

YVES GUINDON
MANAGER, SECURITY AND FACILITIES

M. FARID, P. Eng.
PROJECT MANAGER

THIS DRAWING IS THE SOLE PROPERTY OF THE CANADIAN SPACE AGENCY 'CSA' AND CAN NOT BE DISTRIBUTED OR REPRODUCED WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE 'CSA'.

TRANSFER OF THIS DRAWING IN HARD COPY AND/OR ELECTRONIC FORMAT TO ANY OTHER ORGANIZATION MUST BE FOR A SPECIFIC AND LIMITED USE ONLY WITH PRE-AUTHORIZATION FROM THE 'CSA' PROJECT AUTHORITY.

UPON COMPLETION OF SUCH USE, ALL HARD COPIES AND ELECTRONIC FILES MUST BE DESTROYED AND/OR RETURNED TO THE 'CSA' PROJECT AUTHORITY.

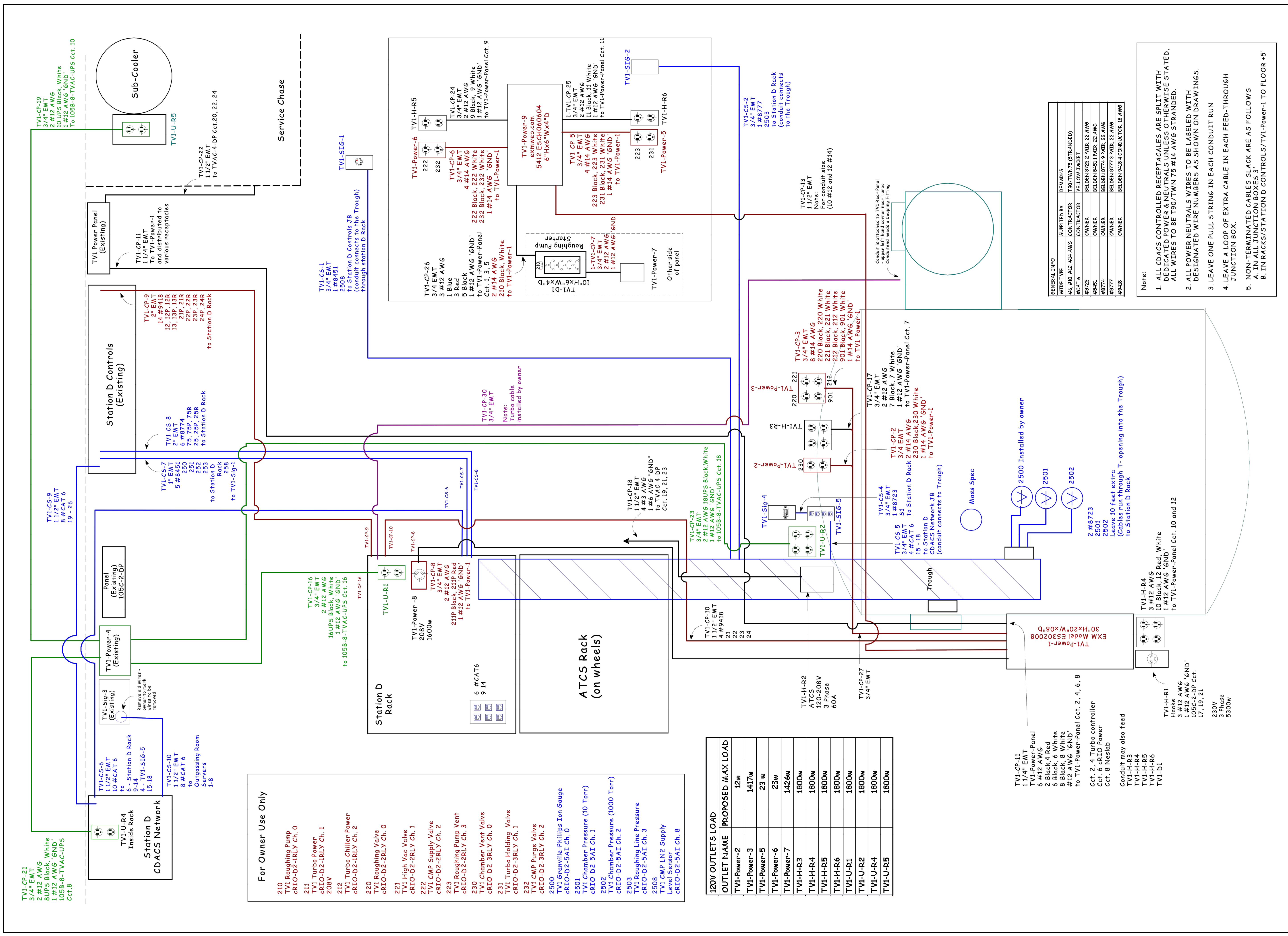
NO.	REVISION	DATE
5.		
4.		
3.	ISSUED FOR TENDER	SEPT, 14
2.	ISSUED FOR FINAL REVIEW	SEPT, 14
1.	ISSUED FOR REVIEW	AUG, 14

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

DAVID FLORIDA LABORATORY
BUILDING NO. 65, SHIRLEY'S BAY, ONTARIO

TQF TV1 / TP2 REFIT

drawing no.	TV1 WIRING SCHEMATIC	dessin no.
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



WIRE TYPE	SUPPLIED BY	REMARKS
#6, #12, #14 AWG	T90/TWIN75 (STRANDED)	
#6 AT 6	CONTRACTOR	YELLOW TACKET
#8723	OWNER	BELDEN 8723 2 PAIR, 22 AWG
#8451	OWNER	BELDEN 8451 PAIR, 22 AWG
#8774	OWNER	BELDEN 8774 9 PAIR, 22 AWG
#8777	OWNER	BELDEN 8777 3 PAIR, 22 AWG
#9418	OWNER	BELDEN 9418 4-CONDUCTOR, 18 AWG

- Note:
- ALL CDACS CONTROLLED RECEPTACLES ARE SPLIT WITH DEDICATED POWER & NEUTRALS UNLESS OTHERWISE STATED. ALL WIRES TO BE T90/TWIN 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 FOLLOW 5
A. IN ALL JUNCTION BOXES 3'
B. IN RACKS/STATION D CONTROLS/TVI-Power-1 TO FLOOR +5'

For Owner Use Only

210	TVI Roughing Pump
	cRIO-D2-1RLY Ch. 0
211	TVI Turbo Power
	cRIO-D2-1RLY Ch. 1
208V	
212	TVI Turbo Chiller Power
	cRIO-D2-1RLY Ch. 2
220	TVI Roughing Valve
	cRIO-D2-2RLY Ch. 0
221	TVI High Vac Valve
	cRIO-D2-2RLY Ch. 1
222	TVI CMP Supply Valve
	cRIO-D2-2RLY Ch. 2
223	TVI Roughing Pump Vent
	cRIO-D2-2RLY Ch. 3
230	TVI Chamber Vent Valve
	cRIO-D2-3RLY Ch. 0
231	Turbo Holding Valve
	cRIO-D2-3RLY Ch. 1
232	TVI CMP Purge Valve
	cRIO-D2-3RLY Ch. 2
2500	TVI Granville-Phillips Ion Gauge
	cRIO-D2-5AI Ch. 0
2501	TVI Chamber Pressure (10 Torr)
	cRIO-D2-5AI Ch. 1
2502	TVI Chamber Pressure (1000 Torr)
	cRIO-D2-5AI Ch. 2
2503	TVI Roughing Line Pressure
	cRIO-D2-5AI Ch. 3
2508	TVI CMP LN2 Supply
	cRIO-D2-5AI Ch. 4
	cRIO-D2-5AI Ch. 8

OUTLET NAME	PROPOSED	MAX LOAD
TVI-Power-2	12w	
TVI-Power-3	141.7w	
TVI-Power-5	23 w	
TVI-Power-6	23w	
TVI-Power-7	142.6w	
TVI-H-R3	1800w	
TVI-H-R4	1800w	
TVI-H-R5	1800w	
TVI-H-R6	1800w	
TVI-U-R1	1800w	
TVI-U-R2	1800w	
TVI-U-R4	1800w	
TVI-U-R5	1800w	

TVI-CP-11
1 1/4" EMT
TVI-Power-Panel
6 #12 AWG
2 Black, 4 Red
6 Black, 6 White
8 Black, 8 White
#12 AWG 'GND'
to TVI-Power-Panel Cct. 2, 4, 6, 8

Cct. 2, 4 Turbo controller
Cct. 8 RTD power
Cct. 8 Nestab

Conduit may also feed
TVI-H-R3
TVI-H-R4
TVI-H-R5
TVI-H-R6
TVI-D1

TVI-CP-10
1 1/2" EMT
4 #9418
21
22
23
24

TVI-CP-9
3/4" EMT
2 #12 AWG 18UPS Black, White
1 #12 AWG 'GND'
to 105B-8-TVAC-UPS Cct. 18

TVI-CP-8
3/4" EMT
2 #12 AWG
21P Black, 21P Red
1 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-7
3/4" EMT
1 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-6
3/4" EMT
4 #14 AWG
223 Black, 232 White
231 Black, 232 White
1 #14 AWG 'GND'
to TVI-Power-1

TVI-CP-5
3/4" EMT
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-4
3/4" EMT
2 #12 AWG
220 Black, 221 White
221 Black, 212 White
901 Black, 901 White
1 #14 AWG 'GND'
to TVI-Power-1

TVI-CP-3
3/4" EMT
8 #14 AWG
220 Black, 220 White
221 Black, 212 White
901 Black, 901 White
1 #14 AWG 'GND'
to TVI-Power-1

TVI-CP-2
3/4" EMT
2 #14 AWG
230 Black, 230 White
to TVI-Power-1

TVI-CP-1
3/4" EMT
2 #12 AWG
7 Black, 7 White
1 #12 AWG 'GND'
to TVI-Power-Panel Cct. 7

TVI-CP-17
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-16
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-15
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-14
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-13
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-12
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-11
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-10
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-9
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-8
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-7
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-6
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-5
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-4
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-3
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-2
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

TVI-CP-1
3/4" EMT
2 #12 AWG
2 #12 AWG 'GND'
to TVI-Power-1

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

THIS DRAWING IS THE SOLE PROPERTY OF THE CANADIAN SPACE AGENCY "CSA" AND CAN NOT BE DISTRIBUTED OR REPRODUCED WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE "CSA".
TRANSFER OF THIS DRAWING IN HARD COPY AND/OR ELECTRONIC FORMAT TO ANY OTHER ORGANIZATION MUST BE FOR A SPECIFIC AND LIMITED USE ONLY WITH PRE-AUTHORIZATION FROM THE "CSA" PROJECT AUTHORITY.
UPON COMPLETION OF SUCH USE, ALL HARD COPIES AND ELECTRONIC FILES MUST BE DESTROYED AND/OR RETURNED TO THE "CSA" PROJECT AUTHORITY.

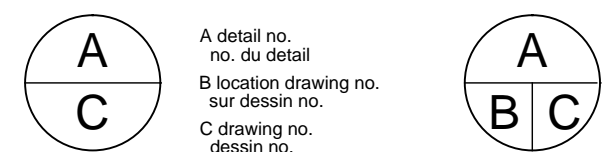
Junction Box List

	Item	Part Name	Supplied By	Part Size	Box			Part #	Notes
					# of Gangs	# of Hubs	Hub Size		
Racks and Disconnects	1	Station D Instrumentation Rack	Owner	19"W x 70"H x 23"D				C2RR197023BK1	Hammond, Rack
	2	Station D CDACS Network Rack	Owner	23.62"Wx15.75"Dx25"H				WM-5604	Bud Industries, Wall mounted mini-rack
	3	TV1-D1	Owner	Re-use					Roughing pump disconnect - Re-use
CDACS Controlled Outlets	4	TV1-Power-1	Owner	30"Wx20"Hx8"D				5412 ES302008	
	5	TV1-Power-2	Contractor	FS single gang	1	1	3/4"	CIFS-1G-3/4	1x 125V 15A duplex Deccora type outlet - Grey - HBL215GY + Brushed stainless steel cover
	6	TV1-Power-3	Contractor	FS double gang	2	1	3/4"	CIFS-2G-3/4	2x 125V 15A duplex Deccora type outlet - Grey - HBL215GY + Brushed stainless steel cover
	7	TV1-Power-4	Existing	n/a					UPS Power Distribution
	8	TV1-Power-5	Contractor	FS single gang	1	1	3/4"	CIFS-1G-3/4	1x 125V 15A duplex Deccora type outlet - Grey - HBL215GY + Brushed stainless steel cover
	9	TV1-Power-6	Contractor	FS single gang	1	1	3/4"	CIFS-1G-3/4	1x 125V 15A duplex Deccora type outlet - Grey - HBL215GY + Brushed stainless steel cover
	10	TV1-Power-7	Owner	Re-use					Roughing Pump Receptacle - Re-use
	11	TV1-Power-8	Contractor	FS single gang					Turbo Receptacle - Re-use
	12	TV1-Power-9	Owner	6"Wx6"Hx4"D				5412 ESCH060604	
Standard Hydro Outlets	13	TV1-H-R1	Contractor	FS single gang					Haaka Receptacle - Re-use
	14	TV1-H-R2	Owner	Re-use					ATCS Receptacle - Re-use
	15	TV1-H-R3	Contractor	FS double gang	2	1	3/4"	CIFS-2G-3/4	2x 125V 15A duplex Deccora type outlet - White - HBL215WA + Brushed stainless steel cover
	16	TV1-H-R4	Contractor	FS double gang	2	1	3/4"	CIFS-2G-3/4	2x 125V 15A duplex Deccora type outlet - White - HBL215WA + Brushed stainless steel cover
	17	TV1-H-R5	Contractor	FS Single gang	1	1	3/4"	CIFS-1G-3/4	TV1-Power-8
	18	TV1-H-R6	Contractor	FS Single gang	1	1	3/4"	CIFS-1G-3/4	1x 125V 15A duplex Deccora type outlet - White - HBL215WA + Brushed stainless steel cover
UPS Outlets	19	TV1-U-R1	Contractor	FS Single gang	1	1	3/4"	CIFS-1G-3/4	1x 125V 15A duplex white outlet with lockable flap cover
	20	TV1-U-R2	Contractor	FS double gang	2	1	3/4"	CIFS-2G-3/4	2x 125V 15A duplex white outlet with lockable flap cover
	21	TV1-U-R4	Contractor	FS Single gang	1	1	3/4"	CIFS-1G-3/4	1x 125V 15A duplex white outlet with lockable flap cover
	22	TV1-U-R5	Contractor	FS Single gang	1	1	3/4"	CIFS-1G-3/4	1x 125V 15A duplex white outlet with lockable flap cover
	23	TP2-U-R1	Contractor	FS Single gang	1	1	3/4"	CIFS-1G-3/4	1x 125V 15A duplex white outlet with lockable flap cover
CDACS Signal	24	TV1-Sig-1	Contractor	FS single gang	1	1	3/4"	CIFS-1G-3/4	Blank Cover
	25	TV1-Sig-2	Contractor	FS single gang	1	1	3/4"	CIFS-1G-3/4	Blank Cover
	26	TV1-Sig-3	Existing	n/a					Communications - may want to replace if possible
	27	TV1-Sig-4	Contractor	FS single gang	1	1	3/4"	CIFS-1G-3/4	Blank Cover
	28	TV1-Sig-5	Contractor	FS single gang	1	2	3/4"	CIFS-1G-3/4	Blank Cover
	30	TP1-Sig-1	Contractor	FS single gang	1	1	3/4"	CIFS-1G-3/4	Blank Cover
	31	TP2-Sig-1	Contractor	FS single gang	1	1	3/4"	CIFS-1G-3/4	Blank Cover

Note: TV1-U-R3 - not used

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



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

drawing dessin
ELECTRICAL PART SCHEDULE

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. E4 no. du dessin

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

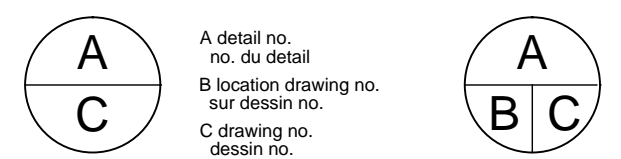
THIS DRAWING IS THE SOLE PROPERTY OF THE CANADIAN SPACE AGENCY "CSA" AND CAN NOT BE DISTRIBUTED OR REPRODUCED WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE "CSA".

TRANSFER OF THIS DRAWING IN HARD COPY AND/OR ELECTRONIC FORMAT TO ANY OTHER ORGANIZATION MUST BE FOR A SPECIFIC AND LIMITED USE ONLY WITH PRE-AUTHORIZATION FROM THE "CSA" PROJECT AUTHORITY.

UPON COMPLETION OF SUCH USE, ALL HARD COPIES AND ELECTRONIC FILES MUST BE DESTROYED AND/OR RETURNED TO THE "CSA" PROJECT AUTHORITY.

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



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

TQF TV1 / TP2 REFIT

drawing **TV1 & TP2 POWER & SIGNAL** dessin

designed **TQF** conce

drawn **TQF / B-OPS** dessine

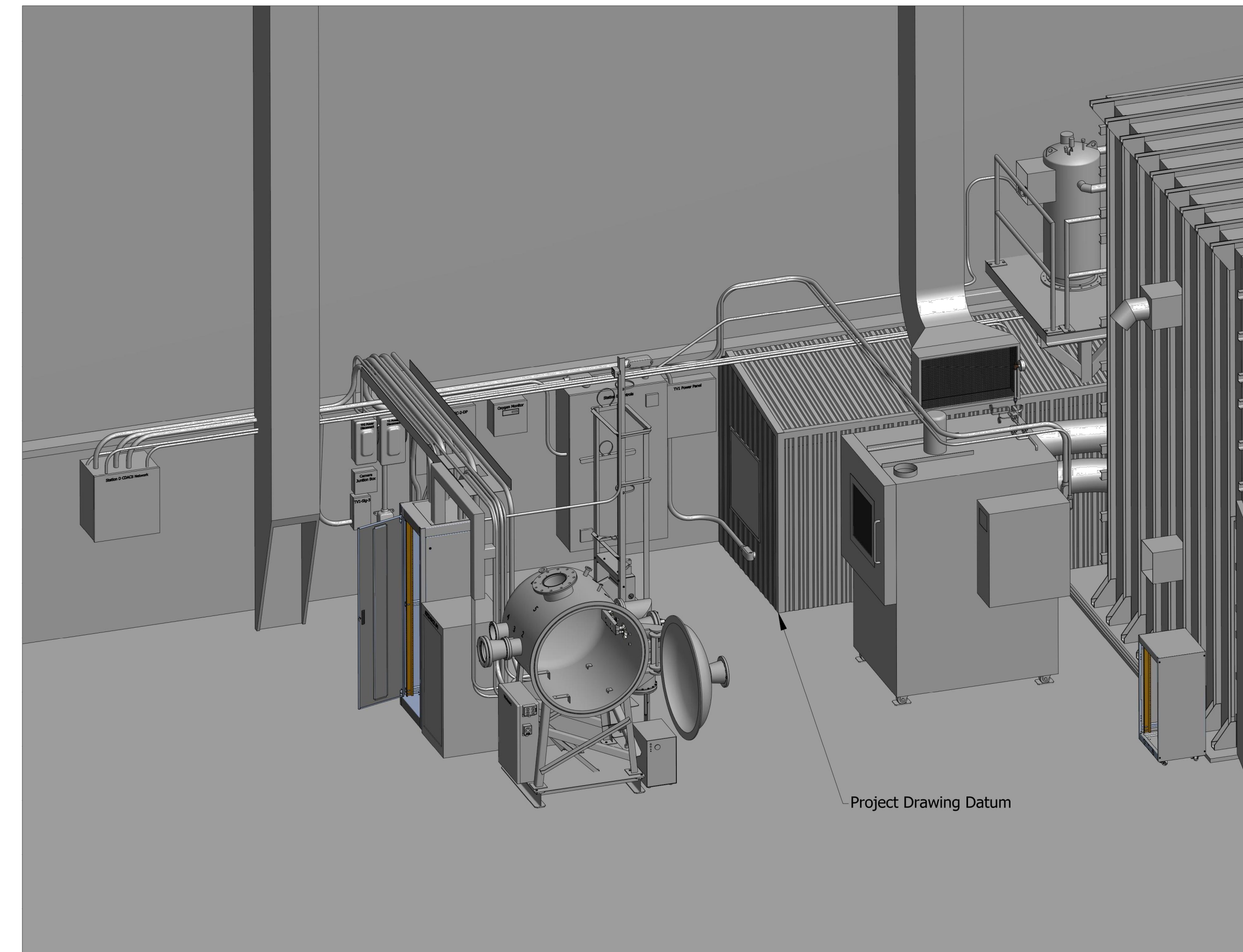
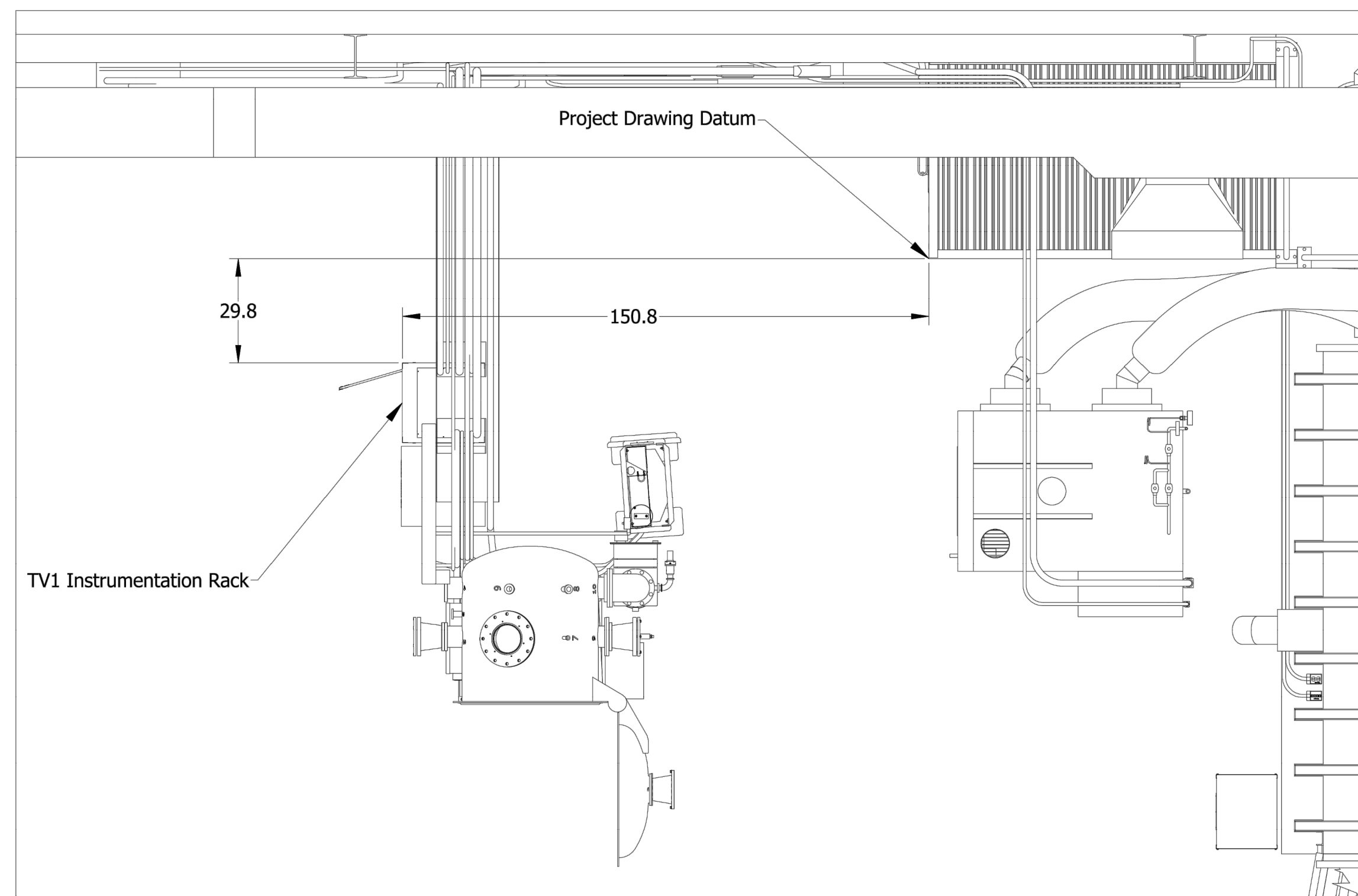
reviewed **TQF** examine

approved **TQF** approuve

scale **N.T.S.**

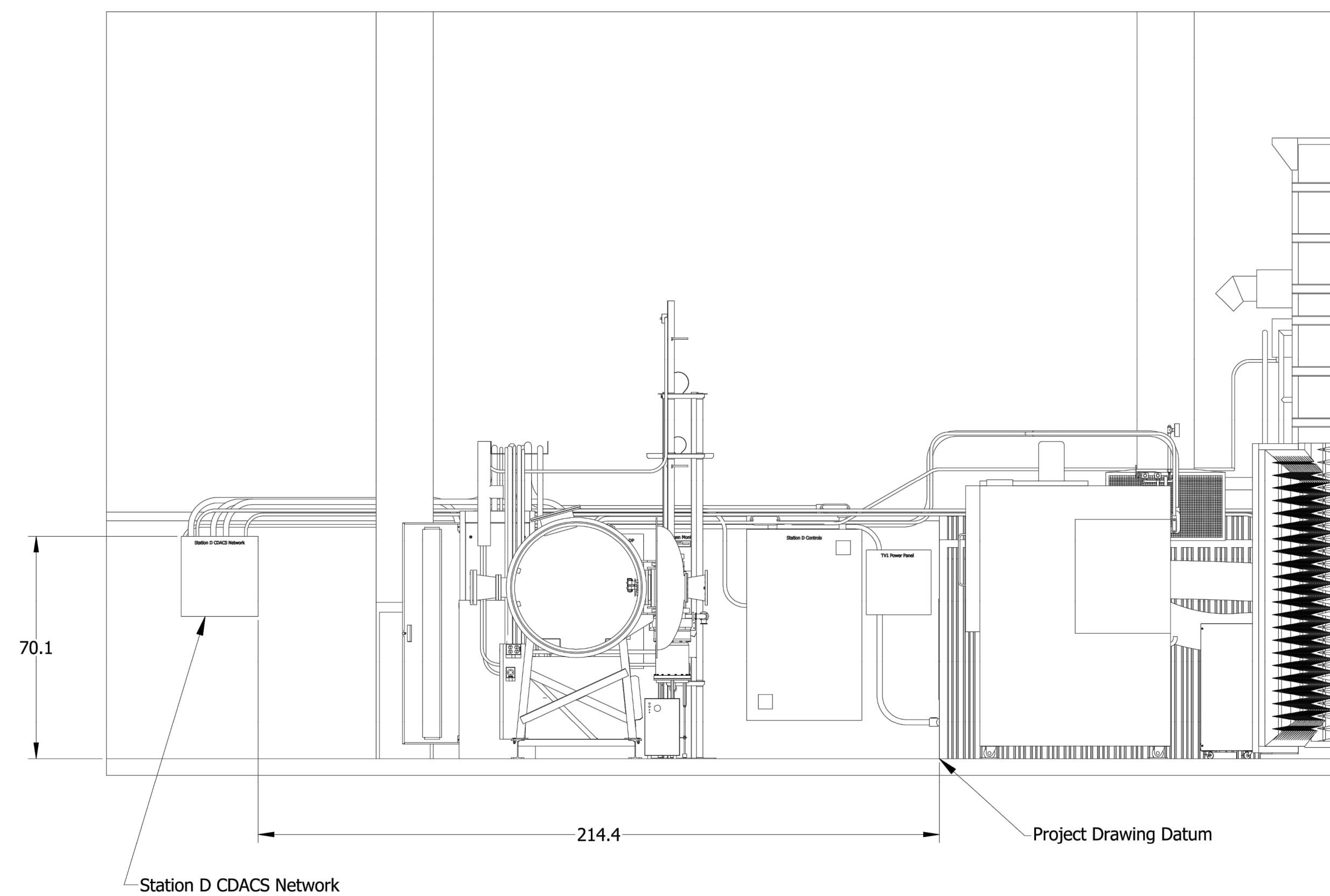
project no. **CSA13-G1** no. du projet

drawing no. **E5** no. du dessin



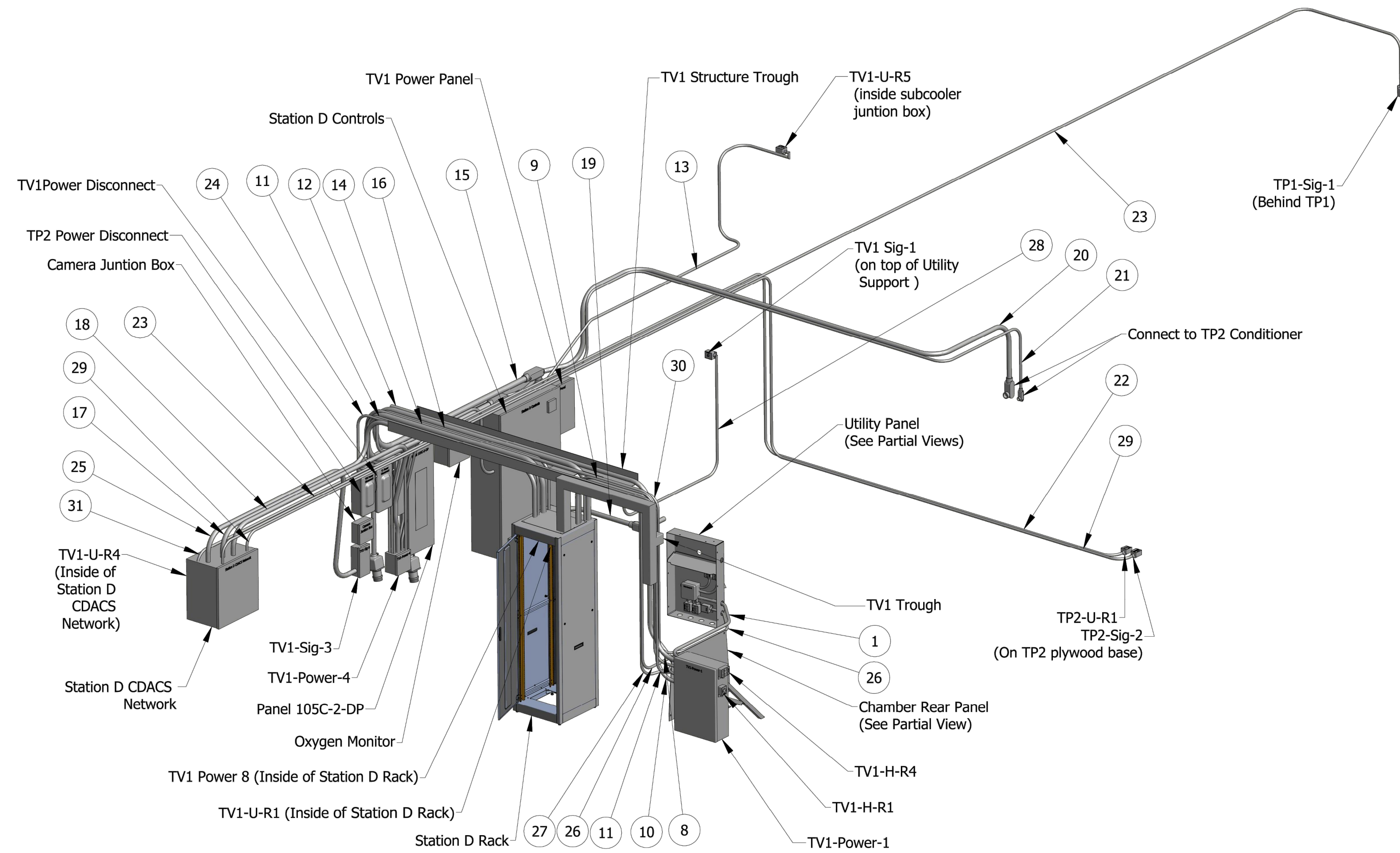
NOTES:

- 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.
- ALL PARTS SUPPLIED BY OWNER TO BE FULLY INSTALLED BY CONTRACTOR.



TV1 and TP2 Power And Signal in Swing Bay

Overall View from Front-Left



CONDUIT LIST						
ITEM	CONDUIT NAME	EMT SIZE	LENGTH	END 1	END 2	
1	TV1-CP-13	1-1/2"	5.0 ft	TV1-Power-1	TV1-Power-9	
2	TV1-CP-6	3/4"	0.7 ft	TV1-Power-6	TV1-Power-9	
3	TV1-CP-24	3/4"	1.2 ft	TV1-H-R5	TV1-Power-9	
4	TV1-CP-5	3/4"	0.2 ft	TV1-Power-5	TV1-Power-9	
5	TV1-CP-25	3/4"	0.2 ft	TV1-H-R6	TV1-Power-9	
6	TV1-CP-27	3/4"	5.0 ft	TV1-Power-3	TV1-Power-1	
7	TV1-CP-7	3/4"	0.3 ft	TV1-D1	TV1-Power-7	
8	TV1-CP-10	1-1/2"	11.1 ft	TV1-Power-1	Station D Rack	
9	TV1-CP-8	3/4"	11.5 ft	TV1-Power-1	Station D Rack	
10	TV1-CP-11	1-1/4"	31.5 ft	TV1-Power-1	TV1 Power Panel	
11	TV1-CP-23	3/4"	27.0 ft	TV1-U-R2	TV1-Power-4	
12	TV1-CP-18	1-1/2"	17.8 ft	TV1-H-R2	TVAC-4-DP	
13	TV1-CP-19	3/4"	28.0 ft	TV1-Power-4	TV1-U-R5 (Subcooler)	
14	TV1-CS-8	2"	18.0 ft	Station D Control	Station D Rack	
15	TV1-CP-9	2"	20.8 ft	Station D Control	Station D Rack	
16	TV1-CS-7	1"	19.0 ft	Station D Control	Station D Rack	
17	TV1-CS-6	1-1/2"	17.2 ft	Station D CDACS Network	Station D Rack	
18	TV1-CS-9	1-1/2"	18.0 ft	Station D CDACS Network	TV1-Power-4	
19	TV1-CP-22	1-1/2"	8.4 ft	TV1 Power Panel	Service Chase	
20	TP2-CP-1	1-1/2"	34.6 ft	TP2 Power Disconnect	TP2 Conditioner	
21	TP2-CP-UPS	3/4"	30.0 ft	TP2 Conditioner	TV1-Power-4	
22	TP2-CP-3	3/4"	40.0 ft	TP2-U-R1	TV1-Power-4	
23	TP1-CS-1	3/4"	61.3 ft	Station D CDACS Network	TP1-Sig-1	
24	TV1-CP-16	3/4"	15.7 ft	TV1-Power-4	Station D Rack	
25	TV1-CS-10	1-1/2"	16.1 ft	Station D CDACS Network	TV1-Sig-3	
26	TV1-CS-2	3/4"	11.5 ft	TV1-Sig-2	Trough	
27	TV1-CS-5	3/4"	9.0 ft	TV1-Sig-5	Trough	
28	TV1-CS-1	3/4"	9.4 ft	TV1-Sig-1	Trough	
29	TP2-CS-1	3/4"	40 ft	TP2-Sig-2	Station D CDACS Network	
30	TV1-CP-30	3/4"	12.6 ft	Station D Rack	TV1 Turbo	
31	TV1-CP-21	3/4"	14.3 ft	TV1-U-R4 in Station D CDACS Network	TV1-Power-4	
32	TV1-CP-26	3/4"	0.5 ft	TV1-Power-9	TV1 Roughing Pump Disconnect	
33	TV1-CS-4	3/4"	0.1 ft	TV1-Sig-4	TV1-Sig-5	
34	TV1-CP-2	3/4"	0.8 ft	TV1-Power-2	TV1-CP-27	
35	TV1-CP-17	3/4"	0.8 ft	TV1-H-R3	TV1-CP-27	
36	TV1-CP-3	3/4"	0.2 ft	TV1-Power-3	TV1-CP-27	

YVES GUINDON
MANAGER, SECURITY AND FACILITIES

M. FARID, P. Eng.
PROJECT MANAGER

THIS DRAWING IS THE SOLE PROPERTY OF THE CANADIAN SPACE AGENCY "CSA" AND CAN NOT BE DISTRIBUTED OR REPRODUCED WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE "CSA".

TRANSFER OF THIS DRAWING IN HARD COPY AND/OR ELECTRONIC FORMAT TO ANY OTHER ORGANIZATION MUST BE FOR A SPECIFIC AND LIMITED USE ONLY WITH PRE-AUTHORIZATION FROM THE "CSA" PROJECT AUTHORITY.

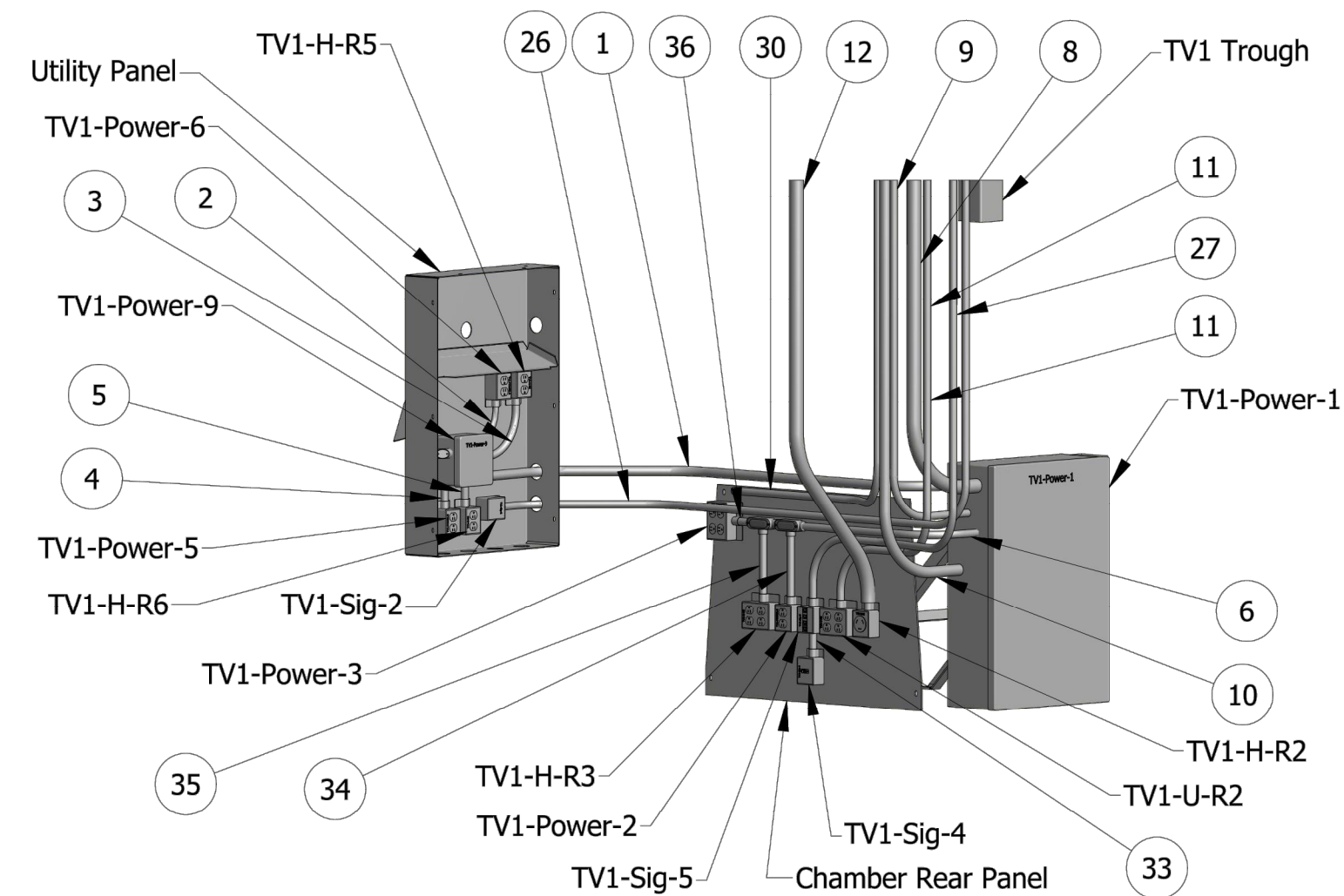
UPON COMPLETION OF SUCH USE, ALL HARD COPIES AND ELECTRONIC FILES MUST BE DESTROYED AND/OR RETURNED TO THE "CSA" PROJECT AUTHORITY.

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

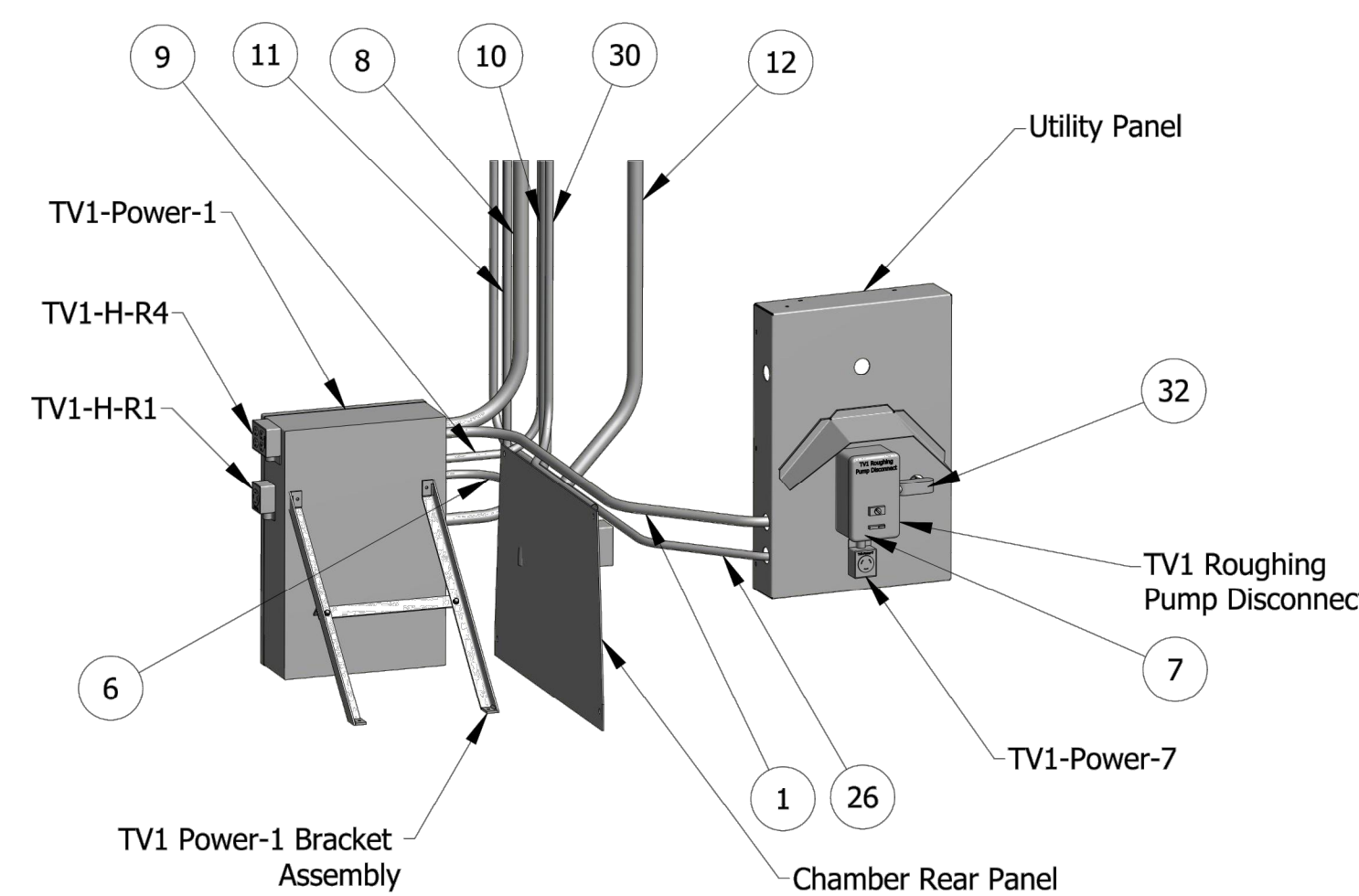
PROFESSIONAL STAMP

	A detail no. / no. du détail	
	B location drawing no. / sur dessin no.	
	C drawing no. / dessin no.	
project	DAVID FLORIDA LABORATORY	project
	BUILDING No. 65, SHIRLEY'S BAY, ONTARIO	
	TQF TV1 / TP2 REFIT	
drawing	TV1 & TV2 POWER & SIGNAL	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.	E6	no. du dessin

Partial View from Rear-Left



Partial View from Rear-Right



NOTES:

- 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.
- ALL PARTS SUPPLIED BY OWNER TO BE FULLY INSTALLED BY CONTRACTOR.