

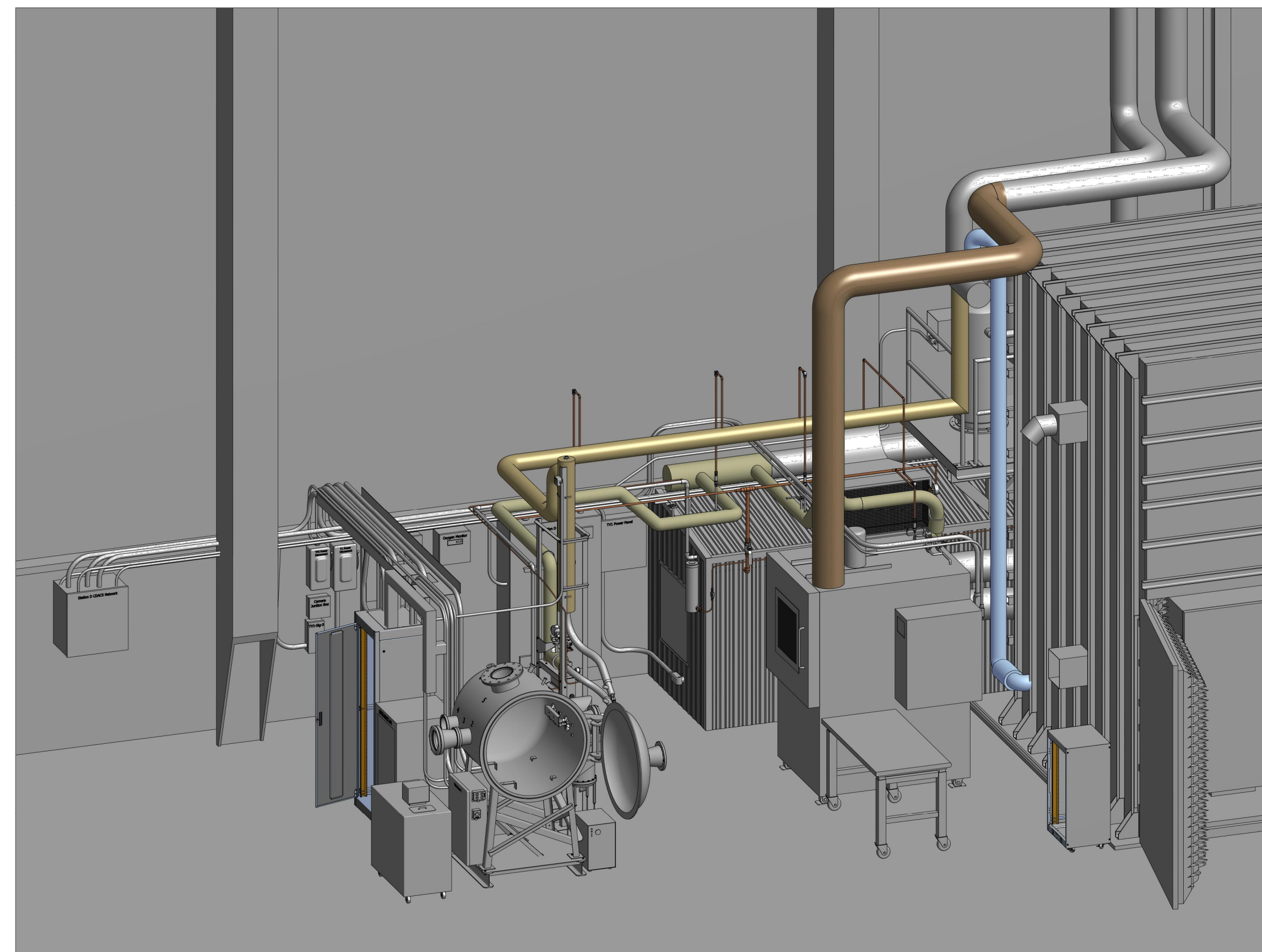
DAVID FLORIDA LABORATORY

BUILDING 65, SHIRLEY'S BAY

Yves Saulnier

Executive Director, Corporate Services & Human Resources

TQF TV1 / TP2 REFIT



DRAWING LIST

ARCHITECTURAL

- A1 - ARCH NOTES & PROJECT MAIN EQUIPMENT
- A2 - EQUIPMENT & SERVICES SUPPORTS
- A3 - EQUIPMENT LOCATION & ANCHORAGE

MECHANICAL

- M1 - MECH NOTES, LEGEND & INSULATION DETAILS
- M2 - TV1 & TP2 CONDITIONER PLUMBING
- M3 - TP2 CHAMBER & CONDITIONER VENTS
- M4 - TV1 CMP VENT
- M5 - TV1 CMP & TP2 CONDITIONER LN2
- M6 - TV1 & TP2 GN2
- M7 - TV1 COMP. AIR, PNEUMATIC & PUMP EXHAUST

ELECTRICAL

- E1 - ELECT. NOTES, MODIFICATIONS & DEMOLITION
- E2 - TP2 CHAMBER & CONDITIONER WIRING SCHEMATIC
- E3 - TV1 WIRING SCHEMATIC
- E4 - ELECTRICAL PARTS SCHEDULE
- E5 - TV1 & TP2 POWER & SIGNAL
- E6 - TV1 & TP2 POWER & SIGNAL

YVES GUINDON
MANAGER, SECURITY AND FACILITIES

M. FARID, P. Eng.
PROJECT MANAGER

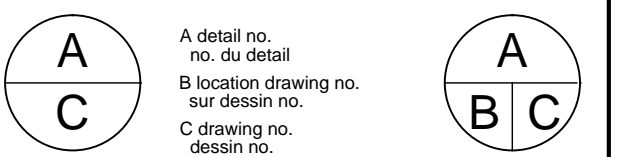
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No.	REVISION	Date
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3.	ISSUED FOR TENDER	SEPT, 14
2.	ISSUED FOR FINAL REVIEW	SEPT, 14
1.	ISSUED FOR REVIEW	AUG, 14

PROFESSIONAL STAMP



project / projet
DAVID FLORIDA LABORATORY
 BUILDING No. 65, SHIRLEY'S BAY, ONTARIO
TQF TV1 / TP2 REFIT

drawing / dessin
COVER SHEET

designed / conçu

date

drawn / dessiné
TQF / B-OPS

date

reviewed / examiné

date

approved / approuvé

date

scale

project no. / no. du projet
CSA13-G1

drawing no. / no. du dessin
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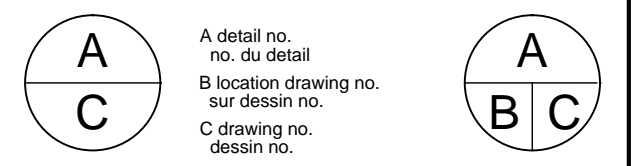
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PROFESSIONAL STAMP



project DAVID FLORIDA LABORATORY
BUILDING No. 65, SHIRLEY'S BAY, ONTARIO
TQF TV1 / TP2 REFIT

drawing ARCHITECTURAL NOTES & PROJECT MAIN EQUIPMENT

designed	TQF	conçu
date		
drawn	TQF / B-OPS	dessiné
date		
reviewed	TQF	examiné
date		
approved	TQF	approuvé
date		
scale	N.T.S.	

project no. CSA13-G1 no. du projet

drawing no. A1 no. du dessin

ABBREVIATIONS	
CSA	CANADIAN SPACE AGENCY
DFL	DAVID FLORIDA LABORATORY
B-OPS	BUILDING OPERATIONS & SECURITY GROUP
TQF	THERMAL QUALIFICATION FACILITY GROUP
TV1	THERMAL VACUUM CHAMBER #1
TCU	THERMAL CONDITIONING UNIT
TP2	THERMAL / PIM CHAMBER #2
LN2	LIQUID NITROGEN
GN2	GASEOUS NITROGEN
CMP	CONTAMINATION MONITORING PLATE
CDACS	COMBINED DATA ACQUISITION & CONTROL SYSTEM
TRAPS	THERMAL RESPONSE AND POWER SYSTEM
ATCS	AUTOMATED THERMAL CONTROL SYSTEM
HAAKE	CLOSED LOOP REFRIGERATED CIRCULATOR



TEMPORARY TARP INSTALLED AT PROJECT AREA IN SWING SPACE, CONTRACTOR TO MODIFY & SEAL IT AS REQUIRED PRIOR TO CONSTRUCTION. VIEW 1 A1



OVERALL VIEW OF TV1 & TP2 CONDITIONER UNITS IN SWING SPACE AREA (NOT POSITIONED IN PLACE) VIEW 2 A1

- GENERAL ARCHITECTURAL & PARTITION NOTES:**
- THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL ISSUED CONTRACT SPECIFICATIONS, ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS, EXCEPT WHERE REPLACED OR CHANGED BY DIRECTIVE OR CORRECTIVE ADDENDA OR REVISED DRAWINGS AND SPECIFICATIONS.
- PAY FOR ALL NECESSARY PERMITS AND FEES REQUIRED TO BE PERFORMED BY LOCAL AUTHORITIES HAVING JURISDICTION INCLUDING INSPECTION AND TESTING. TURN OVER TO THE OWNER ORIGINAL APPROVAL DOCUMENTATION & CERTIFICATES. APPLICATION TO THE CITY OF OTTAWA FOR THE BUILDING PERMIT ONLY BY OWNER.
- ALL WORK UNDER THIS CONTRACT SHALL AS A MINIMUM BE IN FULL COMPLIANCE WITH LATEST EDITION OF THE FOLLOWING CODES:
 - ONTARIO BUILDING CODE,
 - ONTARIO ELECTRICAL SAFETY CODE, ONTARIO FIRE CODE,
 - ONTARIO PLUMBING CODE, NFPA-13 & ASHRAE 90.1
- IMMEDIATELY AFTER AWARDING THE CONTRACT, CONTRACTOR TO CHECK THE AVAILABILITY & DELIVERY TIMES OF ALL SUPPLIED ARCHITECTURAL, STRUCTURAL, MECHANICAL & ELECTRICAL ITEMS. PROVIDE CSA PROJECT MANAGER WITH PROJECT SCHEDULE, CRITICAL PATH OF TASKS, COMPLETE SHOP DRAWINGS, INTERFERENCE DRAWINGS, PRODUCT DATA ON MANUFACTURED ITEMS, SAMPLES, MOCK-UPS AND OTHER INFORMATION TO CONFIRM THE CONTRACTOR'S UNDERSTANDING OF THE DESIGN INTENT DOCUMENTS PRIOR TO UNDERTAKING THOSE PORTIONS OF THE WORK. PROVIDE AN UPDATED WEEKLY SCHEDULE BY END OF EACH WEEK.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING WORK. BE RESPONSIBLE FOR ALL FLOOR CUTTING, CORE DRILLING, ALL CHASES, OPENINGS AND PATCHING AS MAY BE REQUIRED BY ALL SUB TRADES WHO MAY OR MAY NOT BE UNDER HIS CONTRACT AGREEMENTS.
- ALL DIMENSIONS SHALL BE VERIFIED ON SITE. DIMENSIONS SHOWN ON DRAWINGS ARE IN INCHES.
- UNLESS NOTED OTHERWISE, ALL DIMENSIONS SHOWN ARE FROM FINISHED FACES TO FINISHED FACE OF WALLS, CEILINGS AND OTHER SURFACES REFERRED. DIMENSIONS INDICATED AS CLEAR DIMENSIONS SHALL BE FROM FINISHED SURFACES.
- ALL ISSUED DOCUMENTS ARE DESIGN INTENT DOCUMENTS. THEY ARE INTENDED TO CONVEY THE INTENDED FINAL NEW CONDITIONS.
- REVIEW ALL CONSTRUCTION DOCUMENTS, IF ANY DISCREPANCY OCCURS ON THE ENGINEER'S DRAWINGS, THE CONTRACTOR SHALL - DURING TENDERING - ASSUME THE LARGER / GREATER. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- EXAMINE THE SITE TO DETERMINE THE FULL EXTENT OF THE PROJECT. REFER TO BOUNDARIES ON THE PLAN. CONTRACTOR IS STRONGLY RECOMMENDED TO VISIT THE SITE BEFORE BIDDING THE PROJECT TO DETERMINE THE EXTENT OF ANY REMOVALS, MODIFICATIONS, CUTTING AND PATCHING IN SERVICES, FLOORS, WALLS, CEILING AND ROOF.
- CONTRACTOR SHOULD BE LICENSED TO PERFORM ALL WORK SHOWN IN THE DRAWINGS INCLUDING DEMOLITION. CERTIFICATE OF DISPOSAL TO BE ISSUED TO OWNER AFTER REMOVALS ARE DONE.
- CONTRACTOR IS RESPONSIBLE FOR HEALTH AND SAFETY OF WORKERS, BUILDING OCCUPANTS, AND BUILDING. COMPLY WITH THE ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT.
- GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO KEEP THE OWNER'S ACCESS AREAS CLEAN. REMOVE GARBAGE / DEBRIS AND CLEAN DAILY AS REQUIRED AND UPON COMPLETION. GENERAL CONTRACTOR SHALL REMOVE ALL PROTECTIVE MATERIALS AND TO HAVE PROFESSIONAL CLEANING SERVICE TO CLEAN AND WIPE DOWN ALL EQUIPMENT, WINDOWS, DOORS, WALLS, FLOORS, CEILINGS & MILLWORK UPON COMPLETION.
- CSA SHALL BE GIVEN THE OPTION OF RETAINING ANY REMOVED PARTS, COMPONENTS OR EQUIPMENT. COORDINATE AND HAND OVER TO OWNER AS NECESSARY. DISPOSE OF ANY REMAINING UNWANTED EQUIPMENT OR SERVICES AND REMOVE OFF SITE.
- REMOVE ALL DEMOLITION AND CONSTRUCTION WASTE FROM SITE ON DAILY BASIS. DO NOT USE CSA WASTE CONTAINERS. AN AREA WILL BE DESIGNATED FOR LOCATING CONTRACTOR WASTE BINS.
- DO NOT DAMAGE EXISTING FIRE SEPARATIONS AND FIRE PROTECTIONS IN THE PROJECT AREAS. ANY DAMAGES INCURRED BY THIS CONTRACT TO EXISTING FIRE SEPARATIONS AND PROTECTIONS SHALL BE RESTORED TO THE ORIGINAL CONDITIONS TO MEET REQUIRED RATING AND CODES AT NO ADDITIONAL COSTS TO THE PROJECT.
- UNDER ANY CIRCUMSTANCES, DO NOT BLOCK REQUIRED ACCESS TO EXITS AND FIRE ESCAPE ROUTES DURING THE PROJECT DURATION. ALL EXISTING LIFE SAFETY SYSTEMS AND INDICATORS SHALL BE OPERATIONAL AT ALL TIMES.
- GENERAL CONTRACTOR TO PROTECT ALL ARCHITECTURAL FINISHES, FLOORS, BUILDING & TESTING EQUIPMENT DURING CONSTRUCTION AND SHALL BE RESPONSIBLE FOR ANY DAMAGES RESULTING FROM THE PROJECT'S WORK. THE CONTRACTOR SHALL MAKE GOOD ALL DAMAGED SURFACES INCLUDING ANY PAINT TOUCH-UPS REQUIRED. REPAIR ALL WALLS AND FLOORS IN CORE AREA WHERE MECHANICAL, PLUMBING, POWER, VOICE AND DATA PASS THROUGH.
- CORE DRILL / CUT CONCRETE AND METAL FLOORS AS REQUIRED TO PERMIT INSTALLATION OF ALL NEW SERVICES AS PER DRAWINGS AND OWNER INSTRUCTIONS & REQUESTS. JACK HAMMERING IS NOT ALLOWED. PATCH & INFILL ABANDONED / UNUSED HOLES WITH HIGH STRENGTH NON-SHRINK GROUT AND REINFORCE WITH WIRE MESH AS REQUIRED.
- ACCESS TO THE SITE FOR MATERIAL, WORK FORCES AND FOR WASTE REMOVAL IS TO BE COORDINATED WITH CSA PROJECT MANAGER, USE ONLY ELEVATORS DESIGNATED BY CSA AND PROTECT THEM FROM DAMAGE.
- CSA WILL PROVIDE SECURITY ESCORTS. PROVIDE AT LEAST 48 HOURS NOTICE OF WHEN WORKERS WILL BE ON SITE TO ALLOW FOR SECURITY ESCORTS. NOTIFY CSA IMMEDIATELY OF ANY CHANGE IN SCHEDULE THAT AFFECTS THE NEED FOR SECURITY ESCORTS.
- UNLESS NOTED OTHERWISE, CARRY OVER THE SAME PARTITION DETAILS OVER DOOR OPENINGS AND SIDELIGHT OPENINGS. BRACE WALLS AND DOOR FRAMES AS REQUIRED.
- UNLESS INDICATED OTHERWISE, ALL DOORS TO BE LOCATED 6" FROM THE ADJACENT WALL FACE TO INSIDE OF HINGED DOOR JAMB.
- CONTRACTOR TO PROVIDE ALL REQUIRED BLOCKING IN WALL AND CEILING WHERE HEAVY LOADING IS ANTICIPATED. THESE BLOCKING AND REINFORCEMENTS MAY NOT BE SHOWN ON DRAWINGS AND DETAILS. ALL REINFORCEMENTS IN CEILING PLENUM AREAS SHALL BE OF NON-COMBUSTIBLE AND SHALL NOT GENERATE AIRBORNE PARTICLES.
- CONTRACTOR TO PROVIDE FULL DRAWINGS, SKETCHES & SPECIFICATIONS FOR ALL PROPOSED SERVICES SUPPORTS, ANCHORS & HANGERS UNDER THIS PROJECT SCOPE FOR PROJECT MANAGER AND TQF GROUP APPROVALS BEFORE COMMENCING ANY WORK.
- CONTRACTOR TO SUPPORT ALL SERVICES SHOWN ON THIS PROJECT SCOPE FROM BUILDING STRUCTURAL MEMBERS, SUPPORT ALL MECHANICAL PIPING USING CLEVIS HANGERS AT ADEQUATE SPACING TO INSURE NO SAG OR FAILURE OF JOINTS, DO NOT USE PERFORATED BAND, WIRE CHAIN OR SOLID RING TYPE HANGERS. ISOLATE COPPER PIPE FROM HANGER OR OTHER PIPING WHERE ELECTROLYTIC ACTION CAN OCCUR. ADEQUATELY BRACE PIPING AND ALLOW FOR EXPANSION OR CONTRACTION. PROVIDE EXPANSION LOOPS OR JOINTS SIZED TO COMPENSATE FOR CHANGES IN PIPE LENGTH CAUSED BY A TEMPERATURE DIFFERENTIAL OF 200°C. ALL SUPPORTS & HANGERS TO BE HOT DIPPED GALVANIZED OR ZINC ELECTROPLATED.
- CONTRACTOR TO PROVIDE FULL SYSTEM OF SUPPORTS AND HANGERS COMPLETE WITH ALL NECESSARY BRACKETS, BASE PLATES, INSERTS, FASTENERS, RODS AND ALL OTHER ACCESSORIES IN ACCORDANCE WITH MSS SP-58 AND TO MATCH EXISTING BUILDING SUPPORTS. ALL SUPPORTS & HANGERS TO BE E. MYATT, ITT GRINNELL OR APPROVED EQUAL.
- NO SUPPORTS IS ALLOWED FROM SWING SPACE OWSJ CEILING, MINIMIZE FLOOR SUPPORTS AND LIMIT TO WITHIN 10" MAX FROM EQUIPMENT OR WALLS TO MAXIMISE FLOOR WORK AREA (SUBJECT TO B-OPS / TQF APPROVAL). USE PAINTED STEEL L BRACKETS & AIRCRAFT GALVANIZED CABLES AS REQUIRED, WELD L BRACKETS TO BUILDING WALL STRUCTURAL BEAMS, NO DRILLING IS ALLOWED, ALL STEEL TO BE PRIMED AND PAINTED, COLOR TO MATCH EXISTING. ANCHORING TO BUILDING INTERIOR SIDING SHEETS IS NOT ALLOWED.
- PROVIDE AS-BUILT DRAWINGS TO RECORD ANY DEVIATIONS FROM THE DESIGN INTENT DRAWINGS.
- WORK UNDER THIS PROJECT MAYBE CONDUCTED IN A CLEANROOM ENVIRONMENT, MANDATING SPECIAL MEASURES TO BE TAKEN TO REDUCE LABORATORY DISRUPTION. CLASS 100,000 CLEANROOM STANDARDS ARE TO BE MET FOR THE AREA SURROUNDING CONSTRUCTION AT ALL TIMES AND ARE SUBJECT TO VERIFICATION.
- EXACT TARPING LIMITS AND ACCESS ROUTES TO BE DETERMINED ON-SITE IN COORDINATION WITH CSA.
- ALL TARPS TO BE WHITE, TIGHT SEALED FROM CEILING TO FLOOR, USE HEAVY DUTY COMMERCIAL DOUBLE SIDED TAPE TO SECURE METAL STUDS TO FLOORS, WALLS & CEILINGS AS REQUIRED, NO WOOD MATERIALS TO BE USED IN TARPS CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR CLEANING, PATCHING, REPAIRING & PAINTING ALL DAMAGED SURFACES & TAPE MARKS AFTER REMOVING TARPS.
- WEEKEND AND/OR AFTER HOURS SHUTDOWNS TO BE SCHEDULED IN AGREEMENT WITH CSA PROJECT MANAGER. ALLOW FOR AT LEAST 48 HOURS NOTICE IN ADVANCE.
- PROVIDE 12" X 12" ACCESS DOORS TO ALL RECESSED PLUMBING, HVAC AND ELECTRIC FIXTURES.
- APPLY SMOOTH BEAD OF CAULKING AS REQUIRED FOR ANY ARCHITECTURAL FINISHES AND TO DOOR FRAMES, MOLDINGS, ETC....
- AT THE END OF CONSTRUCTION, CONTRACTOR TO PAINT ALL WALLS & CEILINGS WITHIN CONSTRUCTION BOUNDARIES, COLOR & FINISH TO MATCH EXISTING.
- WORK UNDER THIS PROJECT MAYBE CONDUCTED AT ELEVATIONS IN EXCESS OF 15m± (50 ft ±), CONTRACTOR MUST ENSURE THAT ALL STAFF & SUB CONTRACTORS ARE TRAINED IN ELEVATED WORK AND FALL PROTECTION.
- DO NOT SUBJECT ANY PART OF THE BUILDING TO ANY NOISE, DUST OR ANY OTHER UNACCEPTABLE ENVIRONMENTAL CONDITIONS DURING THE COURSE OF THE PROJECT. ANY NOISY / DUSTY / SMELLY ACTIVITIES SHALL BE DONE AFTER HOURS OR AT WEEKENDS, COORDINATE WITH CSA PROJECT MANAGER WITH A MINIMUM NOTICE OF 48 HOURS.

YVES GUINDON
MANAGER, SECURITY AND FACILITIES

M. FARID, P. Eng.
PROJECT MANAGER

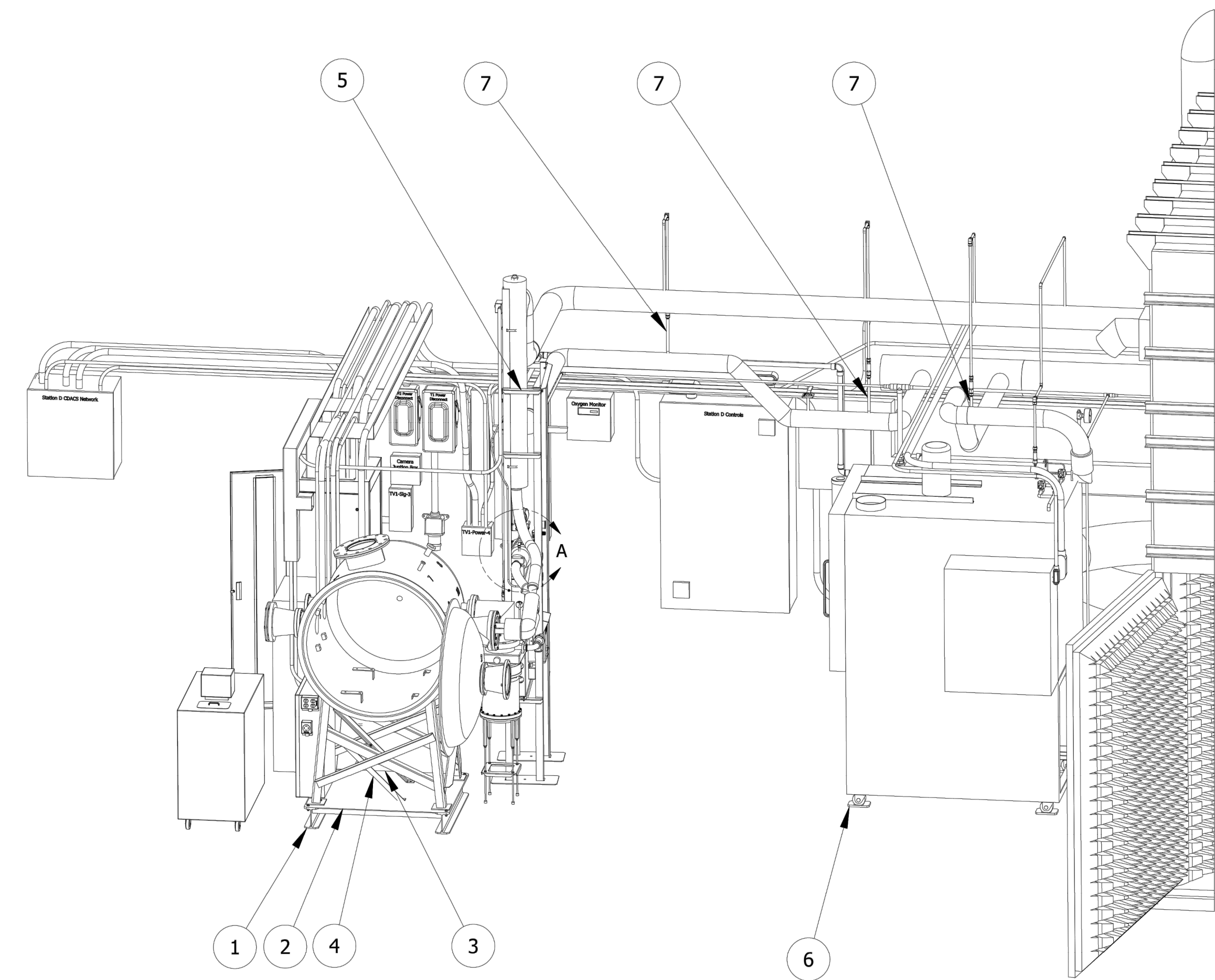
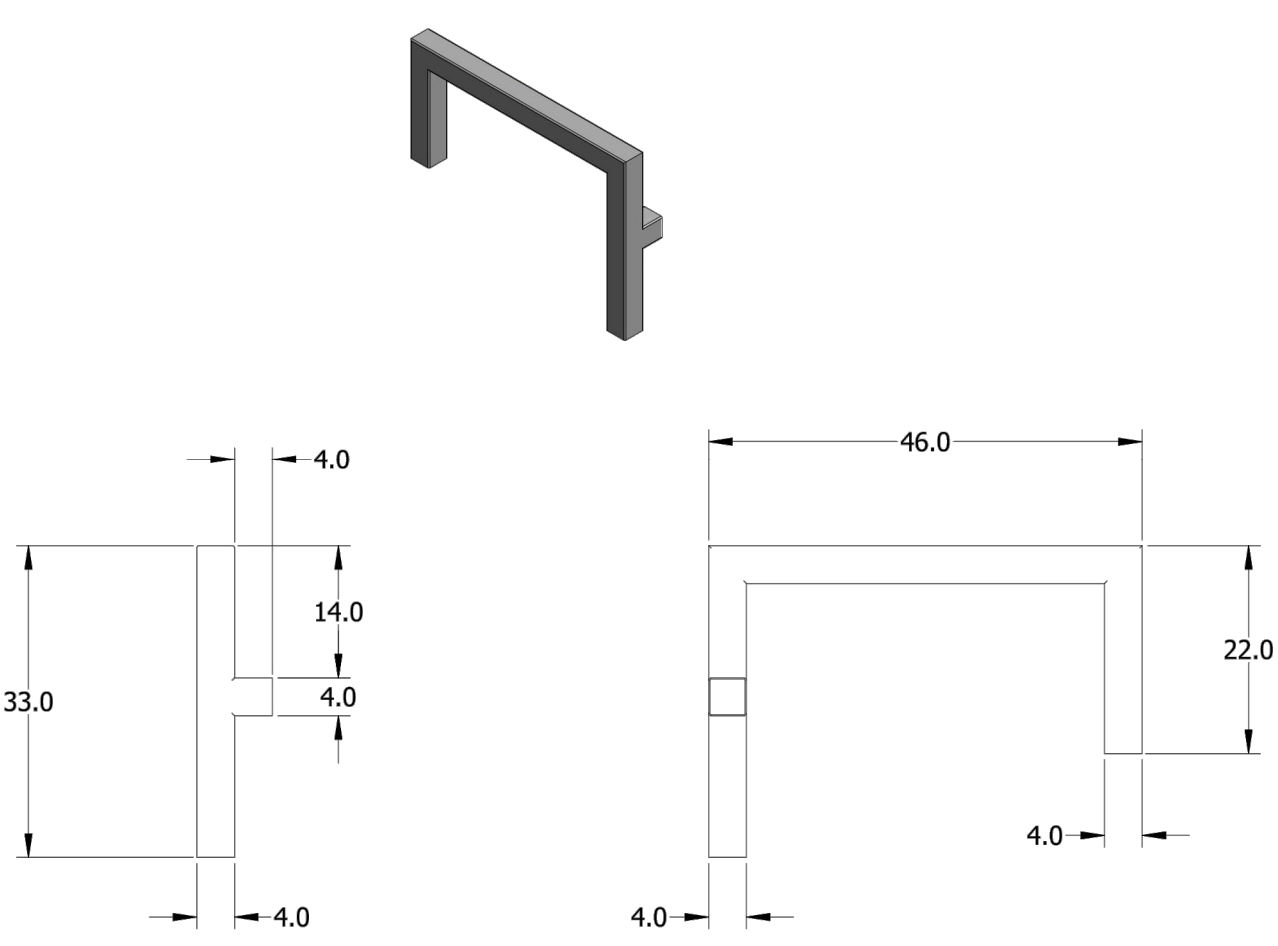
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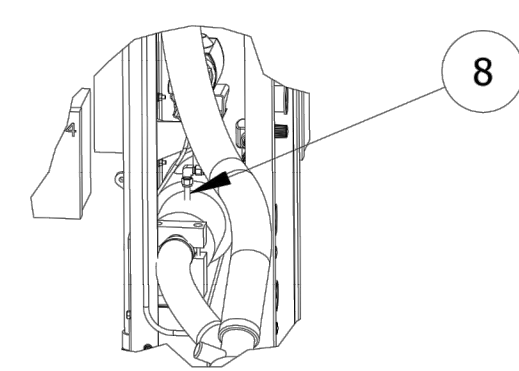
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TV1 Trough

ELECTRICAL TROUGH SUPPLIED BY OWNER, FULLY INSTALLED BY CONTRACTOR



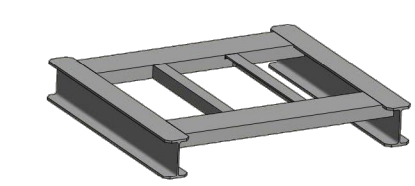
ITEM	QTY	PARTS LIST	
		PART NAME	SUPPLIED BY
1	1	TV1 Chamber Base	Owner
2	1	TV1 Chamber Base Cover Plate	Owner
3	1	TV1 Rear Panel	Owner
4	1	TV1 Power-1 Bracket Assembly	Owner
5	1	TV1 Utility Support Assembly	Owner
6	4	TP2 Conditioner Wheel Pad	Owner
7	3	PRV SS 3/4" OD Tube, modify from McMaster 89895K762	Owner
8	1	TV1 CMP Purge SS 3/8" OD Tube, modify from McMaster 9157K91	Owner



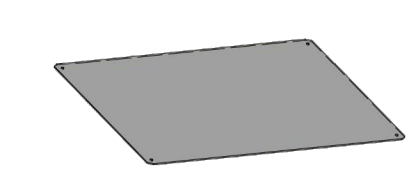
DETAIL A

NOTES:

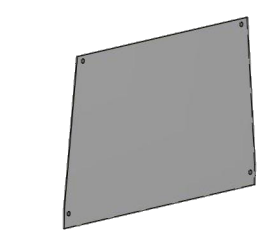
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Item 1



Item 2



Item 3



Item 4



Item 5



Item 6

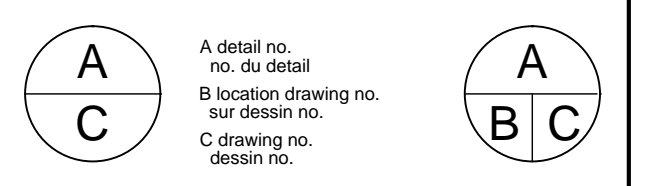


Item 7



Item 8

PROFESSIONAL STAMP



project / projet
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BUILDING No. 65, SHIRLEY'S BAY, ONTARIO
TQF TV1 / TP2 REFIT

drawing / dessin
EQUIPMENT & SERVICES SUPPORTS

designed / conçu
date
TQF

drawn / dessiné
date
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scale
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CSA13-G1

drawing no. / no. du dessin
A2

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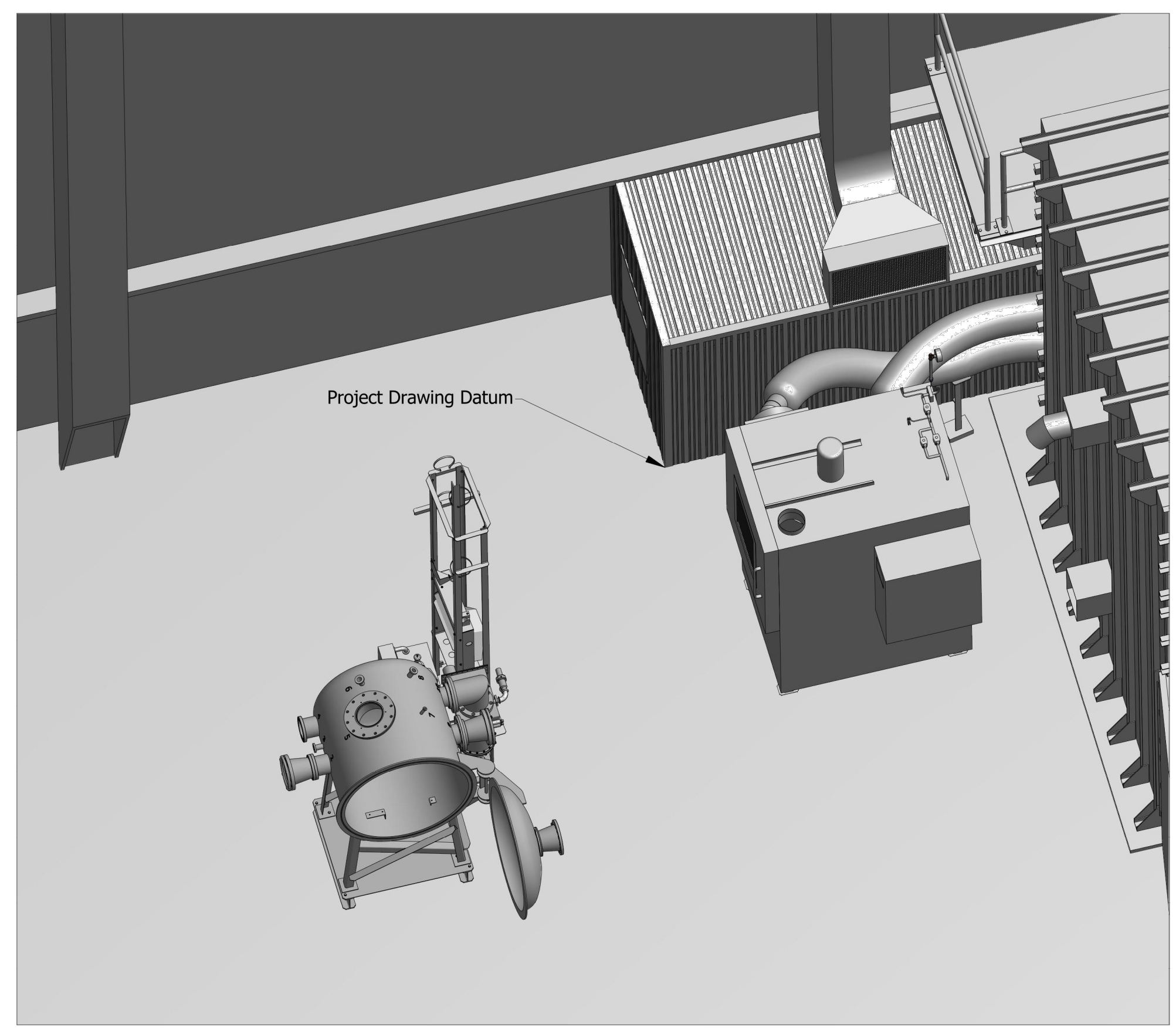
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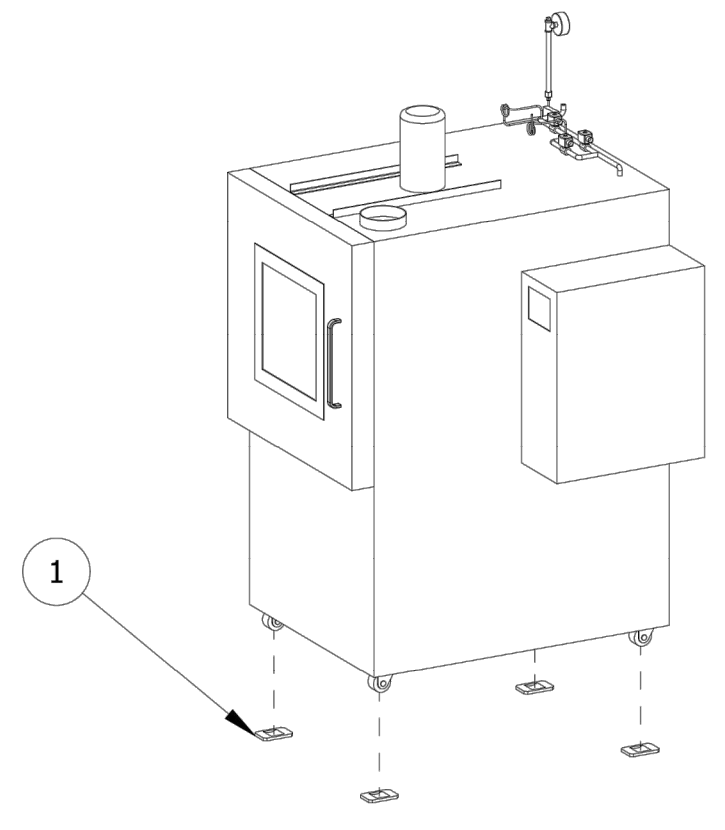
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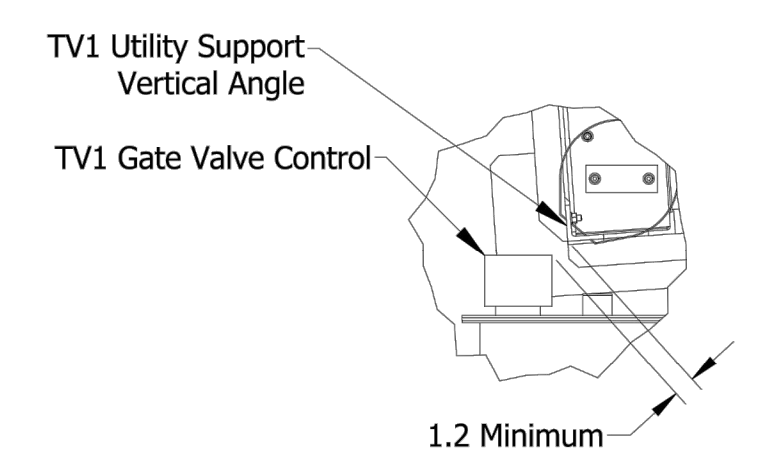
		PARTS LIST	
ITEM	QTY	PART NAME	SUPPLIED BY
1	4	Conditioner Wheel Pad	Owner



Preparation of TP2 Conditioner

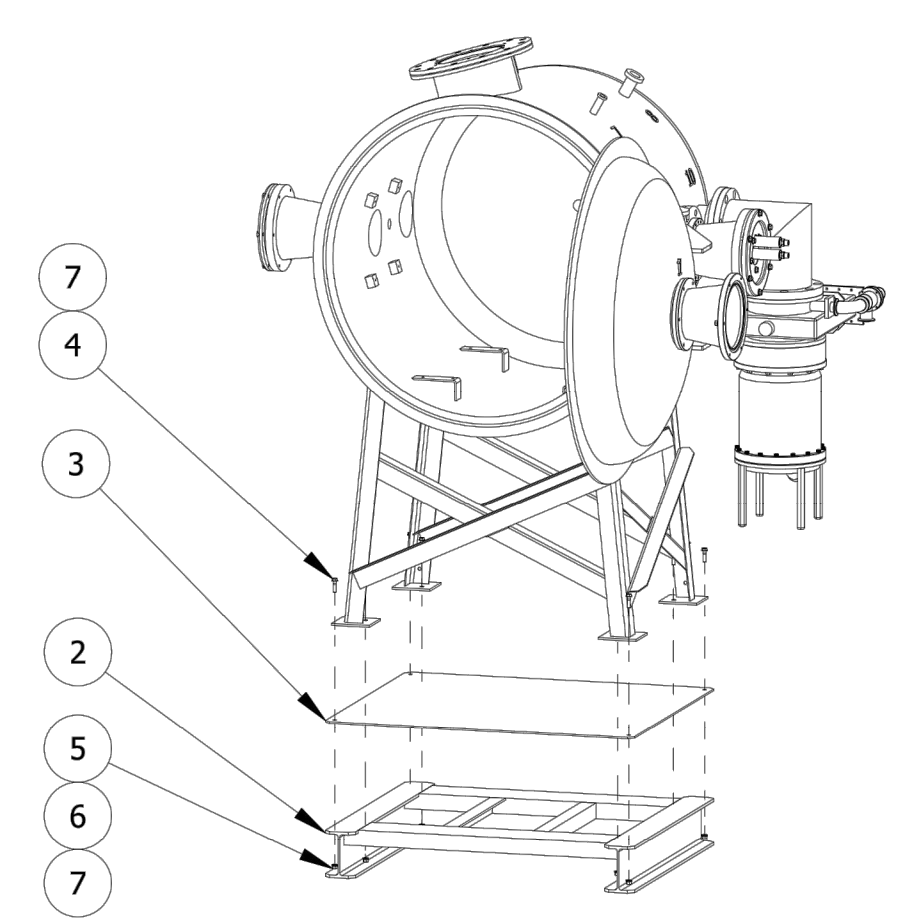
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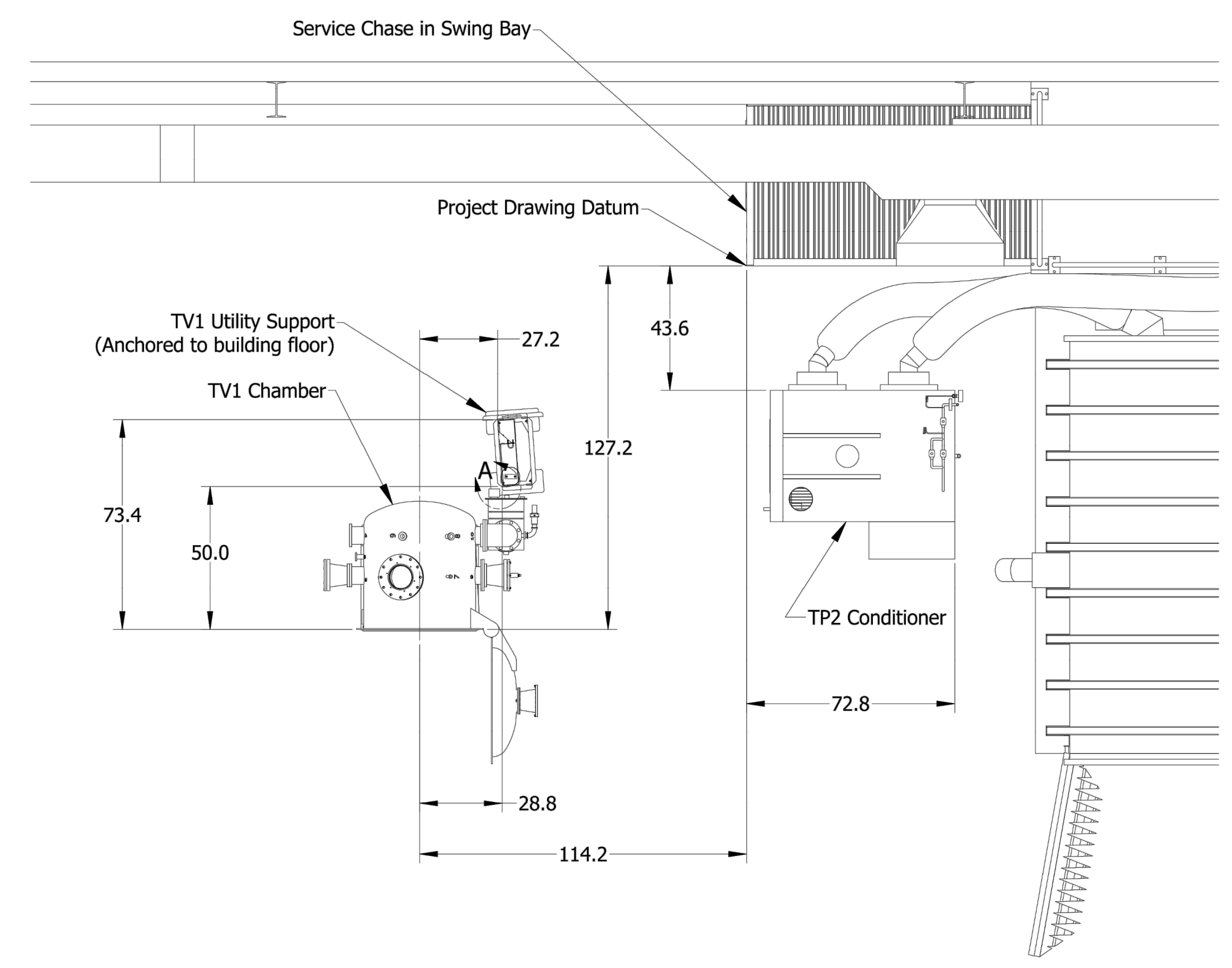


DETAIL A
(Keep Utility Support at least 1.2" away from TV1 Gate Valve Control)

		PARTS LIST	
ITEM	QTY	PART NAME	SUPPLIED BY
2	1	TV1 Base Weldment Assembly	Owner
3	1	TV1 Base Cover Sheet	Owner
4	8	3/8"-16 UNC SS Hex Head Bolt 1.5" Length	Contractor
5	8	3/8"-16 UNC SS Hex Head Nut	Contractor
6	8	3/8" SS Split Washer	Contractor
7	16	3/8" SS Flat Washer	Contractor



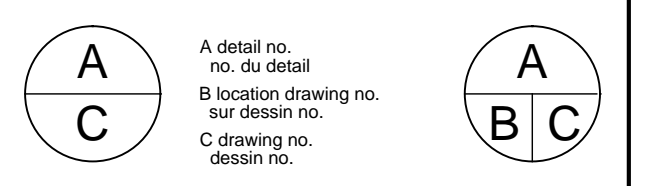
Preparation of TV1



New Positions of TV1 and TP2 Conditioner

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PROFESSIONAL STAMP



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BUILDING No. 65, SHIRLEY'S BAY, ONTARIO
TQF TV1 / TP2 REFIT

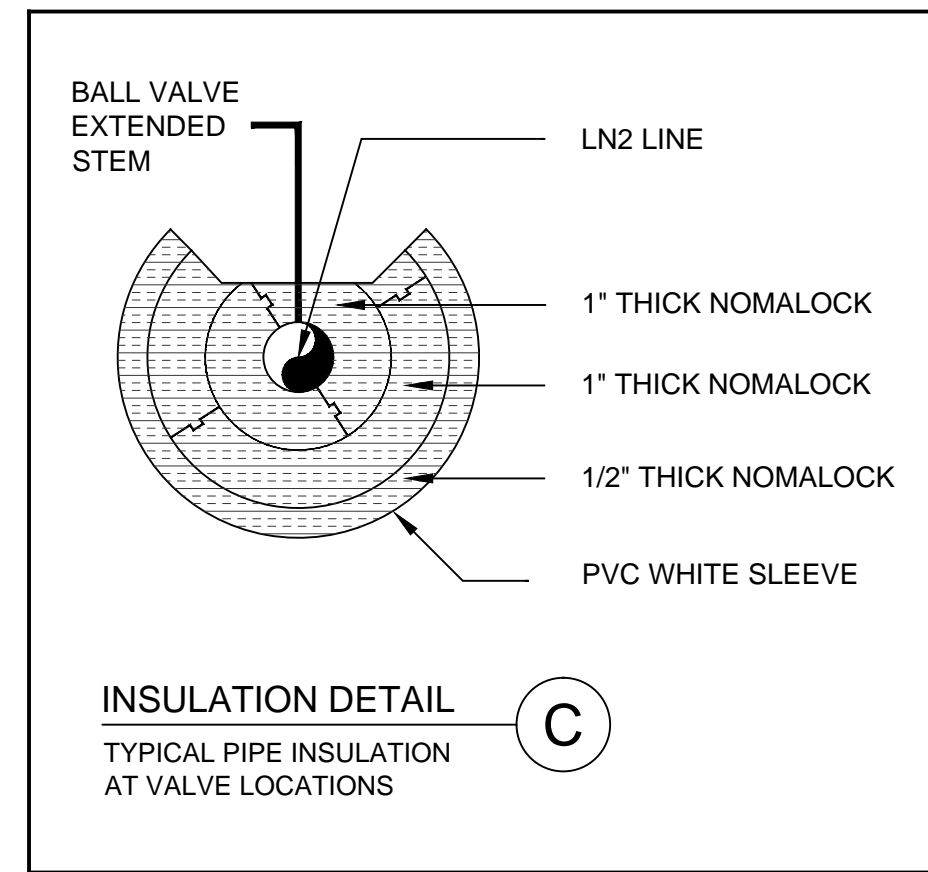
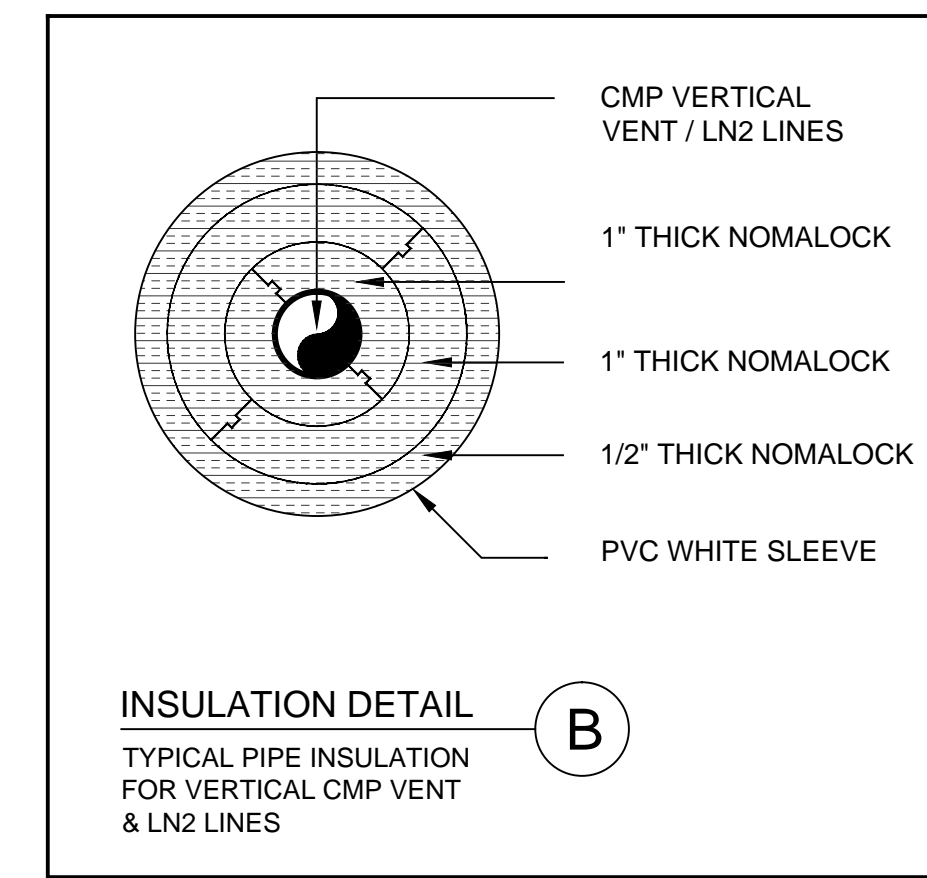
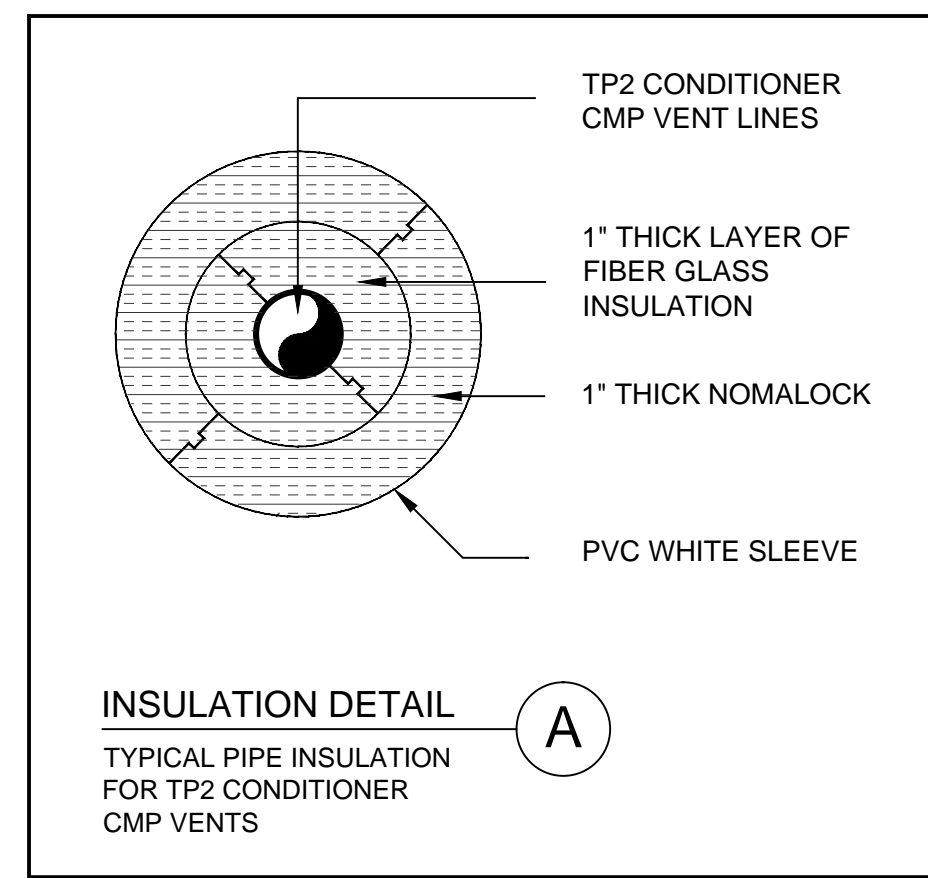
drawing
EQUIPMENT LOCATION & ANCHORAGE

designed	TQF	conçu
date		
drawn	TQF / B-OPS	dessiné
date		
reviewed	TQF	examiné
date		
approved	TQF	approuvé
date		
scale	N.T.S.	

project no. **CSA13-G1** no. du projet
drawing no. **A3** no. du dessin

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- ALL WORK SHALL CONFIRM TO THE LATEST CODE REQUIREMENTS OF THE ONTARIO BUILDING CODE, MUNICIPAL BYLAWS AND AUTHORITIES HAVING JURISDICTION. THE INSTALLATION SHALL BE IN ACCORDANCE TO THE STANDARDS OF C.S.A. & U.L.C. FOLLOW ALL RECOMMENDATIONS OUTLINED BY THE MANUFACTURER.
- EXAMINE THE SITE TO DETERMINE THE FULL EXTENT OF THE PROJECT. REFER TO BOUNDARIES ON THE PLAN. CONTRACTOR IS STRONGLY RECOMMENDED TO VISIT THE SITE BEFORE BIDDING THE PROJECT TO DETERMINE THE EXTENT OF ANY REMOVALS, MODIFICATIONS AND NEW WORK.
- IF ANY DISCREPANCY OCCURS ON THE ENGINEER'S DRAWINGS, THE CONTRACTOR SHALL, DURING TENDERING, ASSUME THE LARGER / GREATER. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- ALL DIMENSIONS SHALL BE VERIFIED ON SITE. DIMENSIONS SHOWN ON DRAWINGS ARE IN INCHES.
- EXACT LOCATION OF EQUIPMENT AND PIPING IS SUBJECT TO SITE MEASUREMENTS. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL TO ENGINEER PRIOR TO COMMENCING, FABRICATION, MANUFACTURING OR ORDERING EQUIPMENT.
- PAY FOR ALL NECESSARY PERMITS REQUIRED TO BY LOCAL AUTHORITIES HAVING JURISDICTION, INCLUDING INSPECTION AND TESTING. APPLY FOR TSSA PERMIT APPLICATION FOR ALL WORK PERFORMED UNDER THIS CONTRACT THAT IS SUBJECT TO THE BOILER & PRESSURE VESSELS ACT. TURN OVER TO THE OWNER ORIGINAL APPROVAL DOCUMENTATION & CERTIFICATES.
- VERIFY LOCATION AND ELEVATION OF EXISTING SERVICES AND MAINS TO BE TIED INTO PRIOR TO COMMENCING WORK.
- ALL SHUTDOWNS MUST BE COORDINATED WITH CSA PROJECT MANAGER.
- IMMEDIATELY AFTER AWARDED THE CONTRACT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A DETAILED WORK SCHEDULE, IN THE FORM OF A COMPUTERIZED BAR CHART OUTLINING ALL PROJECT ACTIVITIES AND SCHEDULED SHUT DOWNS.
- DRAWINGS ARE NOT INTENDED TO SHOW THE DETAILS OF ALL PIPE ROUTES, OFFSETS, ETC. BE RESPONSIBLE FOR CAREFULLY EXAMINING THE WORK SITE PRIOR TO TENDER CLOSE OUT AND INCLUDE IN THE TENDER PRICE ALL NECESSARY LABOR AND MATERIAL REQUIRED FOR A FULLY OPERABLE SYSTEM AS INTENDED.
- ALL COPPER PIPING TO BE TYPE 'K' HARD COPPER INCLUDING (BUT NOT LIMITED TO) MANIFOLDS, VENTS & STRAIGHT RUNS. ALL JOINTS TO BE BRAZED USING SIL-FOS 15% SILVER WITH ARGON PURGE CRYOGENIC APPROVED PRODUCT, NO FLUX ON COPPER - COPPER CONNECTIONS, FLUX RECOMMENDED FOR COPPER - BRASS CONNECTIONS. THE CONTRACTOR SHALL SUBMIT BRAZER'S VALID CERTIFICATES, BRAZING / SOLDER PROCEDURE AND TWO BRAZING SAMPLES FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO MAKING ANY CONNECTIONS ON SITE.
- ALL WALL AND FLOOR PENETRATIONS SHALL BE SEALED BY THE CONTRACTOR IN ACCORDANCE WITH APPLICABLE CODES & THE ENGINEER'S REQUIREMENTS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION (SUPPLY AND INSTALLATION) OF ALL PIPING, FIXTURES, ETC. SHOWN ON THE DRAWING OR SPECIFICATIONS UNLESS OTHERWISE INDICATED. ALL MATERIAL & EQUIPMENT TO BE NEW AND FREE FROM DEFECTS.
- CONTRACTOR SHALL ARRANGE FOR ALL NECESSARY HOT WORK PERMITS TO COMPLETE THE WORK.
- ALL THREADED FITTINGS & COMPRESSION FITTING MUST BE BRASS, KF FITTINGS TO BE STAINLESS STEEL.
- ALL THREADED SOLENOID VALVES TO BE PIPED WITH MALE BRASS NPT'S & ALL THREADED FITTINGS ARE TO BE SEALED WITH TEFLON TAPE.
- BRAZING OF COPPER - COPPER JOINTS WITH SIL-FOS 15 w/ ARGON PURGE, NO FLUX. BRAZING OF COPPER - BRASS JOINTS WITH SIL-FOS 15 w/ ARGON PURGE, APPROPRIATE FLUX
- PURGE ALL LINES AFTER INSTALLATION WITH ARGON TO PREVENT THE ENTRY OF DEBRIS FROM TRAVELING FURTHER INTO THE CLEAN SYSTEM COMPONENTS.
- ALL PIPING INSULATION TO BE INSTALLED AFTER LEAK TESTING IS COMPLETED.
- ALL INSULATION JOINTS TO BE STAGGERED. PROVIDE REMOVABLE INSULATION JOINTS AT ALL VALVES & UNIONS.
- CONTRACTOR TO PROVIDE 12" INSULATION PROTECTION GALVANIZED SHIELD PLATES / SADDLES AT EACH PIPE HANGER LOCATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR RELOCATING ANY SERVICES OBSTRUCTING THE PATH OF NEW PIPING AND EQUIPMENT AND SHALL DO SO AFTER THE ENGINEER'S APPROVAL AT NO ADDITIONAL COST TO THE PROJECT.
- ALL EQUIPMENT SHOWN TO BE REMOVED ON THESE DRAWINGS SHALL BE REMOVED IN THEIR ENTIRETY, INCLUDING BUT NOT LIMITED TO: ALL RELATED PIPING, FITTINGS, VALVES, PIPE HANGERS, CONTROLS AND INSULATION.
- SEVERAL SYSTEMS OR PART OF SYSTEMS WILL BE SUBJECT TO A MINIMAL SHUT DOWN PERIOD. BE RESPONSIBLE FOR HAVING ALL NECESSARY TOOLS, MANPOWER AND EQUIPMENT REQUIRED TO MAXIMIZE THE PRODUCTION DURING A SHUT DOWN. ALL SHUT DOWNS SHALL BE COORDINATED WITH CSA PROJECT MANAGER.
- ALL PIPING TO BE TESTED FOR A MINIMUM OF 24 HOURS. ALL TESTS TO BE OBSERVED & APPROVED BY CSA PM. DO NOT CONCEAL ANY PIPE UNTIL TESTED & INSPECTED. REFER TO TABLE ON M1 FOR MORE TESTING DETAILS.
- REFER TO NOTES 29, 30, 31 & 32 ON DRAWING A1 FOR ALL SERVICES SUPPORTS & HANGERS.
- CONTRACTOR TO FULLY INSTALL ALL OWNER SUPPLIED PIPING SUPPORTS.
- CONTRACTOR TO TEMPORARILY SUPPORT ALL REMAINING PIPING LEFT AFTER DEMOLITION OR MODIFICATION UNTIL NEW PIPING & BRANCHES ARE TIED IN & INSTALLED AND FINAL PERMANENT SUPPORTS ARE IN PLACE.
- PARTS NOTED ON DRAWINGS TO BE SUPPLIED BY OWNER SHALL BE FULLY INSTALLED & SUPPORTED BY CONTRACTOR.
- SMOKE EATERS & POWERED EXHAUST FANS TO BE USED DURING ALL BRAZING / WELDING / SOLDERING / CUTTING / GRINDING ACTIVITIES TO MINIMIZE CONTAMINATION & ODOR TO ADJACENT AREAS. ALL BUILDING HVAC RETURN GRILLS WITHIN CONSTRUCTION AREA TO BE BLOCKED AT ALL TIMES.
- WORK UNDER THIS PROJECT MAYBE CONDUCTED AT ELEVATIONS IN EXCESS OF 15 m± (50 ft ±). CONTRACTOR MUST ENSURE THAT ALL STAFF & SUB CONTRACTORS ARE TRAINED IN ELEVATED WORK AND FALL PROTECTION.
- DO NOT SUBJECT ANY PART OF THE BUILDING TO ANY NOISE, DUST OR ANY OTHER UNACCEPTABLE ENVIRONMENTAL CONDITIONS DURING THE COURSE OF THE PROJECT. ANY NOISY / DUSTY / SMELLY ACTIVITIES SHALL BE DONE AFTER HOURS OR AT WEEKENDS, COORDINATE WITH CSA PROJECT MANAGER WITH A MINIMUM NOTICE OF 48 HOURS.



SAMPLE IMAGE OF APPROVED 15% SIL-FOS ARGON PURGED BRAZED PIPING. CONTRACTOR TO PROVIDE TWO SIMILAR SAMPLES FOR ENGINEER APPROVAL.

INFORMATION FOR CONTRACTOR USE & TSSA APPLICATION								
SERVICE	MATERIAL	SIZE (Inch)	WORKING PRESSURE (PSI)	MAX PRESSURE (PSI)	TESTING			REMARKS
					PRESSURE (PSI)	MEDIA	DURATION	
TP2 VENTS	AL	4	5	15	20	AIR	24 hrs	
TV1 CMP VENTS	CU	1 1/2	5	15	20	AIR	24 hrs	
LN2	CU	1/2	50	50	65	AIR	24 hrs	
GN2	CU	1/2	20 - 50	100	125	AIR	24 hrs	
COMP. AIR	CU	1/4	100	120	150	AIR	24 hrs	

MECHANICAL LEGEND	
SYMBOL	DESCRIPTION
	PIPE TEE UP
	PIPE TEE DOWN
	PIPE TURNING DOWN
	BACKWATER VALVE
	BALANCING VALVE
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE, SWING
	PURGE VALVE
	COMBINATION BALANCING AND SHUT-OFF VALVE
	PUMP
	GATE VALVE
	GLOBE VALVE
	KNIFE-GATE VALVE
	NEEDLE VALVE
	PLUG VALVE
	PRESSURE RELIEF VALVE
	SOLENOID VALVE
	THERMAL VALVE
	3 WAY TEMPERATURE REGULATOR VALVE w/ DIAL THERMOMETER & SENSING BULB
	TEMPRETURE GAUGE w/ ISOLATING BALL VALVE
	PRESSURE GAUGE w/ ISOLATING BALL VALVE
	CONCENTRIC REDUCER
	FLEXIBLE CONNECTION

PIPE AND DUCT IDENTIFICATION	
DUCT	24"X12" - SAD - GALV
SIZE	SIZE - SERVICE - MATERIAL
PIPE	2" - CHWS - CS
SIZE	SIZE
DUCT - (inch) INSIDE DIMENSIONS WITH FIRST FIGURE INDICATING DIMENSION SHOWN	
PIPE - (inch) NOMINAL DIAMETER	
DUCT SERVICE DESIGNATIONS	
EAD - EXHAUST AIR DUCT	
OAD - OUTSIDE AIR DUCT	
RAD - RETURN AIR DUCT	
SAD - SUPPLY AIR DUCT	
PIPE SERVICE DESIGNATIONS	
LN2 - LIQUID NITROGEN	
GN2 - GASEOUS NITROGEN	
GHe - GASEOUS HELIUM	
CHWS - CHILLED WATER SUPPLY	
CHWR - CHILLED WATER RETURN	
CR - COMPRESSED AIR	
MISCELLANEOUS	
F - STANDPIPE	
FP - FIRE PROTECTION	
NG - NATURAL GAS	
MATERIAL DESIGNATIONS	
AL - ALUMINUM	
DI - DUCTILE IRON	
CI - CAST IRON	
FRP - FIBBER REINFORCED PLASTIC	
VJ - VACUUM JACKETED PIPE	
GALV - GALVANIZED STEEL	
CS - CARBON STEEL	
PVC - POLYVINYL CHLORIDE	
CU - COPPER	
SST - STAINLESS STEEL	

YVES GUINDON
MANAGER, SECURITY AND FACILITIES
M. FARID, P. Eng.
PROJECT MANAGER

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5.		
4.		
3.	ISSUED FOR TENDER	SEPT, 14
2.	ISSUED FOR FINAL REVIEW	SEPT, 14
1.	ISSUED FOR REVIEW	AUG, 14
No.	REVISION	Date

PROFESSIONAL STAMP
A detail no. / no. de detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet
DAVID FLORIDA LABORATORY
BUILDING No. 65, SHIRLEY'S BAY, ONTARIO

TQF TV1 / TP2 REFIT

drawing / dessin
MECHANICAL NOTES, LEGEND & INSULATION DETAILS

designed / conçu
date
TQF

drawn / dessiné
date
TQF / B-OPS

reviewed / examiné
date
TQF

approved / approuvé
date
TQF

scale
N.T.S.

project no. / no. du projet
CSA13-G1

drawing no. / no. du dessin
M1

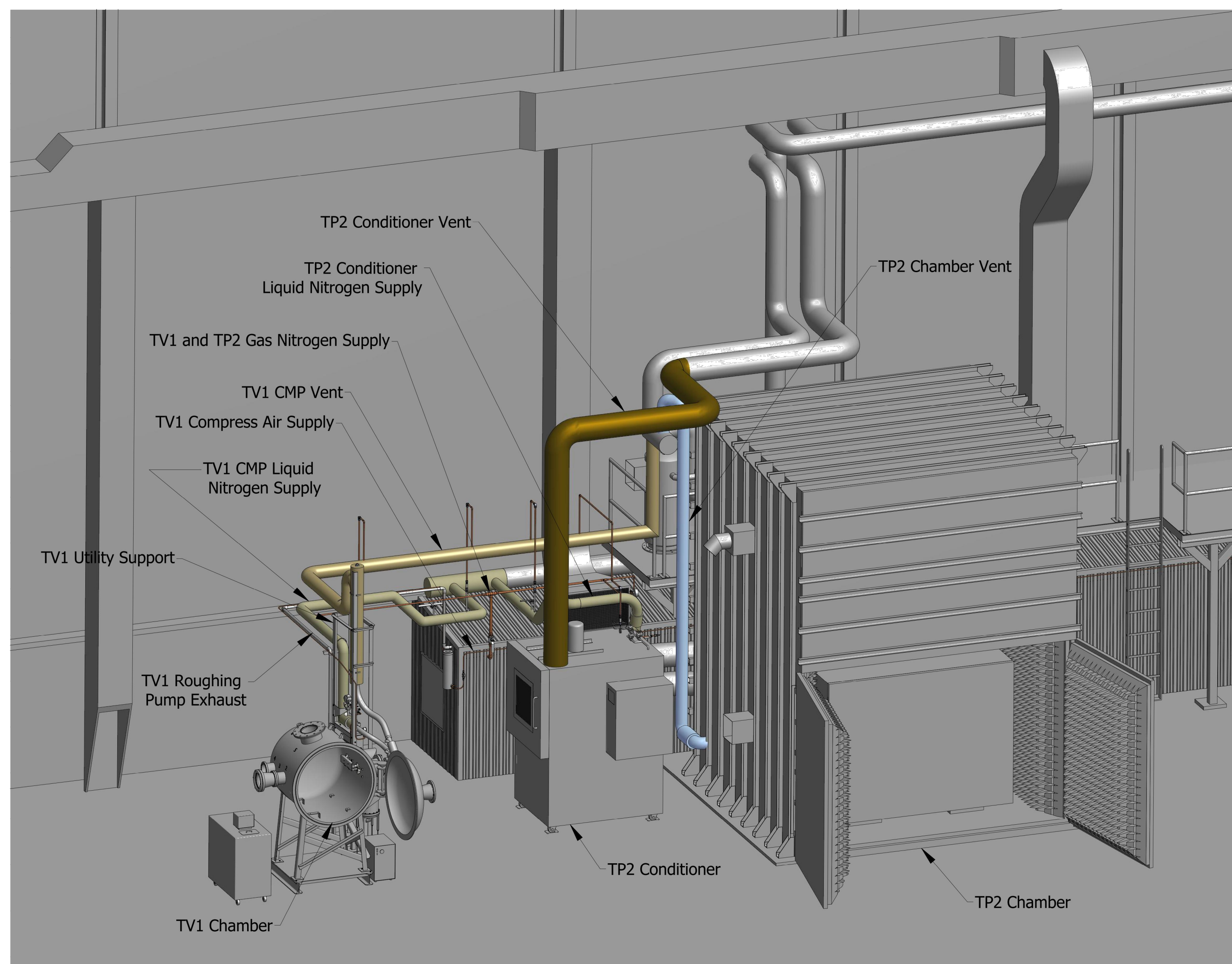
YVES GUINDON
MANAGER, SECURITY AND FACILITIES

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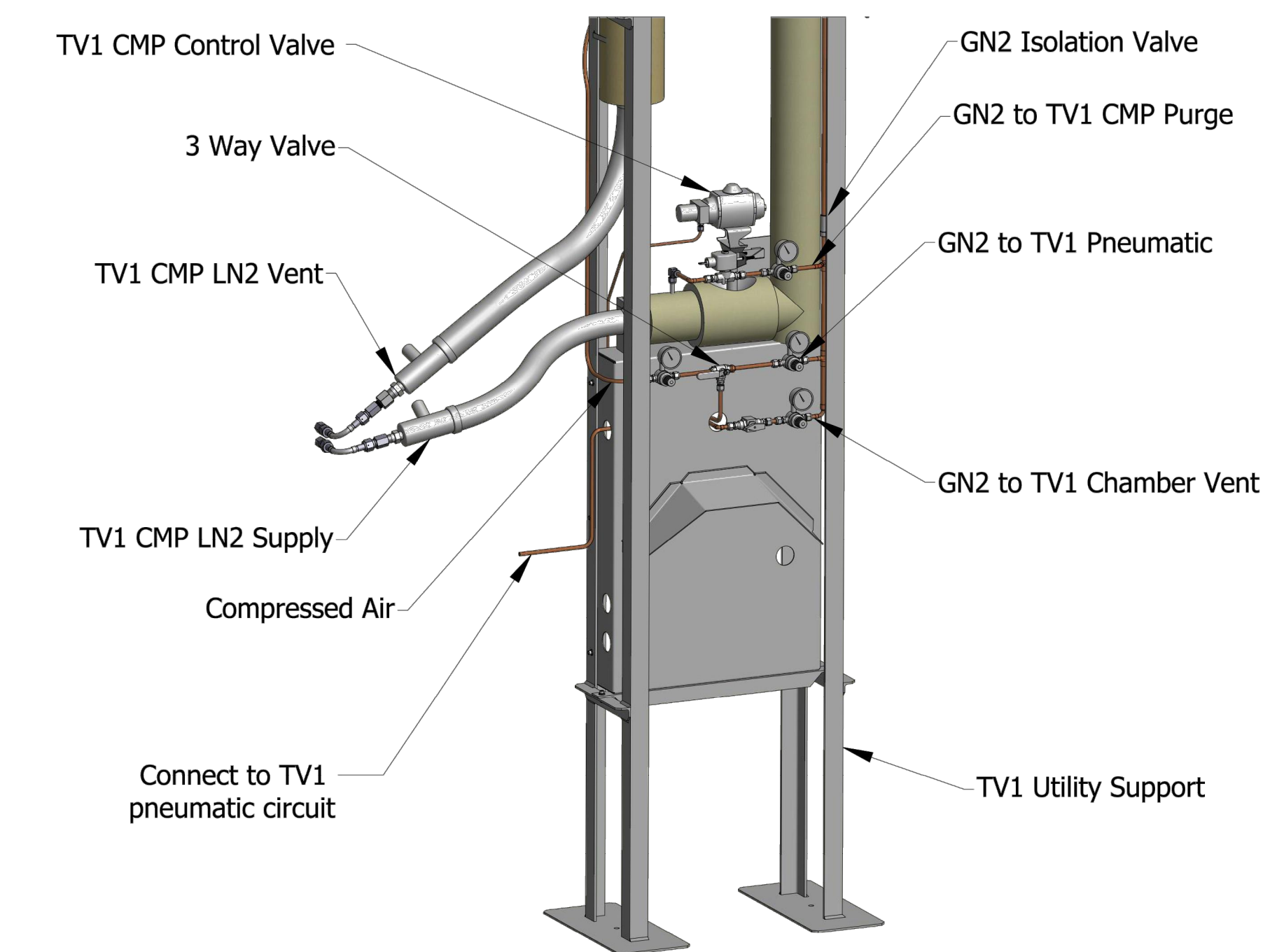
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TV1 and TP2 Plumbing Overall View



TV1 Utility Support
(Viewing from TP2)

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PROFESSIONAL STAMP

A C	A detail no. no. du détail B location drawing no. sur dessin no. C drawing no. dessin no.	A B C
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project	DAVID FLORIDA LABORATORY BUILDING No. 65, SHIRLEY'S BAY, ONTARIO	project
drawing	TQF TV1 / TP2 REFIT	dessin
designed	TQF	conçu
date		
drawn	TQF / B-OPS	dessiné
date		
reviewed	TQF	examiné
date		
approved	TQF	approuvé
date		
scale	N.T.S.	
project no.	CSA13-G1	no. du projet
drawing no.	M2	no. du dessin

- NOTES:**
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 - ALL PARTS SUPPLIED BY OWNER TO BE FULLY INSTALLED BY CONTRACTOR.
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 - NO FLUX ON COPPER - COPPER CONNECTIONS.
 - FLUX RECOMMENDED FOR COPPER - BRASS CONNECTIONS.

YVES GUINDON
MANAGER, SECURITY AND FACILITIES

M. FARID, P. Eng.
PROJECT MANAGER

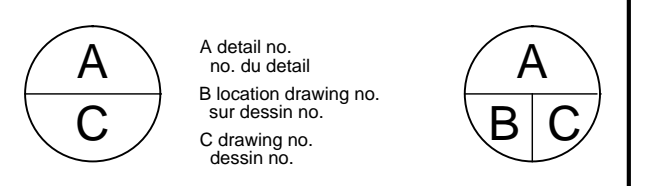
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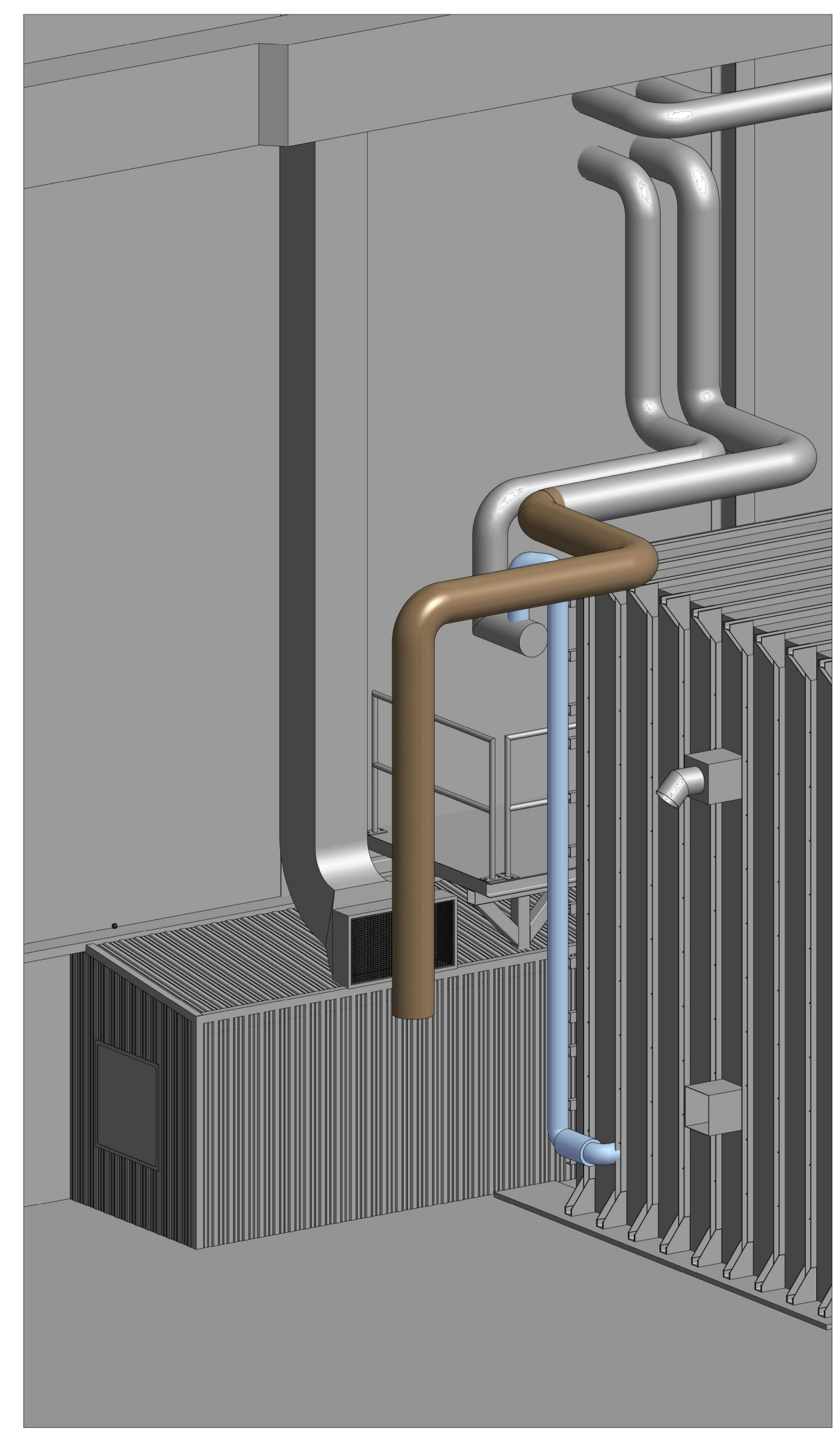
project / projet
DAVID FLORIDA LABORATORY
BUILDING No. 65, SHIRLEY'S BAY, ONTARIO
TQF TV1 / TP2 REFIT

drawing / dessin
TP2 CHAMBER & CONDITIONER VENTS

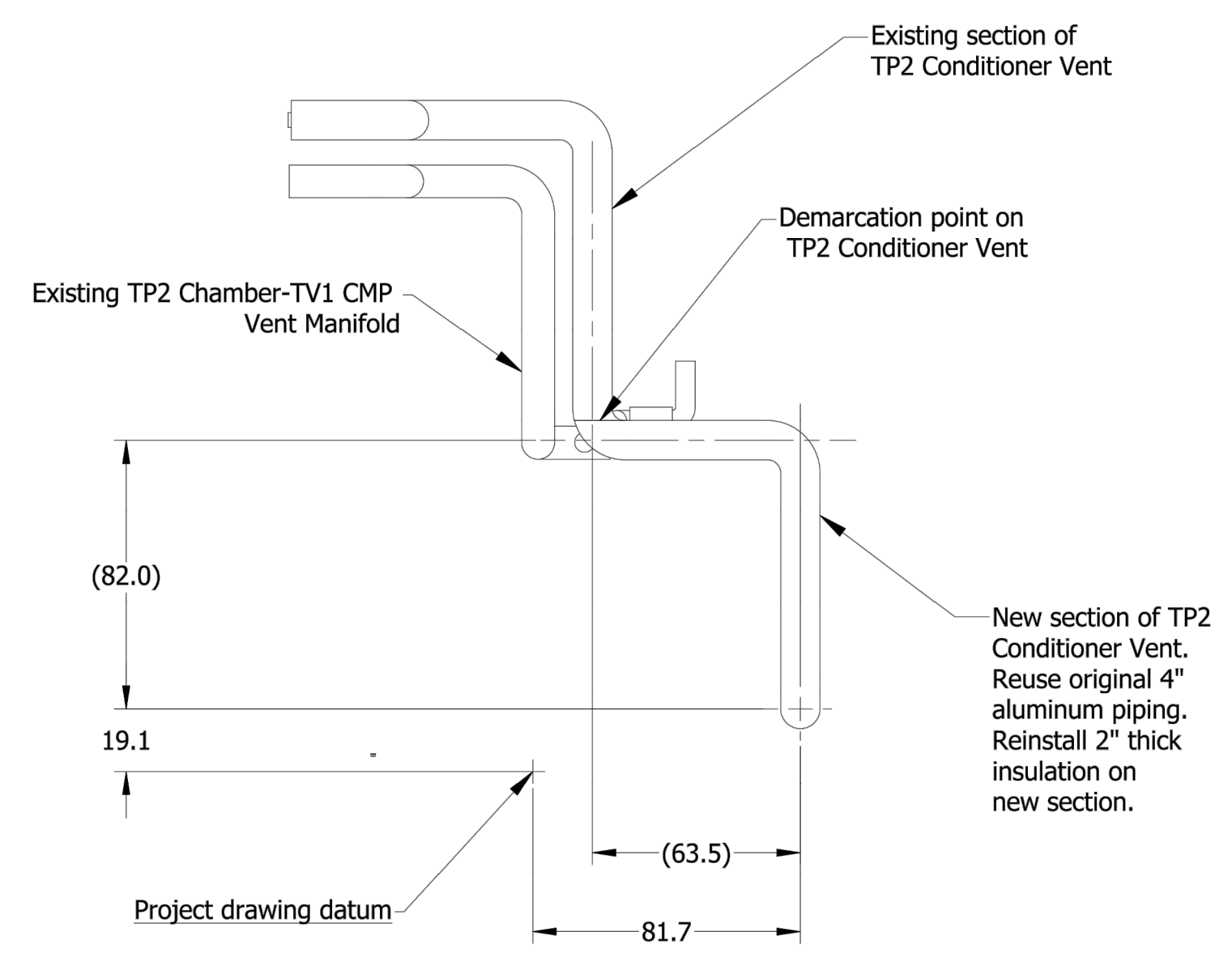
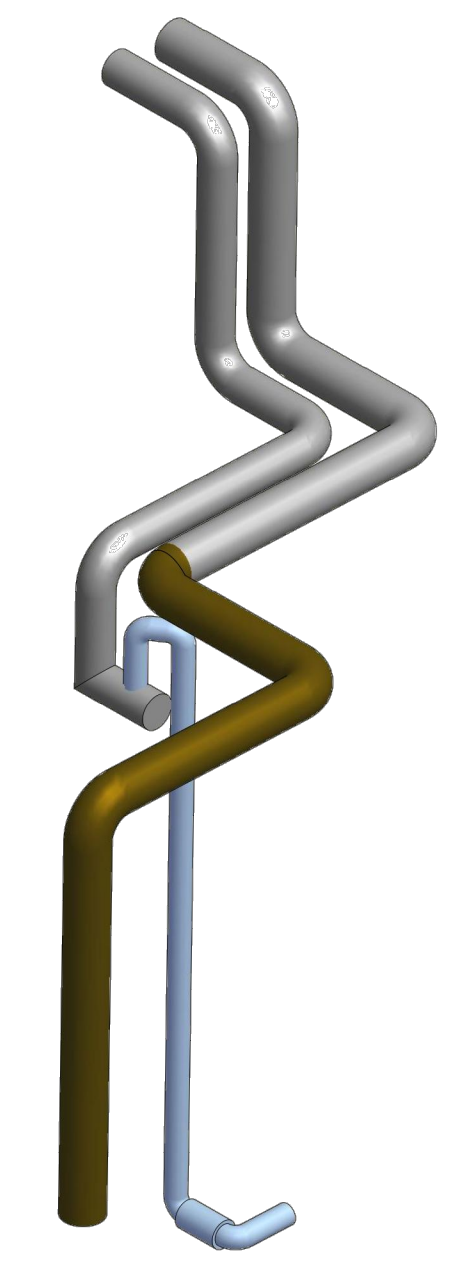
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approved / approuvé	TQF
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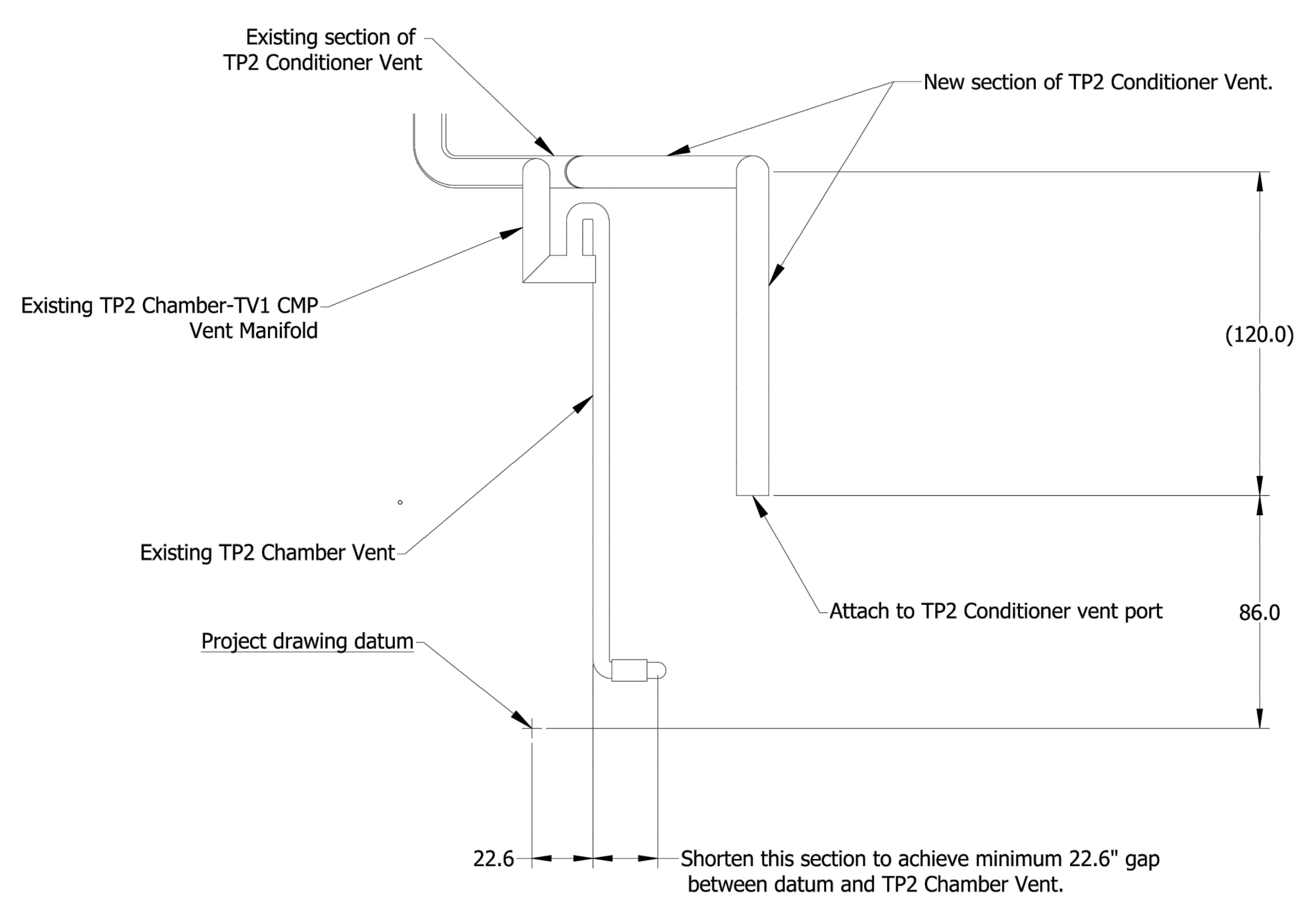
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M3



TP2 Chamber and TP2 Conditioner Vents



- NOTES:**
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 2. ALL PARTS SUPPLIED BY OWNER TO BE FULLY INSTALLED BY CONTRACTOR.
 3. ALL BRAZING TO BE SIL-FOS 15% WITH ARGON PURGE.
 4. NO FLUX ON COPPER - COPPER CONNECTIONS.
 5. FLUX RECOMMENDED FOR COPPER - BRASS CONNECTIONS.



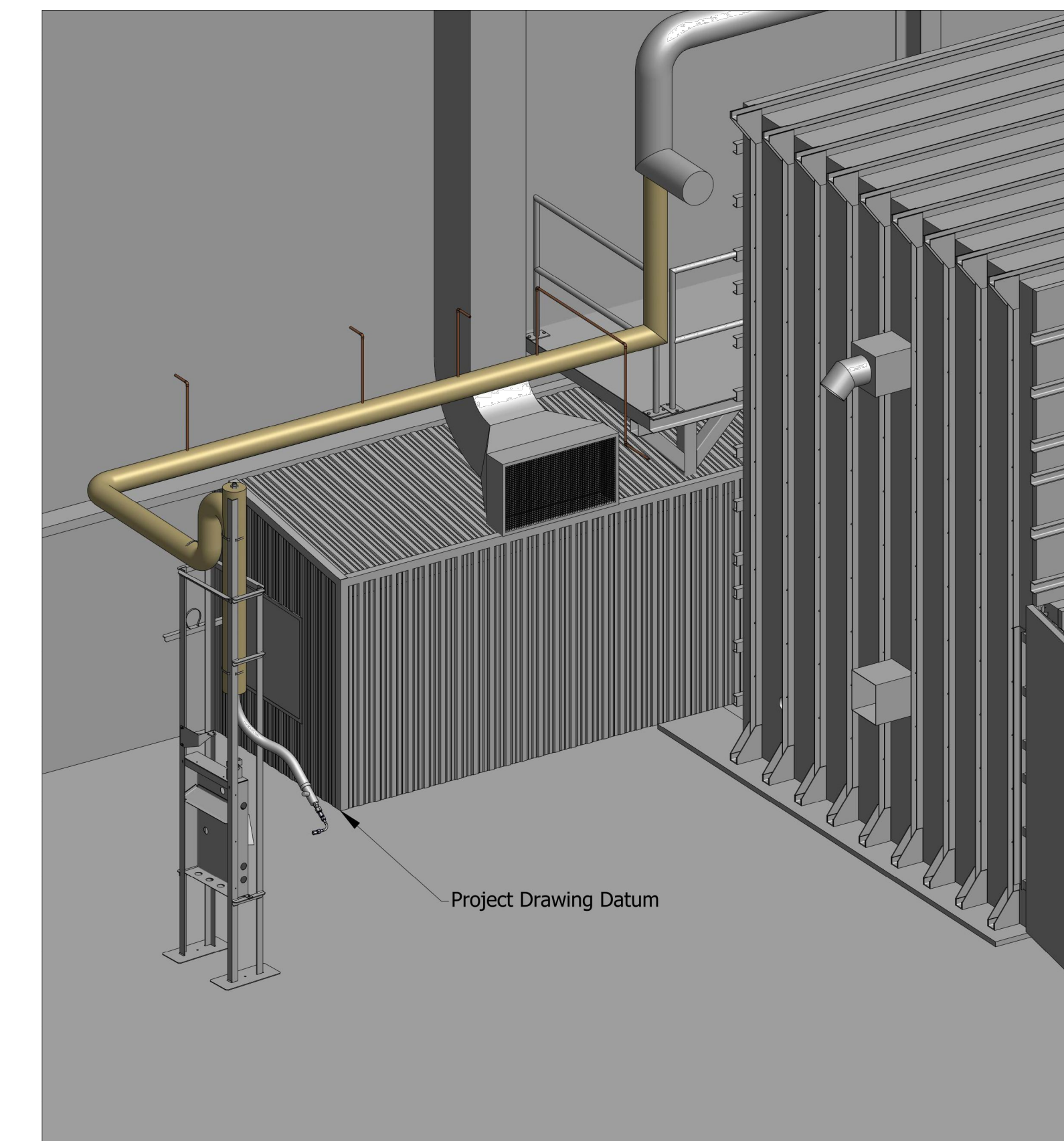
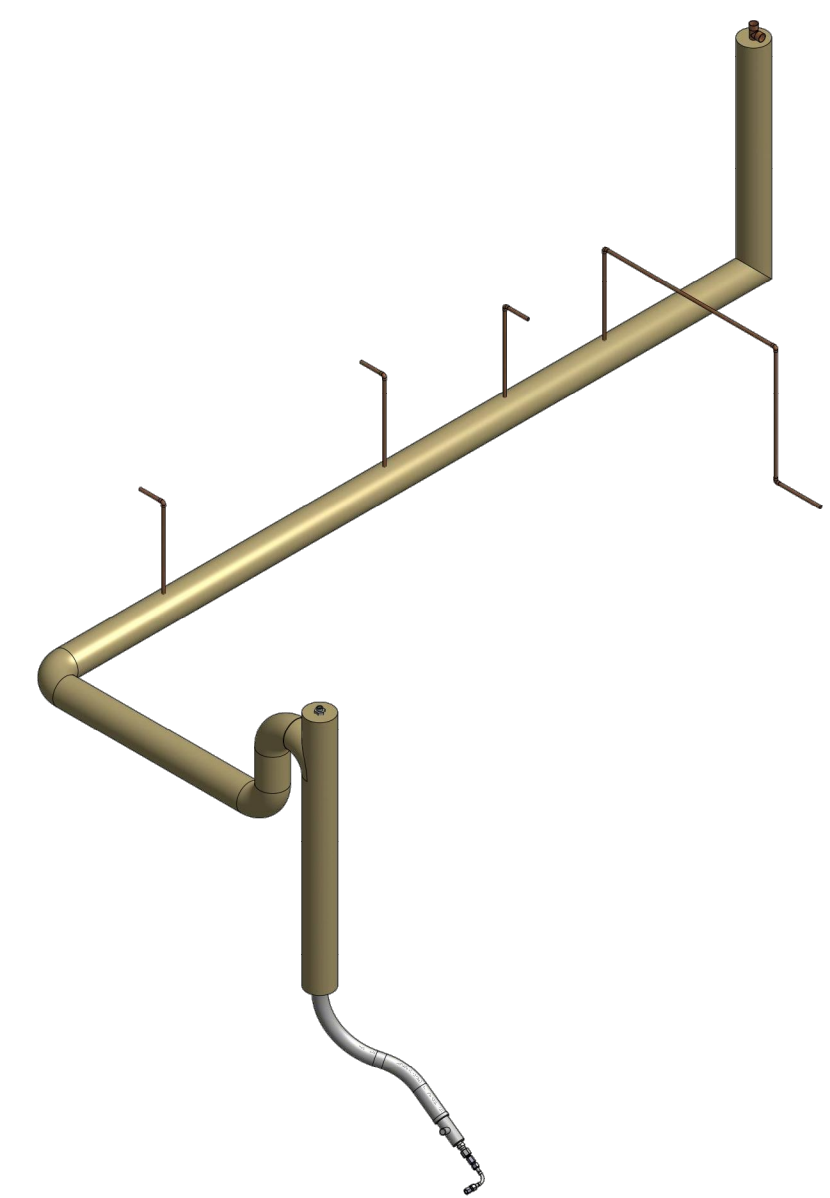
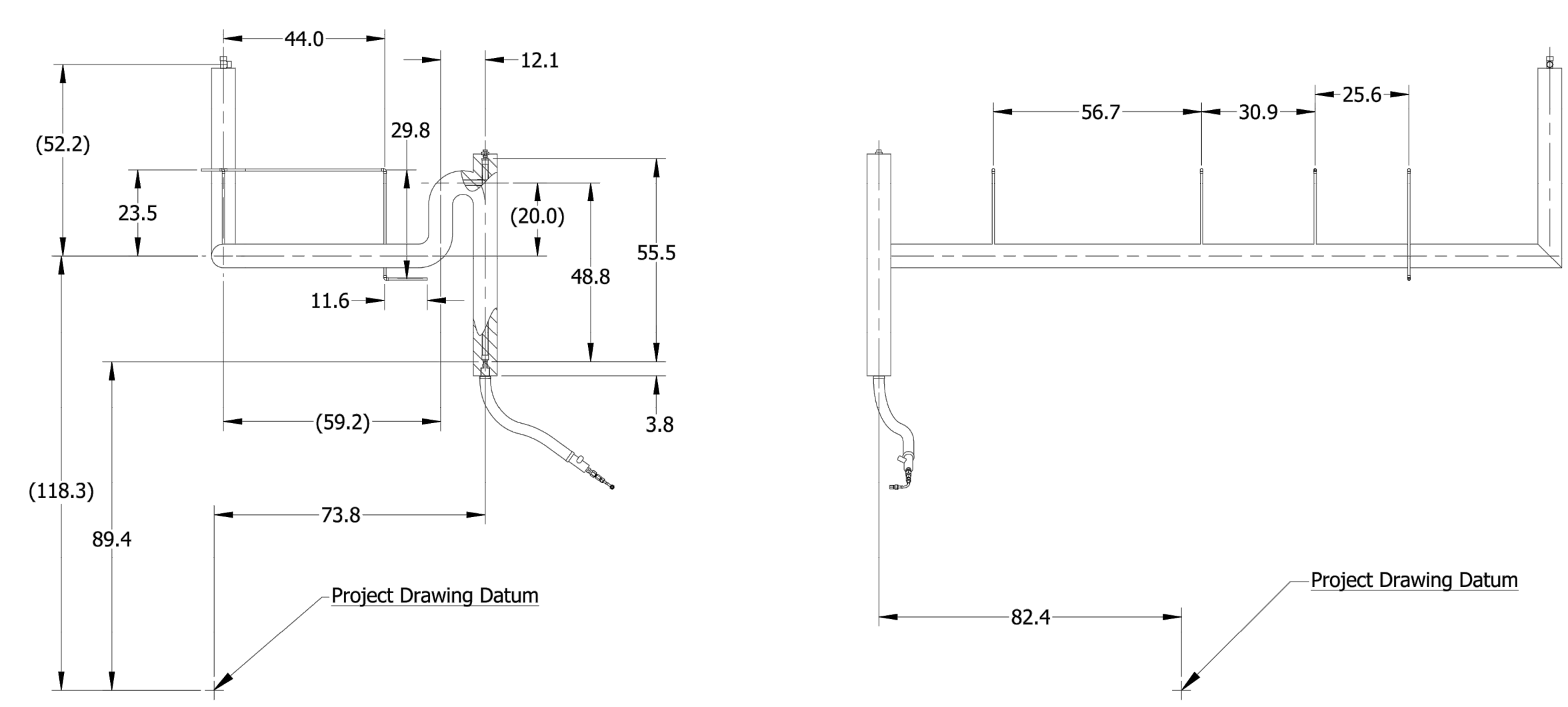
YVES GUINDON
MANAGER, SECURITY AND FACILITIES

M. FARID, P. Eng.
PROJECT MANAGER

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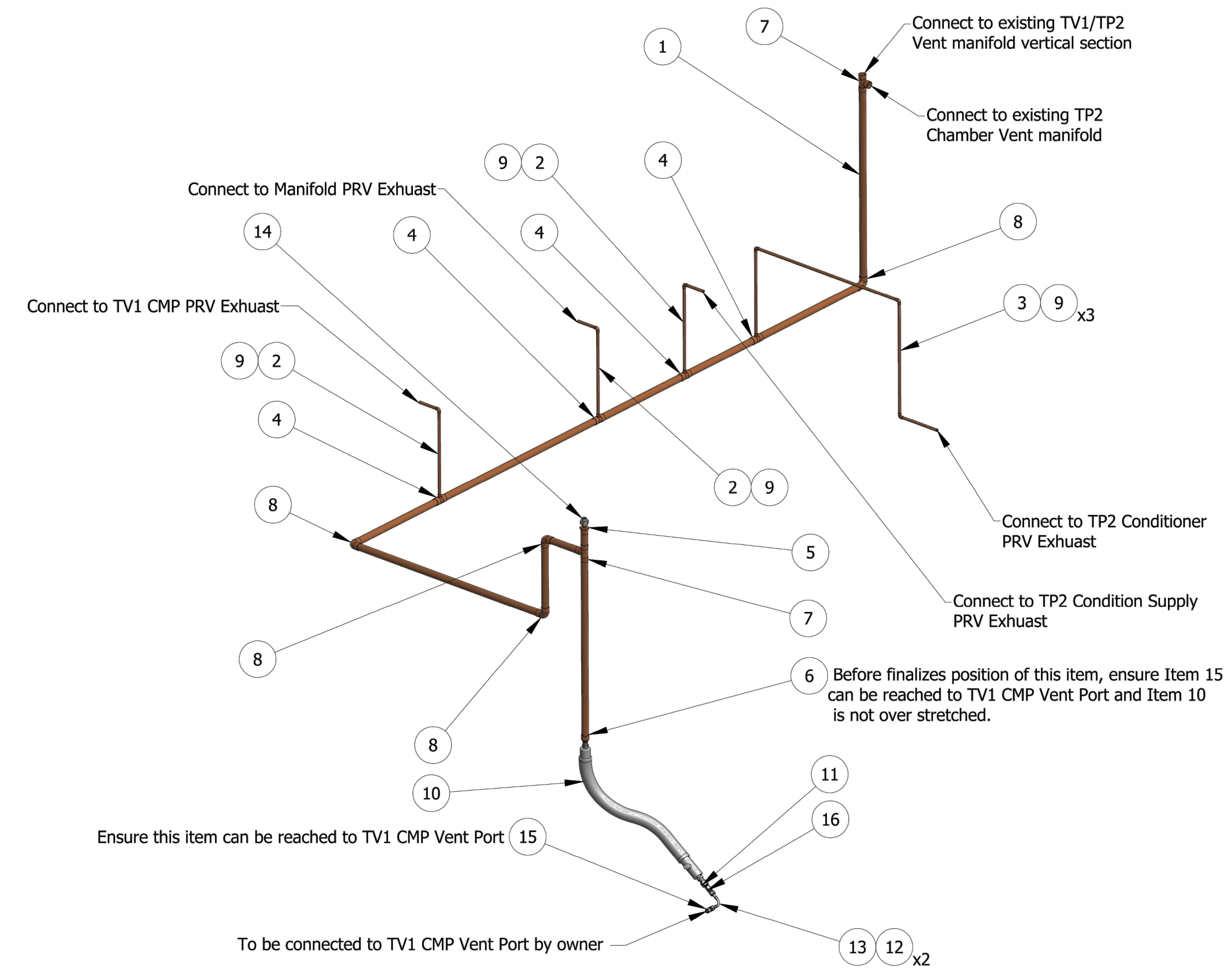
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TV1 CMP Vent

- NOTES:**
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PARTS LIST			
ITEM	QTY	PART NAME	SUPPLIED BY
1	31'	Type "K" 1-1/2" copper pipe on TV1 vent	Contractor
2	2.5'	Type "K" 1/2" copper pipe on TV1 and Manifold PRVs exhaust to vent line	Contractor
3	10'	Type "K" 1/2" copper pipe on TP2 Conditioner PRV exhaust to vent line.	Contractor
4	4	Copper reducing Tee 1-1/2" x 1-1/2" x 1/2"	Contractor
5	1	Copper adaptor 1-1/2" pipe X 1/2" MNPT	Contractor
6	1	Copper adaptor 1-1/2" pipe X 3/4" FNPT	Contractor
7	2	Copper Tee 1-1/2"	Contractor
8	4	Copper elbow 1-1/2"	Contractor
9	6	Copper elbow 1/2"	Contractor
10	1	TV1 CMP Vent SS 3/4" flexible VJ hose	Owner
11	1	SS adaptor 3/4" FNPT X 1/2" MNPT, McMaster 51205K324	Owner
12	2	Swagelok 1/2" VCR Gasket SS-8-VCR-2-GR	Owner
13	1	TV1 CMP VCR 1/2" weld elbow assembly	Owner
14	1	SS Koncentric Union 1/2" with 1/2" FNPT ends, SSP 1/2 KUT	Owner
15	1	Swagelok VCR adaptor 3/8" FNPT X 1/2" MVCR, SS-8-VCR-7-6	Owner
16	1	Swagelok VCR adaptor 1/2" FNPT X 1/2" MVCR, SS-8-VCR-7-8	Owner

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project / projet
DAVID FLORIDA LABORATORY
BUILDING No. 65, SHIRLEY'S BAY, ONTARIO
TQF TV1 / TP2 REFIT

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TV1 CMP VENT	
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scale	N.T.S.
project no.	CSA13-G1 / no. du projet
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