

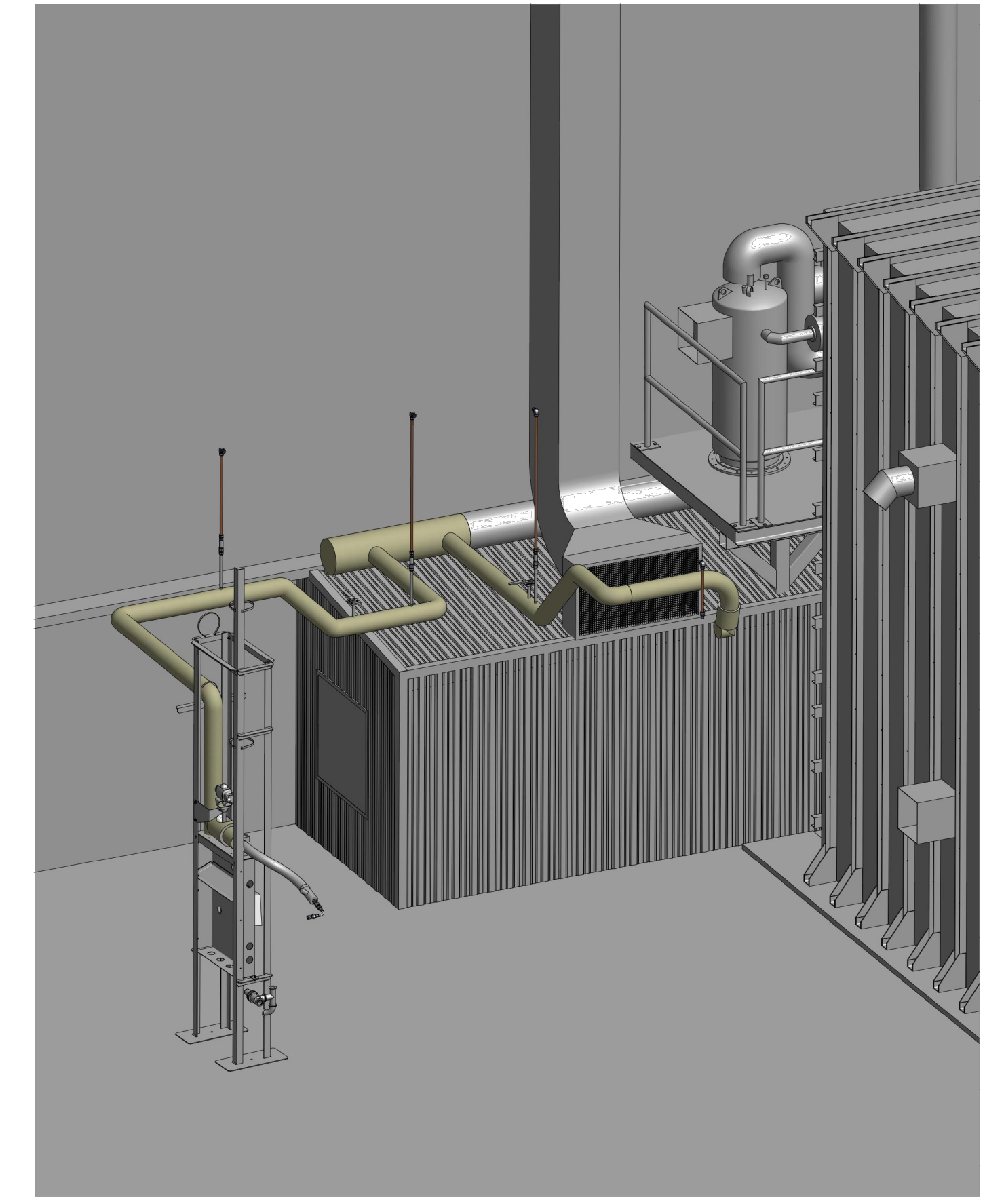
YVES GUINDON
MANAGER, SECURITY AND FACILITIES

M. FARID, P. Eng.
PROJECT MANAGER

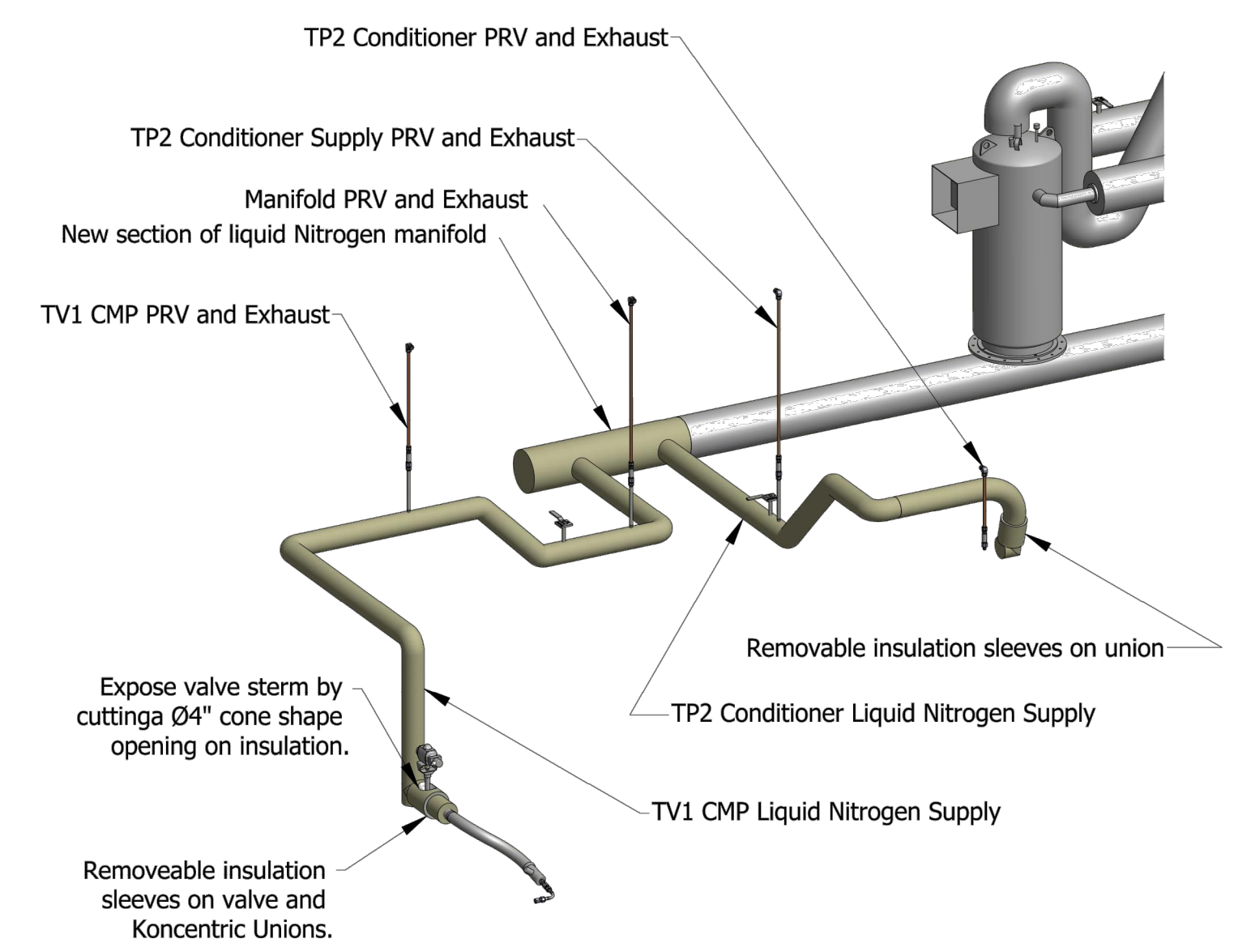
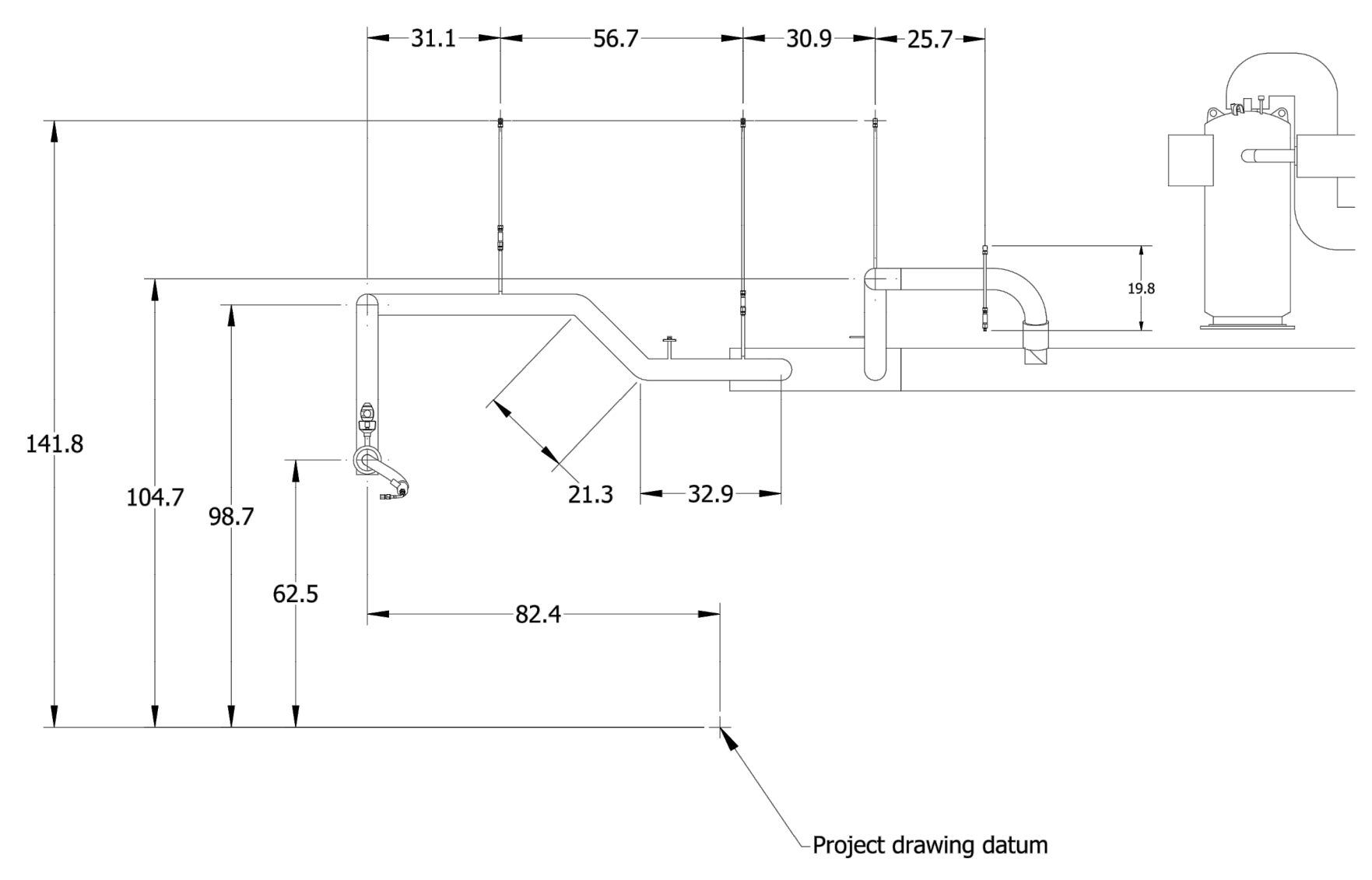
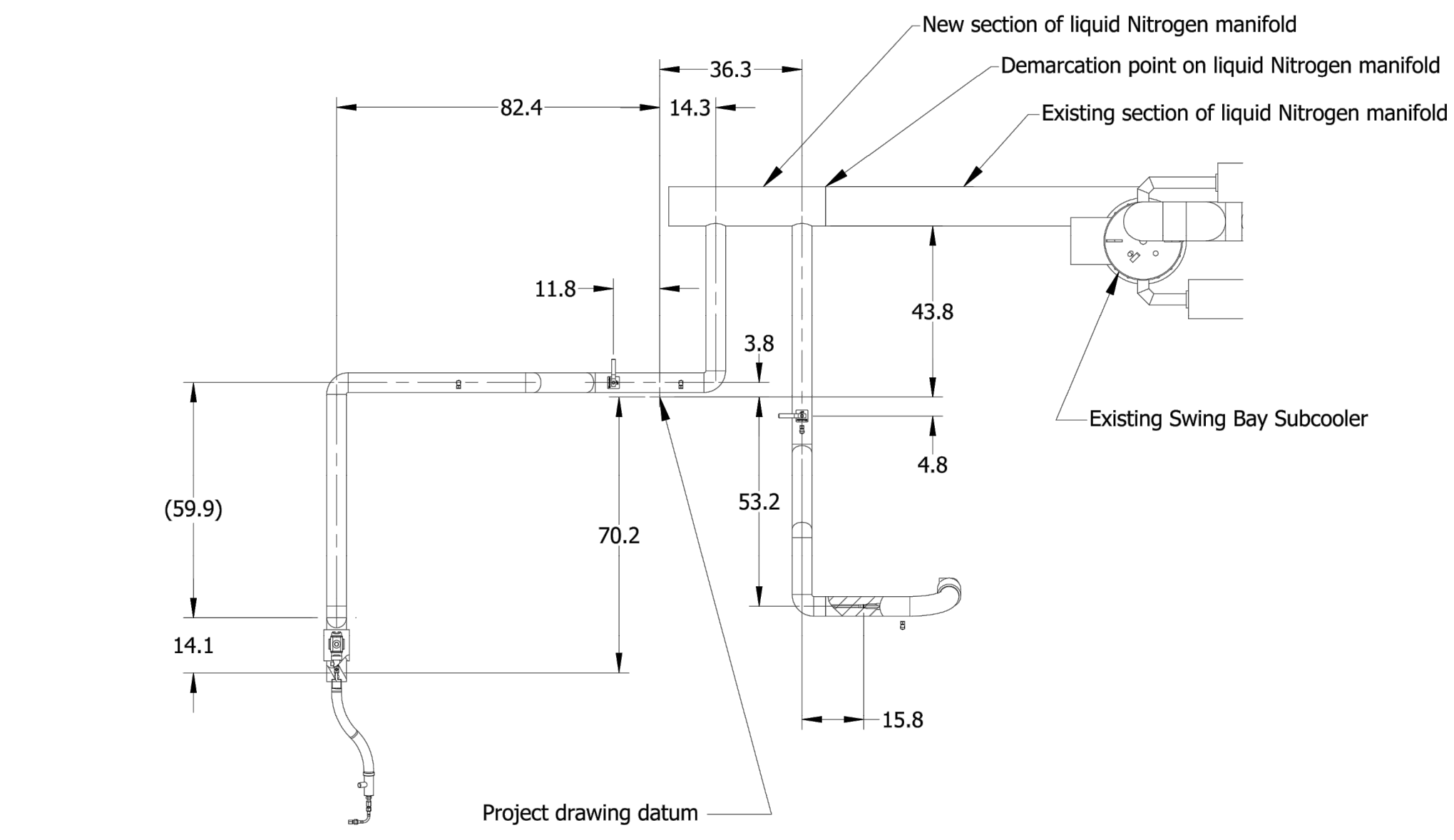
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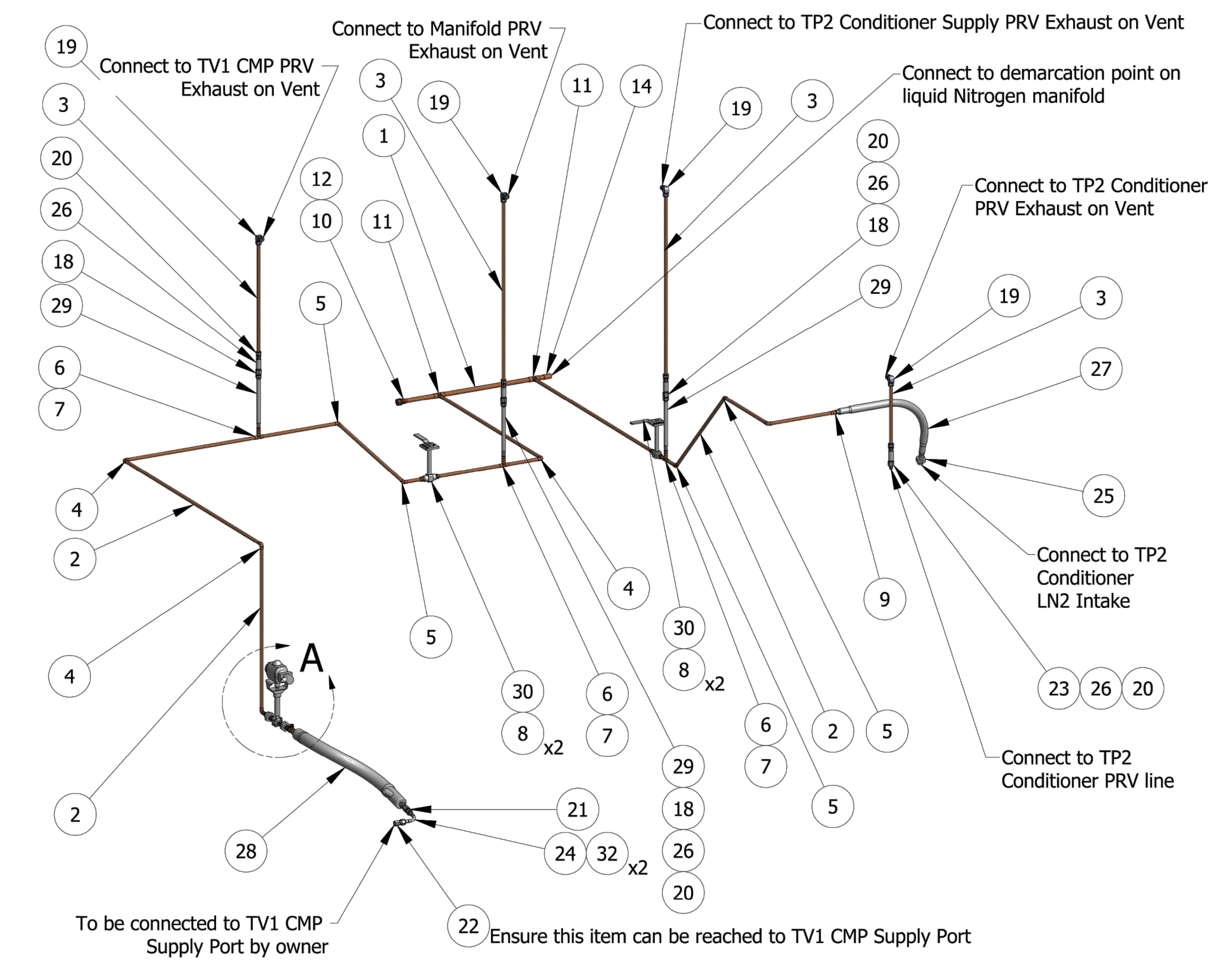
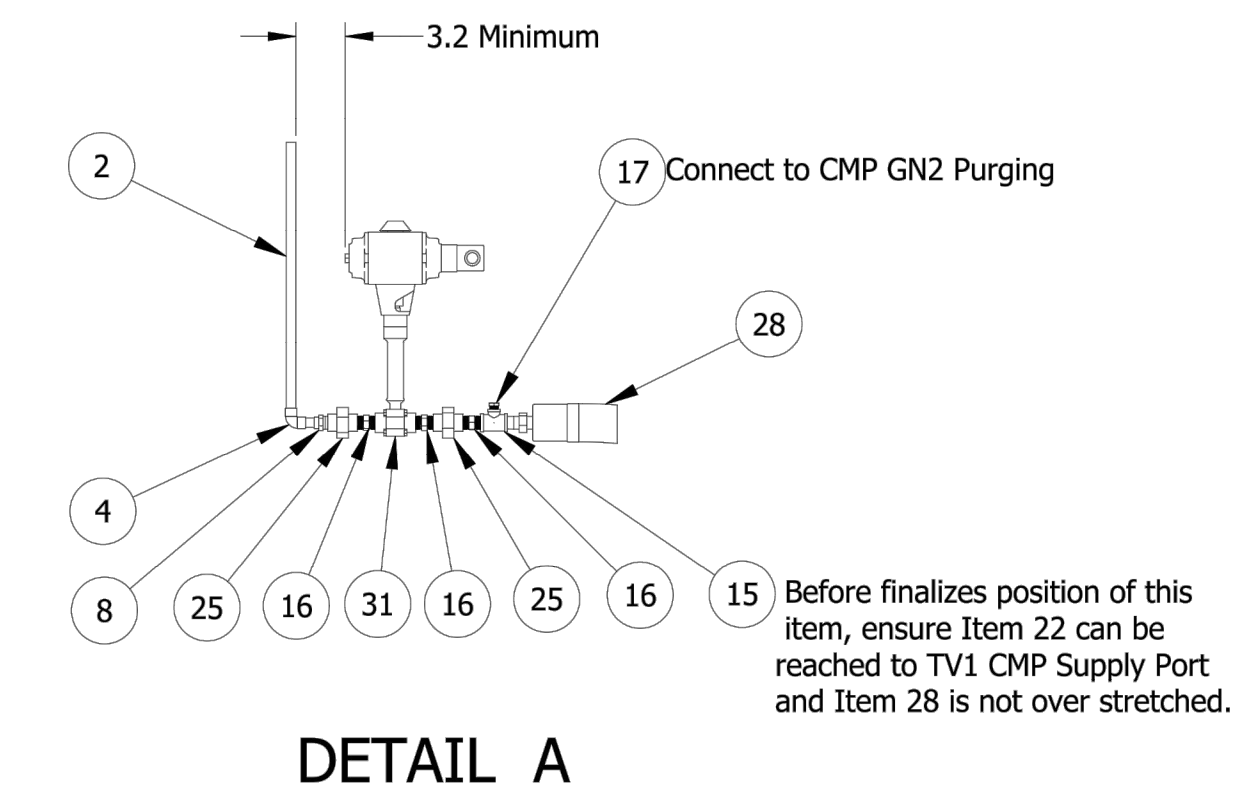
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TV1 CMP, TP2 Conditioner Liquid Nitrogen Supplies and PRVs



- NOTES:**
1. ALL DIMENSIONS AND QUANTITIES SHOWN ARE A VERY ROUGH ESTIMATE AND FOR REFERENCE ONLY WITH NO CHANGE TO CONTRACT VALUE IF OTHERWISE FOUND DURING CONSTRUCTION. CONTRACTOR TO VERIFY ALL QUANTITIES & RUN LENGTHS ON SITE.
 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.



ITEM	QTY	PARTS LIST	SUPPLIED BY
2	22 R	Type "K" 1/2" copper pipe on TV1 CMP and TP2 Conditioner liquid Nitrogen supplies	Contractor
3	12 R	Type "K" 1/2" copper pipe on PRV exhaust lines	Contractor
4	5	1/2" copper 90° elbow	Contractor
5	4	1/2" copper 45° elbow	Contractor
6	3	1/2" copper Tee	Contractor
7	3	Copper adaptor 1/2" pipe X 3/8 FNPT	Contractor
8	5	Copper adaptor 1/2" pipe X 1/2" MNPT	Contractor
9	1	Copper adaptor 1/2" pipe X 1/2" FNPT	Contractor
10	1	Copper adaptor 3/4" pipe X 3/4" MNPT	Contractor
11	2	Copper reducing Tee 3/4" X 3/4" X 1/2"	Contractor
12	1	3/4" bronze cast cap	Contractor
14	1	3/4" copper coupling	Contractor
15	1	Reducing Tee 1/2" x 1/2" x 1/4"	Contractor
16	3	1/2" SS Hex Nipple 1-7/8" length	Contractor
17	1	SS Hex Reducing Bushing 1/4" Male X 1/8" Female	Contractor
18	3	Swagelok SS adaptor 5/8 Tube X 1/2" FNPT, SS-1010-7-8	Owner
19	4	Swagelok 5/8" brass elbow, B-1010-9	Owner
20	4	Swagelok brass adaptor 5/8" tube X 1/2" MNPT, B-1010-1-8	Owner
21	1	Swagelok VCR adaptor 1/2" FNPT X 1/2" MVCR, SS-8-VCR-7-8	Owner
22	1	Swagelok VCR adaptor 3/8" FNPT X 1/2" MVCR, SS-8-VCR-7-6	Owner
23	1	Swagelok brass adaptor 1/4" Tube X 1/2" FNPT, B-400-7-8	Owner
24	1	TV1 CMP VCR 1/2" weld elbow assembly	Owner
25	3	SS Koncentric Union 1/2" with FNPT ends, SSP 1/2 KUT	Owner
26	4	Pressure Release Valve	Owner
27	1	1/2" SS flexible hose for TP2 Conditioner LN2 supply	Owner
28	1	1/2" SS flexible VJ hose for TV1 CMP LN2 supply	Owner
29	3	3/4" OD PRV SS tube. Modified from McMaster 89895K762	Owner
30	2	1/2" Worcester manual isolation valve	Owner
31	1	1/2" Worcester Control Valve 60° V Seat	Owner
32	2	Swagelok 1/2" VCR Gasket, SS-8-VCR-2-GR	Owner

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

PROFESSIONAL STAMP

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

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

drawing	dessein
TV1 CMP & TP2 CONDITIONER LN2	
designed	TQF concu
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reviewed	TQF examine
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approved	TQF approuve
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scale	N.T.S.
project no.	CSA13-G1 no. du projet
drawing no.	M5 no. du dessin

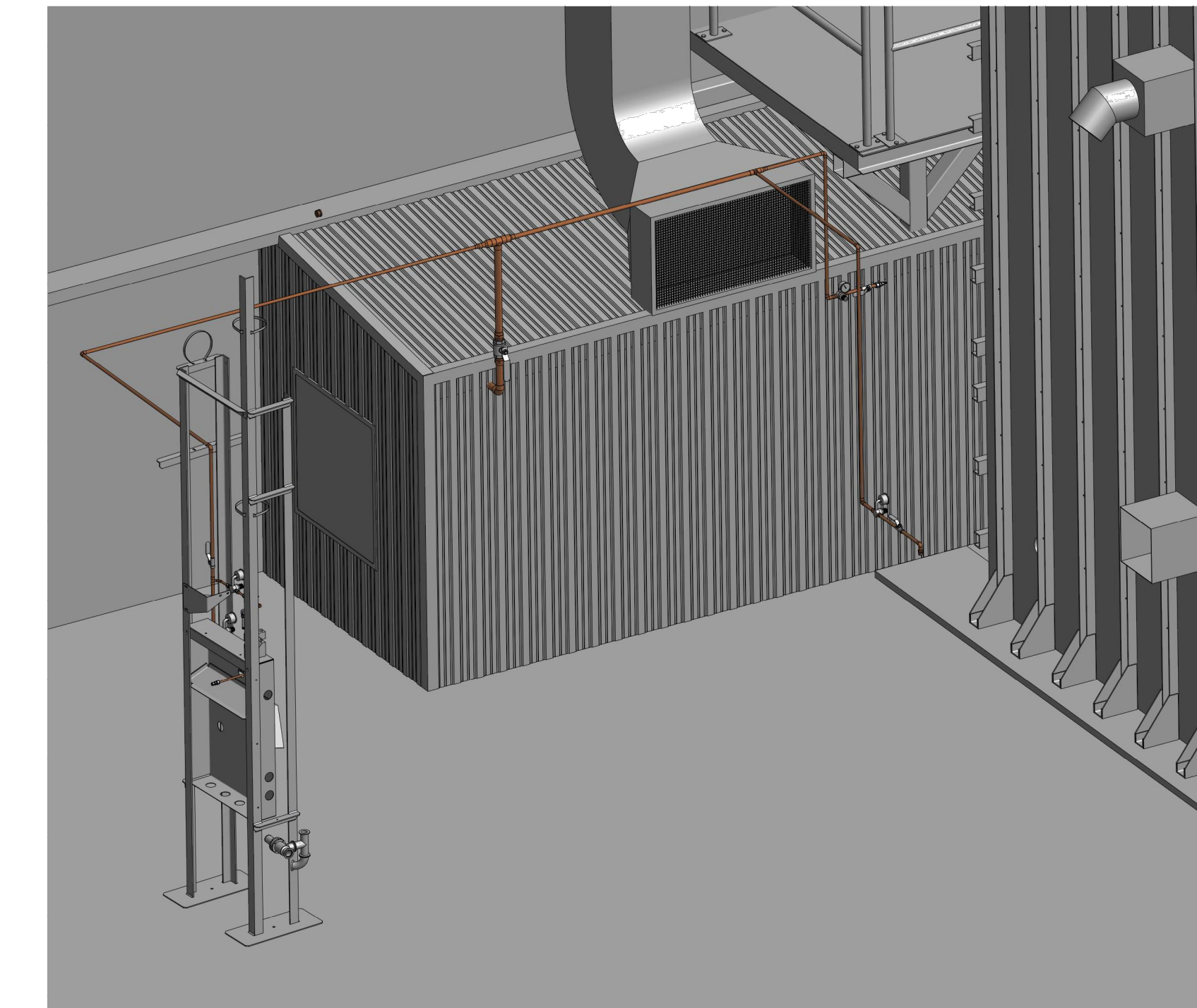
YVES GUINDON
MANAGER, SECURITY AND FACILITIES

M. FARID, P. Eng.
PROJECT MANAGER

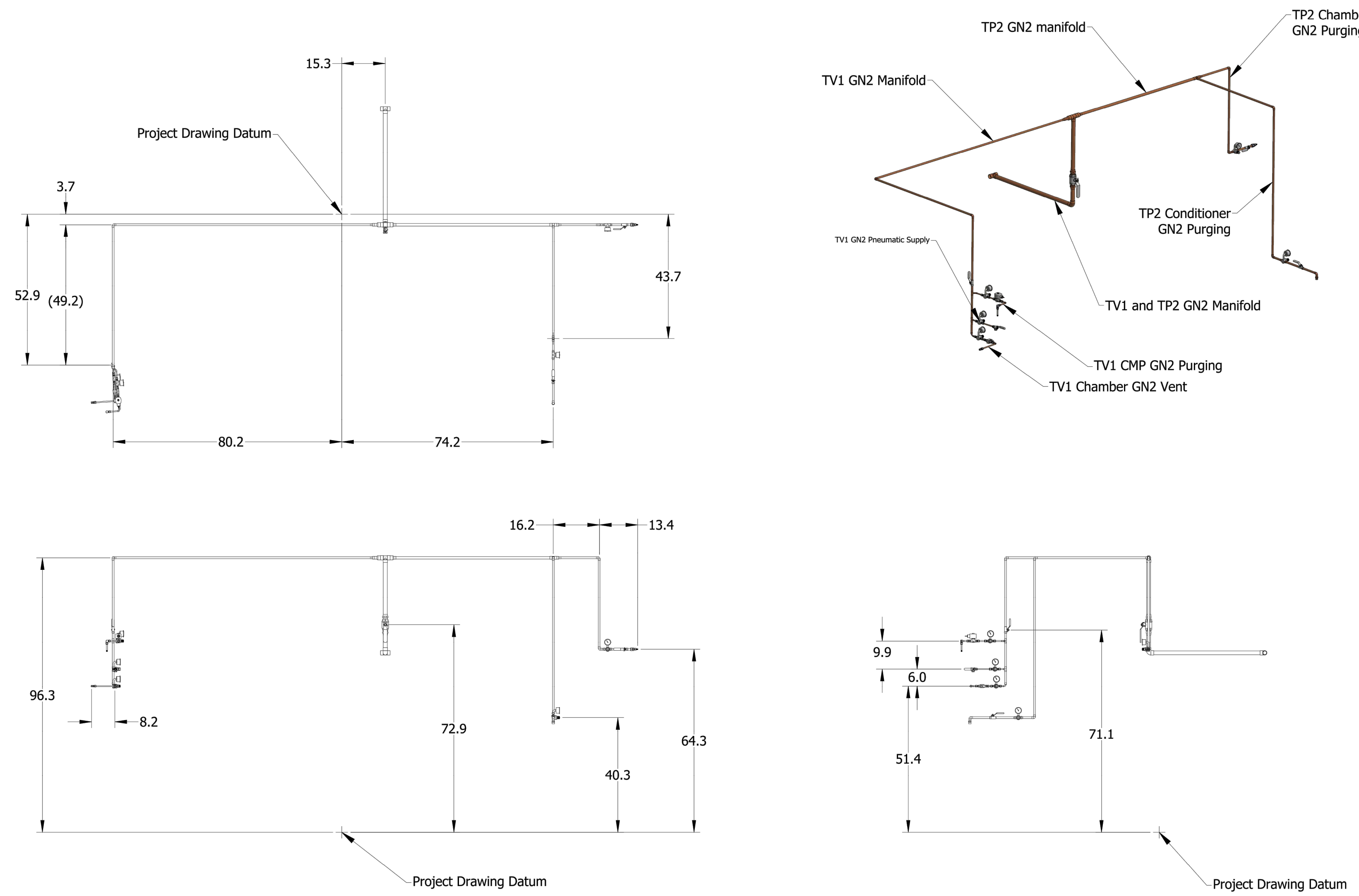
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TV1 and TP2 Gas Nitrogen Supplies



ITEM	QTY	PARTS LIST	SUPPLIED BY
1	5.5 ft	1-1/4" Type "K" copper pipe on GN2 supply manifold to TV1 and TP2	Contractor
2	5 ft	3/4" Type "K" copper pipe on TP2 GN2 supply manifold	Contractor
3	30 ft	1/2" Type "K" copper pipe on TV1 GN2 manifold, TP2 Chamber Purge and TP2 Conditioner Purge	Contractor
4	3 ft	1/4" Type "K" copper pipe on TV1 CMP purge, TV1 Pnematcis and TV1 Chamber Vent	Contractor
5	2	Copper Tee 1-1/4"	Contractor
6	2	1-1/4" to 3/4" Copper Reducing Coupling	Contractor
7	2	3/4" to 1/2" Copper Reducing Coupling	Contractor
8	1	3/4" X 3/4" X 1/2" Copper Reducing Tee	Contractor
9	1	1-1/4" 90° Copper Elbow	Contractor
10	7	1/2" Copper 90 Deg Elbow	Contractor
11	2	Copper Adaptor 1-1/4" pipe to 1-1/4" MNPT	Contractor
12	1	Copper Adapter 1/2" pipe to 1/2" MNPT	Contractor
13	2	Copper Reducing Tee 1/2" x 1/2" x 1/4"	Contractor
14	1	Copper Adapter 1/4" pipe to 3/8" MNPT	Contractor
15	4	Copper Adaptor 1/2" pipe to 1/4" MNPT	Contractor
16	2	1/4" 90 Deg Copper Elbow	Contractor
17	1	1/4" 45 degree Copper Elbow	Contractor
18	1	Copper Reducing Elbow 1/2" to 1/4"	Contractor
20	1	1-1/4" GN2 Main isolation valve, McMaster 47865K26	Owner
21	3	1/2" Manual Isolation Valve, McMaster 47865K530	Owner
22	5	1/4" Miniture Regulator with Gauge, Parker R344-02CG	Owner
23	1	3/8" Solenoid Valve, ASCO 8263G206LT	Owner
24	1	3/8" Brass 3 Way Ball Valve, McMaster 4093T22	Owner
25	1	SS Tube To CMP Purge Inlet, Modify from McMaster 9157K91	Owner
26	1	3/8" Brass Ball Valve FNPT End, McMaster 4114T25	Owner
27	1	Swagelok Reducing Union 5/8" to 3/8", B-1010-6-6	Owner
28	1	Swagelok Elbow for 3/8" OD Tube, SS-600-9	Owner
29	1	Swagelok Soft Tube 3/8" ID Insert, B-815-6	Owner
30	1	Swagelok 3/8" to 1/4" Reducing Union, B-600-6-4	Owner
31	4	Swagelok Adaptor 3/8" tube to 3/8" MNPT, B-600-1-6	Owner
32	6	Swagelok Adaptor 3/8" tube to 1/4" MNPT, B-600-1-4	Owner

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

PROFESSIONAL STAMP

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A detail no.
no. du detail
B location drawing no.
sur dessin no.
C drawing no.
dessin no.

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

drawing TV1 & TP2 GN2 dessin

designed TQF concu
date

drawn TQF / B-OPS dessine
date

reviewed TQF examine
date

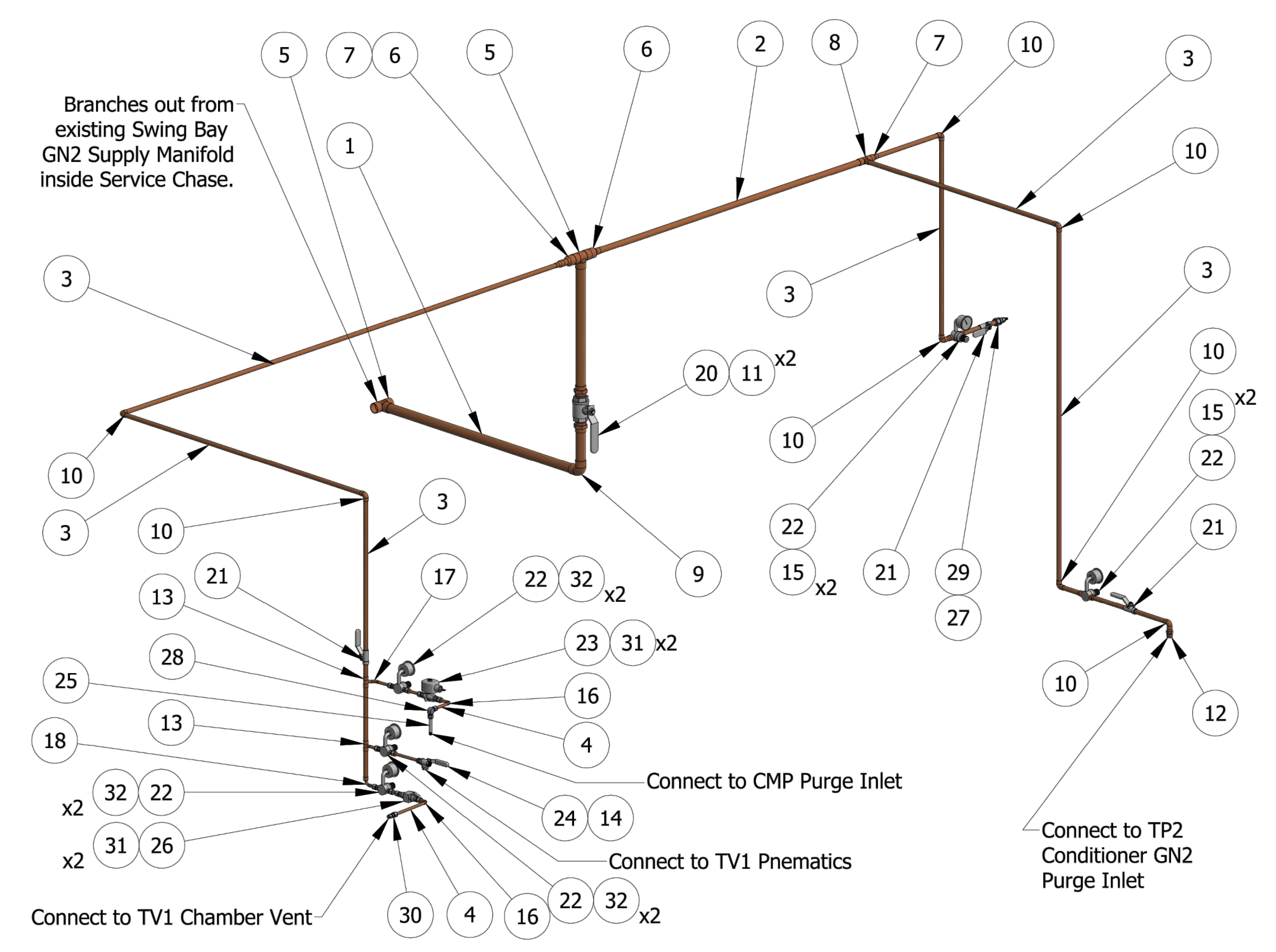
approved TQF approve
date

scale N.T.S.

project no. CSA13-G1 no. du projet

drawing no. M6 no. du dessin

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 - NO FLUX ON COPPER - COPPER CONNECTIONS.
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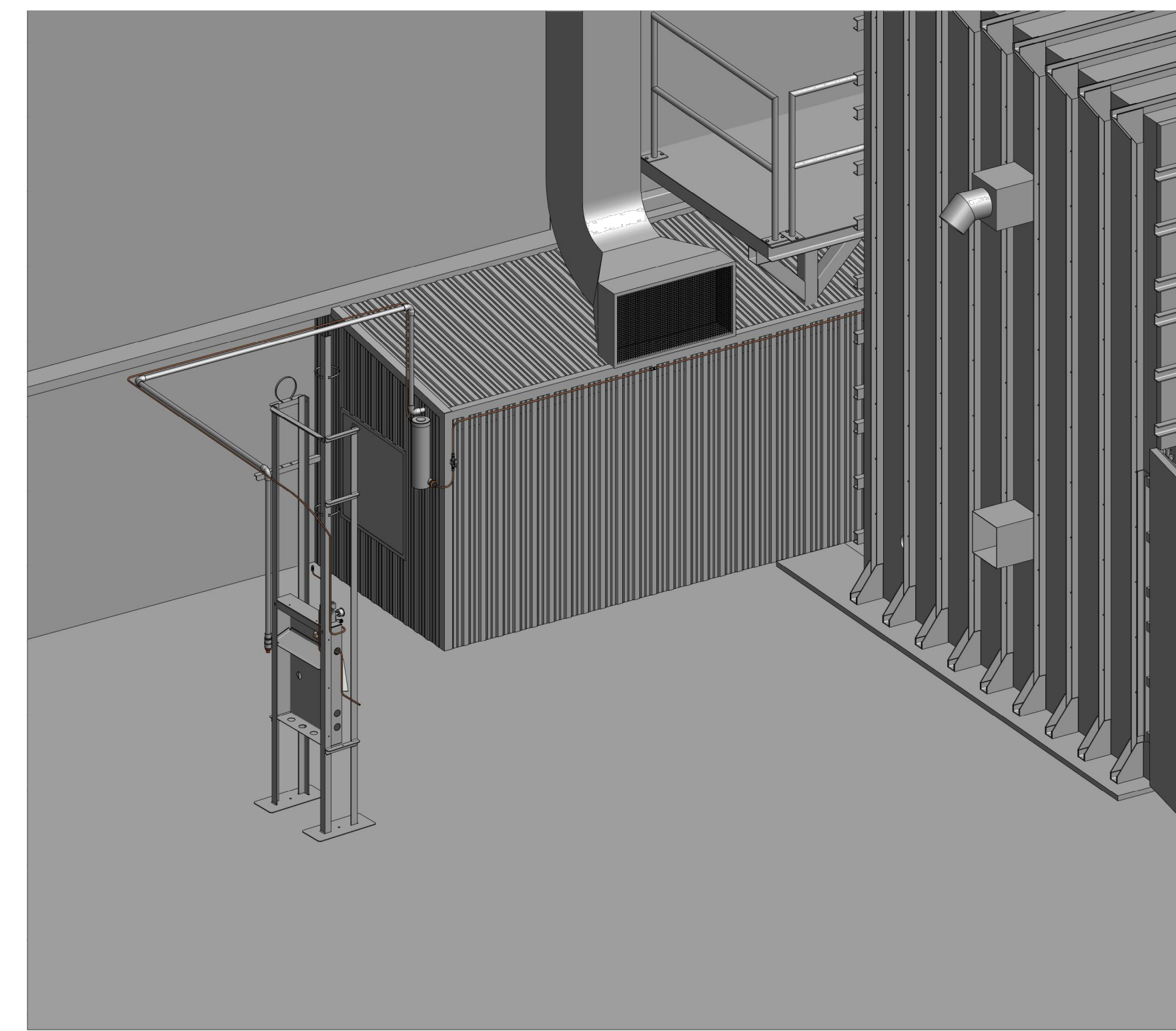
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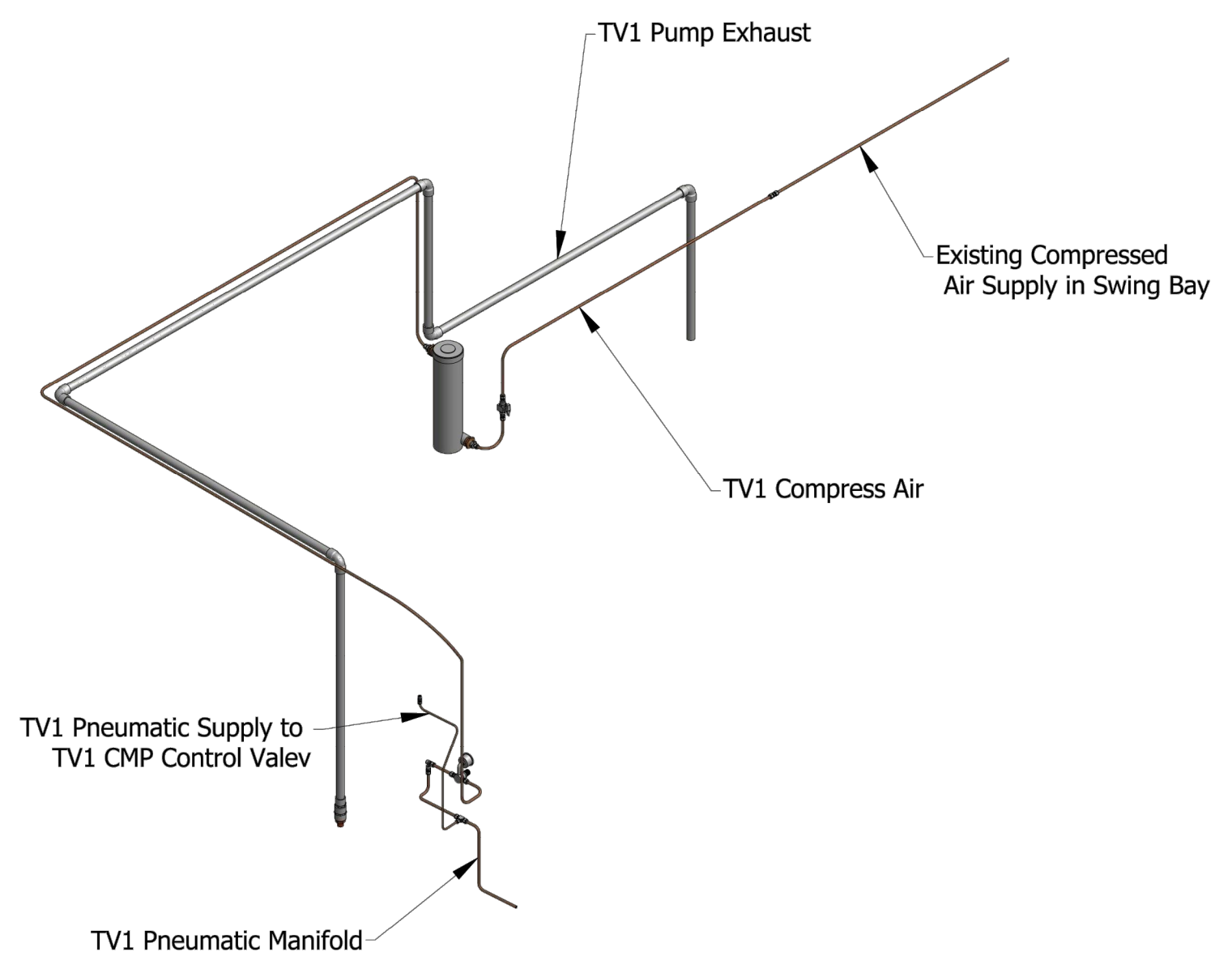
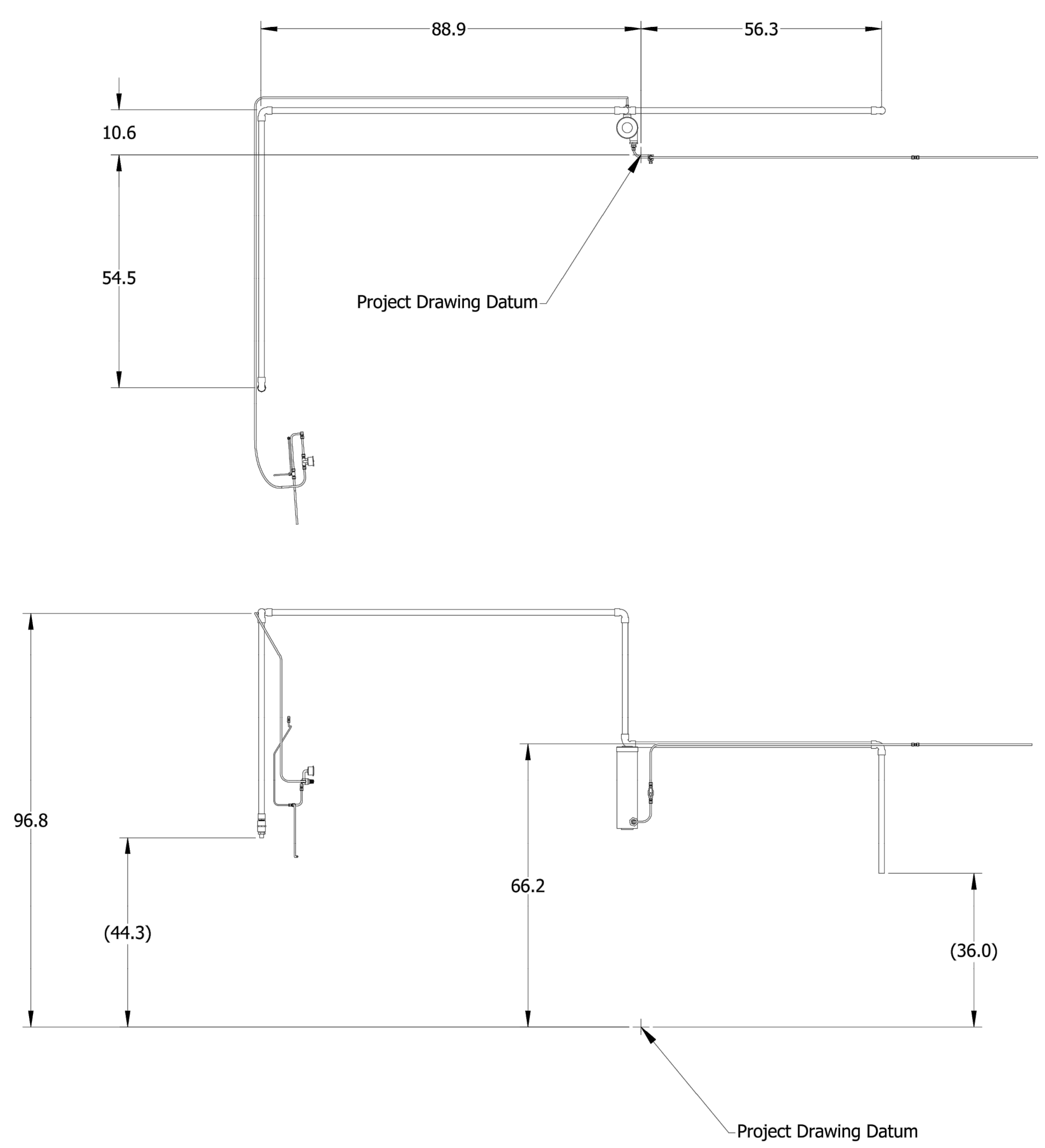
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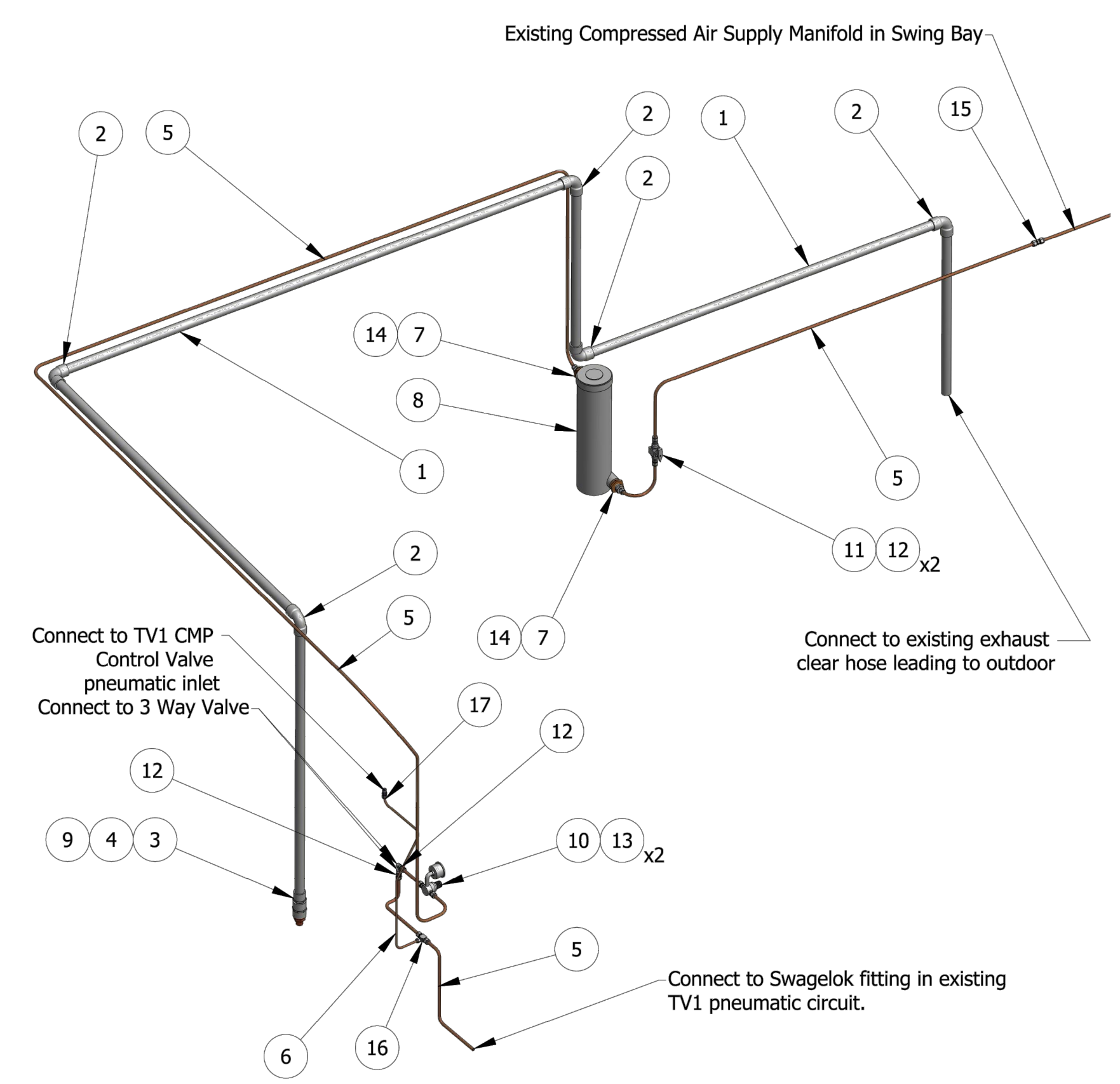
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TV1 Compressed Air, TV1 Pneumatics and TV1 Pump Exhaust



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ITEM	QTY	PARTNAME	SUPPLIED BY
1	27 ft	1" Standard Wall White PVC Pipe on TV1 Roughing Pump Exhaust	Contractor
2	5	1 inch 90° White PVC Elbow	Contractor
3	1	PVC Adaptor 1" pipe to 1" MNPT	Contractor
4	1	PVC 1" FNPT Coupling	Contractor
5	32 ft	1/4" (3/8" OD) Copper Tubing on TV1 Compressed Air Supply and on TV1 Pneumatic	Contractor
6	3 ft	1/8" (1/4" OD) Copper Tubing on Pneumatic Supply to TV1 CMP Control Valve	Contractor
7	2	Bronze Reducing Bushing 1" MNPT to 3/4" FNPT	Contractor
8	1	Air Dryer	Contractor
9	1	Copper Adaptor 3/4" pipe to 1" MNPT	Contractor
10	1	1/4" Miniture Regulator with Gauge, Parker R344-02CG	Owner
11	1	3/8 Ball Valve FNPT End, McMaster 4114T25	Owner
12	4	Swagelok Adaptor 3/8" tube to 3/8" MNPT, B-600-1-6	Owner
13	2	Swagelok Adaptor 3/8" tube to 1/4" MNPT B-600-1-4	Owner
14	2	Swagelok Adaptor 3/8" tube to 3/4" MNPT, B-600-1-12	Owner
15	1	Swagelok Union 3/8", B-600-6	Owner
16	1	Swagelok Reducing Tee 3/8" X 3/8" X 1/4", B-600-3-6-4	Owner
17	1	Swagelok Adaptor 1/4" tube to 1/4" MNPT, B-400-1-4	Owner

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

PROFESSIONAL STAMP

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A detail no.
no. du detail
B location drawing no.
sur dessin no.
C drawing no.
dessin no.

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project	DAVID FLORIDA LABORATORY	project
	BUILDING No. 65, SHIRLEY'S BAY, ONTARIO	
	TQF TV1 / TP2 REFIT	
drawing	TV1 COMP AIR, PNEUMATIC & PUMP EXHAUST	dessin
date	TQF	conçu
drawn	TQF / B-OPS	dessiné
date	TQF	examiné
approved	TQF	approuvé
scale	N.T.S.	
project no.	CSA13-G1	no. du projet
drawing no.	M7	no. du dessin

GENERAL ELECTRICAL 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.
- ALL WORK MUST BE IN FULL ACCORDANCE WITH THE CANADIAN ELECTRIC CODE PART 1 C22.1-02 AND THE LATEST EDITION OF THE ONTARIO SAFETY CODE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION (SUPPLY, INSTALLATION & WIRING) OF ALL EQUIPMENT SHOWN ON THE CONTRACT DRAWINGS AND SPECIFICATIONS UNLESS CHANGED OR REPLACED BY REVISED DRAWINGS, SPECIFICATIONS ADDENDA.
- THE SUCCESSFUL BIDDER SHALL ARRANGE AND PAY FOR ALL NECESSARY PERMITS AND WORK REQUIRED TO BE PERFORMED BY LOCAL AUTHORITIES INCLUDING INSPECTION BY ESA AND TESTING.
- ALL DIMENSIONS SHALL BE VERIFIED ON SITE. EXACT LOCATION OF EQUIPMENT IS SUBJECT TO SITE MEASUREMENTS. DIMENSIONS SHOWN ON DRAWINGS ARE IN INCHES.
- ALL BIDDERS AND THEIR SUB TRADES ARE STRONGLY ADVISED TO ATTEND THE SITE VISIT TO FAMILIARIZE THEMSELVES WITH THE SITE CONDITIONS AND EXACT SCOPE OF 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.
- DRAWINGS ARE NOT INTENDED TO SHOW THE DETAILS OF CONDUIT ROUTES, OFFSETS, ETC. BE RESPONSIBLE FOR CAREFULLY EXAMINE 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.
- PARTS NOTED ON DRAWINGS TO BE SUPPLIED BY OWNER SHALL BE FULLY INSTALLED & SUPPORTED BY CONTRACTOR.
- ALL WIRING TO BE MINIMUM #12 AWG COPPER STRANDED WIRES UNLESS OTHERWISE STATED. CONDUITS & JUNCTION BOXES SHALL NOT BE LOADED MORE THAN 60% OF ITS MAXIMUM RATED CAPACITY.
- ALL ELECTRICAL RACEWAYS & EQUIPMENT TO BE SQUARE TO BUILDING LINES AND SHALL BE SEPARATELY SUPPORTED FROM BUILDING STRUCTURE. A GROUND CONDUCTOR IS REQUIRED IN ALL RACEWAYS.
- ALL CONNECTORS & COUPLINGS SHALL BE STEEL WITH INSULATED THROATS, ALL CONDUITS TO BE EMT, MINIMUM OF 3/4" UNLESS OTHERWISE STATED, ARMORED CABLE IS NOT A CONDUIT & PROJECT MANAGER MUST APPROVE THE USE OF IT.
- LOCATE ALL BOXES ON STRAIGHT RUNS, EACH BOX TO BE BONDED.
- ALL CONDUIT RUNS SHALL BE COLOR CODED TO BUILDING COLOR CODE, ALL CONDUITS TO BE MARKED AT THE START AND END OF EACH RUN & AT BOTH SIDES OF ANY WALL, STANDARD ELECTRIC TAPE IS TO BE USED FOR MARKING.
- ALL OUTLETS, SWITCHES, COMMUNICATION JACKS TO BE WHITE, DECORA STYLE W/ BRUSHED STAINLESS STEEL COVER PLATE UNLESS OTHERWISE STATED.
- USE OF TIE WRAPS OR TIE WIRE IS NOT ACCEPTABLE.
- 3D MODELS SHOWN ON DRAWINGS ARE FOR REFERENCE ONLY AND NOT INTENDED TO SHOW ALL ELECTRICAL PARTS SUCH AS JUNCTION BOXES, LB'S ETC. CONTRACTOR IS RESPONSIBLE FOR FULL INSTALLATION AS DIRECTED BY CODE.
- ALL CONDUITS RUNS LENGTH SHOWN ON DRAWINGS ARE FOR GENERAL REFERENCE ONLY, CONTRACTOR TO EXAMINE SITE TO DETERMINE EXACT ROUTE & DIMENSIONS.
- SOME CONDUIT RUNS ARE NOT SHOWN ON 3D MODELS. CONTRACTOR TO FOLLOW ALL LINE DIAGRAMS, SCHEMATICS, 3D MODELS & TABLES FOR FULL ELECTRICAL SCOPE.
- IMMEDIATELY AFTER AWARDED THE CONTRACT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A DETAILED WORK SCHEDULE, IN THE FORM OF COMPUTERIZED BAR CHART OUTLINING ALL PROJECT ACTIVITIES AND SCHEDULED SHUT DOWNS.
- CORE DRILL WALLS AND FLOORS FOR NEW SERVICES & WIRING. SEALING OF ALL EXISTING OPENINGS AFTER SERVICES ARE REMOVED SHALL FORM PART OF THIS CONTRACT.
- INSTALL EQUIPMENT IN FULL ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS.
- REFER TO NOTES 29, 30, 31 & 32 ON DRAWING A1 FOR ALL SERVICES SUPPORTS & HANGERS.
- ALL WORK CARRIED OUT IN THE CLEAN ROOMS SHALL BE PRE-SCHEDULED AND SUBJECT TO CSA PROJECT MANAGER'S APPROVAL. MAINTAIN CLEAN ROOM CLASS 100,000 STANDARDS AT ALL TIMES.
- 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.
- ALL SERVICES OR EQUIPMENT THAT IS SHOWN TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY COMPLETE WITH ALL ASSOCIATED SERVICES, SUPPORTS, HANGERS ETC. ANY ABANDONED OR UNUSED COMPONENTS FOUND WITHIN THE SCOPE OF THIS PROJECT SHALL BE TERMINATED, REMOVED AND REMAINING IF ANY SHALL BE MADE SAFE.
- DRAWINGS ARE NOT INTENDED TO SHOW THE DETAILS OF EACH COMPONENT TO BE INSTALLED OR REMOVED. THEY ARE ONLY PROVIDING A GENERAL OVERVIEW OF THE PROJECT SCOPE. BE RESPONSIBLE TO REVIEW THE SITE CONDITIONS DURING THE TENDER PERIOD AND EXAMINE THE EXTENT OF THE DEMOLITION, REMOVALS & NEW INSTALLATIONS.
- OWNER SHALL BE GIVEN THE OPTION OF RETAINING ANY REMOVED COMPONENTS OR EQUIPMENT. COORDINATE AND HAND OVER AS NECESSARY. DISPOSE OF ANY REMAINING UNWANTED EQUIPMENT OR SERVICES AND REMOVE OFF SITE.
- DO NOT SUBJECT ANY PART OF THE BUILDING TO ANY NOISE, DUSTY / SMELLY ACTIVITIES SHALL BE DONE AFTER HOURS OR AT WEEKENDS, COORDINATE WITH CSA PROJECT MANAGER WITH A MINIMUM NOTICE OF 48 HOURS.



ITEMS TO BE REMOVED FROM SIDE OF SERVICE CHASE

VIEW 1
E1



TP2 CONDITIONER DISCONNECT

VIEW 2
E1



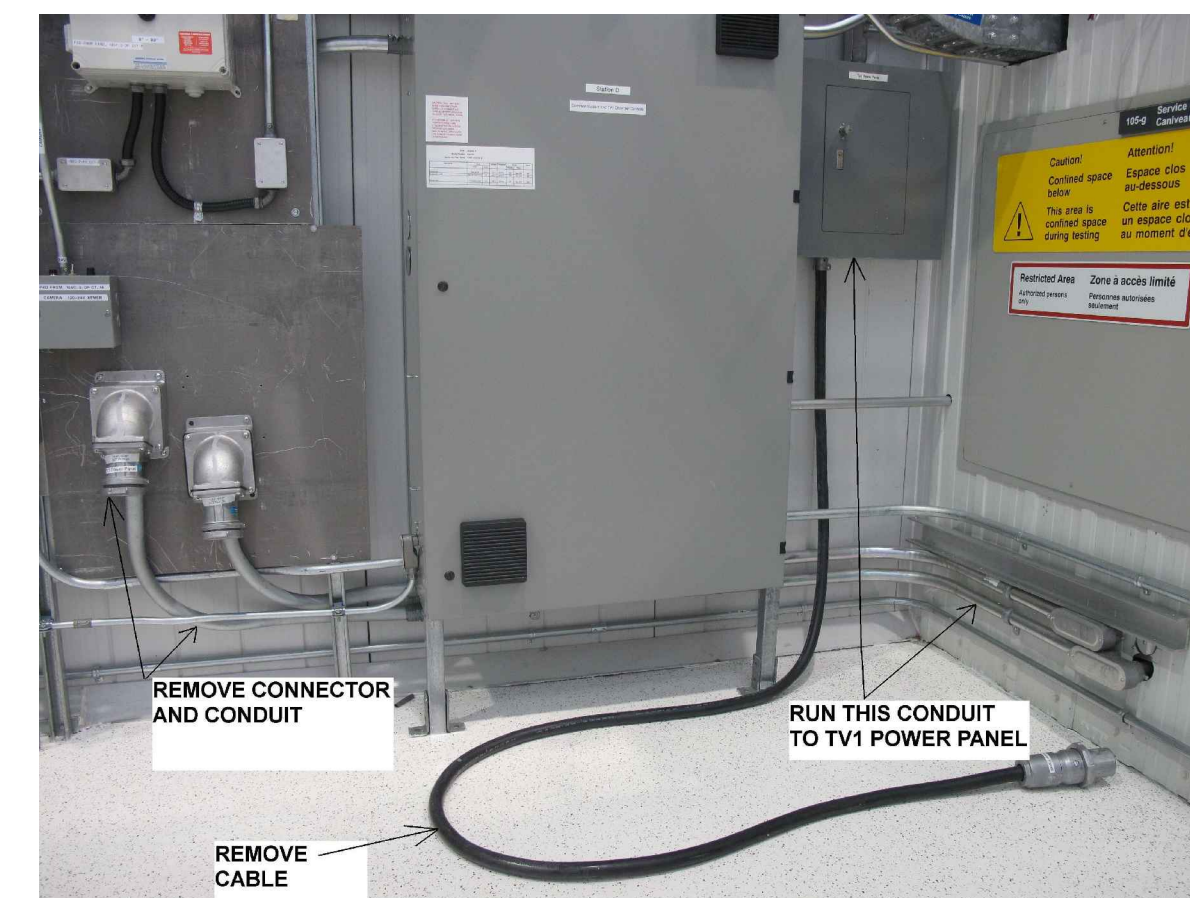
OVERALL VIEW, REMOVE WIRE TRAY

VIEW 3
E1



REMOVE EXISTING WIRE TRAY C/W ALL SUPPORTS & ACCESSORIES.

VIEW 4
E1



TV1 POWER CONNECTION

VIEW 5
E1



TV1 OLD ELECTRICAL PANEL

VIEW 6
E1

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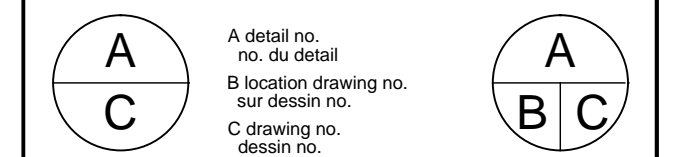
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PROFESSIONAL STAMP



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

drawing **ELECTRICAL NOTES, MODIFICATIONS AND DEMOLITION** dessin

designed **TQF** concu

date

drawn **TQF / B-OPS** dessine

date

reviewed **TQF** examine

date

approved **TQF** approuve

date

scale **N.T.S.**

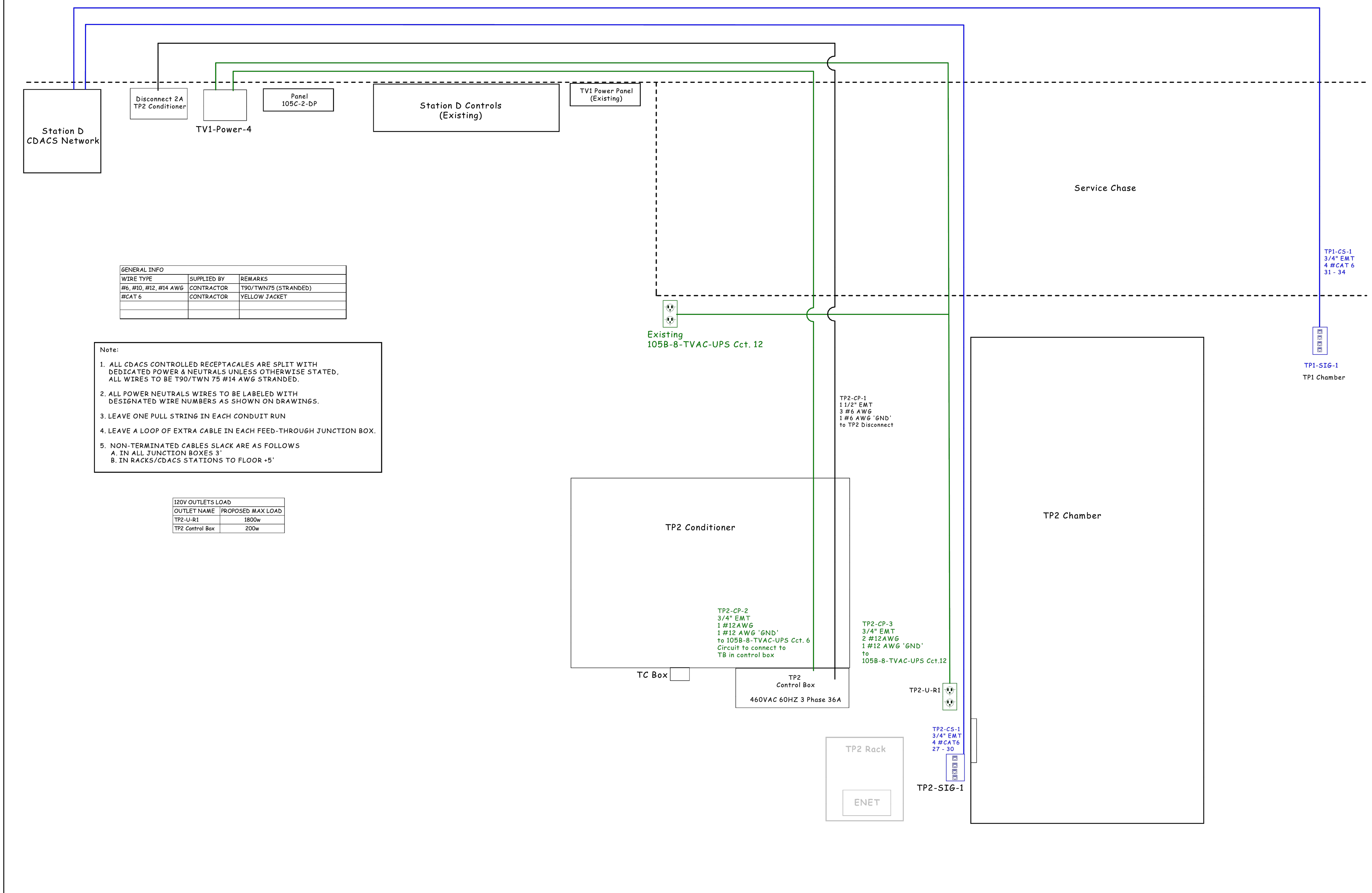
project no. **CSA13-G1** no. du projet

drawing no. **E1** no. du dessin

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GENERAL INFO		
WIRE TYPE	SUPPLIED BY	REMARKS
#6, #10, #12, #14 AWG	CONTRACTOR	T90/TWN75 (STRANDED)
#CAT 6	CONTRACTOR	YELLOW JACKET

- Note:
- ALL CDACS CONTROLLED RECEPTACLES ARE SPLIT WITH DEDICATED POWER & NEUTRALS UNLESS OTHERWISE STATED, ALL WIRES TO BE T90/TWN 75 #14 AWG STRANDED.
 - ALL POWER NEUTRALS WIRES TO BE LABELED WITH DESIGNATED WIRE NUMBERS AS SHOWN ON DRAWINGS.
 - LEAVE ONE PULL STRING IN EACH CONDUIT RUN
 - LEAVE A LOOP OF EXTRA CABLE IN EACH FEED-THROUGH JUNCTION BOX.
 - NON-TERMINATED CABLES SLACK ARE AS FOLLOWS
A. IN ALL JUNCTION BOXES 3'
B. IN RACKS/CDACS STATIONS TO FLOOR +5'

120V OUTLETS LOAD	
OUTLET NAME	PROPOSED MAX LOAD
TP2-U-R1	1800w
TP2 Control Box	200w

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

PROFESSIONAL STAMP

A
C

A detail no.
no. du detail
B location drawing no.
sur dessin no.
C drawing no.
dessin no.

A
B
C

project	DAVID FLORIDA LABORATORY	project
	BUILDING No. 65, SHIRLEY'S BAY, ONTARIO	
	TQF TV1 / TP2 REFIT	
drawing	TP2 CHAMBER & CONDITIONER WIRING SCHEMATIC	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.	E2	no. du dessin