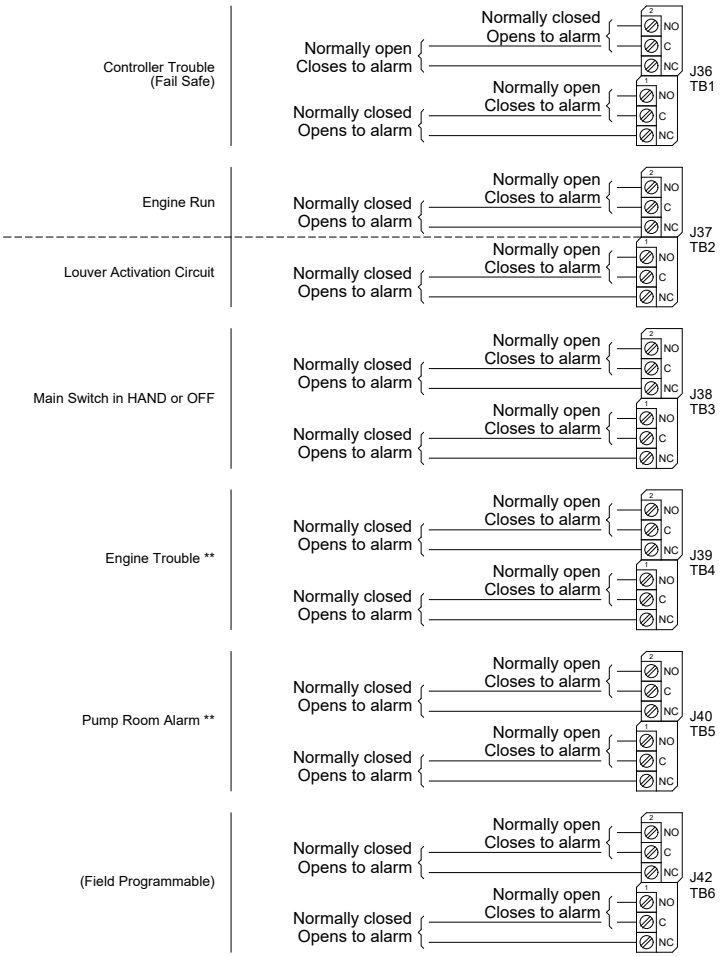
Network Connection (VMB1)

Shielded Female Connector RJ45

* Remove jumper to use this feature
** Re-assignable

Remote Alarm Terminals (DB1)

Terminals Wire Size:
250VAC / 8A Max.
24 - 12 AWG
0.5 Nm



All wiring between the controller and diesel engine shall be stranded (NFPA20)

Wiring between controller and engine (terminals 301, 302, 303, 304, 305, 310, 311, 312, 2 ,3 ,4 ,5) must be #14AWG as minimum.

Wiring between controller and engine (terminals 12 [rated at 10A or 22A for 20 seconds] 1, 9, 10 [rated at 10A]) must be stranded #10AWG as minimum.

Wiring between controller and engine (terminals 6, 8, 11 [rated at 30A]) must be stranded and sized according to distance.

0-5' (0-1.5m) - 12 AWG (4 mm2)
6-10' (1.8-3m) - 10 AWG (6 mm2)
11-15' (3.3-4.5m) - 8 AWG (10 mm2)
16-20' (4.8-6m) - 2x10 AWG (2x6 mm2)
21-32' (6.4-9.75m) - 2x8 AWG (2x10 mm2)

Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
Contact manufacturer for "As Built" drawing.

TORNATECH

SEISMIC PWV COMPLIANT

c UL us

FM APPROVED

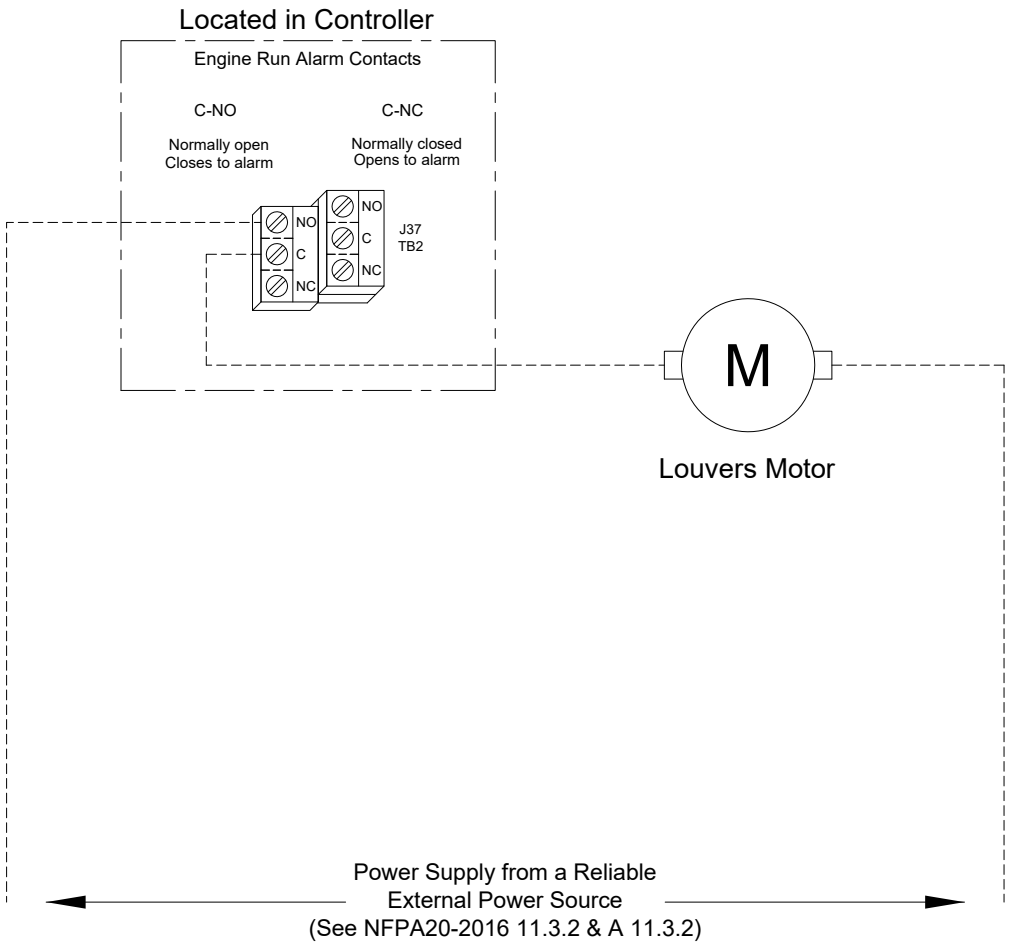
NYC Dpt of Building Approved

REV.	DESCRIPTION	DD/MM/YY	Drawing number
3	Revised text	22/07/21	GPD-TD700 /E
2	Revised IN3	22/05/19	
1	Revised logo	18/06/18	CDL

Diesel Engine Fire Pump Controller
12VDC or 24VDC Negative Ground
Louver Connection

Model: GPD

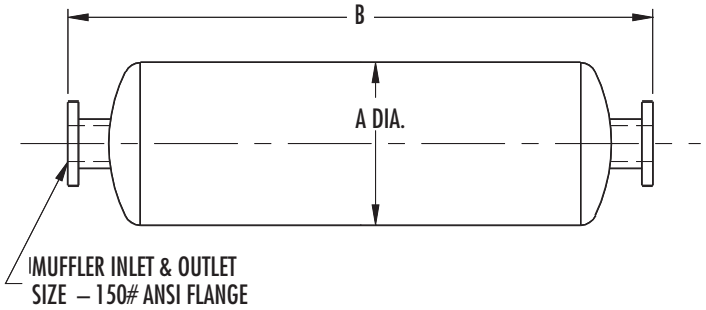
Built to the latest edition of the NFPA 20 standard



REV.	DESCRIPTION	DD/MM/YY	Drawing number
			GPD-TD701 /E
1	Revised logo	18/06/18	
0	First issue	10/11/16	

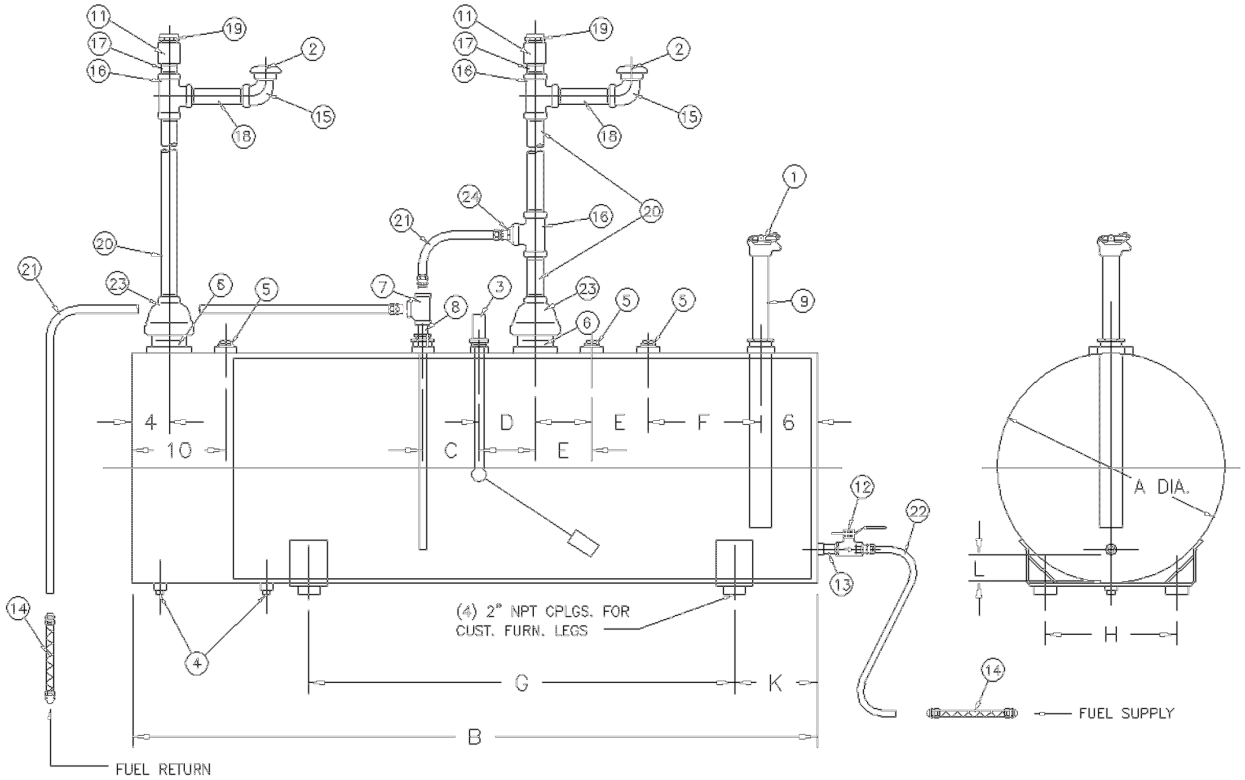
AURORA® FIRE PUMPS

DIESEL ENGINE MUFFLERS



ENGINE MODEL	MUFFLER INLET & OUTLET	COMMERCIAL GRADE			RESIDENTIAL GRADE			CRITICAL GRADE		
		A	B	WGT	A	B	WGT	A	B	WGT
CATERPILLAR										
3406C	6" FLANGED	12	42	35	12	54	43	16	73	131
3412C*, 3508C, C18*	8" FLANGED	18	49	110	18	61	124	20	75	220
CLARKE FIRE PROTECTION										
JU4H-UF10, -UF12, -UF14, -UF20, -UF22, -UF24, -UFAB26, -UFAEA0, -UFAEE8, -UFAEF2, -UFADJ2, -UFADJ8	3" NPT	8	36	19	8	42	21	10	42	42
JU4R-UF09, -UF11, -UF13, -UF19, -UF21, -UF23, -UFAEA9, -UFAEE7, -UFAEF1										
JU4H-UF30, -UF32, -UF34, -UF40, -UF42, -UF 50, -UF52, -UF54, -UF58, -UFADJG, -UFADP0, -UFADR0, -UFADW8, -UFADY8, -UFAD5G	4" FLANGED	10	36	24	10	46	29	12	55	68
JU4R-UF40, -UF49, UF51 -UF53										
JU6H-UF30, -UF32, -UF34, -UF 50, -UF52, -UF54, -UF58, -UF60, -UF62, -UF62, -UF68, -UF84, -UFAAPG, -UFAAQ8, -UFAARG, -UFAAS0,-UFAB76, -UFABL0, -UFABL8, -UFD0, -UFD2, -UFG8, -UFM0, -UFM2, -UFM8, -UFAD58, -UFAD88, -UFADM0, -UFADM8, -UFADN0, -UFADNG, -UFADP8	5" FLANGED	10	42	27	10	54	34	14	61	92
DP6H SERIES										
JW6H-UF30, -UF40, UF48										
DS0H SERIES*	5" FLANGED	10	42	27	10	54	34	14	61	92
DR8H SERIES*										
JW6H-UF50, -UF58, -UF60, -UF8, -UFAAM8, -UFAA80, -UFADD0, -UFADB0, -UFADF0, -UFADJ0, -FAD70, -UFAD80	6" FLANGED	12	42	35	12	54	43	16	73	131
JU6H-UFAD98, -UFADP0, -UFADQ0, -UFADR0, -UFADR8, -UFADS0, -UFADS8, -FADT0, -UFADW8 -UFADX8										
DQ6H SERIES										
DT2H SERIES*										
JX6H SERIES	8" FLANGED	18	49	110	18	61	124	20	75	220
CUMMINS										
CFP5E, CFP59, CFP7E Series	4" NPT, FLANGED	10	36	24	10	46	29	12	55	68
CFP83 Series	4" NPT, FLANGED	10	36	24	10	46	29	12	55	68
CFP9E Series	5" NPT, FLANGED	10	42	27	10	54	34	14	61	92
CFP11E Series	5" NPT, FLANGED	10	42	27	10	54	34	14	61	92
CFP15E Series	6" FLANGED	12	42	35	12	54	43	16	73	131
CFP23E Series	8" NPT, FLANGED	18	49	110	18	61	124	20	75	220
CFP30E Series	10" NPT, FLANGED	22	64	205	22	75	220	28	99	360
DEUTZ										
DFP4-2011 Series	3" NPT	8	36	19	8	42	21	10	42	42
DFP4-2012 Series	4" FLANGED	10	36	24	10	46	29	12	55	68
DFP6 Series	6" FLANGED	12	42	35	12	54	43	16	73	131

General Arrangement



A	B	C	D	E	F	G	H	K	L	Z
39.00	72.00	6.00	6.00	6.00	13.00	44.00	23.00	8.50	4.30	3" NPT

DIESEL FUEL TANK NOTES:

1. Tanks are constructed and labeled in accordance with UL-142.
2. Fittings shown areconsistent with N.F.P.A. 30 and UL-142.
3. Tank to be pitched toward drain 1/4" per foot with outlet on the same elevation as engine fuel pump. Means of elevating Tank (by others) may be required.
4. Usable tank volume is total capacity less 5% for expansion.

ILLUSTRATION NOTES:

1. All dimensions are in inches and may vary ±.25" (6.35 mm).
2. Components shown are shipped loose for field assembly.
3. Illustration is for component identification only. Actuel installation must meet local codes and all applicable standards.
4. Refer to section 916 page 259 for details of Pentair furnished components.

Fuel Tank Information	
Nominal Tank Size	300.0 US.gal
Usable Volume	270.0 US.gal
Tank Type	Double Wall
Fuel Tank Sizing	NFPA 20 & UL 142
Fuel Tank Includes leak detector and 3" emergency vent	
Weight	720.0 lb

Components Furnished By Pentair

Item No.	Qty	Description
1	1	2" NPT Lockable Fuel Cap
2	2	2" NPT Screened Tank Vent"
3	1	Fuel Gauge 1 1/2" NPT
4	2	1" NPT Drain Plug
5	3	2" NPT Pipe Plug
6	1	4" NPT Close Nipple
7	1	1/2" NPT Tee
8	1	1/2" NPT Close Nipple
9	1	2" Fuel Fill Black Pipe
10	1	"Z"x"Z"x2" NPT Tee
11	2	"Z" NPT Pipe Coupling
12	1	3/4" NPT Lockable Fuel Value
13	1	3/4" NPT Close Nipple
14	2	Fuel Hoses For Supply & Return (Furnished By Engine Mfr.)
15	2	2" NPT Street Elbow
16	2	"Z"x"Z"x"2" NPT Tee
17	2	"Z" NPT Closed Nipple
18	2	2" NPT X 6" Long Nipple
19	2	"Z" NPT Emergency Vent
23	1	4"x"Z" NPT Reducer
24	1	2"x1/2" NPT Reducer

Components Furnished By Others

Item No.	Qty	Description
20	3	"Z" Size Piping For Vent
21	1	1/2" Tubing And Fittings or 1/2" Black Pipe
22	1	3/4" Tubing And Fittings or 3/4" Black Pipe

Quote Information

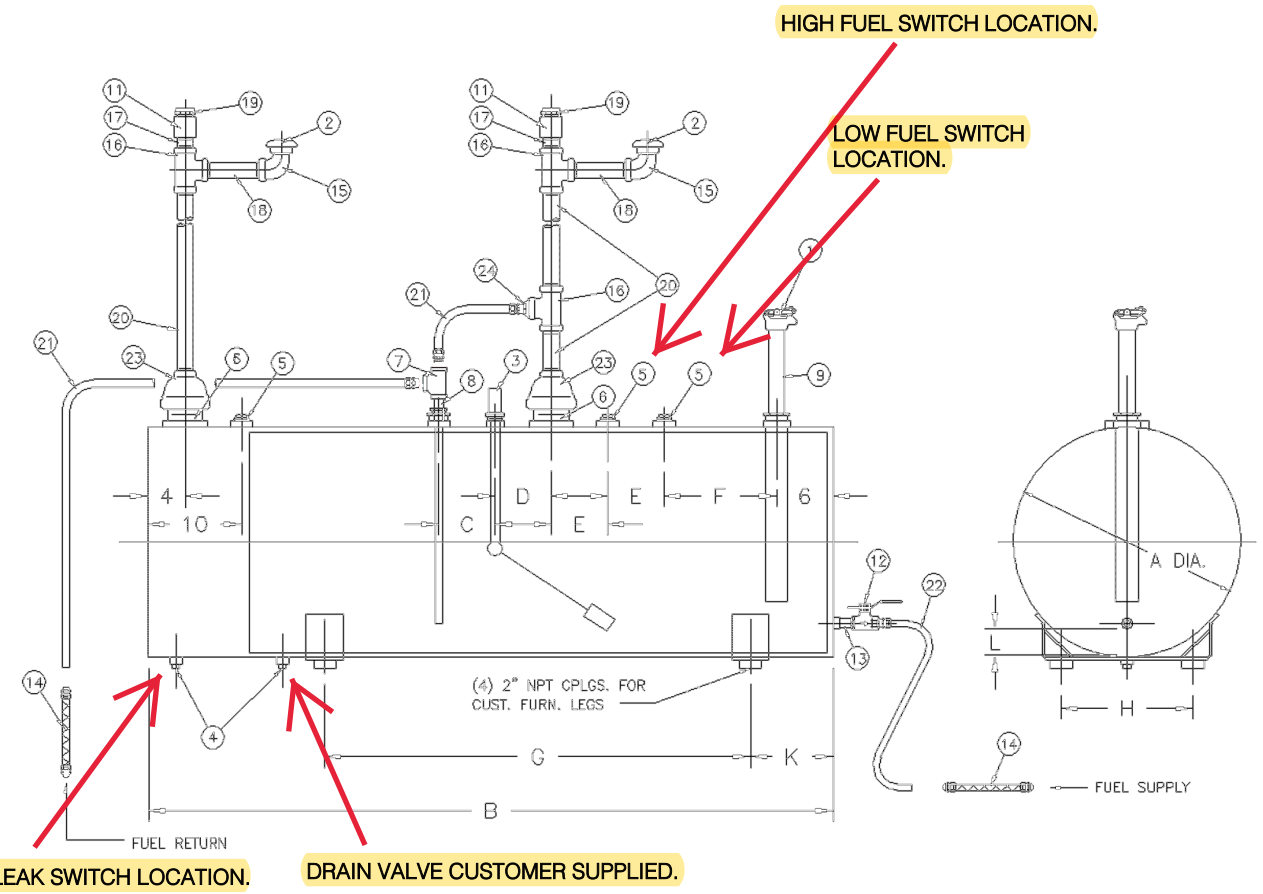
Customer	THE BROWN COMPANY INC
Customer Quote	0
Job Name	College of the Sequoias
Market	-

PENTAIR

Quote Item	001
Quote Date	02 May 2022

General Arrangement

HIGH, LOW AND LEAK FUEL SWITCHES NEED CONDUITS AND WIRES RAN TO DIESEL FIRE PUMP CONTROLLER
HIGH AND LOW NEED FLEX CONDUIT ON DEVISES TO ALLOW RAISING AND LOWERING SWITCHES INTO TANK.
LEAK DOES NOT NEED A FLEX CONDUIT.



A	B	C	D	E	F	G	H	K	L	Z
39.00	72.00	6.00	6.00	6.00	13.00	44.00	23.00	8.50	4.30	3" NPT

DIESEL FUEL TANK NOTES:

1. Tanks are constructed and labeled in accordance with UL-142.
2. Fittings shown areconsistent with N.F.P.A. 30 and UL-142.
3. Tank to be pitched toward drain 1/4" per foot with outlet on the same elevation as engine fuel pump. Means of elevating Tank (by others) may be required.
4. Usable tank volume is total capacity less 5% for expansion.

ILLUSTRATION NOTES:

1. All dimensions are in inches and may vary ±.25" (6.35 mm).
2. Components shown are shipped loose for field assembly.
3. Illustration is for component identification only. Actuel installation must meet local codes and all applicable standards.
4. Refer to section 916 page 259 for details of Pentair furnished components.

Fuel Tank Information	
Nominal Tank Size	
Usable Volume	
Tank Type	Double Wall
Fuel Tank Sizing	NFPA 20 & UL 142
Weight	

Components Furnished By Pentair

Item No.	Qty	Description
1	1	2" NPT Lockable Fuel Cap
2	2	2" NPT Screened Tank Vent"
3	1	Fuel Gauge 1 1/2" NPT
4	2	1" NPT Drain Plug
5	3	2" NPT Pipe Plug
6	1	4" NPT Close Nipple
7	1	1/2" NPT Tee
8	1	1/2" NPT Close Nipple
9	1	2" Fuel Fill Black Pipe
10	1	"Z"x"Z"x2" NPT Tee
11	2	"Z" NPT Pipe Coupling
12	1	3/4" NPT Lockable Fuel Value
13	1	3/4" NPT Close Nipple
14	2	Fuel Hoses For Supply & Return (Furnished By Engine Mfr.)
15	2	2" NPT Street Elbow
16	2	"Z"x"Z"x"2" NPT Tee
17	2	"Z" NPT Closed Nipple
18	2	2" NPT X 6" Long Nipple
19	2	"Z" NPT Emergency Vent
23	1	4"x"Z" NPT Reducer
24	1	2"x1/2" NPT Reducer

Components Furnished By Others

Item No.	Qty	Description
20	3	"Z" Size Piping For Vent
21	1	1/2" Tubing And Fittings or 1/2" Black Pipe
22	1	3/4" Tubing And Fittings or 3/4" Black Pipe

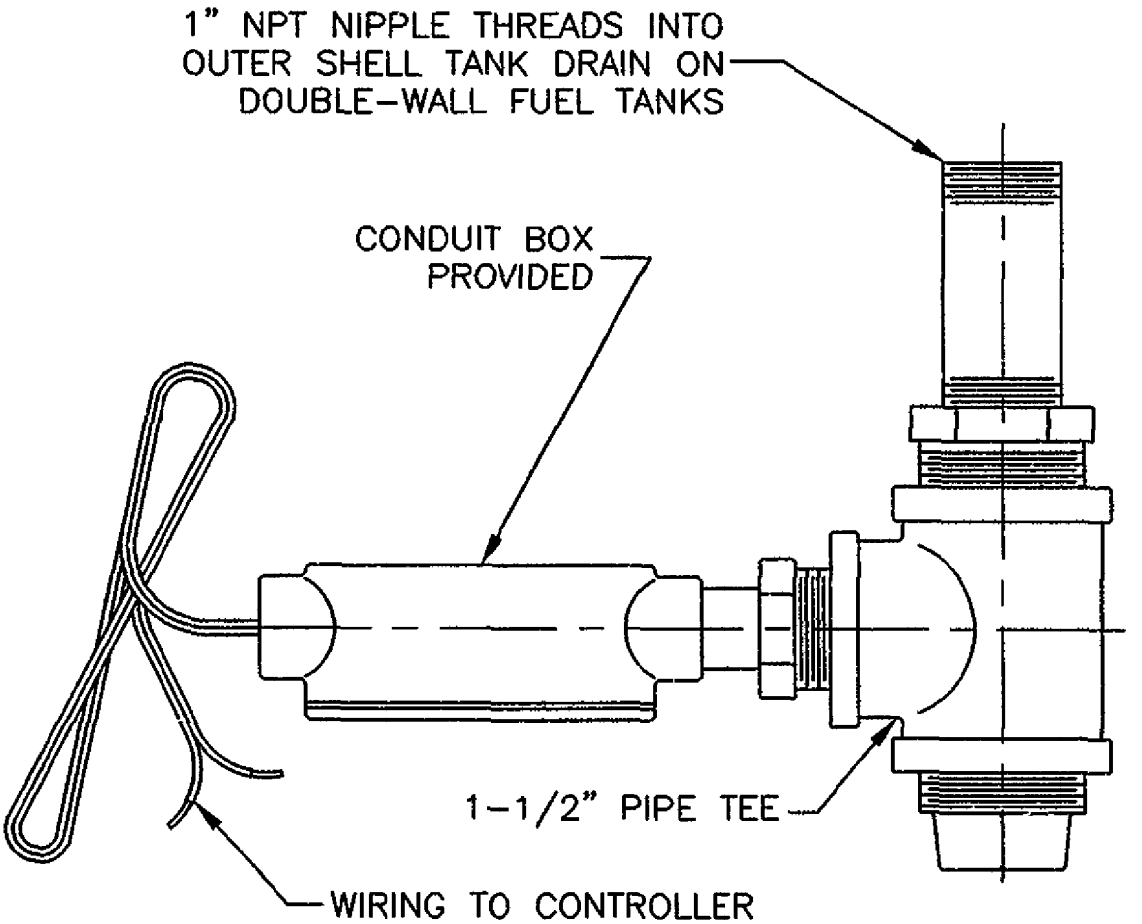
Quote Information

Customer	THE BROWN COMPANY INC
Customer Quote	0
Job Name	
Market	-

PENTAIR

Quote Item	001
Quote Date	06 Jan 2022

ALARM SWITCH		032 1863 000
DIESEL FUEL SPILL		THRU
		--- ---- ---



FLOAT SWITCH AND PIPING ASSEMBLY TO DETECT THE PRESENCE OF DIESEL FUEL LEAKING INTO OUTER SHELL OF DOUBLE-WALL TANKS.
MODEL FLS-TS SUPPLIED BY
CHICAGO TECHNICAL SALES
OAKBROOK TERRACE IL 60181

REV	DATE	REVISION	BY	CK'D

DO NOT SCALE DRAWING
PLOT SCALE 1 = 2

AURORA
PENTAIR PUMP GROUP

NOTES:
STANDARD TOLERANCES UNLESS OTHERWISE SPECIFIED.
1. FINISH = 125 RMS.
2. 2 PLACE DECIMALS ± .06.
3. 3 PLACE DECIMALS ± .010.
4. ANGULAR DIMENSIONS ± 1/2'.
5. CHAMF. ALL MACH'D. SURFACE .005-.010x45' AND REMOVE ALL BURRS.
6. ALL PARTS MUST BE FREE FROM SCALE.
7. NO TOLERANCE NEEDED ON REFERENCE DIMENSIONS.
8. ALL BOLT CIRCLE TOLERANCE PER ANSI B16.5.
9. CONCENTRICITY TO CENTERLINE .005.

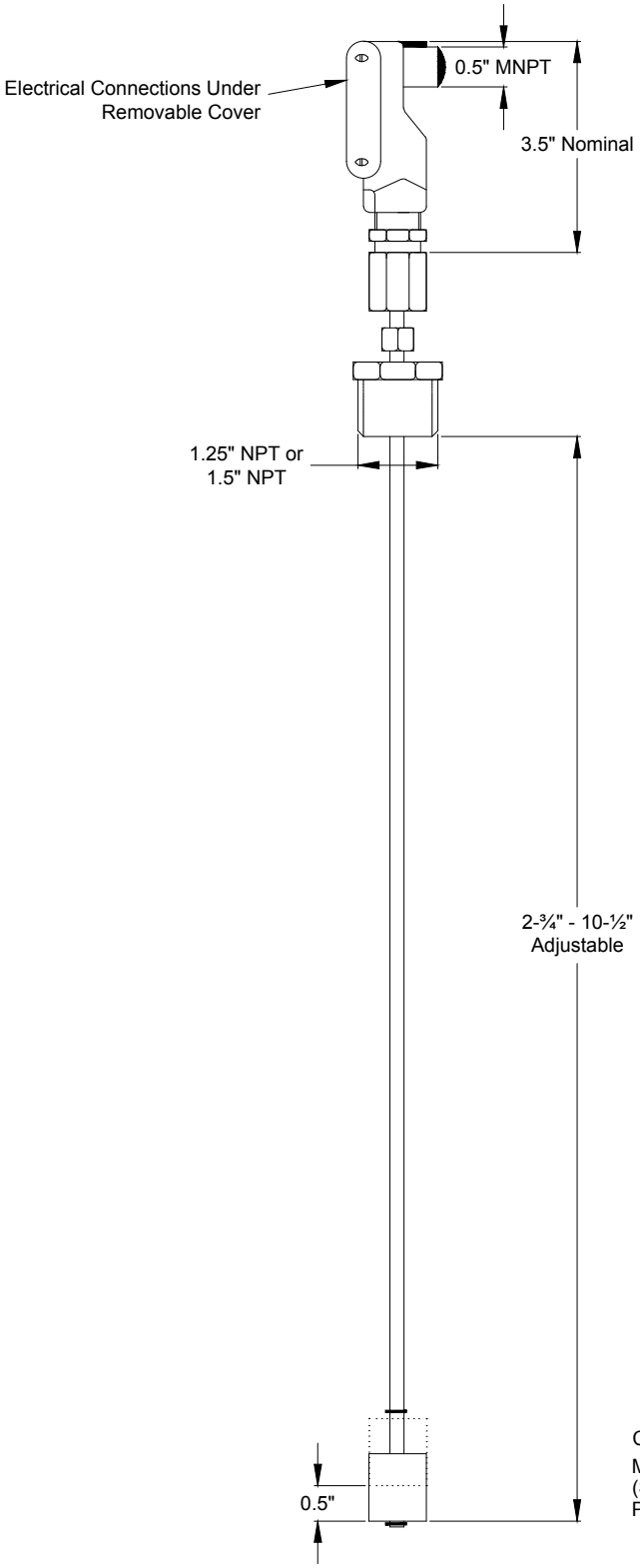
DRAWN BY	FUEL SPILL ALARM SWITCH	
S. TOMLIN		
DATE 04/25/01	REV —	--- ---- ---
CHECKED BY S. TOMLIN	SIZE	THRU
APPROVED BY S. TOMLIN	A	032 1863 000

Diesel Engine Fire Pump Controller
High Fuel Level Switch

Model: GPD

Schematic

Built to the latest edition of the NFPA 20 standard



Ordering Instructions

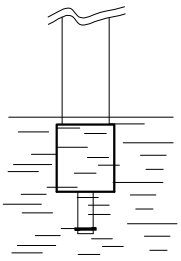
Specify Fitting Size :

☐ - 1.25" (1-1/4") NPT (Option D08A)

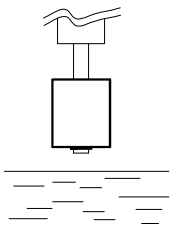
☒ - 1.50" (1-1/2") NPT (Option D08B)

CUSTOMER TO SUPPLY 2" X 1.5" BLACK NPT BUSHING FOR FUEL TANK OUTLET.

Float Switch Configuration



The contact is CLOSED when the float is in the liquid



The contact is OPEN when float is above the liquid level.

Contact Rating:

Maximum 0-250 Vac, 20W
(Switch REED)
Pilot Duty Switch

Drawing for information only.
Manufacturer reserves the right to modify this drawing whitout notice.
Contact manufacturer for "As Built" drawing.

TORNA TECH

c UL us
#E324587

REV.	DESCRIPTION	DD/MM/YY	Drawing number
			GPD-FL005 /E
1	New Design	20/01/15	
0	First Issue	22/09/14	

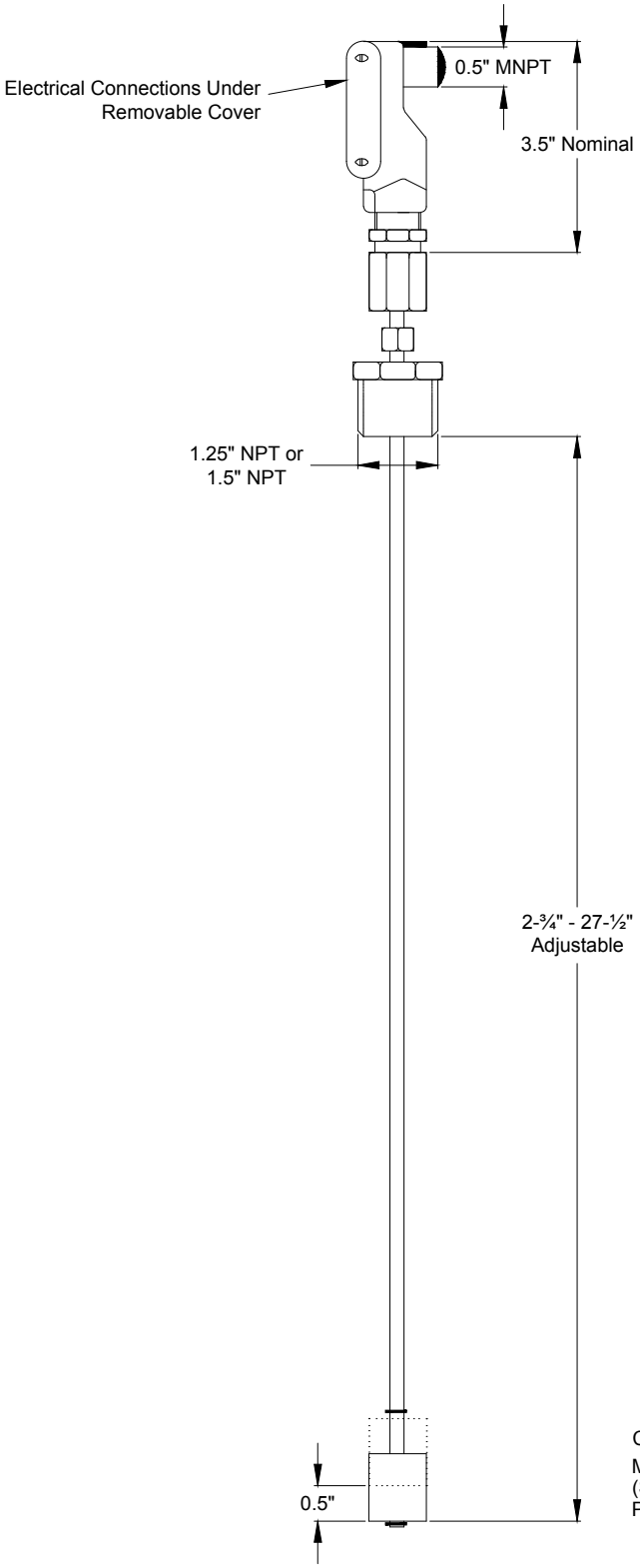
Diesel Engine Fire Pump Controller

Low Fuel Level Switch

Model: GPD

Schematic

Built to the latest edition of the NFPA 20 standard



Ordering Instructions

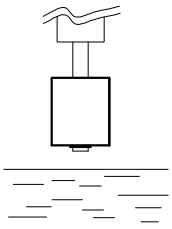
Specify Fitting Size :

☐ - 1.25" (1-1/4") NPT (Option D07A)

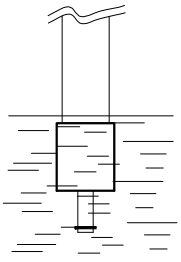
☒ - 1.50" (1-1/2") NPT (Option D07B)

CUSTOMER TO SUPPLY A 2" X 1.5" BLACK NPT BUSHING FOR FUEL TANK OUTLET.

Float Switch Configuration



The contact is CLOSED when float is above the liquid level.



The contact is OPEN when the float is in the liquid

Contact Rating:

Maximum 0-250 Vac, 20W
(Switch REED)
Pilot Duty Switch

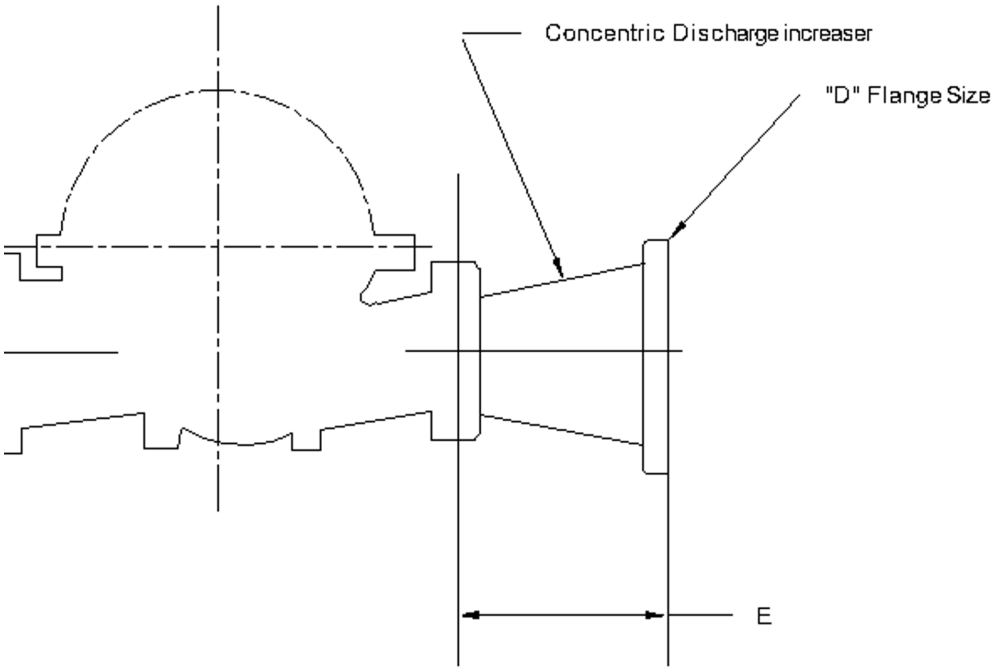
Drawing for information only.
Manufacturer reserves the right to modify this drawing whitout notice.
Contact manufacturer for "As Built" drawing.

TORNATECH

c UL us
#E324587

REV.	DESCRIPTION	DD/MM/YY	Drawing number
6	New Design	20/01/15	GPD-FL001 /E
5	New Format + Only Low Level	22/09/14	
4	Adjustable	04/07/14	

General Arrangement



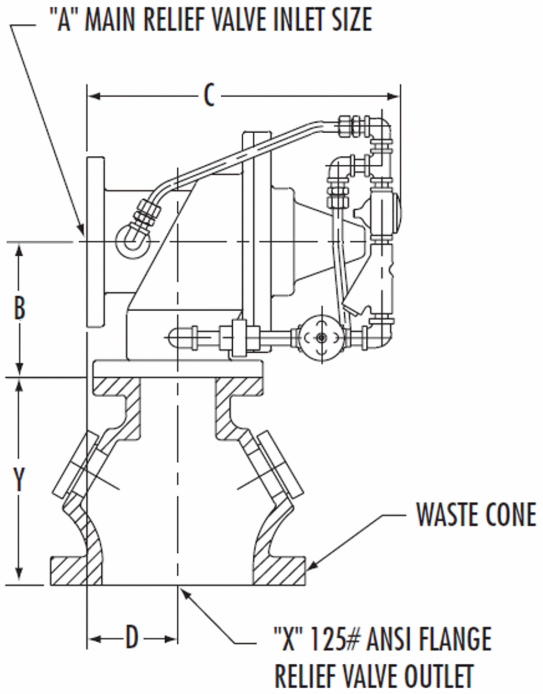
Discharge Size	D	E	Discharge Increaser Flange Rating
6x8	8.00	11.00	125 lb

NOTES:

1. Dimensions are in inches (mm) and may vary ± 1/4".
2. Dimensions applicable to both Class 125 & Class 250 fittings.
3. Illustrations show the intended installation positions and orientation of each fitting: Eccentric Suction Reducers are to be installed with the straight side to the top to prevent air entrapment.
4. Proper pipe supports are required to prevent strain on pump casing.
5. Fittings shown are intended to adapt the fire pump suction and discharge flanges to the actual system manifold pipe sizes. Refer to NFPA 20 for the minimum system manifold size for each flow rating (GPM), but in no case should the system suction pipe be a smaller pipe size than that of the pump suction flange.

Quote Information			
Customer	THE BROWN COMPANY INC		
Customer Quote	0		
Job Name	College of the Sequoias		
Market	-		
PENTAIR		Quote Item	001
		Quote Date	02 May 2022

General Arrangement



A	B	C	D
4.00	7.62	16.93	5.06

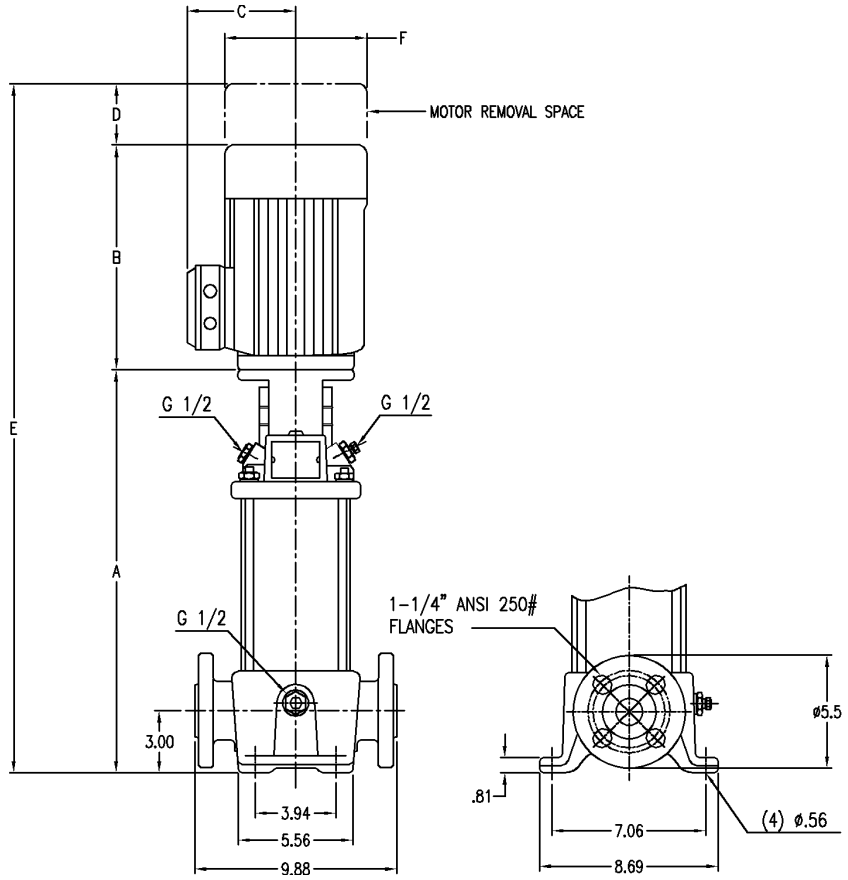
X	Y
6.00	11.00

NOTES:

1. Dimensions are in inches (mm) and may vary ±1/4 (6).
2. Valves are available with inlet flange ratings of 125# or 250#. All waste cones have 125# flange ratings.
3. Dimensions for conventional relief valves are not affected by flange rating.
4. Relief valve discharge is intended to be piped to waste. Refer to factory if discharge is to be piped to a line where back pressure is present.
5. Maximum operating pressure for valves rated for 125# is 175 PSI.
6. Maximum operating pressure for valves rated for 250# is 300 PSI.

Quote Information			
Customer	THE BROWN COMPANY INC		
Customer Quote	0		
Job Name	College of the Sequoias		
Market	-		
PENTAIR		Quote Item	001
		Quote Date	02 May 2022

General Arrangement



A	B	C	D	E	F
21.80	12.10	7.20	2.10	35.90	7.20

NOTES:

All dimensions are in inches.

Dimensions may vary ± 1/4" (6mm) due to normal manufacturing tolerances

-

-

Pump Data	
Model	PVM1-17
Stages	17
Flow	10.00 USgpm
Head	160.0 psi
Rotation	Right Hand
Suc/Disch Size	0.00 in
Connection Suc/Disch	1.25" ANSI 250# flg w/ 1.25" NPT female

Motor Data	
Power	2.00 hp
Phase	3
Frequency	60 Hz
Voltage	230/460
Speed	3500
Frame Size	56CZ
Efficiency	premium
Enclosure	TEFC

Pump Materials of Construction	
Pump Material	Cast Iron
Elastomer	-

Estimated Weights	
Pump	106.0 lb
Motor	0.00 lb

Additional Options

Quote Information	
Customer	THE BROWN COMPANY INC
Customer Quote	0
Job Name	College of the Sequoias
Market	-

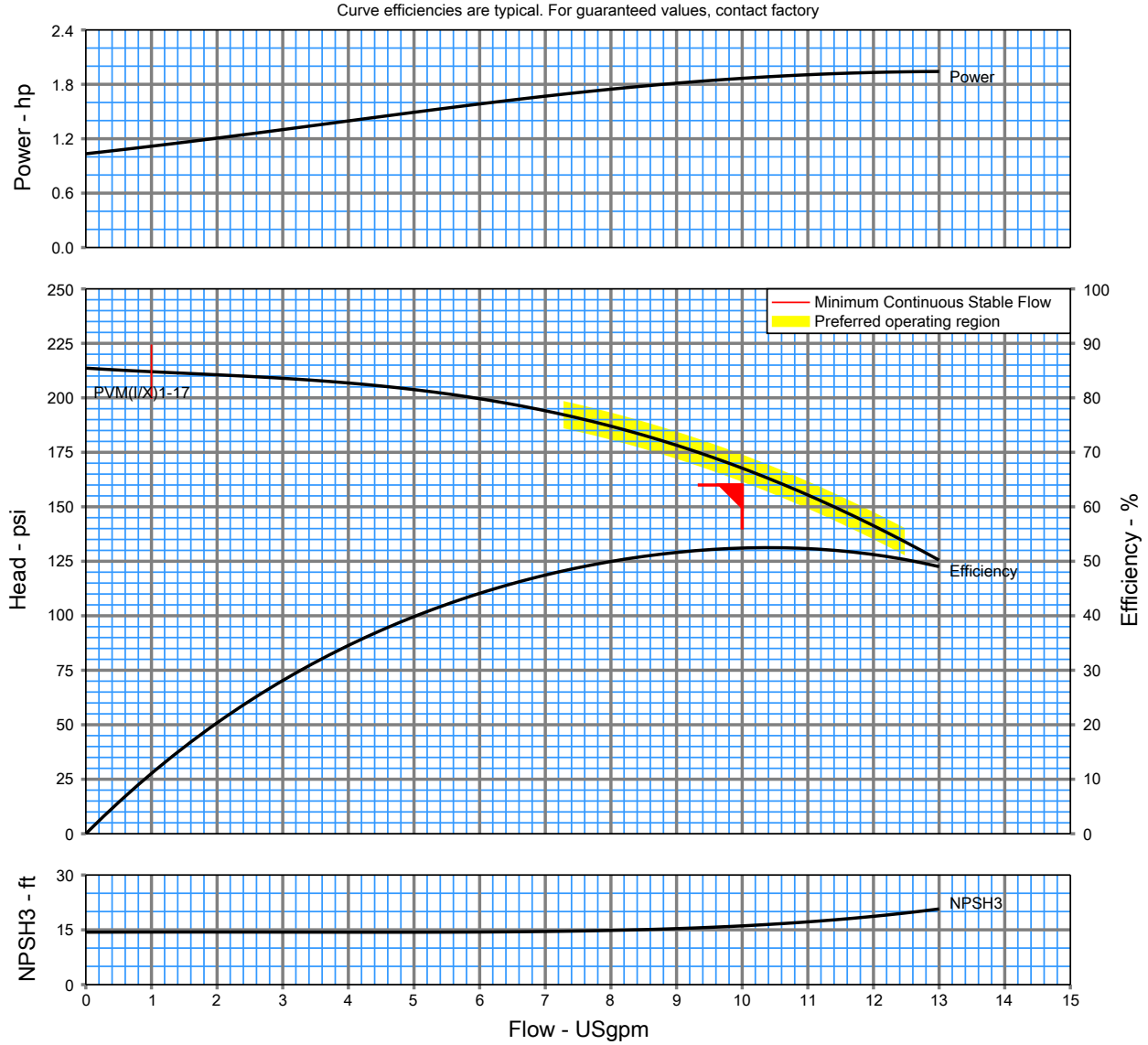
PENTAIR	Quote Item	001
	Quote Date	02 May 2022

Customer : THE BROWN COMPANY INC
Project name : College of the Sequoias

Jockey Pump Curve

Encompass 2.0 - 22.1.1

Curve efficiencies are typical. For guaranteed values, contact factory



Item number	: 001	Size	: PVM(X)1-17
Service	:	Stages	: 17
Quantity	: 1	Speed, rated	: 3500 rpm
Quote number	: 25115	Based on curve number	: PVM(X)1-17
Date last saved	: 02 May 2022 9:53 AM	Efficiency	: 52.43 %
Flow, rated	: 10.00 USgpm	Power, rated	: 1.87 hp
Differential head / pressure, rated	: 160.0 psi	NPSH required	: 16.08 ft
		Viscosity	: 1.00 cP
Fluid density, rated / max	: 0.999 / 0.999 SG	Cq/Ch/Ce/Cn [ANSI/HI 1.1-1.5-1994]	: 1.00 / 1.00 / 1.00 / 1.00

TORNATECH

Project: College of the Sequoias

Customer:

Engineer: Cordiner Consulting

Pump Manufacturer: Aurora

Technical Data
Submittal Document

Model JP3

Across the Line Start
Jockey Pump Controller

Contents:

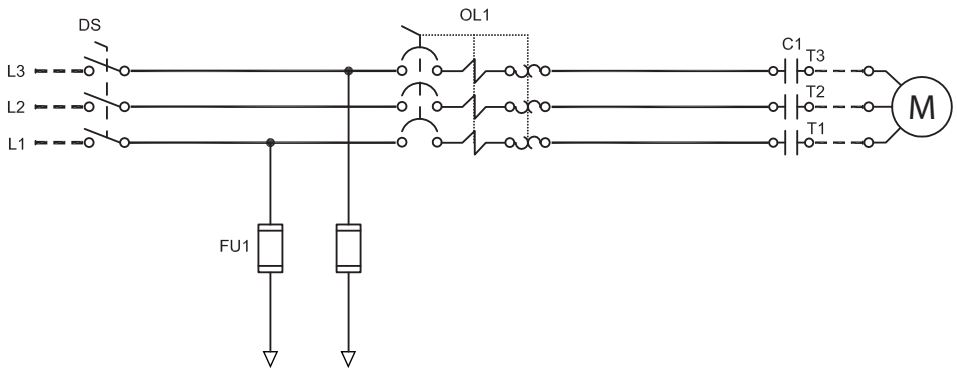
Note: The drawings included in this package are for controllers covered under our standard offering. Actual AS BUILT drawings may differ from what is shown in this package.

c UL us N.Y.C. APPROVED CE OPTIONAL SEISMIC COMPLIANT

March 2020

Technical Data

Model JP3 Jockey Pump Controller



N.Y.C. APPROVED

OPTIONAL

SEISMIC COMPLIANT

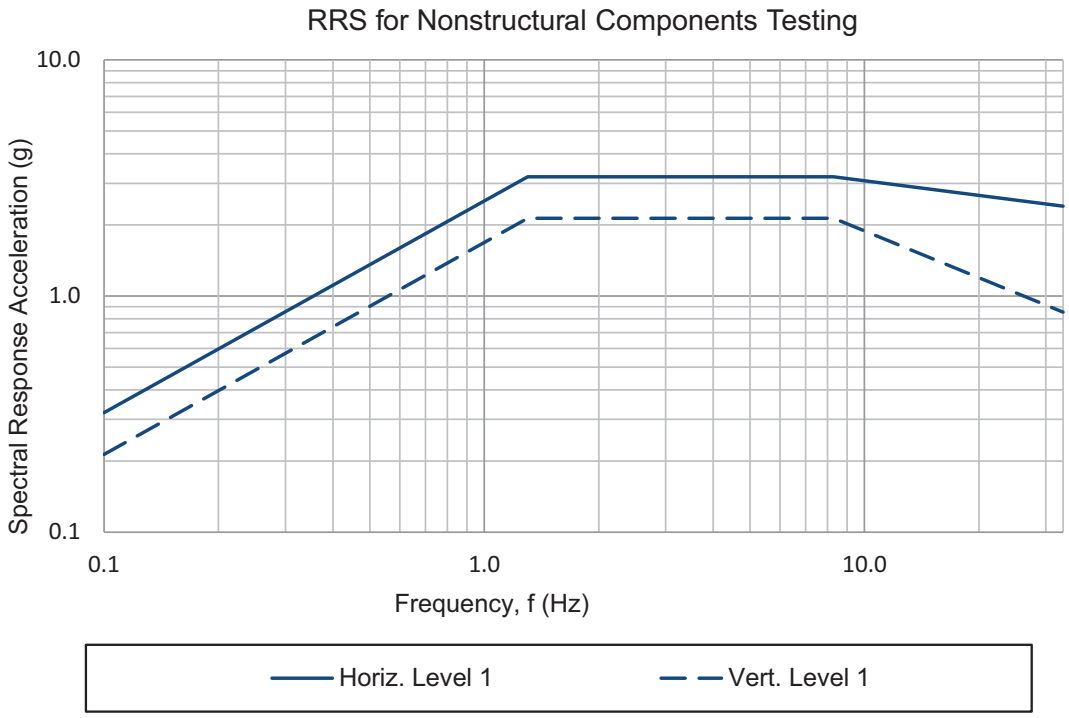
Listing	Underwriters Laboratory (UL)	UL508A - Industrial Pump Controllers
	CSA	CSA C22.2 No. 14 Industrial Control Equipment
	New York City	Accepted for use in the City of New York by the Department of Buildings
	Seismic Certification	See page 4 for details
	Optional	
	☐ CE Mark	Various EN, IEC & CEE directives and standards
Enclosure	**Protection Rating** ☑ Standard: NEMA 2 **Optional** ☐ NEMA 12 ☐ NEMA 3 ☐ NEMA 3R ☐ NEMA 4 ☐ NEMA 4X-304 sst painted ☐ NEMA 4X-304 sst brushed finish ☐ NEMA 4X-316 sst painted ☐ NEMA 4X-316 sst brushed finish	
	Accessories • Wall mounting lugs (x4)	**Paint Specifications** • Red RAL3002 • Powder coating • Glossy textured finish

Fuseless Motor Starter	• Main disconnect – padlockable – rotary type handle – door interlocked • Thermo-magnetic motor protector • Contactor		
Control Circuit	• 24V.AC		
***iPD*+ Operator Interface**	• Solid state controls • All adjustments on door front • Navigation pushbuttons		
Pressure Sensing	• Pressure transducer for fresh water application 316 stainless steel construction • Rated for 0-600psi working pressure • Pressure sensing line connection 1/2” brass Male NPT		

Visual Indications	• Manual motor start/run LED
	• Automatic motor start/run LED
	• Motor overload
	• Pressure reading
	  • Start pressure
	  • Stop pressure
	  • System pressure
	• System pressure diagnostic LED’s
	  • Green: system pressure at or above stop pressure
	  • Yellow: system pressure between start and stop pressure
	  • Red: system pressure at or below start pressure
	• AUTO mode
	• OFF mode		

Timers	• Minimum run timer (off delay) • Delay start timer (on delay) • Visual countdown		
Counters	• Pump start counter • Elapsed timer meter (hours / non-resettable)		
Operators	• OFF-AUTO pushbutton • Start and Stop pushbutton		
Operation	Automatic Start	Start on pressure drop	
	Manual Start	Start pushbutton	
	Stopping	Stop pushbutton	
	Timers	Field adjustable & visual countdown	• Minimum run timer (off delay) • Delay start timer (on delay)

Seismic Certification	Seismic Certification Company	TRU Compliance, LLC A Tobalski Watkins Affiliate						TWEI Project No.: 15014			
	Mounting details	Rigid wall mounting									
	Seismic Information	Building Code	Test Criteria	Seismic Parameters	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
		IBC 2015, CBC 2016	ICC-ES AC156	ASCE 7-10 Chapter 13	2.0	1.0	1.5	3.20	2.40	1.33	0.53
					3.2	0.0	1.5	3.20	1.28	2.13	0.85



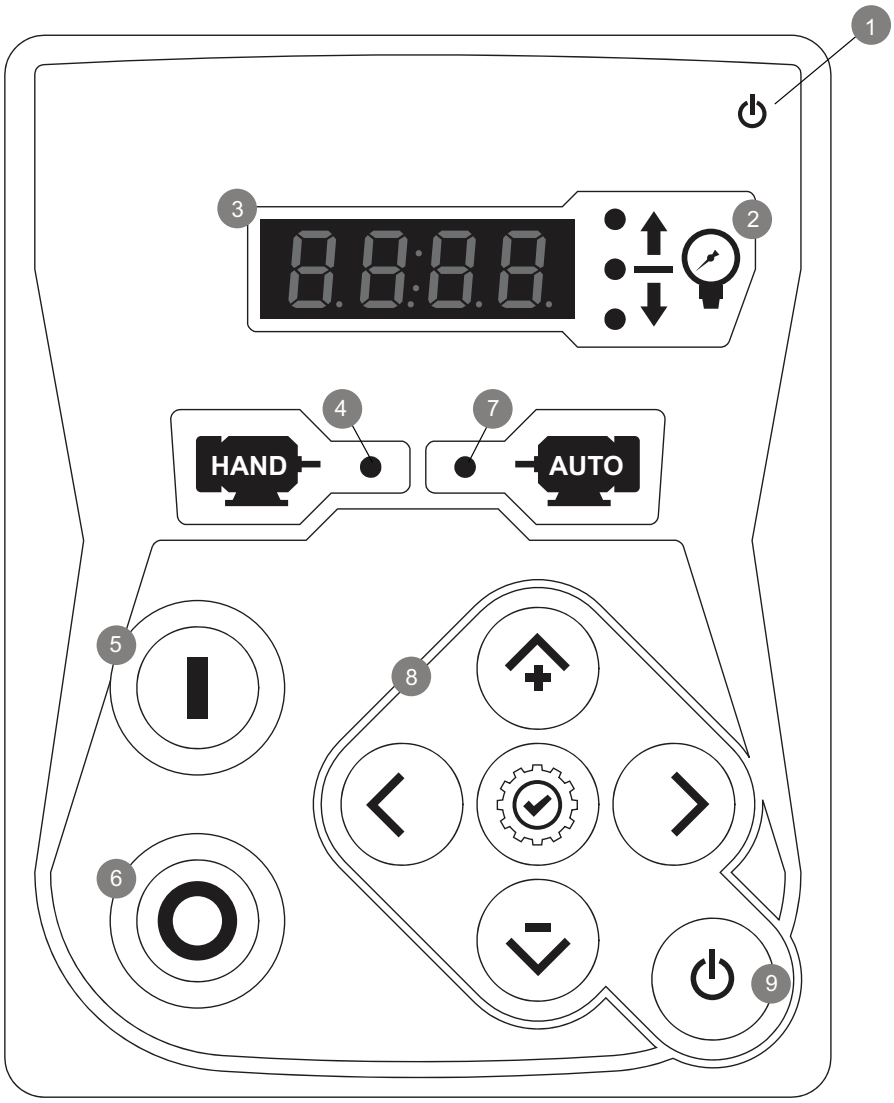
Notes:
• Components are tested in accordance with ICC-ES AC156, IBC 2015 & CBC 2016.
• OSHPD Special Seismic Certification Preapproval (OSP)

☐ A4	Elapsed time meter (time totalizer)
☐ A5	Motor run alarm contact
☐ A6	Loss of power alarm contact
☐ A7	Overload or short circuit alarm contact
☐ D11D	Pressure transducer 0-600psi with ½" MNPT 316 stainless steel bushing
☐ D14	Export packing for 1 controller
☐ D13A	Externally mounted wetted parts
☐ D14	Export packing for 1 controller
☐ D18	Audible alarm
☐ D19	Anti-condensation heater and thermostat
☐ D20	Anti-condensation heater and humidistat
☐ D21	Tropicalization
☐ D22	Phase reversal / failure pilot light and alarm contact
☐ D23	Controller power healthy pilot light and alarm contact
☐ D24	Pump failure via current sensing relay with pilot light and dry alarm contact
☐ D25	Low zone pump control function
☐ D26	Mid zone pump control function
☐ D27	High zone pump control function
☐ D28	Selector switch in auto alarm contacts
☐ D29	Selector switch in off alarm contacts
☐ D30	Motor heater circuit
☐ D32	Service entrance rated - 100kA short circuit withstand rating: • 120V/1ph (0.5hp max.) • 240V/1ph (1hp max.) • 200V-208V - 60hz (2hp max.) • 220V-240V - 60hz (3hp max.) • 380V-416V - 50hz - 60hz (5hp max.) • 440V-480V - 60hz (5hp max.)
☐ D33	Service entrance rated - 65kA short circuit withstand rating: • 120V/1ph (0.5hp max.) • 240V/1ph (1hp max.) • 200V-208V - 60hz (3hp-15hp max.) • 220V-240V - 60hz (5hp-15hp max.) • 380V-416V - 50hz - 60hz (7.5hp - 40hp max.) • 440V-480V - 60hz (7.5hp-40hp max.)
☐ D34	Service entrance rated - 42kA short circuit withstand rating: • 600V - 60hz (7.5hp max.)

☑ L01	Other language and English (bilingual)
☐ L02	French
☐ L03	Spanish
☐ L04	German
☐ L05	Italian
☐ L06	Polish
☐ L07	Romanian
☐ L08	Hungarian
☐ L09	Slovak
☐ L10	Croatian
☐ L11	Czech
☐ L12	Portuguese
☐ L13	Dutch
☐ L14	Russian
☐ L15	Turkish
☐ L16	Swedish
☐ L17	Bulgarian
☐ L18	Thai
☐ L19	Indonesian
☐ L20	Slovenian
☐ L21	Danish
☐ L22	Greek
☐ L23	Arabic
☐ L24	Hebrew
☐ L25	Chinese

Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.

iPD+ Operator Interface



1 - Power on LED
2 - System status LED
3 - Digital display
4 - Hand start LED
5 - START pushbutton
6 - STOP pushbutton
7 - Auto start LED
8 - Navigation keypad
9 - ON - OFF pushbutton

Jockey Pump Controller

Across the Line / 3 Phase

Dimensions

Model:JP3

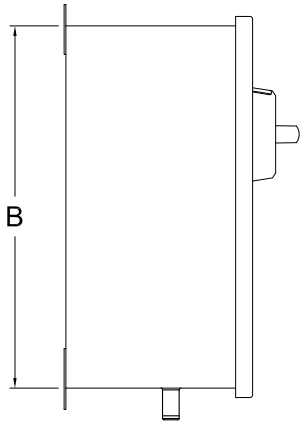
Built to the latest edition of the UL 508A & CSA C22.2 No.14 standard

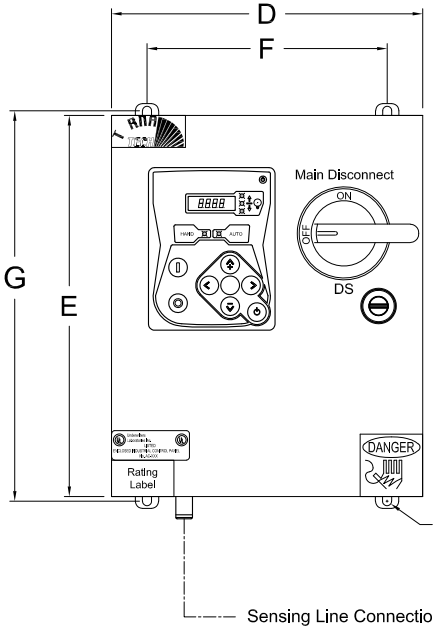
PER QUOTE DRAWING No.

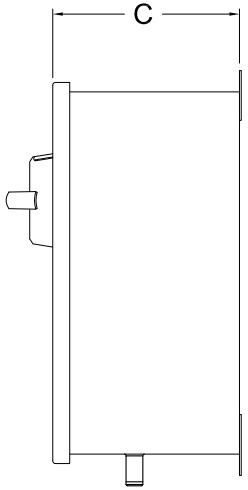
NYC Dpt of Building Approved

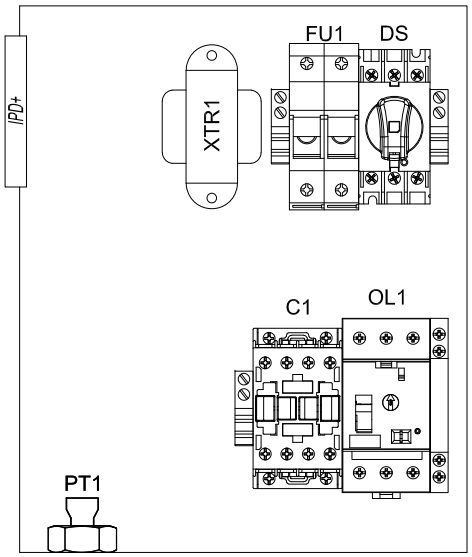
REV.	DESCRIPTION	DD/MM/YY
6	Modified J19 Outputs ID	10/06/16
7	Revised logo	18/06/18
8	Sensing line connection changed	25/03/25

Drawing No. JP3-DI500/E

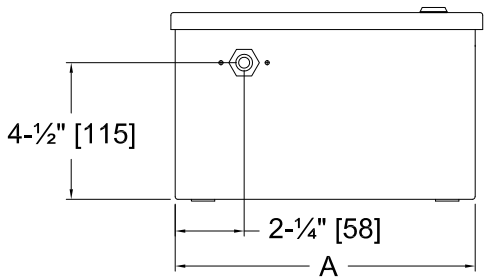








Standard Internal Layout



Dimensions*							
Maximum Motor Horsepower					Enclosure Dimensions	Door Dimensions	Anchor Dimensions
200-208V	220-240V	380-416V	440-480V	575-600V	A X B X C	D X E	F X G
10HP	10HP	15HP	20HP	25HP	10"X12"X6-½"	10-⅝"X12-⅝"	8"X12-¾"
20HP	30HP	40HP	60HP	60HP	16"X16"X7-½"	16-½"X16-½"	14"X16-¾"

Notes:
- Standard NEMA: NEMA 2
- Standard Paint: Textured Red RAL 3002.
- All Dimensions are in Inches [Millimeters]
- Use Watertight Conduit and Connector Only.
- Protect Equipment Against Drilling Chips.
- Door Swing Equal to Door Width

Drawing for information only.

Manufacturer reserves the right to modify this drawing without notice.
Contact manufacturer for "As Built" drawing.
*Dimensions may change depending on option required. Consult Factory for exact dimensions.

Projection

Jockey Pump Controller

Across the Line / 3 Phase

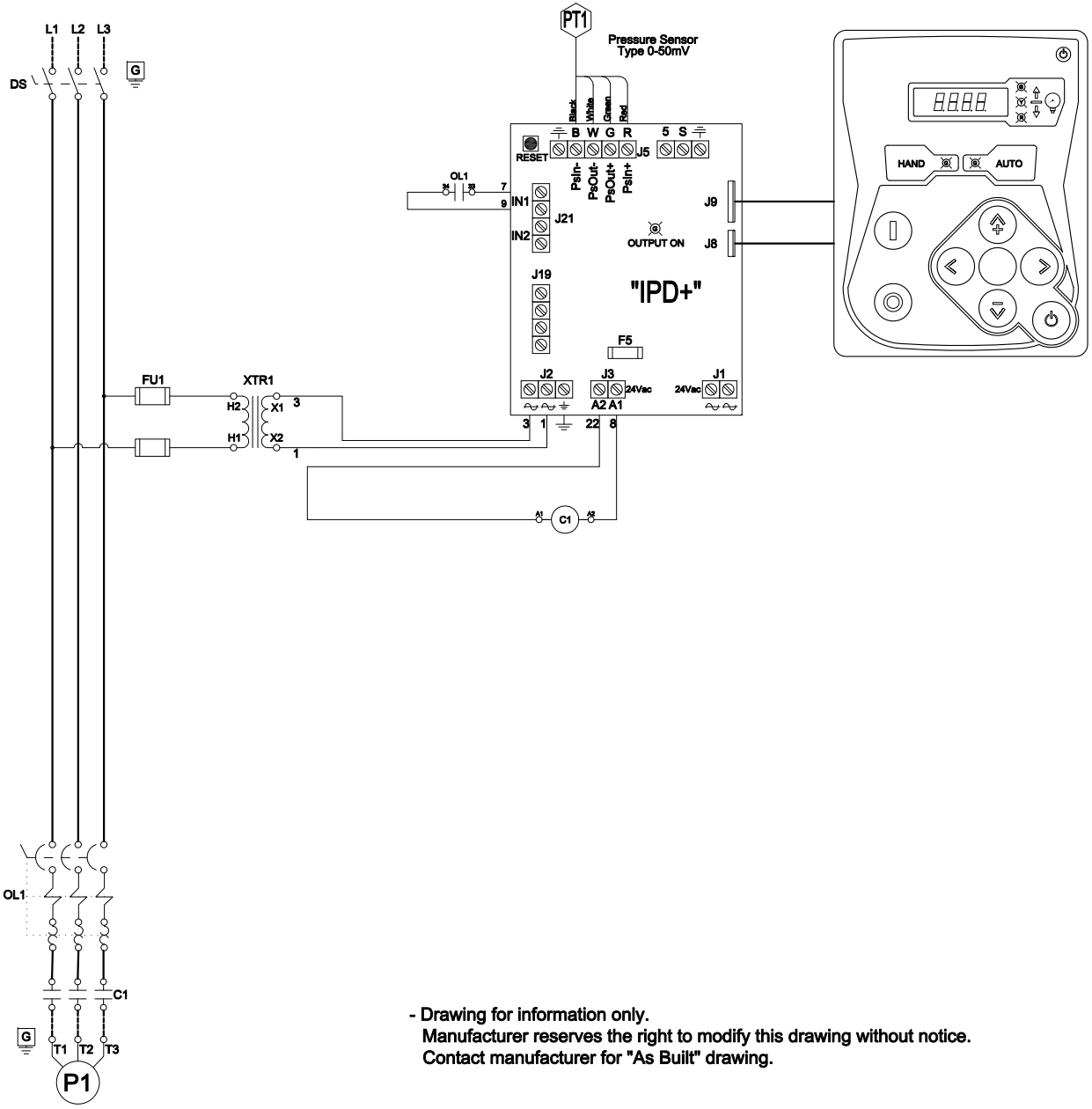
Wiring schematic

Model:JP3

Built to the latest edition of the UL 508A & CSA C22.2 No.14 standard

PER QUOTE DRAWING No.		
REV.	DESCRIPTION	DD/MM/YY
5	Modified Tornatech & Seismic Logo	14/04/16
6	Modified J19 Outputs ID	10/06/16
7	Revised logo	18/06/18

Drawing No. JP3-WS500/E



- Drawing for information only.
  Manufacturer reserves the right to modify this drawing without notice.
  Contact manufacturer for "As Built" drawing.

Jockey Pump Controller

Across the Line / 3 Phase

Line and Motor Terminal Size

Model:JP3

Built to the latest edition of the UL 508A & CSA C22.2 No.14 standard

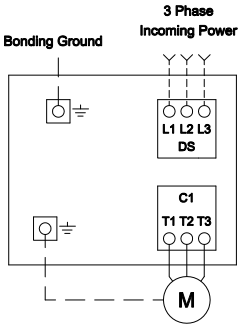
PER QUOTE DRAWING No.

SEISMIC CERT COMPLIANT | NYC Dpt of Building Approved

REV.	DESCRIPTION	DD/MM/YY
5	Modified Tornatech & Seismic Logo	14/04/16
6	Modified J19 Outputs ID	10/06/16
7	Revised logo	18/06/18

Drawing No. JP3-TD500/E

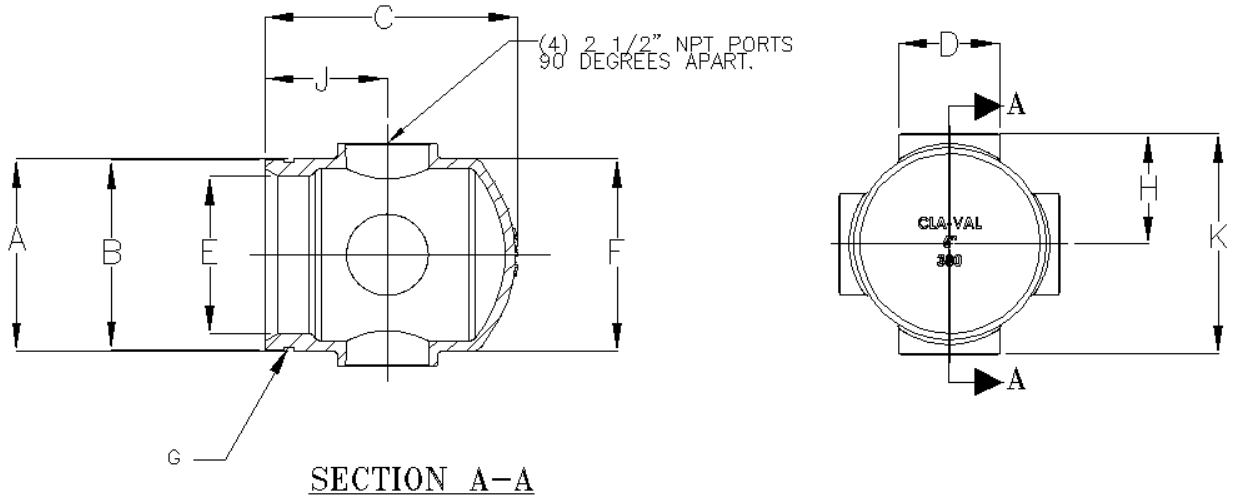
Power Connections and Motor Connections



Line Terminals (L1,L2,L3,GND)							
Maximum Motor Horsepower					Wire Size Copper Only	Torque	Wire Size Ground Copper Only
200-208V	220-240V	380-416V	440-480V	575-600V			
10HP	10HP	20HP	20HP	25HP	#14 AWG - #6 AWG	2 Nm	#14 AWG - #2 AWG
20HP	30HP	40HP	60HP	60HP	#12 AWG - #1 AWG	6 Nm	#6 AWG - #2 AWG

Motor Terminals (T1,T2,T3,GND)							
Maximum Motor Horsepower					Wire Size Copper Only	Torque	Wire Size Ground Copper Only
200-208V	220-240V	380-416V	440-480V	575-600V			
5HP	7.5HP	10HP	15HP	20HP	#14 AWG - #10 AWG	1.8 Nm	#14 AWG - #2 AWG
10HP	10HP	15HP	20HP	25HP	#14 AWG - #6 AWG	2.5 Nm	#12 AWG - #2 AWG
15HP	20HP	30HP	50HP	50HP	#10 AWG - #3 AWG	5 Nm	#12 AWG - #2 AWG
20HP	30HP	40HP	60HP	60HP	#10 AWG - #2 AWG	11.3 Nm	#12 AWG - #2 AWG

General Arrangement



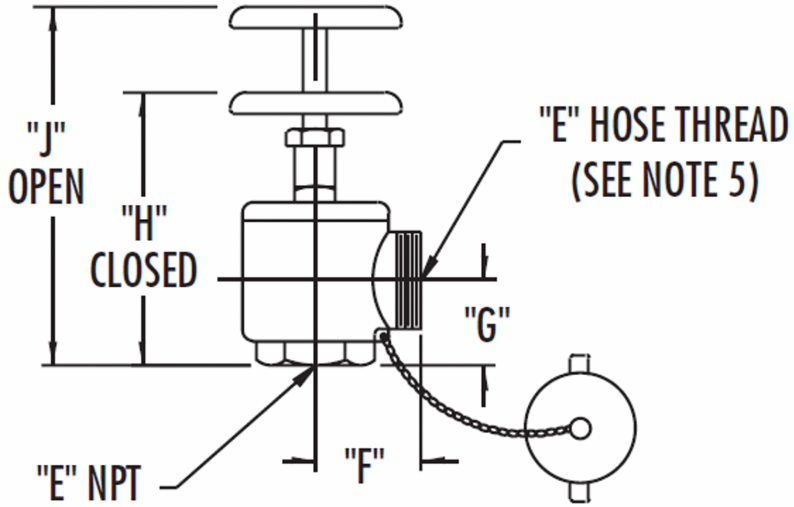
Model	A	B	C	D	E	F	G	H	J
6" X 4 TAPS	6.75	6.64	8.80	3.50	5.50	6.75	6" Grooved Connection	3.88	4.25

NOTES:

1. Dimensions are in inches (mm) and may vary ±1/4 (6).
2. Dimensions are for reference only and are for identification purposes.
3. Drawing depicits purchased OEM CLA-VAL test header p/n 21120301h, size 6", gpm 750 - 1000, four ports, 2 1/2 npt port size, and grooved 300# flange.

Quote Information			
Customer	THE BROWN COMPANY INC		
Customer Quote	0		
Job Name	College of the Sequoias		
Market	-		
PENTAIR		Quote Item	001
		Quote Date	02 May 2022

General Arrangement



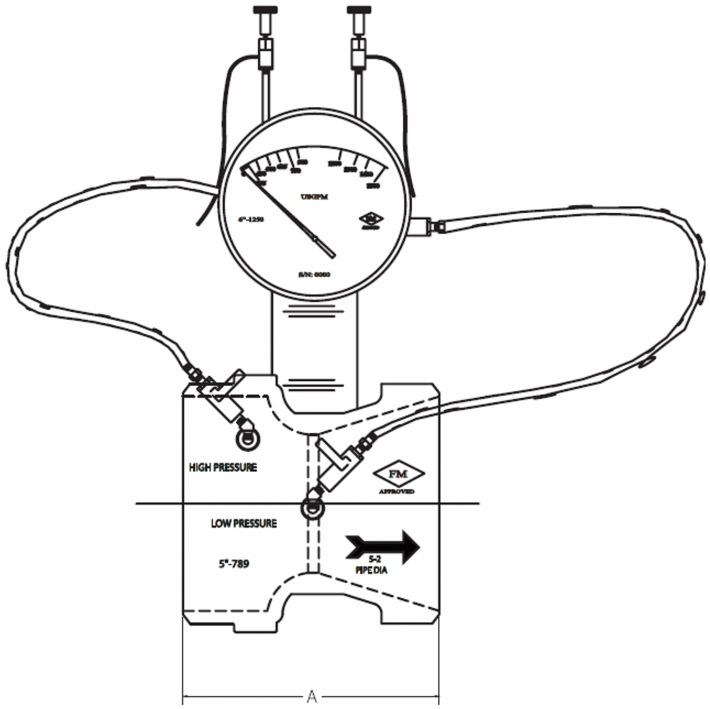
E	F	G	H	J
2.50	3.50	2.75	9.50	11.00

NOTES:

1. Dimensions are in inches (mm) and may vary ±1/4 (6).
2. Components shown are shipped loose for field installation and assembly.
3. Manifold supply size “A” and the number of hose valves (“B”) meets or exceeds the minimums specified by N.F.P.A. 20 for the pump ratings indicated.
4. Manifolds for 3000 through 5000 GPM ratings consist of multiple sections and may require support (by others).
5. 1-1/2” Hose valves furnished with 1-1/2” National Standard Fire Hose Thread: 1.9900 (50.55) O.D. (max.) , 6 threads per inch. 2-1/2” Hose valves are furnished with 2-1/2” National Standard Fire Hose Thread: 3.0686 (77.94) O.D. (max.), 7-1/2 threads per inch. Refer to factory for other thread conventions or adaptors.

Quote Information			
Customer	THE BROWN COMPANY INC		
Customer Quote	0		
Job Name	College of the Sequoias		
Market	-		
PENTAIR		Quote Item	001
		Quote Date	02 May 2022

General Arrangement

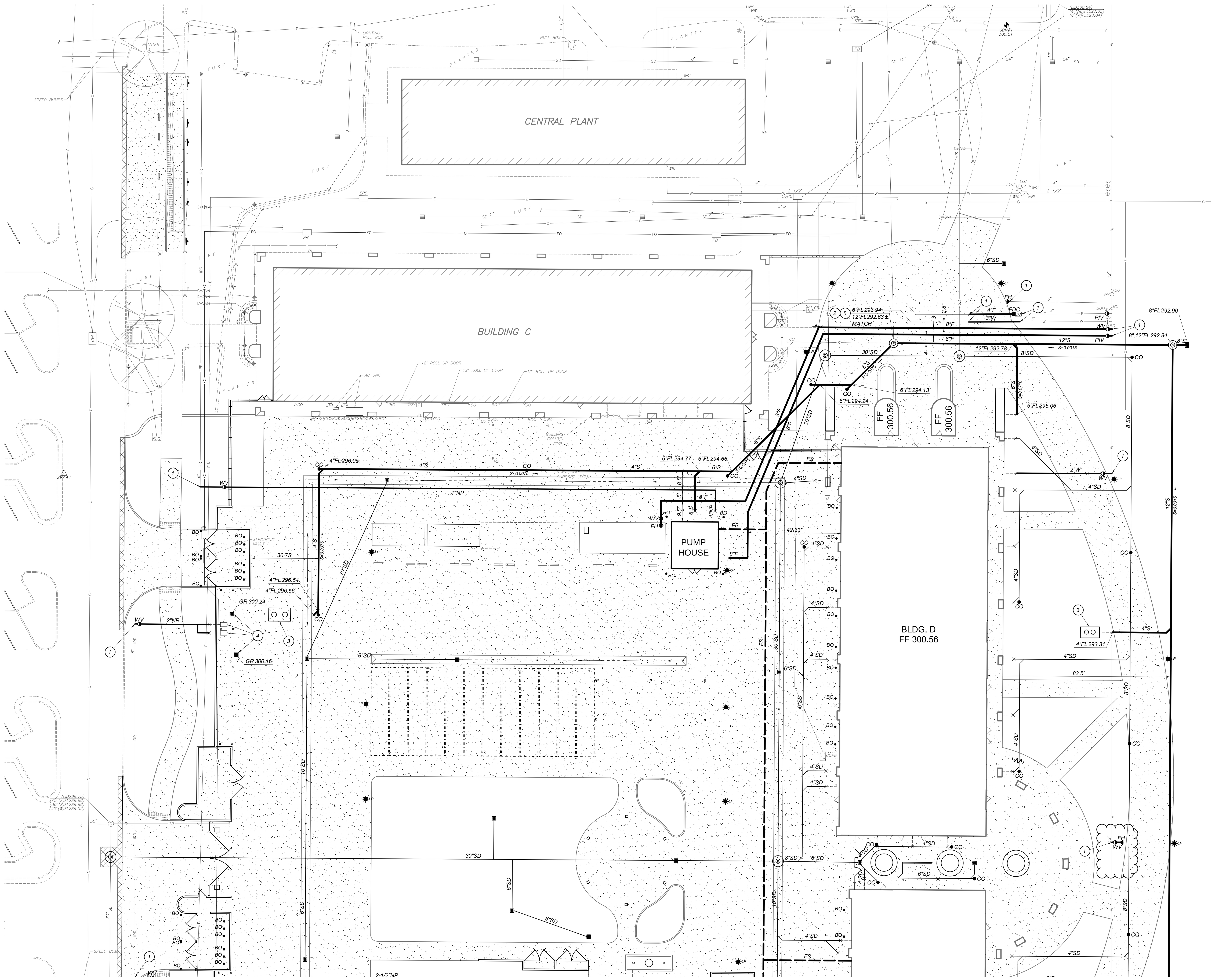


NOMINAL FLOW RATE G.P.M	PIPE SIZE	A
1,000	6.00	7.00

NOTES:

1. ACCURACY IS APPROXIMATELY 2%.
2. FLOWMETER IS GLOBAL VISION INCORPORATED VENTURI TYPE RATED FOR 500 PSI WITH BUTT-WELD, GROOVED, OR CLASS 300 FLANGED CONNECTIONS AND FOR 275 PSI WITH CLASS 150 FLANGED CONNECTIONS.
3. PROPER OPERATION REQUIRES THAT MINIMUM DISTANCES OF STRAIGHT PIPE RUNS BE MAINTAINED BOTH UPSTREAM AND DOWNSTREAM FROM FLOWMETER. REFER TO MANUFACTURER'S INSTRUCTIONS BEFORE ATTEMPTING INSTALLATION.
4. METER RANGE IN 50% TO 200% OF NOMINAL FLOW. DIAL IS DIRECT READING IN G.P.M.AND L.P.M. FOR THE SPECIFIED RANGE.
5. PART NUMBER INCLUDES COMPLETE ASSEMBLY OF VENTURI, 4" DIAMETER DIAL AND INTERCONNECTING HOSES.
6. EACH ASSEMBLY TO BE INDIVIDUALLY BOXED, WITH THE AURORA PART NO. CLEARLY MARKED ON THE OUTSIDE OF THE BOX.

Quote Information			
Customer	THE BROWN COMPANY INC		
Customer Quote	0		
Job Name	College of the Sequoias		
Market	-		
PENTAIR		Quote Item	001
		Quote Date	02 May 2022



SEE SHEET C602

UTILITY LEGEND:

Symbol	Description
6"S	SEWER MAIN, SIZE AS NOTED ON PLANS. PIPE BEDDING AND BACKFILL PER DETAIL [C/X102]
6"W	WATER MAIN, SIZE AS NOTED ON PLANS, MIN. 30" COVER. THRUST BLOCKS PER DETAIL [D/X102]. PIPE BEDDING AND BACKFILL PER DETAIL [C/X102]
2"NP	NON-POTABLE WATER MAIN, SIZE AS NOTED ON PLANS, MIN. 30" COVER. THRUST BLOCKS PER DETAIL [D/X102]. PIPE BEDDING AND BACKFILL PER DETAIL [C/X102]
FS	FIRE SPRINKLER LATERAL, SEE FIRE PROTECTION PLANS
8"F	FIRE MAIN, SIZE AS NOTED ON PLANS, MIN. 42" COVER. THRUST BLOCKS PER DETAIL [D/X102]. PIPE BEDDING AND BACKFILL PER [C/X102]
6"SD	STORM DRAIN PIPE, SEE GRADING PLAN
FF	FINISHED FLOOR
FL	FLOWLINE
●CO	SEWER CLEANOUT PER DETAIL [H/X102]
DC	DOUBLE CHECK DETECTOR ASSEMBLY PER CITY STD 6411 SEE DETAIL [B/X103]
FDC	FIRE DEPARTMENT CONNECTION PER CITY STD 6411 SEE DETAIL [B/X103]
PIV	POST INDICATOR VALVE PER [D/X102]
FH	FIRE HYDRANT ASSEMBLY PER CITY STD 6315 SEE DETAIL [A/X103]
WV	WATER VALVE PER [J/X102]
(S)	SEWER MANHOLE PER DETAIL [E/X102]
E—	CAP OR PLUG END OF UTILITY LINE
×--	POINT OF CONNECTION TO PROPOSED UTILITY, COORDINATE WITH PLUMBING PLANS PRIOR TO CONNECTION.
S=0.0020→	FLOWLINE SLOPE AND DIRECTION OF FLOW
(1)	CONNECT TO EXISTING WATER LINE WITH WATER- TIGHT CONNECTION. VERIFY SIZE, DEPTH, AND LOCATION.
(2)	CONNECT TO EXISTING SEWER LINE WITH WATER-TIGHT CONNECTION. VERIFY SIZE, DEPTH, AND LOCATION.
(3)	SAND/OIL SEPARATOR, SEE PLUMBING PLANS
(4)	PRESSURE WASHER AND DRAIN INLET, SEE PLUMBING PLANS
(5)	MANHOLE DROP DOWN CONNECTION PER DETAIL [F/X103]

GENERAL SITE UTILITY NOTES:

1. AS FIRST ORDER OF WORK, CONTRACTOR SHALL POTHOLE EXISTING UTILITIES AND NOTIFY ENGINEER IMMEDIATELY OF LOCATIONS, SIZE AND DEPTH.
2. THE CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION, SIZE, DEPTH, AND TYPE OF ALL EXISTING UTILITIES AND INTERFERENCES SITUATED ALONG THE ROUTE OF THE PROPOSED CONSTRUCTION PRIOR TO COMMENCEMENT OF EXCAVATION, FABRICATION, AND INSTALLATION. THE CONTRACTOR SHALL CONSTRUCT ALL IMPROVEMENTS IN SUCH A MANNER AS WILL PROTECT ALL EXISTING UNDERGROUND UTILITIES AND, IN THE EVENT OF ANY CONFLICTS, SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING.
3. SEE IRRIGATION PLANS FOR PROPOSED IRRIGATION PIPE ALIGNMENT.
4. COORDINATE EXACT POINTS OF CONNECTION TO BUILDING PLUMBING AND NOTIFY THE ENGINEER OF ANY CONFLICT SO THAT ADJUSTMENTS CAN BE MADE IF NEEDED.
5. SAWCUT EXISTING CONCRETE IMPROVEMENTS AS NECESSARY TO INSTALL NEW WATER OR SEWER IMPROVEMENTS. CONSTRUCT NEW CONCRETE IMPROVEMENTS TO MATCH ADJACENT CONCRETE IMPROVEMENTS AND JOIN TOGETHER WITH DOWEL BARS PER DETAIL [F/X101]
6. INSTALLATION, TYPE, AND MANUFACTURER'S MODELS OF DOMESTIC WATER METERS, DRAIN INLETS/OUTLETS AND OTHER APPURTENANCES OF SITE UTILITY SYSTEMS SHALL BE DONE IN STRICT ACCORDANCE WITH GOVERNING AUTHORITY REQUIREMENTS.
7. LAYOUT OF MATERIALS, EQUIPMENT AND SYSTEMS IS GENERALLY DIAGRAMMATIC UNLESS SPECIFICALLY DIMENSIONED. SOME WORK MAY BE SHOWN OFFSET FOR CLARITY. THE ACTUAL LOCATIONS OF ALL MATERIALS, PIPING, FIXTURES, EQUIPMENT, SUPPORTS, ETC., SHALL BE CAREFULLY PLANNED PRIOR TO INSTALLATION OF ANY WORK TO AVOID ALL INTERFERENCES WITH EACH OTHER OR WITH STRUCTURAL, ELECTRICAL, PLUMBING AND MECHANICAL, ARCHITECTURAL OR ANY OTHER ELEMENTS. ALL CONFLICTS SHALL BE CALLED TO THE ATTENTION OF THE ARCHITECT AND THE ENGINEER PRIOR TO THE INSTALLATION OF ANY WORK OR THE ORDERING OF ANY EQUIPMENT.
8. ANY INSPECTION TO BE MADE BY THE AUTHORITY HAVING JURISDICTION SHALL REQUIRE A MINIMUM OF 24 HOUR NOTICE.
9. PURITY TESTS ARE REQUIRED ON ALL WATER SYSTEM INSTALLATIONS. CONTRACTOR TO COORDINATE WITH THE AUTHORITY HAVING JURISDICTION.
10. IF THE TOP OF THE STEM OF ANY WATER GATE VALVE IS DEEPER THAN 4' BELOW FINISHED PAVEMENT GRADE, THE CONTRACTOR SHALL INSTALL A STEM EXTENSION SO THAT THE TOP OF THE STEM, WITH EXTENSION, SHALL BE NO DEEPER THAN 4' NOR SHALLOWER THAN 2' FROM FINISHED GRADE.
11. BACKFILL UTILITY TRENCHES PER DETAIL [C/X102]
12. ADJUST EXISTING UTILITY LIDS TO FINISHED GRADE PER UTILITY COMPANY STANDARDS AND DETAIL [B/X102] AND INSTALL TRAFFIC RATED LIDS WHERE LOCATED IN A TRAFFIC AREA.

SCALE: 1"=20'

0 5 20 40
SCALE IN FEET

Know what's **below.**
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Blair, Church & Flynn
CONSULTING ENGINEERS
451 Clovis Avenue, Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

MARK	DATE	DESCRIPTION
2	12-13-2022	ADDENDUM 2
	11/1/2022	DSA BACKCHECK

REGISTERED PROFESSIONAL ENGINEER — LANE R. BADER — No. 47083 — CIVIL — STATE OF CALIFORNIA
11/1/2022
Date Signed

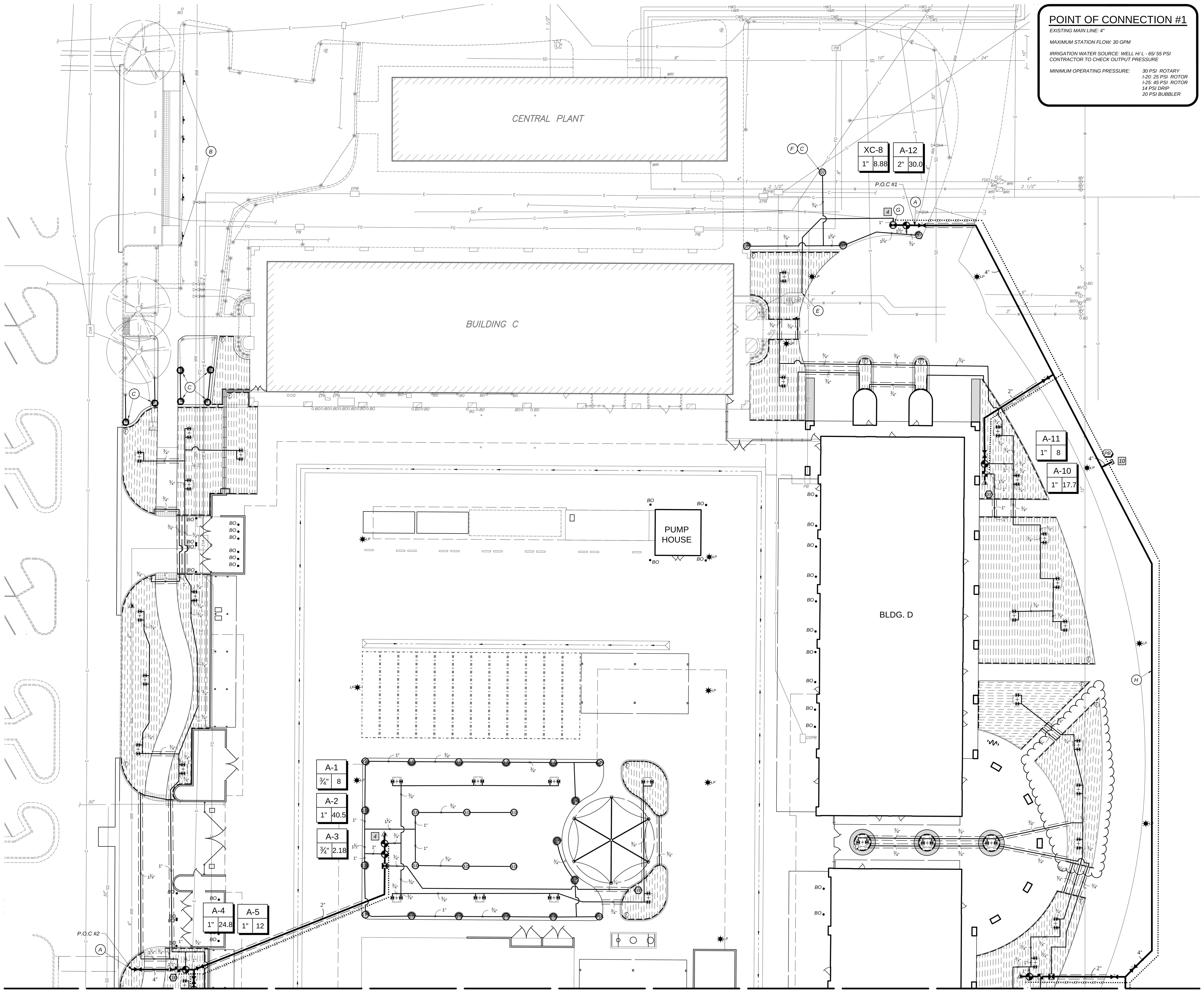
TETER, LLP
FRESNO HEADQUARTERS
VISALIA | BAKERSFIELD | MODESTO | SAN LUIS OBISPO
ARCHITECTS ENGINEERS CONNECTED

TULARE CAMPUS CTE
COLLEGE OF THE SEQUOIAS
4999 E. BARDSLEY AVE.
TULARE, CA

DRAWING TITLE
PARTIAL UTILITY PLAN

PROJECT NO.
20-12032

DRAWING
C601



SEE SHEET L102

POINT OF CONNECTION #1

EXISTING MAIN LINE: 4"

MAXIMUM STATION FLOW: 30 GPM

IRRIGATION WATER SOURCE: WELL H/ L - 65/ 55 PSI
CONTRACTOR TO CHECK OUTPUT PRESSURE

MINIMUM OPERATING PRESSURE: 30 PSI ROTARY; I-20: 25 PSI ROTOR; I-25: 45 PSI ROTOR; 14 PSI DRIP; 20 PSI BUBBLER

POINT OF CONNECTION #2

EXISTING MAIN LINE: 6"

MAXIMUM STATION FLOW: 40.5 GPM

IRRIGATION WATER SOURCE: WELL H/ L - 65/ 55 PSI
CONTRACTOR TO CHECK OUTPUT PRESSURE

MINIMUM OPERATING PRESSURE: 30 PSI ROTARY; I-20: 25 PSI ROTOR; I-25: 45 PSI ROTOR; 14 PSI DRIP; 20 PSI BUBBLER

IRRIGATION LEGEND

NOTE: FLOW FOR AN ADJUSTABLE ARC NOZZLE IS BASED ON A HALF CIRCLE ARC

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	ARC	PSI	GPM	RADIUS	DETAIL
	EXISTING RELOCATED MP ROTATOR K HUNTER MP2000 PROS-06-PRS40-CV	90-210	40	0.77	19'	K/L103
	TREE BUBBLER HUNTER PROS-00-PCN-50	360	30	0.5		A/L104

SYMBOL	MANUFACTURER/MODEL	PSI	GPM	RADIUS	DETAIL
0.75	HUNTER I-20-04-SS-PRB-SR 0.75	50	0.75	25'	K/L103
1.5	HUNTER I-20-04-SS-PRB-SR 1.5	50	1.5	25'	K/L103
3.0	HUNTER I-20-04-SS-PRB-SR 3.0	50	3	25'	K/L103
07	HUNTER I-25-04-SS 07	60	7.5	48'	K/L103

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	DETAIL
	DRIP CONTROL KIT IRRITROL 700DK-1-MF	B/L104
	DRIP CONTROL KIT-LOW FLOW IRRITROL 700DK-075-LF	B/L104
F	FLUSH VALVE ASSEMBLY	E/L104
OP	DRIP OPERATION INDICATOR HUNTER ECO-ID	F/L104
	AREA TO RECEIVE DRIPLINE NETAFIM TLCV-04-18 TECHLINE PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH CHECK VALVE. 0.4 GPH EMITTERS AT 18" O.C. DRIPLINE LATERALS SPACED AT 18" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. MINIMUM 3" COVER	C/L104

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	DETAIL
	EXISTING REMOTE CONTROL VALVE	/
	REMOTE CONTROL VALVE IRRITROL 100	I/L103
	QUICK COUPLER VALVE HUNTER-44RC WITH HK44 KEY AND HS2 HOSE SWIVEL	H/L103
	GATE VALVE LARGE LEEMCO LMV-BB PUSH-ON BELL ENDS, OR EQUAL (LARGE)	G/L103
	GATE VALVE SMALL NIBCO T-113-K, OR EQUAL(SMALL PIPE SIZE)	G/L103
CA	CONTROLLER HUNTER A2C-1200 WITH TWO, A2M-600 EXPANSION MODULES (24 TOTAL STATIONS). ACC-PED POWDER COATED PEDESTAL	J/L103
RS	WIRELESS RAIN/FREEZE SENSOR HUNTER WIRELESS SOLAR-SYNC, RAIN/FREEZE SENSOR (WSS-SEN). MOUNT ON WALL FASCIA/CAP OVER PLANTING BED	L/L103
	PERMANENT CAP WITH THRUST BLOCK	B/L103
PB	PULL BOX	M/L103
	IRRIGATION LATERAL LINE: PVC SCHEDULE 40, BELL END, SOLVENT WELD - SIZE AS NOTED	C/L103
	IRRIGATION MAINLINE: PVC CLASS 200 GASKETED - SIZE AS NOTED	A/L103
	PIPE SLEEVE: PVC SCHEDULE 40 TWICE PIPE SIZE	D/L103
# / #" #	VALVE NUMBER / VALVE FLOW (GPM) / VALVE SIZE	
	CONTROL WIRE SLEEVE	D/L103
	DRIPLINE MANIFOLD: PVC SCHEDULE 40	D/L104
	CONTROL WIRE PLUS ONE (1) COMMON WIRE	E/L103
#	NUMBER OF SPARE CONTROL WIRE PLUS ONE (1) SPARE COMMON WIRE. PROVIDE A 10 FOOT LOOP IN VALVE BOX	
	PROPOSED TREE, SEE PLANTING PLAN ON SHEET L201 FOR VARIETY AND SIZE	
A	CONNECT NEW MAIN LINE TO EXISTING MAIN LINE	
B	PROTECT HEADS FROM HARDSCAPE IMPROVEMENTS.	
C	EXISTING RELOCATED MP ROTATOR (SEE DEMOLITION PLAN - SHEET - C201). ADJUST HEADS/NOZZLES FOR NEW IMPROVEMENTS. SEE GENERAL IRRIGATION NOTE #17	
E	CONNECT NEW LATERAL LINE TO EXISTING LATERAL LINE	
F	CONNECT EXISTING SPRINKLER ON NEW LATERAL LINE	
G	CONNECT EXISTING RELOCATED VALVE SCHEDULED TO REMAIN OPERATIONAL TO NEW MAIN LINE.	
H	PIPING SHOWN OUTSIDE OF PLANTING BED FOR CLARITY. INSTALL WITHIN PLANTING BED	

WATER CONSERVATION COMPLIANCE STATEMENT:

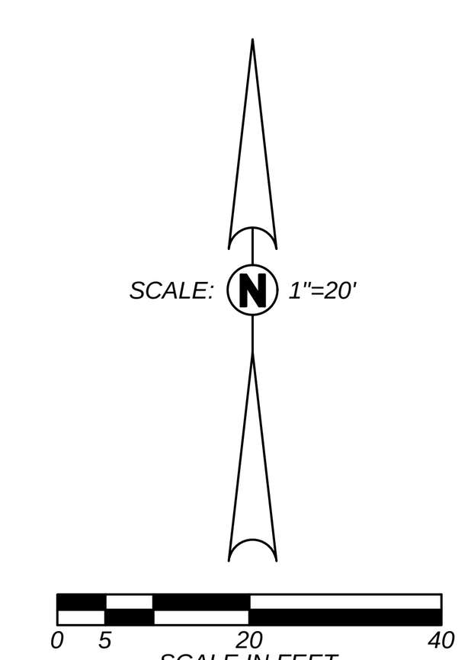
I HAVE COMPLIED WITH THE CRITERIA OF THE LANDSCAPE WATER CONSERVATION ORDINANCE AND GUIDELINES, AND HAVE APPLIED THEM FOR THE EFFICIENT USE OF WATER IN THE IRRIGATION DESIGN PLAN.

DAVID W. BRILEY, RLA 2787

IRRIGATION SYSTEM OBSERVATION LOG

ITEM NO.	WORK ITEM DESCRIPTION	REVIEWED & ACCEPTED BY OWNER'S REP OR LAND ARCH		DATE
		PRINT NAME	SIGNATURE	
IR-1	EXISTING SYSTEM OPERATION & PRESSURE CHECK			
IR-2	PIPING/WIRE SLEEVES UNDER PAVEMENT			
IR-3	MAIN LINE INSTALLATION & PRESSURE TEST			
IR-4	VALVE INSTALLATIONS			
IR-5	IRRIGATION COVERAGE PRIOR TO PLANTING			
IR-6	CONTROL EQUIPMENT INSTALLATION			
IR-7	BOOSTER PUMP INSTALLATION & START-UP (MANUF.)	N/A	N/A	
IR-8	FINAL SYSTEM OPERATION REVIEW			

NOTE: THE ORIGINAL VERSION OF THIS LOG SHALL BE MAINTAINED ON THE AS-BUILT RECORD DRAWING SET.
WORK ITEMS MAY NOT BE REVIEWED IF PRIOR WORK ITEMS HAVE NOT BEEN ACCEPTED.



SEE SHEET L102 FOR IRRIGATION PLAN AND NOTES AND L103 AND L104 FOR DETAILS

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Blair, Church & Flynn CONSULTING ENGINEERS
451 Clovis Avenue, Suite 200, Clovis, California 93612
Tel (559) 326-1400 Fax (559) 326-1500

TETER, LLP
FRESNO HEADQUARTERS
VISALIA | BAKERSFIELD | MODESTO | SAN LUIS OBISPO
ARCHITECTS ENGINEERS CONNECTED

MARK	DATE	DESCRIPTION
2	12-13-2022	ADDENDUM 2
	11/1/2022	DSA BACKCHECK

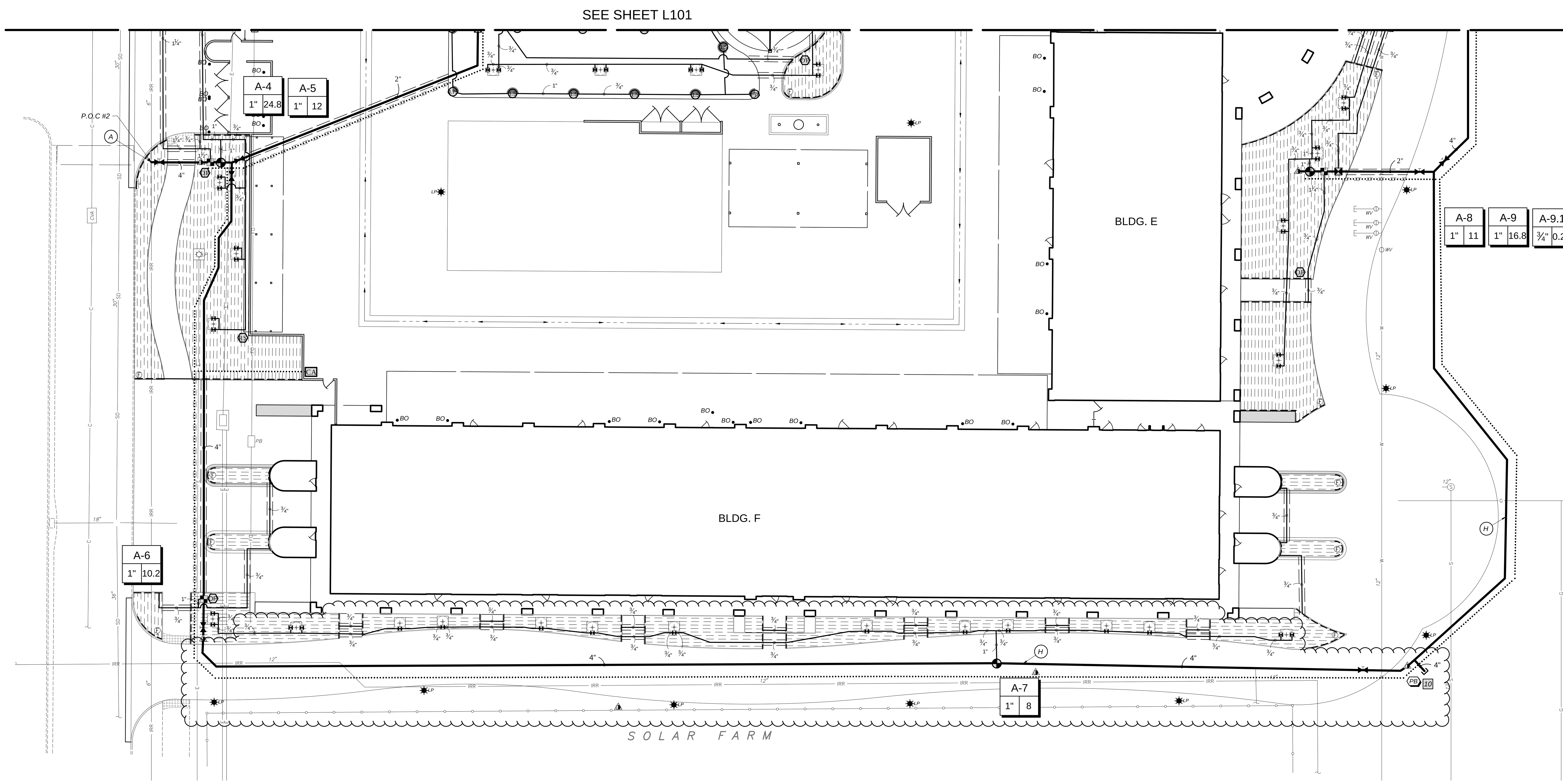
TULARE CAMPUS CTE
COLLEGE OF THE SEQUOIAS
4999 E. BARDSLEY AVE.
TULARE, CA

DRAWING TITLE: IRRIGATION PLAN

PROJECT NO. 20-12032

DRAWING L101

SEE SHEET L101



IRRIGATION LEGEND

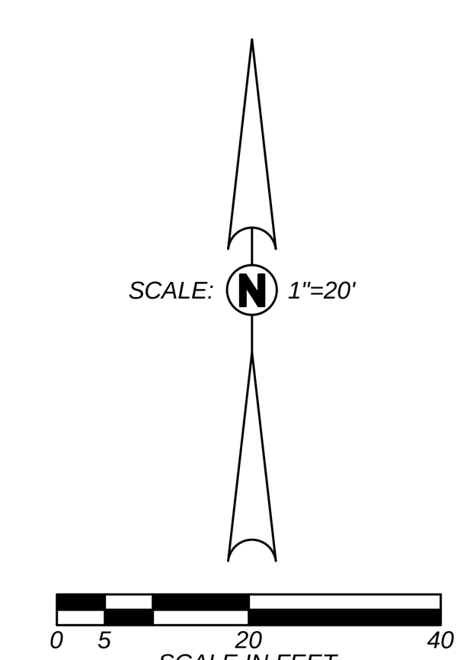
NOTE: FLOW FOR AN ADJUSTABLE ARC NOZZLE IS BASED ON A HALF CIRCLE ARC

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	ARC	PSI	GPM	RADIUS	DETAIL
	EXISTING RELOCATED MP ROTATOR K HUNTER MP2000 PROS-06-PRS40-CV	90-210	40	0.77	19'	K/L103
	TREE BUBBLER HUNTER PROS-00-PCN-50	360	30	0.5		A/L104

SYMBOL	MANUFACTURER/MODEL	PSI	GPM	RADIUS	DETAIL
0.75	HUNTER I-20-04-SS-PRB-SR 0.75	50	0.75	25'	K/L103
1.5	HUNTER I-20-04-SS-PRB-SR 1.5	50	1.5	25'	K/L103
3.0	HUNTER I-20-04-SS-PRB-SR 3.0	50	3	25'	K/L103
07	HUNTER I-25-04-SS 07	60	7.5	48'	K/L103

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	DETAIL
	DRIP CONTROL KIT IRRITROL 700DK-1-MF	B/L104
	DRIP CONTROL KIT-LOW FLOW IRRITROL 700DK-075-LF	B/L104
F	FLUSH VALVE ASSEMBLY	E/L104
OP	DRIP OPERATION INDICATOR HUNTER ECO-ID	F/L104
	AREA TO RECEIVE DRIPLINE NETAFIM TLCV-04-18 TECHLINE PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH CHECK VALVE. 0.4 GPH EMITTERS AT 18" O.C. DRIPLINE LATERALS SPACED AT 18" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. MINIMUM 3" COVER	C/L104

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	DETAIL
	EXISTING REMOTE CONTROL VALVE	/
	REMOTE CONTROL VALVE IRRITROL 100	I/L103
	QUICK COUPLER VALVE HUNTER-44RC WITH HK44 KEY AND HS2 HOSE SWIVEL	H/L103
	GATE VALVE LARGE LEEMCO LMV-BB PUSH-ON BELL ENDS, OR EQUAL (LARGE)	G/L103
	GATE VALVE SMALL NIBCO T-113-K, OR EQUAL(SMALL PIPE SIZE)	G/L103
CA	CONTROLLER HUNTER A2C-1200 WITH TWO, A2M-600 EXPANSION MODULES (24 TOTAL STATIONS). ACC-PED POWDER COATED PEDESTAL	J/L103
RS	WIRELESS RAIN/FREEZE SENSOR HUNTER WIRELESS SOLAR-SYNC, RAIN/FREEZE SENSOR (WSS-SEN). MOUNT ON WALL FASCIA/CAP OVER PLANTING BED	L/L103
	PERMANENT CAP WITH THRUST BLOCK	B/L103
PB	PULL BOX	M/L103
	IRRIGATION LATERAL LINE: PVC SCHEDULE 40, BELL END, SOLVENT WELD - SIZE AS NOTED	C/L103
	IRRIGATION MAINLINE: PVC CLASS 200 GASKETED - SIZE AS NOTED	A/L103
	PIPE SLEEVE: PVC SCHEDULE 40 TWICE PIPE SIZE	D/L103
# / #" / #	VALVE NUMBER VALVE FLOW (GPM) VALVE SIZE	
	CONTROL WIRE SLEEVE	D/L103
	DRIPLINE MANIFOLD: PVC SCHEDULE 40	D/L104
	CONTROL WIRE PLUS ONE (1) COMMON WIRE	E/L103
#	NUMBER OF SPARE CONTROL WIRE PLUS ONE (1) SPARE COMMON WIRE. PROVIDE A 10 FOOT LOOP IN VALVE BOX	
	PROPOSED TREE, SEE PLANTING PLAN ON SHEET L201 FOR VARIETY AND SIZE	
A	CONNECT NEW MAIN LINE TO EXISTING MAIN LINE	
B	PROTECT HEADS FROM HARDSCAPE IMPROVEMENTS.	
C	EXISTING RELOCATED MP ROTATOR (SEE DEMOLITION PLAN - SHEET - C201). ADJUST HEADS/NOZZLES FOR NEW IMPROVEMENTS. SEE GENERAL IRRIGATION NOTE #17	
E	CONNECT NEW LATERAL LINE TO EXISTING LATERAL LINE	
F	CONNECT EXISTING SPRINKLER ON NEW LATERAL LINE	
G	CONNECT EXISTING RELOCATED VALVE SCHEDULED TO REMAIN OPERATIONAL TO NEW MAIN LINE.	
H	PIPING SHOWN OUTSIDE OF PLANTING BED FOR CLARITY. INSTALL WITHIN PLANTING BED	



SEE SHEET L101 FOR IRRIGATION PLAN AND L103 AND L104 FOR DETAILS

Blair, Church & Flynn
CONSULTING ENGINEERS
451 Clovis Avenue, Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

MARK	DATE	DESCRIPTION
2	12-13-2022	ADDENDUM 2
	11/1/2022	DSA BACKCHECK

LICENSED LANDSCAPE ARCHITECT
DAVID W. BRILEY NO. 2787
Signature
12/31/22
Renewal Date
Date
STATE OF CALIFORNIA

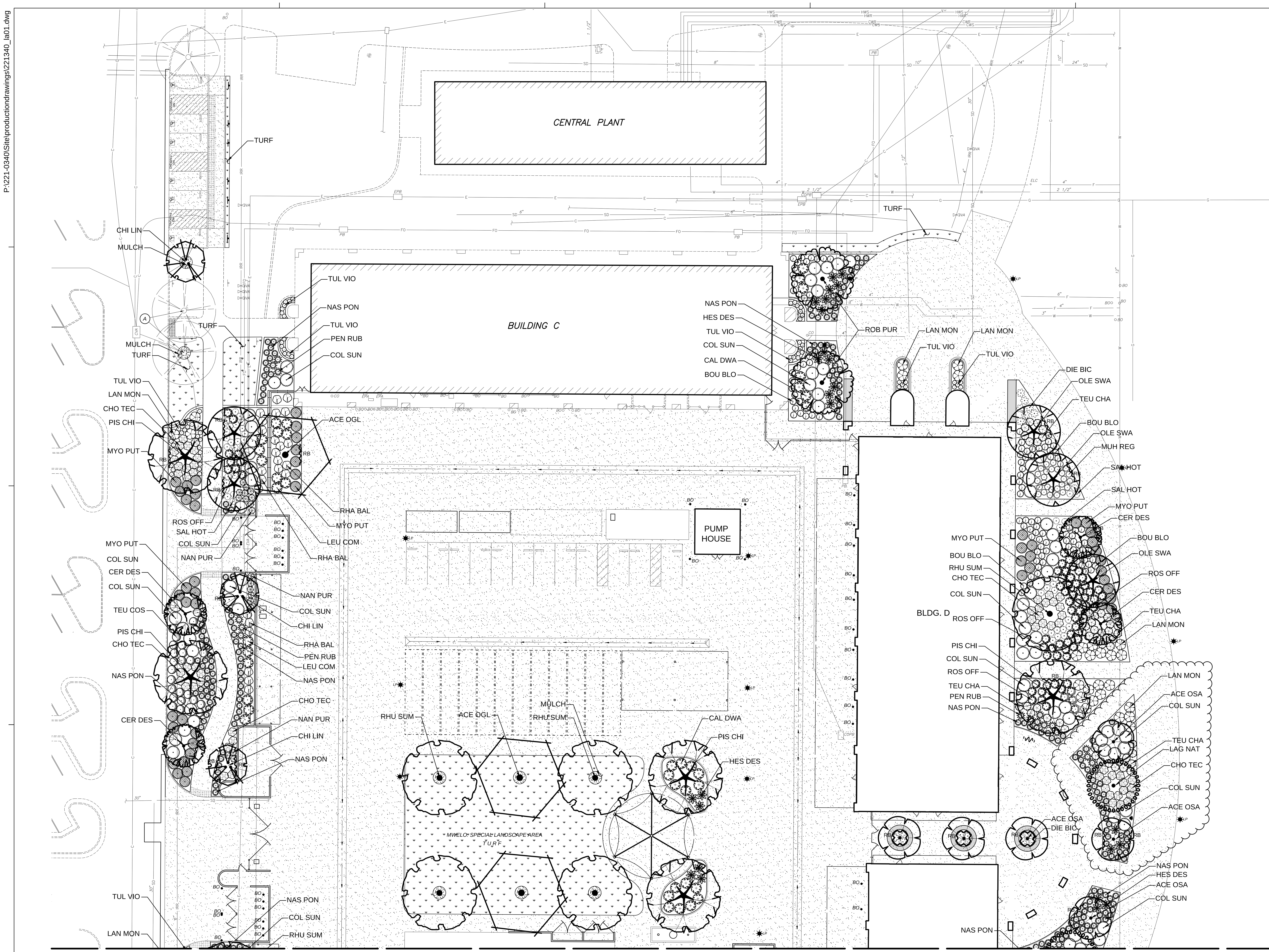
TETER, LLP
FRESNO HEADQUARTERS
VISALIA I BAKERSFIELD I MODESTO I SAN LUIS OBISPO
ARCHITECTS ENGINEERS CONNECTED
TETER

TULARE CAMPUS CTE
COLLEGE OF THE SEQUOIAS
4999 E. BARDSLEY AVE.
TULARE, CA

DRAWING TITLE
IRRIGATION PLAN

PROJECT NO.
20-12032

DRAWING
L102



LANDSCAPE SHADE CALCULATIONS

SHADING PER CALGREEN 5.106.12

SITE SHADING - LANDSCAPE & HARDSCAPE	QUANTITY PROPOSED (SF)	PERCENT REQUIRED	SHADE AREA REQUIRED (SF)
LANDSCAPED AREA (EXCLUDING SPECIAL USE & PARKING LANDSCAPE AREAS)	25,014	20	5,003
UNCOVERED HARDSCAPE AREA (EXCLUDING PARKING HARDSCAPE AREAS)	114,311	20	22,862
TOTAL SITE SHADE REQUIRED			27,865
PROVIDED SHADE TREES	**PROVIDED SHADE AREA**	**NO. TREES**	
VERY LARGE (40' dia.= 1256 SF)	3,768	3	
LARGE (35' dia.= 962 SF)	15,392	16	
MEDIUM (30' dia.= 707 SF)	4,949	7	
SMALL (20' dia.= 314 SF)	5,024	16	
TOTALS	29,133	42	
OVER (UNDER) LANDSCAPE & HARDSCAPE SHADE REQUIREMENT			**1,268**

PARKING LOT SHADING	QUANTITY PROPOSED (SF)	PERCENT REQUIRED	SHADE AREA REQUIRED (SF)
PARKING LOT STALLS & AISLES	1,500	50	750
PARKING LOT LANDSCAPE	0	20	0
PARKING LOT HARDSCAPE	642	20	128
TOTAL PARKING SHADE REQUIRED			878
PROVIDED SHADE TREES - PARKING LOT AREA	**PROVIDED SHADE AREA**	**NO. TREES**	
VERY LARGE (40' dia.= 1256 SF)	0	0	
LARGE (35' dia.= 962 SF)	0	0	
MEDIUM (30' dia.= 707 SF)	707	1 (E)	
SMALL (20' dia.= 314 SF)	314	1	
TOTALS	1,021	2	
OVER (UNDER) PARKING LOT SHADE REQUIREMENT			**143**

LANDSCAPE PLANTING AREA REQUIREMENT (DSA 1-L)

	AREA (SF)
NEW BUILDING FOOTPRINT:	41,000
REQUIRED MWELO COMPLIANT PLANTING:	30,750
EXISTING IRRIGATED AREA DESIGNATED FOR REMOVAL:	7,509
PROPOSED MWELO COMPLIANT PLANTING:	25,014
TOTAL CREDIT FOR MWELO COMPLIANT PLANTING:	32,523
EXCESS / (DEFICIT) OF PROPOSED COMPLIANT PLANTING:	1,773

WATER CONSERVATION COMPLIANCE STATEMENT:

I HAVE COMPLIED WITH THE CRITERIA OF THE LANDSCAPE WATER CONSERVATION ORDINANCE AND GUIDELINES, AND HAVE APPLIED THEM FOR THE EFFICIENT USE OF WATER IN THE PLANTING DESIGN PLAN.

DAVID W. BRILEY, RLA 2787

SCALE: 1"=20'

0 5 20 40 SCALE IN FEET

SEE SHEET L202 FOR PLANTING PLAN AND L204 FOR NOTES AND DETAILS

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TETER, LLP

FRESNO HEADQUARTERS

VISALIA | BAKERSFIELD | MODESTO | SAN LUIS OBISPO

ARCHITECTS ENGINEERS CONNECTED

MARK	DATE	DESCRIPTION
2	12-13-2022	ADDENDUM 2
	11/1/2022	DSA BACKCHECK

TULARE CAMPUS CTE

COLLEGE OF THE SEQUOIAS

4999 E. BARDSLEY AVE.

TULARE, CA

DRAWING TITLE

PLANTING PLAN

PROJECT NO.

20-12032

DRAWING

L201

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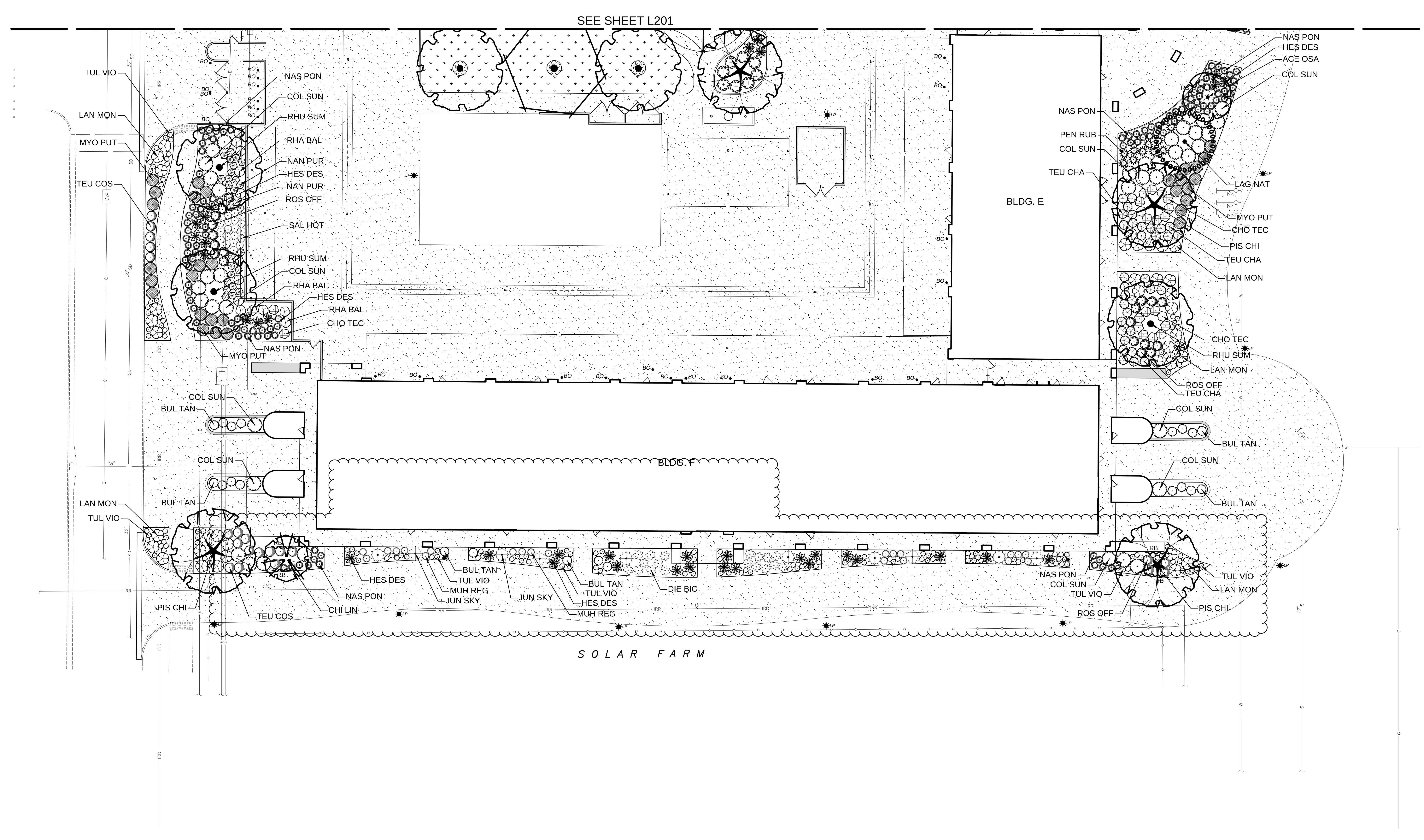

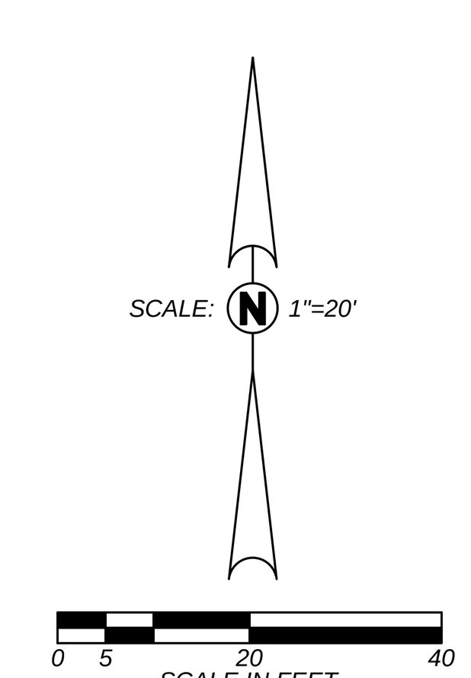

SEE SHEET L203 FOR PLANTING LEGEND AND L204 FOR NOTES AND DETAILS

Know what's below. Call before you dig.

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CONSULTING ENGINEERS
451 Clovis Avenue, Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

PLOT DATE: 11/2/2022 12:18:51 PM

MARK	DATE	DESCRIPTION
2	12-13-2022	ADDENDUM 2
	11/1/2022	DSA BACKCHECK

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ARCHITECTS ENGINEERS CONNECTED

TULARE CAMPUS CTE
COLLEGE OF THE SEQUOIAS
4999 E. BARDSLEY AVE.
TULARE, CA

DRAWING TITLE
PLANTING PLAN

PROJECT NO.
20-12032

DRAWING
L202

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PLANT LEGEND

SUNSET ZONE # 8   TOTAL MIXED PLANTING AREA =25,014 SF

2022-10-25 09:57

TREES	CODE	BOTANICAL / COMMON NAME	CONT	WATER USE	QTY	DETAIL	REMARKS (SIZE, FORM, SHADE, SIZE, EXPOSURE)
	ACE OSA	ACER PALMATUM `OSAKAZUKI` OSAKAZUKI JAPANESE MAPLE	15 GAL	M	6	A/L204	DECIDUOUS MULTI-TRUNK. ORANGE-CRIMSON FALL COLOR. MS: 20'-25' X 20'-25'
	ACE OGL	ACER RUBRUM `OCTOBER GLORY` OCTOBER GLORY RED MAPLE	24"BOX	M	3	A/L204	DECIDUOUS STANDARD FORM. VERY LARGE SHADE.
	CER DES	CERCIDIUM X 'DESERT MUSEUM' DESERT MUSEUM PALO VERDE	24"BOX	L	4	A/L204	DECIDUOUS.YELLOW FLOWERS. LOW BRANCHING. MS: 25' X 15'-20'
	CHI LIN	CHILOPSIS LINEARIS DESERT WILLOW	15 GAL	L	4	A/L204	DECIDUOUS, STANDARD FORM MS: 30` H X 10'-20` W
	LAG NAT	LAGERSTROEMIA `NATCHEZ` NATCHEZ CRAPE MYRTLE	15 GAL	M	2	A/L204	DECIDUOUS. STANDARD FORM. PARTIAL SHADE. SMALL SHADE. MS: 25' X 25'
	OLE SWA	OLEA EUROPAEA 'SWAN HILL' TM SWAN HILL OLIVE	24"BOX	L	5	A/L204	EVERGREEN. BLUISH GREEN OR SILVER OR GRAY. MS: 30' X 20'-30'
	PIS CHI	PISTACIA CHINENSIS `KEITH DAVEY` KEITH DAVEY CHINESE PISTACHE	15 GAL	L	8	A/L204	DECIDUOUS. FULL SUN. STANDARD FORM. LARGE SHADE. MS: 25'-40' X 25'-35'
	RHU SUM	RHUS LANCEA AFRICAN SUMAC	24"BOX	L	8	A/L204	EVERGREEN. LARGE SHADE. MS: 30' X 20'-35'
	ROB PUR	ROBINIA X AMBIGUA 'PURPLE ROBE' PINK FLOWERING LOCUST	24"BOX	L	2	A/L204	DECIDUOUS. MEDIUM SHADE. MS: 40' X 20'-30'

SHRUBS	CODE	BOTANICAL / COMMON NAME	SIZE	WATER USE	QTY	DETAIL	REMARKS
	BUL TAN	BULBINE FRUTESCENS 'TINY TANGERINE' TINY TANGERINE BULBINE	5 GAL	L	21	B/L204	FULL SUN, PART SHADE. MS: 1'-2' X 3'-4'
	CAL DWA	CALLISTEMON VIMINALIS `LITTLE JOHN` DWARF WEEPING BOTTLEBRUSH	1 GAL	L	23	B/L204	MS: 3' X 5'
	CHO TEC	CHONDROPETALUM TECTORUM SMALL CAPE RUSH	1 GAL	L	80	B/L204	SUN OR SHADE. DENSE TUFTED SMALL CLUSTERS OF BROWN FLOWERS. MS:3'-4' H X 3'-4' W
	COL SUN	COLEONEMA PULCHELLUM 'SUNSET GOLD' SUNSET GOLD BREATH OF HEAVEN	5 GAL	L	109	B/L204	FULL SUN TO PART SHADE. MS: 2' X 4'-6'
	DIE BIC	DIETES BICOLOR FORTNIGHT LILY	5 GAL	L	34	B/L204	FULL SUN, PART SHADE. WHITE FLOWERS. MS:2'-4' X 2'-3'
	HES DES	HESPERALOE PARVIFLORA 'DESERT FLAMENCO' TM DESERT FLAMENCO RED YUCCA	5 GAL	L	54	B/L204	SALMON, CORAL FLOWERS MS:2'-4' X 2'-5'
	JUN SKY	JUNIPERUS SCOPULORUM 'SKYROCKET' SKYROCKET JUNIPER	15 GAL	L	10	B/L204	EVERGREEN. MS: 15'-20' X 2'-3'
	LAN MON	LANTANA MONTEVIDENSIS TRAILING LANTANA	1 GAL	L	63	B/L204	FULL SUN TO PART SUN. LILAC FLOWES MS:1'-2' X 3'-5'
	LEU COM	LEUCOPHYLLUM FRUTESCENS `COMPACTA` COMPACT TEXAS RANGER	5 GAL	L	16	B/L204	MATURE HEIGHT & SPREAD: 5` X 5`
	MYO PUT	MYOPORUM PARVIFOLIUM `PUTAH CREEK` PUTAH CREEK MYOPORUM	1 GAL	L	80	B/L204	MS: 1` X 8`
	NAN PUR	NANDINA DOMESTICA 'NANA PURPUREA' DWARF HEAVENLY BAMBOO	5 GAL	L	46	B/L204	FULL SUN, PARTIAL SUN. MS: 1'-2' X 2'-3'
	RHA BAL	RHAPHIOLEPIS UMBELLATA `MINOR` MINOR YEDDA HAWTHORN	5 GAL	L	36	B/L204	MATURE HEIGHT & SPREAD: 3`-4` X SAME
	ROS OFF	ROSMARINUS OFFICINALIS `COLLINGWOOD INGRAM` COLLINGWOOD INGRAM ROSEMARY	5 GAL	L	88	B/L204	FULL SUN. DARK BLUE FLOWERS. MS: 2'-3' X 4'
	SAL HOT	SALVIA MICROPHYLLA 'HOT LIPS' HOT LIPS GRAHAM SAGE	5 GAL	L	63	B/L204	FULL SUN TO PARTIAL SHADE. RED FLOWERS MS:2'-3' X 2'-3'
	TEU CHA	TEUCRIUM CHAMAEDRYS GERMANDER	5 GAL	L	82	B/L204	FULL SUN. MS: 3' X 3'
	TEU COS	TEUCRIUM COSSONII CREEPING GERMANDER	5 GAL	L	43	B/L204	FULL SUN.PINK OR PURPLE FLOWERS. MS: 4"-6" X 2'-4'
	TUL VIO	TULBAGHIA VIOLACEA SOCIETY GARLIC	1 GAL	L	214	B/L204	MS: 1'-3' X 1'-2'

GRASSES	CODE	BOTANICAL / COMMON NAME	SIZE	WATER USE	QTY	DETAIL	REMARKS
	BOU BLO	BOUTELOUA GRACILIS 'BLONDE AMBITION' BLONDE AMBITION BLUE GRAMA	5 GAL	L	103	B/L204	MS: 12"-36" X 12"-36"
	MUH REG	MUHLENBERGIA CAPILLARIS `REGAL MIST` PINK MUHLY	5 GAL	L	41	B/L204	MS: 3'-4' X 2'-3'
	NAS PON	NASSELLA TENUISSIMA `PONY TAILS` MEXICAN FEATHERGRASS	1 GAL	L	266	B/L204	MS: 2` X 2`-3`
	PEN RUB	PENNISETUM ADVENA `RUBRUM` PURPLE FOUNTAIN GRASS	5 GAL	L	27	B/L204	FULL SUN MS: 4'-5' X 3'-4'

GROUND COVERS	CODE	BOTANICAL / COMMON NAME	CONT	WATER USE	QTY	DETAIL	REMARKS
	TURF	'CELEBRATION' BERMUDAGRASS	SOD	M	9,175 SF	E/L204	
	MULCH	WALK-ON WOOD MULCH	N/A	N/A	225 SF		
RB	ROOT BARRIER UB24-2					D/L204	
A	PROTECT EXISTING TREE IN PLACE. TPZ PER SECTION 320190						

SEE SHEET L201 AND L202 FOR PLANTING PLAN AND L204 FOR NOTES AND DETAILS

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PLOT DATE: 11/2/2022 12:19:02 PM

MARK	DATE	DESCRIPTION
2	12-13-2022	ADDENDUM 2
	11/1/2022	DSA BACKCHECK

LICENSED LANDSCAPE ARCHITECT
DAVID W. BRILEY NO. 2787
Signature
12/31/22
Renewal Date
Date
STATE OF CALIFORNIA

T E T E R , L L P
FRESNO HEADQUARTERS
VISALIA I BAKERSFIELD I MODESTO I SAN LUIS OBISPO
ARCHITECTS ENGINEERS CONNECTED
TETER

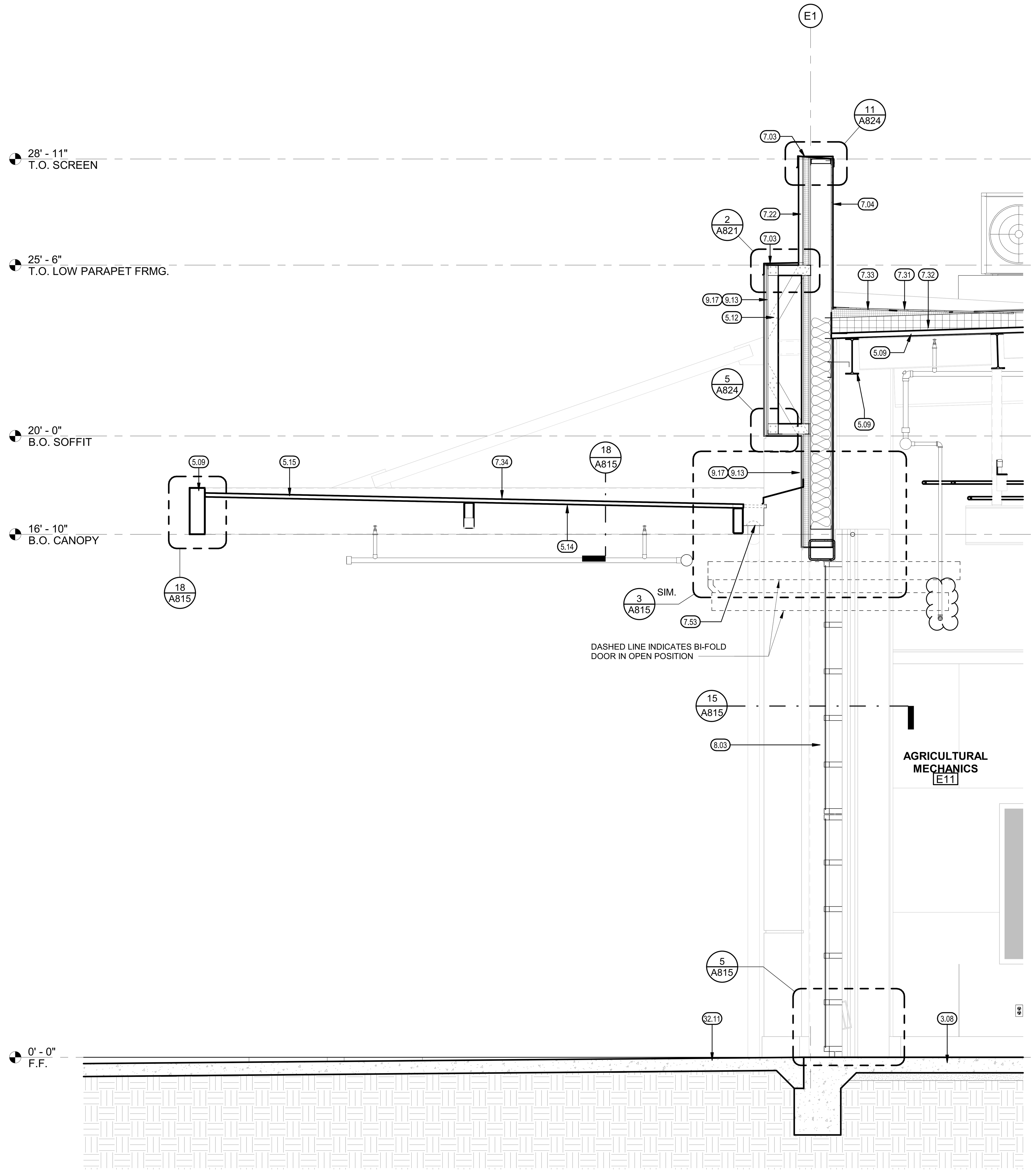
TULARE CAMPUS CTE
COLLEGE OF THE SEQUOIAS
4999 E. BARDSLEY AVE.
TULARE, CA

DRAWING TITLE
PLANTING PLAN

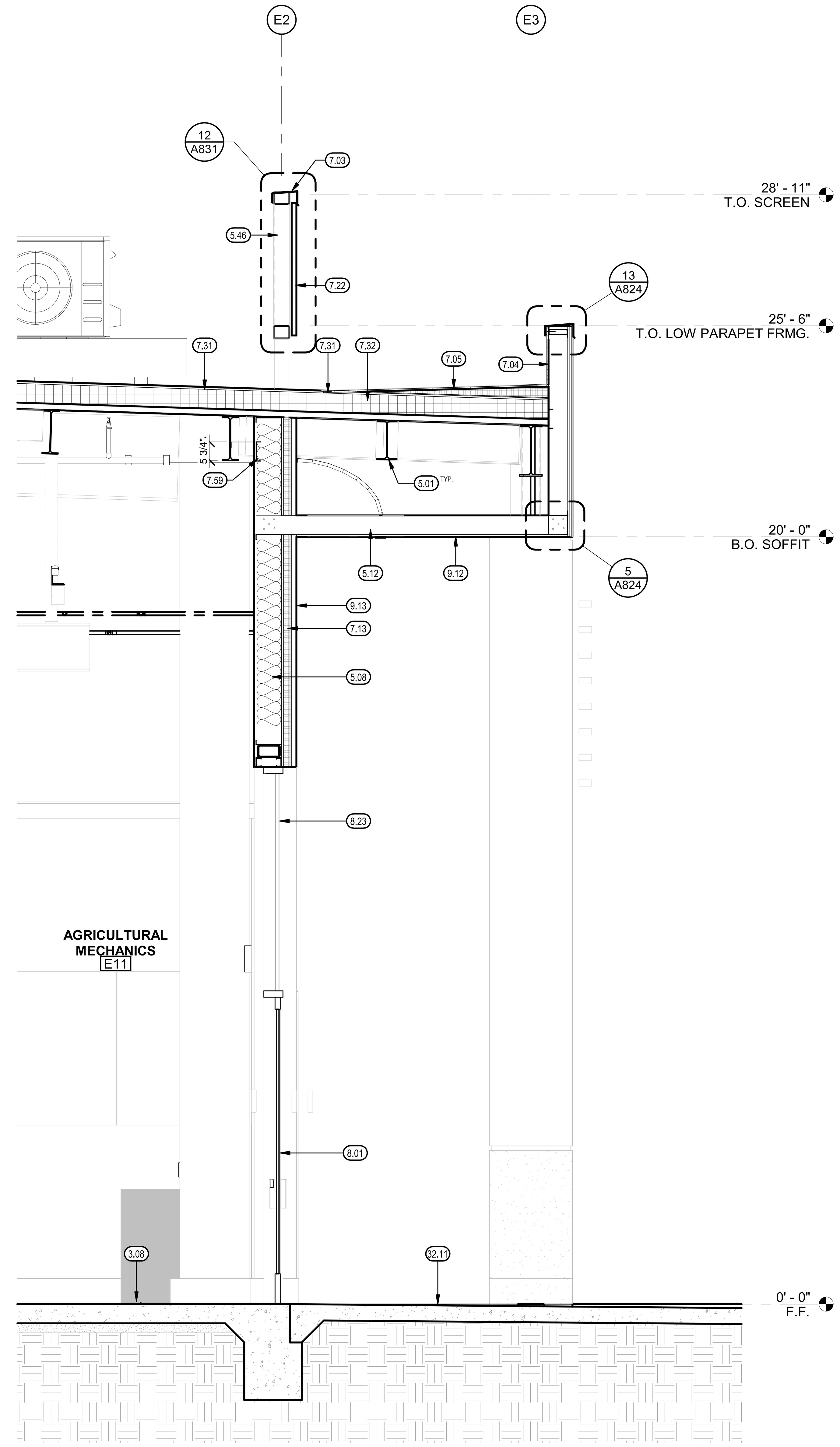
PROJECT NO.
20-12032

DRAWING
L203

Drawing: P:\221-0340\Site\productiondrawings\221340_la01.dwg; L203 Planting Plan - BCF.ctb
Plot by: balvarez Nov 02, 2022 - 12:19pm



WALL SECTION - BUILDING E 1/2" = 1'-0" 20



WALL SECTION - BUILDING E 1/2" = 1'-0" 10

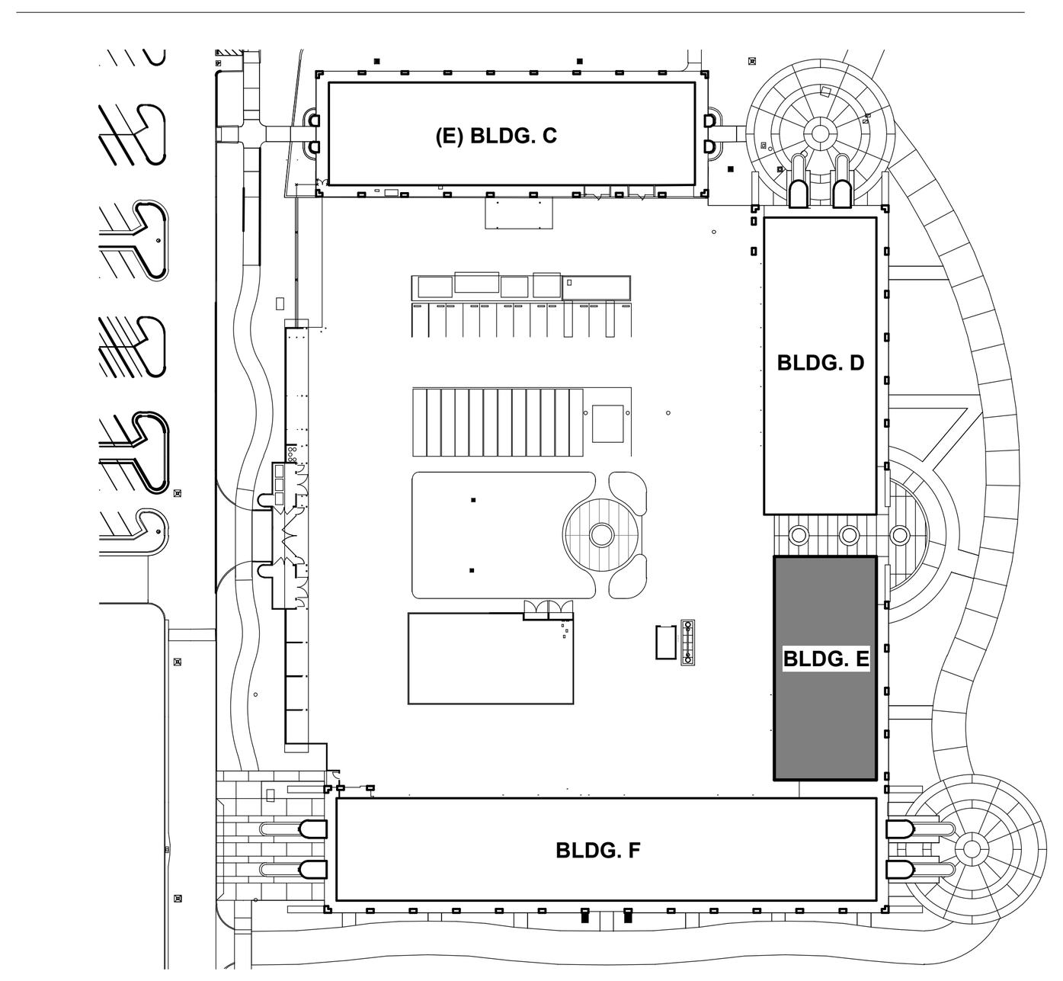
KEYNOTES (00.00)

3.08	INTERIOR CONCRETE SLAB OVER VAPOR BARRIER, SEE STRUCTURAL
5.01	STRUCTURAL STEEL FRAMING, SEE STRUCTURAL
5.08	6" METAL STUDS (OR OTHER SIZE INDICATED), SEE STRUCTURAL
5.09	ROOF FRAMING, SEE STRUCTURAL
5.12	METAL SOFFIT/CEILING FRAMING AT 16" O.C. (SEE 3/A840)
5.14	ROOF CANOPY METAL DECK, SEE STRUCTURAL
5.15	METAL ROOF DECK, SEE STRUCTURAL
5.46	SCREEN WALL STEEL SUPPORT FRAMING, SEE STRUCTURAL
7.03	MIN. 24 GA. SHEET METAL CAP/SILL FLASHING (PAINT) SLOPED 1/2":12" MIN.
7.04	SINGLE PLY ROOFING MEMBRANE OVER COVER BOARD OVER 5/8" GLASS MATT GYP. SHEATHING. CARRY MEMBRANE UP AND OVER TOP OF PARAPET AND DOWN ONTO ROOF SURFACE 12" MIN., TYP.
7.05	RIGID INSULATION SLOPED CRICKET BY ROOFING CONTRACTOR W/MIN. 1/4" PER FOOT SLOPE TOWARD DRAIN
7.13	2" RIGID WALL INSULATION
7.22	TYPE 1 HORIZONTALE METAL SIDING OVER VERTICAL BATTEN SYSTEM
7.31	SINGLE PLY MEMBRANE ROOFING SYSTEM OVER COVERBOARD
7.32	MIN. 6" RIGID INSULATION (BY ROOFING CONTRACTOR) AND METAL ROOF DECK, SEE STRUCTURAL
7.33	CRICKET, TAPERED INSULATION
7.34	APPLY RUBBERIZED COATING TO TOP OF METAL DECK AND SIDE OF PERIMETER BEAMS FOR WATER-TIGHT SEAL
7.53	16 GA. STAINLESS STEEL GUTTER, WELD ALL SEAMS WATER TIGHT. KEEP ENDS +/- 3/4" AWAY FROM CROSS SUPPORT BEAMS (FLASH WATER TIGHT)
7.59	18 GAUGE G.I. CLOSURE STRIP SIZED AS REQUIRED (PAINT) w/ 6" VERT. LETG & 2-#10 S.M. SCREWS TO STUDS @16" o.c. MAX.
8.01	DOOR AND FRAME AS SCHEDULED (SIDE LITES WHERE INDICATED)
8.03	VERTICAL BI-FOLD STEEL DOORS WITH GLASS PANELS (FULLY TEMPERED)
8.23	ALUMINUM CURTAIN WALL WINDOWS & ENTRANCE DOORS, SEE SCHEDULES
9.12	3/4" EXTERIOR 3 COAT PLASTER SYSTEM WITH ACRYLIC COATING OVER HI-RIB METAL LATH
9.13	5/8" EXTERIOR GYPSUM SHEATHING AND WEATHER BARRIER
9.17	7/8" EXTERIOR 3-COAT PLASTER SYSTEM WITH ACRYLIC COATING
32.11	CONCRETE PAVING/WALK, SLOPE TO DRAIN AWAY FROM BUILDING, SEE CIVIL

GENERAL NOTES

A. SEE STRUCTURAL FOR TOP OF STEEL ELEVATION (T.O.S.).

KEYPLAN



MARK	DATE	DESCRIPTION
	11/1/2022	DSA RESUBMITTAL
2	12-13-2022	ADDENDUM 2

TETER, LLP
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ARCHITECTS ENGINEERS CONNECTED

TULARE CAMPUS CTE
COLLEGE OF THE SEQUOIAS
4999 E. BARDSLEY AVE.
TULARE, CA

DRAWING TITLE
WALL SECTIONS

PROJECT NO.
21-12032

DRAWING
A431

PLOT DATE: 11/1/2022 10:02:39 PM

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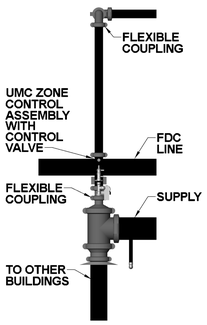
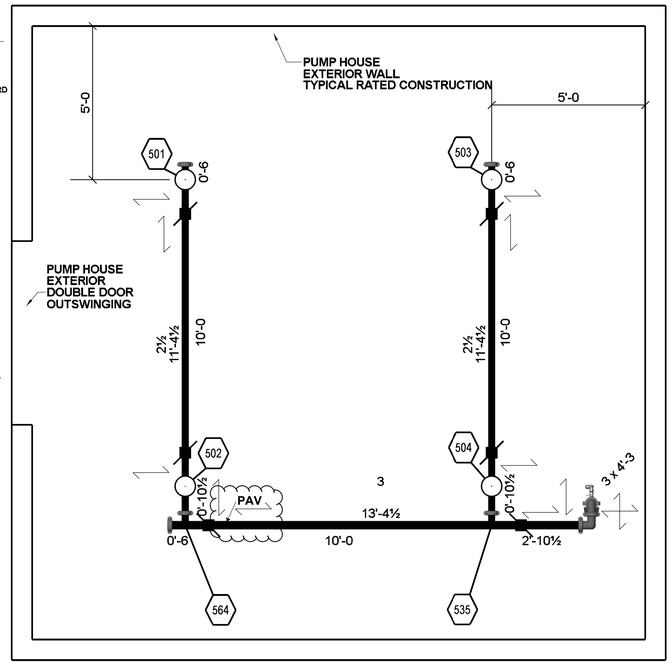
PUMP HOUSE SPRINLKER NOTES

- SPRINKLER SYSTEM IN THE PUMP HOUSE IS SUPPLIED BY A STAND ALONE RISER SUPPLIED FROM A TEE ON THE DISCHARGE SIDE OF THE PUMP
- SYSTEM HAS BEEN DESIGNED TO EXTRA HAZARD GROUP 2 DUE TO THE STORAGE OF FUEL.



5 PUMP ROOM SPRINKLER RISER



SYMBOL LEGEND

- DIA / LENGTH — SPRINKLER MAIN PIPING
- DIA / LENGTH — SPRINKLER BRANCH PIPING
- PIPE HANGER
- OS&Y GATE VALVE
- SUPERVISED CONTROL VALVE
- GROOVED 90
- PUMP TEST MANIFOLD
- PIPE STAND
- WALL MOUNTED FDC

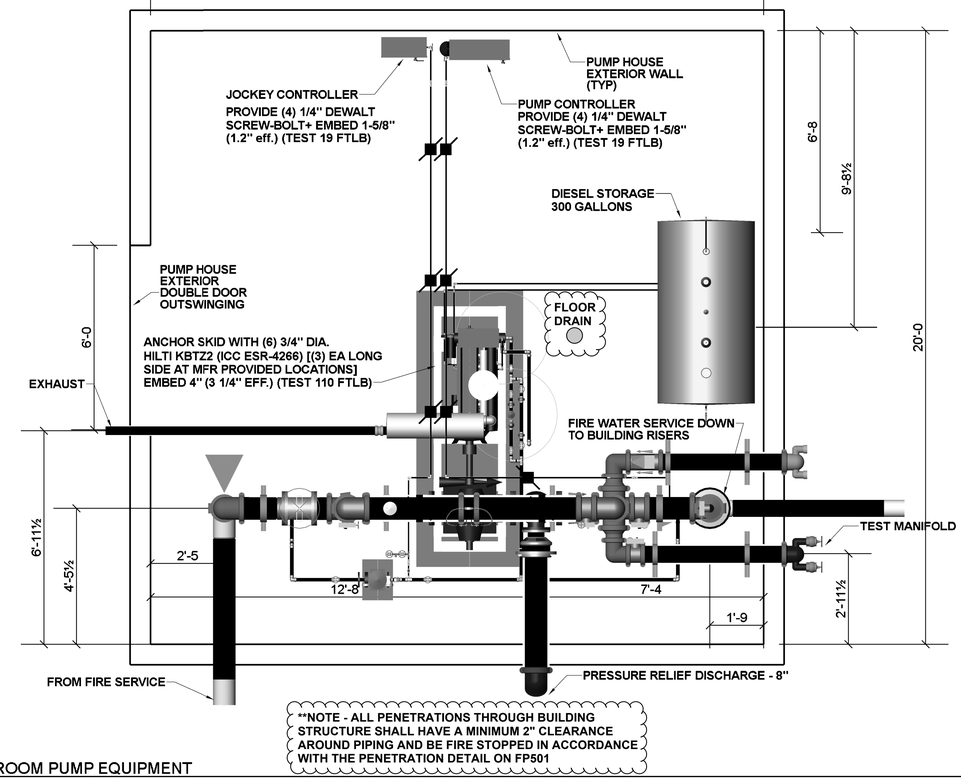
"REFER TO SPRINKLER LEGEND FOR SPRINKLER SYMBOLS"

Hydraulic Information	
Remote Area Name	Pump House Remote Area
Occupancy Classification	Extra Hazard Group 2
Density	0.4 GPM
Total Hose Streams	500 GPM
Flowing Heads	4 @ 40 GPM
K-Factor	5.6
Total Water Required	660.094 GPM
Total Pressure Required	-150.94 psi
Base of Riser	660.094 GPM
Base of Riser	-150.94 psi
Safety Margin	+177.74 (663.25%)

1 PUMP ROOM SPRINKLER LAYOUT
1/2"=1'-0"

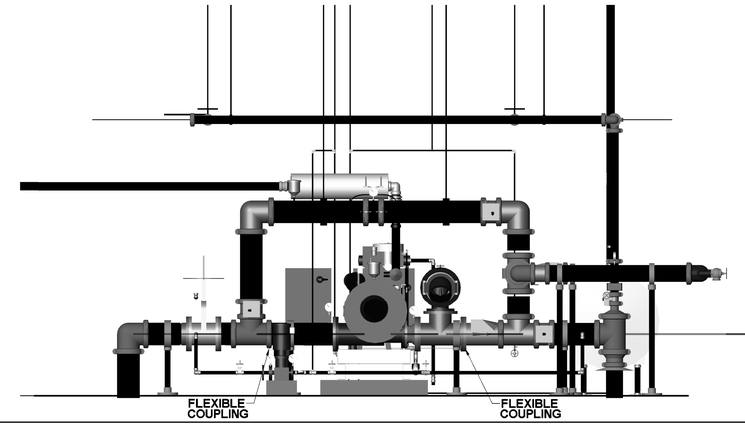
SPRINKLER SCHEDULE

Sprinkler Symbol	Count	Manufacturer	Model	Orifice Size	K-Factor	Temperature Rating	Sprinkler Orientation	Finish
○	4	VICTAULIC Inc.	V2703	1/2"	5.6	200 °F	UPRIGHT	Brass



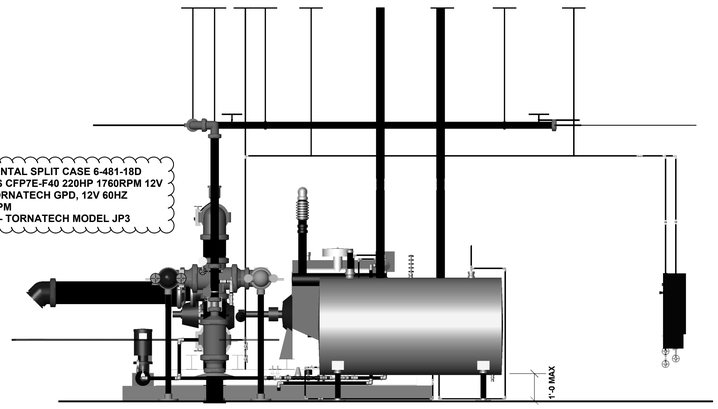
**NOTE - ALL PENETRATIONS THROUGH BUILDING STRUCTURE SHALL HAVE A MINIMUM 2" CLEARANCE AROUND PIPING AND BE FIRE STOPPED IN ACCORDANCE WITH THE PENETRATION DETAIL ON FP501

2 PUMP ROOM PUMP EQUIPMENT
1/2"=1'-0"



3 PUMP ROOM SECTION
1/2"=1'-0"

FIRE PUMP - AURORA HORIZONTAL SPLIT CASE 6-481-18D
FIRE PUMP MOTOR - CUMMINS CFP7E-F40 220HP 1760RPM 12V
FIRE PUMP CONTROLLER - TORNATECH GPD, 12V 60HZ
JOCKEY PUMP - PVM1-17 10GPM
JOCKEY PUMP CONTROLLER - TORNATECH MODEL JP3



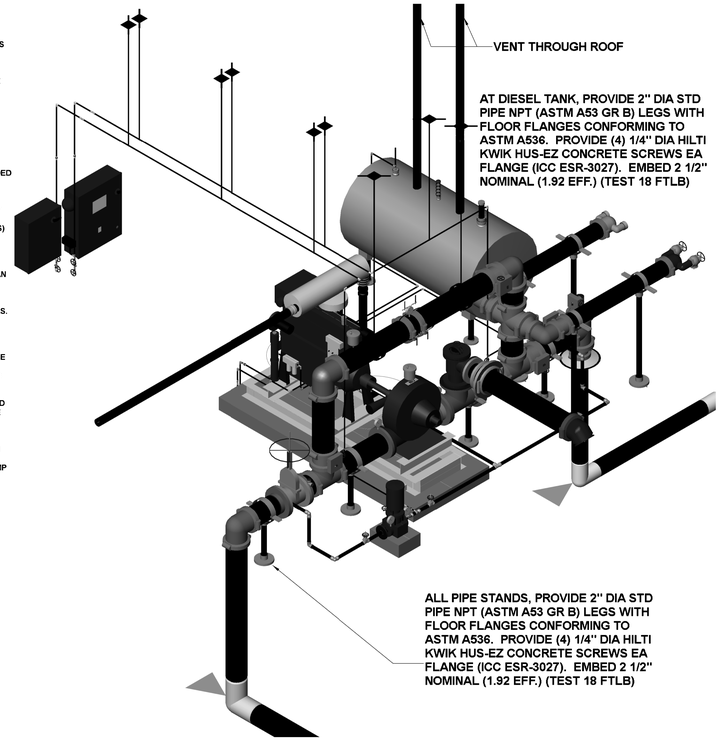
4 PUMP ROOM SECTION
1/2"=1'-0"

PUMP HOUSE NOTES

THE FOLLOWING INFORMATION FROM NFPA 20 SHALL BE ADHERED TO DURING CONSTRUCTION AND OPERATION OF THIS PUMP HOUSE:

4.13.3 HEAT.
4.13.3.1 AN APPROVED OR LISTED SOURCE OF HEAT SHALL BE PROVIDED FOR MAINTAINING THE TEMPERATURE OF A PUMP ROOM OR PUMP HOUSE, WHERE REQUIRED, ABOVE 40°F (4°C).
4.13.3.2 THE REQUIREMENTS OF 11.6.5 SHALL BE FOLLOWED FOR HIGHER TEMPERATURE REQUIREMENTS FOR INTERNAL COMBUSTION ENGINES.
4.13.4 NORMAL LIGHTING. ARTIFICIAL LIGHT SHALL BE PROVIDED IN A PUMP ROOM OR PUMP HOUSE.
4.13.5 EMERGENCY LIGHTING.
4.13.5.1 PUMP ROOMS SHALL BE PROVIDED WITH EMERGENCY LIGHTING.
4.13.5.2 THE INTENSITY OF ILLUMINATION IN THE PUMP ROOM(S) SHALL BE 3.0 FT-CANDLES (32.3 LUX), UNLESS OTHERWISE SPECIFIED BY A REQUIREMENT RECOGNIZED BY THE AUTHORITY HAVING JURISDICTION.
4.13.5.3 EMERGENCY LIGHTS SHALL NOT BE CONNECTED TO AN ENGINE-STARTING BATTERY.
4.13.5.4 THE EMERGENCY LIGHTING SHALL BE CAPABLE OF MAINTAINING THE LIGHTING LEVEL FOR A MINIMUM OF 2 HOURS.
4.13.6 VENTILATION. PROVISION SHALL BE MADE FOR VENTILATION OF A PUMP ROOM OR PUMP HOUSE.
4.13.7* DRAINAGE.
4.13.7.1 FLOORS SHALL BE PITCHED FOR ADEQUATE DRAINAGE OF ESCAPING WATER AWAY FROM CRITICAL EQUIPMENT SUCH AS THE PUMP, DRIVER, CONTROLLER, AND SO FORTH.
4.13.7.2 THE PUMP ROOM OR PUMP HOUSE SHALL BE PROVIDED WITH A FOOR DRAIN THAT WILL DISCHARGE TO A FROST-FREE LOCATION.

INCOMING SERVICE PENETRATES THROUGH FLOOR OUTGOING TO BUILDINGS D, E, AND F, PENETRATES THROUGH FLOOR
FOR ALL WALL AND ROOF PENETRATIONS REFER TO FIRE PUMP HOUSE PLANS



5 PUMP ROOM ISOMETRIC
1/2"=1'-0"

MARK	DATE	DESCRIPTION
B	11/1/22	DSA BACKCHECK
2	12-13-2022	ADDENDUM 2

TETTER, LLP
ARCHITECTS ENGINEERS CONNECTED
FRESNO HEADQUARTERS
VISALIA | BAKERSFIELD | MODESTO | SAN LUIS OBISPO

TULARE CAMPUS CTE
COLLEGE OF THE SEQUOIAS
4999 E. BARDSLEY AVE.
TULARE, CA

DRAWING TITLE
FIRE PROTECTION - PUMP HOUSE AND PUMP PLAN

PROJECT NO.
19-12032

DRAWING
FP107

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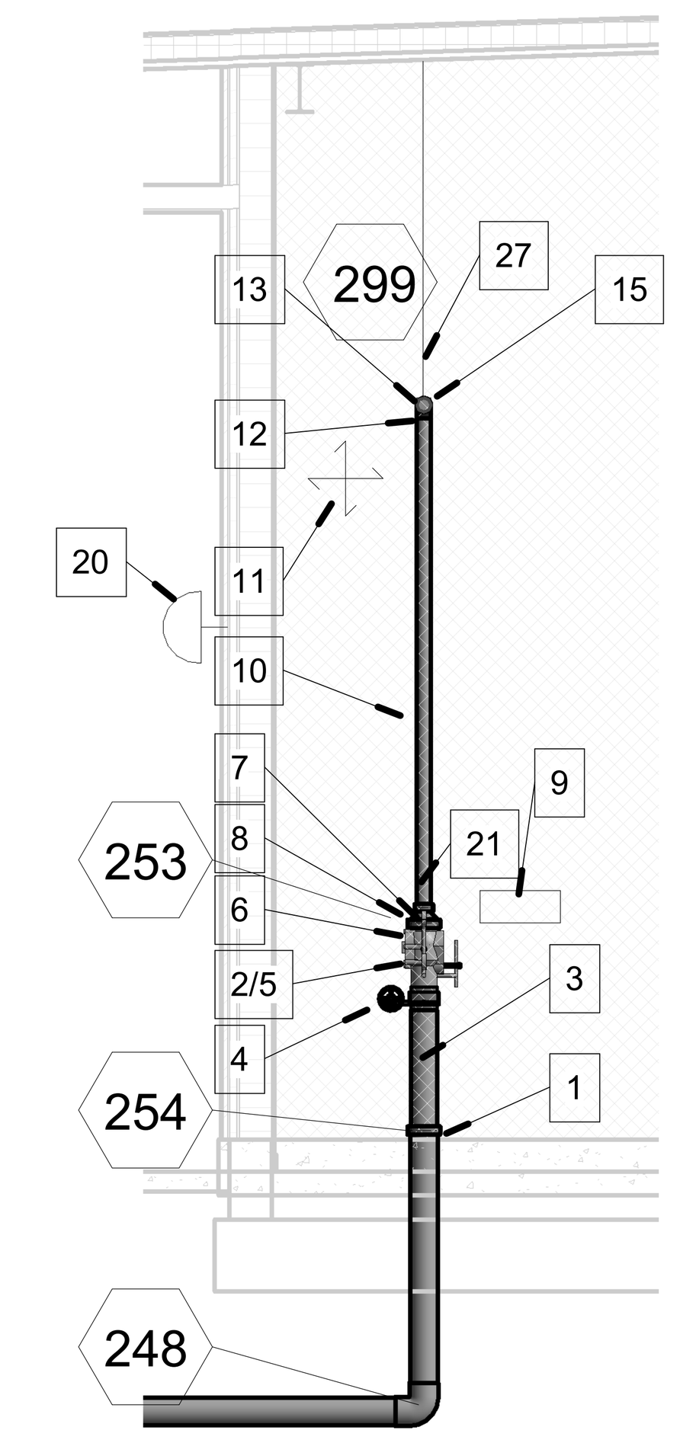
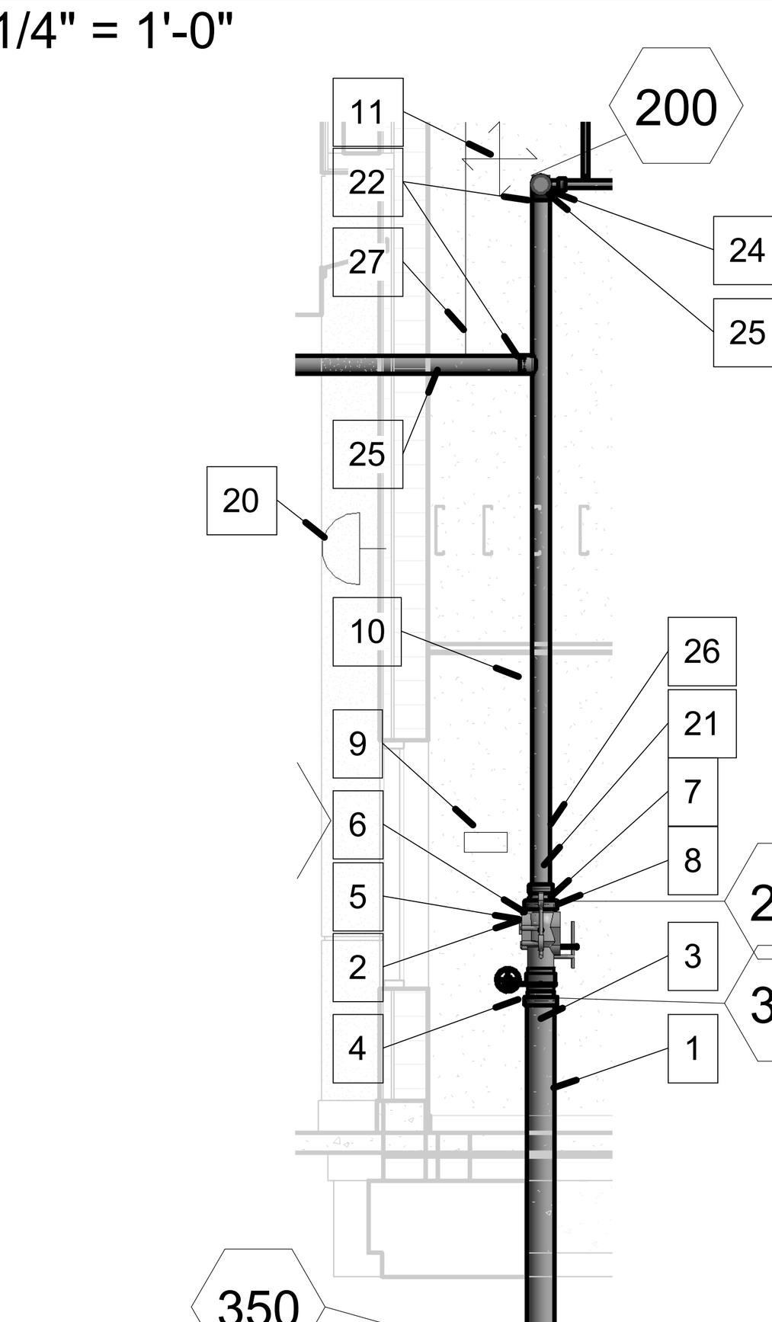
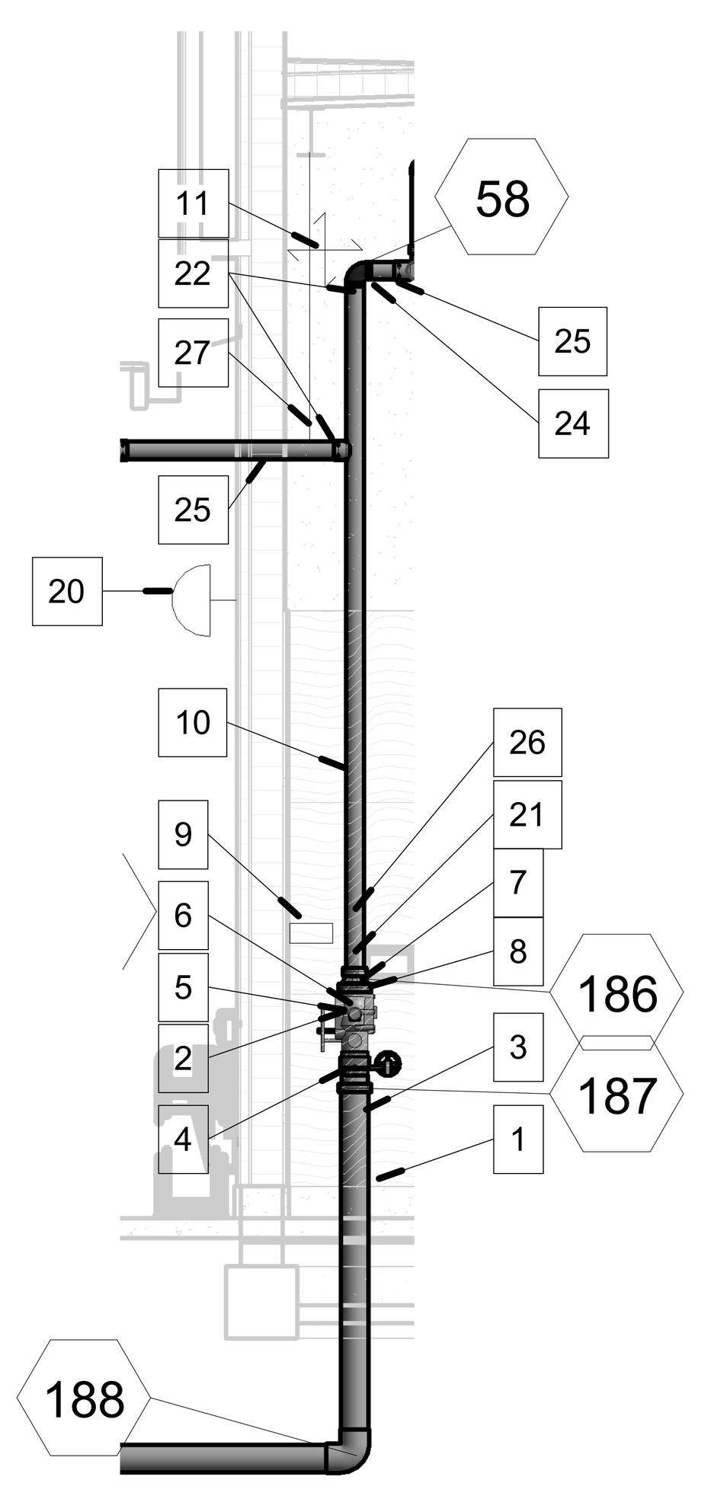


1 BUILDING D RISER DETAIL
1/4" = 1'-0"



2 BUILDING E RISER DETAIL
1/4" = 1'-0"



3 BUILDING F RISER DETAIL
1/4" = 1'-0"

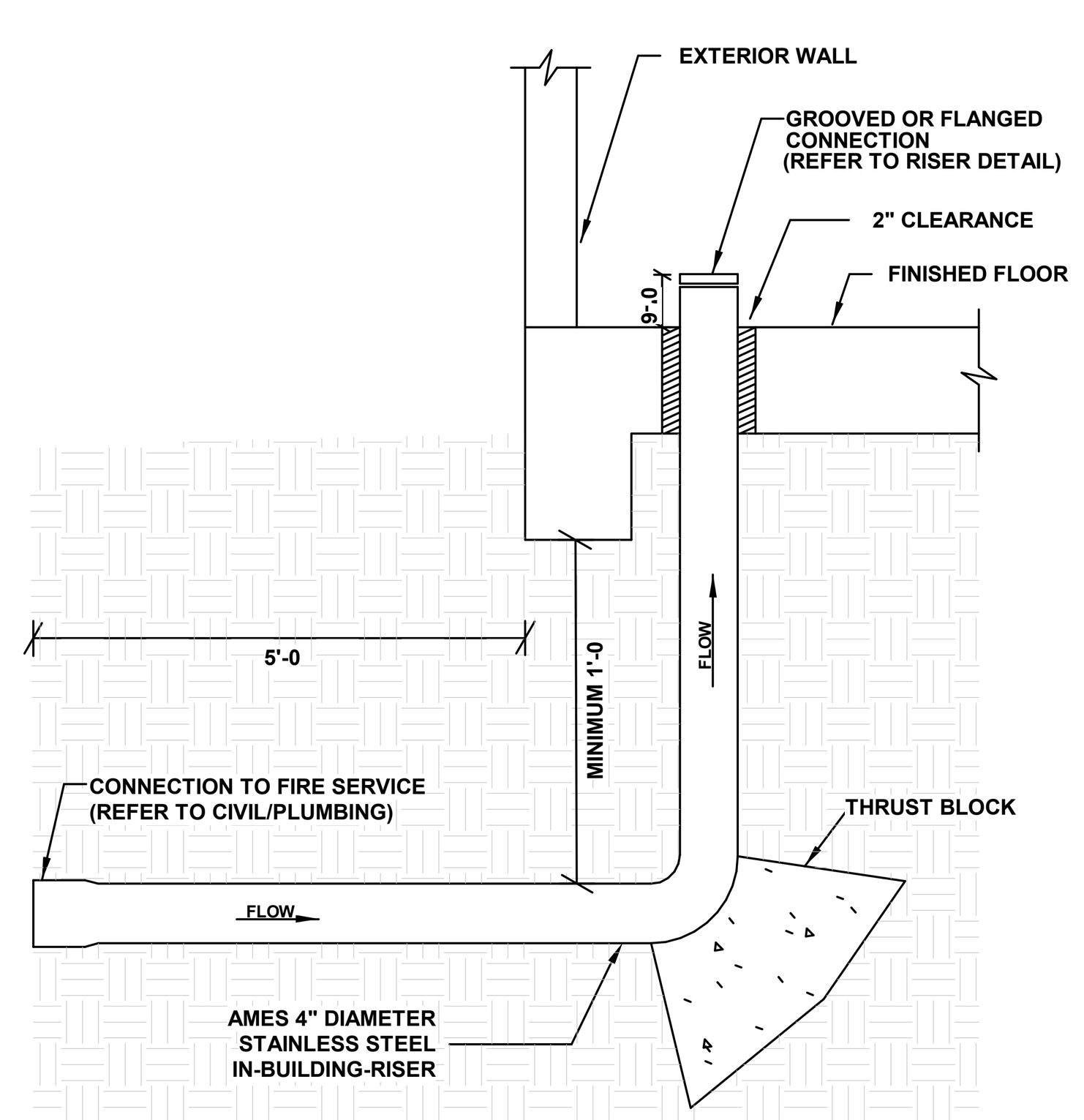
PLOT DATE: 10/27/2022 10:54:34 PM

1. POINT OF CONNECTION 1'-0 AFF - 6" FLEXIBLE COUPLING
2. 2" MAIN DRAIN PIPING - THREADED BLACK STEEL SCHEDULE 40
3. 6" RISER PIPING - GROOVED BLACK STEEL SCHEDULE 10
4. VICTAULIC 705W SUPERVISED CONTROL VALVE - GROOVED
5. 2" TEST AND DRAIN
6. VICTAULIC UMC UNIVERSAL MANIFOLD RISER
7. 6" x 3" BLDG D, 6" x 4" BLDGS E&F GROOVED CONCENTRIC REDUCER
8. 6" GROOVED FLEXIBLE COUPLING
9. SPARE SPRINKLER BOX - MOUNTED ON EXTERIOR WALL OF EACH RISER ROOM - SHALL CONTAIN (6) SPARE SPRINKLERS (3) OF EACH TYPE AND COMPATIBLE WRENCHES FOR BUILDINGS D & E - (12) SPARE SPRINKLERS (3) OF EACH TYPE AND COMPATIBLE WRENCHES FOR BUILDING F.
10. 3" RISER TO SYSTEM BLDG D 4" RISER TO SYSTEM BLDGS E & F - GROOVED BLACK STEEL SCHEDULE 10
11. 4-WAY SWAY BRACE - ATTACHED TO WALL STRUCTURE - REFER TO 4-WAY SWAY BRACE DETAIL
12. 3" GROOVED FLEXIBLE COUPLING
13. 3" GROOVED TEE
14. 3" GROOVED RIGID COUPLING
15. 3" CROSS MAIN TO SYSTEM
16. 0-300 PSI GAUGE - 1/4" NPS
17. 1/4" NPS GAUGE ISOLATION VALVE
18. 3" VANE TYPE WATERFLOW SWITCH
19. 2" MAIN DRAIN DISCHARGE TO EXTERIOR - TO TERMINATE VIA 1/2" OUTLET AND 1/2" SMOOTH TEST OUTLET (BROKEN SPRINKLER)(NOT GRAPHICALLY SHOWN FOR CLARITY)
20. 24V ELECTRIC WATERFLOW BELL TO BE INSTALLED ON EXTERIOR WALL
21. HYDRAULIC PLACARD AND GENERAL INFORMATION SIGN PER NFPA 13 25.5 & 25.6
22. 4" GROOVED FLEXIBLE COUPLING
23. 4" GROOVED RIGID COUPLING
24. 4" GROOVED 90° ELBOW BLDG F AND TEE BLDG E
25. 4" CROSS MAIN TO SYSTEM
26. 4" VANE TYPE WATERFLOW SWITCH
27. HANGER WITHING 24" OF RISER

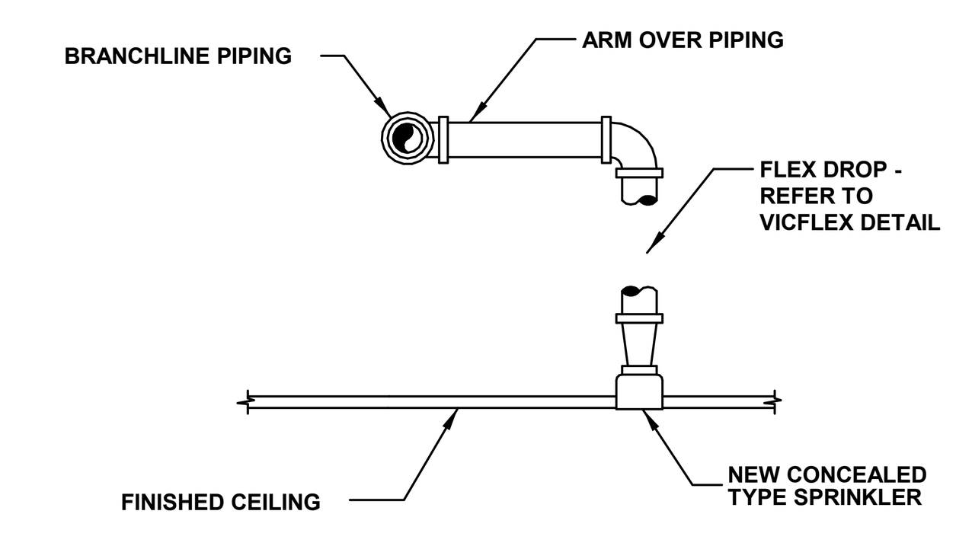
4 SYSTEM RISER KEY NOTES
N.T.S.

- WET SYSTEM RISERS SHALL BE A 6" VICTAULIC UMC RISER CONTROL ASSEMBLY WITH 705W SUPERVISED CONTROL VALVE.
- FDC IS A REMOTE FREE STANDING FDC. REFER TO CIVIL PLANS FOR INSTALLATION LOCATION.
- SUPERVISED CONTROL VALVES AND VANE STYLE WATERFLOW SWITCH SHALL ALL BE SUPERVISED BY THE BASE BUILDING FIRE ALARM SYSTEM
-
- A 24V ALARM BELL SHALL BE INSTALLED ON THE EXTERIOR WALL OF THE RISER LOCATION
- SYSTEM INSPECTOR'S TEST AND DRAIN IS ATTACHED TO THE RISER AND SHALL BE PIPED TO THE EXTERIOR OF THE BUILDING VIA A 2" MAIN DRAIN. THIS SHALL TERMINATE OVER A SPLASH BLOCK WITH A 1/2" OUTLET COMPLETED WITH A 1/2" SMOOTH OUTLET (BROKEN SPRINKLER).

5 RISER NOTES

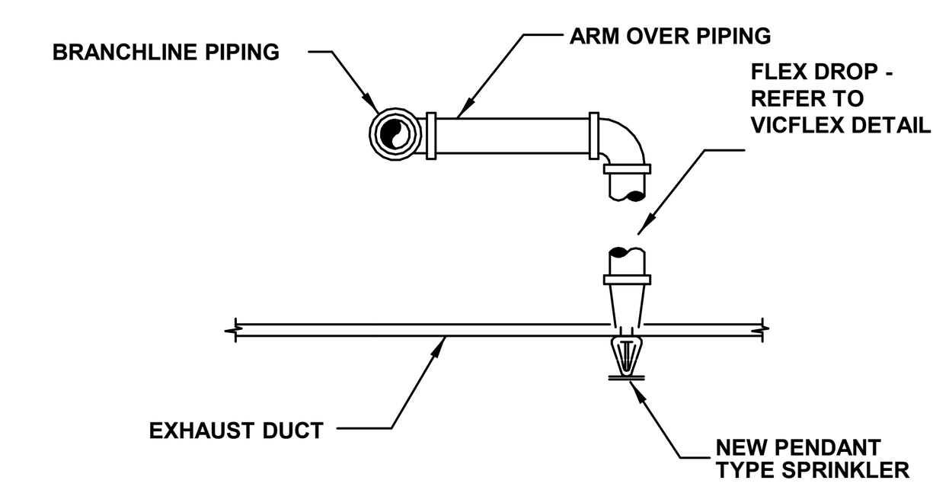


6 AMES STAINLESS STEEL IN-BUILDING RISER
N.T.S



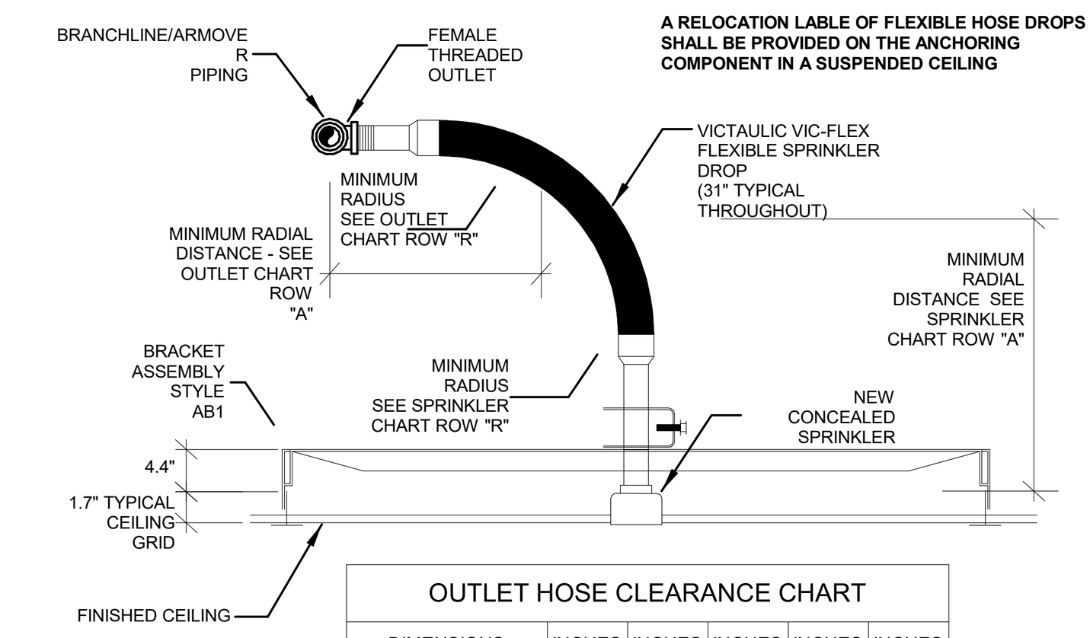
ALL PENDENT AND CONCEALED PENDENTS ON PROJECT SHALL BE INSTALLED USING 31" VIC FLEX FLEXIBLE SPRINKLER DROPS.

TYPICAL PENDANT SPRINKLER HEAD INSTALLATION DETAIL
N.T.S.



* COORDINATE EXHAUST DUCT PENETRATION WITH MECHANICAL CONTRACTOR *

TYPICAL EXHAUST DUCT PENDANT SPRINKLER INSTALLATION DETAIL
N.T.S.



OUTLET HOSE CLEARANCE CHART

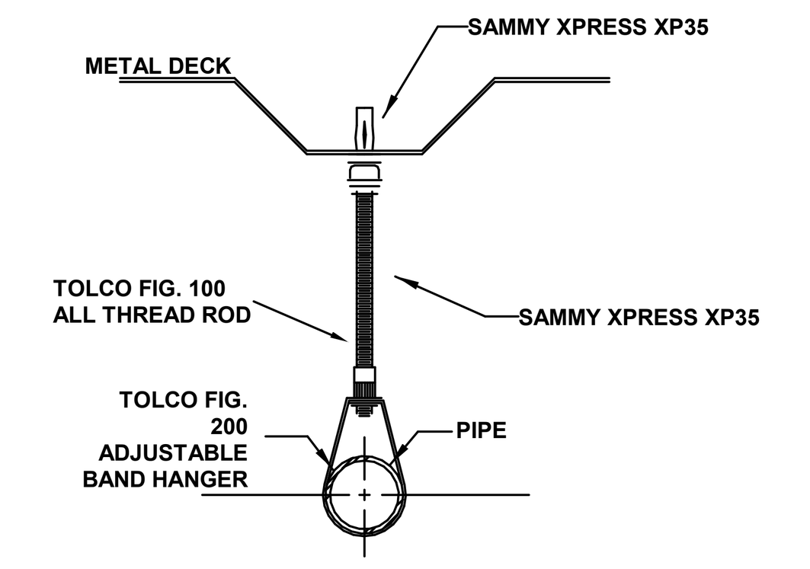
	DIMENSIONS	INCHES	INCHES	INCHES	INCHES	INCHES
R	MINIMUM BEND RADIUS	3	4	5	6	7
A	MINIMUM	9.4	10.4	11.4	12.4	13.4

SPRINKLER HOSE CLEARANCE CHART

	DIMENSIONS	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES
R	MINIMUM BEND RADIUS	2	3	4	5	6	7
A	MINIMUM	10.1	11.1	12.1	13.1	14.1	15.1

ALL PENDENT AND CONCEALED PENDENTS ON PROJECT SHALL BE INSTALLED USING 31" VIC FLEX FLEXIBLE SPRINKLER DROPS.
MAX BENDS - 3
EQUIVALENT LENGTH = 52'-0

VIC-FLEX FLEX HEAD DETAIL
N.T.S.

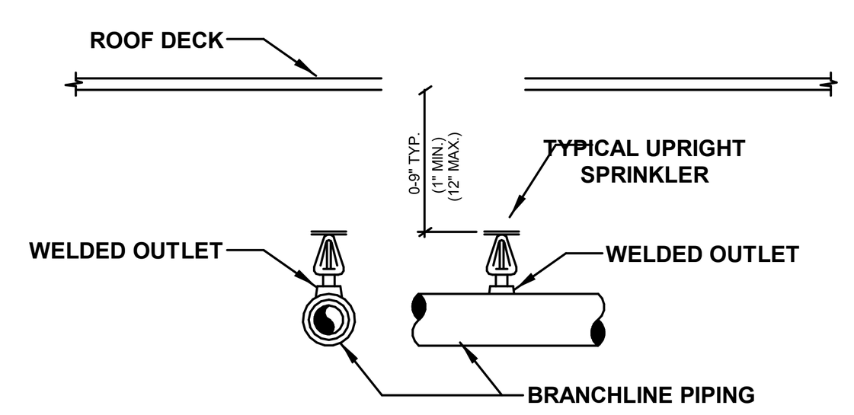


NOTE: DETAIL SHOWN IS FOR 1" ARM OVERS ONLY. FOR ALL OTHER PIPE SIZES SEE DETAIL BELOW

MAXIMUM SUSPENDED LOAD BASED ON STRUCTURAL REQUIREMENTS IS 30LBS.

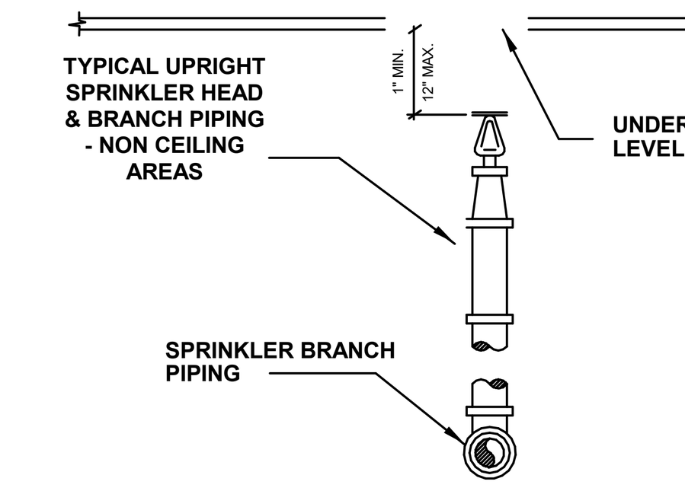
SYMBOL ON PLANS

SAMMY X-PRESS XP35 - 1-1/2" AND GREATER
N.T.S.



NOTE:
NFPA 13 2016 EDITION 8.6.4.2
8.6.4.2.1 UNLESS THE REQUIREMENTS OF 8.6.4.2.2 OR 8.6.4.2.3 ARE MET, DEFLECTORS OF SPRINKLERS SHALL BE ALIGNED PARALLEL TO CEILINGS, ROOFS, HIPS, OR THE INCLINE OF STAIRS.
8.6.4.2.2 WHERE SPRINKLERS ARE INSTALLED IN THE PEAK BELOW ASLOPED CEILING OR ROOF SURFACE, THE SPRINKLER SHALL BE INSTALLEDWITH THE DEFLECTOR HORIZONTAL.
8.6.4.2.3 ROOFS HAVING A PITCH NOT EXCEEDING 2 IN 12(16.7 PERCENT) ARE CONSIDERED HORIZONTAL IN THE APPLICATION OF 8.6.4.2, AND SPRINKLERS SHALL BE PERMITTED TO BE INSTALLED WITHDEFLECTORS HORIZONTAL.

UPRIGHT SPRINKLER ON BRANCHLINE DETAIL
N.T.S.



NOTE:
NFPA 13 2016 EDITION 8.6.4.2
8.6.4.2.1 UNLESS THE REQUIREMENTS OF 8.6.4.2.2 OR 8.6.4.2.3 ARE MET, DEFLECTORS OF SPRINKLERS SHALL BE ALIGNED PARALLEL TO CEILINGS, ROOFS, HIPS, OR THE INCLINE OF STAIRS.
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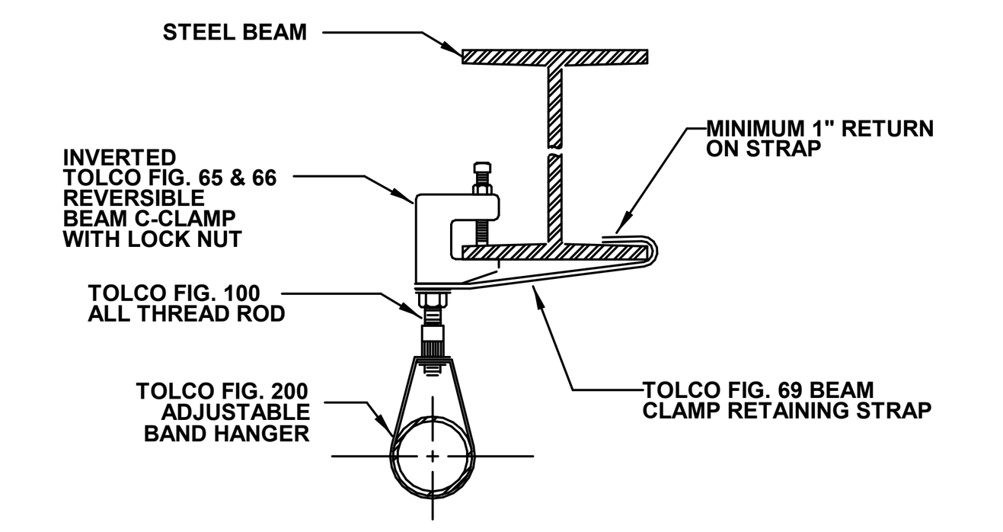
TYPICAL UPRIGHT SPRINKLER INSTALLATION DETAIL
N.T.S.

** WHERE HANGERS OR BRACING ANCHORS/CLAMPS ARE INSTALLED ON THE BOTTOM FLANGE OF A BEAM, BOTTOM FLANGE BRACING ON ONE SIDE OF THE CLAMP MUST BE INSTALLED. **

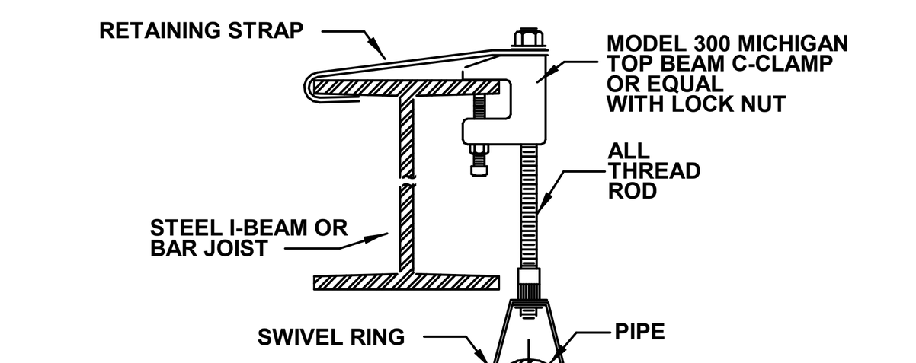


TOLCO FIG 200 HAS THE LOWEST MAX LOAD IN LBS. OF ALL HANGER COMPONENTS. THE TABLE BELOW REFLECTS THE MAXIMUM WEIGHT IN LBS. FOR THESE HANGERS.

1"	400
1-1/2"	400
2"	400
4"	1000

SYMBOL FOR BEAM CLAMP IS CONSISTANT THROUGHOUT. REFER TO "TOP BEAM C-CLAMP" DETAIL.

REVERSIBLE BEAM C-CLAMP WITH RETAINING STRAP (BEAM)
N.T.S.

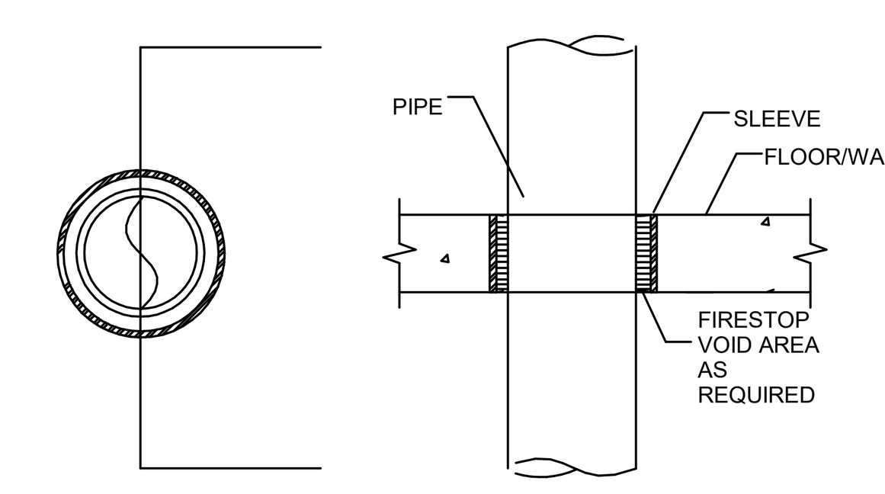


TOLCO FIG 200 HAS THE LOWEST MAX LOAD IN LBS. OF ALL HANGER COMPONENTS. THE TABLE BELOW REFLECTS THE MAXIMUM WEIGHT IN LBS. FOR THESE HANGERS.

1"	400
1-1/2"	400
2"	400
4"	1000

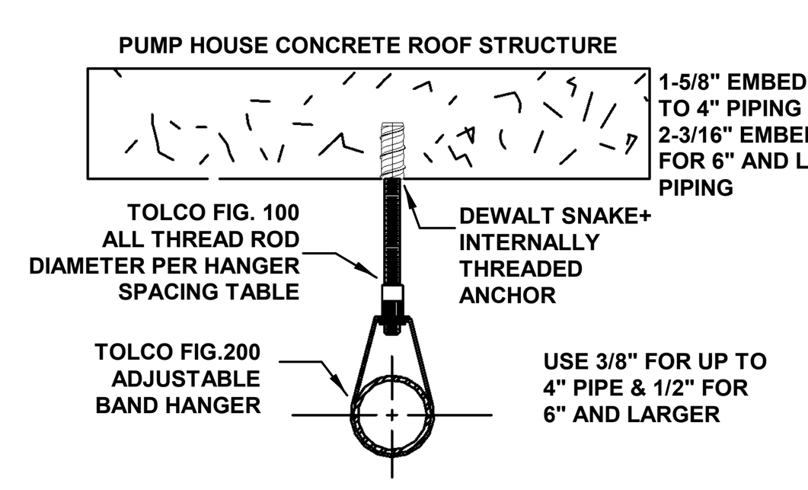
SYMBOL ON PLANS

TOP BEAM C-CLAMP WITH RETAINING STRAP (BEAM)
N.T.S.



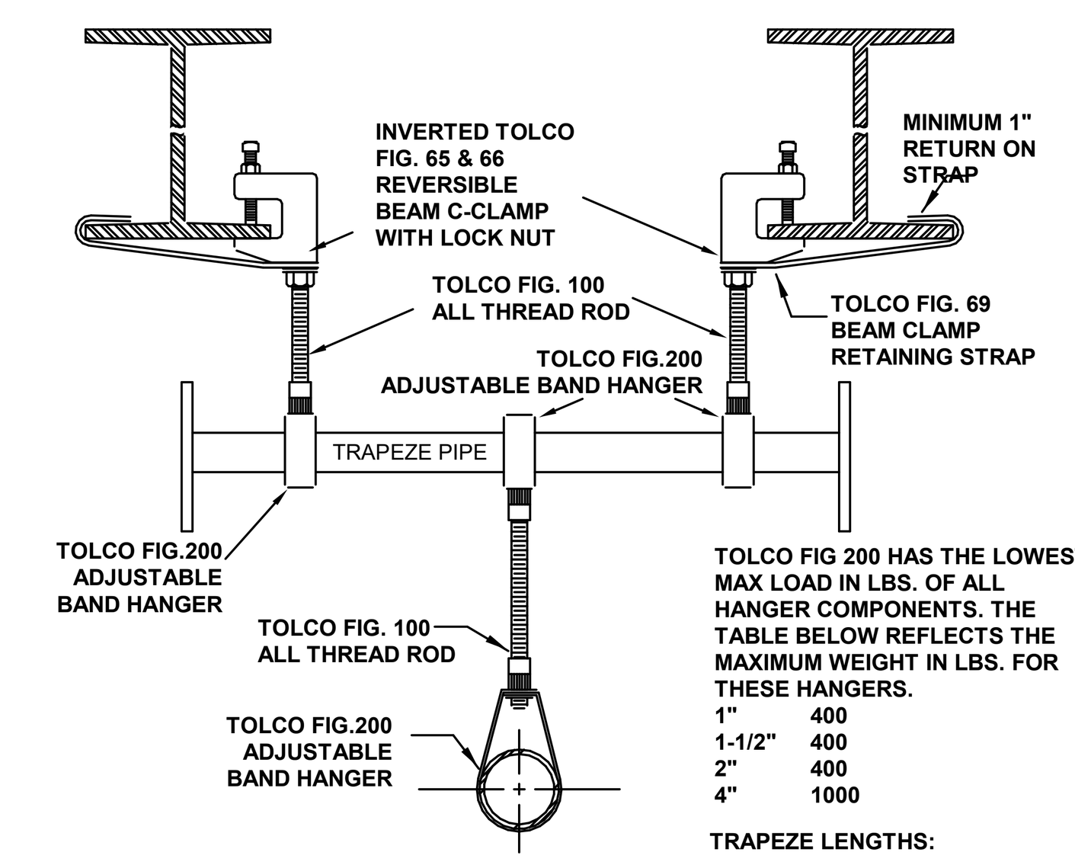
SLEEVE REQUIREMENTS PER NFPA 13 2016ed
9.3.4.3 WHERE CLEARANCE IS PROVIDED BY A PIPE SLEEVE, A NOMINAL DIAMETER 2 IN. (50 MM) LARGER THAN THE NOMINAL DIAMETER OF THE PIPE SHALL BE ACCEPTABLE FOR PIPE SIZES 1 IN. (25 MM) THROUGH 31/2 IN. (90 MM), AND THE CLEARANCE PROVIDED BY A PIPE SLEEVE OF NOMINAL DIAMETER 4 IN. (100 MM) LARGER THAN THE NOMINAL DIAMETER OF THE PIPE SHALL BE ACCEPTABLE FOR PIPE SIZES 4 IN. (100 MM) AND LARGER.
9.3.4.5 NO CLEARANCE SHALL BE REQUIRED IF FLEXIBLE COUPLINGS ARE LOCATED WITHIN 1 FT (300 MM) OF EACH SIDE OF A WALL OR IF THE REQUIREMENTS OF 9.3.2.3.1(2) ARE MET.

TYPICAL SLEEVE PENETRATION INSTALLATION DETAIL AND REQUIREMENTS
N.T.S.



TO BE USED TO ANCHOR SWAY BRACING IN PUMP HOUSE.

DRILLED SHALLOW CONCRETE ANCHOR
N.T.S.



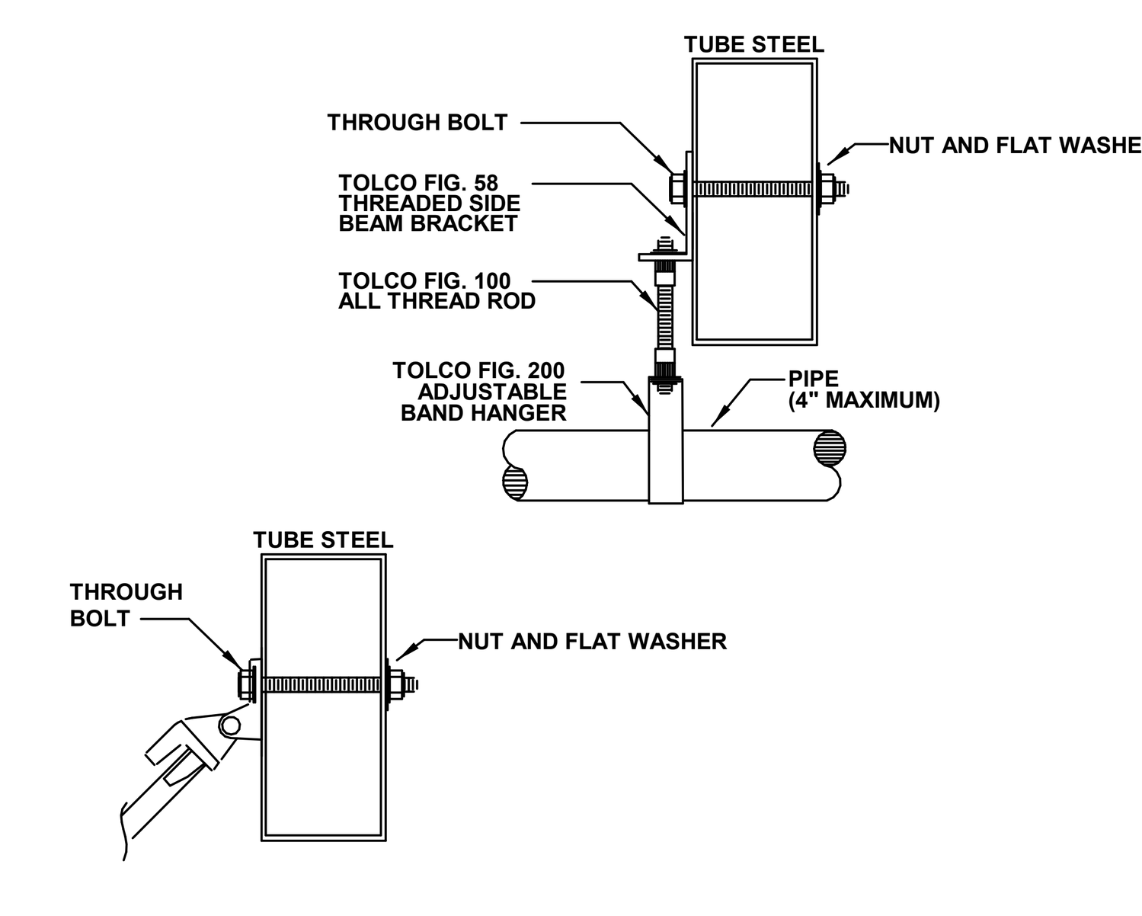
TOLCO FIG 200 HAS THE LOWEST MAX LOAD IN LBS. OF ALL HANGER COMPONENTS. THE TABLE BELOW REFLECTS THE MAXIMUM WEIGHT IN LBS. FOR THESE HANGERS.

1"	400
1-1/2"	400
2"	400
4"	1000

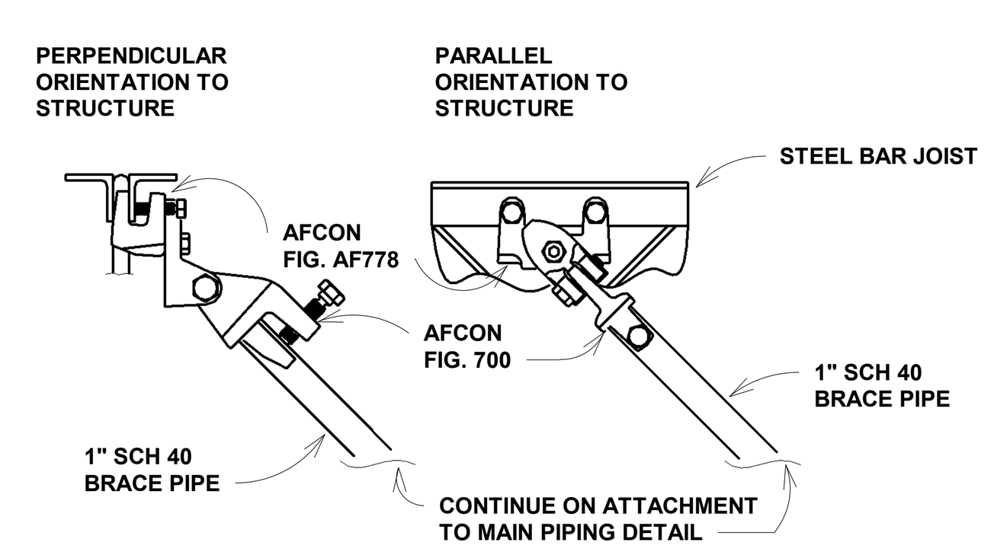
TRAPEZE LENGTHS:

TRAPEZE SYMBOL:
- 4" SCH 10 AT 6'-0
- MODULUS = 0.51
- MINIMUM TRAPEZE PIPE IS 2" SCH 40

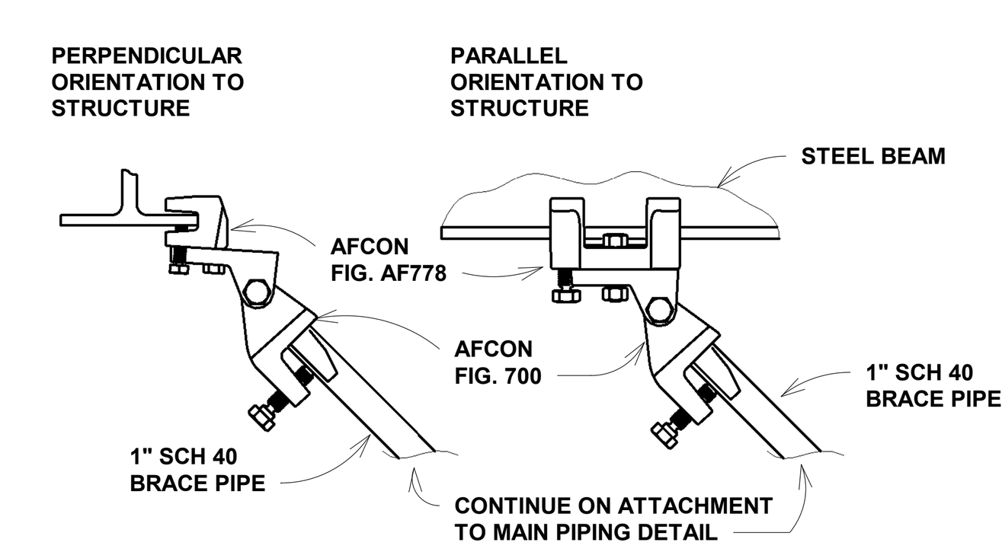
REVERSIBLE BEAM C-CLAMP WITH PIPE TRAPEZE HANGER
N.T.S.



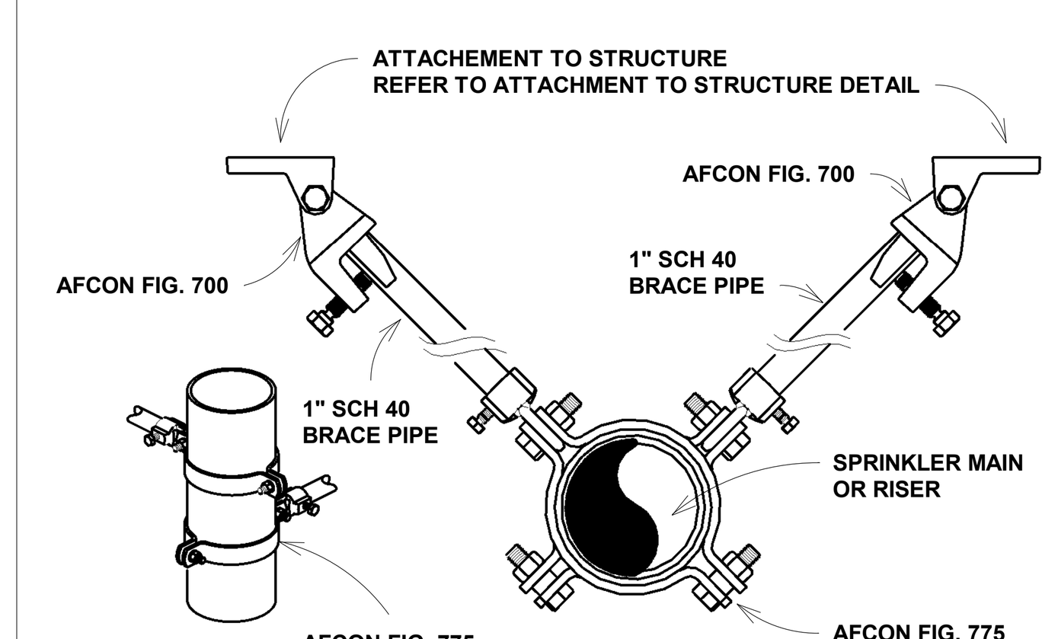
HSS HANGING AND BRACING ATTACHMENT TO STEEL
N.T.S.



AFCON FIG 700 / 775 ATTACHMENT TO STEEL BEAM FLANGE
N.T.S.



AFCON FIG 700 / 775 ATTACHMENT TO STEEL BAR JOIST
N.T.S.



AFCON FIG 700 / 775 4-WAY SWAY BRACE ATTACHMENT
N.T.S.

TABLE 9.2.2.1(a) MAXIMUM DISTANCE BETWEEN HANGERS (FT-IN.)

NOMINAL PIPE SIZE	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
STEEL PIPE	N/A	12-0	12-0	15-0	15-0	15-0	15-0	15-0	15-0	15-0
THREADED LIGHTWALL	N/A	12-0	12-0	12-0	12-0	12-0	12-0	N/A	N/A	N/A
COPPER TUBE	8-0	8-0	10-0	10-0	12-0	12-0	12-0	N/A	N/A	N/A
CPVC	5-6	6-0	6-6	7-0	8-0	9-0	N/A	N/A	N/A	N/A

FIGURE A.9.2.3.2.2 DISTANCE FROM SPRINKLER TO HANGER

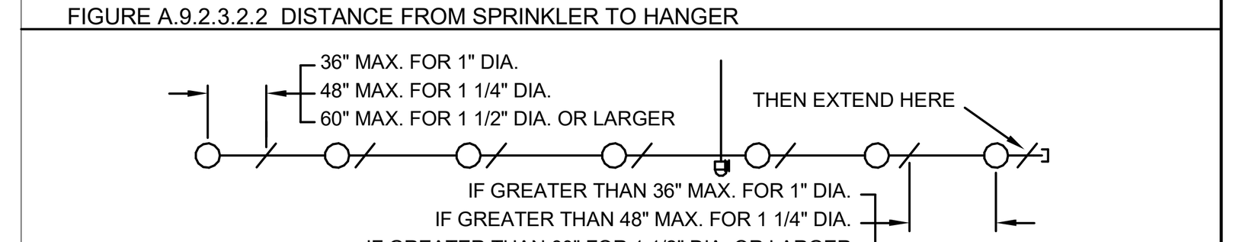


TABLE 9.1.2.1 HANGER ROD SIZE

PIPE SIZE	DIAMETER OF ROD	PIPE SIZE	DIAMETER OF ROD
UP TO AND INCLUDING 4"	3/8"	6" AND 8"	1/2"

NFPA HANGER SPACING TABLE
N.T.S.

Install a ball valve in line with the PAV to assist in servicing the strainer without disabling the sprinkler system.

1. Read and understand the instructions provided before you proceed with installation. The PAV shall be installed in accordance with local ordinances and the applicable NFPA13 standard.

2. The Engineer of Record should select the Model PAV, Potter Air Vent installation location. Usually at a point in the system that will vent the most air. Refer to piping plans for location.

3. The location of the PAV must not interfere with the spray pattern of any sprinkler head. The connection point must be off the top of the pipe. (See Fig. 1)

4. The piping must be level or pitch back toward the fire sprinkler system piping and arranged in such a manner that water will not become trapped. The outlet of the PAV contains a 1/2" male NPT threaded connection allowing the device to be piped to a drain or other suitable location if there are concerns about inadvertent water discharge.

5. Immediately after installation and filling of the fire sprinkler system, the PAV should be inspected for leaks and proper operation. The unit should be inspected periodically. Thereafter the manufacturer recommends quarterly or more frequently.

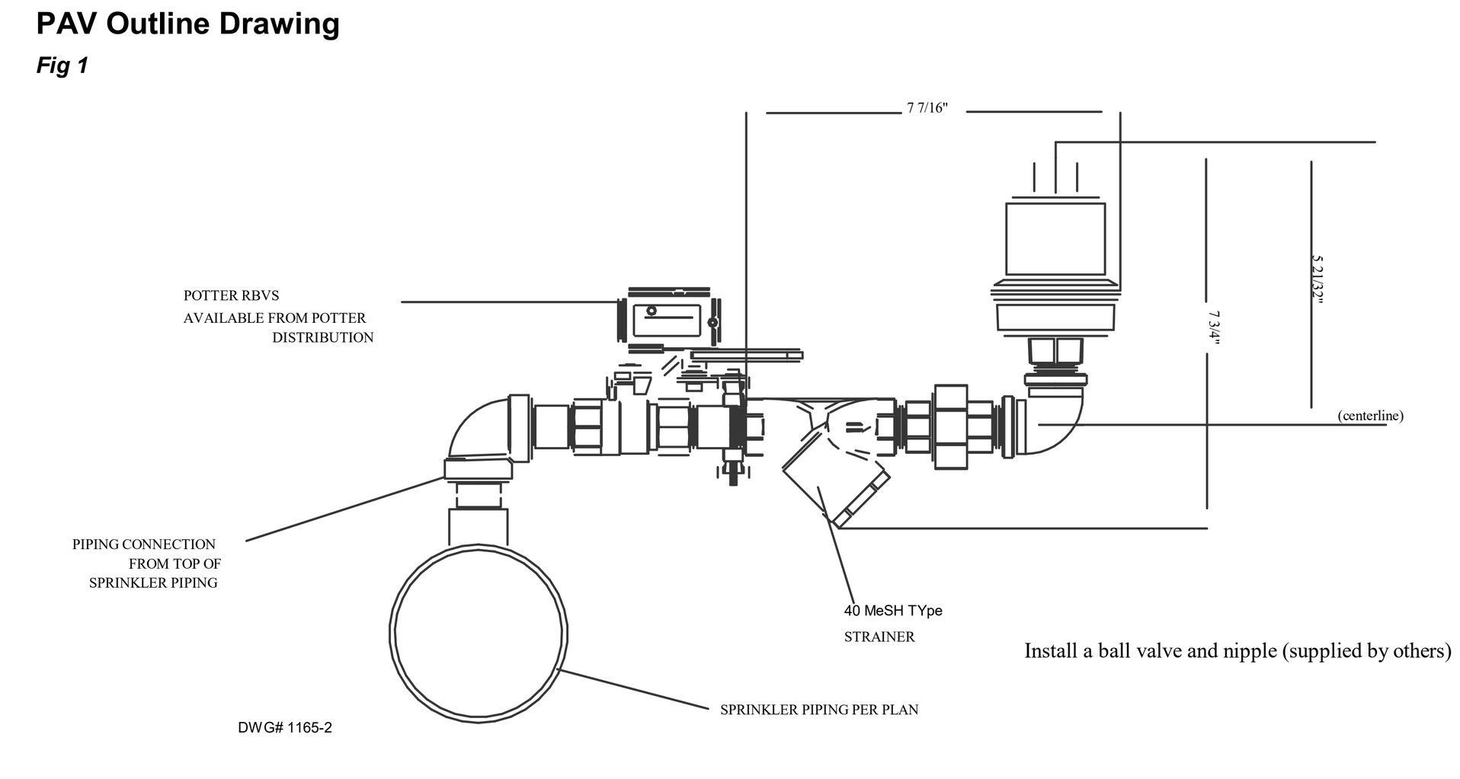
6. Inspection should include removal and cleaning of the strainer screen. Remove the screen and flush with clean water. Use a wire brush if necessary to remove any particles trapped in the screen.

PAV and Shutoff Valve Replacement

The vent used in the PAV is not field replaceable. If the vent should fail, the entire unit must be replaced.

PAV Outline Drawing

Fig 1

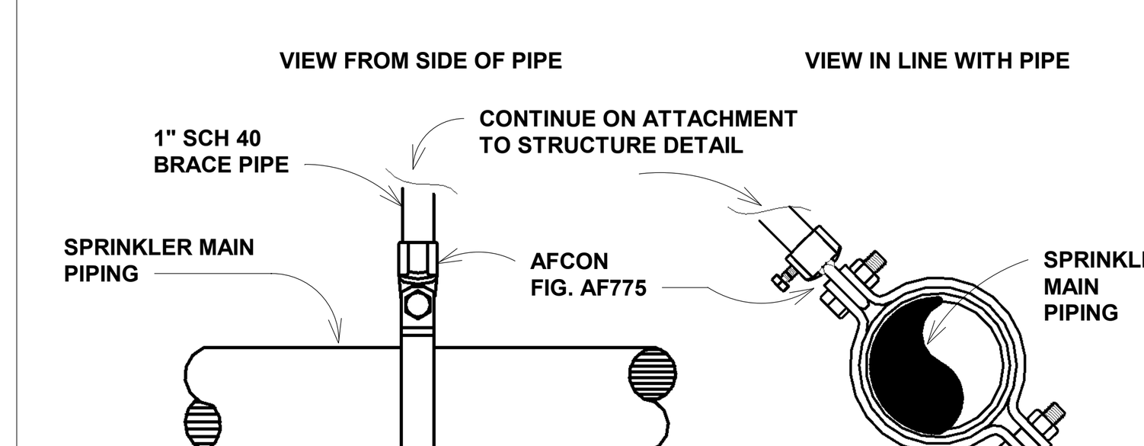


Install a ball valve and nipple (supplied by others)

DWG# 1165-2

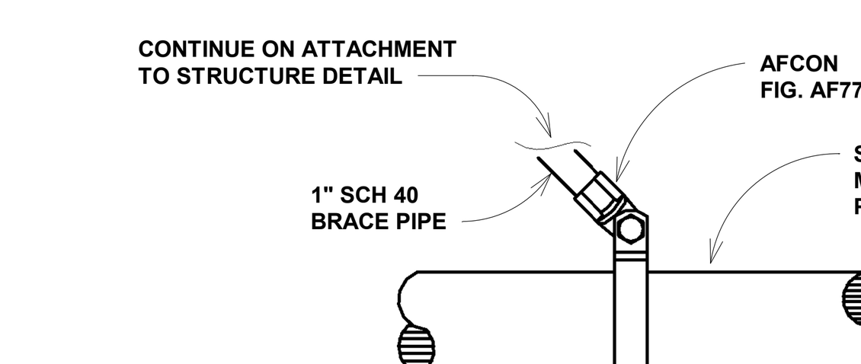
AIR VENT DETAIL
N.T.S.

Potter Electric Signal Company, LLC • St. Louis, MO • Phone: 800-325-3936 • www.pottersignal.com



LATERAL SWAY BRACE ATTACHMENT
N.T.S.

SYMBOL ON PLANS



LONGITUDINAL SWAY BRACE ATTACHMENT
N.T.S.

SYMBOL ON PLANS

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MARK	DATE	DESCRIPTION
2	12-13-2022	ADDENDUM 2
B	11/1/22	DSA BACKCHECK

TETER, LLP
FRESNO HEADQUARTERS
VISALIA | BAKERSFIELD | MODESTO | SAN LUIS OBISPO
ARCHITECTS ENGINEERS CONNECTED

TETER

TULARE CAMPUS CTE
COLLEGE OF THE SEQUOIAS
4999 E. BARDSLEY AVE.
TULARE, CA

DRAWING TITLE
FIRE PROTECTION - DETAILS

PROJECT NO.
19-12032

DRAWING
FP501