Utah Transit Authority
669 West 200 South
Salt Lake City, Utah 84101
Phone: (801) 741-8885
Fax: (801) 741-8892

CHANGE ORDER
No. **4**

TITLE: Two (2) Additional DC Breakers

DATE: 3/18/2022

PROJECT/CODE: SGR397 - TPSS Component Replacement

This is a change order to CONTRACT No: 20-03378VW

TO: C3M

ATTN: Salvador Benitez

DESCRIPTION OF CHANGE: Brief scope, references to scope defining documents such as RFIs, submittals, specified drawings, exhibits, etc.

UTA requests two (2) additional DC breakers for each of nine (9) substations to enhance future light rail operations. The addition of two (2) DC breakers will allow better main line operations during contingency operations, allowing for more localized sectionalization and better maintenance access. This update includes the additional DC breakers, hardware, design, and additional fabrication incorporated into the base C3M TPSS Rehabilitation Contract.

The nine substations include:
1. SRD1 (Delta Center)
2. SRT2 (300 South)
3. SRN3 (900 South)
4. SRB4 (Burton)
5. SRH5 (Huslers)
6. SRW6 (Walton)
7. SRC7 (Central)
8. SRH8 (Murry)
9. SRP9 (Pallas)

The original scope of work prescribed that all nineteen (19) Impulse substations would have the existing two (2) DC breakers replaced. However, UTA and C3M found that the existing layouts could allow for the addition two DC breakers. This was also true for those substations scheduled to receive a larger sized transformer (note: the larger transformer is not anticipated to affect the electrical ratings of the breakers; however, this scope includes engineering to verify breaker ratings with the larger transformer).

Change Order Total: $2,694,731

Direction or Authorization to Proceed (DAP) previously executed: YES _____ NO __X__

It is mutually agreed upon, there is a schedule impact due to this Change order: YES __X__ NO _____

The amount of any adjustment to time for Substantial Completion and/or Guaranteed Completion or Contract Price includes all known and stated impacts or amounts, direct, indirect and consequential, (as of the date of this Change Order) which may be incurred as a result of the event or matter giving rise to this Change Order. Should conditions arise subsequent to this Change Order that impact the Work under the Contract, including this Change Order, and justify a Change Order under the Contract, or should subsequent Change Orders impact the Work under this Change Order, UTA or the Contractor may initiate a Change Order per the General Provisions, to address such impacts as may arise.

Current Change Order

Lump Sum:	$2,694,731
Unit Cost:	-
Cost Plus:	-
T&M NTE:	-
Total:	**$2,694,731**

Contract

Original Contract Sum:	$38,077,408
Net Change by Previously Authorized Changes:	$82,684
Previous Project Total:	**$38,160,092**
Net Change This Change Order:	$2,694,731
Current Project Total:	**$40,854,823**

Schedule

Final Completion Date Prior to This Change:	2/28/2025
Contract Time Change This Change Order (Calendar Days):	**42**
Final Completion Date as of This Change Order:	4/11/2025

ACCEPTED:
By: DocuSigned by: Salvador Benitez
Date: 3/24/2022

Salvador Benitez
C3M

By: _____
Date: _____

Jared Scarbrough
Project Manager <$25,000

By: _____
Date: _____

Dave Hancock
Director of Capital Construction <$75,000

By: _____
Date: _____

Mary DeLoretto
Chief Service Development Officer <$100,000

By: _____
Date: _____

Vicki Woodward
Procurement

By: DocuSigned by: Mike Bell
Date: 3/24/2022

Michael Bell
Legal Review

By: _____
Date: _____

Jay Fox
Executive Director >$200,000

Change Order Summary Worksheet

Previously Authorized Changes

Contract 20-03378VW C3M

Change Order No	Date	Amount of CO	Running Contract Total	Subject
Original Contract			$38,077,408	
1	7/9/2021	$0	$38,077,408	Amendment #1
2	8/20/2021	$0	$38,077,408	Amendment #2
3	3/18/2022	$82,684	$38,160,092	One Click and Trip (Impulse)
Total to Date		**$ $82,684**		

C3M Power Systems Change Proposal

Utah Transit Authority
669 West 200 South
Salt Lake City, UT, 84101

2/11/2022

ATTN: Jared Scarbrough

21036M1 UTA SOGR TPSS REHAB
C3M Contract #20-03378 CCN #8100001

SUBJECT: 2 Additional DC Feeder Breakers

REFERENCE: Utah Transit Authority Construction Change Directive

Dear Mr. Jared Scarbrough:

We are pleased to provide the proposal to furnish and install the necessary electrical work in accordance with the above reference(s) in addition to our electrical contract price for the sum of **$2,694,731.16**. Please see the accompanying documentation to substantiate this proposal.

Regarding the project construction schedule, this additional work will require an extension of time of **42** calendar days. Our costs associated with our request for time extension are included in our proposal. Costs associated with preparing modification of the contract schedule program are excluded from our quotation.

We need to be advised that the proposed change will proceed or has been cancelled in order for us to coordinate our electrical installation with the work of other trades. We will be pleased to proceed with this work upon receipt of your change order in the above amount.

Sincerely,

Salvador Benitez Jr
Senior Project Manager
salvador.benitezjr@c3mpowersystems.com

C3M Power Systems,LLC
1030 Hampton Park Boulevard, Suite 200
Capitol Heights, Maryland , 20743
240-319-2322

ORIGINAL

C3M POWER SYSTEMS CHANGE PROPOSAL

CCN#	**8100001**
Date:	2/11/2022
Project Name:	21036M1 UTA SOGR TPSS REHAB
Project Number:	21036M1 UTA SOGR TPSS REHAB

Work Description

Our Scope Includes the Following:

·The implementation of (2) Additional DC Feeder Breakers into the design for 9 Traction Power Substations.
·The procurement, handling, additional rigging, and installation of (2) Additional DC Feeder Breaker Line Ups at (9) Traction Power Substations at **SRP9 Pallas, SRM8 Murray, SRC7 Central, SRW6 Walton, SRH5 Huslers, SRB4 Burton, SRN3 900 South, SRT2 300 S, SRD1 Delta**
·Transfer Trip Configuration at (10) Substations **SRP9 Pallas, SRM8 Murray, SRC7 Central, SRW6 Walton, SRH5 Huslers, SRB4 Burton, SRN3 900 South, SRT2 300 S, SRD1 Delta, and SRA10 Atwoods**, including adjacent (6) Siemens substations **I-Hub, AP1, E1, YRY2, SH1, WV1 West Valley 1**. The reconfiguration includes hardware and components, relays, and control wiring to perform the reconfiguration of the adjacent substations. Testing of the configuration of what was implemented.
·Additional field and integrated Testing for the two additional DC Feeder Breakers at all (9) Traction Power Substations. **SRP9 Pallas, SRM8 Murray, SRC7 Central, SRW6 Walton, SRH5 Huslers, SRB4 Burton, SRN3 900 South, SRT2 300 S, SRD1 Delta**
·UTA would need to define which breakers need to feed which track (i.e. Evens=North, Odds=South, or could be FDR 1 and 2 Feed North, FDR 3 and 4 Feed South) etc. during the development of the design packages.
·Conduit Configuration from Pad Mounted Disconnect to Positive Feeder Manhole or TPSS as required. Includes the addition of (2) additional conduits between Positive Feeder Manhole and Newly Installed Pad Mounted Disconnect for a total of (4) Spare Conduits.
·SRD1 - Delta Center requires low voltage conduits to be brought into the existing pad mounted disconnects. It also requires the spare feeder conduits known as Duct Bank D3 to be excavated, located, and routed into the existing Pad Mounted Disconnects. Currently these conduits are located just outside the pad mounted disconnects and will have to be located and rerouted into the existing pad mounted disconnect. Timeline for the scope includes (1) Day for locating conduits, (1) for exposing conduits, (1) day for rerouting conduits to existing pad mounted disconnect, (1) day for concrete encasement and curing, (1) day for backfill and cleanup.
·42 Additional Days Required. Include Additional days for installation of added DC Feeder Cubicles, Additional days for Cable installation, terminations, and testing of added control wiring from the Supervisory Control Cabinet to the new DC Feeder Breakers. Additional time for Field Testing of added DC Breakers. See Schedule Anaylsis for details of each added or increased activity.

Our Scope Excludes the Following:

· All existing conduits will be utilized and tied into the associated manhole or existing disconnect foundation as shown in underground layout design.
·Replacement of the Positive Feeder Cables for the replacement DC Feeder Breakers 172-1 and 172-2 is contractual scope. Any additional cable to be replaced will be determined after the condition assessments and will be part of Option #002 Feeder Cable Replacement if executed by UTA.
·Testing of the existing SCADA that has not been upgraded in the adjacent substations. Testing will only be performed on those indications and inputs that have been incorporated for the transfer trip reconfiguration. .
·The Battery System includes the battery calculations for the inclusion of (2) additional DC Feeder Breakers per substation, battery charger, batteries (as needed), and racks. Battery system upgrades are part of the Provisional Sum items and to be utilized in all substations being upgraded. This has now been removed from this proposal and will be tracked through the Provisional Sum Agreements. The total amount removed from estimate is $40K per substation for Battery System Upgrade.
·The placement of the dielectric floor will be part of the provisional sum agreements and installed as shown in the contract drawings.
·Modification to the HVAC caused by the addition of the two new DC feeder cubicles will be part of the Provisional Sum

C3M POWER SYSTEMS CHANGE PROPOSAL

CCN# **8100001**
Date: 2/11/2022
Project Name: 21036M1 UTA SOGR TPSS REHAB
Project Number: 21036M1 UTA SOGR TPSS REHAB

agreements.

We reserve the right to correct this quote for errors and omissions.

This quote covers direct costs only and we reserve the right to claim for impact and consequential costs.
This price is good for acceptance within **90** days from the date of receipt.
We request a time extension of **42** days.
We will supply and install all materials, labor, and equipment as per your instructions on **CCN# 8100001.**

Itemized Breakdown

Description	Qty	Total Mat.	Total Hrs.
DC Gear Testing/Support	18	0.00	360.00
Labels & ID's Allowance	17	0.00	68.00
Continuity of Service	18	3,600.00	144.00
Two Section DC Switchgear	9	5,850.00	360.00
Grounding of Equipment	18	1,350.00	45.00
Removal & Reinstallation of Rear Doors	18	7,200.00	432.00
Test & Connect Cables	288	0.00	720.00
Reconfiguration of Adjacent Subs	6	0.00	144.00
Additional Conduit in 10way Duct Bank	300	441.00	45.00
Conduit Install & Config. Delta	1	1,500.00	48.00
Cutting, Patching & Fireproofing	18	7,200.00	72.00
Conduit Work from Trough to Gear	18	3,600.00	72.00
SCADA CONTROL CABLING	9,720	2,332.80	97.20
Totals	**10,449**	**33,073.80**	**2,607.20**

Summary

General Materials		33,073.80
Quoted Materials		15,000.00
Material Tax	(@ 10.000 %)	4,807.38
Total Material		**52,881.18**
GENERAL FOREMAN		22,925.11
FOREMAN		32,033.36
JOURNEYMAN		98,460.91
APPRENTICE 4YR		49,230.45
Total Labor		**202,649.83**
Field Office and Expenses		
Field Office	(2,607.20 @ 0.00 @ $0.08 + 6.000 % + 0.000 % + 0.000 %)	221.09
Project Executive	(0.25 @ 7.00 @ $1,276.08 + 0.000 % + 0.000 % + 0.000 %)	2,233.14
Sr. Project Manager	(2.00 @ 7.00 @ $984.08 + 0.000 % + 0.000 % + 0.000 %)	13,777.12
Project Engineer - C3M	(3.50 @ 7.00 @ $745.76 + 0.000 % + 0.000 % + 0.000 %)	18,271.12

C3M POWER SYSTEMS CHANGE PROPOSAL

CCN# **8100001**
Date: 2/11/2022
Project Name: 21036M1 UTA SOGR TPSS REHAB
Project Number: 21036M1 UTA SOGR TPSS REHAB

Summary (Cont'd)

Project Engineer - Wasatch	(1.50 @ 7.00 @ $745.76 + 0.000 % + 0.000 % + 0.000 %)	7,830.48
Administrative Assistant	(2.50 @ 7.00 @ $346.08 + 0.000 % + 0.000 % + 0.000 %)	6,056.40
Superintendent	(3.00 @ 7.00 @ $1,137.28 + 0.000 % + 0.000 % + 0.000 %)	23,882.88
Safety Officer	(1.00 @ 7.00 @ $715.28 + 0.000 % + 0.000 % + 0.000 %)	5,006.96
QC Manager	(1.00 @ 7.00 @ $528.00 + 0.000 % + 0.000 % + 0.000 %)	3,696.00
Warehouseman	(3.50 @ 7.00 @ $607.68 + 0.000 % + 0.000 % + 0.000 %)	14,888.16
Warehouse/Prefab Shop	(1.00 @ 2.00 @ $10,263.93 + 0.000 % + 0.000 % + 0.000 %)	20,527.86
10% DIRECT LABOR & FRINGES	(202,649.83 @ 0.00 @ $0.10 + 0.000 % + 0.000 % + 0.000 %)	20,264.98
5% SMALL TOOLS @ DIRECT LABOR	(2,607.20 @ 0.05 @ $47.71 + 0.000 % + 0.000 % + 0.000 %)	6,219.48
10% DIRECT MATERIALS	(33,073.80 @ 0.00 @ $0.10 + 0.000 % + 0.000 % + 0.000 %)	3,307.38
Total Field Office and Expenses		**146,183.05**
FOREMAN TRUCK RENTAL - MONTHLY	(1.00 @ 2.00 @ $2,940.00 + 10.000 % + 0.000 % + 0.000 %)	6,468.00
Rental Equipment and Tools	(2,607.20 @ 0.00 @ $2.25 + 0.000 % + 0.000 % + 0.000 %)	5,866.20
Expendable Tools	(2,607.20 @ 0.00 @ $0.35 + 0.000 % + 0.000 % + 0.000 %)	912.52
JOB SITE PICKUP TRUCK	(2.00 @ 2.00 @ $2,940.00 + 0.000 % + 0.000 % + 0.000 %)	11,760.00
STAKE BODY TRUCK	(0.50 @ 2.00 @ $2,000.00 + 0.000 % + 0.000 % + 0.000 %)	2,000.00
Fuel for Equipment	(2,176.06 @ 2.00 @ $4.00 + 0.000 % + 0.000 % + 0.000 %)	17,408.48
Equipment Maintenance	(3.00 @ 2.00 @ $250.00 + 0.000 % + 0.000 % + 0.000 %)	1,500.00
Total Equipment		**45,915.20**
Markup	(@ 15.000 %)	67,144.39
Total Markups		**67,144.39**
SUBCONTRACTORS		
STV - 4 DC Breaker Design	($246,127.00 + 0.000 % + 0.000 % + 5.000 %)	258,433.35
Balfour Beatty - 4 DC Breaker	($1,642,302.00 + 0.000 % + 0.000 % + 5.000 %)	1,724,417.10
IRH RIgging & Storing	($113,033.63 + 0.000 % + 0.000 % + 5.000 %)	118,685.31
Total Subcontractors		**2,101,535.76**
P&P Bond	(@ 0.879 %)	22,997.36
Warranty/Guarantee	(@ 2.000 %)	52,786.14
Limited Liability	(@ 0.098 %)	2,638.25
Subtotal		**2,694,731.16**
Final Amount		**$2,694,731.16**

ORIGINAL

C3M POWER SYSTEMS CHANGE PROPOSAL

CCN#	**8100001**
Date:	2/11/2022
Project Name:	21036M1 UTA SOGR TPSS REHAB
Project Number:	21036M1 UTA SOGR TPSS REHAB

CLIENT ACCEPTANCE

CCN # **8100001**
Final Amount: **$2,694,731.16**

Name: _____

Date: _____

Signature: _____

Change Order #: _____

I hereby accept this quotation and authorize the contractor to complete the above described work.

ORIGINAL

Balfour Beatty

REQUEST FOR CHANGE (RFC)

BBII Project/SO Reference	3461	RFC#	01

Project Information

Project Title	Contract No.	Date of this RFC
UTA STATE OF GOOD REPAIR TPSS REHABILITATION	4300001382 (21036M1)	January 12, 2022

To: SALVADOR BENITEZ, JR	C3M POWER SYSTEMS LLC BETHESDA, MARYLAND 20814
From MATHEW P. HANSON	BALFOUR BEATTY - TRACTION POWER GROUP GOLDSBORO, NC 27530

Change Information

Change Description

Two (2) Additional DC Breakers at the following Nine (9) substations: **$ 1,642,302.00**

1. SRD1 (Delta Center)
2. SRT2 (300 South)
3. SRN3 (900 South)
4. SRB4 (Burton)
5. SRH5 (Huslers)
6. SRW6 (Walton)
7. SRC7 (Central)
8. SRH8 (Murry)
9. SRP9 (Pallas)

This proposal is for work outside of the original specification and the project's original scope of work. See scope letter attached for additional detail.

Current and cumulative effect of this change order:

Original Contract Value	$	8,393,520.00
Previous Change Orders	$	-
Amount of this Change Order	$	1,642,302.00
Current Contract Value	$	10,035,822.00

Change Justification (check all that apply)

☐ Safety	☐ Design Scope Change or Error	☐ Reliability
☐ Operability	☐ Construction Scope Change or Error	☐ Additional work items
☐ Maintainability	☐ Eligible for backcharge	☑ Other

Reimbursement Type ☐ T&M ☐ T&M NTE ☑ LS ☐ **Other/To be calculated**

Schedule Impact

Will Change Affect the Overall Completion Date?	☐ YES ☑ NO	Proposed New Overall Completion Date	

This RFC is:

☐ **APPROVED** ☐ **REJECTED**

Comments:

SIGNATURES OF APPROVAL:

Supplier: **BALFOUR BEATTY - Traction Power Group** MATHEW P. HANSON

Contractor: **C3M POWER SYSTEMS LLC** SALVADOR BENITEZ, JR

BBR Internal Distribution

☑ Project Manager ☐ Quality Assurance

☐ Other _____ ☑ Accounting

Form No. FIN-001
Revision Date 11/11/14

REQUEST FOR CHANGE (RFC)

Balfour Beatty

BBII Project/SO Referen 3461 **RFC#** 01

Project Information

Change Information Detail

Change Description

Line	Description			Amount
1	Materials/Suppliers/Shipping			$ 1,307,309.00
2	Design Labor - PM, PE, CAD, SOF	625 hours		$ 100,000.00
2	Production Labor - FAB, WELD, ASM, QA	2160 hours		$ 216,000.00
3	Insurance			$ 18,993.00
4		Subtotal		$ 1,642,302.00
5		Sales Tax	0.0%	$ -
6		Total		$ 1,642,302.00

Total for this change order $ 1,642,302.00

January 18, 2022 STV-C3M-LTR-0004

C3M Power Systems LLC
1030 Hampton Park Blvd, Suite 200
Capitol Heights, MD 20743
Attn: Salvador Benitez Jr., Project Manager

Re: UTA Potential Change Order 005 – Two (2) Additional DC Breakers
Contract#: 20-03378VW

Dear Mr. Benitez:

We have completed the review of the reference UTA Potential Change Order 005 – Two (2) Additional DC Breakers for nine (9) TPSS. In accordance with Article 4.2.2 of our Design Services Agreement (DSA) between C3M Power Systems and STV Incorporated, STV is submitting the price in the amount of $246,127 to perform the design work identified by UTA.

STV design services include the design modifications to incorporate the two (2) additional breakers at the nine locations identified by UTA in PCO-05, which will include updating the schematics, equipment room layouts, sites plans, conduit and cable schedules to accommodate the additional breakers.

The exclusions, assumptions, and clarifications of Exhibit A – Scope of Services of the DSA shall apply.

STV reserves the right to evaluate the schedule impact based upon execution of the PCO.

Please feel free to contact me if you have any questions.

Sincerely,
STV Incorporated

Ja-Mie Luey, P.E. Vice President
Authorized Representative

cc: Eric Root STV Incorporated

Quote Summary

Prepared For

C3M POWER SYSTEMS LLC

Contact:	Rogelio Rivera	***Quoted By:***	Robert Dedman		
Phone Number:	240-972-1821	***Fax number:***			
Job Address:	Tracks Line - UTA Rail, Salt Lake City Utah				
Billing Address:	1030 Hampton Park Boulevard, Suite 200, Capitol Heights, Maryland 20743				
Customer PO:		***Bid Number:***	00194-22	***Version:***	1

On behalf of Intermountain Rigging and Heavy Haul, I would like to thank you for accepting our solicitation for this project. IRH proposes to provide labor, tool, and equipment to complete the following work as described:

UTA TPSS Rehab Rigging DC Breakers CO1
Adder: Receive 2) additional breakers at the IRH warehouse for 9) separate locations, load onto IRH trailers and deliver to site. Unload and place as instructed.
Locations: SRP9 Pallas, SRM8 Murray, SRC7 Central, SRW6 Walton, SRH5 Huslers, SRB4 Burton, SRN3 900 South, SRT2 300 S, SRD1 Delta

.

Receive 18 additional 20K DC Switch Gear at the IRH warehouse and deliver to site at the time of installation.	$17,920.00
.	
SRP9 Pallas, Unloading and Placement 2- DC Switch Gear 20K	$10,128.00
.	
SRM8 Murray, Unloading and Placement 2- DC Switch Gear 20K	$10,128.00
.	
SRC7 Central, Unloading and Placement 2- DC Switch Gear 20K	$10,128.00
.	
SRW6 Walton, Unloading and Placement 2- DC Switch Gear 20K	$10,128.00
.	
.	
SRH5 Huslers, Unloading and Placement 2- DC Switch Gear 20K	$10,128.00
.	
SRB4 Burton, Unloading and Placement 2- DC Switch Gear 20K	$10,128.00
.	

IRH
P.O. Box 27163 Salt Lake City, Utah 84127-0163
Tel: (801) 972-5581 (800) 786-7864
Fax: (801) 974-0834 (800) 334-2409

SRN3 900 South, Unloading and Placement 2- DC Switch Gear 20K .	$10,128.00
SRT2 300 S, Unloading and Placement 2- DC Switch Gear 20K .	$10,128.00
SRD1 Delta. Unloading and Placement 2- DC Switch Gear 20K .	$10,128.00
21. P&P Bond .	$1,963.00

Clarifications:

- Others to Provide the Following:
  Free and clear access to all work areas
  All electrical disconnects and reconnects
  All mechanical disconnects and reconnects
  Handling of any hazardous waste
  Handling of all items not listed in the above work scope
- Note: We reserve the right to charge additional for delays by others beyond our control.
- IRH is excluding leveling and anchoring of equipment at this time but will provide as needed on a time and materials basis.

Labor:	**$51,746.98**
Storage & P&P Bond:	**$1,998.33**
Crane Service:	**$32,067.00**
Equipment:	**$27,221.32**
Grand Total:	**$113,033.63**

TERMS AND CONDITIONS:

Customer assumes all responsibility for floor and all surfaces of the work area used to support machinery, materials and equipment either to be moved or used to perform the work. At Customer's request. IRH will consult with Customer about loads and stress to such surfaces. However, any damage resulting from failure of floor, driveway, parking lot, or any other surface, whether to the surface itself, equipment, tools, utilities, personnel, items being moved, or property nearby is the responsibility of the Customer.

All charges are due upon presentation of invoice, unless specified otherwise by written contract. All Invoices are subject to a 1.5% per month finance charge if unpaid within 30 days from date of invoice. Customer agrees to pay all collection costs, including attorneys fees, if required to collect this matter. 2 hours minimum charge Monday through Friday. 4 Hours minimum charges weekends and holidays. Saturday work is subject to a $20.00/man hour surcharge. Sunday and holiday work is subject to a $25.00/man hour surcharge. All materials and subcontractors are subject to a surcharge. Customer assumes all storage risks. IRH does not insure and is not responsible for stored items unless prior arrangements are made.

Approved By: ***P.O. #:***

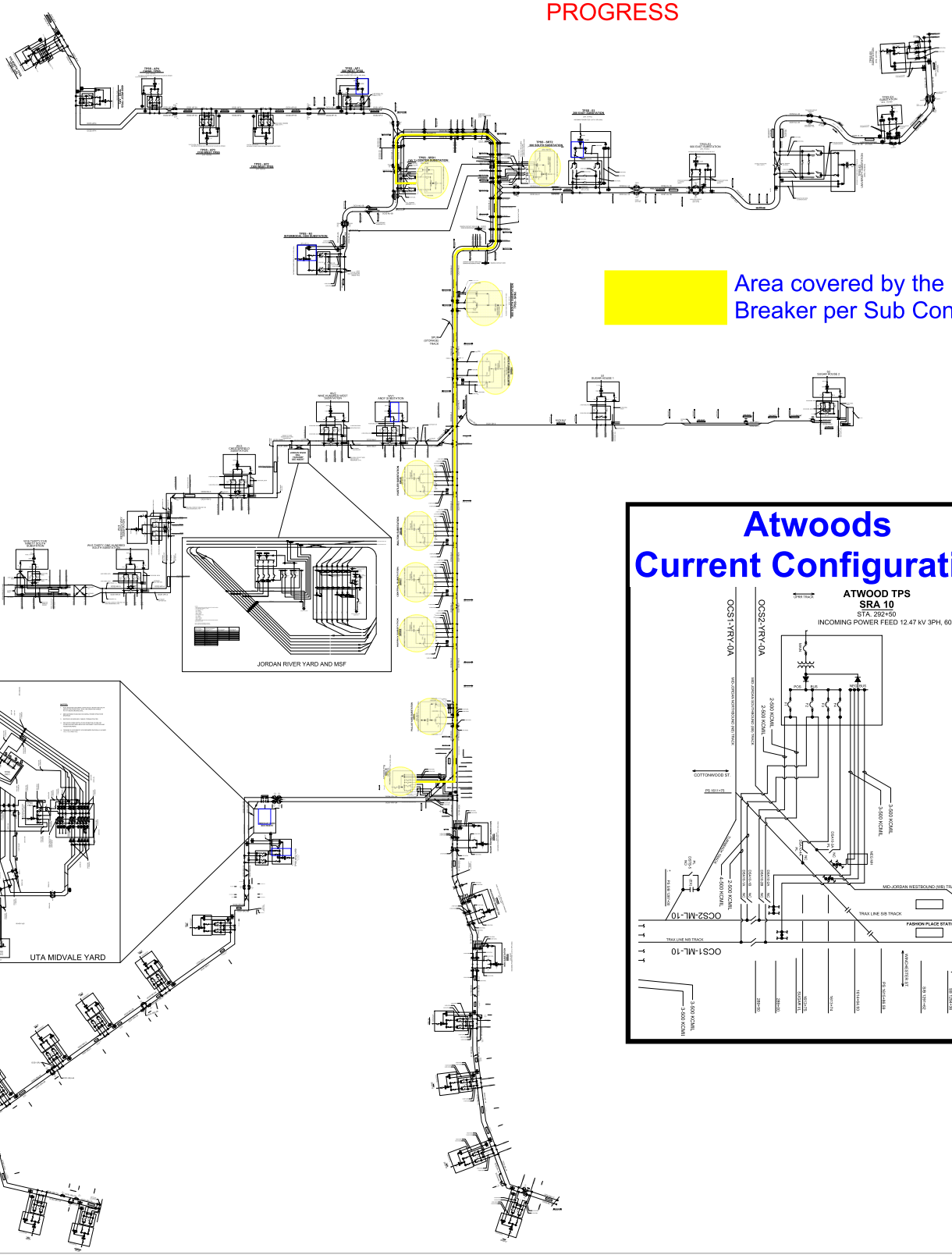
Please sign and return upon approval

IRH
P.O. Box 27163 Salt Lake City, Utah 84127-0163
Tel: (801) 972-5581 (800) 786-7864
Fax: (801) 974-0834 (800) 334-2409

Existing UTA TPSS/OCS
Two (2) Breaker Configuration

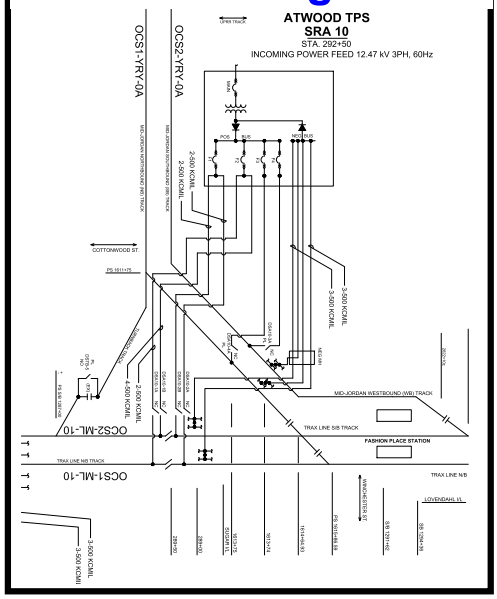
UTA OCS SECTIONALIZATION MAP

DRAFT - WORK IN PROGRESS



Area covered by the Four (4) DC Breaker per Sub Configuration

Atwoods
Current Configuration

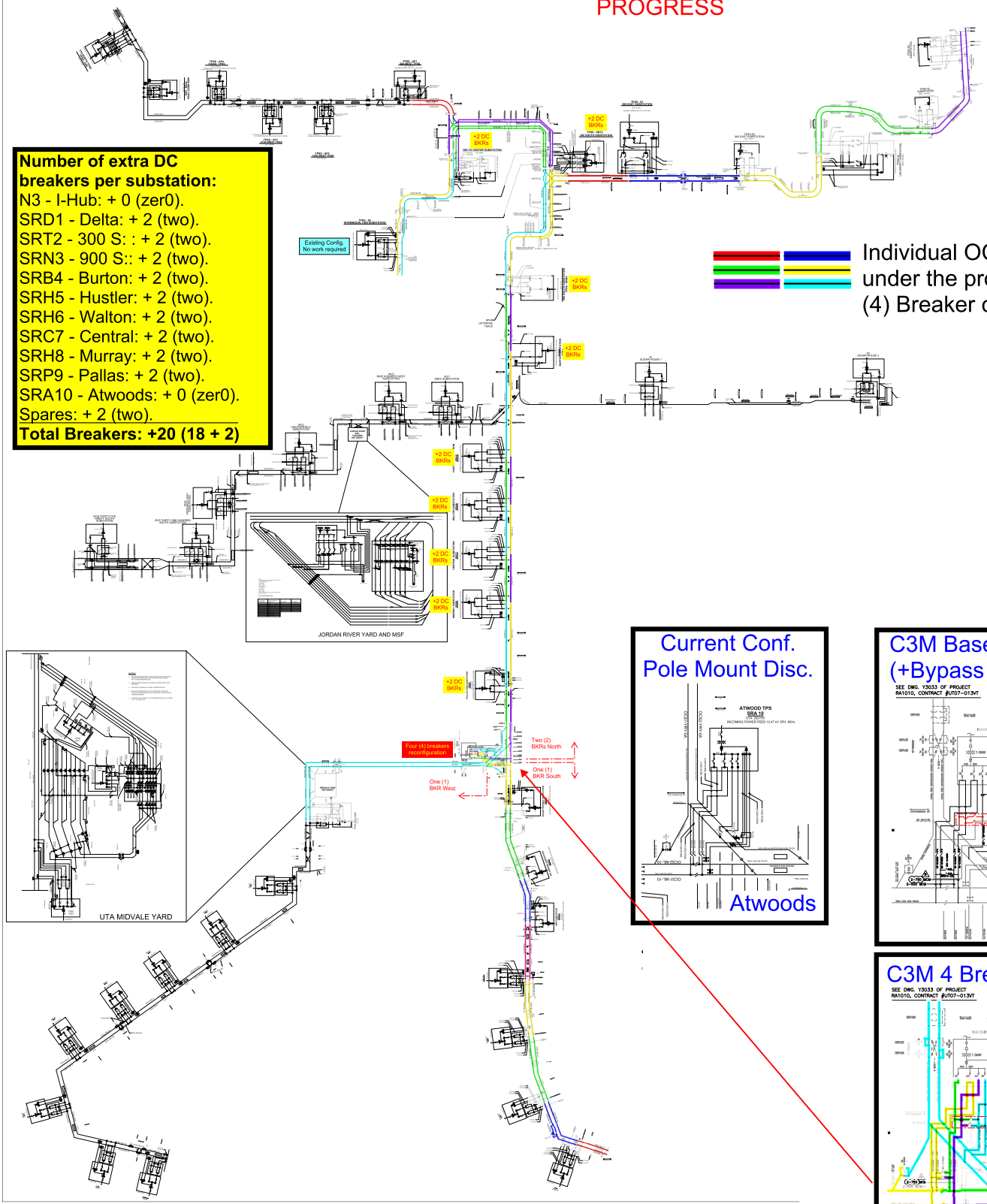


Proposed UTA TPSS/OCS Four (4) Breaker Configuration (Please zoom in on the TPSSs)

UTA OCS SECTIONALIZATION MAP

DRAFT - WORK IN PROGRESS

Number of extra DC breakers per substation:
N3 - I-Hub: + 0 (zer0).
SRD1 - Delta: + 2 (two).
SRT2 - 300 S: : + 2 (two).
SRN3 - 900 S:: + 2 (two).
SRB4 - Burton: + 2 (two).
SRH5 - Hustler: + 2 (two).
SRH6 - Walton: + 2 (two).
SRC7 - Central: + 2 (two).
SRH8 - Murray: + 2 (two).
SRP9 - Pallas: + 2 (two).
SRA10 - Atwoods: + 0 (zer0).
Spares: + 2 (two).
Total Breakers: +20 (18 + 2)

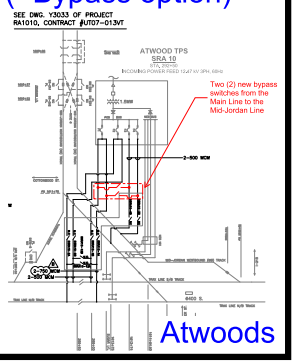


Individual OCS Sections under the proposed Four (4) Breaker configuration

Current Conf. Pole Mount Disc.

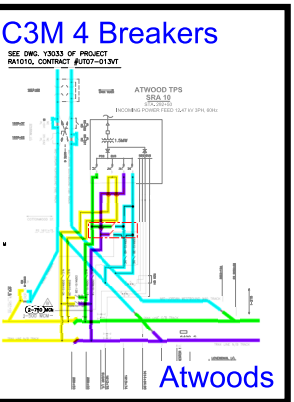
Atwoods

C3M Base Scope (+Bypass option)



Atwoods

C3M 4 Breakers



Atwoods

Atwoods. Proposed Reconfiguration. Cable Routing.

NOTES:

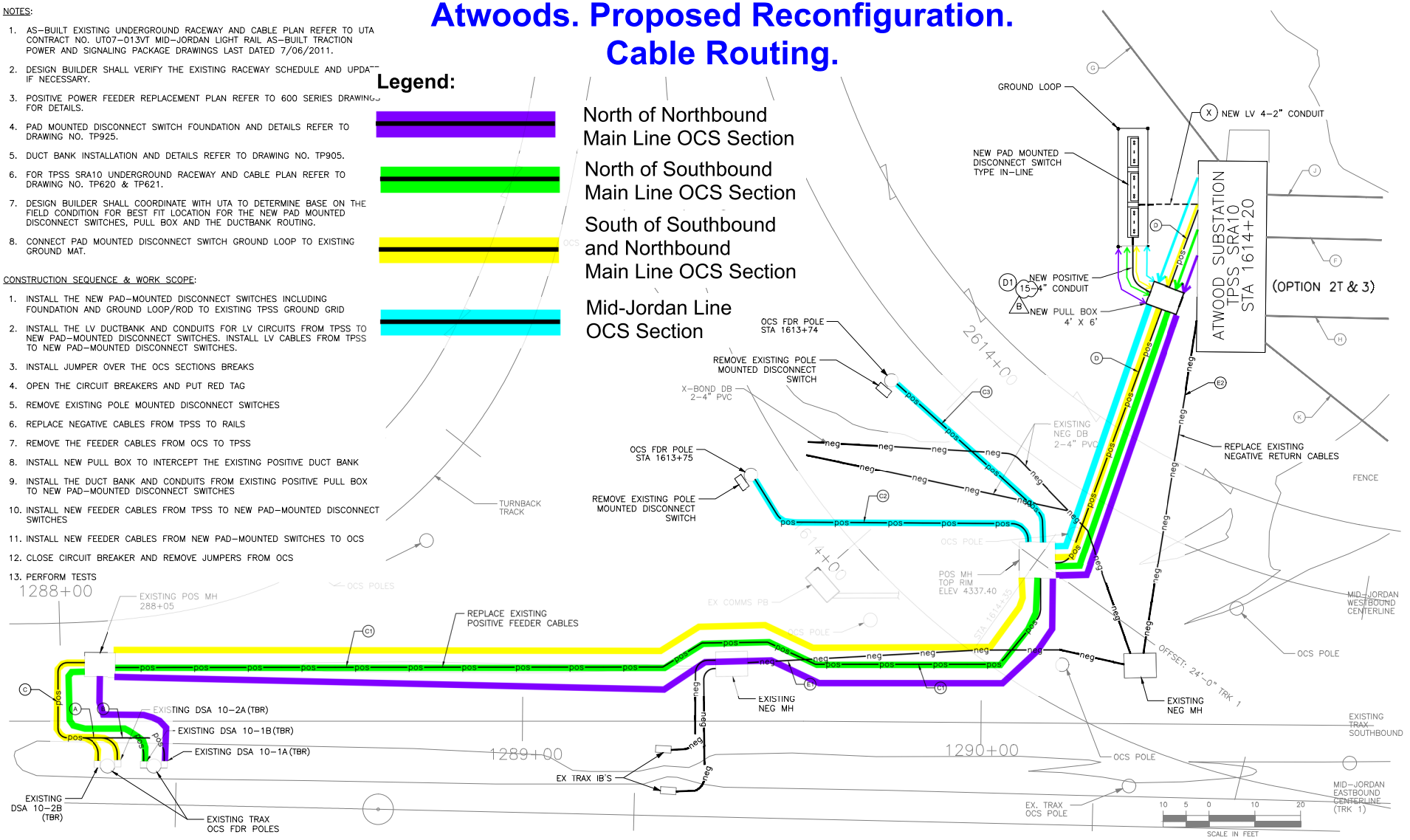
1. AS-BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT07-013VT MID-JORDAN LIGHT RAIL AS-BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 7/06/2011.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. POSITIVE POWER FEEDER REPLACEMENT PLAN REFER TO 600 SERIES DRAWINGS FOR DETAILS.
4. PAD MOUNTED DISCONNECT SWITCH FOUNDATION AND DETAILS REFER TO DRAWING NO. TP925.
5. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
6. FOR TPSS SRA10 UNDERGROUND RACEWAY AND CABLE PLAN REFER TO DRAWING NO. TP620 & TP621.
7. DESIGN BUILDER SHALL COORDINATE WITH UTA TO DETERMINE BASE ON THE FIELD CONDITION FOR BEST FIT LOCATION FOR THE NEW PAD MOUNTED DISCONNECT SWITCHES, PULL BOX AND THE DUCTBANK ROUTING.
8. CONNECT PAD MOUNTED DISCONNECT SWITCH GROUND LOOP TO EXISTING GROUND MAT.

CONSTRUCTION SEQUENCE & WORK SCOPE:

1. INSTALL THE NEW PAD-MOUNTED DISCONNECT SWITCHES INCLUDING FOUNDATION AND GROUND LOOP/ROD TO EXISTING TPSS GROUND GRID
2. INSTALL THE LV DUCTBANK AND CONDUITS FOR LV CIRCUITS FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES. INSTALL LV CABLES FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES.
3. INSTALL JUMPER OVER THE OCS SECTIONS BREAKS
4. OPEN THE CIRCUIT BREAKERS AND PUT RED TAG
5. REMOVE EXISTING POLE MOUNTED DISCONNECT SWITCHES
6. REPLACE NEGATIVE CABLES FROM TPSS TO RAILS
7. REMOVE THE FEEDER CABLES FROM OCS TO TPSS
8. INSTALL NEW PULL BOX TO INTERCEPT THE EXISTING POSITIVE DUCT BANK
9. INSTALL THE DUCT BANK AND CONDUITS FROM EXISTING POSITIVE PULL BOX TO NEW PAD-MOUNTED DISCONNECT SWITCHES
10. INSTALL NEW FEEDER CABLES FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES
11. INSTALL NEW FEEDER CABLES FROM NEW PAD-MOUNTED SWITCHES TO OCS
12. CLOSE CIRCUIT BREAKER AND REMOVE JUMPERS FROM OCS
13. PERFORM TESTS

Legend:

- North of Northbound Main Line OCS Section
- North of Southbound Main Line OCS Section
- South of Southbound and Northbound Main Line OCS Section
- Mid-Jordan Line OCS Section



REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER — MICHAEL HSIAO — No. 11663776-2202 — Exp. 03/31/2021 — CIVIL — STATE OF UTAH

Submitted By: _____

Approved By: _____

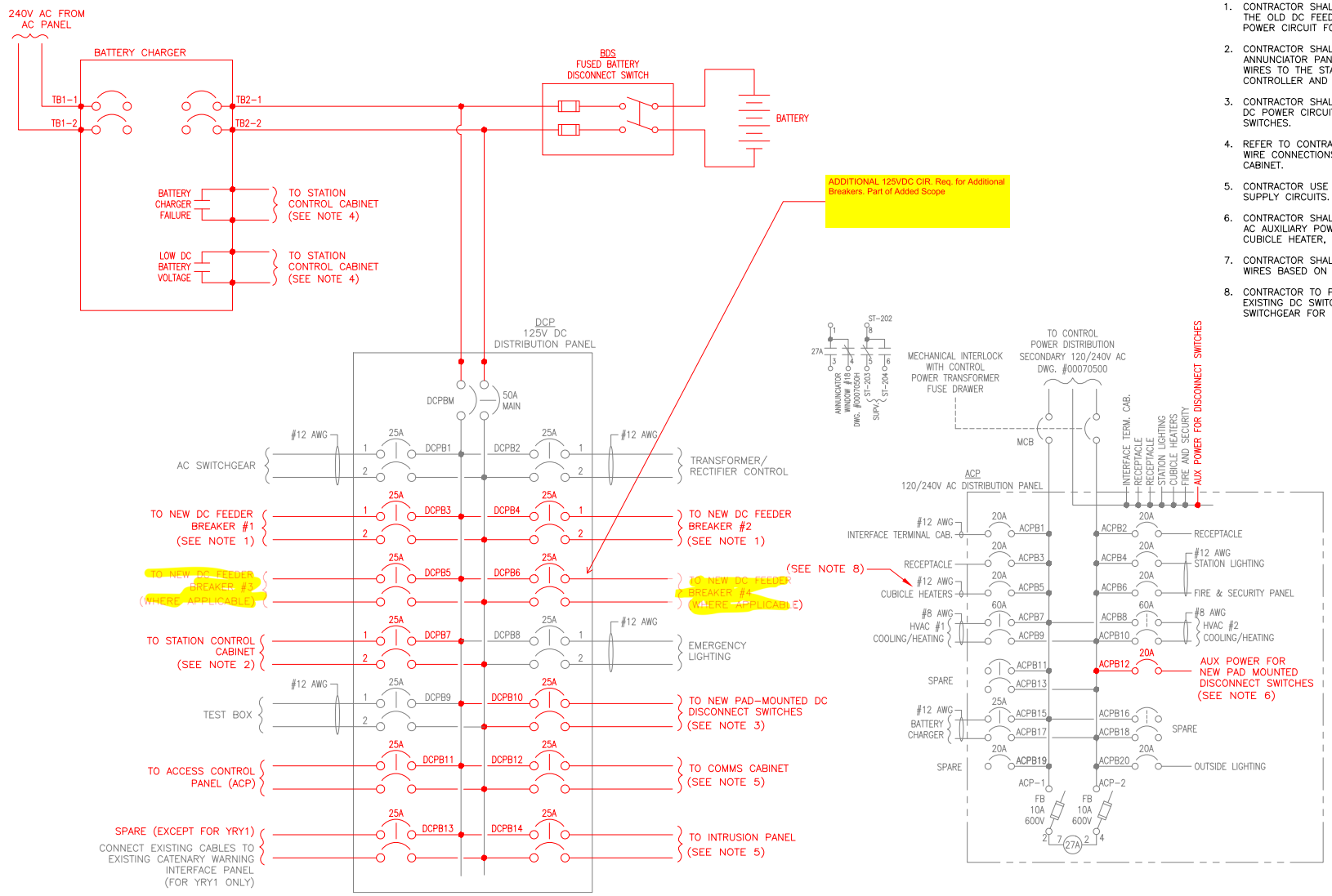
UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Designed By:	J. LAU
Drawn By:	A. CHEUNG
Checked By:	M. HSIAO
Approved By:	M. HSIAO

UTA REHABILITATION OF TPSS
ATWOODS SUBSTATION
SITE PLAN AND CONSTRUCTION SEQUENCES
TPSS SRA10 – OPTION 2T & 3
SHEET 1 OF 1

Scale:	1"=10'-0"
CADD Filename:	UTA-TP320.dwg
Submittal Date	09/23/20
UTA Contract No.:	UT13-064GL
Drawing No.:	TP320
Sheet No.:	

ADDITIONAL CONTROL WIRING



NOTES:

1. CONTRACTOR SHALL DISCONNECT THE EXISTING POWER CIRCUIT FOR THE OLD DC FEEDER BREAKERS AND TERMINATE THE NEW 125 V DC POWER CIRCUIT FOR NEW DC FEEDER BREAKERS.
2. CONTRACTOR SHALL DISCONNECT THE EXISTING POWER CIRCUIT FOR ANNUNCIATOR PANEL AND RUN THE NEW 125 V DC POWER CIRCUIT WIRES TO THE STATION CONTROL CABINET TO USE FOR THE LOGIC CONTROLLER AND PLC.
3. CONTRACTOR SHALL USE THE SPARE TO CONNECT THE NEW 125 V DC POWER CIRCUIT TO THE NEW PAD-MOUNTED DC DISCONNECT SWITCHES.
4. REFER TO CONTRACT SHEET NO. TP142 & TP143 FOR ALL INDICATION WIRE CONNECTIONS TO LOGIC CONTROLLER IN STATION CONTROL CABINET.
5. CONTRACTOR USE NEW CIRCUIT BREAKER FOR ASSOCIATED POWER SUPPLY CIRCUITS.
6. CONTRACTOR SHALL USE SPARE CIRCUIT IN ACP TO PROVIDE 120V AC AUXILIARY POWER TO DC MANUAL DISCONNECT SWITCHES FOR CUBICLE HEATER, ETC.
7. CONTRACTOR SHALL CONFIRM FINAL SIZE OF CIRCUIT BREAKERS AND WIRES BASED ON CONNECTED LOADS OF THE SUPPLIED EQUIPMENT.
8. CONTRACTOR TO PROTECT THIS CIRCUIT DURING DEMOLISHING OF THE EXISTING DC SWITCHGEAR AND TERMINATE IT TO THE NEW DC SWITCHGEAR FOR HEATERS.

REV	DATE	Description

STV 100 Years in association with c3m POWER SYSTEMS

Submitted By: _____

UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

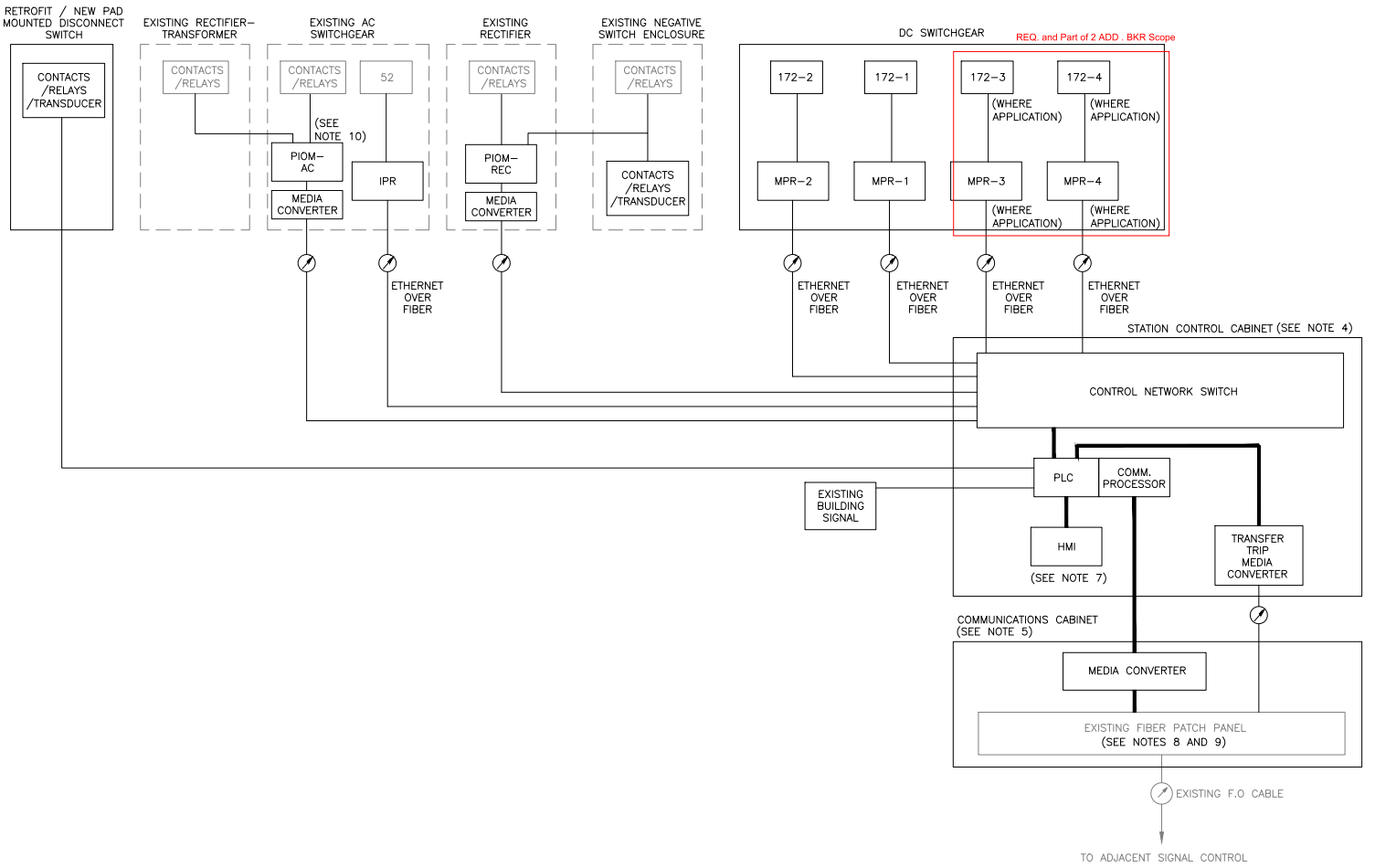
Approved By: _____

Designed By:	K. KWONG
Drawn By:	T. NG
Checked By:	E. ROOT
Approved By:	J. LUEY

UTA REHABILITATION OF TPSS

125VDC AND 120VAC DISTRIBUTION PANELBOARD SCHEDULES SCOPE A & B

Scale:	NTS
CADD Filename:	GENYTP140.DWG
Submittal Date	JANUARY 26, 2022
UTA Contract No.:	20-03378VW
Drawing No.:	TP140
Sheet No.:	



NOTES:

1. CONTRACTOR SHALL SUBMIT DETAILED INSTALLATION DRAWINGS FOR REVIEW AND APPROVAL BY THE UTA.
2. ALL FIBER OPTIC STRANDS AND CONDUCTORS PROVIDED UNDER THIS CONTRACT SHALL BE TESTED AND TERMINATED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. All FIBER OPTICAL STRANDS AND CONDUCTORS USED FOR THIS PROJECT SHALL BE VERIFIED END TO END BY THE CONTRACTOR.
3. THE INTEGRITY OF ALL COMMUNICATION LINK AND EQUIPMENT SHALL BE CONTINUOUSLY MONITORED LOCALLY (AT THE TPSS) AND REMOTELY (AT THE OCC).
4. FOR GENERAL ARRANGEMENT OF THE STATION CONTROL CABINET, REFER TO CONTRACT SHEET NO. TP404.
5. FOR GENERAL ARRANGEMENT OF THE COMMUNICATIONS CABINET, REFER TO CONTRACT SHEET NO. TP407.
6. REFER TO CONTRACT DRAWINGS TP142 TO TP145 FOR PLC AND PIOM SCHEMATIC AND CONNECTION DETAILS.
7. REFER TO CONTRACT SHEETS TP405 AND TP406 FOR HMI DISPLAY REQUIREMENTS.
8. FIBER CABLE BETWEEN MEDIA CONVERTER AND FIBER PATCH PANEL IS TO BE PROVIDED BY THE CONTRACTOR. CONTRACTOR SHALL PROVIDE ALL TERMINALS AND INCIDENTALS REQUIRED. UTA IS ONLY RESPONSIBLE TO PERFORM TERMINATION /SPLICING AT THE FIBER PATCH PANEL FOR ALL OUTGOING CONNECTIONS TO THE SCADA NETWORK. ALL COMMUNICATION CABINET CONNECTIONS WITHIN THE TPSS SHALL BE PROVIDED BY THE CONTRACTOR.
9. CONTRACTOR SHALL SUPPORT UTA DURING INSTALLATION, TESTING AND COMMISSIONING WORK OF THE COMMUNICATIONS NETWORK.
10. IN LIEU OF CONNECTING THE DIGITAL INPUTS FROM THE TRANSFORMER TO PIOM–AC, CONTRACTOR MAY CONNECT THESE POINTS TO PIOM–RECT DEPENDING ON THE MAXIMUM NUMBER OF DIGITAL INPUT POINTS ALLOWED IN PIOM–RECT OR MAY USE DISCRETE INPUTS INTO THE AC SWITCHGEAR IPR IF AVAILABLE.

LEGEND

FIBER OPTIC JUMPER

CAT6A CABLE

HARD WIRE

REV	DATE	Description
△		
△		
△		
△		
△		
△		

STV 100 Years in association with c3m POWER SYSTEMS

Submitted By: _____

UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Approved By: _____

Designed By:	K. KWONG
Drawn By:	T. NG
Checked By:	E. ROOT
Approved By:	J. LUEY

UTA REHABILITATION OF TPSS

COMMUNICATION SYSTEM BLOCK DIAGRAM TYPICAL FOR SCOPE A & B

Scale:	NTS
CADD Filename:	GENYTP141.DWG
Submittal Date	JANUARY 26, 2022
UTA Contract No.:	20–03378VW
Drawing No.:	TP141
Sheet No.:	

CONDUIT AND CABLE SCHEDULE

RACEWAY CONSTRUCTION			CABLE CONSTRUCTION					FROM		TO		
RACEWAY IDENTIFICATION	SIZE [INCHES]	TYPE	CIRCUIT NAME	SIZE (AWG/KCMIL)	NO. OF COND.	INSUL/ TYPE	RATING	EQUIPMENT	LOCATION	EQUIPMENT	LOCATION	COMMENTS
A001	–	–	RECTIFIER/DC SWGR	–	–	–	–	RECTIFIER	TPSS	DC SWITCHGEAR	TPSS	800V DC, 4000A BUS
B001	2" DIA.	GRS	DCP/DC SWGR-F1	#12	1-2/C	XHHW	600V	DC DISTRIBUTION PANEL (DCP) (E)	TPSS	6" X 6" WIREWAY (E)	TPSS	125 V DC POWER CIRCUIT FROM DCP TO 172-1 CUBICLE FOR CLOSE AND TRIP CIRCUIT AND MPR-1
			DCP/DC SWGR-F2	#12	1-2/C	XHHW	600V					125 V DC POWER CIRCUIT FROM DCP TO 172-2 CUBICLE FOR CLOSE AND TRIP CIRCUIT AND MPR-2
			DCP/DC SWGR-F3	#12	1-2/C	XHHW	600V					125 V DC POWER CIRCUIT FROM DCP TO 172-3 CUBICLE FOR CLOSE AND TRIP CIRCUIT AND MPR-3 (NOTE 1)
			DCP/DC SWGR-F4	#12	1-2/C	XHHW	600V					125 V DC POWER CIRCUIT FROM DCP TO 172-4 CUBICLE FOR CLOSE AND TRIP CIRCUIT AND MPR-4 (NOTE 1)
			DCP/STATION CTRL CAB.	#12	1-2/C	XHHW	600V					125 V DC POWER CIRCUIT FROM DCP TO STATION CONTROL CABINET
			DCP/COMMS CAB.	#12	1-2/C	XHHW	600V					125 V DC POWER CIRCUIT FROM DCP TO COMMUNICATIONS CABINET
			DCP/DC DISCONNECT SW	#10	1-2/C	XHHW	600V					125 V DC POWER CIRCUIT FROM DCP TO THE PAD MOUNTED DC DISCONNECT SWITCHES
B002	1" DIA.	GRS	DCP/STATION CTRL CAB.	#12	1-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	STATION CTRL CAB.	TPSS	125 V DC POWER CIRCUIT FROM DCP TO STATION CONTROL CABINET
B003	1" DIA.	GRS	DCP/COMMS CAB.	#12	1-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	COMMS CABINET	TPSS	125 V DC POWER CIRCUIT FROM DCP TO COMMUNICATIONS CABINET
B004	2" DIA.	GRS	DCP/DC DISCONNECT SW	#10	1-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	DC DISC. SW.	TPSS	125 V DC POWER CIRCUIT FROM DCP TO PAD MOUNTED DC DISCONNECT SWITCHES
B005	2" DIA.	GRS	DCP/DC SWGR-F1	#12	1-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	DC SWGR 172-1 CUBICLE	TPSS	125 V DC POWER CIRCUIT FROM DCP TO 172-1 CUBICLE FOR CLOSE AND TRIP CIRCUIT AND MPR-1
			186/MPR-1	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM LOCKOUT RELAY 186 AT RECTIFIER TO MPR-1 AT 172-1 CUBICLE
			86/33P	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM DC SWITCHGEAR DOOR INTERLOCK TO LOCKOUT RELAY 86 AT AC SWITCHGEAR
			186/33P	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM DC SWITCHGEAR DOOR INTERLOCK TO LOCKOUT RELAY 186 AT RECTIFIER
B006	2" DIA.	GRS	DCP/DC SWGR-F2	#12	1-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	DC SWGR 172-2 CUBICLE	TPSS	125 V DC POWER CIRCUIT FROM DCP TO 172-2 CUBICLE FOR CLOSE AND TRIP CIRCUIT AND MPR-2
			186/MPR-2	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM LOCKOUT RELAY 186 AT RECTIFIER TO MPR-2 AT 172-2 CUBICLE
			86/33P	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM DC SWITCHGEAR DOOR INTERLOCK TO LOCKOUT RELAY 86 AT AC SWITCHGEAR
			186/33P	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM DC SWITCHGEAR DOOR INTERLOCK TO LOCKOUT RELAY 186 AT RECTIFIER
B007	2" DIA.	GRS	DCP/DC SWGR-F3	#12	1-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	DC SWGR 172-3 CUBICLE	TPSS	125 V DC POWER CIRCUIT FROM DCP TO 172-3 CUBICLE FOR CLOSE AND TRIP CIRCUIT AND MPR-3 (NOTE 1)
			186/MPR-3	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM LOCKOUT RELAY 186 AT RECTIFIER TO MPR-3 AT 172-3 CUBICLE (NOTE 1)
			86/33P	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM DC SWITCHGEAR DOOR INTERLOCK TO LOCKOUT RELAY 86 AT AC SWITCHGEAR
			186/33P	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM DC SWITCHGEAR DOOR INTERLOCK TO LOCKOUT RELAY 186 AT RECTIFIER
B008	2" DIA.	GRS	DCP/DC SWGR-F4	#12	1-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	DC SWGR 172-4 CUBICLE	TPSS	125 V DC POWER CIRCUIT FROM DCP TO 172-4 CUBICLE FOR CLOSE AND TRIP CIRCUIT AND MPR-4 (NOTE 1)
			186/MPR-4	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM LOCKOUT RELAY 186 AT RECTIFIER TO MPR-4 AT 172-4 CUBICLE (NOTE 1)
			86/33P	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM DC SWITCHGEAR DOOR INTERLOCK TO LOCKOUT RELAY 86 AT AC SWITCHGEAR
			186/33P	#14	1-2/C	XHHW	600V					TRIP SIGNAL FROM DC SWITCHGEAR DOOR INTERLOCK TO LOCKOUT RELAY 186 AT RECTIFIER
B009	3/4" DIA.	GRS	BATT DS/BATT	#1	2-1/C	XHHW	600V	BATT DS	TPSS	125 VDC BATTERY	TPSS	CONNECTION FROM BATTERY DISCONNECT TO BATTERY
B010	3/4" DIA.	GRS	BATT CHG/BATT DS	#1	2-1/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	BATT DS	TPSS	CONNECTION FROM BATTERY CHARGER TO BATTERY DISCONNECT
B011	3/4" DIA.	GRS	BATT CHG/DCP	#1/0	2-1/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	DCP	TPSS	CONNECTION FROM BATTERY CHARGER TO DC DISTRIBUTION PANEL
B012	3/4" DIA.	GRS	BATT CHG/DCP	#1/0	2-1/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	BATT CHG	TPSS	CONNECTION FROM BATTERY CHARGER TO DC DISTRIBUTION PANEL
B013	2" DIA.	GRS	ACP/DC DISCONNECT SW	#10	1-3/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	ACP	TPSS	120 V AC POWER CIRCUIT FROM ACP TO PAD MOUNTED DC DISCONNECT SWITCHES
B014	2" DIA.	GRS	ACP/DC DISCONNECT SW	#10	1-3/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	DC DISC. SW.	TPSS	120 V AC POWER CIRCUIT FROM ACP TO PAD MOUNTED DC DISCONNECT SWITCHES
B015	2" DIA.	GRS	PLC/DC DISC. SW	#14	12-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	STATION CTRL CAB.	TPSS	OPEN & CLOSED STATUS AND OCS LINE VOLTAGES FROM DC DISCONNECT SWITCHES TO PLC IN STATION CONTROL CABINET
				#16	4-2/C	XHHW	600V					
			PLC/EM. TRIP STATIONS	#14	2-2/C	XHHW	600V					EMERGENCY TRIP CONTACTS FROM EMERGENCY TRIP STATIONS 1 & 2 TO PLC
B016	2" DIA.	GRS	PLC/DC DISC. SW	#14	12-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	DC DISC. SW.	TPSS	OPEN & CLOSED STATUS AND OCS LINE VOLTAGES FROM DC DISCONNECT SWITCHES TO PLC IN STATION CONTROL CABINET
				#16	4-2/C	XHHW	600V					
B017	2" DIA.	GRS	NEG BUS/DISC SW	#6	1-2/C	XHHW	2000V	6" X 6" WIREWAY (E)	TPSS	DC DISC. SW.	TPSS	NEGATIVE REFERENCE CIRCUIT FROM PAD MOUNTED DC DISCONNECT SWITCHES TO NEGATIVE BUS IN NEGATIVE SWITCH CUBICLE
B018	2" DIA.	GRS	NEG BUS/DISC SW	#6	1-2/C	XHHW	2000V	6" X 6" WIREWAY (E)	TPSS	NEG SWITCH CUB	TPSS	NEGATIVE REFERENCE CIRCUIT FROM PAD MOUNTED DC DISCONNECT SWITCHES TO NEGATIVE BUS IN NEGATIVE SWITCH CUBICLE
B019	3/4" DIA.	GRS	TPSS ES/PLC, 86, 186	#14	3-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	EMER. TRIP STA. 1	TPSS	EMERGENCY TRIP CONTACTS FROM EMERGENCY TRIP STATION 1 TO PLC, 186 AND 86 (SEE NOTE 4)
B020	3/4" DIA.	GRS	TPSS ES/PLC, 86, 186	#14	3-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	EMER. TRIP STA. 2	TPSS	EMERGENCY TRIP CONTACTS FROM EMERGENCY TRIP STATION 2 TO PLC, 186 AND 86 (SEE NOTE 4)
EXISTING CONDUIT			TPSS ES 1 & 2/86	#14	2-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	AC SWGR CUBICLE	TPSS	EMERGENCY TRIP CONTACTS FROM EMERGENCY TRIP STATIONS 1 & 2 TO 86 IN AC SWITCHGEAR CONTROL COMPARTMENT
EXISTING CONDUIT			TPSS ES 1 & 2/186	#14	2-2/C	XHHW	600V	6" X 6" WIREWAY (E)	TPSS	RECTIFIER CUBICLE	TPSS	EMERGENCY TRIP CONTACTS FROM EMERGENCY TRIP STATIONS 1 & 2 TO 186 IN RECTIFIER CONTROL COMPARTMENT

NOTES:
1. APPLIES TO SUBSTATIONS WITH FOUR FEEDER BREAKER ARRANGEMENT ONLY. REFER TO TP004 FOR LIST OF SUBSTATIONS.
2. REFER TO DRAWINGS TP160 FOR SUBSTATION RACEWAY ROUTING SECTIONS.
3. CONTRACTOR SHALL FURNISH AND INSTALL 6" TO 12" OF PVC CONDUIT FOR TRANSITION FROM RGS TO PVC CONDUIT WHEN ENTERING THE DC SWITCHGEAR, RECTIFIER AND NEGATIVE SWITCH CUBICLES FOR ELECTRICAL ISOLATION.
4. SEE DWG TP160 FOR SITE SPECIFIC DETAILS.

TYPICAL CONTROL CABLE INSTALLATION FOR ALL LOCATIONS WITH ADDED 2 BREAKER OPTIONS. ADDITIONAL CABLE PART OF SCOPE

REV	DATE	Description

STV 100 Years in association with c3m POWER SYSTEMS

Submitted By: _____

UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Approved By: _____

Designed By: K. KWONG
Drawn By: T. NG
Checked By: E. ROOT
Approved By: J. LUEY

UTA REHABILITATION OF TPSS

CONDUIT AND CABLE SCHEDULE - TYPICAL SUBSTATION SCOPE A & B SH 1

Scale: NTS
CADD Filename: GENYTP170.DWG
Submittal Date: JANUARY 26, 2022
UTA Contract No.: 20-03378VW
Drawing No.: TP170
Sheet No.:

CONDUIT AND CABLE SCHEDULE

RACEWAY CONSTRUCTION			CABLE CONSTRUCTION					FROM		TO		
RACEWAY IDENTIFICATION	SIZE [INCHES]	TYPE	CIRCUIT NAME	SIZE (AWG/KCMIL)	NO. OF COND.	INSUL/ TYPE	RATING	EQUIPMENT	LOCATION	EQUIPMENT	LOCATION	COMMENTS
C001	1" DIA.	GRS	COMM PRO/MEDIA CON.	CAT6	1	PLENUM	600V	COMMS CABINET	TPSS	STATION CTRL CAB.	TPSS	CAT6 CABLE FROM MEDIA CONVERTER IN COMMUNICATIONS CABINET TO COMM. PROCESSOR IN STATION CONTROL CABINET
			TT MEDIA CON/FIBER PP	FJ	2	PLENUM	600V					FIBER JUMPER FROM FIBER PATCH PANEL IN COMMUNICATIONS CABINET TO TRANSFER TRIP MEDIA CONVERTER IN STATION CONTROL CABINET
C002	2" DIA.	GRS	NET. SW./IPR	FJ	2	PLENUM	600V	STATION CONTROL CABINET	TPSS	AC SWITCHGEAR	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO IPR IN AC SWITCHGEAR
			NET. SW./MPR-1	FJ	2	PLENUM	600V			172-1 CUBICLE	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO MPR-1 IN DC SWITCHGEAR 172-1 CUBICLE
			NET. SW./MPR-2	FJ	2	PLENUM	600V			172-2 CUBICLE	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO MPR-2 IN DC SWITCHGEAR 172-2 CUBICLE
			NET. SW./MPR-3	FJ	2	PLENUM	600V			172-3 CUBICLE	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO MPR-3 IN DC SWITCHGEAR 172-3 CUBICLE (NOTE 1)
			NET. SW./MPR-4	FJ	2	PLENUM	600V			172-4 CUBICLE	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO MPR-4 IN DC SWITCHGEAR 172-4 CUBICLE (NOTE 1)
			NET. SW./PIOM-RECT VIA MEDIA CONVERTER	FJ	2	PLENUM	600V			RECTIFIER	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO PIOM-RECT IN RECTIFIER CUBICLE
			NET. SW./PIOM-AC VIA MEDIA CONVERTER	FJ	2	PLENUM	600V			AC SWITCHGEAR	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO PIOM-AC IN AC SWITCHGEAR CUBICLE
C003	1" DIA.	GRS	PIOM-AC	FJ	2	PLENUM	600V	6" X 6" WIREWAY (E)	TPSS	AC SWITCHGEAR	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO IPR IN AC SWITCHGEAR
			NET. SW./IPR	FJ	2	PLENUM	600V			AC SWITCHGEAR	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO PIOM-AC IN AC SWITCHGEAR CUBICLE
C004	3/4" DIA.	GRS	NET. SW./MPR-1	FJ	2	PLENUM	600V	6" X 6" WIREWAY (E)	TPSS	172-1 CUBICLE	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO MPR-1 IN DC SWITCHGEAR 172-1 CUBICLE
C005	3/4" DIA.	GRS	NET. SW./MPR-2	FJ	2	PLENUM	600V			172-2 CUBICLE	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO MPR-2 IN DC SWITCHGEAR 172-2 CUBICLE
C006	3/4" DIA.	GRS	NET. SW./MPR-3	FJ	2	PLENUM	600V			172-3 CUBICLE	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO MPR-3 IN DC SWITCHGEAR 172-3 CUBICLE (NOTE 1)
C007	3/4" DIA.	GRS	NET. SW./MPR-4	FJ	2	PLENUM	600V			172-4 CUBICLE	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO MPR-4 IN DC SWITCHGEAR 172-4 CUBICLE (NOTE 1)
C008	3/4" DIA.	GRS	PIOM-RECT	FJ	2	PLENUM	600V			RECTIFIER	TPSS	FIBER JUMPER FROM CONTROL NETWORK SWITCH IN STATION CONTROL CABINET TO PIOM-RECT IN RECTIFIER CUBICLE

NOTES:
1. APPLIES TO SUBSTATIONS WITH FOUR FEEDER BREAKER ARRANGEMENT ONLY. REFER TO TP004 FOR LIST OF SUBSTATIONS.
2. REFER TO DRAWINGS TP160 FOR SUBSTATION RACEWAY ROUTING SECTIONS.
3. CONTRACTOR SHALL FURNISH AND INSTALL 6" TO 12" OF PVC CONDUIT FOR TRANSITION FROM RGS TO PVC CONDUIT WHEN ENTERING THE DC SWITCHGEAR, RECTIFIER AND NEGATIVE SWITCH CUBICLES FOR ELECTRICAL ISOLATION.

TYPICAL CONTROL CABLE INSTALLATION FOR ALL LOCATIONS WITH ADDED 2 BREAKER OPTIONS. ADDITIONAL CABLE PART OF SCOPE

REV	DATE	Description

STV 100 Years in association with c3m POWER SYSTEMS

Submitted By: _____

UTA TRAX
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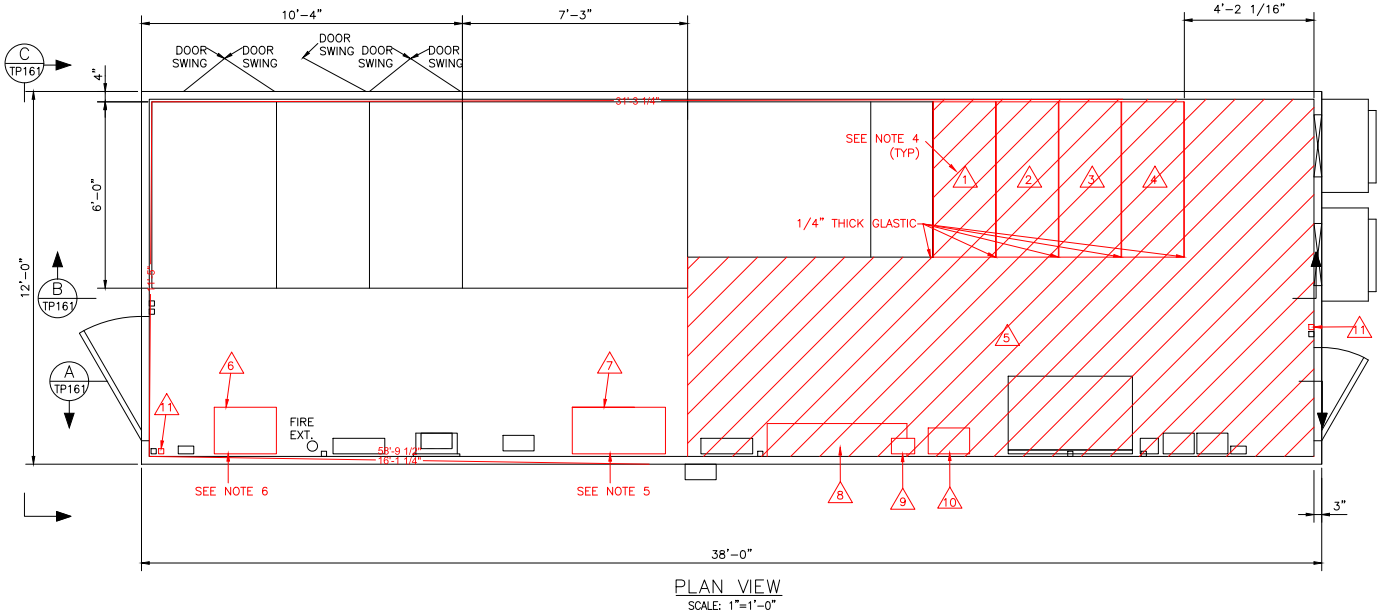
Checked By: E. ROOT
Approved By: J. LUEY

UTA REHABILITATION OF TPSS

CONDUIT AND CABLE SCHEDULE – TYPICAL SUBSTATION SCOPE A & B SH 2

Scale: NTS
CADD Filename: GENYTP171.DWG
Submittal Date: JANUARY 26, 2022
UTA Contract No.: 20-03378VW
Drawing No.: TP171
Sheet No.:



PLAN VIEW
SCALE: 1"=1'-0"

NOTES:

1. REFER TO CONTRACT DRAWING TP002 FOR ABBREVIATIONS AND EQUIPMENT DESIGNATIONS.
2. REFER TO CONTRACT DRAWING TP121 FOR LIST OF EXISTING EQUIPMENT.
3. EQUIPMENT DIMENSIONS ARE APPROXIMATE. ADJUST THE DIMENSIONS IN ACCORDANCE WITH THE REQUIREMENTS OF FURNISHED EQUIPMENT.
4. AFTER REMOVAL OF DC SWITCHGEAR, CONTRACTOR TO REPAIR INSULATED FLOORING. THE FLOOR OF THE DC SWITCHGEAR SHALL BE COVERED WITH DIELECTRIC INSULATING MATERIALS, AMAZITE OR EQUAL.
5. REFER TO CONTRACT SHEET NO. TP404 FOR GENERAL ARRANGEMENT OF THE STATION CONTROL CABINET.
6. REFER TO CONTRACT SHEET NO. TP406 FOR GENERAL ARRANGEMENT OF THE COMMUNICATIONS CABINET.

KEYNOTE:

1. CONTRACTOR SHALL INSTALL THE FOLLOWING EQUIPMENT AND ALL ANCILLARIES TO INTEGRATE WITH THE EXISTING TPSS TO MAKE A FULLY FUNCTIONAL TPSS.

1. 800V DC, 4000A DC FEEDER BREAKER 172-1
2. 800V DC, 4000A DC FEEDER BREAKER 172-2
3. 800V DC, 4000A DC FEEDER BREAKER 172-3
4. 800V DC, 4000A DC FEEDER BERAKER 172-4
5. DIELECTRIC FLOOR, AMAZITE OR EQUAL
6. COMMUNICATION CABINET
7. STATION CONTROL CABINET
8. 125V D.C. BATTERY AND RACK
9. BATTERY DISCONNECT SWITCH
10. BATTERY CHARGER
11. EMERGENCY TRIP STATION

AVERAGE LENGTH OF CONTROL CABLE FROM NEW BREAKERS TO STATION CONTROL CABINET IS 60 LF

1/2"=1'-0"

REV	DATE	Description

STV 100 Years in association with c3m POWER SYSTEMS

Submitted By: _____

UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Approved By: _____

Designed By:	K. KWONG
Drawn By:	T. NG
Checked By:	E. ROOT
Approved By:	J. LUEY

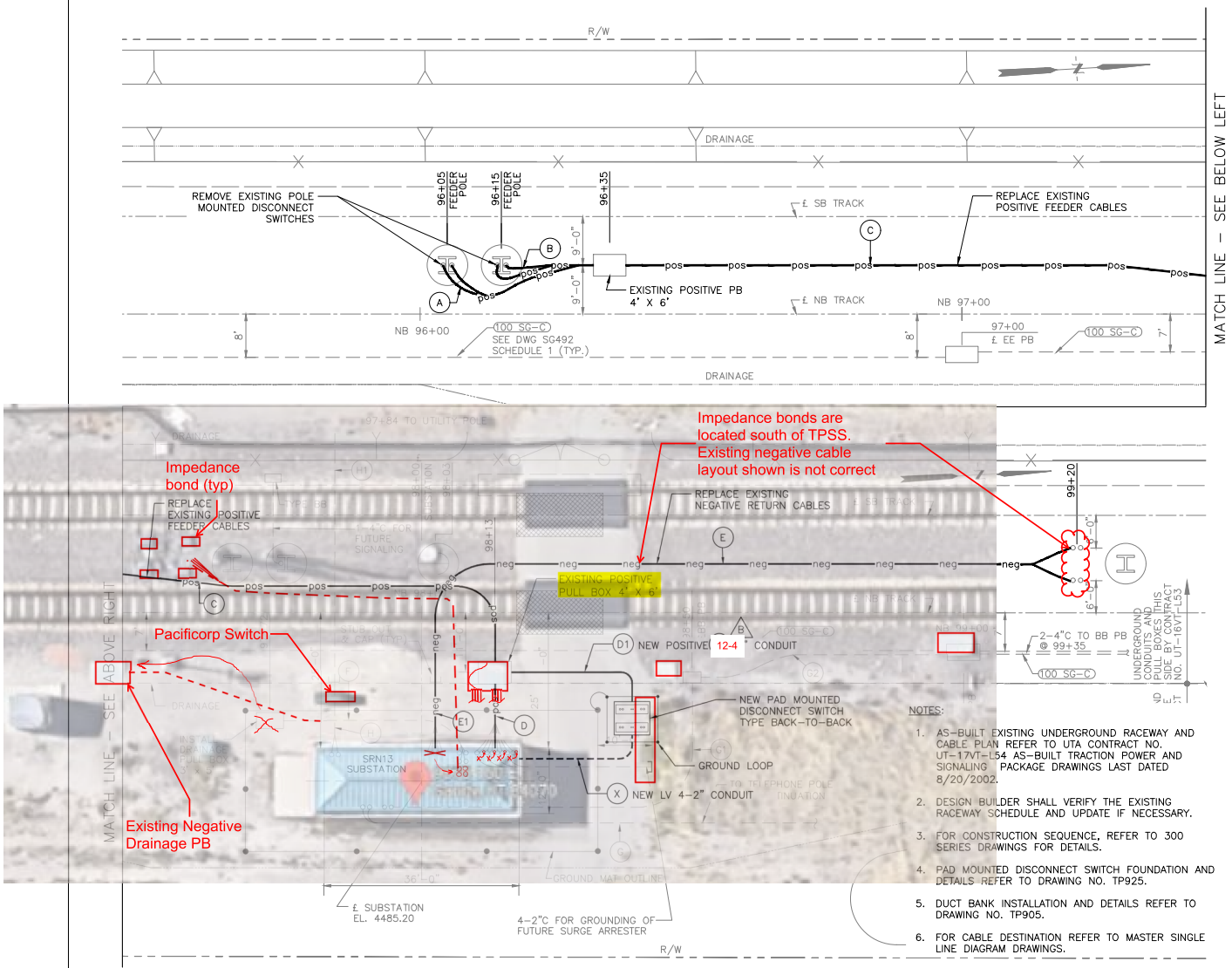
UTA REHABILITATION OF TPSS

NEW EQUIPMENT ARRANGEMENT PLAN
SUBSTATION YRY1 SCOPE B

Scale:	1/2" = 1'-0"
CADD Filename:	YRY1YTP123.DWG
Submittal Date	JANUARY 26, 2022
UTA Contract No.:	20-03378VW
Drawing No.:	TP123
Sheet No.:	

C3M Power Systems Change Proposal

ADDITIONAL RACEWAY IN SCOPE



NOTES:

1. AS-BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT-17VT-L54 AS-BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 8/20/2002.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. FOR CONSTRUCTION SEQUENCE, REFER TO 300 SERIES DRAWINGS FOR DETAILS.
4. PAD MOUNTED DISCONNECT SWITCH FOUNDATION AND DETAILS REFER TO DRAWING NO. TP925.
5. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
6. FOR CABLE DESTINATION REFER TO MASTER SINGLE LINE DIAGRAM DRAWINGS.

RACEWAY AND CABLE INSTALLATION SCHEDULE

DUCT BANKS	CONDUIT	CABLE	FEEDER	CONDUIT ASSIGNMENT
Ⓐ	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION(OCS)
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION(OCS)
Ⓑ	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION(OCS)
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION(OCS)
Ⓒ	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION
Ⓓ	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(IN)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(IN)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(IN)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(IN)
B	2-4"(N)	SPARE	–	–
Ⓓ	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH BREAKER BUS
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH BREAKER BUS
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH BREAKER BUS
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH BREAKER BUS
	2-4"	SPARE	–	FUTURE NORTH SECTION
	4-4"	SPARE	–	FUTURE NORTH SECTION
Ⓔ1	1-4"	3-500 MCM (N)		NEGATIVE RETRUN
	1-4"	3-500 MCM (N)	–	NEGATIVE RETURN
	2-4"	SPARE	–	FUTURE NEGATIVE RETURN
Ⓔ	1-4"	3-500 MCM (N)	–	NEGATIVE RETURN
	1-4"	3-500 MCM (N)	–	NEGATIVE RETURN
	2-4"	SPARE	–	FUTURE NEGATIVE RETURN
Ⓕ	4-4"	–	DR1-DR4 CONTACTORS	DRAINAGE CKT
Ⓖ	2-4"	–	–	TELEPHONE
Ⓖ1	2-2"	–	–	COMMUNICATION
Ⓖ2	2-2"	–	–	COMMUNICATION
Ⓗ	2-6"	–	–	UTILITY 12KV POWER SUPPLY
Ⓗ1	2-6"	–	–	UTILITY 12KV POWER SUPPLY
Ⓧ	1-2"(N)	24-2/C #18 AWG	SCADA B	PAD MOUNTED DISC SW
	1-2"(N)	2-2/C #10 AWG, #10 G	AUX/CONT POWER	PAD MOUNTED DISC SW
	1-2"(N)	1-2/C #6 AWG	NEG BUS	PAD MOUNTED DISC SW
	1-2"(N)	–	SPARE	PAD MOUNTED DISC SW

REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER MICHAEL HSIAO No. 11663776-2202 Exp. 03/31/2021 CIVIL STATE OF UTAH

Submitted By: _____

wsp

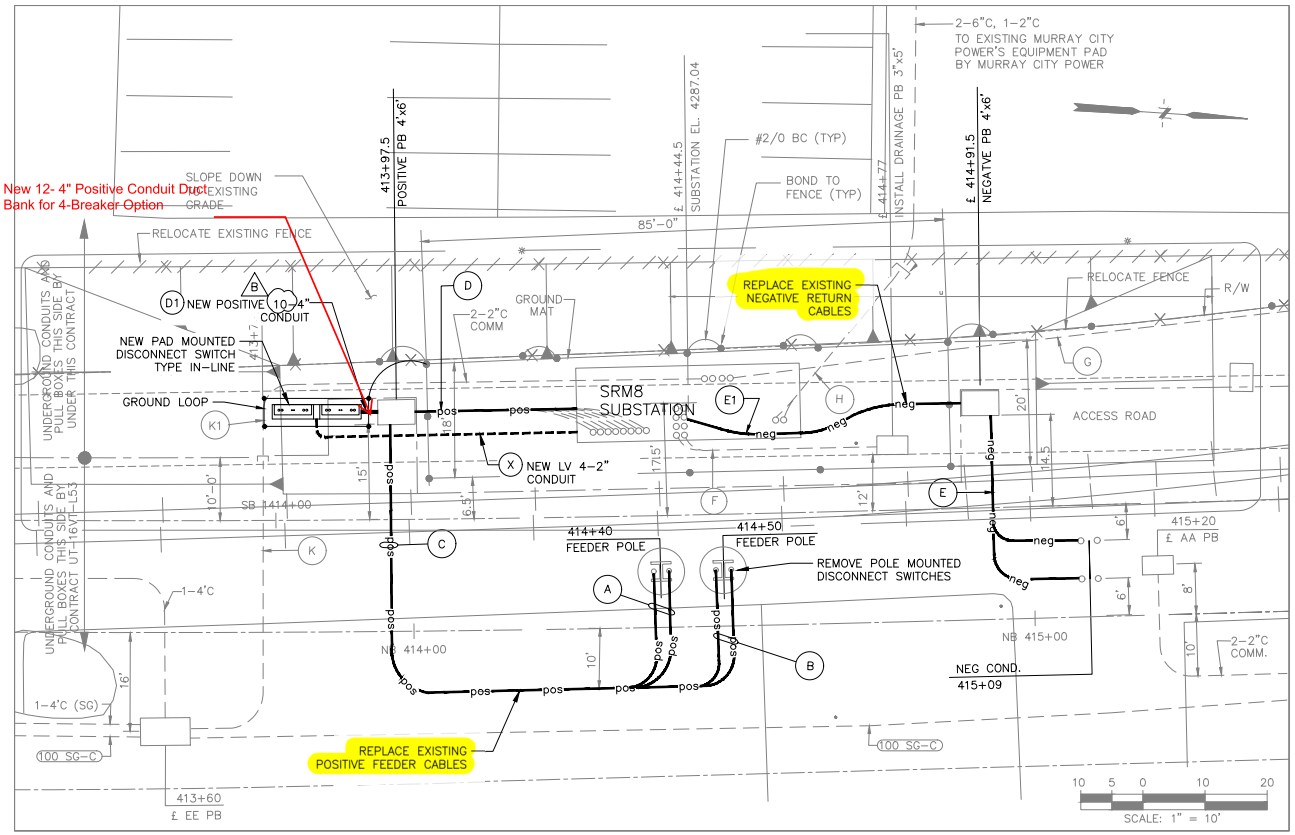
Approved By: _____

UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Designed By:	J. LAU
Drawn By:	A. CHEUNG
Checked By:	M. HSIAO
Approved By:	M. HSIAO

UTA REHABILITATION OF TPSS
9400 SUBSTATION
UNDERGROUND RACEWAY AND CABLE PLANS
TPSS SRN13
SHEET 1 OF 1

Scale:	1"=10'-0"
CADD Filename:	UTA-TP605-B
Submittal Date	09/23/20
UTA Contract No.:	UT13-064GL
Drawing No.:	TP605
Sheet No.:	



NOTES:

1. AS-BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT-17VT-L54 AS-BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 8/20/2002.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. POSITIVE POWER FEEDER REPLACEMENT PLAN REFER TO 600 SERIES DRAWINGS FOR DETAILS.
4. PAD MOUNTED DISCONNECT SWITCH FOUNDATION AND DETAILS REFER TO DRAWING NO. TP925.
5. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
6. FOR TPSS SRM8 UNDERGROUND RACEWAY AND CABLE PLAN REFER TO DRAWING NO. TP630.
7. DESIGN BUILDER SHALL COORDINATE WITH UTA TO DETERMINE BASE ON THE FIELD CONDITION FOR BEST FIT LOCATION FOR THE NEW PAD MOUNTED DISCONNECT SWITCHES, PULL BOX AND THE DUCTBANK ROUTING.
8. CONNECT PAD MOUNTED DISCONNECT SWITCH GROUND LOOP TO EXISTING GROUND MAT.

CONSTRUCTION SEQUENCE & WORK SCOPE:

1. INSTALL THE NEW PAD-MOUNTED DISCONNECT SWITCHES INCLUDING FOUNDATION AND GROUND LOOP/ROD TO EXISTING TPSS GROUND GRID
2. INSTALL THE DUCT BANK AND CONDUITS FROM EXISTING POSITIVE PULL BOX TO NEW PAD-MOUNTED DISCONNECT SWITCHES
3. INSTALL THE LV DUCTBANK AND CONDUITS FOR LV CIRCUITS FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES. INSTALL LV CABLES FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES.
4. INSTALL JUMPER OVER THE OCS SECTION BREAKS
5. OPEN THE CIRCUIT BREAKERS AND PUT RED TAG
6. REMOVE EXISTING POLE MOUNTED DISCONNECT SWITCHES
7. REPLACE NEGATIVE CABLES FROM TPSS TO RAILS
8. REMOVE THE FEEDER CABLES FROM OCS TO TPSS
9. INSTALL NEW FEEDER CABLES FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES
10. INSTALL NEW FEEDER CABLES FROM NEW PAD-MOUNTED SWITCHES TO OCS
11. CLOSE CIRCUIT BREAKER AND REMOVE JUMPERS FROM OCS
12. PERFORM TESTS

Replacement of positive feeder cables and condition assessment of negative feeder cables is scope. Replacement of negative feeder cables is Option 2F

REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER MICHAEL HSIAO No. 11663776-2202 Exp. 03/31/2021 CIVIL STATE OF UTAH

wsp

Submitted By: _____

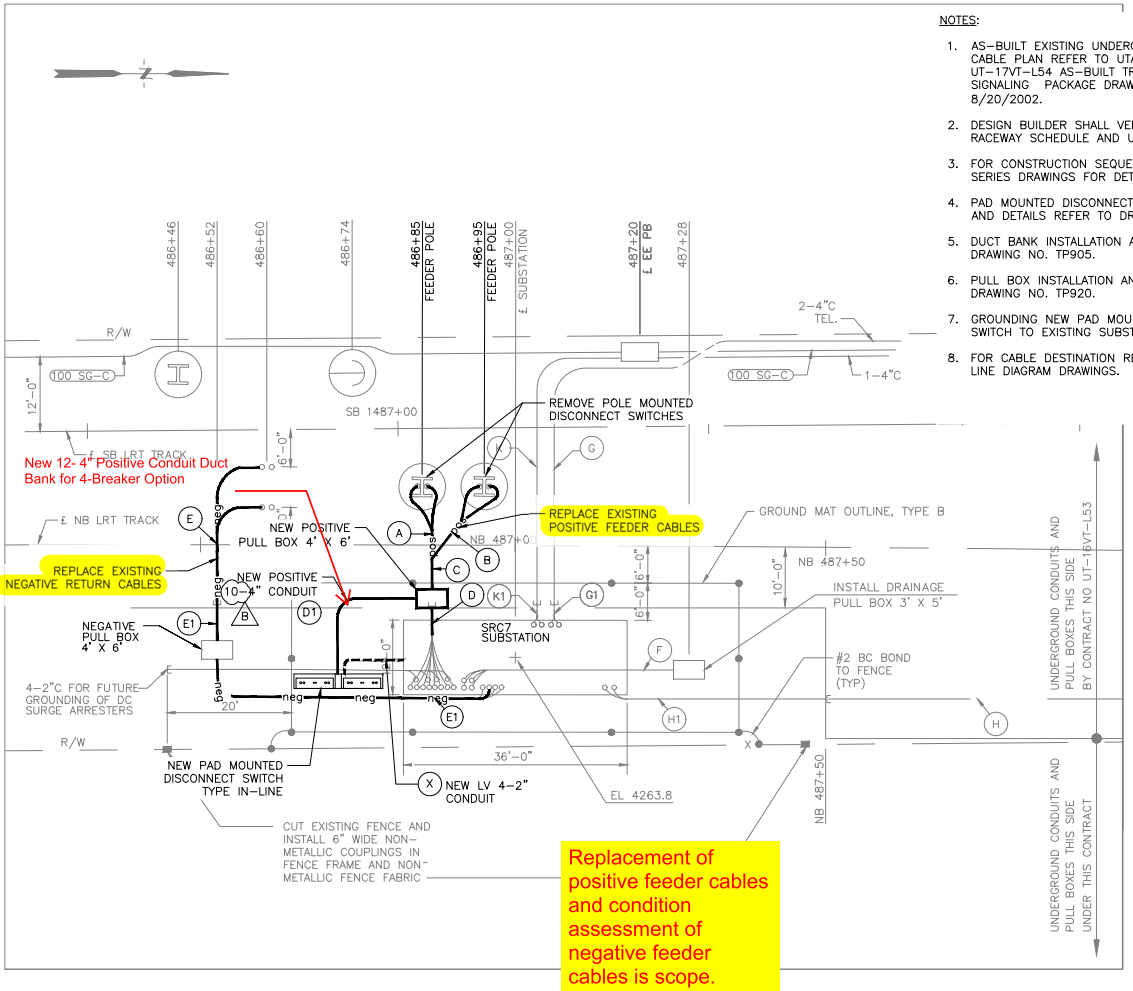
UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Approved By: _____

Designed By:	J. LAU
Drawn By:	A. CHEUNG
Checked By:	M. HSIAO
Approved By:	M. HSIAO

UTA REHABILITATION OF TPSS
MURRAY SUBSTATION
SITE PLAN AND CONSTRUCTION SEQUENCES
TPSS SRM8
SHEET 1 OF 1

Scale:	1"=10'-0"
CADD Filename:	UTA-TP330.dwg
Submittal Date	09/23/20
UTA Contract No.:	UT13-064GL
Drawing No.:	TP330
Sheet No.:	



Replacement of positive feeder cables and condition assessment of negative feeder cables is scope. Replacement of negative feeder cables is Option 2G

NOTES:

1. AS-BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT-17VT-L54 AS-BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 8/20/2002.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. FOR CONSTRUCTION SEQUENCE, REFER TO 300 SERIES DRAWINGS FOR DETAILS.
4. PAD MOUNTED DISCONNECT SWITCH FOUNDATION AND DETAILS REFER TO DRAWING NO. TP925.
5. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
6. PULL BOX INSTALLATION AND DETAILS REFER TO DRAWING NO. TP920.
7. GROUNDING NEW PAD MOUNTED DISCONNECTED SWITCH TO EXISTING SUBSTATION GROUND GRID.
8. FOR CABLE DESTINATION REFER TO MASTER SINGLE LINE DIAGRAM DRAWINGS.

RACEWAY AND CABLE INSTALLATION SCHEDULE

DUCT BANKS	CONDUIT	CABLE	FEEDER	CONDUIT ASSIGNMENT
Ⓐ	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION(OCS)
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION(OCS)
Ⓑ	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION(OCS)
	1-4"	3-500 MCM (N)	172-1	FEEDER NORTH SECTION(OCS)
Ⓒ	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION
	1-4"	3-500 MCM (N)	172-1	FEEDER NORTH SECTION
Ⓓ1	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(OUT)
	1-4"(N)	3-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(IN)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(IN)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(IN)
	1-4"(N)	3-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(IN)
B	2-4"(N)	SPARE	–	–
Ⓓ	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH BREAKER BUS
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH BREAKER BUS
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH BREAKER BUS
	1-4"	3-500 MCM (N)	172-1	FEEDER NORTH BREAKER BUS
	2-4"	SPARE	–	FUTURE SECTION
	2-4"	SPARE	–	FUTURE SECTION
Ⓔ	1-4"	3-500 MCM	–	NEGATIVE RETURN
	1-4"	3-500 MCM	–	NEGATIVE RETURN
	2-4"	SPARE	–	FUTURE NEGATIVE RETURN
Ⓔ1	1-4"	3-500 MCM	–	NEGATIVE RETURN
	1-4"	3-500 MCM	–	NEGATIVE RETURN
	2-4"	SPARE	–	FUTURE NEGATIVE RETURN
Ⓕ	4-4"	–	DR1-DR4 CONTACTORS	DRAINAGE CKT
Ⓖ	2-4"	–	–	TELEPHONE
Ⓖ1	2-4"	–	–	TELEPHONE
Ⓗ	2-6"	–	–	UTILITY 12KV POWER SUPPLY
Ⓗ1	2-6"	–	–	UTILITY 12KV POWER SUPPLY
Ⓚ	2-2"	–	–	COMMUNICATION
Ⓚ1	2-2"	–	–	COMMUNICATION
Ⓧ	1-2"(N)	24-2/C #18 AWG	SCADA B	PAD MOUNTED DISC SW
	1-2"(N)	2-2/C #10 AWG, #10 G	AUX/CONT POWER	PAD MOUNTED DISC SW
	1-2"(N)	1-2/C #6 AWG	NEG BUS	PAD MOUNTED DISC SW
	1-2"(N)	–	SPARE	PAD MOUNTED DISC SW

REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER MICHAEL HSIAO No. 11663776-2202 Exp. 03/31/2021 CIVIL STATE OF UTAH

Submitted By: _____

wsp

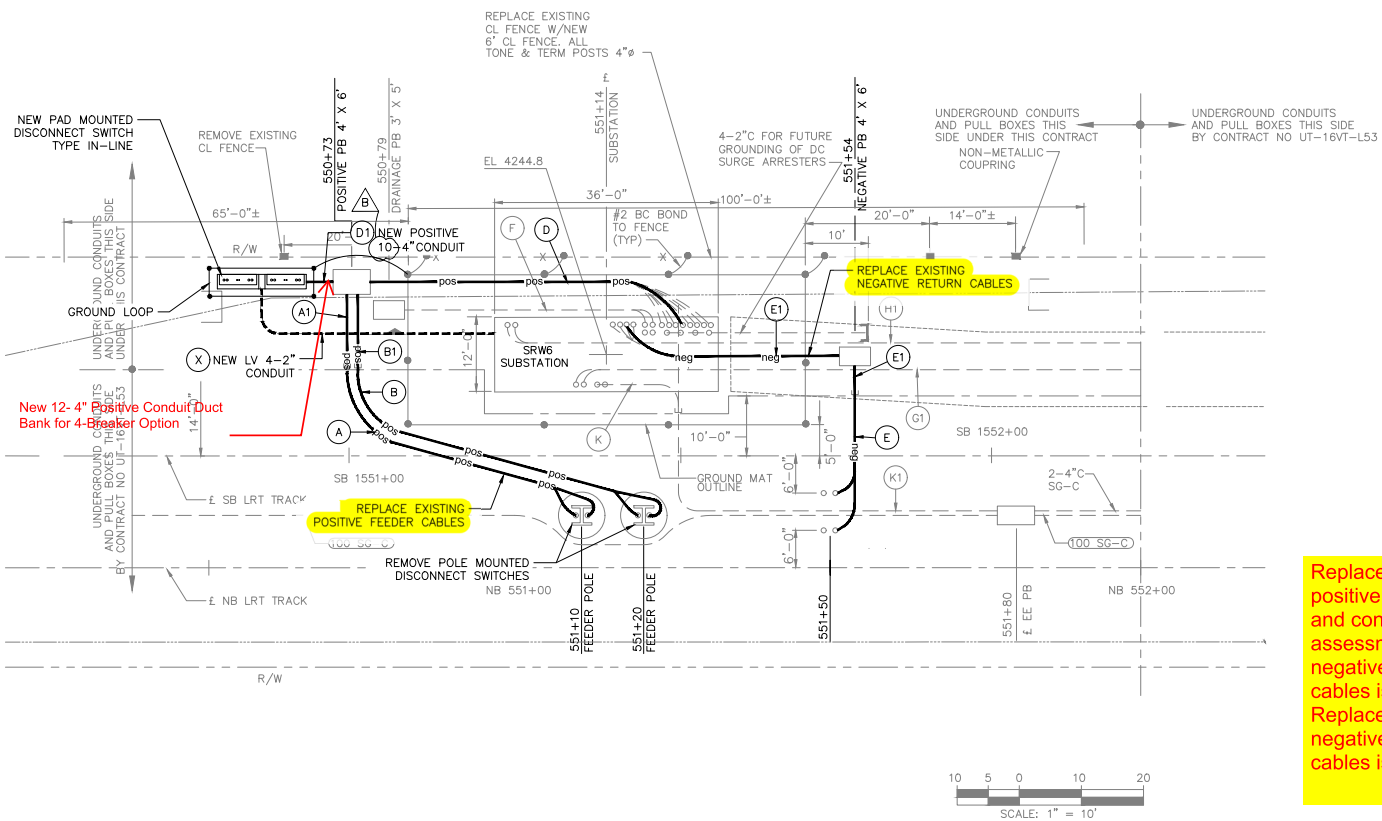
UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Approved By: _____

Designed By: J. LAU
Drawn By: A. CHEUNG
Checked By: M. HSIAO
Approved By: M. HSIAO

UTA REHABILITATION OF TPSS
CENTRAL POWER SUBSTATION
UNDERGROUND RACEWAY PLANS
TPSS SRC7
SHEET 1 OF 2

Scale: 1"=10'-0"
CADD Filename: UTA-TP635-B
Submittal Date: 09/23/20
UTA Contract No.: UT13-064GL
Drawing No.: TP635
Sheet No.:



Replacement of positive feeder cables and condition assessment of negative feeder cables is scope. Replacement of negative feeder cables is Option 2H

NOTES:

1. AS-BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT-17VT-L54 AS-BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 8/20/2002.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. POSITIVE POWER FEEDER REPLACEMENT PLAN REFER TO 600 SERIES DRAWINGS FOR DETAILS.
4. PAD MOUNTED DISCONNECT SWITCH FOUNDATION AND DETAILS REFER TO DRAWING NO. TP925.
5. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
6. FOR TPSS SRW6 UNDERGROUND RACEWAY AND CABLE PLAN REFER TO DRAWING NO. TP640.
7. DESIGN BUILDER SHALL COORDINATE WITH UTA TO DETERMINE BASE ON THE FIELD CONDITION FOR BEST FIT LOCATION FOR THE NEW PAD MOUNTED DISCONNECT SWITCHES, PULL BOX AND THE DUCTBANK ROUTING.
8. CONNECT PAD MOUNTED DISCONNECT SWITCH GROUND LOOP TO EXISTING GROUND MAT.

CONSTRUCTION SEQUENCE & WORK SCOPE:

1. INSTALL THE NEW PAD-MOUNTED DISCONNECT SWITCHES INCLUDING FOUNDATION AND GROUND LOOP/ROD TO EXISTING TPSS GROUND GRID
2. INSTALL THE LV DUCTBANK AND CONDUITS FOR LV CIRCUITS FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES. INSTALL LV CABLES FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES.
3. INSTALL JUMPER OVER THE OCS SECTIONS BREAKS
4. OPEN THE CIRCUIT BREAKERS AND PUT RED TAG
5. REMOVE EXISTING POLE MOUNTED DISCONNECT SWITCHES
6. REPLACE NEGATIVE CABLES FROM TPSS TO RAILS
7. REMOVE THE FEEDER CABLES FROM OCS TO TPSS
8. INSTALL NEW PULL BOX TO INTERCEPT THE EXISTING POSITIVE DUCT BANK
9. INSTALL THE DUCT BANK AND CONDUITS FROM EXISTING POSITIVE PULL BOX TO NEW PAD-MOUNTED DISCONNECT SWITCHES
10. INSTALL NEW FEEDER CABLES FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES
11. INSTALL NEW FEEDER CABLES FROM NEW PAD-MOUNTED SWITCHES TO OCS
12. CLOSE CIRCUIT BREAKER AND REMOVE JUMPERS FROM OCS
13. PERFORM TESTS

REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER MICHAEL HSIAO No. 11663776-2202 Exp. 03/31/2021 CIVIL STATE OF UTAH

Submitted By: _____

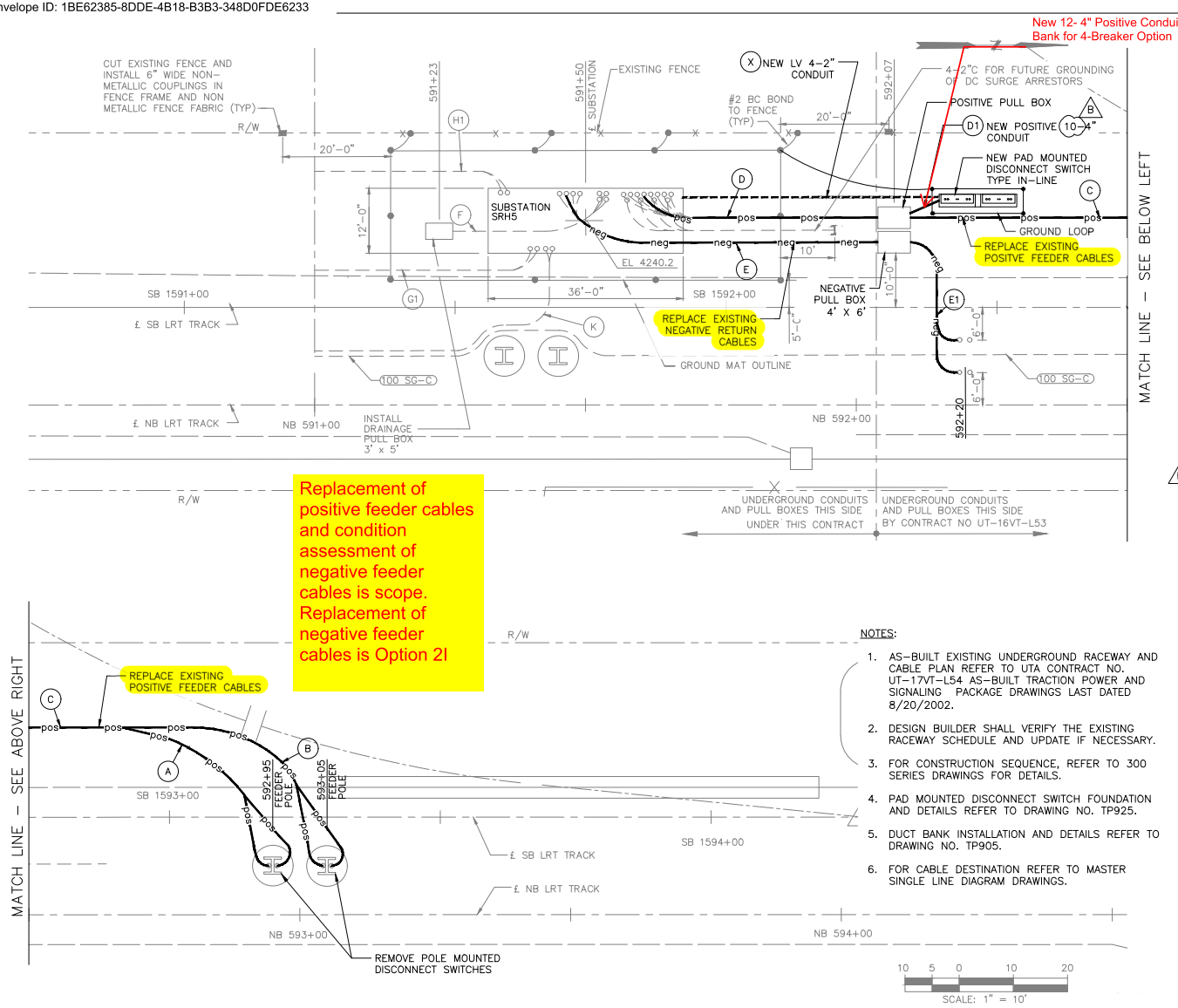
UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Approved By: _____

Designed By:	J. LAU
Drawn By:	A. CHEUNG
Checked By:	M. HSIAO
Approved By:	M. HSIAO

UTA REHABILITATION OF TPSS
WALTON SUBSTATION
SITE PLAN AND CONSTRUCTION SEQUENCES
TPSS SRW6
SHEET 1 OF 1

Scale:	1"=10'-0"
CADD Filename:	UTA-TP340.dwg
Submittal Date	09/23/20
UTA Contract No.:	UT13-064GL
Drawing No.:	TP340
Sheet No.:	



Replacement of positive feeder cables and condition assessment of negative feeder cables is scope. Replacement of negative feeder cables is Option 2I

NOTES:

1. AS-BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT-17VT-L54 AS-BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 8/20/2002.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. FOR CONSTRUCTION SEQUENCE, REFER TO 300 SERIES DRAWINGS FOR DETAILS.
4. PAD MOUNTED DISCONNECT SWITCH FOUNDATION AND DETAILS REFER TO DRAWING NO. TP925.
5. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
6. FOR CABLE DESTINATION REFER TO MASTER SINGLE LINE DIAGRAM DRAWINGS.

RACEWAY AND CABLE INSTALLATION SCHEDULE

DUCT BANKS	CONDUIT	CABLE	FEEDER	CONDUIT ASSIGNMENT
A	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION(OCS)
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION(OCS)
B	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION(OCS)
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION(OCS)
C	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH SECTION
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH SECTION
D1	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(OUT)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(IN)
	1-4"(N)	2-500 MCM (N)	172-2	FEEDER SOUTH PAD MOD(IN)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(IN)
	1-4"(N)	2-500 MCM (N)	172-1	FEEDER NORTH PAD MOD(IN)
B	2-4"(N)	SPARE	-	-
D	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH BREAKER BUS
	1-4"	2-500 MCM (N)	172-2	FEEDER SOUTH BREAKER BUS
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH BREAKER BUS
	1-4"	2-500 MCM (N)	172-1	FEEDER NORTH BREAKER BUS
	2-4"	SPARE	-	FUTURE SECTION
	4-4"	SPARE	-	FUTURE SECTION
E	1-4"	3-500 MCM (N)	-	NEGATIVE RETURN
	1-4"	3-500 MCM (N)	-	NEGATIVE RETURN
	2-4"	SPARE	-	FUTURE NEGATIVE RETURN
E1	1-4"	3-500 MCM (N)	-	NEGATIVE RETURN
	1-4"	3-500 MCM (N)	-	NEGATIVE RETURN
	2-4"	SPARE	-	FUTURE NEGATIVE RETURN
F	4-4"	-	DR1-DR4 CONTACTORS	DRAINAGE CKT
G	2-4"	-	-	TELEPHONE
G1	2-4"	-	-	TELEPHONE
H	2-6"	-	-	UTILITY 12KV POWER SUPPLY
H1	2-6"	-	-	UTILITY 12KV POWER SUPPLY
K	2-2"	-	-	COMMUNICATION
X	1-2"(N)	24-2/C #18 AWG	SCADA	PAD MOUNTED DISC SW
	1-2"(N)	2-2/C #10 AWG, #10 G	AUX/CONT POWER	PAD MOUNTED DISC SW
	1-2"(N)	1-2/C #6 AWG	NEG BUS	PAD MOUNTED DISC SW
	1-2"(N)	-	SPARE	PAD MOUNTED DISC SW

REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER MICHAEL HSIAO No. 11663776-2202 Exp. 03/31/2021 CIVIL STATE OF UTAH

Submitted By: _____

wsp

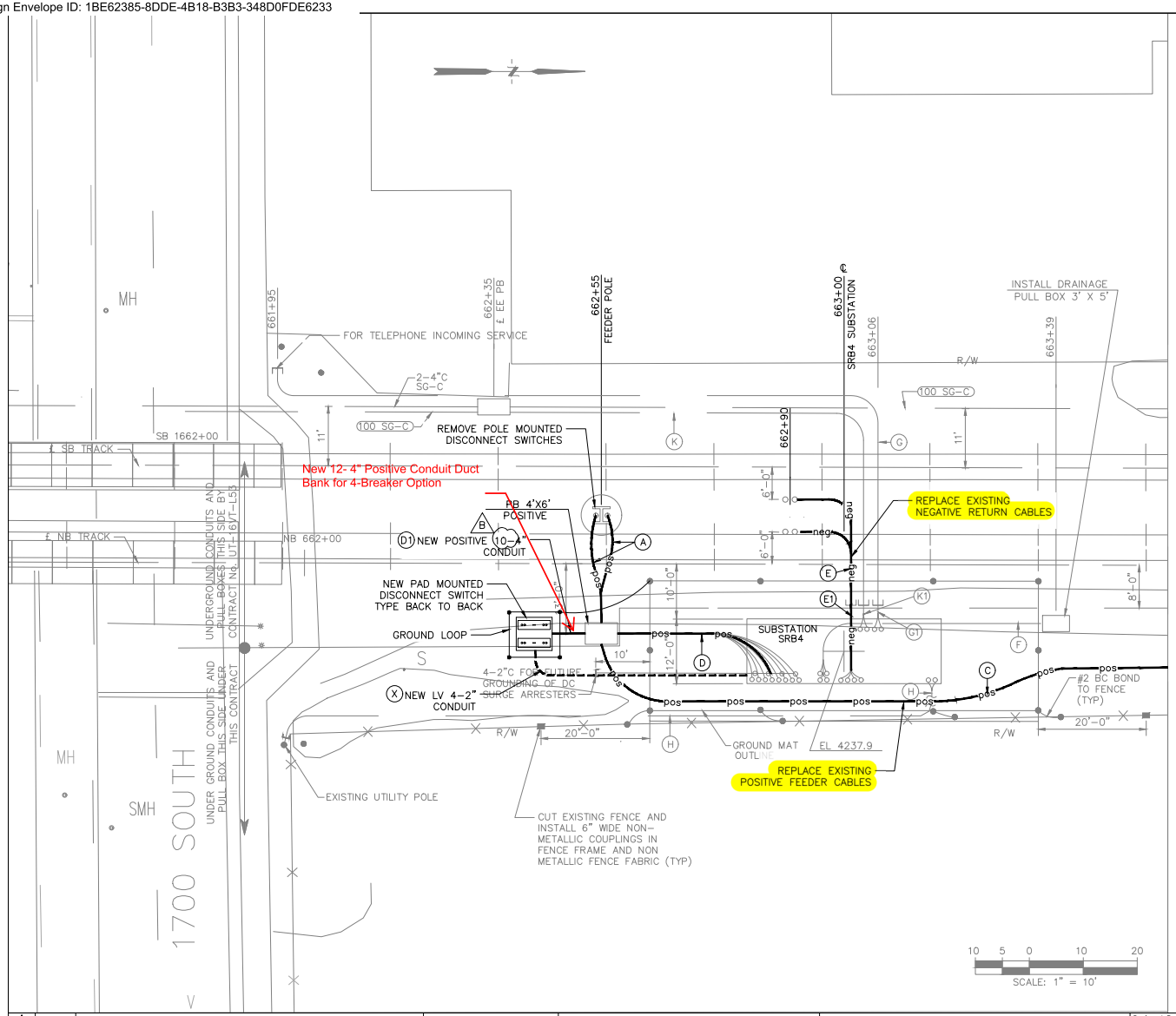
Approved By: _____

UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Designed By: J. LAU
Drawn By: A. CHEUNG
Checked By: M. HSIAO
Approved By: M. HSIAO

UTA REHABILITATION OF TPSS
HUSLERS SUBSTATION
UNDERGROUND RACEWAY AND CABLE PLANS
TPSS SRH5
SHEET 1 OF 1

Scale: 1"=10'-0"
CADD Filename: UTA-TP645-B
Submittal Date: 09/23/20
UTA Contract No.: UT13-064GL
Drawing No.: TP645
Sheet No.:



MATCH LINE STA 663+60 SEE DWG TP351

Replacement of positive feeder cables and condition assessment of negative feeder cables is scope. Replacement of negative feeder cables is Option 2J

NOTES:

1. AS-BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT-17VT-L54 AS-BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 8/20/2002.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. POSITIVE POWER FEEDER REPLACEMENT PLAN REFER TO 600 SERIES DRAWINGS FOR DETAILS.
4. PAD MOUNTED DISCONNECT SWITCH FOUNDATION AND DETAILS REFER TO DRAWING NO. TP925.
5. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
6. FOR TPSS SRB4 UNDERGROUND RACEWAY AND CABLE PLAN REFER TO DRAWING NO. TP650 & TP651.
7. DESIGN BUILDER SHALL COORDINATE WITH UTA TO DETERMINE BASE ON THE FIELD CONDITION FOR BEST FIT LOCATION FOR THE NEW PAD MOUNTED DISCONNECT SWITCHES, PULL BOX AND THE DUCTBANK ROUTING.
8. CONNECT PAD MOUNTED DISCONNECT SWITCH GROUND LOOP TO EXISTING GROUND MAT.

CONSTRUCTION SEQUENCE & WORK SCOPE:

1. INSTALL THE NEW PAD-MOUNTED DISCONNECT SWITCHES INCLUDING FOUNDATION AND GROUND LOOP/ROD TO EXISTING TPSS GROUND GRID
2. INSTALL THE DUCT BANK AND CONDUITS FROM EXISTING POSITIVE PULL BOX TO NEW PAD-MOUNTED DISCONNECT SWITCHES
3. INSTALL THE LV DUCTBANK AND CONDUITS FOR LV CIRCUITS FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES. INSTALL LV CABLES FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES.
4. INSTALL JUMPER OVER THE OCS SECTION BREAKS
5. OPEN THE CIRCUIT BREAKERS AND PUT RED TAG
6. REMOVE EXISTING POLE MOUNTED DISCONNECT SWITCHES
7. REPLACE NEGATIVE CABLE FROM TPSS TO RAILS
8. REMOVE THE FEEDER CABLES FROM OCS TO TPSS
9. INSTALL NEW FEEDER CABLES FROM TPSS TO NEW PAD-MOUNTED DISCONNECT SWITCHES
10. INSTALL NEW FEEDER CABLES FROM NEW PAD-MOUNTED SWITCHES TO OCS
11. CLOSE CIRCUIT BREAKER AND REMOVE JUMPERS FROM OCS
12. PERFORM TESTS

REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER
MICHAEL HSIAO
No. 11663776-2202
Exp. 03/31/2021
CIVIL
STATE OF UTAH

Submitted By: _____

wsp

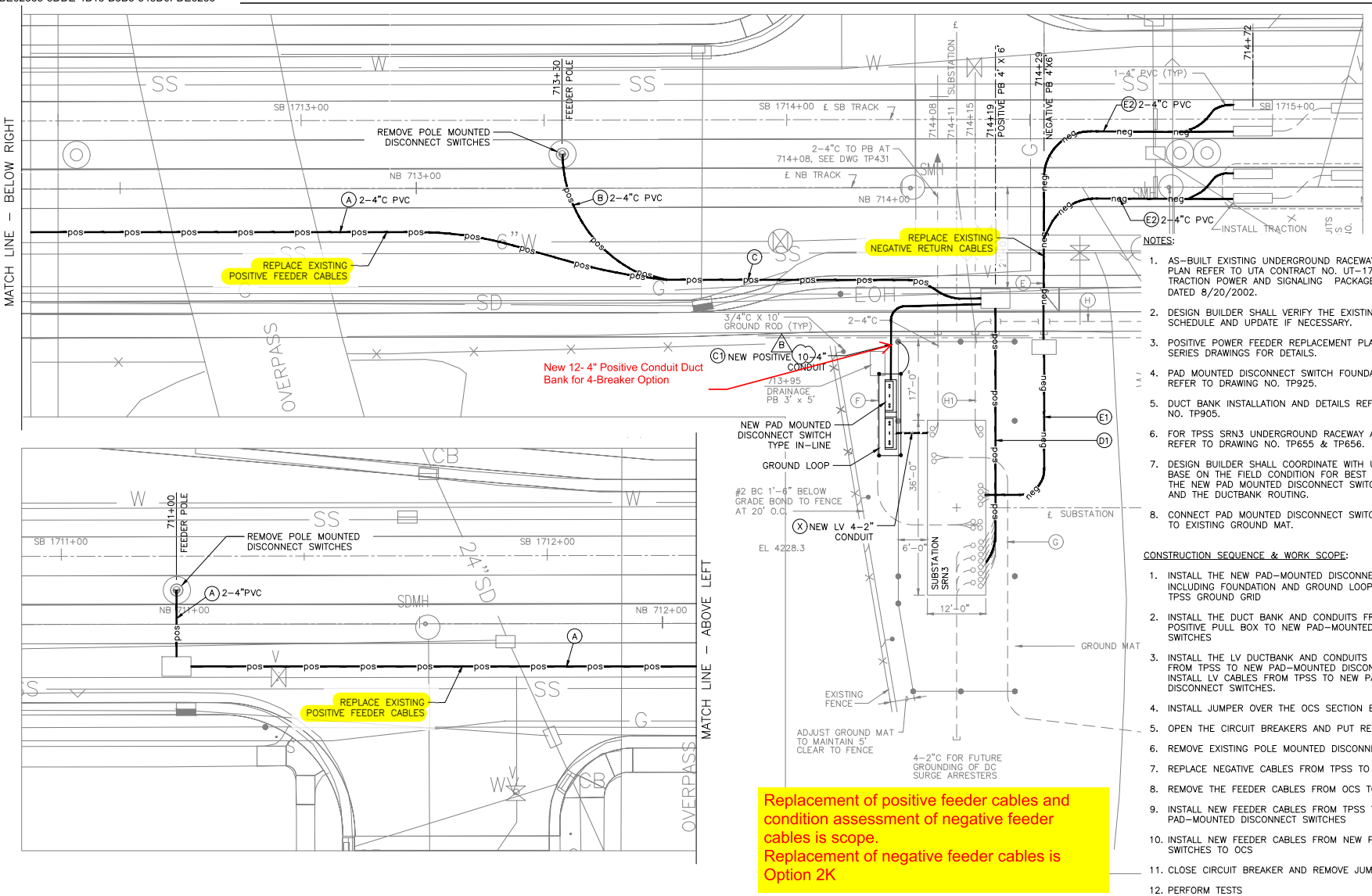
UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Approved By: _____

Designed By:	J. LAU
Drawn By:	A. CHEUNG
Checked By:	M. HSIAO
Approved By:	M. HSIAO

UTA REHABILITATION OF TPSS
BURTON SUBSTATION
SITE PLAN AND CONSTRUCTION SEQUENCES
TPSS SRB4
SHEET 1 OF 2

Scale:	1"=10'-0"
CADD Filename:	UTA-TP350.dwg
Submittal Date	09/23/20
UTA Contract No.:	UT13-064GL
Drawing No.:	TP350
Sheet No.:	



Replacement of positive feeder cables and condition assessment of negative feeder cables is scope.
Replacement of negative feeder cables is Option 2K

NOTES:

1. AS–BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT–17VT–L54 AS–BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 8/20/2002.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. POSITIVE POWER FEEDER REPLACEMENT PLAN REFER TO 600 SERIES DRAWINGS FOR DETAILS.
4. PAD MOUNTED DISCONNECT SWITCH FOUNDATION AND DETAILS REFER TO DRAWING NO. TP925.
5. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
6. FOR TPSS SRN3 UNDERGROUND RACEWAY AND CABLE PLAN REFER TO DRAWING NO. TP655 & TP656.
7. DESIGN BUILDER SHALL COORDINATE WITH UTA TO DETERMINE BASE ON THE FIELD CONDITION FOR BEST FIT LOCATION FOR THE NEW PAD MOUNTED DISCONNECT SWITCHES, PULL BOX AND THE DUCTBANK ROUTING.
8. CONNECT PAD MOUNTED DISCONNECT SWITCH GROUND LOOP TO EXISTING GROUND MAT.

CONSTRUCTION SEQUENCE & WORK SCOPE:

1. INSTALL THE NEW PAD–MOUNTED DISCONNECT SWITCHES INCLUDING FOUNDATION AND GROUND LOOP/ROD TO EXISTING TPSS GROUND GRID
2. INSTALL THE DUCT BANK AND CONDUITS FROM EXISTING POSITIVE PULL BOX TO NEW PAD–MOUNTED DISCONNECT SWITCHES
3. INSTALL THE LV DUCTBANK AND CONDUITS FOR LV CIRCUITS FROM TPSS TO NEW PAD–MOUNTED DISCONNECT SWITCHES. INSTALL LV CABLES FROM TPSS TO NEW PAD–MOUNTED DISCONNECT SWITCHES.
4. INSTALL JUMPER OVER THE OCS SECTION BREAKS
5. OPEN THE CIRCUIT BREAKERS AND PUT RED TAG
6. REMOVE EXISTING POLE MOUNTED DISCONNECT SWITCHES
7. REPLACE NEGATIVE CABLES FROM TPSS TO RAILS
8. REMOVE THE FEEDER CABLES FROM OCS TO TPSS
9. INSTALL NEW FEEDER CABLES FROM TPSS TO NEW PAD–MOUNTED DISCONNECT SWITCHES
10. INSTALL NEW FEEDER CABLES FROM NEW PAD–MOUNTED SWITCHES TO OCS
11. CLOSE CIRCUIT BREAKER AND REMOVE JUMPERS FROM OCS
12. PERFORM TESTS

REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER — MICHAEL HSIAO — No. 11663776–2202 — Exp. 03/31/2021 — CIVIL — STATE OF UTAH

Submitted By: _____

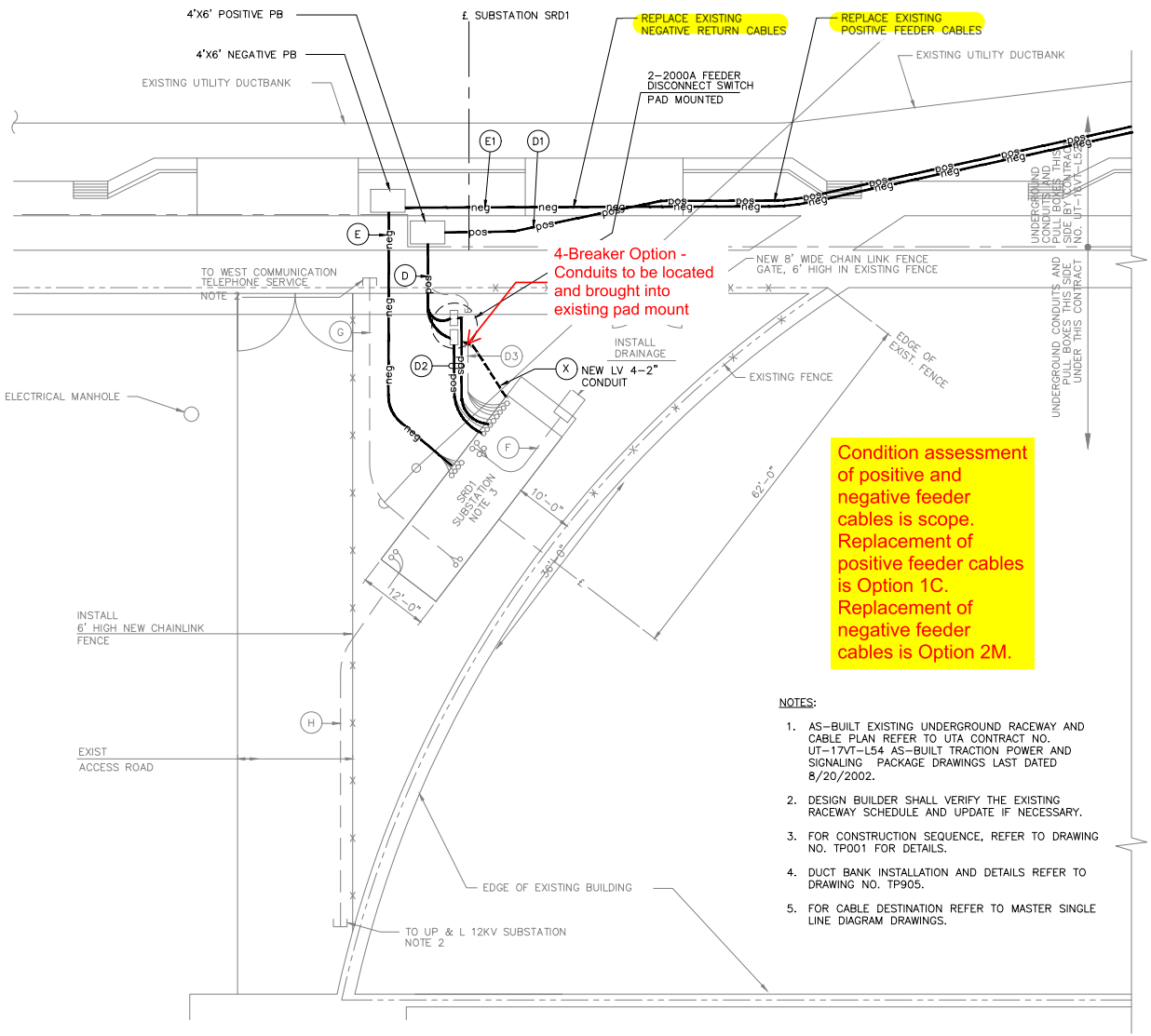
UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Approved By: _____

Designed By:	J. LAU
Drawn By:	A. CHEUNG
Checked By:	M. HSIAO
Approved By:	M. HSIAO

UTA REHABILITATION OF TPSS
NINTH SOUTH SUBSTATION
SITE PLAN AND CONSTRUCTION SEQUENCES
TPSS SRN3
SHEET 1 OF 1

Scale:	1"=10'–0"
CADD Filename:	UTA–TP355.dwg
Submittal Date	09/23/20
UTA Contract No.:	UT–13–0646L
Drawing No.:	TP355
Sheet No.:	



Condition assessment of positive and negative feeder cables is scope. Replacement of positive feeder cables is Option 1C. Replacement of negative feeder cables is Option 2M.

NOTES:

1. AS-BUILT EXISTING UNDERGROUND RACEWAY AND CABLE PLAN REFER TO UTA CONTRACT NO. UT-17VT-L54 AS-BUILT TRACTION POWER AND SIGNALING PACKAGE DRAWINGS LAST DATED 8/20/2002.
2. DESIGN BUILDER SHALL VERIFY THE EXISTING RACEWAY SCHEDULE AND UPDATE IF NECESSARY.
3. FOR CONSTRUCTION SEQUENCE, REFER TO DRAWING NO. TP001 FOR DETAILS.
4. DUCT BANK INSTALLATION AND DETAILS REFER TO DRAWING NO. TP905.
5. FOR CABLE DESTINATION REFER TO MASTER SINGLE LINE DIAGRAM DRAWINGS.

RACEWAY AND CABLE INSTALLATION SCHEDULE

DUCT BANKS	CONDUIT	CABLE	FEEDER	CONDUIT ASSIGNMENT
(D)	1-4"	2-750 MCM(N)	172-2	SOUTHBOUND MOD
	1-4"	2-750 MCM(N)	172-2	SOUTHBOUND MOD
	1-4"	2-500 MCM(N)	172-1	NORTHBOUND MOD
	1-4"	2-500 MCM(N)	172-1	NORTHBOUND MOD
	2-4"	SPARE	–	FUTURE SOUTHBOUND FEEDER
	2-4"	SPARE	–	FUTURE NORTHBOUND FEEDER
(D1)	1-4"	2-750 MCM(N)	172-2	SOUTHBOUND FEEDER
	1-4"	2-750 MCM(N)	172-2	SOUTHBOUND FEEDER
	1-4"	2-500 MCM(N)	172-1	NORTHBOUND FEEDER
	1-4"	2-500 MCM(N)	172-1	NORTHBOUND FEEDER
	2-4"	SPARE	–	FUTURE SOUTHBOUND FEEDER
	2-4"	SPARE	–	FUTURE NORTHBOUND FEEDER
(D2)	1-4"	2-750 MCM(N)	172-2	FEEDER SOUTH BREAKER BUS
	1-4"	2-750 MCM(N)	172-2	FEEDER SOUTH BREAKER BUS
	1-4"	2-500 MCM(N)	172-1	FEEDER NORTH BREAKER BUS
	1-4"	2-500 MCM(N)	172-1	FEEDER NORTH BREAKER BUS
(D3)	2-4"	SPARE	–	FUTURE SOUTH FEEDER
	2-4"	SPARE	–	FUTURE SOUTH FEEDER
(E)	1-4"	3-500 MCM(N)	–	NEGATIVE RETURN
	1-4"	3-500 MCM(N)	–	NEGATIVE RETURN
	2-4"	SPARE	–	FUTURE NEGATIVE RETURN
(E1)	1-4"	3-500 MCM(N)	–	NEGATIVE RETURN
	1-4"	3-500 MCM(N)	–	NEGATIVE RETURN
	2-4"	SPARE	–	FUTURE NEGATIVE RETURN
(F)	4-4"	–	DR1-DR4 CONTACTORS	DRAINAGE CKT
(G)	2-4"	–	–	TELEPHONE
(H)	2-6"	–	–	UTILITY 12KV POWER SUPPLY
(X)	1-2"(N)	24-2/C #18 AWG	SCADA	PAD MOUNTED MOD(E)
	1-2"(N)	2-2/C #10 AWG, #10 G	AUX/CONT POWER	PAD MOUNTED MOD(E)
	1-2"(N)	1-2/C #6 AWG	NEG BUS	PAD MOUNTED MOD(E)
	1-2"(N)	–	SPARE	PAD MOUNTED MOD(E)

SRD1 - Central

REV	DATE	Description
B	02/03/21	ADDENDUM NO. 8
A	09/23/20	PRELIMINARY DESIGN SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER MICHAEL HSIAO No. 11663776-2202 Exp. 03/31/2021 CIVIL STATE OF UTAH

Submitted By: _____

wsp

Approved By: _____

UTA TRAX
SALT LAKE BUS/RAIL PROJECT
UTAH TRANSIT AUTHORITY

Designed By: J. LAU
Drawn By: A. CHEUNG
Checked By: M. HSIAO
Approved By: M. HSIAO

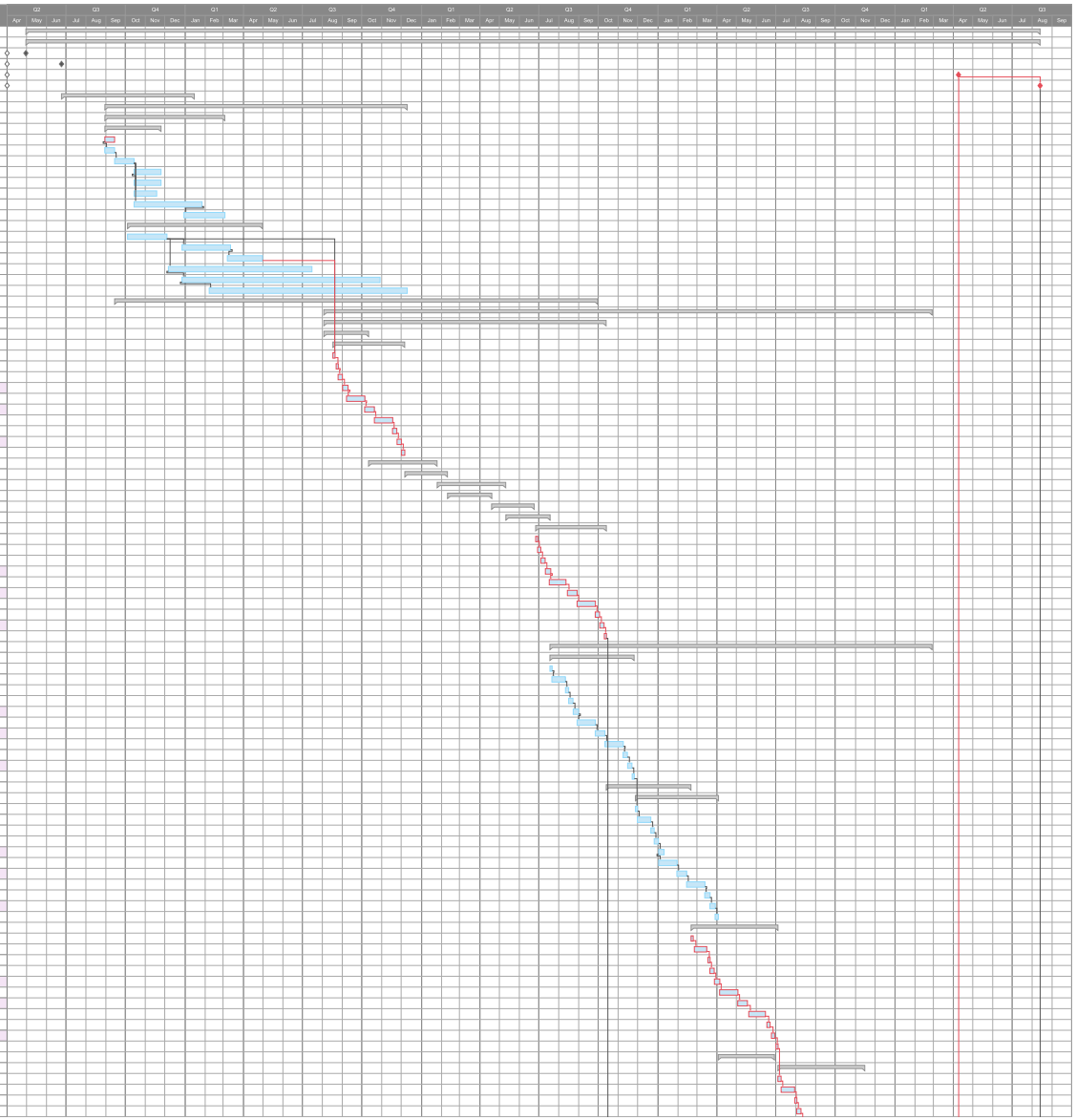
UTA REHABILITATION OF TPSS
DELTA CENTER SUBSTATION
UNDERGROUND RACEWAY AND CABLE PLANS
TPSS SRD1
SHEET 2 OF 2

Scale: 1"=10'-0"
CADD Filename: UTA-TP671-B
Submittal Date: 09/23/20
UTA Contract No.: UT13-064GL
Drawing No.: TP671
Sheet No.:

C3M Power Systems
Added DC Feeder Breaker
Schedule Update & Analysis

UTA SOGR TPSS - Time Analysis - 2 Add. Breakers

Task Name	Duration	Start	Finish	Comments
Traction Power Substation	1118d	04/30/21	08/12/25	
Milestones	1118d	04/30/21	08/12/25	
Contract Award	0	04/30/21	04/30/21	
Notice to Proceed	0	06/24/21	06/24/21	
Substantial Completion	0	04/08/25	04/08/25	
Final Acceptance	0	08/12/25	08/12/25	90 Days After Substantial Completion Date
Initial Tasks & Administrative Submittals	147d	06/24/21	01/14/22	
Design	335d	08/30/21	12/09/22	
Specifications Submit/Review/Approve (S/R/A)	133d	08/30/21	03/02/22	
Long Lead Time Specifications S/R/A	83d	08/30/21	11/24/21	
DC Switchgear	11d	08/30/21	09/13/21	Approval Received in Email on 9/12/2021.
DC Switchgear NPR	11d	08/30/21	09/13/21	
Pad Mounted Disconnect Switches	22d	09/14/21	10/13/21	
Rectifier Transformers	30d	10/14/21	11/24/21	
Rectifiers	30d	10/14/21	11/24/21	
SCC, SCADA, & CCA Cabinets	25d	10/14/21	11/17/21	
90% Specifications S/R/A	75d	10/14/21	01/26/22	
100% Specifications S/R/A	45d	12/30/21	03/02/22	
60%, 90%, & 100% Drawings TPSS SRH5 Hustlers' and YRY1 Collet Yard (DP#001)	150d	10/04/21	04/29/22	
60% Drawings S/R/A	45d	10/04/21	12/03/21	
90% Drawings S/R/A	55d	12/27/21	03/11/22	
100% Drawings S/R/A	45d	03/07/22	04/29/22	
60%, 90%, & 100% Drawing SRN13 9400 and E2 900 (DP#002)	160d	12/06/21	07/15/22	
60%, 90%, & 100% Drawings Remaining Type A and B TPSS SRS11 - SRP9 (DP#003)	220d	12/27/21	10/28/22	
60%, 90%, & 100% Drawings Type C and D TPSS SR4 - SRT2 (DP#004)	220d	02/07/22	12/09/22	
Equipment Procurement (S/R/A, Fabricate, Deliver)	534d	09/14/21	09/29/23	
Construction, Testing, Cx & Final Integration	671d	08/03/22	02/26/25	
TYPE A AND B SUBSTATIONS	312d	08/03/22	10/12/23	
YRY1 Collet Yard	49d	08/03/22	10/10/22	
SRH5 Hustlers Substation	79d	08/17/22	12/05/22	
Mobilize to Site	3d	08/17/22	08/19/22	
Remove Existing DC Switchgear	3d	08/22/22	08/24/22	
Install Dielectric Flooring	5d	08/25/22	08/31/22	
Installation of New DC Switchgear	6d	09/01/22	09/08/22	Additional Day Added for the installation of the (2) Additional DC Feeder Breakers
Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	20d	09/07/22	10/04/22	
Upgrade control, protection, and monitoring system	11d	10/05/22	10/19/22	Additional Day Added for the installation of SCADA Cables for (2) Additional DC Breakers
Pole-mount to pad-mount disconnect switch replacement (B2B)	20d	10/20/22	11/16/22	
Repair/Replacement of Essential Equipment in TPSS	5d	11/17/22	11/23/22	
Field Test and Commission	5d	11/24/22	11/30/22	Additional Day for testing of the (2) Additional DC Breakers
Clean-up and demobilize	3d	12/01/22	12/05/22	
SRN13 9400 Substation	76d	10/11/22	01/24/23	
E2 900 East Substation	48d	12/06/22	02/09/23	
SRS11 Sugar Highway Substation	76d	01/25/23	05/10/23	
E3 University Substation	48d	02/10/23	04/18/23	
E1 200 East Substation	48d	04/19/23	06/23/23	
E5 Medical Center Substation	48d	05/11/23	07/17/23	
SRP9 Pallas Yard Substation	79d	06/26/23	10/12/23	
Mobilize to Site	3d	06/26/23	06/28/23	
Remove Existing DC Switchgear	3d	06/29/23	07/03/23	
Install Dielectric Flooring	5d	07/04/23	07/10/23	
Installation of New DC Switchgear	6d	07/11/23	07/18/23	Additional Day Added for the installation of the (2) Additional DC Feeder Breakers
Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	20d	07/17/23	08/11/23	
Upgrade control, protection, and monitoring system	11d	08/14/23	08/28/23	Additional Day Added for the installation of SCADA Cables for (2) Additional DC Breakers
Pole-mount to pad-mount disconnect switch replacement (in line)	20d	08/29/23	09/25/23	
Repair/Replacement of Essential Equipment in TPSS	5d	09/26/23	10/02/23	
Field Test and Commission	5d	10/03/23	10/09/23	Additional Day for testing of the (2) Additional DC Breakers
Clean-up and demobilize	3d	10/10/23	10/12/23	
TYPE C AND D SUBSTATIONS	422d	07/18/23	02/26/25	
SRB4 Burton Substation	94d	07/18/23	11/24/23	
Mobilize to Site	3d	07/18/23	07/20/23	
Transformer Rectifier Unit 1.5MW to 2MW upgrade	15d	07/21/23	08/10/23	
Remove Existing DC Switchgear	3d	08/11/23	08/15/23	
Install Dielectric Flooring	5d	08/16/23	08/22/23	
Installation of New DC Switchgear	6d	08/23/23	08/30/23	Additional Day Added for the installation of the (2) Additional DC Feeder Breakers
Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	20d	08/29/23	09/25/23	
Upgrade control, protection, and monitoring system	11d	09/26/23	10/10/23	Additional Day Added for the installation of SCADA Cables for (2) Additional DC Breakers
Pole-mount to pad-mount disconnect switch replacement (B2B)	20d	10/11/23	11/07/23	
Repair/Replacement of Essential Equipment in TPSS	5d	11/08/23	11/14/23	
Field Test and Commission	5d	11/15/23	11/21/23	Additional Day for testing of the (2) Additional DC Breakers
Clean-up and demobilize	3d	11/22/23	11/24/23	
SRR12 Rio Grande Substation	93d	10/13/23	02/20/24	
SRN3 900 South Substation	92d	11/27/23	04/02/24	
Mobilize to Site	3d	11/27/23	11/29/23	
Transformer Rectifier Unit 1.5MW to 2MW upgrade	15d	11/30/23	12/20/23	
Remove Existing DC Switchgear	3d	12/21/23	12/25/23	
Install Dielectric Flooring	5d	12/26/23	01/01/24	
Installation of New DC Switchgear	6d	01/02/24	01/09/24	Additional Day Added for the installation of the (2) Additional DC Feeder Breakers
Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	20d	01/03/24	01/29/24	
Upgrade control, protection, and monitoring system	11d	01/30/24	02/13/24	Additional Day Added for the installation of SCADA Cables for (2) Additional DC Breakers
Pole-mount to pad-mount disconnect switch replacement (in line)	20d	02/14/24	03/12/24	
Repair/Replacement of Essential Equipment in TPSS	6d	03/13/24	03/20/24	
Field Test and Commission	6d	03/21/24	03/28/24	Additional Day for testing of the (2) Additional DC Breakers
Clean-up and demobilize	3d	03/29/24	04/02/24	
SRM8 Murray Substation	96d	02/21/24	07/03/24	
Mobilize to Site	3d	02/21/24	02/23/24	
Transformer Rectifier Unit 1.5MW to 2MW upgrade	15d	02/26/24	03/15/24	
Remove Existing DC Switchgear	3d	03/18/24	03/20/24	
Install Dielectric Flooring	5d	03/21/24	03/27/24	
Installation of New DC Switchgear	6d	03/28/24	04/04/24	Additional Day Added for the installation of the (2) Additional DC Feeder Breakers
Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	20d	04/05/24	05/02/24	
Upgrade control, protection, and monitoring system	11d	05/03/24	05/17/24	Additional Day Added for the installation of SCADA Cables for (2) Additional DC Breakers
Pole-mount to pad-mount disconnect switch replacement (in line)	20d	05/20/24	06/14/24	
Repair/Replacement of Essential Equipment in TPSS	5d	06/17/24	06/21/24	
Field Test and Commission	5d	06/24/24	06/28/24	Additional Day for testing of the (2) Additional DC Breakers
Clean-up and demobilize	3d	07/01/24	07/03/24	
E4 Fort Douglas Substation	63d	04/03/24	06/28/24	
SRW8 Walton Substation	96d	07/04/24	11/14/24	
Mobilize to Site	3d	07/04/24	07/08/24	
Transformer Rectifier Unit 1.5MW to 2MW upgrade	15d	07/09/24	07/29/24	
Remove Existing DC Switchgear	3d	07/30/24	08/01/24	
Install Dielectric Flooring	5d	08/02/24	08/08/24	



	Task Name	Duration	Start	Finish	Comments
246	Installation of New DC Switchgear	6d	08/09/24	08/16/24	Additional Day Added for the installation of the (2) Additional DC Feeder Breakers
247	Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	20d	08/19/24	09/13/24	
248	Upgrade control, protection, and monitoring system	11d	09/16/24	09/30/24	Additional Day Added for the installation of SCADA Cables for (2) Additional DC Breakers
249	Pole-mount to pad-mount disconnect switch replacement (in line)	20d	10/01/24	10/28/24	
250	Repair/Replacement of Essential Equipment in TPSS	5d	10/29/24	11/04/24	
251	Field Test and Commission	5d	11/05/24	11/11/24	Additional Day for testing of the (2) Additional DC Breakers
252	Clean-up and demobilize	3d	11/12/24	11/14/24	
253	SRD1 Delta Center Substation	66d	07/01/24	09/30/24	
254	Mobilize to Site	3d	07/01/24	07/03/24	
255	Transformer Rectifier Unit 1.5MW to 2MW upgrade	15d	07/04/24	07/24/24	
256	Remove Existing DC Switchgear	3d	07/25/24	07/29/24	
257	Install Dielectric Flooring	5d	07/30/24	08/05/24	
258	Installation of New DC Switchgear	6d	08/06/24	08/13/24	Additional Day Added for the installation of the (2) Additional DC Feeder Breakers
259	Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	5d	08/14/24	08/20/24	
260	Upgrade control, protection, and monitoring system	11d	08/21/24	09/04/24	Additional Day Added for the installation of SCADA Cables for (2) Additional DC Breakers
261	Retrofit of pad-mount disconnect switches	5e	09/05/24	09/11/24	
262	Repair/Replacement of Essential Equipment in TPSS	5d	09/12/24	09/18/24	
263	Field Test and Commission	5d	09/19/24	09/25/24	Additional Day for testing of the (2) Additional DC Breakers
264	Clean-up and demobilize	3d	09/26/24	09/30/24	
265	SRC7 Central Substation	96d	10/01/24	02/11/25	
266	Mobilize to Site	3d	10/01/24	10/03/24	
267	Transformer Rectifier Unit 1.5MW to 2MW upgrade	15d	10/04/24	10/24/24	
268	Remove Existing DC Switchgear	3d	10/25/24	10/29/24	
269	Install Dielectric Flooring	5d	10/30/24	11/05/24	
270	Installation of New DC Switchgear	6d	11/06/24	11/13/24	Additional Day Added for the installation of the (2) Additional DC Feeder Breakers
271	Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	20d	11/14/24	12/11/24	
272	Upgrade control, protection, and monitoring system	11d	12/12/24	12/26/24	Additional Day Added for the installation of SCADA Cables for (2) Additional DC Breakers
273	Pole-mount to pad-mount disconnect switch replacement (in line)	20d	12/27/24	01/23/25	
274	Repair/Replacement of Essential Equipment in TPSS	5d	01/24/25	01/30/25	
275	Field Test and Commission	5d	01/31/25	02/06/25	Additional Day for testing of the (2) Additional DC Breakers
276	Clean-up and demobilize	3d	02/07/25	02/11/25	
277	SRJ14 Jordan Substation	63d	11/15/24	02/11/25	
278	SRT2 300 South Substation	71d	11/20/24	02/26/25	
279	Mobilize to Site	3d	11/20/24	11/22/24	
280	Transformer Rectifier Unit 1.5MW to 2MW upgrade	15d	11/25/24	12/13/24	
281	Remove Existing DC Switchgear	3d	12/16/24	12/18/24	
282	Install Dielectric Flooring	5d	12/19/24	12/25/24	
283	Installation of New DC Switchgear	1d	12/26/24	12/26/24	
284	Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	5d	12/27/24	01/02/25	
285	Install new conductor in parallel to existing circuit 2A	10d	01/03/25	01/16/25	
286	Repair/Replacement of Essential Equipment in TPSS	5d	01/17/25	01/23/25	
287	Upgrade control, protection, and monitoring system	10d	01/24/25	02/06/25	
288	Retrofit of pad-mount disconnect switches	2d	02/07/25	02/10/25	
289	Install New By-Pass Disconnect Switch	5d	02/11/25	02/17/25	Installation of New By-Pass Disconnect Switches & Associated Conduit
290	Field Test and Commission	4d	02/18/25	02/21/25	Additional Day for testing the (2) additional DC Breakers & By-Pass Switches
291	Clean-up and demobilize	3d	02/24/25	02/26/25	
292	**Option 3 Substations**	52d	10/13/23	12/25/23	
293	SRA10 Atwood	52d	10/13/23	12/25/23	
294	Mobilize to Site	3d	10/13/23	10/17/23	
295	Remove & Reinstall DC Feeder Cables (Per Condition Assessment)	15d	10/18/23	11/07/23	Additional Days for the installation of Cabling for the Added By-Pass Switches.
296	Pole-mount to pad-mount disconnect switches replacement	22d	11/08/23	12/07/23	Two Additional Days for increase in size of Pad Mounted Disconnect and Installation .
297	Reconfiguration of the DC Feeder Breakers	5d	12/08/23	12/14/23	Added activity for the reconfiguration of the DC Feeder Breakers for adjacent Substations changes from 2 to 4 Breakers
298	Field Test and Commission	4d	12/15/23	12/20/23	
299	Clean-up and demobilize	3d	12/21/23	12/25/23	
300	Reconfiguration of Adjacenet Siemens Substations for Transfer Trip & Click & Trip	10d	02/27/25	03/12/25	
301	TDx CIM Support (UTA Placeholder)	15d	03/05/25	03/25/25	
302	Transfer Trip Testing	10d	03/26/25	04/08/25	
303	**Closeout (including Punchlist Items)**	70d	04/09/25	07/15/25	
304					

Key Notes:

1. Additional time required for the installation of the added DC Feeder Breakers at (9) substations. This activity increased by (1) day to allow enough time for the installation and securing of the switchgear.

2. Added time included for additional SCADA and 125 VDC cabling including testing, connecting (on both ends), and labeling.

3. Additional time has been adadded for the reconfiguration of adjacent substations that are not being upgraed to 4-breakers. Also includes the reconfiguration of the adjacent Siemens substations.

4. Includes additional time for additional conduit work at every location. Add (2) conduits into duct bank