BRUGG PIPE SYSTEMS
FLEXIBLE PIPE
STANDARD
INSTALLATION DETAILS

DRAWING INDEX

NOTE:

IT IS IMPERATIVE THAT A BRUGG REPRESENTATIVE PERFORM THE END TERMINATIONS, TEST THE PIPE AND VACUUM MONITORING SYSTEM SHALL BE LISTED WITH THE NATIONAL WORK GROUP OF LEAK DETECTION EQUIPMENT OR THE WARRANTY WILL BE VOIDED.

NOTES:

1. PIPE SUPPORTS OFFERED IN THIS SECTION ARE DESIGNED TO SUPPORT PIPE FROM A BASE STRUCTURE WHERE VERTICAL ADJUSTMENT MAY BE REQUIRED. PIPE GUIDES AND SLIDES ARE DESIGNED TO ALLOW LONGITUDINAL MOVEMENT DUE TO THERMAL EXPANSION AND CONTRACTION OF PIPE.

2. PIPE SUPPORT SYSTEMS PROVIDED HEREIN ARE GENERIC IN NATURE. CONTRACTOR/INSTALLER SHALL BE RESPONSIBLE FOR PROVIDING THE ENGINEER OF RECORD OR THE BUILDING ARCHITECT/ENGINEER WITH ACTUAL MATERIAL DATA AND SPECIFICATIONS FOR THE SYSTEMS INTENDED FOR USE IN THE FORM OF CUT SHEETS AND SHOP DRAWINGS INDICATING INTENDED SPACING, LAYOUT AND FASTENING.

3. CARE SHALL BE TAKEN TO FOLLOW PIPE SUPPORT MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION REQUIREMENTS DURING SITE PREPARATION AND INSTALLATION.

4. PIPE SUPPORT SPACING SHALL BE DETERMINED BY MANUFACTURER'S RECOMMENDATIONS DEFINED BY PIPE SIZE AND TYPE AND SHALL BE INDICATED FOR ENGINEER'S REVIEW.

5. WHEN INSTALLING PIPING SUPPORTS CONTRACTOR/INSTALLER SHALL CONSIDER THE USE OF PROTECTION SHIELDS AND SADDLES DESIGNED TO PREVENT DAMAGE TO PIPE AND PIPE INSULATION.

6. PIPING SHALL BE INSTALLED WITH INSULATION WHERE CLIMATE DICTATES THE POSSIBILITY OF FREEZING.

7. INSULATED PIPING SHOULD BE INSTALLED W/ HIGH DENSITY INSERTS AT SUPPORT/CLAMP LOCATIONS TO PROTECT PIPING AND INSULATION OR INSULATION IN THE AREAS OF EACH SUPPORT SHALL ENCAPSULATE ENTIRE CLAMP AREA WITH PIPE CLAMP BEARING DIRECTLY ON PIPE (BENEATH INSULATION).

8. WHEN INSTALLED ABOVE GROUND PIPING MUST BE PROTECTED FROM ANY DAMAGE DUE TO TRAFFIC, VEHICULAR OR PEDESTRIAN TRAFFIC, CONSTRUCTION ACTIVITY OR ANY OTHER ACTIVITY WHICH MIGHT IMPACT, SCRAPE, PUNCTURE OR CRUSH THE PIPE.

9. PIPING RESTRAINTS ARE RECOMMENDED TO BE INSTALLED AS "CUSH–A–CLAMP" CLAMPS MOUNTED UPON STRUTS MOUNTED EITHER DIRECTLY TO DECK OR ON PIPE SUPPORTED TRAYS AS INDICATED HEREIN.

10. WHEN INSTALLING PIPING RUNS BELOW DECKING OR ANY OTHER SURFACES IN WHICH THERE IS THE POTENTIAL FOR DAMAGE DUE TO PUNCTURE OR PENETRATION FROM ABOVE, IT IS RECOMMENDED THAT INSTALLER PROVIDE ADEQUATE SPACING BELOW SURFACE OR SOME FORM OF BARRIER TO PROTECT PIPE FROM ACCIDENTAL PUNCTURE OR DAMAGE.

11. IT IS RECOMMENDED THAT MANUFACTURER'S INSTALLATION RECOMMENDATIONS BE FOLLOWED. IF MANUFACTURER'S INSTALLATION RECOMMENDATIONS CONFLICT WITH DIRECTIONS PROVIDED HEREIN, THE MANUFACTURER'S RECOMMENDATIONS SHALL TAKE PRECEDENT.

12. PIPE SUPPORTS INDICATED HEREIN HAVE BEEN PROVIDED AS A RECOMMENDED STANDARD PRACTICE TO SERVE AS A GUIDELINE FOR GENERAL CONTRACTORS, ESTIMATORS AND PIPING INSTALLERS. FOR LONG RUNS OF CONTINUOUS PIPING CABLE ROLLERS MAY BE REQUIRED TO ALLOW FOR MULTIPLE CHANGES IN DIRECTION AND OR SHARP TURNS IN WHICH EXPANSION CONSIDERATIONS MAY BE A CONCERN.

13. STRUT ANCHORING SHALL CONFORM TO THE REQUIREMENTS OF LOCAL CODE AND SEISMIC CONSIDERATIONS. THIS INFORMATION SHALL BE PRESENTED TO THE ENGINEER OF RECORD FOR REVIEW AS A SHOP DRAWING SUBMITTAL.

14. A PLANS & DETAILS INDICATING ANY PENETRATIONS IN ROOFING OR EXISTING FLOORS, CEILINGS, ROOFS, WALLS OR SLABS OF ANY MATERIAL MUST BE SUBMITTED TO BUILDING ARCHITECT/ENGINEER PRIOR TO INSTALLATION. THIS SUBMITTAL SHALL PROVIDE METHOD OF WATERPROOFING, FLASHING OR SEALING AS REQUIRED TO ASSURE PROTECTION OF EXISTING STRUCTURES, EQUIPMENT OR SYSTEMS.

15. PRIOR TO PIPING INSTALLATION CONTRACTOR SHALL PROVIDE A PIPE SUPPORT PLAN TO ENGINEER OF RECORD AND BUILDING ARCHITECT OR ENGINEER FOR APPROVAL OF SYSTEM. SUBMITTAL SHALL INCLUDE CONSIDERATIONS AND OR CALCULATIONS INDICATING CONFORMANCE WITH LOCAL REQUIRED SEISMIC CONSIDERATIONS.

16. N.D. ERYOU, PHD, PE – CONSULTING ENGINEER SHALL NOT BE HELD LIABLE FOR ANY DAMAGE ARISING FROM IMPROPERLY INSTALLED EQUIPMENT OR PIPING.

17. REQUIREMENTS NECESSARY FOR THE STRENGTH, STABILITY OR PROPER OPERATION OF AN EXISTING OR PROPOSED INSTALLATION, OR FOR THE PUBLIC SAFETY, HEALTH AND GENERAL WELFARE, NOT SPECIFICALLY COVERED BY THE INFORMATION PROVIDED HEREIN, SHALL BE DETERMINED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

18. DUE TO THE FLEXIBILITY INHERENT IN THE BRUGG FLEXWELL PIPING SYSTEM, CALCULATED SEISMIC FORCES HAVE BEEN FOUND TO BE INSIGNIFICANT. THE FLEXIBLE PIPE HAS EXTENSIVE DAMPING CAPABILITY AND FLEXIBILITY SUCH THAT SEISMIC FORCES WILL BE NEARLY ZERO. STANDARD PIPE SUPPORTS WILL ADEQUATELY HANDLE THE APPLIED LOADS.

ISSUES/REVISIONS

No.	Description	Date

NOTICE

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Consulting Engineering Engineer
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NAPLES, FL 34103

CLIENT:
BRUGG PIPESYSTEMS
Flexible solutions

Core engineered solutions
safety. compliance. reliability.

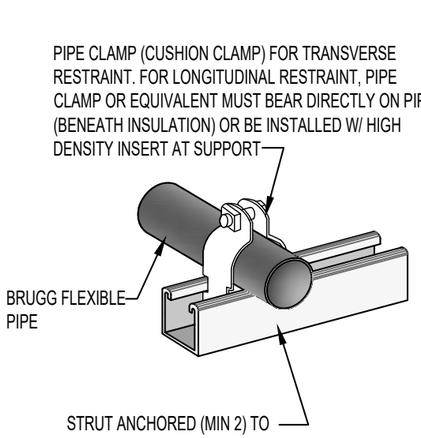
PROJECT:
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD
INSTALLATION DETAILS

COVER SHEET

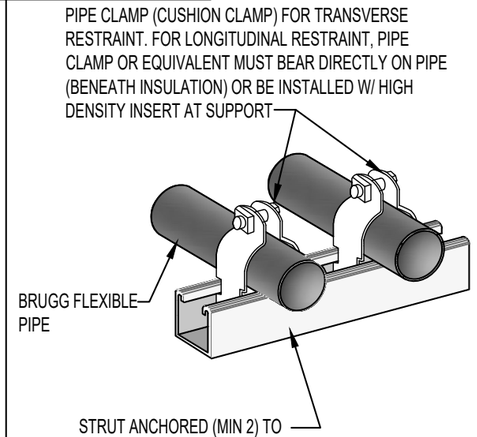
SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D–000
CADD FILE NO. 022114

NOTE: PROVIDE FLASHING AND SEALANT AS REQUIRED FOR WEATHERPROOFING, TYP.



SINGLE

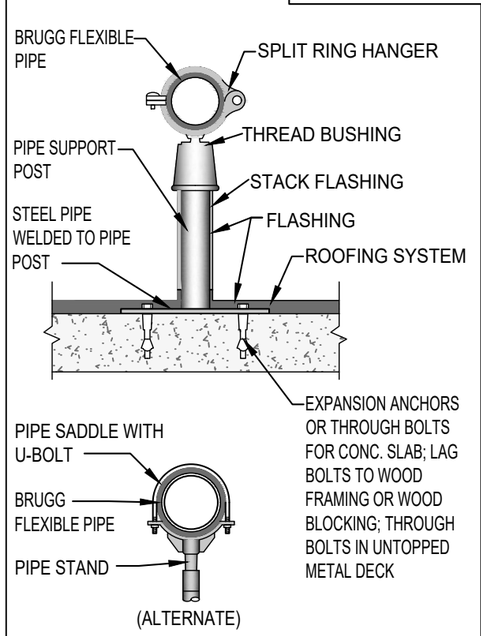


MULTIPLE

EXTERIOR ROOF- STRUT MOUNT PIPE SUPPORTS

SCALE: 3/4" = 1'

NOTE: PROVIDE FLASHING AND SEALANT AS REQUIRED FOR WEATHERPROOFING, TYP.



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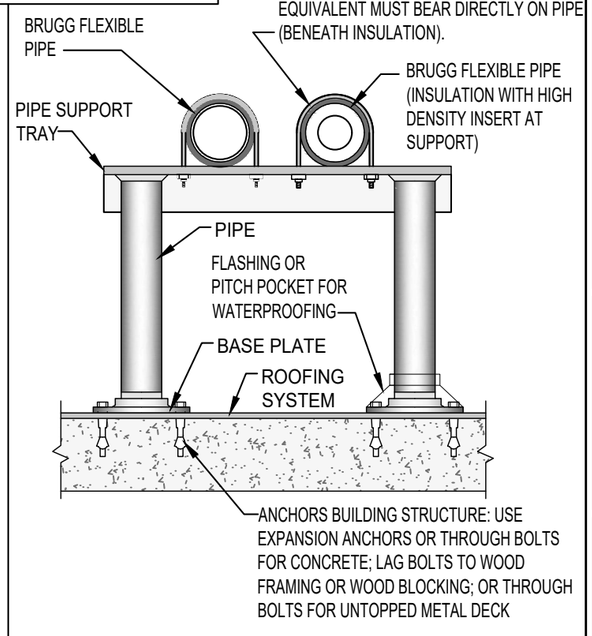
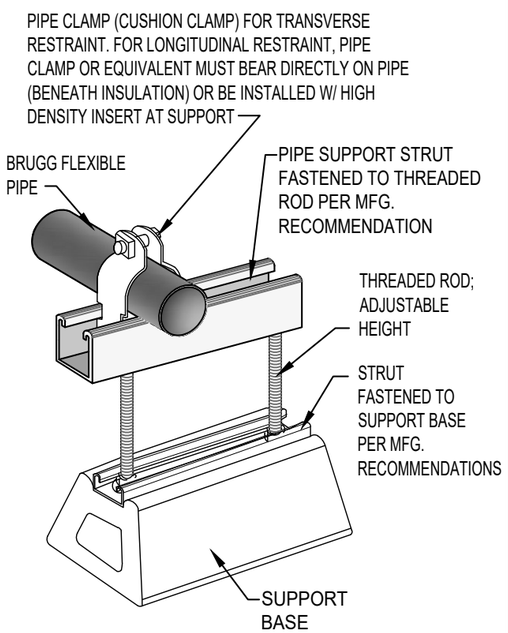


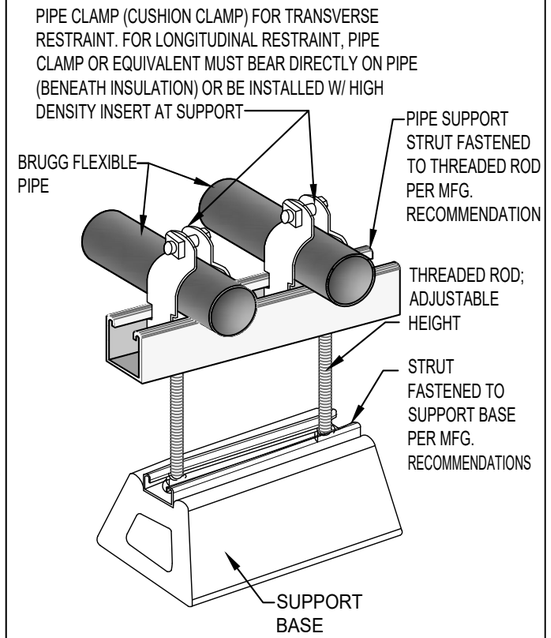
MULTIPLE

ROOF- TRAY MOUNT PIPE SUPPORTS

SCALE: 3/4" = 1'



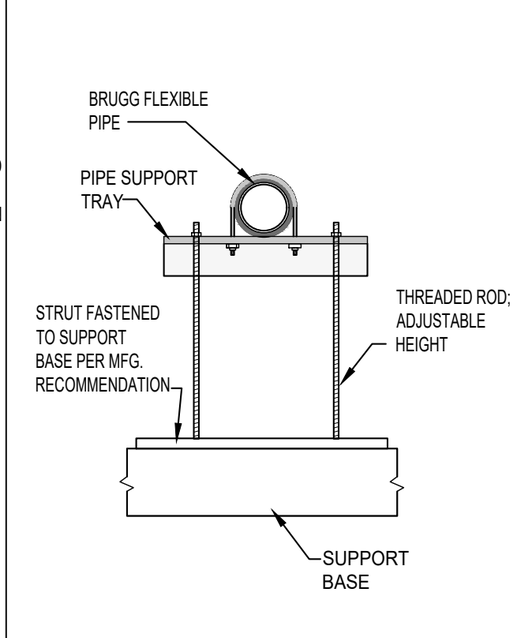
SINGLE PIPE



MULTIPLE PIPES

STRUT MOUNT PIPE SUPPORTS

SCALE: 3/4" = 1'



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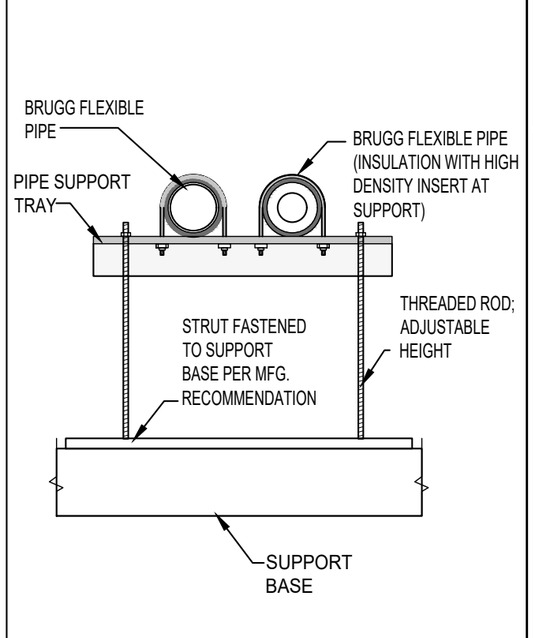

MULTIPLE

INTERIOR FLOOR- TRAY MOUNT PIPE SUPPORTS

SCALE: 3/4" = 1'

ISSUES/REVISIONS

No.	Description	Date

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CLIENT:

BRUGG PIPESYSTEMS
Flexible solutions

Core engineered solutions
safety. compliance. reliability.

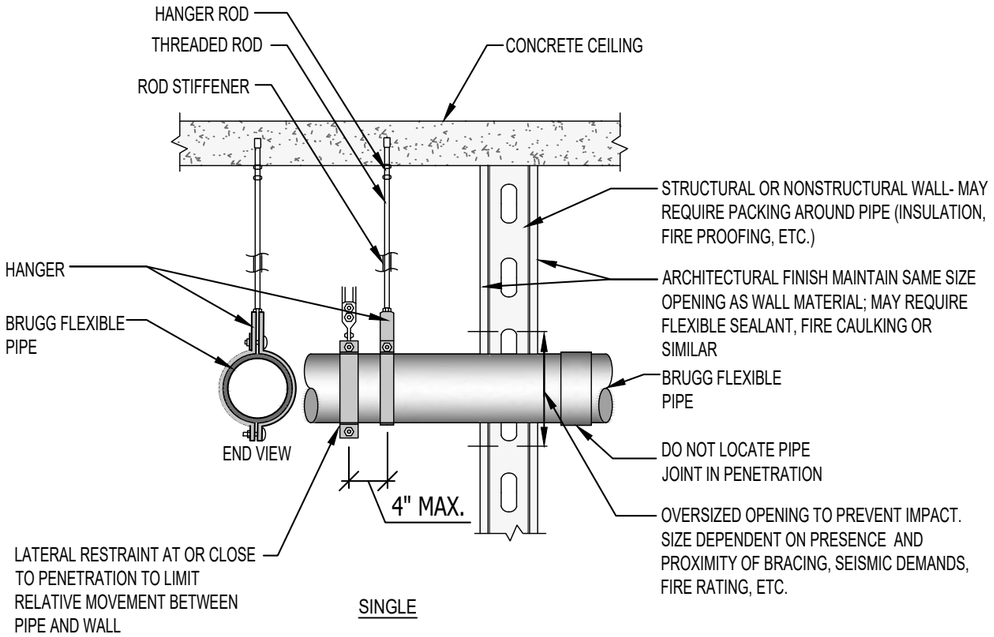
PROJECT:

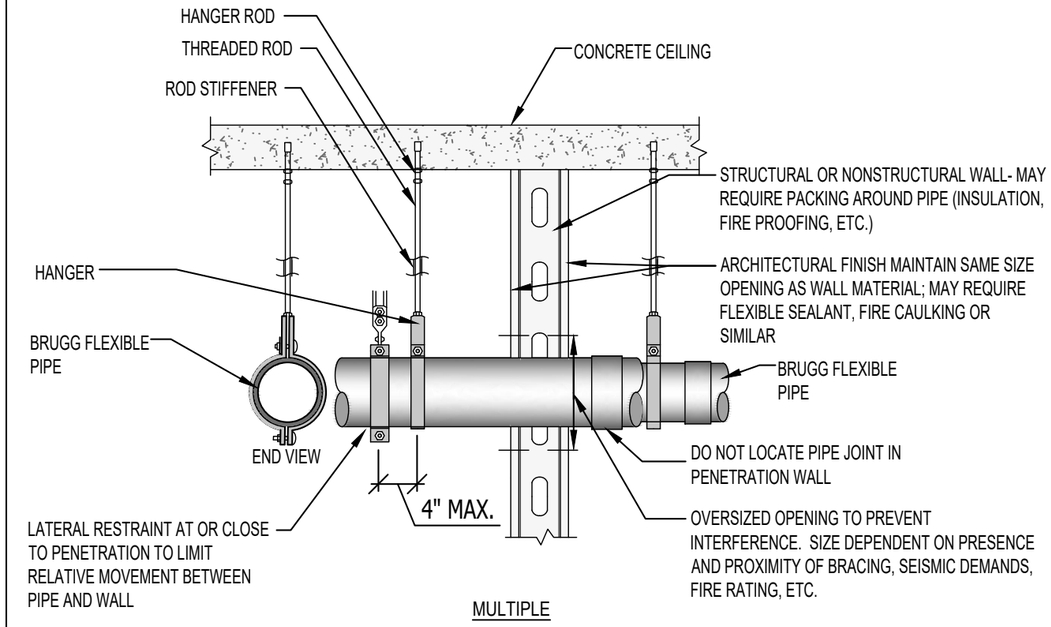
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

EXTERIOR ROOF MOUNT & INT. FLOOR MOUNT PIPE SUPPORT DETAILS

SEAL & SIGNATURE

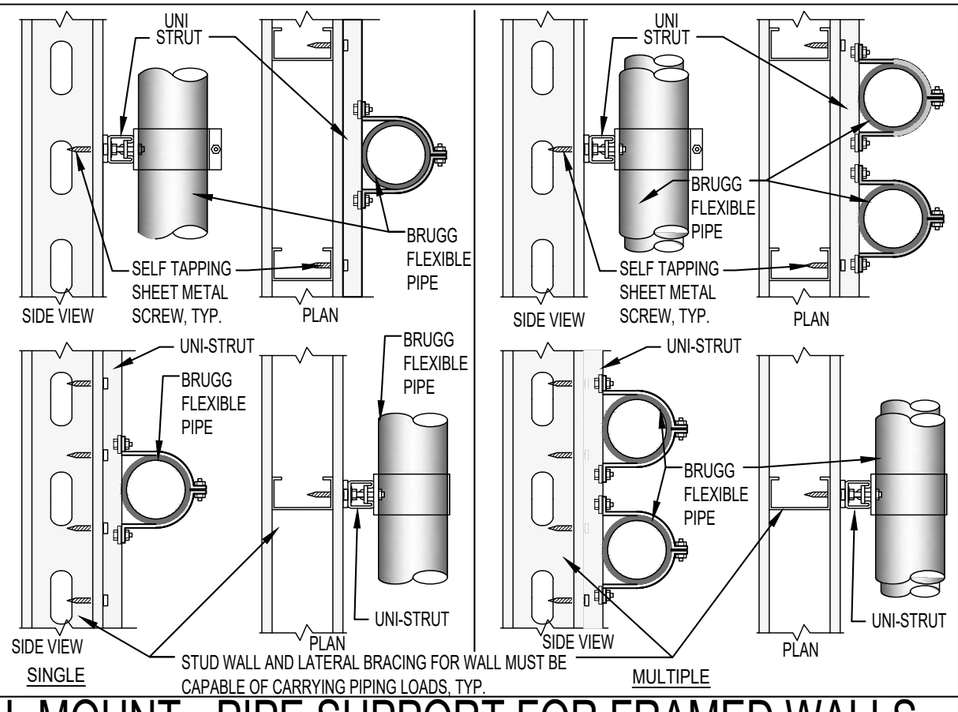
DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D-100
CADD FILE NO. 022114



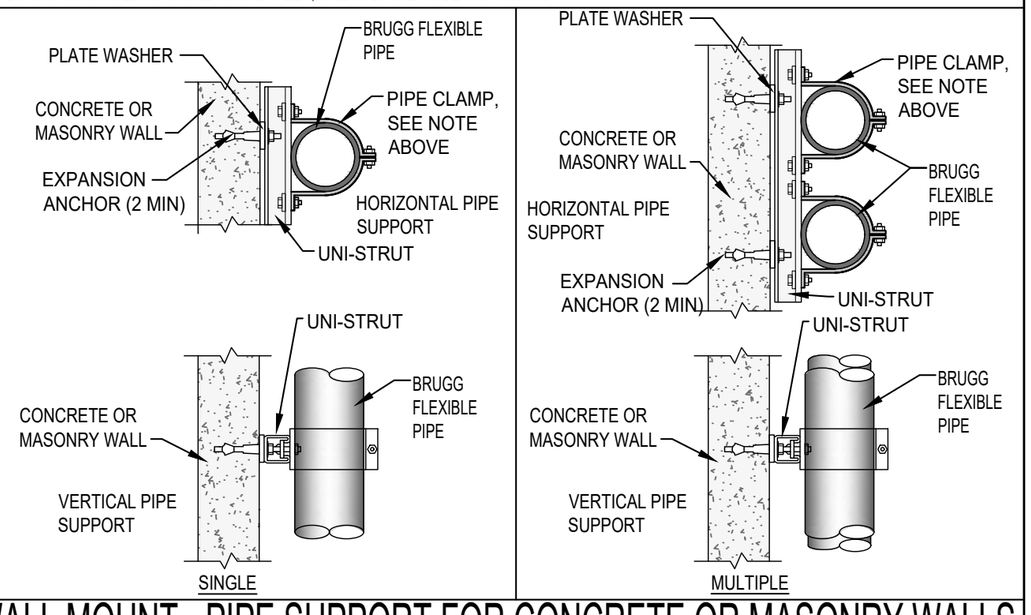


CEILING MOUNT-PIPE HANGER SUPPORTS

SCALE: 3/4" = 1'



NOTE: RISERS MUST BE DESIGNED TO ACCOMODATE RELATIVE EXPANSION AND CONTRACTION BETWEEN THE PIPING AND THE STRUCTURE, AS WELL AS SEISMIC DEMANDS. WHERE RESTRAINT IS PROVIDING TO RESIST LATERAL FORCES ONLY (I.E. A PIPE "GUIDE") USE U-BOLTS OR CLAMPS THAT ALLOW FOR MOVEMENT IN THE LONGITUDINAL DIRECTION. LATERAL RESTRAINTS FOR PIPE RISERS MAY BE REQUIRED AT ALTERNATE FLOORS OR SPACED NO MORE THAN 20 FEET, CHECK LOCAL CODE PROVISIONS



WALL MOUNT - PIPE SUPPORT FOR FRAMED WALLS

SCALE: 3/4" = 1'

WALL MOUNT - PIPE SUPPORT FOR CONCRETE OR MASONRY WALLS

SCALE: 3/4" = 1'

ISSUES/REVISIONS

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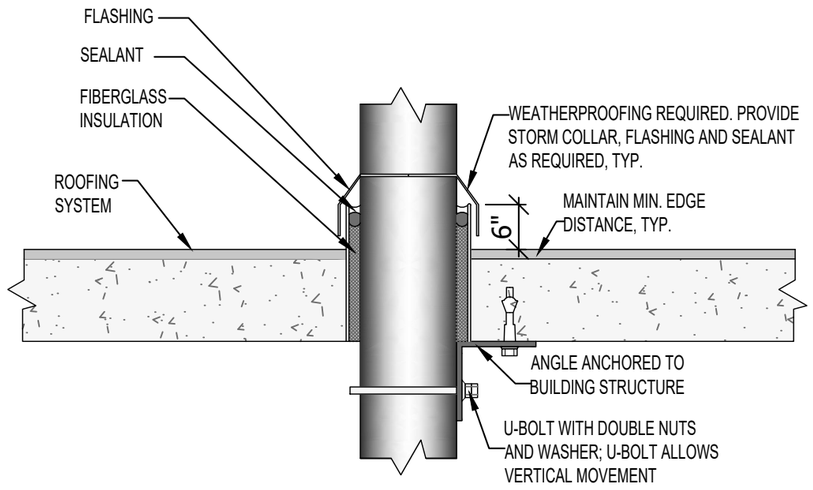
Core engineered solutions safety. compliance. reliability.

PROJECT: BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

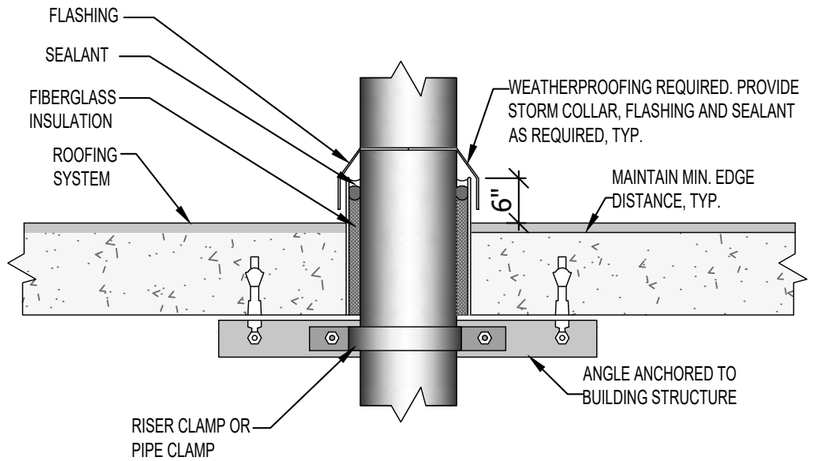
CEILING MOUNT & WALL MOUNT PIPE SUPPORT DETAILS

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D–200
CADD FILE NO. 022114



AXIALLY UNRESTRAINED MOUNTING

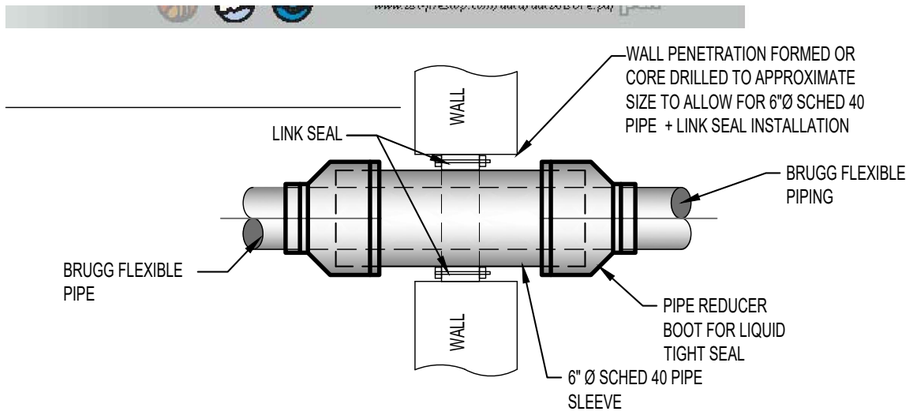


AXIALLY RESTRAINED MOUNTING

ROOF PENETRATION DETAILS

NTS

REFERENCE PHOTO - LINK-SEAL SYSTEM



NOTES:

1. LINKSEAL, MODULAR LINK, PIPE PENETRATION SYSTEMS SHALL BE INSTALLED TO ASSURE A PERMANENT SEAL AGAINST THE ENTRY OF WATER, SOIL OR BACKFILL MATERIALS. ONLY WALL, FLOOR OR CEILING PENETRATIONS AR RISK OF WATER, SOIL OR BACKFILL PENETRATION SHOULD BE INSTALLED WITH THIS SYSTEM, UNLESS SPECIFICALLY DIRECTED TO DO SO BY AHJ, EOR OR OWNER.

2. IN SOME INSTANCES THE AHJ, EOR OR OWNER MAY REQUEST THAT THE LINK SEAL SYSTEM BE INSTALLED WITH A "PSI" CONPENSATING WALL PENETRATION SEAL". THESE SEALS ARE USED TO GATHER & COMPENSATE FOR LARGE RADIAL & AXIAL MOVEMENTS OF PIPE LINES & PROVIDES ADDITIONAL HYDROSTATIC PRESSURE RESISTANCE. IN SOME INSTANCES THE PURPOSE FOR THIS BOOT MAY BE PURELY AESTHETIC.

3. LINK SEAL OFFERS A 1 HOUR FIRE RESISTANT VERSION OF THEIR MODULAR LINK SYSTEM (SILICONE MODEL T) .HOWEVER THE FIRE RESISTANCE RATING CERTIFICATION IS PROVIDED BY "FACTORY MUTUAL" WHICH MAY OR MAY NOT BE ACCEPTED BY THE AUTHORITY HAVING JURISDICTION AS A UL CERTIFICATION IS TYPICALLY REQUIRED FOR FIRE RATED ASSEMBLIES. AS SUCH, THE THIRD PARTY FIRE STOPPONG IS GENERALLY RECOMMENDED FOR USE IN PROVIDING A CODE COMPLIANT UL CERTIFIED FIRE RATING @ PIPE PENETRATIONS, SUCH AS 3M FIRE BARRIER SEALANT, INSTALLED PER MFG RECOMMENDATIONS OR APPROVED EQUAL ARE RECOMMENDED.

WATERPROOF WALL PIPE PENETRATION DETAILS

NTS

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No.	Description	Date

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Core engineered solutions safety. compliance. reliability.

PROJECT:
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

WALL PENETRATION DETAILS

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D–300
CADD FILE NO. 022114

LIQUID TIGHT
Core RigidFlex Entry Fittings for BRUGG Pipe

Penetration with Boot				
BRUGG Flexwell-HL Pipe: Direct Thru Sump	Pipe O.D. (Inches)	Hole Saw Size (Hole I.D.) (Inches)	Sump Fitting O.D. (Inches)	Split Insert (2-Per Fitting)
HL-30/48 (1.0-Inch)	1.9	5.5	6.9	3.5X1.9
HL-48/71 (1.5-Inch)	2.8	6.625	8.3	4.5X2.8
HL-60/83 (2.0-Inch)	3.3	6.625	8.3	4.5X3.3
HL-98/134 (3.0-Inch)	5.3	6.625	8.3	N/A

Sleeve with Boot		
BRUGG Flexwell-HL Pipe: Thru 6-Inch Sleeve	Pipe O.D. (Inches)	Split Insert (1-Per Fitting)
HL-30/48 (1.0-Inch)	1.9	4.5X1.9
HL-48/71 (1.5-Inch)	2.8	4.5X2.8
HL-60/83 (2.0-Inch)	3.3	4.5X3.3

Sleeve with Boot		
BRUGG Flexwell-HL Pipe: Thru 4-Inch Sleeve	Pipe O.D. (Inches)	Split Insert (1-Per Fitting)
HL-30/48 (1.0-Inch)	1.9	3.5X1.9
HL-48/71 (1.5-Inch)	2.8	4.5X2.8
HL-60/83 (2.0-Inch)	3.3	4.5X3.3

TYPICAL TRANSITION SUMP FOR BRUGG VERTICAL PIPE TO STEEL HORIZONTAL PIPE

ISSUES/REVISIONS

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PROJECT:
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

CORE RIGIDFLEX ENTRY FITTINGS

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D–400
CADD FILE NO. 022114

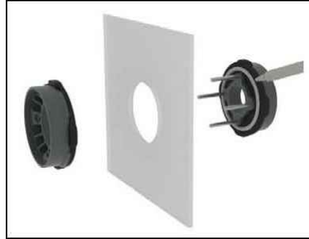
Core RigidFlex® Entry Fittings - Installation Instructions

(for Flat or Curved Single-Wall Sumps)

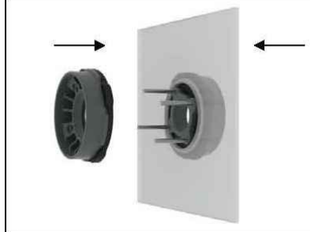
STEP 1 Using a hole saw, cut the appropriate size hole in the sump wall at the location of the pipe entry. Clean surface area around the hole where fitting gaskets will make contact.

- For Small Housing Fittings - 3 ½ " Hole Saw
- For Medium Housing Fittings - 5 ½ " Hole Saw
- For Large Housing Fittings - 6 5/8" Hole Saw

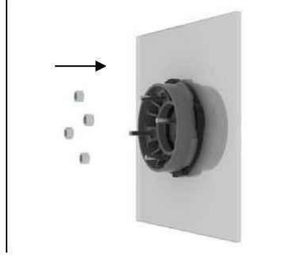
STEP 2 Apply a ¼" bead of gasket sealant on both inside and outside gasket surfaces.



STEP 3 Slide the exterior housing with the embedded bolts through the hole in the sump wall with the bolts facing the interior of the sump. Ensure the fitting is properly centered in the hole. Install the interior housing over the bolts and snap together.



STEP 4 Install the 7/16" locknuts over the bolts and tighten in a star pattern until both gaskets are fully seated evenly and tightly against the sump wall. Tighten nuts to approximately 65-75 inch lbs.



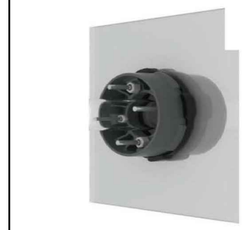
Core Engineered Solutions, Inc.

P: 703.563.0320 F: 703.563.0330 E: info@core-es.com www.core-es.com

Core RigidFlex® Entry Fittings - Installation Instructions

(for Flat or Curved Single-Wall Sumps)

STEP 5 **NOTE: The pipe or conduit should enter the fitting as straight as possible with no more than 12° angle unless otherwise accommodated with a parts specification. If an angled entry is desired, a larger housing may be necessary. Please contact Icon for information.**



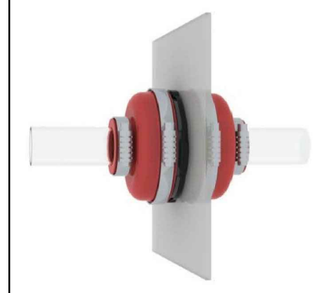
STEP 6 **In the order depicted, slide the exterior boot over the pipe and then insert the pipe through the fitting housing into the sump. Seat the exterior boot completely onto the exterior housing cuff.**

Repeat this process for the interior sump boot by sliding it over the pipe and seating it onto the interior housing cuff.

NOTE: If a separate insert is included in the kit, although not required, it is recommended that you apply FastFuse bonding glue to the mouth of the boot and around the sides of the insert right before pushing it into the boot to provide a more solid secure seal. No cure time is required.

STEP 7 **Install band clamps on each boot and tighten to approximately 65 inch lbs or until securely tight. Unless a filled boot option has been specified, you are now completed and ready to test.**

NOTE: If the fitting has a filled boot option, you can now dispense the filler material into one of the two ports provided in the boot. Rotate the vent port to the 12:00 position. When completed you are ready to test. No cure time is required to proceed to testing afterwards.



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ISSUES/REVISIONS

No.	Description	Date

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CLIENT: BRUGG PIPESYSTEMS Flexible solutions

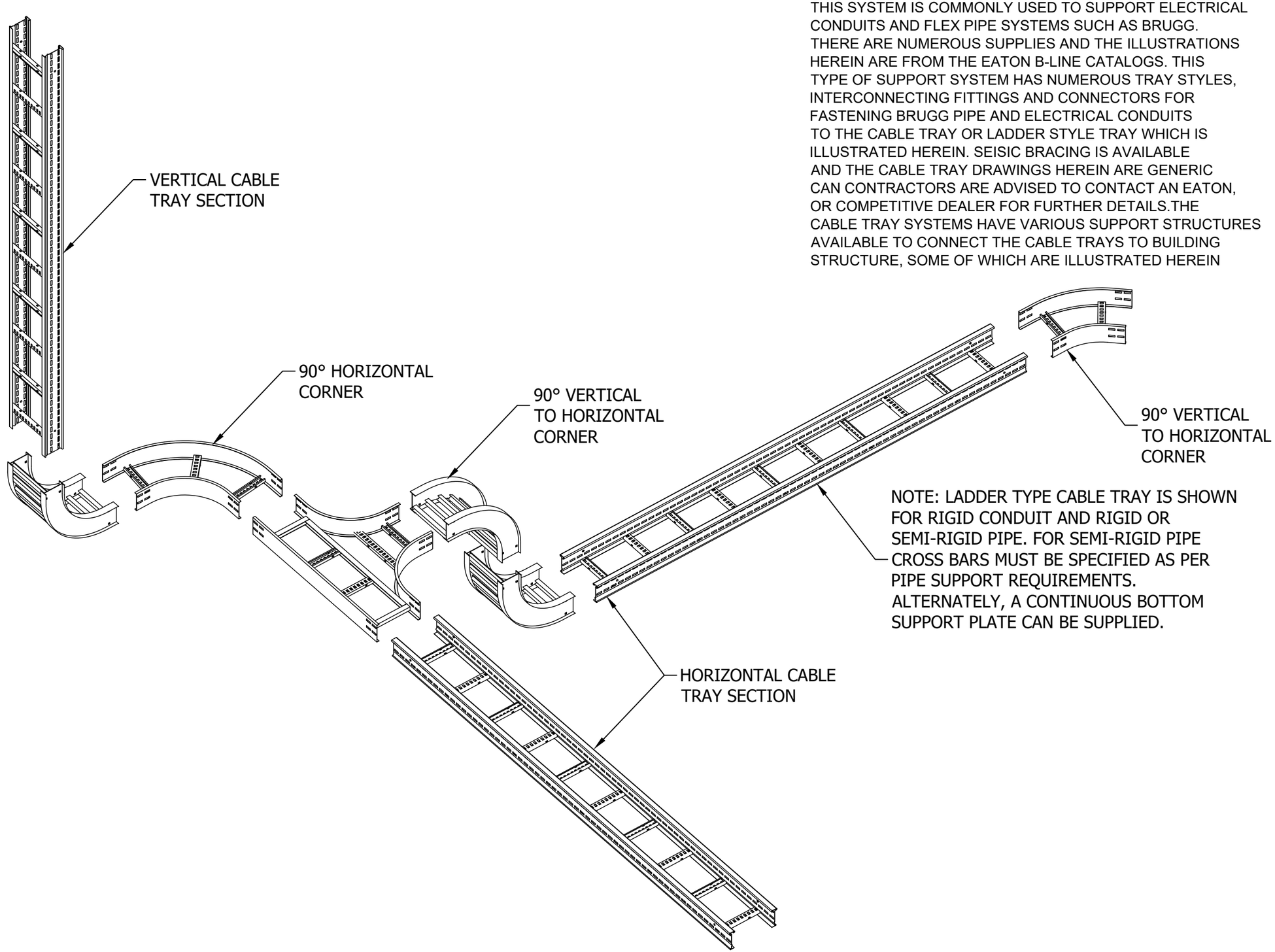
PROJECT: BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD
INSTALLATION DETAILS

ENTRY FITTING INSTALLATION INSTRUCTIONS

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D–410
CADD FILE NO. 022114

CABLE TRAY SYSTEM:
THIS SYSTEM IS COMMONLY USED TO SUPPORT ELECTRICAL CONDUITS AND FLEX PIPE SYSTEMS SUCH AS BRUGG. THERE ARE NUMEROUS SUPPLIES AND THE ILLUSTRATIONS HEREIN ARE FROM THE EATON B-LINE CATALOGS. THIS TYPE OF SUPPORT SYSTEM HAS NUMEROUS TRAY STYLES, INTERCONNECTING FITTINGS AND CONNECTORS FOR FASTENING BRUGG PIPE AND ELECTRICAL CONDUITS TO THE CABLE TRAY OR LADDER STYLE TRAY WHICH IS ILLUSTRATED HEREIN. SEISIC BRACING IS AVAILABLE AND THE CABLE TRAY DRAWINGS HEREIN ARE GENERIC CAN CONTRACTORS ARE ADVISED TO CONTACT AN EATON, OR COMPETITIVE DEALER FOR FURTHER DETAILS.THE CABLE TRAY SYSTEMS HAVE VARIOUS SUPPORT STRUCTURES AVAILABLE TO CONNECT THE CABLE TRAYS TO BUILDING STRUCTURE, SOME OF WHICH ARE ILLUSTRATED HEREIN



NOTE: LADDER TYPE CABLE TRAY IS SHOWN FOR RIGID CONDUIT AND RIGID OR SEMI-RIGID PIPE. FOR SEMI-RIGID PIPE CROSS BARS MUST BE SPECIFIED AS PER PIPE SUPPORT REQUIREMENTS. ALTERNATELY, A CONTINUOUS BOTTOM SUPPORT PLATE CAN BE SUPPLIED.

ISSUES/REVISIONS

No.	Description	Date

NOTICE

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Consulting Engineering Engineer
5051 CASTELLO DRIVE SUITE 244
NAPLES, FL 34103

CLIENT:
BRUGG PIPESYSTEMS
Flexible solutions

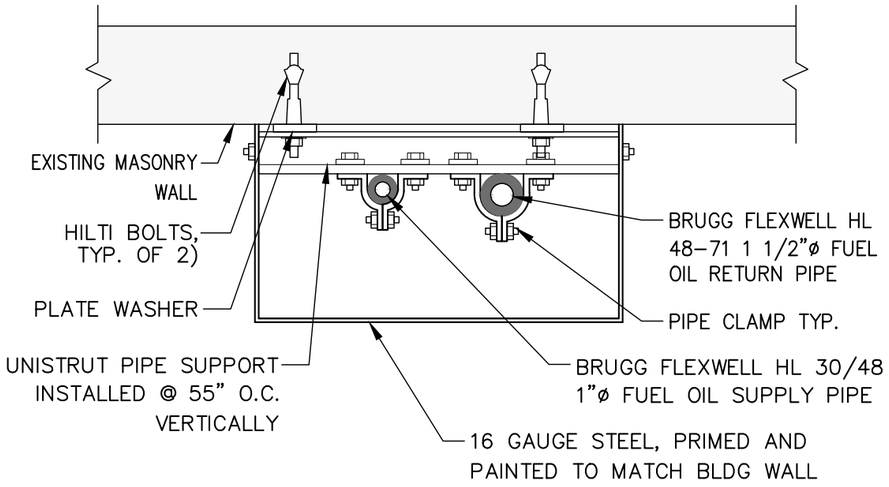
Core engineered solutions
safety. compliance. reliability.

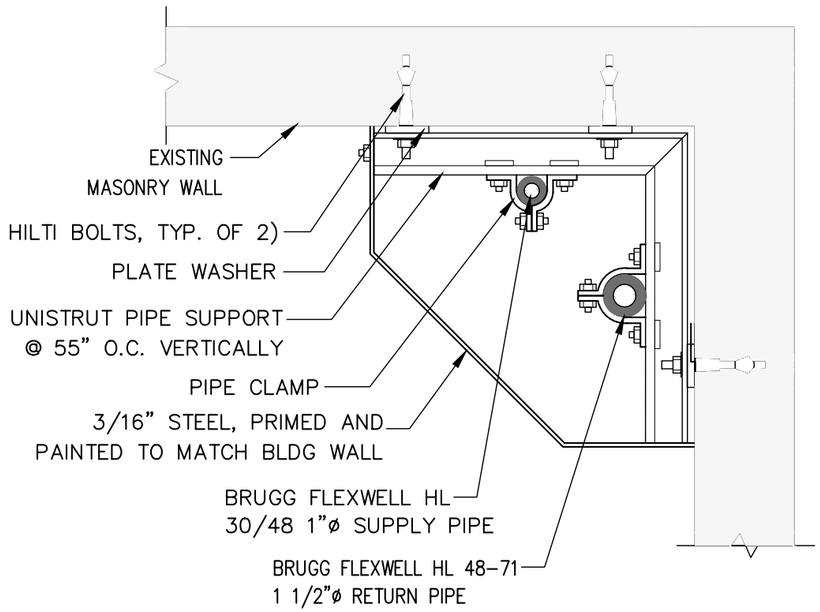
PROJECT:
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

PIPING AND CONDUIT SUPPORT SYSTEM ISOMETRIC VIEW

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No:
D–420
CADD FILE NO. 022114





FLAT WALL INSTALLATION

CORNER INSTALLATION

BRUGG DOUBLE WALL FLEX PIPE VERTICAL PIPE CHASE DETAIL (NON FIRE RATED)

NOT TO SCALE

ISSUES/REVISIONS

No.	Description	Date

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WALL MOUNT PIPE ENCLOSURE + PIPING AND CONDUIT SUPPORT DETAILS

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DATE: JUNE 2020
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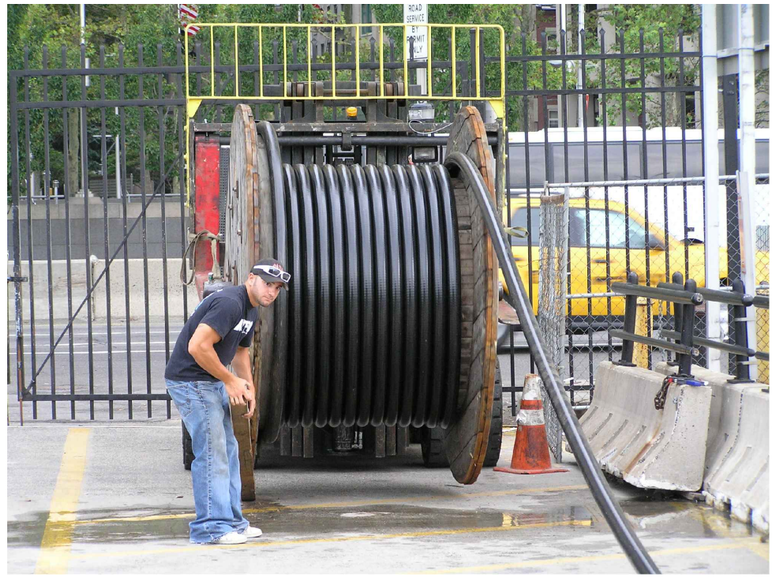
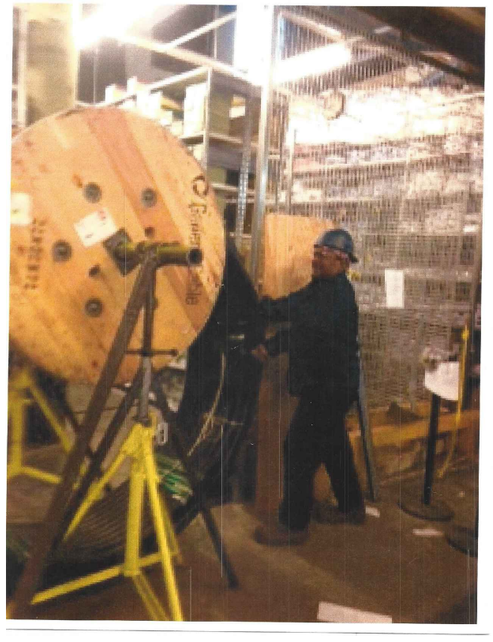
DWG No: D-430
CADD FILE NO. 022114

KINDORF RACK



SKID STEER WITH LARGE DRUM



ROLLER STAND WITH SMALL DRUM

HORIZONTAL UNWIND

ISSUES/REVISIONS

No.	Description	Date

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BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD
INSTALLATION DETAILS

REFERENCE PHOTOS

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
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DWG No: D-440
CADD FILE NO. 022114

NYC Buildings

NYC Buildings Department
280 Broadway, New York, NY 10007

Rick D. Chandler, P.E., Commissioner

BUILDINGS BULLETIN 2014-010
OTCR

Supersedes: Buildings Bulletin 2012-010 dated August 21, 2012, Buildings Bulletin 2013-008 dated June 13, 2013

Issuer: Alan Price, P.E.
Director, Office of Technical Certification and Research

Issuance Date: August 28, 2014

Purpose: This document establishes acceptance criteria for flexible fuel-oil piping systems as alternative materials to the NYC Construction Codes.

Related Code/Zoning Section(s):

AC	28-113.2.1	MC	1301	BC	707 (708)*
AC	28-113.2.2	MC	1302.3	BC	1704.13 (1704.14)*
1 RCNY	101-06	MC	1305.9	BC	1704.16 (1704.17)*

*parenthesis denotes corresponding section of 2014 NYC Construction Codes

Subject(s): Fuel oil, fuel oil piping; Fuel oil, fuel oil piping, flexible; Fuel oil piping, flexible , continuous leak detection

Background: Table MC 1302.3 of the NYC Mechanical Code lists code-prescribed materials and applicable standards for fuel-oil pipes. This bulletin establishes the acceptance criteria for flexible fuel-oil piping systems with continuous leak detection as an alternative to the code.

Description: This bulletin covers flexible fuel-oil piping systems consisting of a metallic primary carrier and secondary containment. This may include a single or double metallic piping system encased with outer polymer jacket.

Evaluation Scope: NYC Construction Codes

Evaluation Criteria: Pursuant to section AC 28-113, the Office of Technical Certification and Research (OTCR) recognizes flexible fuel-oil piping system tested, and evaluated in accordance with ULC-S667-11 "*Metallic Underground Piping for Flammable and Combustible Liquids.*"[1] Acceptable flexible fuel-oil piping systems shall be listed and labeled by an approved agency in accordance with section AC 28-113.2.3 and shall comply with the conditions of this bulletin.

Uses: Flexible fuel-oil piping systems may be used for transferring fuel oil as follows:

- Below ground pursuant to MC Chapter 13 of the NYC Mechanical Code.
- Above ground use in accordance with section (A) (2) or (A) (3) of this bulletin.

Conditions of Acceptance: Flexible fuel-oil piping systems shall comply with the NYC Construction Codes and the following applicable provisions:

A. Design

1. Flexible fuel-oil piping systems shall be designed in accordance with the NYC Construction Codes, manufacturer's recommendation, and the conditions of the required listing in accordance with the Evaluation Criteria section of this Bulletin.
2. Where installed above ground, flexible fuel-oil piping systems shall be installed in a shaft constructed of 4-inch concrete or masonry in accordance with section MC 1305.9 and installed in accordance with applicable sections of the NYC Construction Codes and the NYC Fire Code.

   Exception for double metallic wall piping: Double metallic flexible fuel-oil piping systems may be installed in a 2-hour fire-resistance rated shaft enclosure complying with sections BC 703.2 and BC 707 (BC 708).

   2.1 Horizontal offsets shall comply with section MC 1305.9.3.

   Exception for double metallic wall piping: If a double metallic flexible fuel-oil piping system is installed as a horizontal offset, such piping system need not also be enclosed in the minimum No. 10 standard Gage steel sleeve referenced in this section.

3. Flexible fuel-oil piping systems may be used above ground for conveying fuel oil at the roof level, and at marina or aviation installations, if such systems are double metallic piping with polymer protective cover for protection from exterior exposure to the elements. A fire-resistance-rated enclosure shall not be required for such applications.
4. Flexible fuel-oil piping systems shall be installed with continuous leak detection.

B. Installation Requirements

Installation requirements shall be in accordance with the manufacturer's instructions, the applicable listing, and the conditions of this bulletin.

C. Special Inspections

The installation of flexible fuel-oil piping systems shall be subject to special inspection requirements pursuant to sections BC 1704.16 (BC 1704.17), BC 1704.13 (BC 1704.14), and 1 RCNY 101-06. Special Inspectors of flexible fuel-oil piping systems shall:

1. Maintain the same qualification requirements for the "Fuel-oil storage and Fuel-oil piping system" category as defined in 1 RCNY section 101-06, Appendix A.
2. Have duties and responsibilities in accordance with, but not limited to 1 RCNY 101-06 and section BC 1704.16 (BC 1704.17).
3. Complete a statement of special inspection within which this bulletin shall be referenced under the Special Inspection Item for "Alternative Materials" in section 3.0 of the TR1 form.

D. Labeling

Flexible fuel-oil piping systems with continuous leak detection system shall be labeled as per section AC 28-113.4.

Referenced Standards:

1. ULC-S667-11 *"Metallic Underground Piping for Flammable and Combustible Liquids"*

ISSUES/REVISIONS

No.	Description	Date

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NAPLES, FL 34103

CLIENT:
BRUGG PIPESYSTEMS
Flexible solutions

Core engineered solutions
safety. compliance. reliability.

PROJECT:
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

NYC DOB APPROVAL DATA

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D–450
CADD FILE NO. 022114

BRUGG PIPESYSTEMS Flexible solutions	**FSR-HL® - Pipesystems**	RT / RQM - Herbst
		Date: Dec, 14th 2016
	Technical Statement	Page 1 of 1

FSR-HL® - FLEXWELL Safety Pipe

Customer:

BRUGG Pipesystems, LLC
1801 Parish Drive, SE
P.O. Box 1836
Rome, GA 30162-1836

Core Engineered Solutions
Mr. Tony Ramos
1141 River Road
Selkirk, NY 12158

Project: **Emergency power system, pressure rating 240 psi / 16 bar**
Product: **FSR-HL 1.0"; FSR-HL 30/48**
FSR-HL 1.5"; FSR-HL 48/71
FSR-HL 2.0"; FSR-HL 60/83

The FSR-HL pipe system is made of two corrugated stainless steel (316L) pipes and is often used for the transport of diesel fuel in emergency power systems.
Core Engineered Solutions uses this pipesystem in their sales are of New York City and the nearby states.
If the pipesystem is used in high-rise buildings a higher pressure rating of the pipe is needed, because of the geodetic altitude difference.

"Exclusive for Core Engineered Solutions and their own by BRUGG trained and certified members of staff we certify for their sales area of NYC an allowable working pressure of 240 psi / 16 bar in emergency power system applications."

Marc Oliver Herbst
Research & Development /
Quality Management

ZRD1/CCD1 Response Form

Location Information (To be completed by a Buildings Department official if applicable)

House No(s) 222 Street Name West 23rd Street

Borough Manhattan Block 77 Lot 64 BIN 1014130 Job No.

DETERMINATION (To be completed by a Buildings Department official)

Request has been: ☐ Approved ☐ Denied ☒ Approved with conditions

Follow-up appointment required? ☐ Yes ☒ No

Primary Zoning Resolution or Code Section(s): BC 1305.9.1

Other secondary Zoning Resolution or Code Section(s):

Comments:
CONTROL# 43205

The department concurs with the applicants proposal.

OK to use double wall pipe with stainless steel jacket as the required construction for enclosing the outdoor portion of fuel oil transfer, vent and return piping for a roof mounted emergency generator, in lieu of masonry enclosure as is the prescriptive requirement.

Approval is subject to the following conditions:
1. Provide the details of construction on plans for approval including the design of supports, pitch of piping and enclosure, connections to adjoining rated construction, attachment & support of the assembly being protected.
2. The piping is sized in accordance with code. The venting of the upper tank is designed to be returned to the primary tank via separate vent pipe to the top of the primary tank or via oversized return piping, piped to the top of the primary tank.
3. Details of the transfer rupture drainage system and sump, with oil spill detection system and point(s) of annunciation notification are clearly shown on the plans.
4. The plans contain a requirement for progress and final inspection of the installation of both inner and outer piping, drainage system, oil spill detection and the enclosure.
5. The PE of record is supplied with copy of the daily reports of the special inspector during installation operations.
6. The final hydrostatic pressure test of the installed transfer, return an vent piping must be performed prior to sealing the offset elbow joints of the outer wall piping.
7. The horizontal offsets shall be fitted with non-combustible ladders, stairs or ramps, with suitable railings, so as not to obstruct egress from, nor access to exits, mechanical equipment, drains and areas where emergency service operations may need access, or the horizontal offsets be located such that those features are not needed.

==========

Note: If approved determination is not scanned or microfilmed, if will not be deemed valid.

Name of Authorized Reviewer (please print): MARTIN REBHOLZ, RA

Title (please print): MANHATTAN BOROUGH COMMISSIONER

Authorized Signature: Martin Rebholz, RA Borough Commissioner Date: 1-15-16 Time:

Issuers: write signature, date, and time on each page of the request forms; and attach this form.

Note: Determination will expire if construction document approval is not obtained within 12 months of issuance.

ISSUES/REVISIONS

No.	Description	Date

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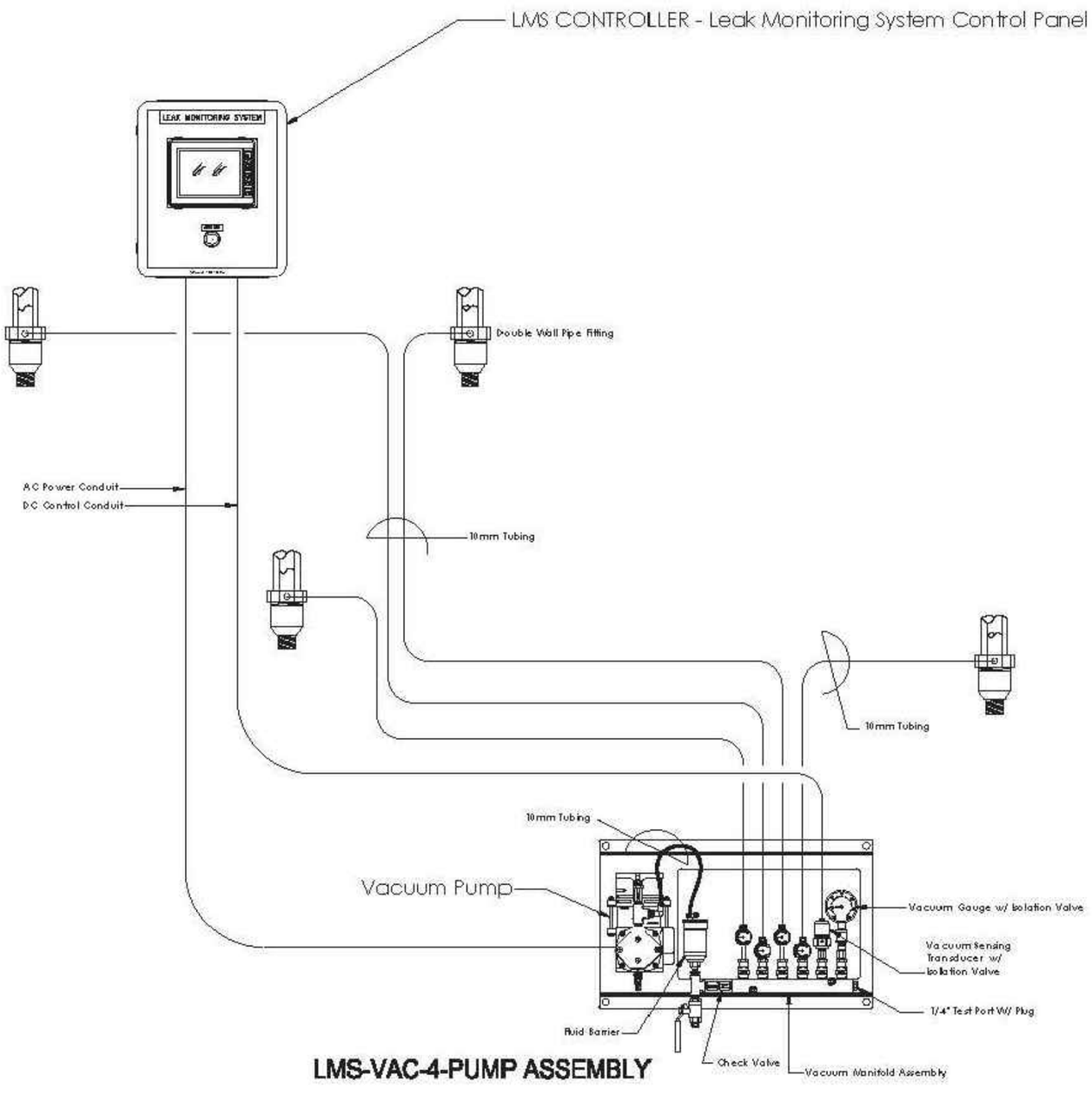
CLIENT:
BRUGG PIPESYSTEMS Flexible solutions
Core engineered solutions safety. compliance. reliability.

PROJECT:
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD
INSTALLATION DETAILS

FLEXWELL APPROVAL LETTER

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D–460
CADD FILE NO. 022114



LMS-VAC-4-PUMP ASSEMBLY

RECOMMENDED SYSTEM CORE SAFE SITE.
NOTE: LEAK DETECTION SYSTEM MUST BE NWGLDE APPROVED TO COMPLY WITH BRUGG WARRANTY TERMS

ISSUES/REVISIONS

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CLIENT:

BRUGG PIPESYSTEMS
Flexible solutions

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PROJECT:

BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

BRUGG LEAK DETECTION DIAGRAM

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
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CHK. BY: NDE
DWG No: D-470
CADD FILE NO. 022114

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BRUGG PIPESYSTEMS

Matrix of Available Fuel Piping in the United States

	FLEXWELL-HL					SECON-X				NIROFLEX		LPG/MP
Model	**HL 13/25**	**HL 30/48**	**HL 48/71**	**HL 60/83**	**HL 98/134**	**SEC 1"**	**SEC 1 1/2"**	**SEC 2"**	**SEC 3"**	**CNT 30/39**	**CNW 60/66**	**LPG 30/40**
Article No.	82111391	82111381	82111481	82111781	82112181	70021191	70021391	70021491	70021691	72131191	72010491	71000492
Size	1/2"	1"	1 1/2"	2"	3"	1"	1 1/2"	2"	3"	1"	2"	1"
Stocked in Rome, GA	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Normal oper. pressure (psig)	145	145	145	145	145	145	145	145	50	145	145	360
Max. oper. pressure (psig)	145	240	240	240	145	145	145	145	50	230	150	360
UL/ULC Label	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A
FL EQ	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A
CA Matrix	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A
Primary pipe ID (inch)	0.5	1.2	1.9	2.4	3.9	1.2	1.9	2.4	3.9	1.2	2.4	1.2
Primary pipe material	316L	316L	316L	316L	316L	316L	316L	316L	316L	316L	316L	316L
Weight (lb/ft.)	0.4	0.9	2.7	3.1	7.1	0.5	1.2	1.3	3.15	0.4	0.8	0.6
Primary pipe vol. (gal/ft.)	0.011	0.06	0.16	0.24	0.68	0.06	0.16	0.24	0.67	0.06	0.24	0.06
Primary pipe wall t'ness (in)	0.039	0.01	0.02	0.02	0.03	0.01	0.02	0.02	0.03	0.01	0.02	0.01
Secondary pipe mat'l.	316L	316L	316L	316L	316L	PA	PA	PA	PA	N/A	N/A	N/A
Outer jacket	LDPE	LDPE	LDPE	LDPE	LDPE	LDPE	LDPE	LDPE	LDPE	LDPE	No	LDPE
Pipe OD (inch)	1.0	1.9	2.8	3.3	5.3	1.7	2.6	2.9	4.7	1.5	2.6	1.7
Interstitial space	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A
Interstice volume (gal/ft.)	0.010	0.03	0.05	0.06	0.16	0.01	0.02	0.02	0.06	N/A	N/A	N/A
Min. bend radius (inch) (2)	15	20	26	28	40	18	24	30	41	8	16	12
Max. ship length (ft.)	6000	3,300	2,200	1900	650	3675	2200	1900	650	3700	1900	3000
End fittings:												
NPT	82935051	82935699	82935799	82935899	82935999	70110210	70110310	70110410	70110510	70320204	72803770	71101294
EZ-Fit	No	82935700	82935820	82935920	82935600	70110212	70110312	70110412	70110512	70320205	No	No
Weight (lbs)	1.5	4	6	10	25	3	4.5	6	13	1	4	3

(1) Diameters of 1 1/2 inch and above may require a bending machine to achieve the minimum bending radius
(2) The maximum coil length for all 3 inch orders shall be determined at the time of request and may require the piping be shipped on a drum. All drum shipments incur additional freight charges.
(3) 3" Secon-X rated to 50 psi maximum.

The Pipe and Fittings Manufactured by BRUGG Pipesystems are warranted to be free from defects in materials and workmanship for a period of thirty (30) years for underground installations, a period of fifteen (15) years for above ground installations, and a period of five (5) years for marina installations. Please reference the complete BRUGG PIPESYSTEMS EXCLUSIVE WARRANTIES for more details.

ISSUES/REVISIONS

No.	Description	Date

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CLIENT: BRUGG PIPESYSTEMS Flexible solutions

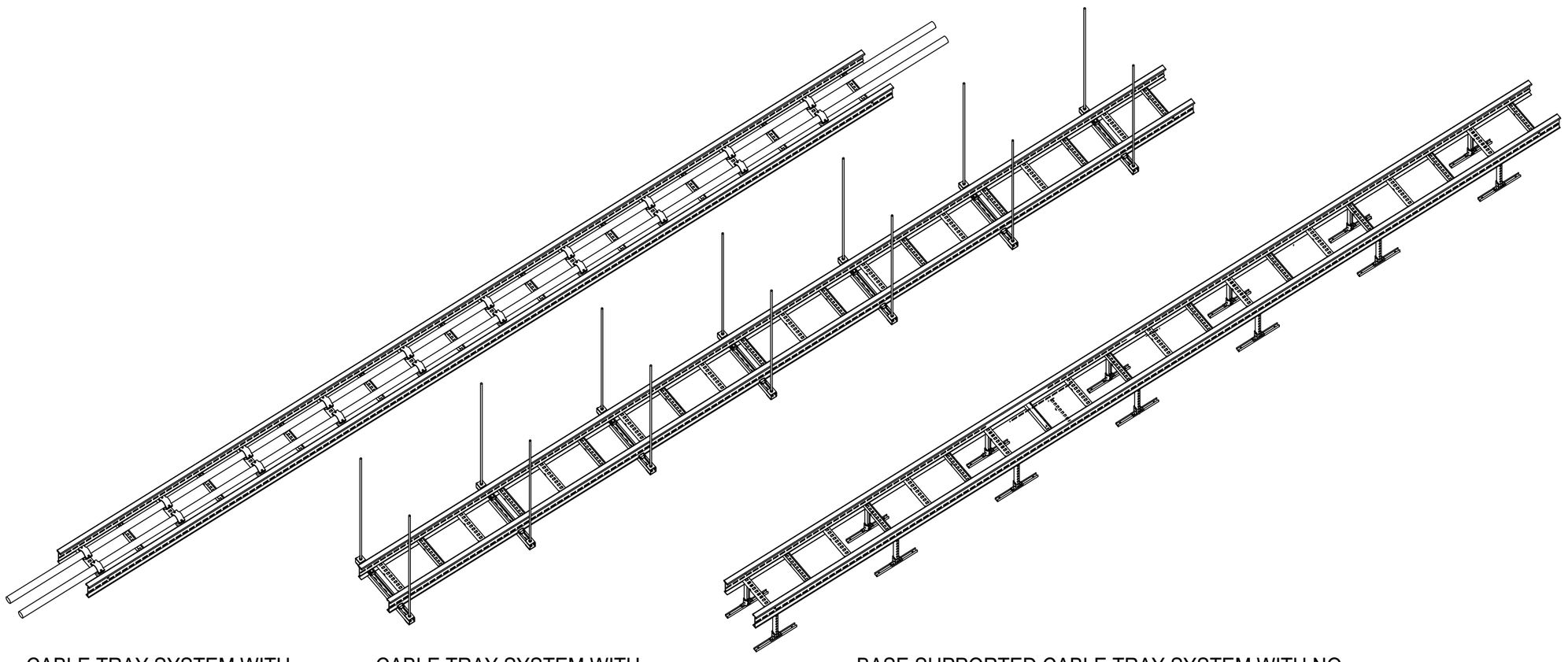
Core engineered solutions safety. compliance. reliability.

PROJECT: BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

BRUGG PIPING MATRIX

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No: D-480
CADD FILE NO. 022114



CABLE TRAY SYSTEM WITH TWO PIPES INSTALLED WITHOUT SUPPORTS

CABLE TRAY SYSTEM WITH NO PIPES INSTALLED & NO SEISMIC BRACING INSTALLED

BASE SUPPORTED CABLE TRAY SYSTEM WITH NO PIPES INSTALLED & NO SEISMIC BRACING INSTALLED

ISSUES/REVISIONS

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PIPING AND CONDUIT SUPPORT SYSTEM

SEAL & SIGNATURE

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PROJECT NO.: 022114
DRAWING BY: JFS
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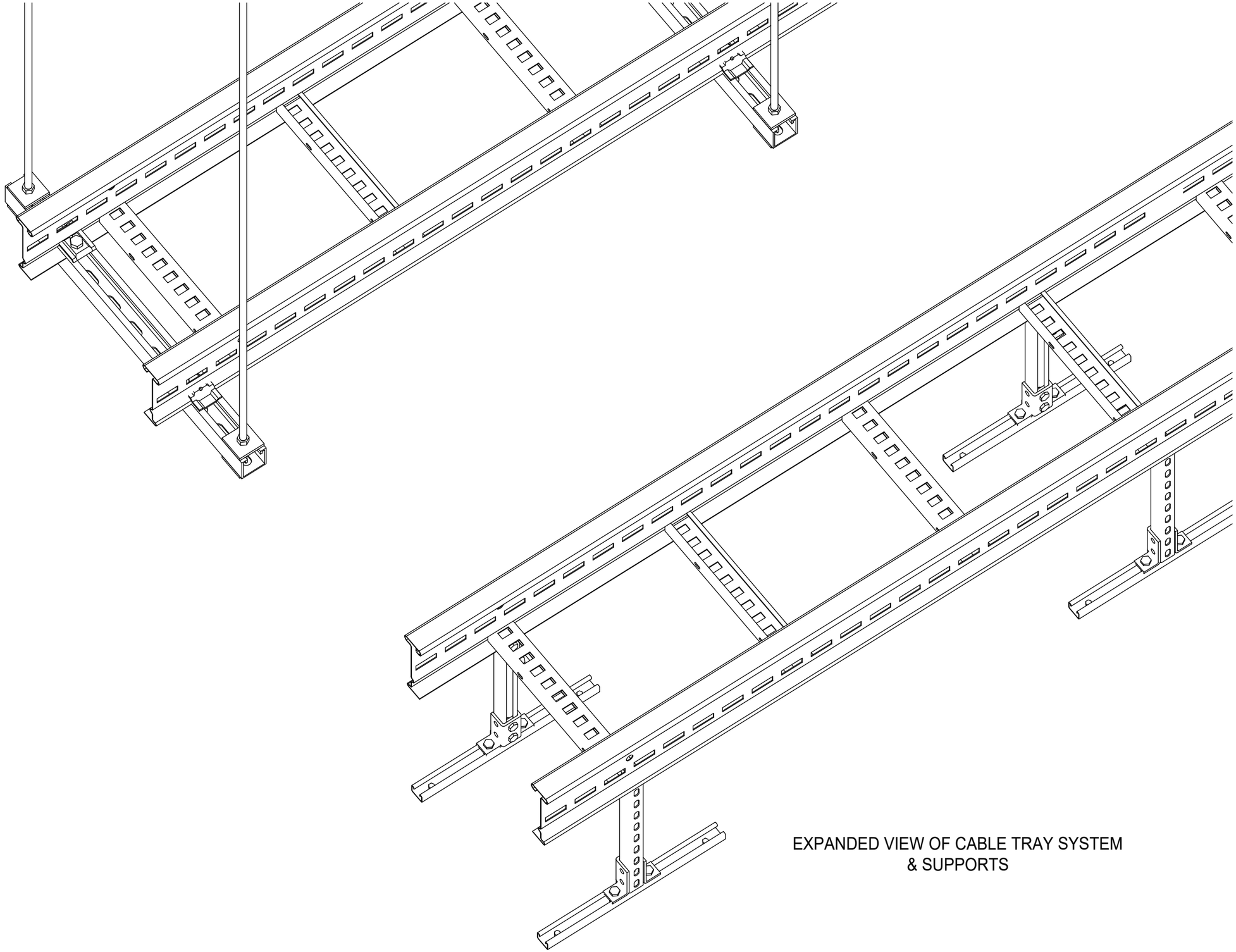
DWG No: D–500
CADD FILE NO. 022114



EXPANDED VIEW OF CABLE TRAY SYSTEM
& SUPPORTS

ISSUES/REVISIONS

No.	Description	Date

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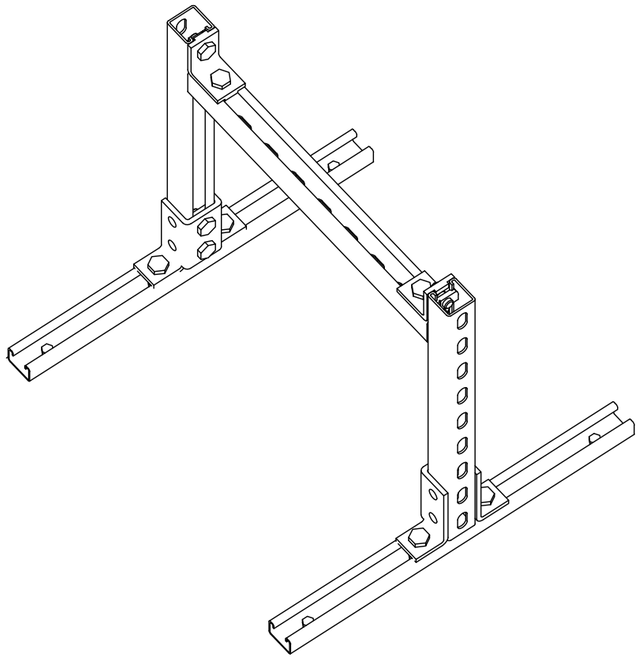
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD
INSTALLATION DETAILS

PIPING AND CONDUIT SUPPORT SYSTEM ENLARGED VIEWS

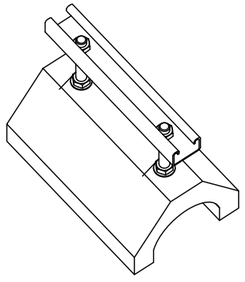
SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No:
D–510
CADD FILE NO.
022114

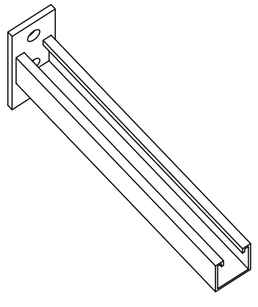
NOTE:
REQUIRED SEISMIC BRACING IS NOT SHOWN



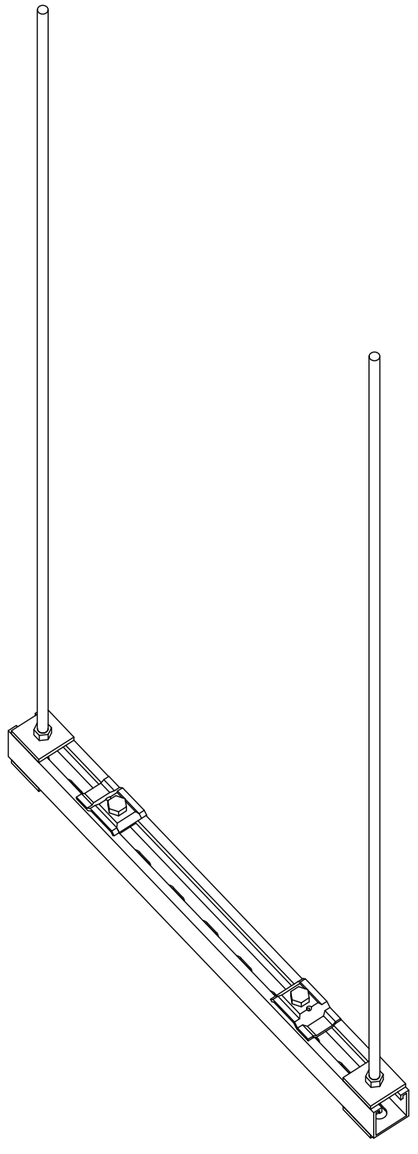
SUPPORT LEGS FOR MOUNTING TO A HORIZONTAL SURFACE



SUPPORT BASE FOR MOUNTING ON A HORIZONTAL ROOF MEMBER



C SUPPORT BRACKET FOR MOUNTING TO A VERTICAL SURFACE



THREADED SUSPENSION RODS FOR MOUNTING UNDER A HORIZONTAL SURFACE

ISSUES/REVISIONS

No.	Description	Date

NOTICE

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CLIENT:
BRUGG PIPESYSTEMS
Flexible solutions

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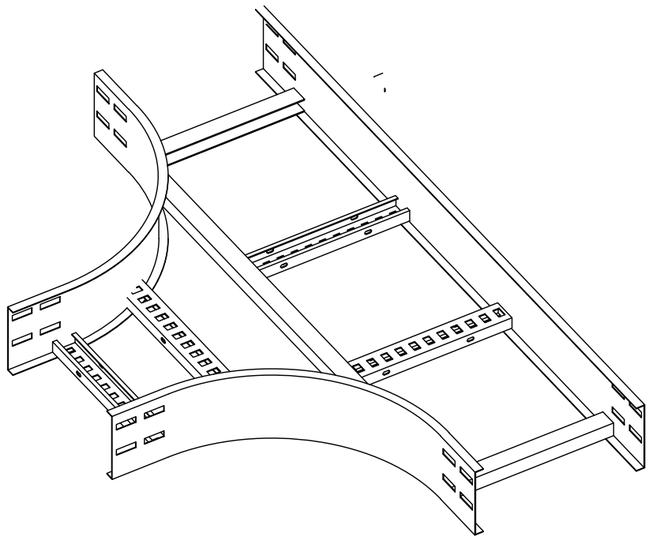
PROJECT:
BRUGG PIPE SYSTEMS
FLEXIBLE PIPE STANDARD INSTALLATION DETAILS

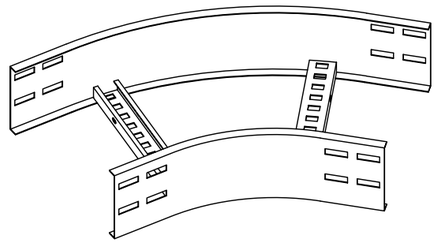
PIPING AND CONDUIT SUPPORT SYSTEM ENLARGED VIEWS

SEAL & SIGNATURE

DATE: JUNE 2020
PROJECT NO.: 022114
DRAWING BY: JFS
CHK. BY: NDE
DWG No:
D–520
CADD FILE NO. 022114



CLOSE UP VIEW OF
HORIZONTAL TEE



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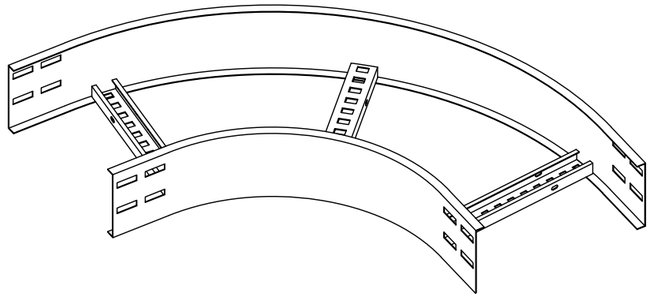
HORIZONTAL 45°
CORNER



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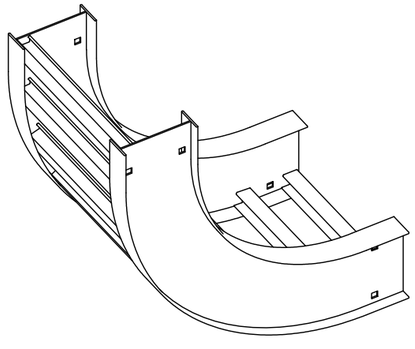
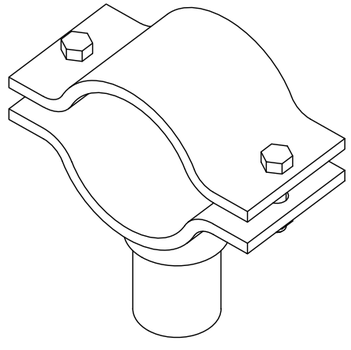
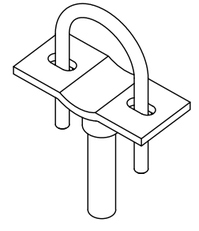


CLOSE UP VIEW OF 90° VERTICAL CORNER



SPLIT PIPE / CONDUIT CLAMP
FOR CABLE TRAY SYSTEM



ROOF PIPE / CONDUIT CLAM FOR
CABLE TRAY SYSTEM

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D–530
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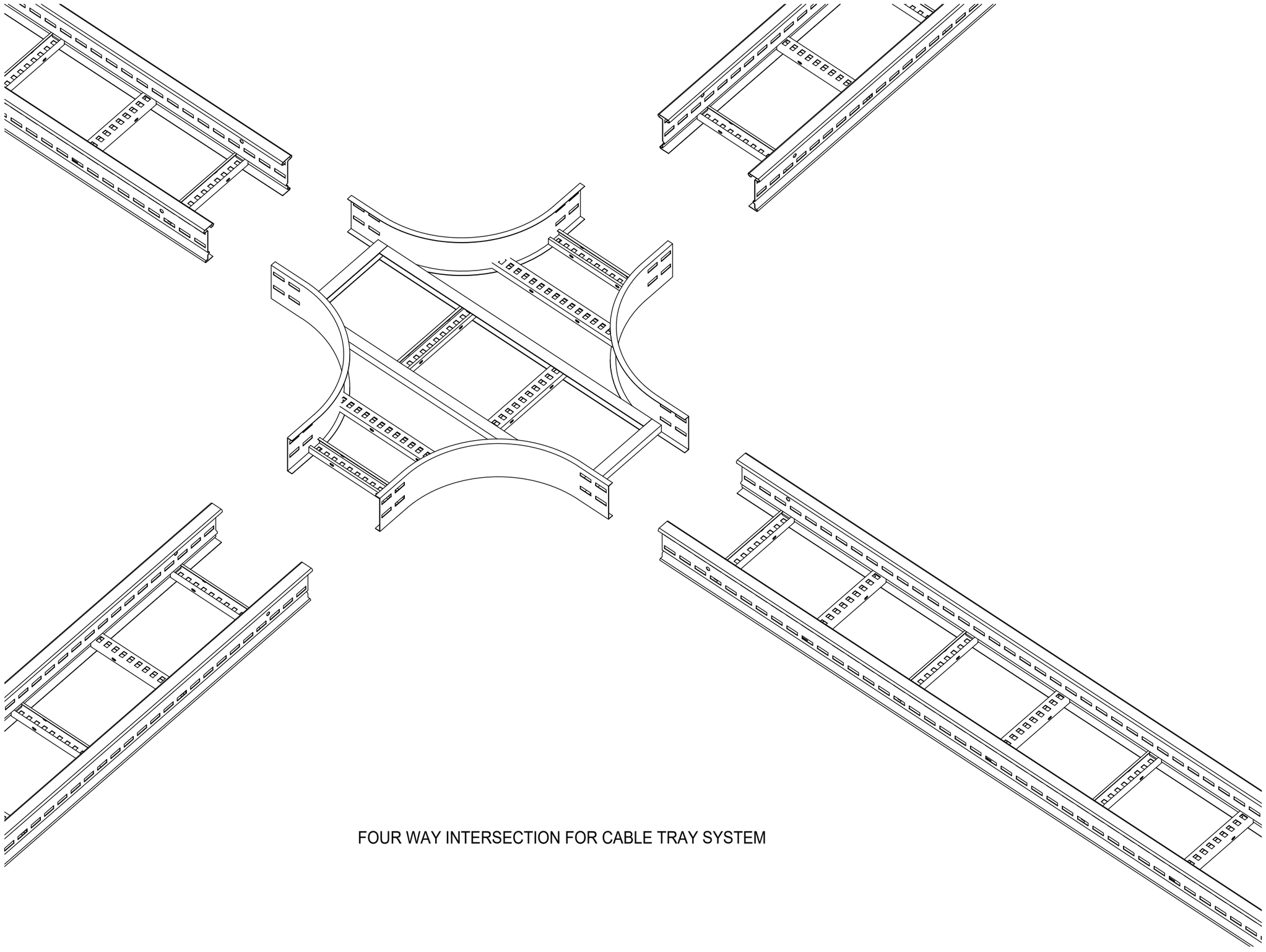
022114



FOUR WAY INTERSECTION FOR CABLE TRAY SYSTEM

ISSUES/REVISIONS

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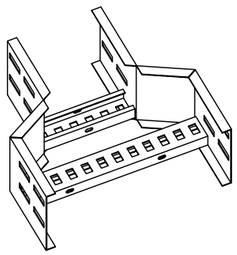
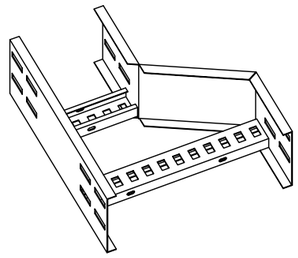
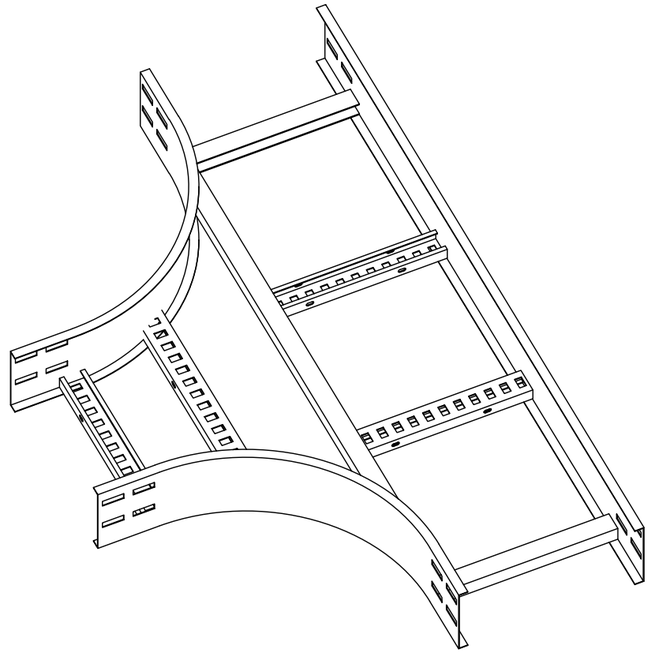


HORIZONTAL EXPANDER



ECCENTRIC HORIZONTAL EXPANDER



HORIZONTAL TEE

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