



January 16, 2015

RE: Requisition No. C14FI101637828
RFP – O'Hare Blue Line Five Stations Renovation Project (Your New Blue)

SUBJECT: Addendum No. 2 and Responses to Bidders' Questions

Dear Plan Holder:

The following information is being distributed to all Plan Holders for the referenced requisition. The attached documents contain both Responses to Bidders' Questions and Addendum No. 2. Addendum No. 2 provides for modifications to the bid documents. Where a portion of the Contract Documents is modified or deleted by this addendum, the unaltered portions of the Contract Documents shall remain in effect. Please acknowledge receipt of Addendum No. 2 in your cover letter.

Modifications to the bid documents included in this package are summarized as follows:

Appendix 1 – Scope of Construction Work

1. Please remove the Appendix 1 – Scope of Construction Work and replace with the attached Appendix 1 –Scope of Construction Work.

Appendix 1 – Specifications

1. Please remove RFP Specification Section SUMMARY OF WORK 01 11 00 and replace with the attached SUMMARY OF WORK 01 11 00.
2. Please add the attached Specification Section GROUNDING 26 19 00.
3. Please add the attached Specification Section INFRARED HEATERS 26 77 00.

Appendix 1 – Preliminary Design Drawings

1. Please add the attached drawing labeled DW_Cumberland Infrared Heaters_Plan 2014-0113.
2. Please add the attached drawing labeled DW_Addison Utilities_2015-0113.
3. Please add the attached Addison drawings labeled A-1501, E-1501A, E-1501B, E-1502A, E-1502B, E-1503, E-1504, E-1505, CO-1501A, CO-1501B, CO-1502, CO-1503 and CO-1504.
4. Please add the attached drawings DW_Cumberland_Light Fixtures_20150114 and DW_Harlem_Light Fixtures_2015-0114.

Appendix 1 – Photos of the Addison Electrical Room

1. Please add the attached photos of the Addison electrical room PH_Addison Electrical Room_2015-0114_1 through PH_Addison Electrical Room_2015-0114_14.

Revise RFP cover page as follows:

~~"Technical and Financial Proposals" must be submitted in a separate envelope from~~
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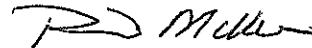
Revise RFP Page 5 as follows:

- ~~3.1 Qualifications Submittal Package Content~~
- 3.1 Technical Proposal

The due date for Proposals remains January 29, 2015, 3:30 P.M., Central Time.

If you have any questions, please contact Terrence Faust at 312-681-2446.

Sincerely,

A handwritten signature in black ink, appearing to read "R Miller", is positioned above the printed name.

Robert Miller
GM, Purchasing

O'Hare Line - Addison, Irving Park, Montrose, Harlem & Cumberland Stations
Req. No. C14FI101637828

Prebid Request for Information (RFI) Log

REQUEST NUMBER	SPEC NUMBER	SUBJECT	INFORMATION REQUESTED	Response
1	RFP Appendix 1	Addison station - Zoning Changes	Addison Station – Appendix 1, Item 4u, notes “processing required zoning changes”. Can CTA please elaborate on any current or future zoning changes and the DBC anticipated scope of work.	The Design/ Build contract shall provide presentation material for "Special Use" zoning.
2	RFP Appendix 1 - Reports	RFP - Lead Based Paint Inspection Reports - Montrose & Harlem	The RFP included Lead Based Paint Inspection Reports for Addison, Irving Park and Cumberland stations. Are similar or other reports available for Montrose and Harlem?	The Design/ Build contract shall provide Lead Based Paint Inspection Report for Montrose and Harlem.
3	RFP Appendix 1 - Scope of Work	Full LBP Abatement	Is a full abatement of any Lead Based Paint on surfaces to be painted the intent of the work scopes described in Appendix No. 1?	Full abatement is not the intent.
4	RFP Appendix 1 - Scope of Work	Ped Bridge & Bus Canopy Painting at Harlem & Cumberland	The Appendix 1 Scope of Work indicates exterior painting at both the Harlem & Cumberland stations. Please confirm that the exterior painting scope only includes the station houses proper and track level platform canopies and not bus canopies and pedestrian bridges (over expressway)?	Current painting scope will be decided during the design process.
5	RFP Appendix 1 - Scope of Work	Interior Painting at Montrose Station	The Appendix 1 Scope of Work shows only painting for the Montrose Station Exterior (and not the interior as is required at all other stations). Please confirm that interior painting is not required at Montrose Station?	Montrose station- Station interior painting shall be included in the contract.
6	RFP Appendix 1 - Scope of Work	Platform Structure Painting	Should platform painting include any steel exposed <u>under</u> the station platforms?	Platform painting shall not include any steel under the platform.
7	RFP Appendix 1 - Scope of Work; Guide Dwgs S-501 to S-505	Platform Edge Replacement	The Appendix 1 scope of work indicates <u>replacement</u> of the platform cantilevered edge at Addison, Irving Park and Montrose stations. Details included in Appendix Guide Drawings S-501 thru S-505 do not indicate a total replacement of the platform edge in these stations but provide quantity by percentage for replacement and repair. Is it the CTA's intent that the cantilevered edges be replaced for the entire length of the platform as described in the scope of work?	CTA's intent is to replace the cantilever edges for the entire platform length at Addison, Irving Park and Montrose.
8	RFP Appendix 1 - Scope of Work	Topping Slab Replacement at Walkways to Irving Park Station Platform	Please verify if new topping slab concrete is to be provided at the north and south walkways to the station boarding platform at the Irving Park Station?	Yes, the new topping slab concrete shall include the north and south walkways and the platform boarding area.
9	RFP Appendix 1 - Scope of Work	Limits of Closure Plate Repair / Replace at Cumberland Station	At Cumberland in the Appendix 1 Scope of Work , Item 3b for Cumberland Station indicates repair/replace closure plate below stationhouse curtain wall. Please clarify which station house exposures (walls)? Please clarify if this includes the walkways to the stationhouse over the expressways. (Also see question 3 regarding painting of the same).	At Cumberland, replace/ repair closure plate below platform level curtain wall.
10	Scope of Work; Div 1 Spec 01 11 00	New ATS at Montrose Station?	Appendix 1, Scope of Work indicates new ATS installation at Harlem and Cumberland. Div 1 specification 01 11 00 Summary of Work states new ATS installation at Montrose, Harlem and Cumberland. Please clarify if the Montrose Station is to get a new ATS.	01 11 00, 1.03, C, 3, e. is incorrect, provide Automatic Transfer Switches only at Harlem and Cumberland.
11	Scope of Work; Div 1 Spec 01 11 00 - Summary of Work	ATS Replacement - Cabling	It is understood that the transfer switches mentioned to be installed in the scope document are replacing existing transfer switches. As new termination points might not align with existing termination points, will new cables have to be installed from the Normal and Reliable breakers feeding the transfer switch, with possible conduit modifications?	Design/ Build Contractor to determine during design phase.
12	Existing Conditions	Elevator Locations and Existing Duct Banks	Addition Station – Is there existing duct bank(s) that will be in the way of the new elevator installation? If so, can CTA provide information of the existing duct bank(s) and the different cables/systems that are installed?	Design/ Build Contractor to determine during design phase.
13	Div 1 Spec 01 11 00	Signal Work	The Div 1 Summary of Work 1.03. C. 1. includes “signal work”. Can CTA identify more specifically the anticipated scope of work associated with train signals.	At Addison, the signal work includes relocating the Workers Ahead (WA) signal and all associated equipment for the new platform extension.
14	Scope of Work; Div 1 Spec 01 11 00 - Summary of Work	Communication System Work	Please confirm that there is no Communications Work at the Irving Park, Montrose, Harlem and Cumberland Stations? In addition, please verify that only new and reconfigured comm system work relative to the platform extension, new elevator, CA booth and new stair are required at Addison Station and not a complete comm system replacement.	Complete replacement of communication system is not in the contract. Design/ Build contract to determine during design.
15	RFP Appendix 1 - Scope of Work	21 Day Longitudinal Platform Closures - Harlem Station	Appendix 1 - Scope of Work G.2.b allows for 21 day longitudinal closures of platforms at Addison, Irving Park. Montrose and Cumberland but not Harlem. If the extent of platform repairs at the edge of the Harlem platform warrants replacement, would 21 day longitudinal platform closures be considered (at Harlem Station)?	CTA does not feel that additional closure days is warranted at Harlem.
16	RFP Appendix 1 - Scope of Work	Remote monitoring of Fire Alarm, Comm etc. for Addison Station Work Scope	With respect to the new elevator and platform / stationhouse extension at Addison for fire alarm, communications and the elevator sump. Is there infrastructure to connect for remote cat monitoring? Is there infrastructure to connect the elevator communications systems for remote cat monitoring? Is there infrastructure to connect the elevator sump pump for remote cat monitoring?	Design/ Build Contractor to determine during design phase.
17	RFP Appendix 1 - Scope of Work	Platform Canopy Light Fixtures - New Ballasts	Please verify if new ballasts are to be placed in platform canopy lighting. Scope of work indicates only re-lamping, but presentation referenced new ballasts.	The contract shall include new ballast in all fixtures where re-lamping light fixtures.
18	Existing Conditions	Addison Station Grounding	Addison Station: If possible, please provide latest electrical grounding CTA standard, and information on the existing electrical grounding system of the Addison Station	See Addendum 2.
19	RFP Appendix 1 - Scope of Work	Station Signage	Please verify that new and replacement signage is only required at Addison Station to the extent required for the reconfiguration associated with platform extension, new elevator and stair. Confirm there is no signage scope at Irving park, Montrose, Harlem and Cumberland.	The contract shall include all signage required for the new customer agent kiosk. Replacement signs are required if damaged by contract work. All signage at the Addison station has to meet ADA requirements.
21			Addison Station: Please provide latest electrical grounding CTA standard, and information on the existing electrical grounding system of the station	See Addendum 2.
22			Please provide a light fixture schedule for the Addison and Montrose stations.	Design/ Build Contractor to determine during design phase.
23			In the as built drawings issued to bidders for this RFP for Addison's, sheet E-11 shows a multi-duct concrete ductbank running underneath the middle of the Addison platform. This ductbank appears to be located in a position that may interfere with the elevator pit and the 35' platform extension. The notes state that this ductbank is for future use. - Is this ductbank present?	See Addendum 2.
23b			Referring to statement in question 23: Is there live power running in it?	Yes.
23c			Referring to statement in question 23: The notes state that this ductbank is for future use. Notes reference dwg. E-25. We do not have this sheet. Please provide this sheet for all bidders.	See Addendum 2.
23d			Referring to statement in question 23: Please provide an as built that would include location size and depth of the ductbank.	See Addendum 2.
23e			Referring to statement in question 23: Any kind of relocation or temporary condition required for the construction at Addison is not listed in the Scope of Work document. Please amend the scope of work document.	Design/ Build Contractor to determine during design phase.
24			Please provide an additional site visit with flaggers & electricians with keys to open the electrical rooms at all 5 stations.	There will not be additional site visits.
25			Addison Station 1. Platform b. “Replace additional platform structure where deteriorated”. Please provide the criteria for “deteriorated”. Currently we cannot quantify this.	At platform level, full depth concrete repair of deteriorated concrete shall be assumed 10% of platform level.

26			Harlem Station 1. Platform a. "Replace platform edge where deteriorated." Please provide the criteria for "deteriorated". Currently we cannot quantify this.	At platform level, full depth concrete repair of deteriorated concrete shall be assumed 10% of platform level.
27			Cumberland Station 1. Platform a. "Replace platform edge where deteriorated." Please provide the criteria for "deteriorated". Currently we cannot quantify this.	At platform level, full depth concrete repair of deteriorated concrete shall be assumed 10% of platform level.
28			Please provide another walkthrough for all stations with flaggers. With the Holidays, the subcontractor community is just starting to digest the scope and documents and are asking to be able to field verify the information.	There will not be additional site visits.
29			It is understood that the transfer switches mentioned to be installed in the scope document are replacing existing transfer switches. As new termination points might not align with existing termination points, will new cables have to be installed from the Normal and Reliable breakers feeding the transfer switch, with possible conduit modifications?	Design/ Build Contractor to determine during design phase.
30			Addition Station – Is there existing duct bank(s) that will be in the way of the new elevator installation? If so, can CTA provide information of the existing duct bank(s) and the different cables/systems that are installed?	See Addendum 2.
31			Will platform windshields be relocated?	Contract states the wind shelters shall be removed, refinished (powder coat) and have new glazing and perforated panels. Re-install at same location.
32			Will fire alarm work be required due to elevator work? Is there infrastructure to connect for remote cta monitoring?	Design/ Build Contractor to determine during design phase.
33			Is there infrastructure to connect the elevator communications systems for remote cta monitoring?	Design/ Build Contractor to determine during design phase.
34			Is there infrastructure to connect the elevator sump pump for remote cta monitoring?	Design/ Build Contractor to determine during design phase.
35			Based on the to-be-renovated-stations' existing pigeon populations and further evidenced by the preliminary drawings that suggest that bird control is needed, could you please share what team is working on providing drawings to flesh out the necessary bird scope?	Bird control scope will be investigated during the design process.
36	Div 26	Harlem/E-10	Drawing E-10 is missing from the Harlem Set. Please issue.	Sheet E-10 is missing from the original CTA drawings.
37	Div 08	Cumberland	Please confirm that the only curtainwall system that need to be replaced is at the platform level. All curtainwall at the station level will be painted only.	The platform level curtain wall at Cumberland is the only curtain wall system that will be replace.
38	Div 08	Cumberland	Please confirm that all curtainwall not within the station or platform, north of grid line A and South of grid line B, will not be included in the scope of work.	See response no. 37.
39	Div 26	Cumberland	Please confirm the only lighting to be replaced is at the Station Level Fare Collection (Sheet E-11) and Platform Level (Sheet E-13), and that no lighting will need to be replaced at the Drive Thru Canopy (Sheet E-15), nor the Parking Areas (Sheets E-3 thru E-5) nor the parking ramps nor bridges.	Lighting at Bus Bridge and Canopy are part of the station.
40	Div 26	Harlem	Please confirm the only lighting to be replaced is at the Station Level and Platform shown on Sheet E-9 (and presumably E-10) and that the lighting shown on Sheet E-8 for the bus canopy and bridge are NOT part of this project.	Lighting at Bus Bridge and Canopy are part of the station.
41	Div 26	Addison	The new elevator will be penetrating the existing platform level electric room. This was modified in 1999 when the electric hut was installed. We presume several feeders and branch circuits are routed through this room as a result of this relocation. Are as-builts available to indicate how this work was done? If so, could they be made accessible to us?	See Addendum No. 2 for pictures of the electrical room.
42	Div 6	Irving Park/Montrose	Please confirm the new walkway railings that are to replace the current railings are to be fiberglass.	The contract walkway handrails shall be galvanized metal.
43	Div 10	All Stations	Please clarify scope of signage. Nothing is listed in "Appendix 1 -Specific scopes" for any of the five stations. As of now, it looks like the specs inserted were placed in error.	Design/ Build Contractor to determine during design phase.
44	Div 12	All Stations	Please confirm if the new sand boxes that will replace the current sand boxes are to be stainless steel or fiberglass.	The new sandboxes shall be fiberglass.
45	Div 5	All Stations	Appendix 1 - Specific scopes call out for all stations to "clean and buff (2) stainless steel gap filler enclosures." Please identify what they are and where they are located.	Gap fillers are the stainless steel boxes found at platform level.
46			Please confirm that the intent is for all new handrail to replace old painted steel is to be RFP.	All new handrail shall be RFP only at the ends of the platform (where perpendicular to track). All walkway handrails shall be galvanized metal (parallel to tracks).
47			There is no "signage specification" nor any indication in the "Specific Scope" of any new or additional signage that is intended. Please either clarify/quantify the signage scope of work or we assume that this is not a requirement of this project.	Design/ Build Contractor to determine during design phase.
48			It appears that in order to properly sandblast the canopy steel, more items will need to be removed than just the lights as stated in the Scope of Work. All TV's, cameras, conduits, heaters, signs, lights, and the Plexiglas in the canopy will need to be removed in order to provide the CTA with the SPC level that will be warranted for a repaint of these areas. Please confirm. Please amend the scope of work document.	See Addendum No. 2, Appendix 1.
49			Does the scope of renovation extend to the bus depot or canopy at the Harlem station? Can a detailed description of the limits of the renovation be provided for this station as well.	See Addendum No. 2, Appendix 1.
50			RFP calls for written proposal to be 8.5x11 sheets. Org chart, phasing diagrams, schedule, etc... are better suited to 11x17 folded into the binders. Please confirm we can submit Org chart, phasing diagrams, schedule, etc...on 11x17 neatly tucked into organized binders.	11 x 17 neatly tucked into organized binders are acceptable.
51			The Cumberland Station is expansive and includes lengthy pedestrian walkways, a rotunda, and further access to parking garages and buildings. Can a detailed description of the limits of work at this location be provided?	See Addendum No. 2, Appendix 1.
52			Is the design/builder or CTA responsible for Testing costs? The contract and documents are not clear.	See response no. 2.
53			Please confirm that the CTA is the generator of all hazardous waste and materials to be removed from the site as a part of the project, and will sign all shipping and disposal manifests/documents as such.	Confirmed.
54			Is it the CTA's intention to Extend the canopy structure out onto the 35' platform extension?	The contract has the canopy extended over the new platform extension.
55			We are requesting a Bid Extension of 3 weeks to 11 Feb 2015	See Addendum 2.

56			Please provide extent/limits of Curtain-wall Replacement at Station Level of the Cumberland station.	See response no. 49.
57			Please provide extent/limits of Curtain-wall Replacement at Platform Level of the Cumberland station.	See response no. 49.
58			Please provide extent/limits of Curtain-wall Replacement at Pedestrian walkways at the Cumberland station.	At Cumberland, no curtain wall will be replaced at the pedestrian walkways above platform level.
59			Please Clarify Section 18.30. It is unclear when funds may be withdrawn from the accounts established with Minority Owned Financial Institutions and how long the accounts must be maintained.	The contract provides that the MFI Deposits should "begin promptly after receipt of the first payment from the Authority and continue until the date sixty days after the date on which payment for Substantial Completion is received," and the "Contractor may make withdrawals and deposits of MFI Deposits, as it deems appropriate."
60			Please Clarify Section 10.8(1)(g) and Section 10.8(2)(k) . These sections provide for the consideration of the contractors "audited overhead costs and profit in accordance with the Contractor's financial proposal." The Contractor's overhead and profit in the financial proposal is expressed as a fixed percentage of the construction costs. What is to be audited?	The pricing for any Changed Work is subject to federal requirements; please see response to the next question.
61			Please Clarify Section 10.8(1)(g) and Section 10.8(2)(k) . These sections provide for the consideration of the contractors "audited overhead costs and profit in accordance with the Contractor's financial proposal." The second sentence of each section reads "If consistent with Federal cost principles, which shall be inclusive of overhead and profit for subcontractors." Please Clarify.	As described in Federal Transit Administration Circular 4220.1F re: Third Party Contracting Guidance, for a recipient of FTA funds, allowable costs for equitable adjustments to a contract are subject to adherence with federal cost principles. Generally, federal cost principles are described in the Federal Acquisition Regulations at 48 CFR Chapter 1, Subpart 31.2, "Contracts with Commercial Organizations". Any overhead and profit paid by the CTA with respect to Changed Work must be in accordance with Federal Transit Administration rules.
62			A conflict exists between Scope of work and Div 1 specification 01 11 00: a. Appendix 1, Scope of work states that ATS installation at Harlem and Cumberland. Div 1 specification 01 11 00 states ATS installation at Montrose, Harlem and Cumberland – Are there 2 or 3 ATS Installations?	See response no. 10.
63			1. Please provide specification as the items below are included in Appendix 1, Scope of work but no specification is provided: a. Replace stationhouse Customer Agent (CA) booth, toilet room and janitor closet with new conforming to City of Chicago codes, ADA regulations and CTA design criteria and standards (this work includes new electric water heater(s) and wall heaters)	Design/ Build Contractor to determine during design phase.
64			Please provide specification as the items below are included in Appendix 1, Scope of work but no specification is provided: Install temporary CA booth during construction for revenue operations during phasing, relocate all electrical, communication and plumbing as required	Design/ Build Contractor to determine during design phase.
65			Addison Station - Will there be any work associated with the existing impedance bonds located just North of the existing platforms.	Design/ Build Contractor to determine during design phase.
66			Addison Station: Please provide latest electrical grounding CTA standard, and information on the existing electrical grounding system of the station	See Addendum 2.
67			Will the Addison Station platform canopy also get extended? If so, will existing lighting and communications systems be extended to new canopy?	The Addison canopy will be extended, including lighting, cameras, signage, monitors and communication.
68			Will the Addison Station platform require additional wind screens, benches, and Trash receptacles?	No, the platform will not require additional wind screens, benches or trash receptacles.
69			Will the Addison Station fire alarm work be required due to elevator work? Is there infrastructure to connect for remote CTA monitoring?	Design/ Build Contractor to determine during design phase.
70			Is there infrastructure to connect the elevator communications systems for remote CTA monitoring at the Addison Station?	Design/ Build Contractor to determine during design phase.
71			Is there infrastructure to connect the elevator sump pump for remote CTA monitoring at the Addison Station?	Design/ Build Contractor to determine during design phase.
72			For the Irving Park Station drawing B.1.b.2 shows repair of the concrete edge, however specific scope appendix 1, pg4 1-A indicates replacement of concrete edge. Are we to Repair or Replace?	See response no. 7.
73			For the Irving Park Station Specific Scope pg4 1-C indicates remove & Replace all platform level topping, however drawing B.1.b.2 indicates removal and replacement of topping adjacent to trim where tactile edge is. Please clarify.	See response no. 7.
74			For Montrose Station, Drawing C1b2 indicates repair of concrete edge, however scope 1a indicates replacement. Are we to Repair or Replace?	See response no. 7.
75			Please confirm that the only new roofing work is at the new elevator penthouse and at the new stairs at the Addison Station.	The new roof work is canopy expansion joint replacement, Addison elevator, stair and platform canopy extension.
76			Will A/E services be counted toward the 26% DBE Goal.	Yes.

77			Please confirm that there is no pedestrian walkway work in this contract	No Response.
78			Is a Bid Bond required to be submitted with our GMP Proposal? We have seen the performance bond information, but cannot find information for a Bid Bond.	No bid bond required.
79			Specifications include section 34 which includes track and signal work. Please confirm there is no track or signal work included in the scope of this project.	See response no. 13.
80			Please advise of any agreements between IDOT and CTA related to Lane Closures to facilitate the work at each station during the full duration of the construction period of the contract. Specifically, are there other planned projects (CTA, IDOT or other) that would impact the ability of the DBC to obtain nightly lane closure permits to facilitate work? If other work is planned that requires lane closures has this project received any priority over others?	1. CTA has no agreement with IDOT. 2. CTA does not have a schedule of IDOT work. 3. There are no priorities with IDOT.
81			Please clarify the Submittal Requirements. The Cover of the RFP states that "Technical and Financial Proposals" must be submitted in a separate envelope from "Qualifications", however, Section 3: Submittal Requirements states that "Each Proposer will submit a Proposal in two separate packages, the first package being the "Technical Proposal" and the second being the "Financial Proposal". Section 3.1 refers to a "Qualification's...", the same as the cover of the RFP. Please provide a Submittal Requirements summary or outline to clarify.	See Addendum 2.
82			Appendix 1, Scope of work states that ATS installation at Harlem and Cumberland. Div 1 specification 01 11 00 states ATS installation at Montrose, Harlem and Cumberland. Please clarify extent of ATS scope.	See response no. 10.
83			The items below are included in Appendix 1, Scope of work but not in the 01 11 00 Summary of Work: Replace stationhouse Customer Agent (CA) booth, toilet room and janitor closet with new conforming to City of Chicago codes, ADA regulations and CTA design criteria and standards (this work includes new electric water heater(s) and wall heaters) Please confirm the intent of the scope	See Addendum No. 2, Appendix 1.
84			The items below are included in Appendix 1, Scope of work but not in the 01 11 00 Summary of Work: Install temporary CA booth during construction for revenue operations during phasing, relocate all electrical, communication and plumbing as required. Please confirm the intent of the scope	See Addendum No. 2, Appendix 1.
85			Is there any communication scope with the new stairway at Addison?	Design/ Build Contractor to determine during design phase.
86			Addison Station: Will the cameras and display panels associated with the train berthing (related to the curved platform), need adjustment or relocation?	At Addison, the cameras and display panels associated with the train berthing (related to the curved platform) will need adjustment and/or relocation.
87			Harlem Station: We have observed significant steel canopy column deterioration (web rust hole) near the base at one location and column pilaster concrete damage at multiple locations (most likely due to the embedded downspout). Repairs to these elements were not specifically identified as part of the scope of work; please clarify if we should include repairs to these elements as part of our lump sum design proposal.	This work is not in the contract work.
88			Historically, the Building Department has not allowed a reduction in stair width with proposed modifications. The Preliminary Design Drawings provided indicate a reduction of stair width when compared to the existing stair. a. Have there been any preliminary discussions with the Building Department regarding a potential reduction in stair width?	At Addison, there is no reduction of stair width.
89			Historically, the Building Department has not allowed a reduction in stair width with proposed modifications. The Preliminary Design Drawings provided indicate a reduction of stair width when compared to the existing stair. b. Has any consideration been given to removal of the existing escalator and replacement with a stair?	At Addison, there is no reduction of stair width. The existing escalator shall not be removed in this contract.
90			The existing Com Ed feed for the Addison station terminates into two junction boxes in the existing electrical room. From there the electrical power feeds go into the electrical building located under Addison Street at track level. In order to demolish the existing electrical room the junction boxes in that room must be removed and a new electrical feed from Commonwealth Edison will be needed. The new Commonwealth feed must go directly to the electrical building located under Addison Street. It appears that this new feed will have to go underneath the expressway lanes. Is this the intention of the CTA?	The Design Build Contract shall be designed with the most cost efficient solution acceptable to the CTA.
91			Addison: Will the platform windbreaks be relocated due to the anticipated train re-berthing?	The platform windbreaks will not be relocated due to the re-berthing.
92			Regarding the proposed elevator at Addison: a. Will fire alarm work be required due to elevator work? Is there infrastructure to connect for remote CTA monitoring?	Design/ Build Contractor to determine during design phase.
93			Regarding the proposed elevator at Addison: Is there infrastructure to connect the elevator communications systems for remote cta monitoring?	Design/ Build Contractor to determine during design phase.
94			Regarding the proposed elevator at Addison: Is there infrastructure to connect the elevator sump pump for remote cta monitoring?	Design/ Build Contractor to determine during design phase.
95			It is understood that the transfer switches mentioned to be installed in the scope document are replacing existing transfer switches. As new termination points might not align with existing termination points, will new cables have to be installed from the Normal and Reliable breakers feeding the transfer switch, with possible conduit modifications	Design/ Build Contractor to determine during design phase.
96			Due to the detail required to submit this proposal and the timing of when it was advertised, we request a proposal period extension of 2 weeks to submit the proposal. Thank you for your consideration.	See Addendum 2.
96		Various	Please provide latest electrical grounding CTA standard, and information on the existing electrical grounding system of the station. The existing drawings do not show adequate detail, such as are there ground wells, if so, how many, etc.	See Addendum 2.
97			Can you please confirm if this project has any fuel tank/piping/pump work.	No, this project does not have any fuel tank/piping/pump work.

98			Will the winning design /construction team be responsible for the any new, additions or modifications of the components of the Transportation Information Display System (TIDS) used by the trains? Our question includes both/either software and hardware. If yes, would the design include visual only, or both ADA compliant visual with audio integration to the PA system?	Design/ Build Contractor to determine during design phase.

Requisition No. C14FI101637828
Request for Proposals
O'Hare Blue Line Station- Addison, Irving Park, Montrose, Harlem and Cumberland Stations-
Station Renovations (Your New Blue)

Addendum No. 2

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Revise RFP Page 5 as follows:

- ~~3.1 Qualifications Submittal Package Content~~
3.1 Technical Proposal

Prebid Questions and responses

APPENDIX 1**SCOPE OF CONSTRUCTION WORK****A. NOTICE**

The Design Build contract (DBC) shall provide design and construction services to the CTA for the upgrade of the Addison, Irving Park, Montrose, Harlem and Cumberland stations on the Blue Line O'Hare Branch. The DBC will provide all engineering and design services, labor, materials, tools, construction equipment, plant, facilities, services, safety provisions, bonds, obtain permits and regulatory approvals, and pay all permit costs, taxes, fees and other costs necessary or required in order to complete the Project in a safe, timely and workmanlike manner.

B. SCOPE OF WORK

The Your New Blue (YNB) is a multi-million dollar capital improvement program to comprehensively upgrade the Blue Line O'Hare Branch infrastructure with a focus on signal & power upgrades, track work and station improvements. The program's goals are to improve reliability, increase capacity and reduce travel time from downtown to the O'Hare airport station.

This Project includes the Addison, Irving Park, Montrose, Harlem and Cumberland stations, which are near each other on the CTA's Blue Line. All of these stations are located in the median of the Kennedy expressway (I-90). The Project will bring elements of these stations to a state of good repair and will add accessibility for people with disabilities at the Addison Blue Line station. The Harlem and Cumberland stations have elevators for accessibility.

The scope of construction work includes design and construction services at the following stations:

1. Addison, 3622 W. Addison Avenue, Chicago, IL 60618
2. Irving Park, 4131 W. Irving Park Rd., Chicago, IL 60613
3. Montrose, 4600 W. Montrose Avenue, Chicago, IL 60641
4. Harlem, 5550 N. Harlem Avenue, Chicago, IL 60656
5. Cumberland, 5800 N. Cumberland Avenue, Chicago, IL 60631

This project will bring platform structural elements of these stations to a state of good repair and will add accessibility for people with disabilities at the Addison Blue Line station. The purpose of this project is to address major deficiencies at the stations.

The work includes concrete, steel, curtain walls and tactile edging repairs, power washing, platform sealing and painting. The work also includes all necessary work to install an elevator at the Addison station. The Harlem and Cumberland stations are ADA-compliant and no additional accessibility improvements are included in the scope of construction work. For the remaining stations, the DBC is responsible for designing and constructing station elements that will not result in the requirement for a fully accessible station.

SPECIFIC SCOPE – ADDISON STATION

1. Platform

- a. Replace cantilevered platform edge along the entire length of platform (approximately 30’)
- b. Replace additional platform structure where deteriorated
- c. Replace platform tactile edge
- d. Replace all platform level topping with concrete, broom finish
- e. Repair expansion joints
- f. Remove and refinish (powder coat) metal furniture, including shelters, benches and trash receptacles; reinstall
- g. Replace platform shelter glazing and perforated panels
- h. Refinish wood (re-stain and seal) at platform benches
- i. Replace sand boxes
- j. Repair and replace closure plate below stationhouse curtainwall
- k. Clean and buff (2) stainless steel gap filler enclosures

2. Canopy

- a. Paint canopy steel (if lead, abate where required), drop and wrap light fixtures
- b. Replace canopy expansion joints
- c. Clean and re-mount light fixtures, replace broken lenses, re-lamp all light fixtures
- d. Install camera(s) at elevator, new stair and platform extension
- e. New conduit in public areas shall be concealed to the greatest extent possible
- f. Pressure wash skylight and canopy structure

3. Station

- a. Paint station interior and exterior (if lead, abate where required)
- b. Pressure wash station
- c. Re-lamp and new ballast all station light fixtures
- d. Repair steel at bottom of entrance rolling grille jambs
- e. Stationhouse shall be separately grounded from Addison Street
- f. Review station grounding system and revise per CTA criteria and standards
- g. Replace stationhouse Customer Agent (CA) booth, toilet room and janitor closet with new conforming to City of Chicago codes, ADA regulations and CTA design criteria and standards (this work includes new electric water heater(s) and wall heaters)
- h. Install temporary CA booth during construction for revenue operations during phasing, relocate all electrical, communication and plumbing as required.

4. New Elevator and Platform Extension

- a. Relocate electrical and communication conduit and panels required for new work, all relocated conduit, wiring and panels shall be new.
- b. Demolition of existing electrical room required for elevator installation
- c. Demolition of street level stationhouse floor for new elevator
- d. Demolition of existing stair from street to platform level
- e. Demolition of platform and construction of new foundation for new elevator

- f. Installation of new relocated electrical room foundations, CMU walls, concrete floor, stainless steel door and hardware and lighting
- g. Installation of elevator enclosure, glass (with perforated panels) and stainless steel cladding to match CTA criteria and standards
- h. Elevator interior shall have stainless steel ceiling and wall panels, flooring to match CTA standards
- i. Elevator pit sump shall meet CTA criteria and standards
- j. Elevator shall have stainless steel window frames and panels
- k. Elevator shall have windows (with anti-graffiti film) as shown on attached drawings
- l. Elevator equipment room shall be at elevator penthouse
- m. Elevator tower shall be vented
- n. Access to elevator penthouse roof shall be by permanent steel ladders (from stationhouse to roof and roof to elevator tower roof) with an interior stationhouse access hatch
- o. Elevator tower shall be separately grounded
- p. Installation of a complete operational electrical traction passenger elevator meeting City of Chicago codes and CTA design criteria
- q. All work shall include city meetings, inspections, corrections, elevator testing and start up
- r. After stair, toilet room and CA booth removal, fill opening in stationhouse topping and floor slab to match adjacent existing floor
- s. New conduit in public areas shall be concealed to the greatest extent possible, exposed conduit shall run in a neat and organized manner.
- t. All exposed conduit shall run in a neat and organized manner
- u. New elevator and stair stationhouse shall be City of Chicago code compliant, meet ADA regulations and CTA criteria and design standards (processing required Zoning changes)
- v. New work shall be similar to existing stationhouse design and materials
- w. Proposing improved systems and/ or materials is encouraged
- x. Provide detectable cane guardrail under new stair
- y. New stair stationhouse shall have lighting and signage per CTA standards and criteria
- z. New stair shall have stainless steel handrails, treads and risers
- aa. New 35' concrete platform extension shall be similar to existing platform design with detectable edge, skylights, end railing, gate and steps to track level, lighting, speakers, cameras, signage and CTA customer call button
- bb. Relocate berthing monitors and sunshields per new rail car berthing location
- cc. Relocate Workers Ahead (WA) signal and associated equipment for new platform extension
- dd. Relocate berthing markers per new platform length
- ee. Paint new stair enclosure (interior and exterior) and platform extension canopy
- ff. Remove one standard turnstile and turn over to the CTA (CTA will procure and install one ADA turnstile at the fare array); provide design and installation support for new turnstile
- gg. Patch floor at new turnstile and revised barrier to match existing
- hh. Reconfigure fare array ornamental stainless steel barrier for new ADA turnstile
- ii. Exposed floor patches shall match adjacent flooring
- jj. Install elevator ADA- compliant communications, way finding signage per ADA standards, City of Chicago code and CTA Design Criteria
- kk. Install new cameras at elevator (interior and exterior) and station stairs
- ll. Clean and buff (2) stainless steel gap filler enclosures at platform level

- mm. Construction phasing and work shall be performed in a manner as to have minimum impact on revenue operations

SPECIFIC SCOPE – IRVING PARK STATION

1. Platform

- a. Replace cantilevered platform edge along the entire length of platform (approximately 30")
- b. Replace platform tactile edge
- c. Replace all platform level topping with concrete, broom finish
- d. Repair expansion joints
- e. Remove and refinish (powder coat) furniture, including shelters, benches and trash receptacles
- f. Replace platform shelter glazing and perforated panels
- g. Refinish wood at platform benches
- h. Replace sand boxes
- i. Repair and replace closure plate below stationhouse curtainwall
- j. Replace walkway railings
- k. Clean and buff (2) stainless steel gap filler enclosures

2. Canopy

- a. Replace canopy expansion joints
- b. Drop and wrap light fixtures
- c. Paint canopy steel framing (if lead, abate where required)
- d. Clean and mount light fixtures, replace broken lenses, re-lamp all light fixtures
- e. Pressure wash skylight and canopy structure

3. Station

- a. Paint station interior and exterior (if lead, abate where required)
- b. Re-lamp and new ballast all station light fixtures
- c. Pressure wash station

SPECIFIC SCOPE – MONTROSE STATION

1. Platform

- a. Replace cantilevered platform edge along the entire length of platform (approximately 30")
- b. Replace platform tactile edge
- c. Replace all platform level topping with concrete, broom finish
- d. Repair expansion joints
- e. Remove and refinish (powder coat) furniture, including shelters, benches and trash receptacles
- f. Replace platform shelter glazing and perforated panels
- g. Refinish wood at platform benches
- h. Replace sand boxes

- i. Repair and replace closure plate below stationhouse curtainwall
 - j. Replace walkway railings
 - k. Clean and buff (2) stainless steel gap filler enclosures
2. Canopy
- a. Replace canopy expansion joints
 - b. Drop and wrap light fixtures
 - c. Paint canopy steel framing (if lead, abate where required)
 - d. Clean and mount light fixtures, replace broken lenses, re-lamp all light fixtures
 - e. Pressure wash skylight and canopy structure
3. Station
- a. Paint station interior and exterior (if lead, abate where required)
 - b. Re-lamp and new ballast all station light fixtures
 - c. Pressure wash station

SPECIFIC SCOPE – HARLEM STATION

1. Platform
- a. Rebuild platform edge where deteriorated
 - b. Replace platform tactile edge where deteriorated or platform edge replaced
 - c. Replace concrete patches with granite panels- +/- 134 pavers (30" x 30")
 - d. Re-grout all platform level granite pavers, level where uneven
 - e. Repair expansion joints
 - f. Repair and replace closure plate below stationhouse curtainwall
 - g. Remove and refinish (powder coat) furniture, including shelters, benches and trash receptacles
 - h. Replace sand boxes
 - i. Replace platform shelter glazing and perforated panels
 - j. Refinish wood at platform benches
 - k. Pressure wash platform
 - l. Clean and buff (2) stainless steel gap filler enclosures
2. Canopy
- a. Replace canopy expansion joints
 - b. Drop and wrap light fixtures
 - c. Paint canopy steel framing (if lead, abate where required)
 - d. Clean and mount light fixtures, replace broken lenses, re-lamp all light fixtures
 - e. Pressure wash skylight and canopy structure
3. Station
- a. Paint station interior and exterior (if lead, abate where required)
 - b. Pressure wash station
 - c. Re-lamp and new ballast all station light fixtures
 - d. Install new Automatic Transfer Switch (ATS)

4. Bus Bridge and Canopies

- a. Clean, replace broken lenses, re-lamp and new ballast all light fixtures

SPECIFIC SCOPE – CUMBERLAND STATION

1. Platform

- a. Rebuild platform edge where deteriorated
- b. Replace platform tactile edge where deteriorated or platform edge replaced
- c. Repair expansion joints
- d. Replace all platform level topping with concrete, broom finish
- e. Repair and replace closure plate below stationhouse curtainwall
- f. Remove and refinish (powder coat) furniture, including shelters, benches and trash receptacles
- g. Replace platform shelter glazing and perforated panels
- h. Refinish wood at platform benches
- i. Pressure wash platform
- j. Replace curtainwall system with new manufactured steel system
- k. Clean and buff (2) stainless steel gap filler enclosures
- l. Repair platform level structure where required

2. Canopy

- a. Replace canopy expansion joints
- b. Drop and wrap light fixtures
- c. Paint canopy steel framing (if lead, abate where required)
- d. Clean and mount light fixtures, replace broken lenses, re-lamp all light fixtures
- e. Pressure wash skylight and canopy structure

3. Station

- a. Paint station interior and exterior (if lead, abate where required)
- b. Repair/ replace closure plate below stationhouse curtainwall
- c. Pressure wash station
- d. Re-lamp and new ballast all station light fixtures
- e. Install new Automatic Transfer Switch (ATS)
- f. Replace sand box

4. Central Hall at Bus Terminal

- a. Install 2 sets of two infrared heaters with pushbutton timed control where shown on attached drawing DW_Infrared Heaters_Plan 2014-0113
- b. Run conduit to electrical room and control pushbutton in a neat manner

5. Pedestrian Bridges, Stairs, Central Hall, Pedestrian and Bus Canopies

- a. Clean, replace broken lenses, re-lamp and new ballast all light fixtures

C. TIME PERIOD REQUIREMENTS

Achieve Substantial Completion of all contract work within five hundred forty (540) calendar days after NTP.

D. CONTRACT MILESTONES

1. Milestone 1: Prepare and submit Validation of RFP Design along with eight (8) presentation boards in accordance with Section 2.1 of the RFP with in thirty (30) calendar days after NTP.
2. Milestone 2: Prepare and submit to CTA 60% design for documents for the platform extension at Addison within sixty (60) calendar days after NTP.
3. Milestone 2A: Prepare and submit to CTA 90% design for documents for the platform extension at Addison within ninety (90) calendar days after NTP.
4. Milestone 3: Prepare and submit to CTA 60% design documents for all work within ninety (90) calendar days after NTP.
5. Milestone 4: Prepare and submit to CTA 90% design documents for all work within one hundred forty one (141) calendar days after NTP.
6. Milestone 5: Prepare and submit to CTA 100% design documents for all work within one hundred ninety two (192) calendar days after NTP.
7. Milestone 6: Prepare, bid and provide work packages for all contract work to CTA for review, approval by no later than three hundred twelve (312) calendar days after NTP.
8. Milestone 7: Achieve Substantial Completion of all contract work within five hundred forty (540) calendar days after NTP.

E. ALLOWABLE TRACK ACCESS**Nightly Single Tracks Between Adjacent Crossovers**

One Single Track Occurrence = One of the following:

- 2200 hrs to 0400 hrs - Mon/Tues (6 hrs)
- 2200 hrs to 0400 hrs - Tues/Wed (6 hrs)
- 2200 hrs to 0400 hrs - Wed/Thurs (6 hrs)
- 2200 hrs to 0400 hrs - Thurs/Fri (6 hrs)
- 2200 hrs to 0500 hrs - Fri/Sat (7 hrs)
- 2200 hrs to 0600 hrs - Sat/Sun (8 hrs)
- 2200 hrs to 0400 hrs - Sun/Mon (6 hrs)

Weekend Single Track Between Adjacent Crossovers

One Weekend Single Track Occurrence = 2200hrs Friday to 0400hrs Monday - (54 hrs.)

F. WEEKEND STATION CLOSURES – ADDISON & MONTROSE

The CTA may allow a maximum of four (4) weekend station closures of the Addison Station and a maximum of two (2) weekend station closures of the Montrose Station between the hours of 2200 hrs Friday to 0400 hrs Monday to provide access for work which may not be feasible while maintaining revenue service operations at the station. The DBC must propose the purpose and quantity of any weekend station closures within in the project approach section of the proposal.

G. CONSTRAINTS

Constraint No. 1 – Track Access Occurrence Constraints

- Only one (1) Track Access Occurrence, of any type, will be allowed at any given time on the Blue Line.
- Nightly Single Tracks Between Adjacent Crossovers will be prohibited during the following time periods prior to November 1, 2015.

2200 hrs to 0400 hrs - Sun/Mon (6 hrs)

2200 hrs to 0400 hrs - Mon/Tues (6 hrs)

2200 hrs to 0400 hrs - Tues/Wed (6 hrs)

2200 hrs to 0400 hrs - Wed/Thurs (6 hrs)

2200 hrs to 0400 hrs - Thurs/Fri (6 hrs)

- Quantity Limits on Track Access Occurrences- The quantity limits on Track Access Occurrences are as stated below.

Nightly Single Tracks Between Adjacent Crossovers shall not exceed one hundred sixty (160) occurrences for the entire project.

Weekend Single Tracks Between Adjacent Crossovers shall not exceed twenty two (22) occurrences for the entire project.

- Proposals which request more Track Access Occurrences than permitted for each type of Track Access Occurrence above may be considered non-responsive. The DBC shall state the total number of Track Access Occurrences, by type, in the project approach section of the Proposal.
- The DBC shall be limited to the total number and type of Track Access Occurrences of each type identified by the DBC in the proposal. Track Access Occurrences will be prohibited as defined in Specification Section 01 35 00.
- The total number of Track Access Occurrences proposed by the DBC shall include the completion of all punch list work activities and correction of any non-conformant work (NCR's).

Constraint No.2- Scheduling of Work Activities1. Flagging and/or Construction Work Zone Constraints

- Dependent upon the DBC's means and methods of performing contract work on or adjacent to the Right of Way, flagging may be required by the Authority. The maximum allowable quantity of flagger and infrastructure shifts proposed by the DBC shall not exceed quantities specified in Specification Section 01 35 00. The DBC shall identify the proposed quantity of flagger and infrastructure shifts in the project approach.
- Flagging may be required and provided by CTA, to protect the work within Track Access Occurrence areas when Contractor's work is adjacent to an active track(s). Flagging required by CTA for work within a Track Access Occurrence area will not be counted towards the allowable flagger shifts provided in Specification Section 01 35 00 of the contract documents.
- All areas of construction are to be fully barricaded from the public. Graffiti within construction limit lines shall be removed within 24 hours. Barricade and boarding area wall design, construction and installation must withstand 30 PSF wind loads (100 mph). DBC is required to submit detailed design prior to barricade construction for Authority review and approval. All lumber must be fire retardant treated and painted with fire resistant (rated) paint.

2. Station, Platform & Entrance Closure Constraints:a. General (all stations):

- All stations must remain open at all times except for approved weekend station closures at Addison & Montrose.
- The Addison & Montrose Station cannot be closed at the same time.
- All Station platforms must remain open and useable for 8-car service at all times, except during approved partial platform closures defined below, during periods of 4-car service or during weekend station closures at Addison & Montrose as approved by CTA.
- Extended and/or weekend entrance closures may be proposed by the DBC where stations have multiple entrance, exit points. CTA will require that rail and bus service be maintained at all times during any proposed extended or weekend entrance closures. Any proposed closure of main station entrances must address temporary lighting, fare control and vending equipment, CA booth and security for operating any proposed temporary station condition from an auxiliary area.
- Staging and lay-down areas for the project are very limited. It is the DBC's responsibility to work with adjacent property owners, obtain staging and laydown areas and provide remote parking and staging areas as needed. No additional compensation or time will be awarded due to limited staging and lay-down area. Vehicle parking on-site will be extremely limited and no personal vehicles shall be parked on-site or within lane closures.

b. Extended Partial Platform Closures- (Addison, Irving Park, Montrose and Cumberland only)

- At the Addison, Irving Park, Montrose and Cumberland Stations, CTA will allow the partial closure of approximately half of the platform area (longitudinally) for an extended period of time.
- During any extended partial platform closure, safe passage between the station and platform areas must be maintained at all times, except during approved weekend station closures at Addison and Montrose.
- During any extended partial platform closure, the platform must remain open for revenue service in one direction (NB or SB) at all times. Access to the station must be maintained at all times.
- During any extended partial platform closure, CTA customers must be able to backride in one direction from an adjacent station. Multiple station backride scenarios will not be allowed.
- No more than two (2) extended partial platform closures will be allowed at each of the four stations. The duration of each extended partial platform closure shall not exceed twenty one (21) consecutive calendar days.

c. Partial Platform Closures during 4-car service hours (All stations)

- Portions of the station platforms may be closed during periods of 4-car service as approved by CTA in advance.
- CTA will, with adequate advance notice, re-berth trains at the station platforms during 4-car service periods to provide access to portions of the platform for the DBC to perform work.
- The stations and platforms must remain open for revenue service during 4-car service periods.

d. Addison Station Constraints:

- The DBC must maintain at all times (except during approved station closure periods) a safe passage way (minimum of 4'-4" wide unobstructed) acceptable to the Authority for CTA passengers to travel between the existing stair, escalator and platform area.
- Weekend Stations closures at Addison will not be allowed during Cubs Home Games or during events prohibiting Track Access Occurrences as defined in Specification Section 01 35 00.
- The platform extension at Addison Station must be completed and placed in order to re-berth trains prior to closing portion the platform area at the new stair.

The new stair and enclosure from the platform to the station area must be completed and placed in service by CTA prior to closing the existing stairway for demolition and construction of the new elevator.

- Once the new stair is constructed and placed in service, access to the existing escalator and new stair must be maintained at all times except during approved weekend station closure periods.

e. Irving Park, Harlem and Cumberland Stations:

- The DBC shall stage/phase all work at the Irving Park, Montrose, Harlem and Cumberland Station in a manner which does not require any complete closure of these stations. CTA must be able to safely operate rail/bus service at all times during all phases of work.

H. LIQUIDATED DAMAGES FOR DBC DELAY

The DBC will be liable for liquidated damages for the time that DBC causes a delay in returning the system to normal operational service after any Track Access Occurrence, Station Closure or scheduled special transit operation including the time required to process the checklist to return the track to service per Specification Section 01 35 00. The time requirements and the amount of liquidated damages are listed below. Any such amounts shall be payable as liquidated damages.

The Authority shall recover liquidated damages by deducting the amount thereof out of any monies due or that may become due the DBC, and if said monies are insufficient to cover said damages then the DBC shall pay the amount due upon demand from the CTA.

1. Failure of the Contractor to return any of the tracks back to service after each authorized track outage scheduled for Contractor's work:
 - From 1 minute up to the first 29 minutes delayed:
Liquidated Damages: \$5,000.00
 - In addition, from 30 minutes up to the first 59 minutes delayed:
Liquidated Damages: \$5,000.00
 - For each additional hour, or fraction thereof, thereafter delayed:
Liquidated Damages: \$30,000.00 per hour.
2. Failure of the DBC to complete Milestone 1 by the prescribed day and time shall result in assessment of Liquidated Damages per calendar day in the amount of \$1200.00.
3. Failure of the DBC to complete Milestone 2 by the prescribed day and time shall result in assessment of Liquidated Damages per calendar day in the amount of \$1200.00.
4. Failure of the DBC to complete Milestone 2A by the prescribed day and time shall result in assessment of Liquidated Damages per calendar day in the amount of \$1200.00.

5. Failure of the DBC to complete Milestone 3 by the prescribed day and time shall result in assessment of Liquidated Damages per calendar day in the amount of \$1200.00.
6. Failure of the DBC to complete Milestone 4 by the prescribed day and time shall result in assessment of Liquidated Damages in the lump sum amount of \$1200.00.
7. Failure of the DBC to complete Milestone 5 by the prescribed day and time shall result in assessment of Liquidated Damages in the lump sum amount of \$1200.00.
8. Failure of the DBC to complete Milestone 6 by the prescribed day and time shall result in a reduction of the Final GMP as provided in Section 9.1 (2) of the Contract.
9. Failure of the DBC to complete Milestone 7 by the prescribed day and time shall result in assessment of Liquidated Damages in the lump sum amount of \$3400.00.

I. PUNCH LIST

The DBC is required to complete all punch list work within ninety (90) calendar days after receipt of notice of substantial completion from the Authority. The CTA reserves the right to complete punch list work not performed by the DBC within the ninety (90) calendar day period and deduct the cost of such work from the Final GMP.

APPENDIX 1 DESIGN GUIDANCE DOCUMENTS (The DBC will comply with requirements of the following documents):

01 – Original Contract Drawings

1. DW_Addison 1968
2. DW_Addison_1999-0317
3. Addison Station A-1501, E-1501A, E-1501B, E-1502A, E-1502B, E-1503, E-1504, E-1505, CO-1501A, CO-1501B, CO-1502, CO-1503 and CO-1504
4. DW_Addison Utilities_2015-0113
5. DW_Irving Park 1968
6. DW_Montrose 1968
7. DW_Harlem 1968
8. DW_Cumberland 1968
9. DW_Cumberland Infrared Heaters_Plan 2015-0113

02 – Division 1 Specifications

- 01 11 00 Summary of Work
- 01 18 00 Project Utility Coordination
- 01 21 00 Allowances
- 01 29 10 Applications and Certificates for Payments
- 01 31 00 Project Management and Coordination
- 01 31 19 Project Meetings
- 01 31 23 Project Website
- 01 32 50 Construction Schedule
- 01 33 00 Submittal Procedures
- 01 25 00 Special Procedures
- 01 35 23 Owner Safety Requirements
- 01 42 10 Reference Standards and Definitions
- 01 43 00 Quality Assurance
- 01 45 00 Quality Control
- 01 45 15 Witness Points
- 01 45 23 Testing And Inspection Service
- 01 50 00 Temporary Facilities and Controls
- 01 53 13 Temporary Bridges
- 01 55 00 Traffic Regulation
- 01 60 00 Product Requirements
- 01 63 00 Product Substitution Procedures
- 01 71 00 Preparation
- 01 73 29 Cutting and Patching
- 01 77 00 Closeout Procedures
- 01 78 23 Operating & Preventative Maintenance Data

03 – Technical Specifications

Division 02 Existing Conditions

- 02 41 16 Structural Demolition
- 02 41 19 Selective Structure Demolition
- 02 61 00 Contaminated Soil Removal and Disposal
- 02 72 00 Lead Abatement

Division 03 Concrete

- 03 01 30 Maintenance of Cast-In-Place Concrete
- 03 20 10 Concrete Reinforcement Epoxy Coated
- 03 30 00 Cast-In-Place Concrete
- 03 30 53 Miscellaneous Cast-In-Place Concrete
- 03 61 11 Non-Shrink Grout
- 03 74 00 Concrete Repairs

Division 04 Masonry

- 04 01 20 Maintenance of Unit Masonry
- 04 50 00 Masonry Restoration and Cleaning
- 04 80 00 Unit Masonry
- 04 80 10 Masonry Tuckpointing and Repairs

Division 05 Metals

- 05 10 30 Structural Steel
- 05 31 00 Steel Deck
- 05 50 00 Metal Fabrications
- 05 50 10 Barriers, High Barriers, Gates
- 05 50 20 Railings and Guardrails
- 05 50 30 Cane Rails
- 05 50 40 Metal Stairs with Cast Abrasive Treads
- 05 71 00 Perforated Metal Panels
- 05 72 30 Metal Stair Tread and Nosing

Division 6 Wood

- 06 10 00 Rough Carpentry
- 06 20 00 Finish Carpentry
- 06 51 50 Fiberglass Handrails, Stair and Platform

Division 07 Thermal and Moisture Protection

- 07 41 00 Metal Roof Panels
- 07 52 60 Modified Bituminous Sheet Roofing–Heat Welded
- 07 62 00 Sheet Metal Flashing and Trim
- 07 62 05 Sheet Metal Coving
- 07 90 00 Joint Sealers
- 07 95 00 Building Expansion Joint
- 07 95 10 Building Expansion Joint Assemblies
- 07 95 13 Expansion Joint Cover Assemblies

Division 08 Openings

- 08 11 00 Standard Steel Doors and Frames
- 08 63 13 Metal Framed Skylights
- 08 71 00 Finish Hardware
- 08 80 00 Glass and Glazing
- 08 90 00 Architectural Steel Window Wall

Division 09 Finishes

- 09 30 05 Tiling- Exterior
- 09 30 10 Tactile Tile

- 09 54 80 Metal Ceiling System
- 09 60 00 Stone Flooring and Compass Rose
- 09 90 00 Painting
- 09 90 10 Cleaning and Protective Coatings of Existing Surfaces

Division 10 Specialties

- 10 14 36 Signs; Rail Right-of -Way, Retroreflective, with Fiber Reinforced Plastic Substrate
- 10 20 00 Louvers and Vents
- 10 20 10 Vents with Motorized Louvers or Dampers
- 10 42 50 Vitreous Enameled Steel Signs
- 10 42 80 Illuminated Signs
- 10 42 90 Braille Tactile Signs

Division 12 Furnishings

- 12 67 23 Station Wood Slat Benches

Division 13 - Not Applicable

Division 14 Conveying Equipment

- 14 21 00 Traction Elevators

Division 15 Through 21- Not Applicable

Division 22 Plumbing

- 22 00 00 Mechanical General Provisions
- 22 05 00 Basic Plumbing Materials and Methods
- 22 07 00 Pipe Insulation
- 22 40 00 Plumbing
- 22 40 01 Plumbing For Underground Drainage

Division 23 Heating Ventilating and Air Conditioning

- 23 00 10 Ventilation

Division 24 Through 25- Not Applicable

Division 26 Electrical

- 26 01 00 General Provisions
- 26 03 00 Electrical Demolition
- 26 05 00 Raceway and Boxes
- 26 10 00 Basic Electrical Materials and Methods
- 26 12 30 Wires Cables, Splices, Terminations
- 26 14 10 Wiring Devices
- 26 17 50 Local Control Panels
- 26 19 00 Grounding
- 26 19 50 Identification
- 26 25 10 Automatic Transfer Switch
- 26 26 60 DC Manual Transfer and Disconnect Switch
- 26 46 00 Dry Type Transformers
- 26 47 00 Panelboards

26 50 10 Lighting Fixtures
26 75 00 Cabinet and Terminal Strips
26 95 00 Electrical Testing

Division 27 Communications

27 01 00 Communication General Provisions
27 18 00 Communication System Power Supply
27 21 10 Ethernet Switch
27 32 00 Telephone
27 73 00 Audio/ Visual Public Address System
27 83 10 CCTV Fixed Dome Color Camera
27 83 20 CCTV PTZ Dome Color Camera
27 83 40 CCTV Security Video Terminal
27 83 50 CCTV Fixed Indoor/ Outdoor HD Color Camera
27 91 00 Control Center Integration
27 92 00 Rapid Transit Station/ Node Integration
27 93 00 Communication System Testing

Division 28 Through 30- Not Applicable

Division 31 Earthwork

31 05 19 Geotextile Fabric
31 15 00 Shoring
31 16 10 Geotechnical and Structural Monitoring Instrumentation
31 20 00 Earthwork
31 20 10 Earthwork for Underground Utilities

Division 32 Exterior Improvements- Not Applicable

Division 33 Utilities

33 67 50 Water Systems
33 68 00 Sewer Systems

Division 34 Track (Loop Track Renewal Project)

34 02 05 Trackwork and Contract Rail Removal
34 02 72 Insulated Rail Joint Components
34 06 10 Miscellaneous Timber
34 06 11 Wood Ties
34 06 12 Hardwood Railroad Ties
34 06 13 Softwood Railroad Ties
34 06 53 Lag Screws
34 10 14 Signs- Rail Right-of-Way Retroflective with Fiber Reinforced Plastic Substrate
34 10 54 Track Marker Signs- Vitreous Enamel Porcelain on Steel

Division 34 Traction Power

34 21 46 Traction Power Cable Lugs
34 21 47 Traction Power Cable Tags
34 21 61 General Provisions Traction Power
34 21 68 Traction Power Underground Duct Banks and Manhole
34 24 19 Contact Rail System

- 34 24 20 Traction Power Contact Rail
- 34 24 22 Contact Rail Insulation Chair- Fiberglass
- 34 24 23 Contact Rail Bonding
- 34 24 30 Rail Connections and Running Rail Bonding Traction

Division 34 Train Control

- 34 42 03 Equipment Removal
- 34 42 17 Worker Ahead Signal Layouts
- 34 42 38 Miscellaneous Components and Products
- 34 42 91 Signal System Tests

04 – Reports

- 1. DW_CTA_TQ_PlatformEdgeRepaiTipicalDetails_Page_1
- 2. DW_CTA_TQ_PlatformEdgeRepaiTipicalDetails_Page_2
- 3. DW_CTA_TQ_PlatformEdgeRepaiTipicalDetails_Page_3
- 4. DW_CTA_TQ_PlatformEdgeRepaiTipicalDetails_Page_4
- 5. DW_CTA_TQ_PlatformEdgeRepaiTipicalDetails_Page_5
- 6. RP_Lead Paint Testing Addison Blue Line station
- 7. RP_Lead Paint Testing Irving Park Blue Line station
- 8. RP_Lead Paint Testing Cumberland Blue Line station

05 – Cut Sheets

- 1. Gap Filler
- 2. Bench Trash Receptacle

06 – Guide Drawings and Photos

- 1. 080_G-A-405_windbreak_rev 0_20130708
- 2. 080_S-A-407_sandbox
- 3. 180_gx-101.1_fare controls_rev 0_20130808
- 4. 180_gx-101_fare controls_rev 0_20130808
- 5. 180_gx-102_fare controls_rev 0_20130808
- 6. ClearDiagramatBoardAreas
- 7. PH_Addison Electrical Room_2015-0114_1 through
PH_Addison Electrical Room_2015-0114_14

07 – CTA Design Criteria

- 1. Chapter 03 Soils and Foundations_Rev 4.0_20131004
- 2. Chapter 04 Civil_rev2.3_DRAFT_20130325
- 3. Chapter 06 Utilities_rev2.3_DRAFT_20130326
- 4. Chapter 07_Structural__rev 4_20130328
- 5. Chapter 08_Architectural_rev 2.3_DRAFT_20130327
- 6. Chapter 09 Mechanical_rev3.0_DRAFT_20130326
- 7. Chapter 10 Electrical_rev 4.0_20130501
- 8. Chapter 16_Signage & Graphics_rev 3.0_20130513

08 – Preliminary Design Drawings

File DW_TA_DWGS_2014-1203

- 1. DW_CTA_TA_Addison Drawing_A.1.b.1
- 2. DW_CTA_TA_Addison Drawing_A.1.b.2
- 3. DW_CTA_TA_Addison Drawing_A.1.b.3

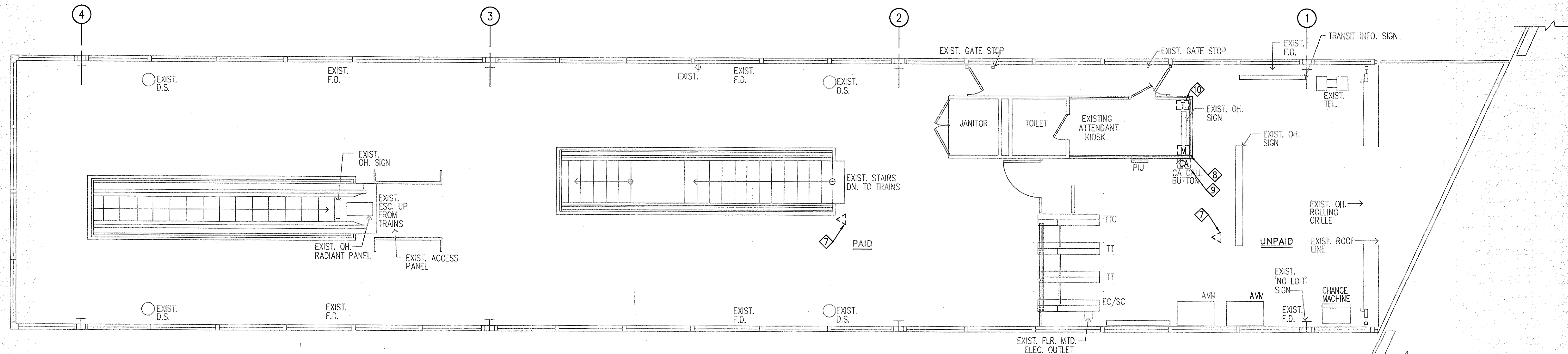
4. DW_CTA_TA_Addison Drawing_A.1.b.4
5. DW_CTA_TA_Addison Drawing_A.1.b.5
6. DW_CTA_TA_Addison Drawing_A.1.b.6
7. DW_CTA_TA_Addison Drawing_A.1.b.7
8. DW_CTA_TA_Addison Drawing_A.1.b.8
9. DW_CTA_TA_Addison Drawing_A.1.b.9
10. DW_CTA_TA_IrvingPark Drawing_B.1.b.1
11. DW_CTA_TA_IrvingPark Drawing_B.1.b.2
12. DW_CTA_TA_Montrose Drawing_C.1.b.1
13. DW_CTA_TA_Montrose Drawing_C.1.b.2
14. DW_CTA_TA_Harlem Drawing_D.1.b.1
15. DW_CTA_TA_Harlem Drawing_D.1.b.2
16. DW_CTA_TA_Cumberland Drawing_E.1.b.1
17. DW_CTA_TA_Cumberland Drawing_E.1.b.2

File DW_CTA_TA_Phasing_2014-1203

1. DW_CTA_TA_Phasing_Addison_A1.b.10
2. DW_CTA_TA_Phasing_Addison_A1.b.11
3. DW_CTA_TA_Phasing_IrvingPark_B1.b.3
4. DW_CTA_TA_Phasing_Montrose_C1.b.3
5. DW_CTA_TA_Phasing_Harlem_D1.b.3
6. DW_CTA_TA_Phasing_Cumberland_E1.b.4

09- Cost Estimate Format

1. MS_CTP_MF_Cost Estimate Format

**STATION PLAN**

SCALE: 1/4" = 1'

NOTES FOR SHEET E-1501A:

1. THE CONTRACTOR SHALL PREPARE FINAL DETAILED SHOP DRAWINGS BASED ON THE DESIGN DIRECTIVE DRAWINGS PRESENTED HEREIN AND AS SPECIFIED IN THE SPECIFICATIONS, TO BE REVIEWED AND APPROVED BY THE CTA.
2. THE STATION AND PLATFORM SHALL REMAIN IN SERVICE AT ALL TIMES. THE CONTRACTOR SHALL ENSURE THE ELECTRICAL SYSTEM REMAINS ENERGIZED 24 HOURS PER DAY INCLUDING ALL COMMUNICATION AND SIGNALLING SYSTEMS. ANY INTERRUPTION OF ELECTRICAL POWER DUE TO THE WORK SHALL BE COORDINATED WITH THE CTA. THE CONTRACTOR SHALL PROVIDE A WRITTEN NOTICE REQUEST 30 DAYS IN ADVANCE TO THE CTA FOR ANY REQUESTED ELECTRICAL SHUTDOWN.
3. THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL BY THE CTA AN ELECTRICAL AND COMMUNICATION STAGING PLAN TO ENSURE A MINIMUM OF DOWNTIME TO ANY CTA SYSTEM. PA AND TELEPHONE SERVICE SHALL BE MAINTAINED PER THE CTA APPROVED CONTRACTOR STAGING PLAN.
4. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE GENERAL CONDITION OF THE WORK AND PROVIDE POWER AND LIGHTING AS REQUIRED TO KEEP THE STATION IN OPERATION AT ALL TIMES PER THE CTA APPROVED CONTRACTOR STAGING PLAN. THE CONTRACTOR SHALL PROVIDE POWER AND LIGHTING FOR ALL TRADES. COORDINATE DEMOLITION WITH ALL OTHER DISCIPLINES.
5. DISCONNECT AND/OR REMOVE EXISTING LIGHTING FIXTURES, WALL SWITCHES, OUTLETS, AND ASSOCIATED CONDUITS AND WIRING AS SHOWN ON THE ARCHITECTURAL DRAWINGS.
6. CTA TO DISCONNECT AND REMOVE ALL FARE COLLECTION EQUIPMENT. THE CONTRACTOR SHALL COORDINATE WITH THE CTA FOR FARE COLLECTION EQUIPMENT WORK WHILE PREPARING STAGING PLAN.
7. DISCONNECT AND COMPLETELY REMOVE EXISTING PUBLIC ADDRESS CEILING SPEAKERS IN THE PAID AND UNPAID AREAS AND ALL WIRING BACK TO THE SOURCE. SPEAKERS SHALL BE INVENTORIED AND DELIVERED TO THE CTA'S WEST SHOPS.
8. DISCONNECT AND COMPLETELY REMOVE THE PUBLIC ADDRESS MICROPHONE AND PRE-AMP AND ALL WIRING BACK TO THE SOURCE WITHIN THE KIOSKS, INVENTORY AND DELIVER TO THE CTA'S WEST SHOPS.

8. DISCONNECT AND COMPLETELY REMOVE THE PUBLIC ADDRESS MICROPHONE AND PRE-AMP AND ALL WIRING BACK TO THE SOURCE WITHIN THE KIOSKS, INVENTORY AND DELIVER TO THE CTA'S WEST SHOPS.
9. DISCONNECT AND COMPLETELY REMOVE THE EXISTING CUSTOMER ASSISTANT PUSH BUTTONS AND ALL WIRING BACK TO THE SOURCE, INVENTORY AND DELIVER TO THE CTA'S WEST SHOPS.
10. DISCONNECT AND COMPLETELY REMOVE THE EXISTING TELEPHONE IN THE KIOSKS AND ALL WIRING BACK TO THE SOURCE, INVENTORY AND DELIVER TO THE CTA'S WEST SHOPS.

NOTES FOR SHEET E-1501B:

1. THE CONTRACTOR SHALL PREPARE FINAL DETAILED SHOP DRAWINGS BASED ON THE DESIGN DIRECTIVE DRAWINGS PRESENTED HEREIN AND AS SPECIFIED IN THE SPECIFICATIONS, TO BE REVIEWED AND APPROVED BY THE CTA.
2. THE STATION AND PLATFORM SHALL REMAIN IN SERVICE AT ALL TIMES. THE CONTRACTOR SHALL ENSURE THE ELECTRICAL SYSTEM REMAINS ENERGIZED 24 HOURS PER DAY INCLUDING ALL COMMUNICATION AND SIGNALLING SYSTEMS. ANY INTERRUPTION OF ELECTRICAL POWER DUE TO THE WORK SHALL BE COORDINATED WITH THE CTA. THE CONTRACTOR SHALL PROVIDE A WRITTEN NOTICE REQUEST 30 DAYS IN ADVANCE TO THE CTA FOR ANY REQUESTED ELECTRICAL SHUTDOWN.
3. THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL BY THE CTA AN ELECTRICAL AND COMMUNICATION STAGING PLAN TO ENSURE A MINIMUM OF DOWNTIME TO ANY CTA SYSTEM. PA AND TELEPHONE SERVICE SHALL BE MAINTAINED PER THE CTA APPROVED CONTRACTOR STAGING PLAN.
4. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE GENERAL CONDITION OF THE WORK AND PROVIDE POWER AND LIGHTING AS REQUIRED TO KEEP THE STATION IN OPERATION AT ALL TIMES PER THE CTA APPROVED CONTRACTOR STAGING PLAN. THE CONTRACTOR SHALL PROVIDE POWER AND LIGHTING FOR ALL TRADES. COORDINATE DEMOLITION WITH ALL OTHER DISCIPLINES.
5. ALL EXISTING ITEMS TO BE REMOVED SHALL BE INVENTORIED BY THE CONTRACTOR AND DELIVER TO THE CTA'S WEST SHOPS OR DISPOSED OF PER THE DIRECTION OF THE CTA.
6. DISCONNECT AND/OR REMOVE EXISTING LIGHTING FIXTURES, WALL SWITCHES, OUTLETS, AND ASSOCIATED CONDUITS AND WIRING AS SHOWN ON THE ARCHITECTURAL DRAWINGS.
7. DISCONNECT AND COMPLETELY REMOVE EXISTING PEOPLE HEATER, PUSH BUTTON, AND ALL WIRING BACK TO THE SOURCE. HEATERS SHALL BE INVENTORIED AND DELIVERED TO THE CTA'S WEST SHOPS.
8. DISCONNECT AND COMPLETELY REMOVE EXISTING PUBLIC ADDRESS HORN SPEAKERS ALONG THE PLATFORM, BRACKETS, AND ALL WIRING BACK TO THE SOURCE. SPEAKERS SHALL BE INVENTORIED AND DELIVERED TO THE CTA'S WEST SHOPS.

9. DISCONNECT AND COMPLETELY REMOVE THE PUBLIC ADDRESS MICROPHONE AND PRE-AMP, TELEPHONE, AND ALL WIRING BACK TO THE SOURCE WITHIN THE SUPERVISOR BOOTH, INVENTORY AND DELIVER TO THE CTA'S WEST SHOPS.
10. THE CONTRACTOR SHALL DISCONNECT AND COMPLETELY REMOVE THE EXISTING PA CABINET AND COMPONENTS IN THE PLATFORM LEVEL ELECTRICAL ROOM, INVENTORY AND DELIVER TO THE CTA'S WEST SHOPS. PA SYSTEM OPERATION SHALL BE MAINTAINED PER THE CTA APPROVED CONTRACTOR STAGING PLAN.
11. THE EXISTING CUSTOMER ASSISTANT PUSH BUTTON SHALL REMAIN INTACT. CONDUIT AND WIRING SHALL BE REROUTED FROM THE ELECTRICAL ROOM PA CABINET TO THE NEW COMMUNICATION ROOM WALLFIELD.
12. DISCONNECT AND COMPLETELY REMOVE THE EXISTING CTA PLATFORM TELEPHONES AND ALL WIRING BACK TO THE SOURCE, INVENTORY AND DELIVER TO THE CTA'S WEST SHOPS.
13. THE CONTRACTOR SHALL RELOCATE EXISTING CTA TELEPHONE SERVICE FROM THE ELECTRICAL ROOM TO THE NEW COMMUNICATION ROOM. TELEPHONE SERVICE SHALL BE MAINTAINED PER THE CTA APPROVED CONTRACTOR STAGING PLAN. THE TELEPHONE TERMINAL CABINET (TTC) IN THE ELECTRICAL ROOM SHALL BE REMOVED. ALL CTA COMMUNICATION CIRCUITS TERMINATING AT THE TTC SHALL BE REROUTED WITH NEW WIRING AND CONDUIT TO THE NEW COMMUNICATION WALLFIELD. THE CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING CTA TELEPHONE TERMINAL CABINET ONLY AFTER THE NEW COPPER SYSTEM IS INSTALLED, TESTED, AND APPROVED IN ACCORDANCE WITH THE STAGING PLAN SUBMITTED BY THE CONTRACTOR.
14. ALL AMERITECH CIRCUITS SHALL BE RELOCATED FROM THE ELECTRICAL ROOM TO THE NEW COMMUNICATION ROOM. THE CONTRACTOR SHALL COORDINATE WITH AMERITECH AND THE CTA TO ARRANGE FOR THE RELOCATION OF THE AMERITECH NETPOP TO THE NEW COMMUNICATION ROOM WALLFIELD.
15. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING WOODEN TELEPHONE JUNCTION BOXES AFTER NEW COPPER TELEPHONE CABLE HAS BEEN SPLICED TO EXISTING PRESSURIZED CTA COPPER BACKBONE CABLE IN THE UNDERGROUND DUCTBANK AT EACH END OF THE STATION PLATFORM.

SENSITIVE SECURITY INFORMATION**CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT****567 WEST LAKE STREET****CHICAGO, IL 60661****RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION**

Chicago Transit Authority

**ADDISON STATION
ELECTRICAL/COMMUNICATION
DEMOLITION - STATION LEVEL**

Scale: As Noted

Date: 03/17/99

J.O. No.

Drawing No.

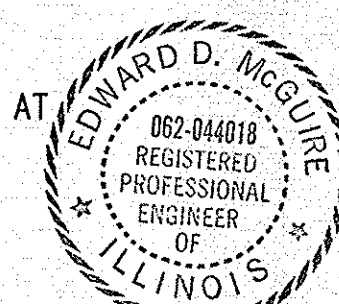
E-1501A

In Charge KJA
Designed By MYM
Drawn By HZ
Checked By HCN
Approved By

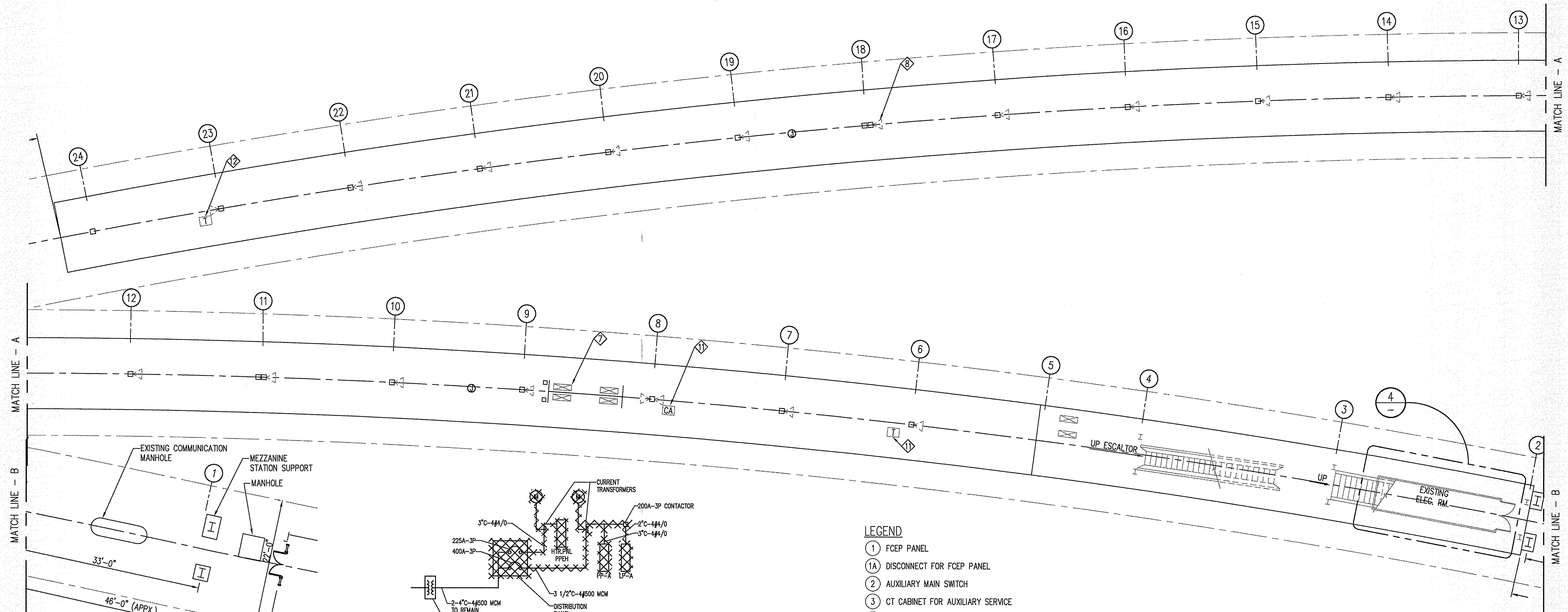
Revision	Date	Approved	Description
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De Leuw, Cather & Company

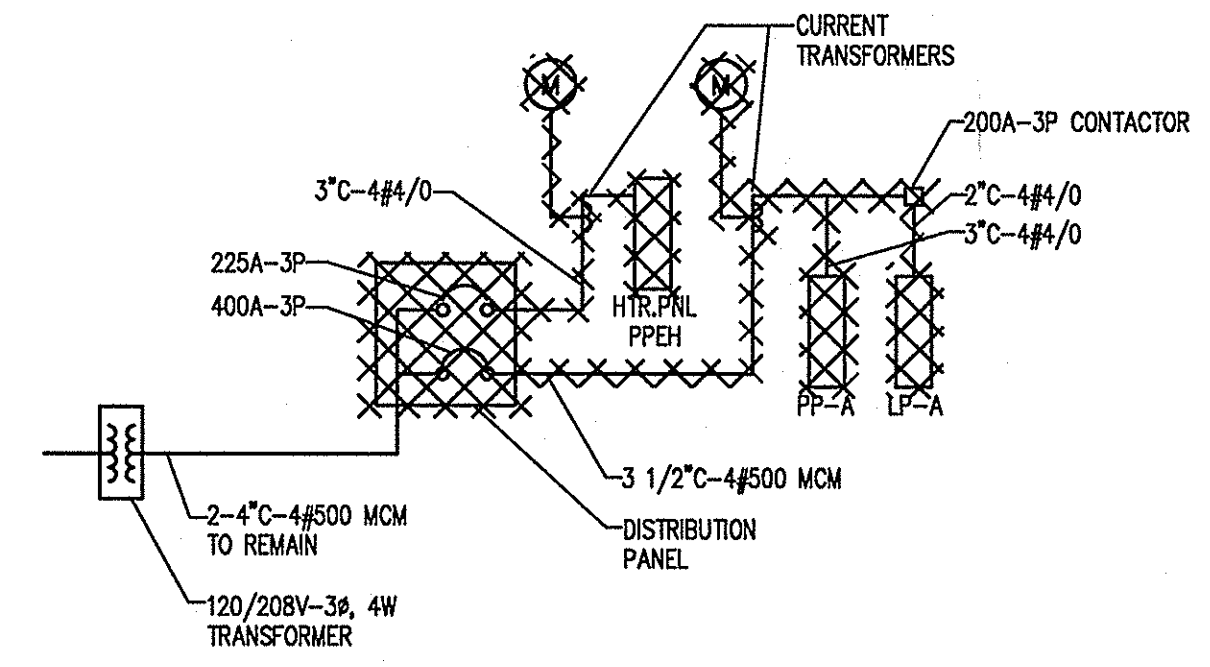
PARSONS TRANSPORTATION GROUP
In association withROSS BARNEY+JANKOWSKI, INC.
ARCHITECTS
KOWALENKO & BILOTTI, INC.
ENVIRONMENTAL CONSULTANTS

4-16-99

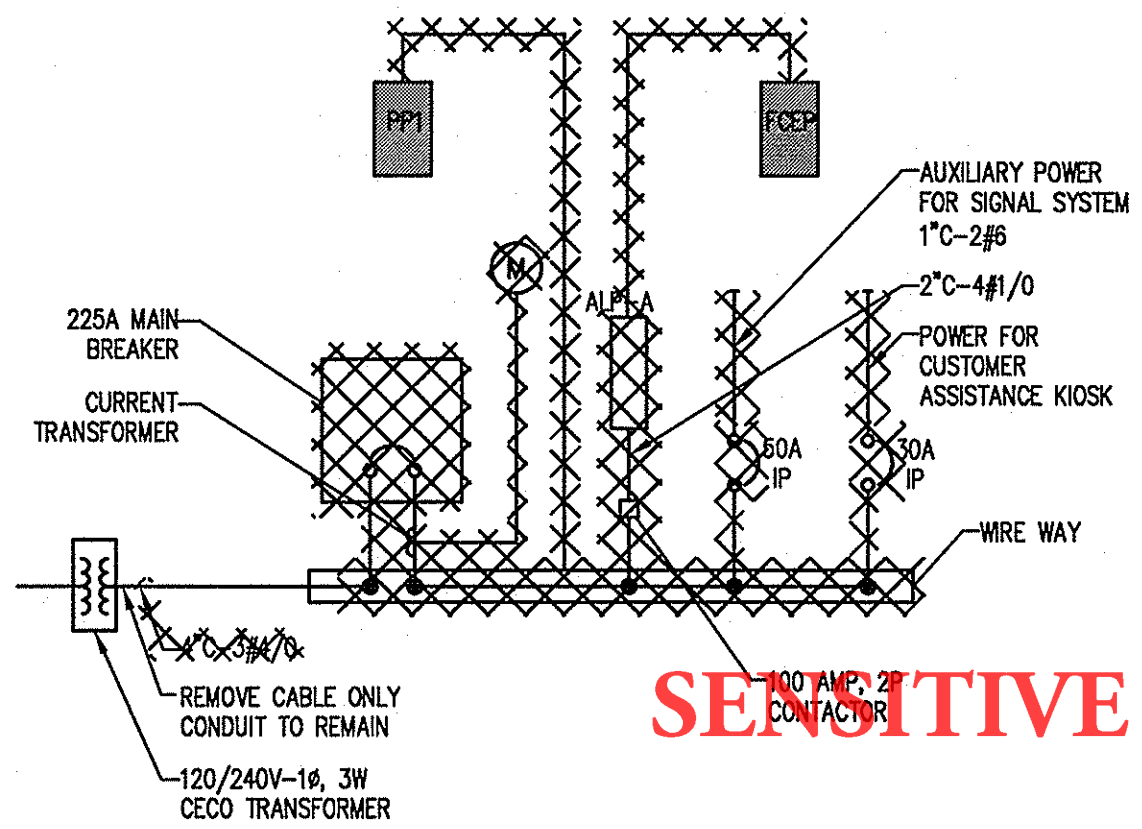


1 EXISTING PLATFORM PLAN
SCALE: 1/8"=1'-0"

2 SINGLE LINE DIAGRAM OF EXISTING NORMAL SYSTEM
SCALE: NTS



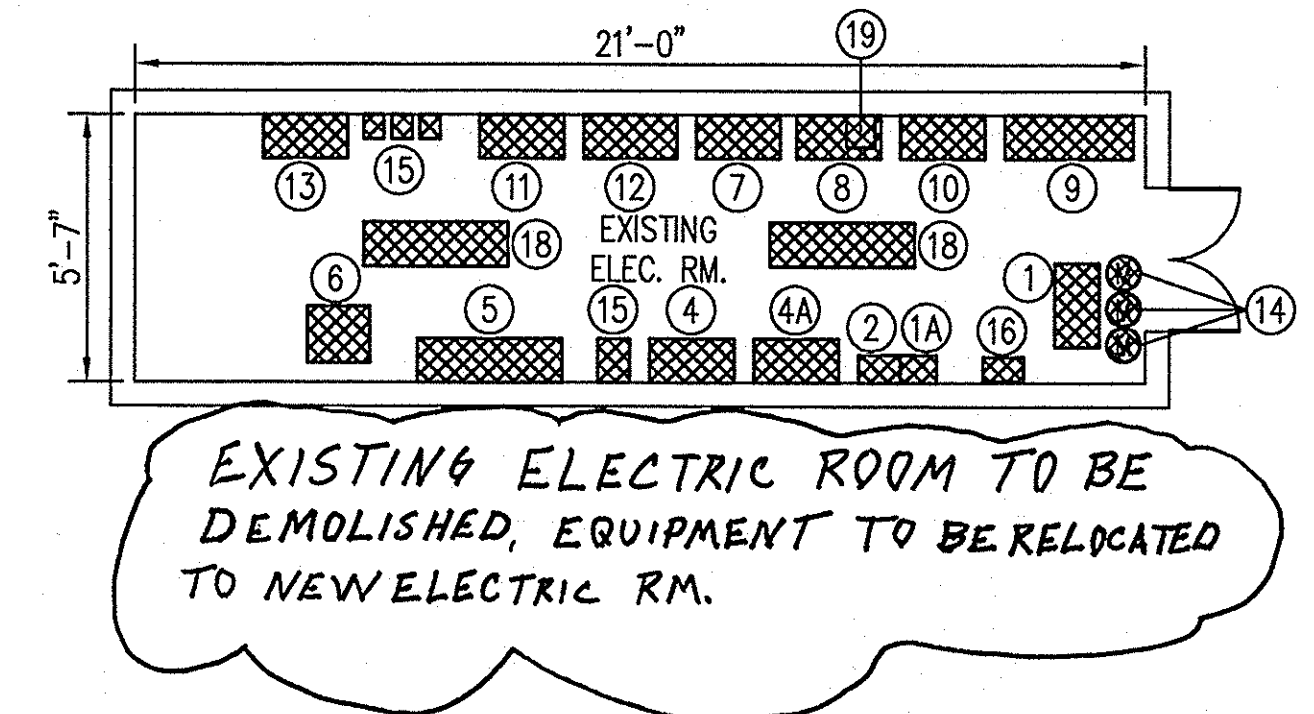
3 SINGLE LINE DIAGRAM OF EXISTING AUXILIARY SYSTEM
SCALE: NTS



LEGEND

- 1 FCEP PANEL
- 1A DISCONNECT FOR FCEP PANEL
- 2 AUXILIARY MAIN SWITCH
- 3 CT CABINET FOR AUXILIARY SERVICE
- 4 PANEL ALPA
- 4A DISCONNECT FOR FCEP PANEL
- 5 ESCALATOR CONTROL PANEL AND DISCONNECT SWITCH
- 6 PA CABINET
- 7 PANEL PPEH AND HEATING CONTROLS
- 8 CT CABINET FOR HEATING PANEL
- 9 MAIN CIRCUIT BREAKER PANEL (NORMAL SERVICE)
- 10 CT CABINET FOR MAIN CIRCUIT BREAKER PANEL
- 11 PANEL LPA AND LIGHTING CONTROLS
- 12 PANEL PPA
- 13 PP1 PANEL
- 14 CECO METERS
- 15 SIGNAL EQUIPMENT
- 16 TELEPHONE TERMINAL BOARD
- 18 LIGHTING FIXTURE
- 19 WALL HEATER

4 EXISTING ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1/4"=1'-0"



EXISTING ELECTRICAL ROOM TO BE DEMOLISHED, EQUIPMENT TO BE RELOCATED TO NEW ELECTRICAL RM.

SENSITIVE SECURITY INFORMATION

CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET
CHICAGO, IL 60661

RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION

Chicago Transit Authority



ADDISON STATION
ELECTRICAL/COMMUNICATION
DEMOLITION PLATFORM LEVEL

Drawing No.
E-1501B

In Charge	KJA			
Designed By	MYM			
Drawn By	HZ			
Checked By	HCN			
Approved By				
Revision	Date	Approved	Description	
0	3/17/99		ISSUED FOR BIDDING	
	3/29/00		PERMIT REVISION	

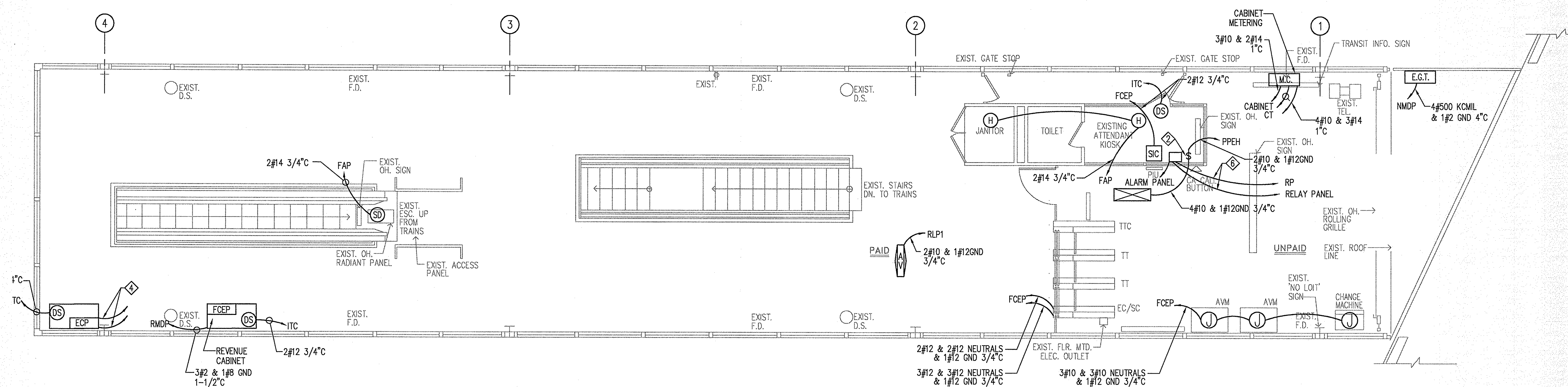
De Leuw, Cather & Company
PARSONS TRANSPORTATION GROUP
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ROSS BARNEY+JANKOWSKI, INC.
ARCHITECTS
KOWALENKO & BILOTTI, INC.
ENVIRONMENTAL CONSULTANTS





321

505

**STATION PLAN**

SCALE: 1/4" = 1'

NOTES:

1. PROVIDE 1-20A, 208V, 2P CIRCUIT BREAKER AT PPEH FOR PEOPLE HEATERS.
2. 30A, 2P MANUAL SWITCH FOR PEOPLE HEATER.
3. NOT USED
4. 2-2" ONE WITH POWER WIRING, ONE WITH CONTROL WIRING FROM JUNCTION BOX FROM FORMER ELECTRICAL ROOM, TO ESCALATOR CONTROL PANEL. POWER WIRING SHOULD BE RAN FROM NMDP. CONTROL WIRING SHOULD BE RAN FROM FORMER LOCATION OF ESCALATOR CONTROL PANEL OR DIRECTLY FROM ESCALATOR WELLWAY.
5. ALL FARE COLLECTION EQUIPMENT CONDUITS SHALL BE INTERCEPTED AT THE LOCATIONS CONVINIENT FOR CONDUIT TO BE REROUTED TO NEW LOCATION OF FCEP.
6. 2#12 3/4" FOR POWER WIRING TO RELIABLE PANEL (RP). 1-2" FOR CONTROL WIRING TO RELAY PANEL. SEE REFERENCE DRAWINGS (E-34 AND E-35 FROM CHICAGO/STATE STATION CDOT NO. D-3-056) FOR NUMBER OF CONTROL WIRES.

SENSITIVE SECURITY INFORMATION**CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT****567 WEST LAKE STREET****CHICAGO, IL 60661****RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION**

Chicago Transit Authority

**ADDISON STATION
ELECTRICAL PLAN
STATION LEVEL**

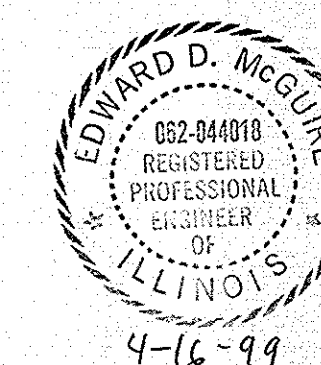
Drawing No.

E-1502A

Scale: As Noted

Date: 03/17/99

J.O. No.



4-16-99

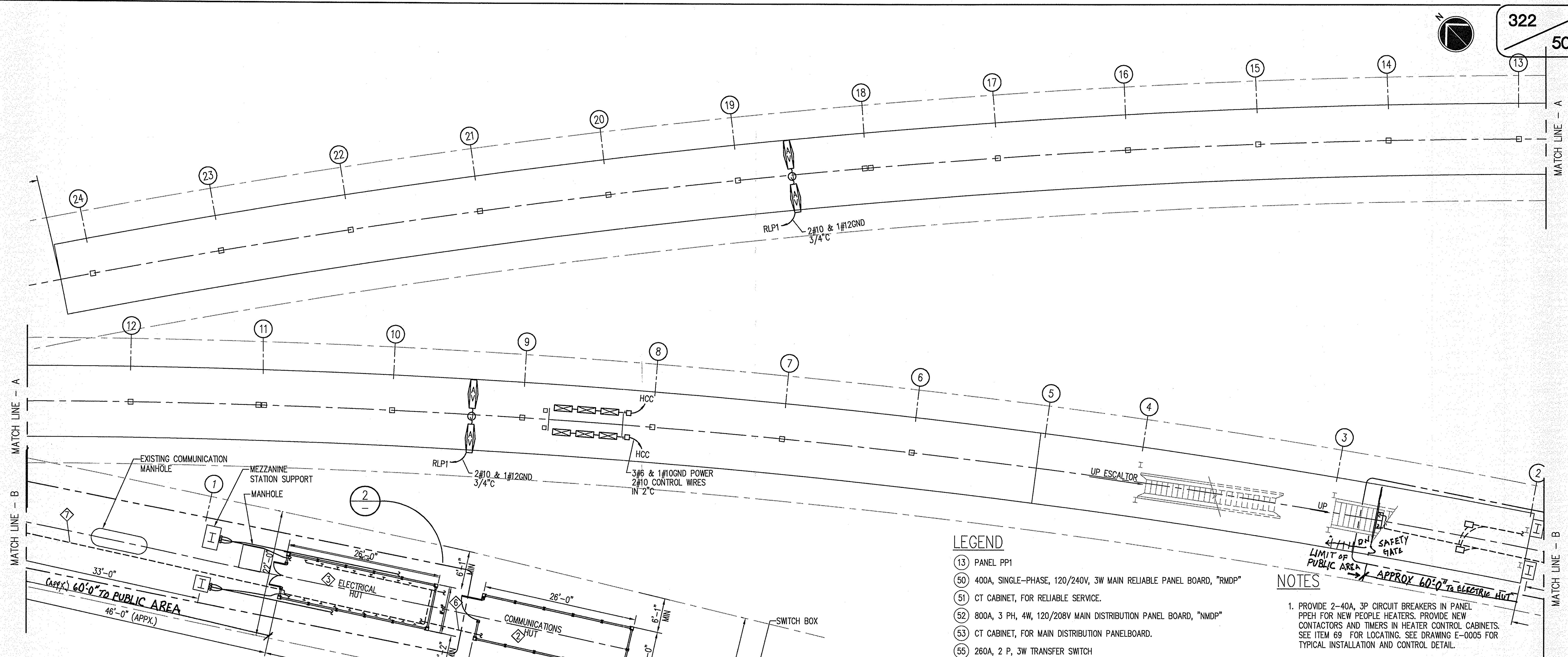
3622 W. Addison Avenue, 60618

In Charge KJA
Designed By MYM
Drawn By HZ
Checked By HCN
Approved By

Revision	Date	Approved	Description
0	3/17/99		ISSUED FOR BIDDING



De Leuw, Cather & Company
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ARCHITECTS
KOWALENKO & BILOTTI, INC.
ENVIRONMENTAL CONSULTANTS



LEGEND

- 13 PANEL PP1
- 50 400A, SINGLE-PHASE, 120/240V, 3W MAIN RELIABLE PANEL BOARD, "RMDP"
- 51 CT CABINET, FOR RELIABLE SERVICE.
- 52 800A, 3 PH, 4W, 120/208V MAIN DISTRIBUTION PANEL BOARD, "NMDP"
- 53 CT CABINET, FOR MAIN DISTRIBUTION PANELBOARD.
- 55 260A, 2 P, 3W TRANSFER SWITCH
- 56 INTERFACE TERMINAL CABINET
- 57 225A, 3 PH, 120/208V, 4W PANEL LP1.
- 58 400A, 3P, 4W MAIN RELIABLE SERVICE SWITCH
- 400 NOTIFIED AFP200 FIRE ALARM PANEL OR APPROVED EQUAL.
- 60 100A, SINGLE-PHASE, 120/240V, 3W, PANEL RLP1 AND LIGHTING CONTROLS.
- 60A 100A, SINGLE-PHASE, 120/240V, 3W PANEL RLP2
- 61 FUTURE RELAY PANEL
- 62 225A, 3 PH, 120/208V, 4W PANEL PPEH.
- 63 CT CABINET FOR PANEL PPEH.
- 64 100A, 3 PH, 120/208V, 4W PANEL LP2 AND LIGHTING CONTROLS.
- 65 225A, 3 PH, 120/208V, 4W PANEL PPA.
- 66 NEMA 3R SPlicing/PULL BOX SIZE AS REQUIRED FOR SERVICE WIRING TO RELIABLE SERVICE SWITCH.
- 67 NEMA 3R SPlicing/PULL BOX SIZE AS REQUIRED TO EXTEND ALL BRANCH CIRCUIT WIRING TO PANELS PP1, LP2, RLP1, RLP2, PPEH, PPA.
- 68 NEMA 3R SPlicing/PULL BOX SIZE AS REQUIRED FOR SERVICE WIRING TO MAIN DISTRIBUTION PANEL BOARD "NMDP" VIA CT CABINET.
- 69 HEATING CONTROLS FOR INFRARED PEOPLE HEATERS.
- 70 WALL MOUNTED HEATER, 14.8 KW

NOTES

- PROVIDE 2-40A, 3P CIRCUIT BREAKERS IN PANEL PPEH FOR NEW PEOPLE HEATERS. PROVIDE NEW CONTACTORS AND TIMERS IN HEATER CONTROL CABINETS. SEE ITEM 69 FOR LOCATING. SEE DRAWING E-0005 FOR TYPICAL INSTALLATION AND CONTROL DETAIL.
- SEE DRAWING E-1504 FOR TYPICAL COMMUNICATION HUT POWER/LIGHTING PLAN.
- SEE DRAWING E-1504 FOR TYPICAL ELECTRICAL HUT POWER/LIGHTING PLAN.
- #4/0 BARE COPPER
- 1 1/4" PVC SLEEVE THRU WALL CHAULK TIGHT WITH SEALANT.
- CONDUIT AND CABLES ROUTED FROM ELECTRICAL HUT TO COMMUNICATION HUT. SEE DRAWING E-0004 FOR DUCT BANK DETAILS.
- PROVIDE CONCRETE ENCASED DUCT BANK BETWEEN EXISTING ELECTRICAL ROOM AND NEW ELECTRICAL HUT. ALL UNDERGROUND DUCTS SHALL BE FIBERGLASS SIZED PER SINGLE LINE DIAGRAMS.
- EXISTING 2-4" CONDUITS WITH 4#500 KCMIL FOR NORMAL SERVICE AND 1-4"C WITH 3#4/0 FOR RELIABLE SERVICE.
- ALL BRANCH CONDUIT AND WIRING COMING FROM PLATFORM UNDERNEATH OF BRIDGE SHALL BE REROUTED TO ELECTRICAL ROOM TO NEW PANELS LP2, PPA, PPEH, PP1, RLP1, RLP2
- ALL BRANCH CONDUIT AND WIRING COMING TO FORMER PANELS AND FORMER ELECTRICAL ROOM FROM UNDERNEATH OF PLATFORM SHALL BE REROUTED TO THIS SPlicing BOX. PROVIDE NEMA 3R, 4"x3"x1.2" SPlicing BOX DIVIDED TO TWO COMPARTMENTS. ONE FOR BRANCH CONDUIT WIRING FOR NORMAL SERVICE PANELS ONE FOR BRANCH CONDUIT WIRING FOR BRANCH CONDUIT WIRING FOR RELIABLE SERVICE PANELS.
- PROVIDE 2-20A, 120V, 1P CIRCUIT BREAKERS AT PANEL RLP1 FOR AV SIGNS.



1 PLATFORM PLAN
SCALE: 1/8"=1'-0"

2 ELECTRICAL HUT
SCALE: 1/4"=1'-0"

SENSITIVE SECURITY INFORMATION
CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET
CHICAGO, IL 60661

<p>In Charge KJA</p> <p>Designed By MYM</p> <p>Drawn By HZ</p> <p>Checked By HCN</p> <p>Approved By</p>	<p>Revision 0</p> <p>Date 3/20/00</p> <p>Date 4/24/99</p> <p>Date 3/17/99</p> <p>PERMIT REVISIONS</p> <p>Revision and Clarifications as noted on drawings</p> <p>ISSUED FOR BIDDING</p>	<p>De Leuw, Cather & Company</p> <p>PARSONS TRANSPORTATION GROUP</p> <p>In association with</p> <p>ROSS BARNEY+JANKOWSKI, INC.</p> <p>ARCHITECTS</p> <p>KOWALENKO & BILOTTI, INC.</p> <p>ENVIRONMENTAL CONSULTANTS</p>	<p>CHICAGO TRANSIT AUTHORITY</p> <p>RED AND BLUE LINE</p> <p>STATION RENOVATION CONSTRUCTION</p>	<p>Chicago Transit Authority</p> <p>cta</p>	<p>ADDISON STATION</p> <p>ELECTRICAL PLAN</p> <p>PLATFORM LEVEL</p> <p>Scale: As Noted</p> <p>Date: 03/17/99</p> <p>J.O. No.</p>	<p>Drawing No.</p> <p>E-1502B</p>
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ADDISON 3622 W. Addison Avenue, 60618

Per meeting between Milt Paterson City of Chicago Chief Electrical Inspector & Douglas Cunningham Electrical Project Manager Walsh Construction Company on 2/3/00.- Walsh Construction has been directed to resubmit drawings with ComEd letter of agreement for Primary Service Splice box. As resolution to City of Chicago code issue 14-16-535(d) (3).

WALSH 2/04/00

WALSH
WALSH CONSTRUCTION
January 28, 2000

City of Chicago Department of Buildings Bureau of Electrical Inspection
Mr. Milton Patterson, Chief Electrical Inspector
121 N. LaSalle Street
Chicago, IL 60602

RE: Request to Utilize Primary Service Splice-Box
Walsh Project No. 99065

Mr. Patterson:

The following is a list of the CTA RT Stations at which we are
primary service splice-boxes with cooperation from Comm

Station
Cermak - Chinatown Station
Sox - 35th Street Station
47th Street Station
Garfield Street Station (Red)
63rd Street Station
69th Street Station
79th Street Station
87th Street Station
Montrose Station
Addison Station
UIC - Halsted Station
UIC - Halsted Station
Kedzie - Homan
Bryn Mawr

Please

Very

Walsh Co.

Douglas R. Cunningham,
Electrical Project Manager

cc: Jack Arora, CTA

1377 W. Washington Boulevard, Suite 102, Chicago, Illinois

CC: G. ZHEA ✓
C. C. M. P. S.
J. P. S.
1/31/00

323

505

FOR LOCATION.

2A FOR LOCATION.

JA, ONE POLE AND 3-15A, 2P
DRAWING CO-1501B FOR LOCATION.

SE BOX 2 SETS OF 4 #500 KCMIL IN

CTRICAL HUT. SEE DRAWING E-1502B

PANELS RLP1 & RLP2 WITH 30-20A, 1
ATE EXISTING BRANCH CIRCUITS AND USE
JS. PROVIDE LIGHTING CONTACTOR AND TIME
NEL. SEE DRAWING E-1502B FOR LOCATION.

NEL PPEH. PROVIDE 3-40A-3P: 1-30A-3P:
AKERS TO MATCH EXISTING CIRCUITS WITH
E-1502B FOR LOCATION.

PANEL PPEH. PROVIDE 1-50A-1P: 2-30A-3P:
ANCH CIRCUIT BREAKERS TO MATCH EXISTING CIRCUITS
E-1502B FOR LOCATION.

4 W PANEL LP2. PROVIDE 42-20A-1P BRANCH CIRCUIT
ACTOR AND TIME CLOCK TO CONTROL LIGHTING LOADS ON
2B FOR LOCATION.

CONNECTION BOX. SEE DRAWING E-1502A FOR LOCATION.

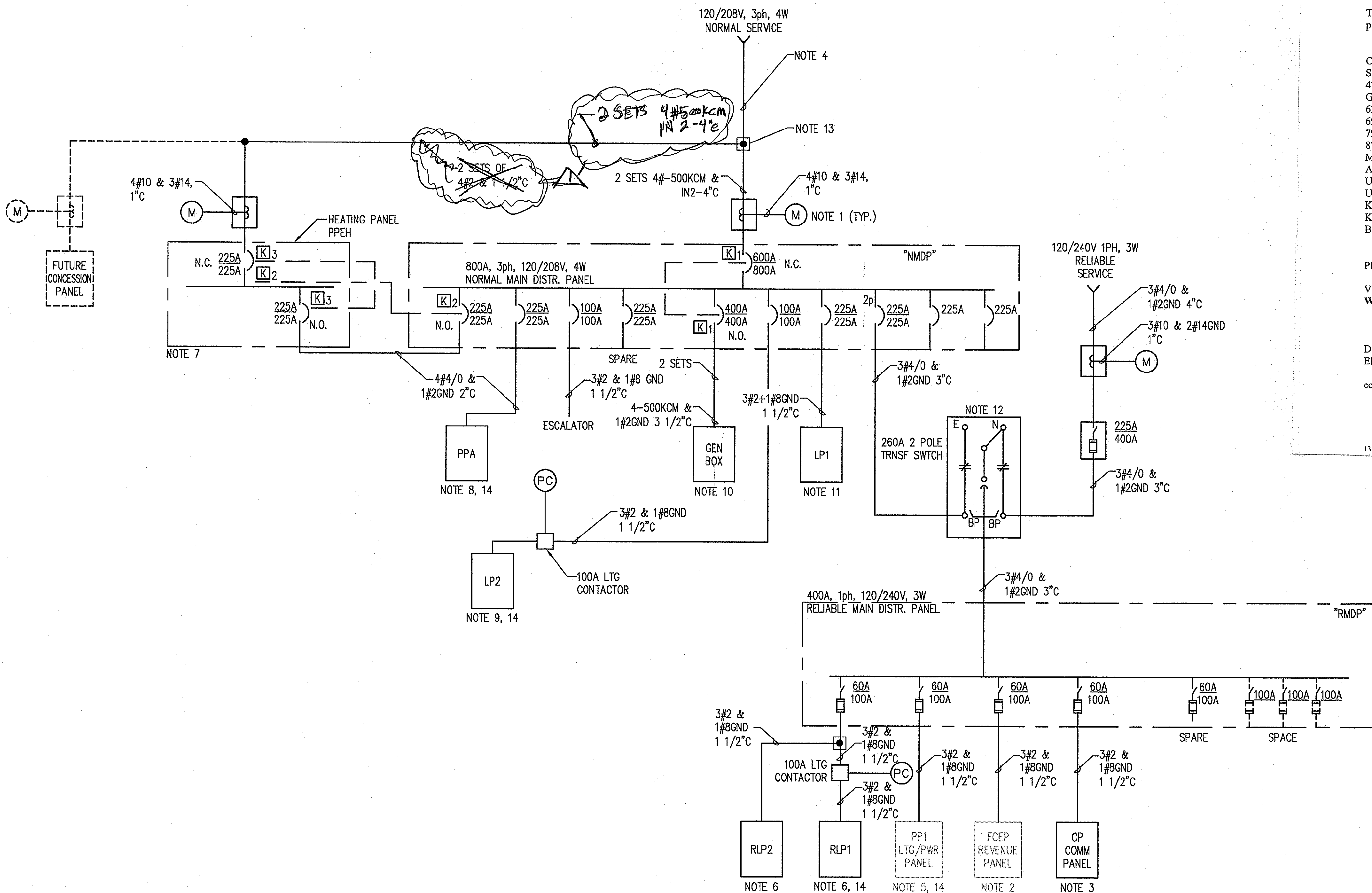
0/208V, 4W WITH 42-20A, 1 POLE CIRCUIT BREAKERS, PANEL, LP1.
LOCATION.

TRANSFER SWITCH WITH BYPASS. SEE DRAWING E-1502B FOR LOCATION

13. PROVIDE NEMA 3R SPLICING/PULL BOX. PROVIDE NEW CONDUIT AND WIRING FROM SPLICING/PULL
BOX TO CURRENT TRANSFORMER CABINET(S).

14. PROVIDE NEMA 3R SPLICING/PULL BOX. EXTEND BRANCH CIRCUIT WIRING TO NEW LOCATION OF PP1.

15. PROVIDE METER SOCKET SIZE PER SERVICE.



SENSITIVE SECURITY INFORMATION

CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET
CHICAGO, IL 60661

RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION

Chicago Transit Authority



ADDISON STATION
ELECTRICAL SINGLE LINE
DIAGRAM

Scale: As Noted Date: 03/17/99 J.O. No.

Drawing No.

E-1503

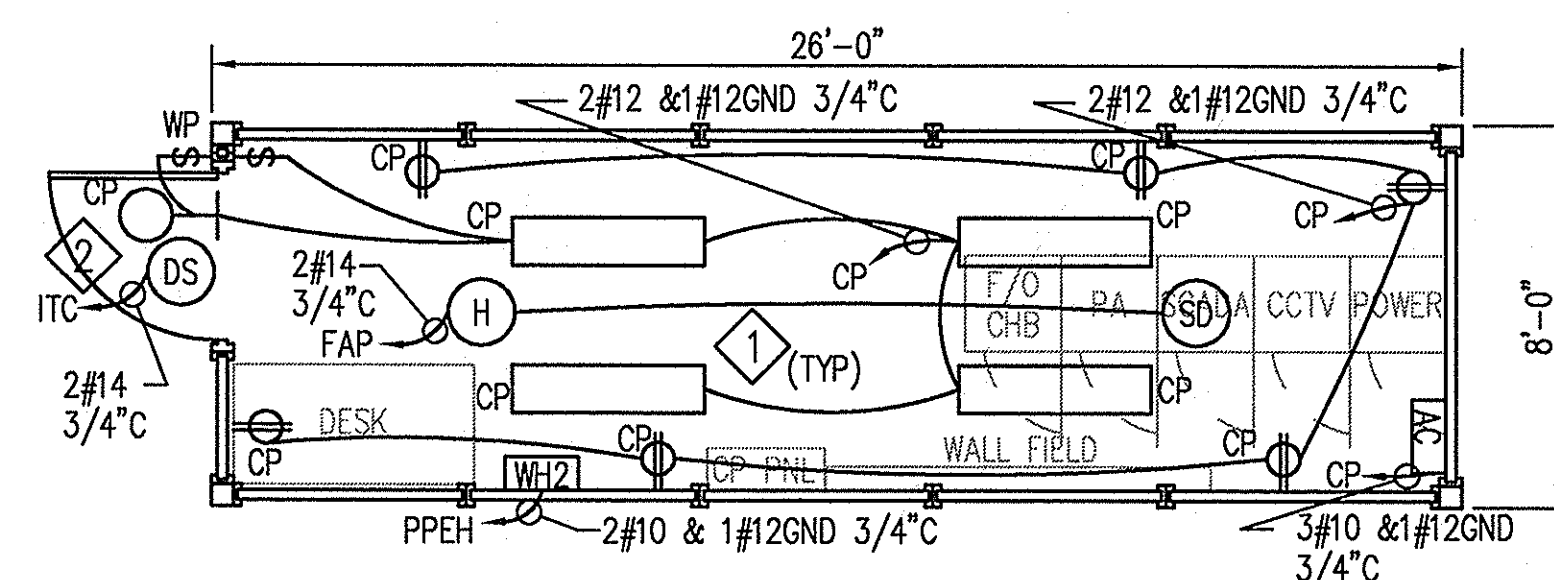
In Charge KJA
Designed By MYM
Drawn By HZ
Checked By HCN
Approved By

Revision	Date	Approved	Description
0	3/17/99		REVISIONS AND CLARIFICATIONS AS NOTED ON DRAWINGS. ISSUED FOR BIDDING

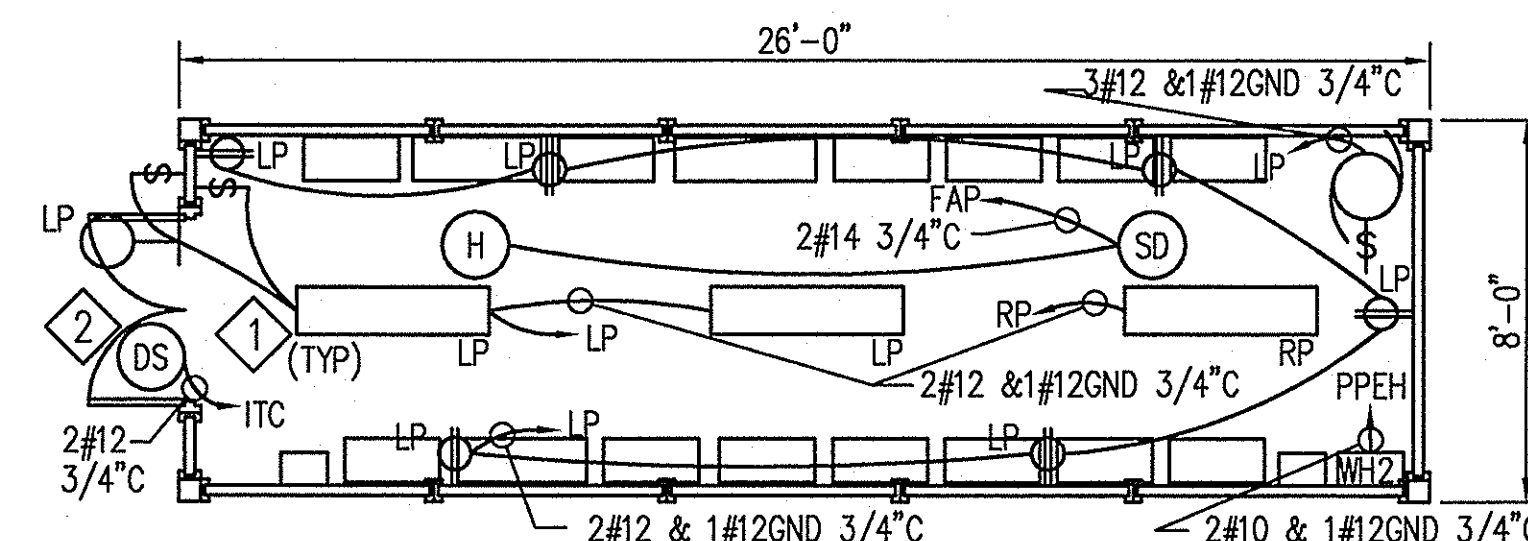
De Leuw, Cather & Company
PARSONS TRANSPORTATION GROUP
in association with
ROSS BARNEY + JANKOWSKI, INC.
ARCHITECTS
KOWALENKO & BILOTTI, INC.
ENVIRONMENTAL CONSULTANTS



ADDISON 3622 W. Addison Avenue, 60618



1 ADDISON COMMUNICATION HUT POWER AND LIGHTING PLAN
SCALE: 1/4" = 1'-0"



2 ADDISON ELECTRICAL HUT POWER AND LIGHTING PLAN
SCALE: 1/4" = 1'-0"

ADDISON STATION REFRIGERATION SCHEDULE

TAG # / UNIT #	NO. COMP.	COMP/TON	COMP/HP	REFRIGERANT	WT. REF.	REMOTE	SELF-CONTAINED	LOCATION	AIR/WATER COLLED	COMMENTS
COMM HUT AC UNIT	1	2	2 HP	R-22	3.6 LB		X	COMM HUT	AIR	SIMILAR TO BARD MODEL WA-241-A

REFRIGERATION NOTES:

1. INSTALL PRESSURE RELIEF VALVE ON HIGH PRESSURE SIDE OF SYSTEM, UPSTREAM OF ANY INTERVENING VALVES.
2. REMOVE EXPANSION VALVES, DEVICES, AND CONNECTIONS FROM AIR STREAM.
3. REFRIGERATION PIPING TO BE TYPE "K" COPPER.
4. ALL CONNECTIONS AND DEVICES TO BE BRAZED.

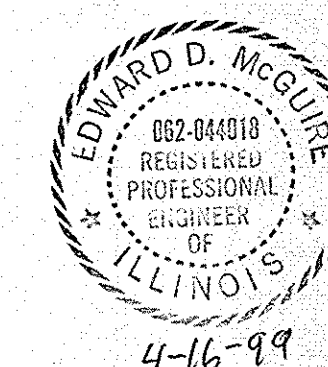
ADDISON STATION VENTILATION SCHEDULE

AREA OR ROOM #	LIST OF SPACE	FLOOR AREA SQ. FT.	CODE SUPPLY VENTILATION	CODE EXHAUST VENTILATION	DESIGN SUPPLY VENTILATION	DESIGN EXHAUST VENTILATION	COMMENTS
ELECT HUT	ELECTRICAL HUT	208 SF	N. R.	N. R.	---	200 CFM	

* FRESH AIR LOUVERS OR GRILL FREE AREA TO EQUAL 1% OF FLOOR AREA.

REFRIGERATION
REVIEWED

MAY 12 2000
DEPT. OF BUILDINGS



NOTES:

1. PROVIDE LIGHTING FIXTURE ICD43R-PE10-E1-FR BY HUBBELL OR AF10332120ESGEB BY LITHONIA OR APPROVED EQUAL.
2. PROVIDE LIGHTING FIXTURE PVL 00705-118 BY HUBBEL OR TWL 705120LP1 BY LITHOMIA OR APPROVED EQUAL.
3. RP DESIGNATES RELIABLE PANEL (RLP1, NMDC OR RMDP).
4. LP DESIGNATES RELIABLE PANEL (LP1 OR LPA).
5. LOCATION OF LP, CP AND RP MAY VARY, REFER ELECTRICAL PLANS FOR LOCATION FOR EACH STATION.
6. LOCATION OF ITC, FAP, AND PPEH MAY VARY. REFER ELECTRICAL PLANS FOR LOCATION EACH STATION.
7. PROVIDE LIGHTING FIXTURE VPX 1075 OR APPROVED EQUAL BY APPLETON BENJAMIN CROUSE HINDS.

8. WH2, wall mounted heater 4.8kw.

SENSITIVE SECURITY INFORMATION

**CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET
CHICAGO, IL 60661**

**RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION**

Chicago Transit Authority



**ADDISON ELECTRICAL
POWER AND LIGHTING PLAN
LAYOUT**

Scale: As Noted

Date: 03/17/99

J.O. No.

Drawing No.

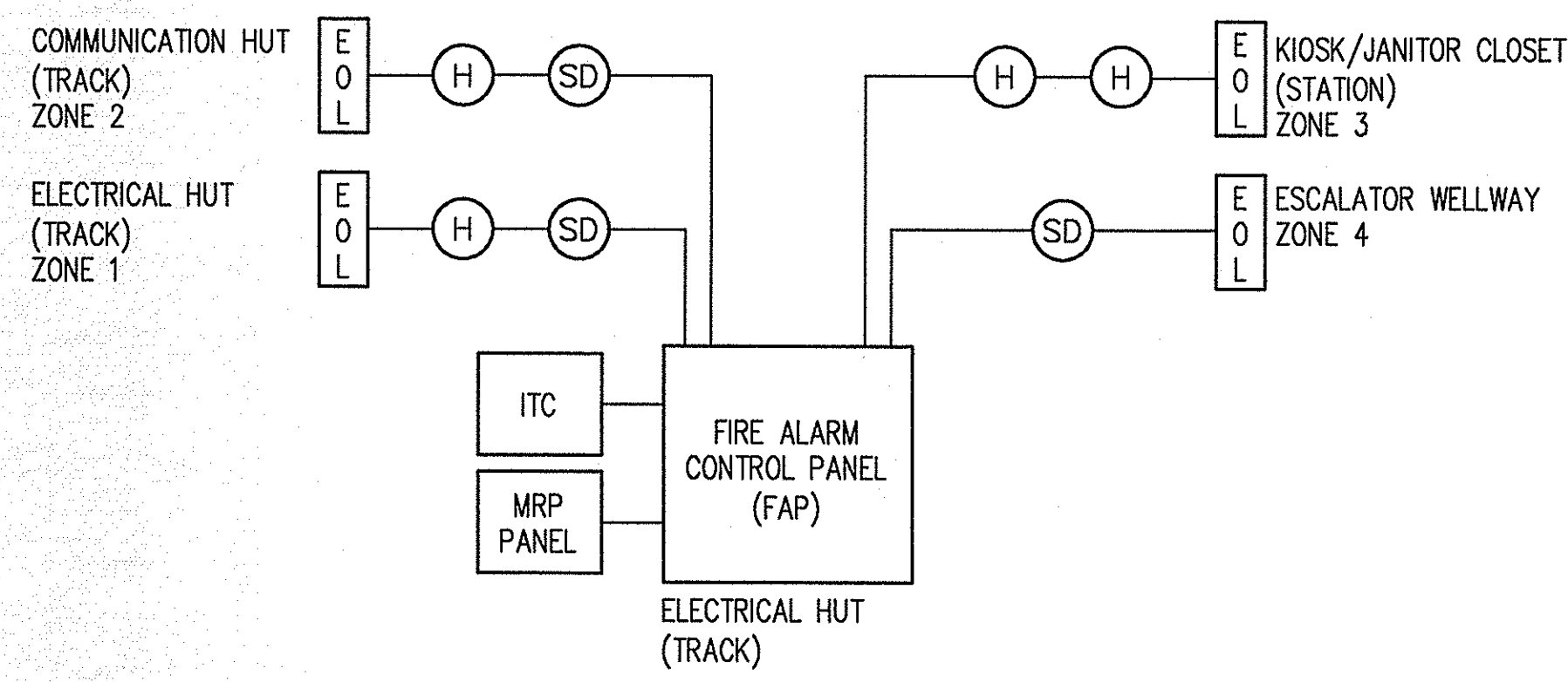
E-1504

In Charge KJA
Designed By MYM
Drawn By DPA
Checked By JJS
Approved By

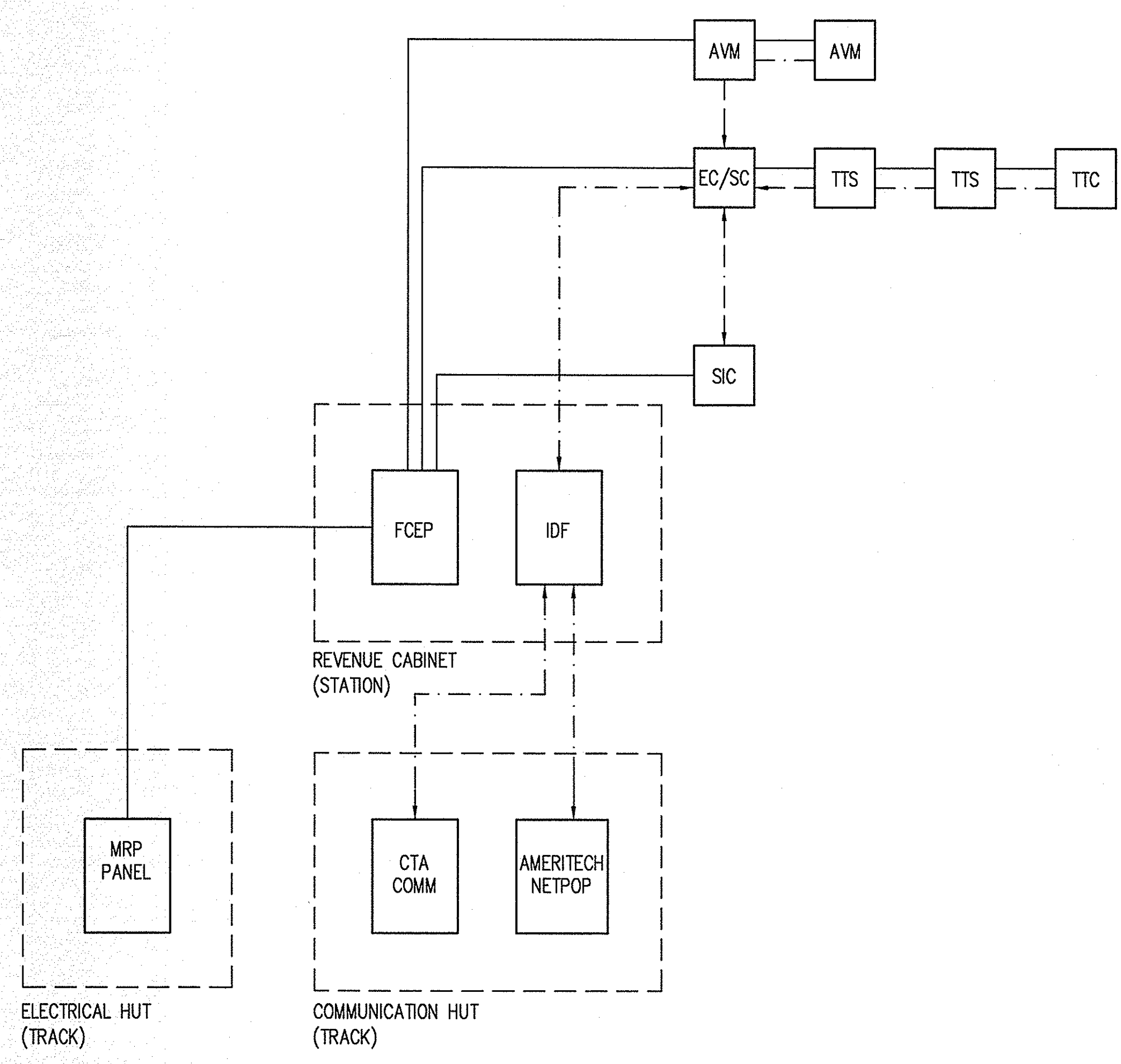
Revision	Date	Approved	Description
0	3/17/99		ISSUED FOR BIDDING

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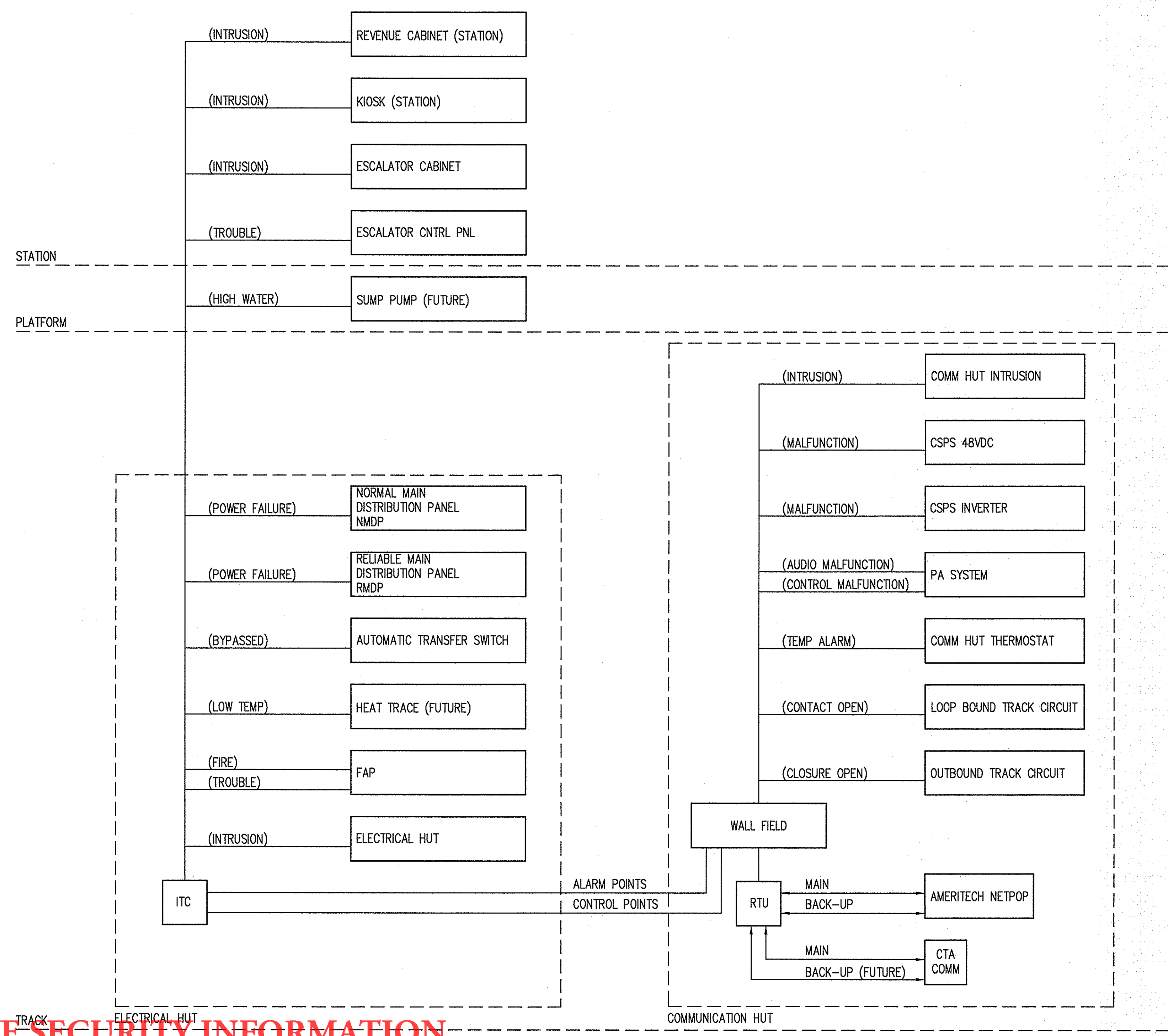
- NOTES:
1. FARE COLLECTION EQUIPMENT BREAKER CABINET LOCATED INSIDE END CABINET.
 2. INTERCONNECTION CONDUIT SIZE 3/4" (MINIMUM) UNLESS OTHERWISE NOTED.



1 FIRE ALARM SYSTEM BLOCK DIAGRAM
SCALE: NTS



2 FARE COLLECTION EQUIPMENT BLOCK DIAGRAM
SCALE: NTS



SENSITIVE SECURITY INFORMATION

CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET
CHICAGO, IL 60661

In Charge	KJA			
Designed By	KMc			
Drawn By	DPA			
Checked By	HCN			
Approved By				
Revision	Date	Approved	Description	
0	3/17/99		ISSUED FOR BIDDING	

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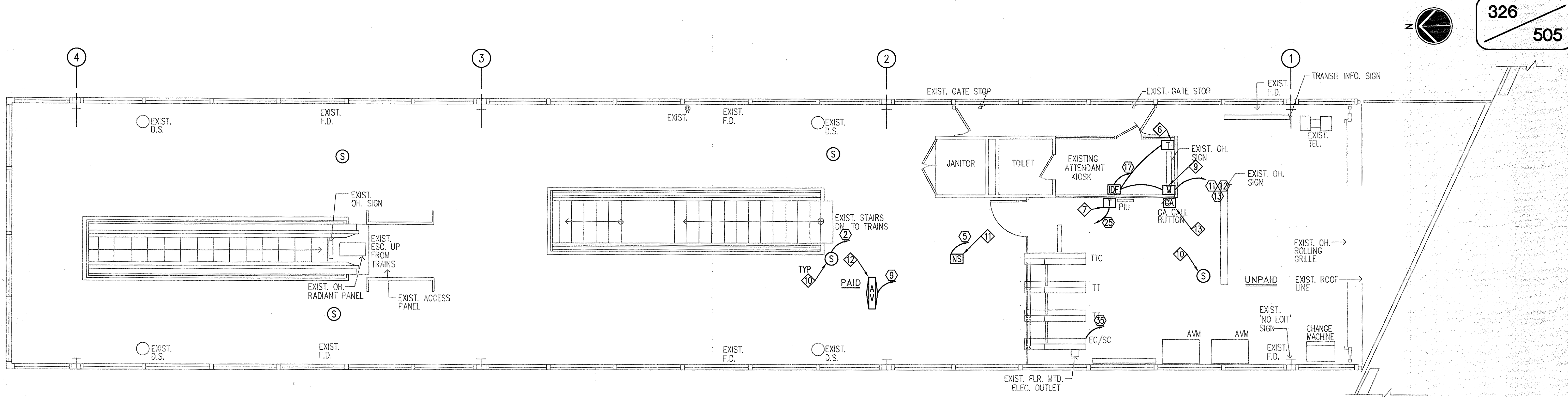
CHICAGO, IL 60661
RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION



ADDISON STATION
MISCELLANEOUS DETAILS
BLOCK DIAGRAMS
Scale: As Noted Date: 03/17/99 J.O. No.
Drawing No. E-1505



2 W. Addison Avenue, 60618



326
505

STATION PLAN

SCALE: 1/4" = 1'

NOTES FOR SHEET CO-1501A:

1. THE CONTRACTOR SHALL PREPARE FINAL DETAILED SHOP DRAWINGS BASED ON THE DESIGN DIRECTIVE DRAWINGS PRESENTED HEREIN AND AS SPECIFIED IN THE SPECIFICATIONS, TO BE REVIEWED AND APPROVED BY THE CTA.
2. THE DETAILED SHOP DRAWINGS PREPARED BY THE CONTRACTOR MUST BE APPROVED BY THE CTA PRIOR TO COMMENCEMENT OF ANY PROCUREMENT AND/OR CONSTRUCTION.
3. THE CONTRACTOR SHALL ENSURE THE COMMUNICATION SYSTEM REMAINS OPERATIONAL 24 HOURS PER DAY. ANY INTERRUPTION OF COMMUNICATION SERVICE, BOTH CTA AND AMERITECH, SHALL BE COORDINATED WITH THE CTA. THE CONTRACTOR SHALL PROVIDE A WRITTEN NOTICE REQUEST 30 DAYS IN ADVANCE TO THE CTA FOR ANY REQUESTED COMMUNICATION SHUTDOWN OR CUT-OVER FOR APPROVAL PRIOR TO INTERRUPTION OF ANY SERVICE.
4. THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL BY THE CTA, A COMMUNICATION STAGING PLAN TO ENSURE A MINIMUM OF DOWNTIME TO ANY PORTION OF THE COMMUNICATION SYSTEM.
5. THE CONDUIT ON THIS SHEET IS SHOWN SCHEMATICALLY FOR THE PURPOSE OF CLARITY. THE CONTRACTOR SHALL SUBMIT TO THE CTA, DURING THE SHOP DRAWING REVIEW PHASE, A DETAILED CONDUIT LAYOUT INSTALLATION PLAN FOR APPROVAL.
6. THE CONTRACTOR SHALL PROVIDE A CTA TYPE III KIOSK TELEPHONE AND 2 PAIR TELEPHONE CABLE TO THE KIOSK IDF, WITH NEW CONDUIT AND WIRING AS REQUIRED. THE CONTRACTOR SHALL PROVIDE A PROTECTOR BLOCK IDF IN THE KIOSK CONNECTED TO THE COMMUNICATION ROOM WALLFIELD. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.
7. THE CONTRACTOR SHALL PROVIDE A CTA TYPE V LOCK BOX TELEPHONE AND 2 PAIR TELEPHONE CABLE TO THE COMMUNICATION ROOM WALLFIELD, WITH NEW CONDUIT AND WIRING AS REQUIRED. THE TELEPHONE SHALL BE PROVIDED WITH A 2 PAIR PROTECTOR BLOCK BEHIND THE PHONE INSIDE THE LOCK BOX. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.
8. THE CONTRACTOR SHALL PROVIDE A CTA TYPE II EQUIPMENT ROOM TELEPHONE AND 2 PAIR TELEPHONE CABLE TO THE ROOM IDF, WITH NEW CONDUIT AND WIRING AS REQUIRED. THE CONTRACTOR SHALL PROVIDE A PROTECTOR BLOCK IDF IN THE ROOM CONNECTED TO THE COMMUNICATION ROOM WALL FIELD. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.

9. THE CONTRACTOR SHALL PROVIDE A CTA COMPLIANT PA MICROPHONE STATION AND SPEAKER WITHIN THE KIOSK AND THE SUPERVISOR BOOTH WIRED BACK TO THE PA EQUIPMENT IN THE COMMUNICATION ROOM. THE MICROPHONE STATION SHALL INCLUDE A MULTI-KEY KEYPAD AND LCD DISPLAY AS DEFINED IN THE SPECIFICATIONS. THE MICROPHONE STATION SHALL BE PERMANENTLY MOUNTED TO THE KIOSK OR BOOTH CONSOLE AND PROTECTED WITH A STAINLESS STEEL COVERING THE BASE OF THE UNIT. THE POWER FOR THE MICROPHONE STATION SHALL BE DIRECTLY FROM THE COMMUNICATION ROOM. PROVIDE NEW CONDUIT AND WIRING AS REQUIRED. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.
10. THE CONTRACTOR SHALL PROVIDE TYPE II PA CONE SPEAKERS WITH BAFFLE, WITH NEW CONDUIT AND WIRING AS REQUIRED TO EXTEND SPEAKER WIRING TO THE NEW COMMUNICATION ROOM PA INTERFACE.
11. THE CONTRACTOR SHALL PROVIDE AN AMBIENT NOISE LEVEL SENSOR WITH A DEDICATED 2 PAIR SHIELDED AUDIO CABLE INSTALLED TO THE COMMUNICATION ROOM PA INTERFACE, WITH NEW CONDUIT AND WIRING AS REQUIRED.
12. THE CONTRACTOR SHALL PROVIDE AUDIO/VISUAL VARIABLE MESSAGE SIGNS AT THE LOCATION(S) SHOWN. AUDIO/VISUAL SIGNS SHALL BE POWERED DIRECTLY FROM THE ELECTRICAL ROOM. DATA CIRCUITS SHALL BE DIRECTLY FROM THE COMMUNICATION ROOM. PROVIDE NEW CONDUIT AND WIRING AS REQUIRED.
13. THE CONTRACTOR SHALL PROVIDE A CTA CUSTOMER ASSISTANT PUSH BUTTON AND 2 PAIR TELEPHONE CABLE TO THE KIOSK IDF, WITH NEW CONDUIT AND WIRING AS REQUIRED. THE BUTTON SHALL BE ROUTED TO THE COMMUNICATION ROOM PA INTERFACE, WITH NEW CONDUIT AND WIRING AS REQUIRED.
14. THE CONTRACTOR SHALL PROVIDE EACH ELEVATOR CAB AND EACH HALL CALL STATION WITH A NEW TWO-WAY HANDSFREE INTERCOM CONNECTED TO A MASTER CONTROLLER IN THE NEW COMMUNICATION ROOM. THE INTERCOMS SHALL BE WIRED THROUGH THE ELEVATOR MACHINE ROOM TO A PROTECTOR BLOCK IDF. THE CONTRACTOR SHALL PROVIDE A PROTECTOR BLOCK IDF IN THE ROOM CONNECTED TO THE COMMUNICATION ROOM WALLFIELD. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS. THE ECS SHALL BE PROVIDED WITH AN AMERITECH CONNECTION TO THE CTA CONTROL CENTER WITH PROVISIONS TO CONVERT THE ECS TO CTA COMMUNICATIONS AS THE FIBER OPTIC BACKBONE BECOMES OPERATIONAL.

NOTES FOR SHEET CO-1501B

1. THE CONTRACTOR SHALL PREPARE FINAL DETAILED SHOP DRAWINGS BASED ON THE DESIGN DIRECTIVE DRAWINGS PRESENTED HEREIN AND AS SPECIFIED IN THE SPECIFICATIONS, TO BE REVIEWED AND APPROVED BY THE CTA.
2. THE DETAILED SHOP DRAWINGS PREPARED BY THE CONTRACTOR MUST BE APPROVED BY THE CTA PRIOR TO COMMENCEMENT OF ANY PROCUREMENT AND/OR CONSTRUCTION.
3. THE CONTRACTOR SHALL ENSURE THE COMMUNICATION SYSTEM REMAINS OPERATIONAL 24 HOURS PER DAY. ANY INTERRUPTION OF COMMUNICATION SERVICE, BOTH CTA AND AMERITECH, SHALL BE COORDINATED WITH THE CTA. THE CONTRACTOR SHALL PROVIDE A WRITTEN NOTICE REQUEST 30 DAYS IN ADVANCE TO THE CTA FOR ANY REQUESTED COMMUNICATION SHUTDOWN OR CUT-OVER FOR APPROVAL PRIOR TO INTERRUPTION OF ANY SERVICE.
4. THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL BY THE CTA, A COMMUNICATION STAGING PLAN TO ENSURE A MINIMUM OF DOWNTIME TO ANY PORTION OF THE COMMUNICATION SYSTEM.
5. THE CONDUIT ON THIS SHEET IS SHOWN SCHEMATICALLY FOR THE PURPOSE OF CLARITY. THE CONTRACTOR SHALL SUBMIT TO THE CTA, DURING THE SHOP DRAWING REVIEW PHASE, A DETAILED CONDUIT LAYOUT INSTALLATION PLAN FOR APPROVAL.
6. THE CONTRACTOR SHALL PROVIDE A CTA COMPLIANT PA MICROPHONE STATION AND SPEAKER WITHIN THE KIOSK AND THE SUPERVISOR BOOTH WIRED BACK TO THE PA EQUIPMENT IN THE COMMUNICATION ROOM. THE MICROPHONE STATION SHALL INCLUDE A MULTI-KEY KEYPAD AND LCD DISPLAY AS DEFINED IN THE SPECIFICATIONS. THE MICROPHONE STATION SHALL BE PERMANENTLY MOUNTED TO THE KIOSK OR BOOTH CONSOLE AND PROTECTED WITH A STAINLESS STEEL COVERING THE BASE OF THE UNIT. THE POWER FOR THE MICROPHONE STATION SHALL BE DIRECTLY FROM THE COMMUNICATION ROOM. PROVIDE NEW CONDUIT AND WIRING AS REQUIRED. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.
7. THE CONTRACTOR SHALL PROVIDE TYPE II PA CONE SPEAKERS WITH BAFFLE, WITH NEW CONDUIT AND WIRING AS REQUIRED TO EXTEND SPEAKER WIRING TO THE NEW COMMUNICATION ROOM PA INTERFACE.
8. THE CONTRACTOR SHALL PROVIDE AN AMBIENT NOISE LEVEL SENSOR WITH A DEDICATED 2 PAIR SHIELDED AUDIO CABLE INSTALLED TO THE COMMUNICATION ROOM PA INTERFACE, WITH NEW CONDUIT AND WIRING AS REQUIRED.
9. THE CONTRACTOR SHALL PROVIDE AUDIO/VISUAL VARIABLE MESSAGE SIGNS AT THE LOCATION(S) SHOWN. AUDIO/VISUAL SIGNS SHALL BE POWERED DIRECTLY FROM THE ELECTRICAL ROOM. DATA CIRCUITS SHALL BE DIRECTLY FROM THE COMMUNICATION ROOM. USE EXISTING CONDUIT WHERE APPLICABLE, PROVIDE NEW CONDUIT AND WIRING AS REQUIRED TO ROUTE DATA AND POWER TO NEW COMMUNICATION ROOM AND ELECTRICAL ROOM RESPECTIVELY. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.
10. THE EXISTING CUSTOMER ASSISTANCE PUSH BUTTON SHALL REMAIN INTACT. THE CONTRACTOR SHALL PROVIDE NEW CONDUIT AND WIRING AS REQUIRED TO REROUTE THE PUSH BUTTON FROM THE ELECTRICAL ROOM PA CABINET TO THE NEW COMMUNICATION ROOM PA SYSTEM INTERFACE. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.
11. THE CONTRACTOR SHALL PROVIDE A CTA TYPE I OUTDOOR VANDAL RESISTANT TELEPHONE AND 2 PAIR TELEPHONE CABLE TO THE COMMUNICATION ROOM WALLFIELD, WITH NEW CONDUIT AND WIRING AS REQUIRED. THE TELEPHONE SHALL BE PROVIDED WITH A 2 PAIR PROTECTOR BLOCK BEHIND THE PHONE INSIDE THE LOCKED ENCLOSURE. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.
12. THE CONTRACTOR SHALL PROVIDE A CTA TYPE II EQUIPMENT ROOM TELEPHONE AND 2 PAIR TELEPHONE CABLE TO THE ROOM IDF, WITH NEW CONDUIT AND WIRING AS REQUIRED. THE CONTRACTOR SHALL PROVIDE A PROTECTOR BLOCK IDF IN THE ROOM CONNECTED TO THE COMMUNICATION ROOM WALLFIELD. SEE SHEET CO-0009 FOR TYPICAL CONDUIT REQUIREMENTS.
13. THE CONTRACTOR SHALL PROVIDE CONDUIT UNDER THE PLATFORM FOR DISTRIBUTION TO TELEPHONES AND CUSTOMER ASSISTANCE PUSH BUTTONS ALONG THE PLATFORM. A NOMINAL 4"x4"x4" JUNCTION BOX SHALL BE PROVIDED ALONG THE CONDUIT AT EACH DEVICE LOCATION. A 3/4" RSC SHALL BE PROVIDED FROM EACH JUNCTION BOX TO THE TELEPHONE OR CA PUSH BUTTON BACKBOX AT PLATFORM LOCATIONS. A TWO PAIR TELEPHONE CABLE SHALL BE PROVIDED FROM THE WALLFIELD TO EACH TELEPHONE OR CA PUSH BUTTON DEVICE.
14. THE CONTRACTOR SHALL PROVIDE A MINIMUM 50-PAIR TELEPHONE CABLE FROM THE WOODEN OUTDOOR TELEPHONE JUNCTION BOX AT EACH END OF THE PLATFORM TO THE COMMUNICATION ROOM WALLFIELD. THE NEW COPPER CABLE SHALL BE SPLICED TO THE EXISTING LEAD JACKETED, PRESSURIZED COPPER BACKBONE CABLE AT EACH MANHOLE AND TERMINATED IN THE COMMUNICATION ROOM AT THE WALLFIELD. THE CONTRACTOR SHALL PREPARE A COPPER PAIR ASSIGNMENT SHOP DRAWING AND COPPER CABLE SCHEDULES TO DOCUMENT ALL EXISTING CIRCUITS AND NEW TERMINATIONS. EACH PAIR SHALL OF THE EXISTING BACKBONE CABLE SHALL TERMINATE ON THE WALLFIELD.

SENSITIVE SECURITY INFORMATION

CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT

567 WEST LAKE STREET

CHICAGO, IL 60661

RED AND BLUE LINE

STATION RENOVATION CONSTRUCTION

Chicago Transit Authority



ADDISON AVENUE
COMMUNICATION PLAN
STATION LEVEL

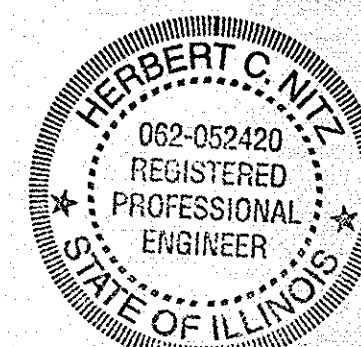
Drawing No.

CO-1501A

Scale: As Noted

Date: 03/17/99

J.O. No.



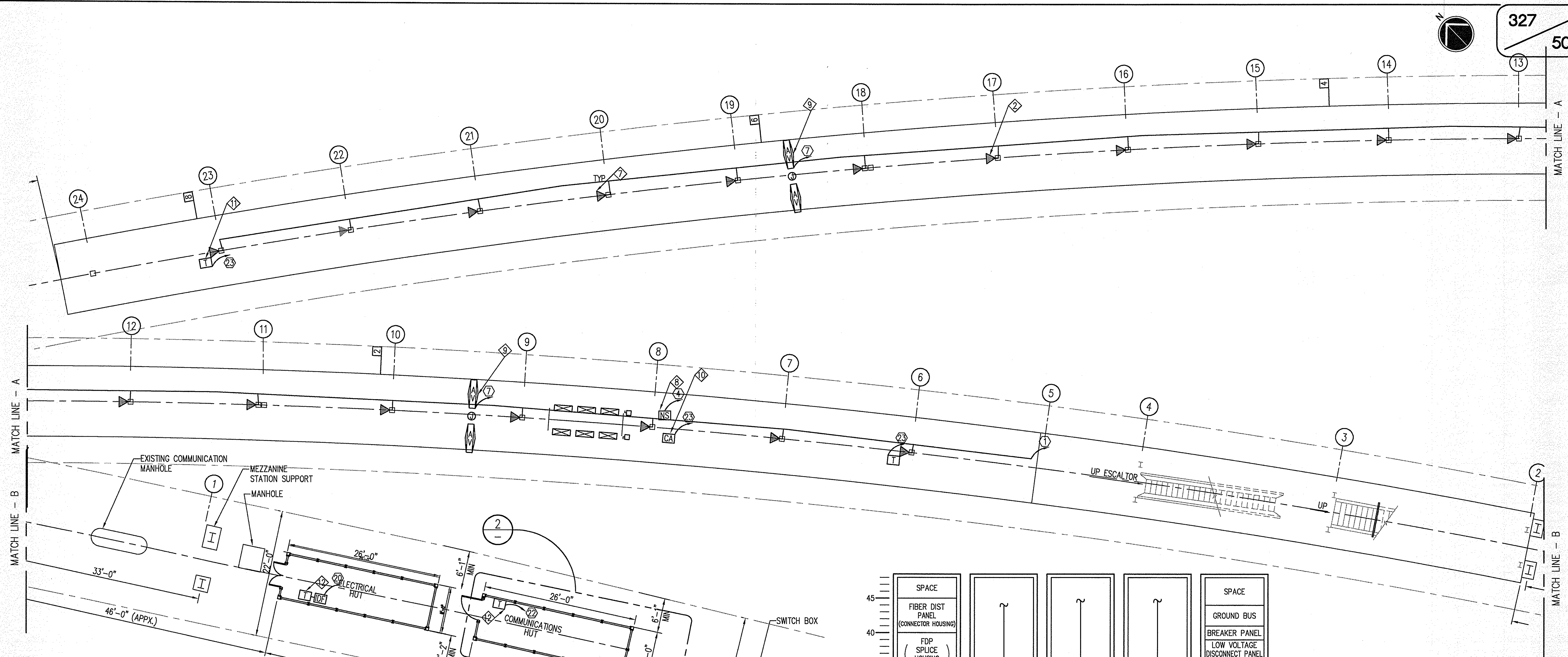
4-16-99

In Charge KJA
Designed By JMC
Drawn By HZ
Checked By HCN
Approved By

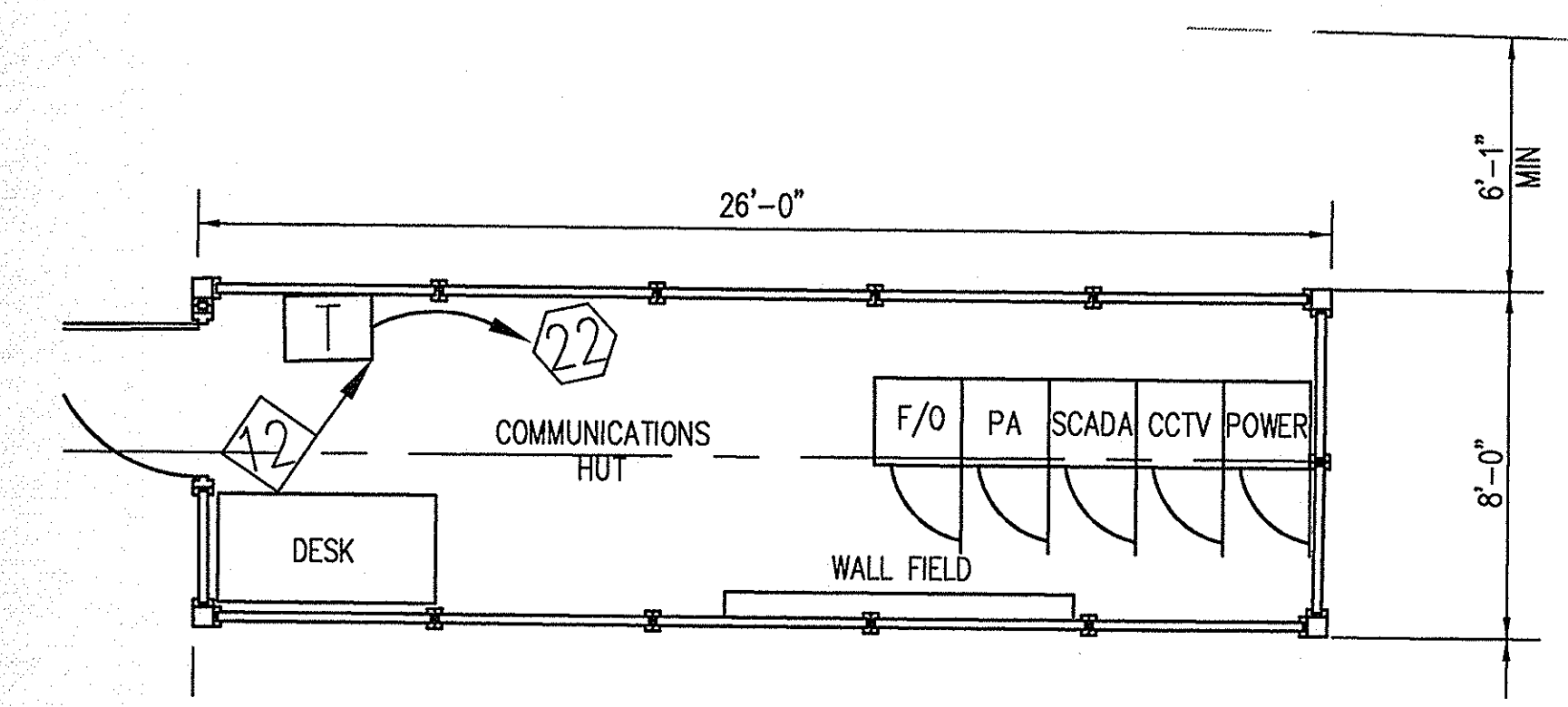
Revision	Date	Approved	Description
0	3/17/99		ISSUED FOR BIDDING

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KOWALENKO & BILOTTI, INC.
ENVIRONMENTAL CONSULTANTS

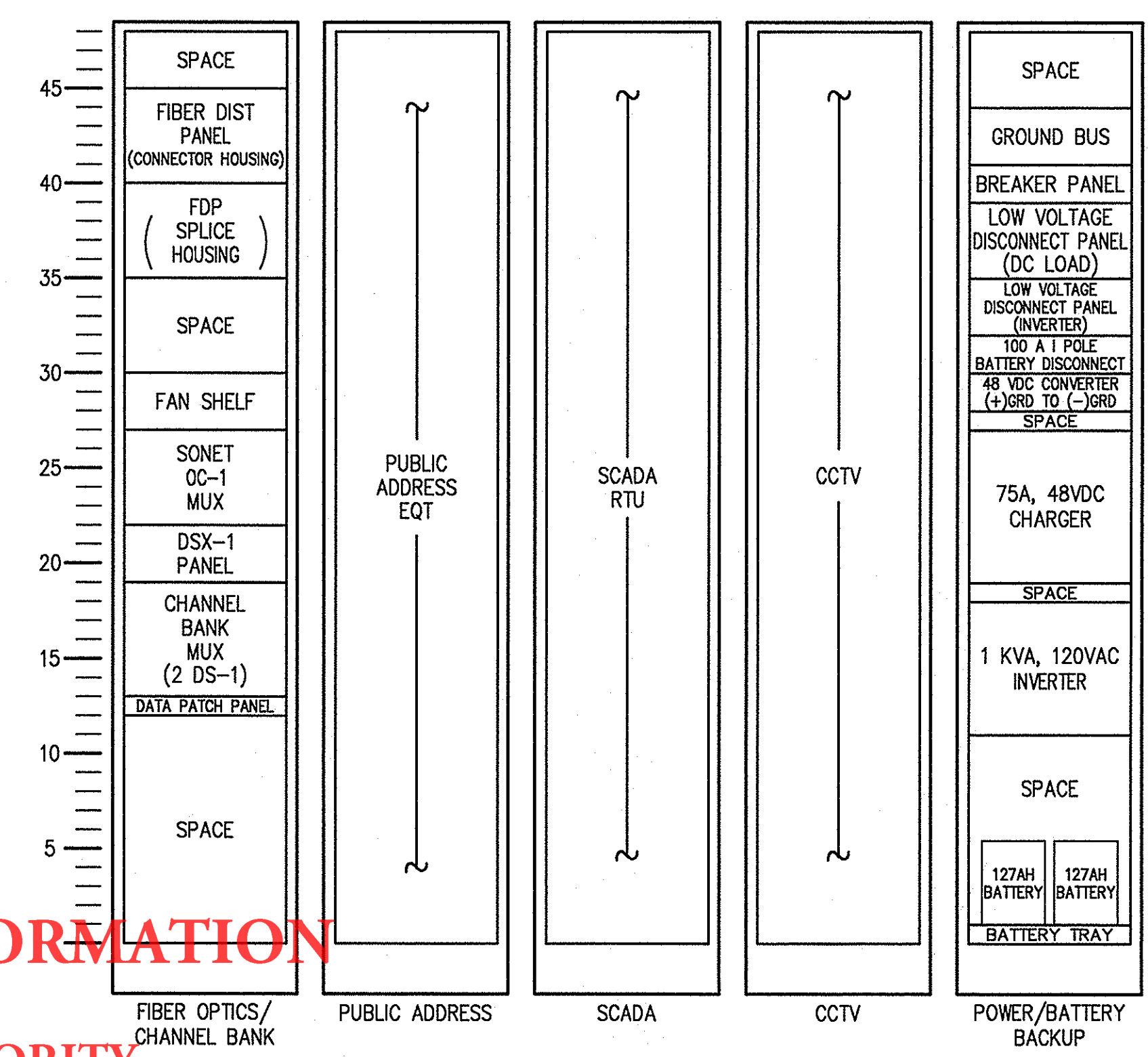
ADDISON AVENUE STATION RENOVATION CONSTRUCTION 3622 W. Addison Avenue, 60618



1 PLATFORM PLAN
SCALE: 1/8"=1'-0"



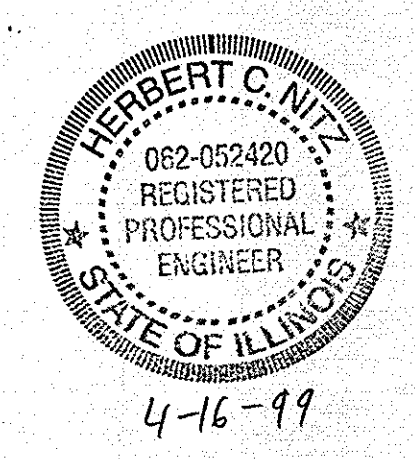
2 COMMUNICATION HUT
SCALE: 1/4"=1'-0"



3 EQUIPMENT RACK ELEVATION

SENSITIVE SECURITY INFORMATION
CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET
CHICAGO, IL 60661

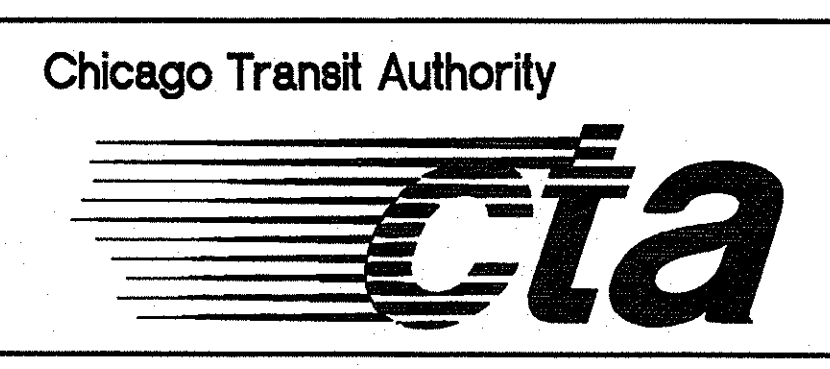
SEE SHEET CO-1501A FOR NOTES



In Charge	KJA			
Designed By	JMC			
Drawn By	HZ			
Checked By	HCN			
Approved By				
Revision	Date	Approved	Description	
0	3/17/99		ISSUED FOR BIDDING	

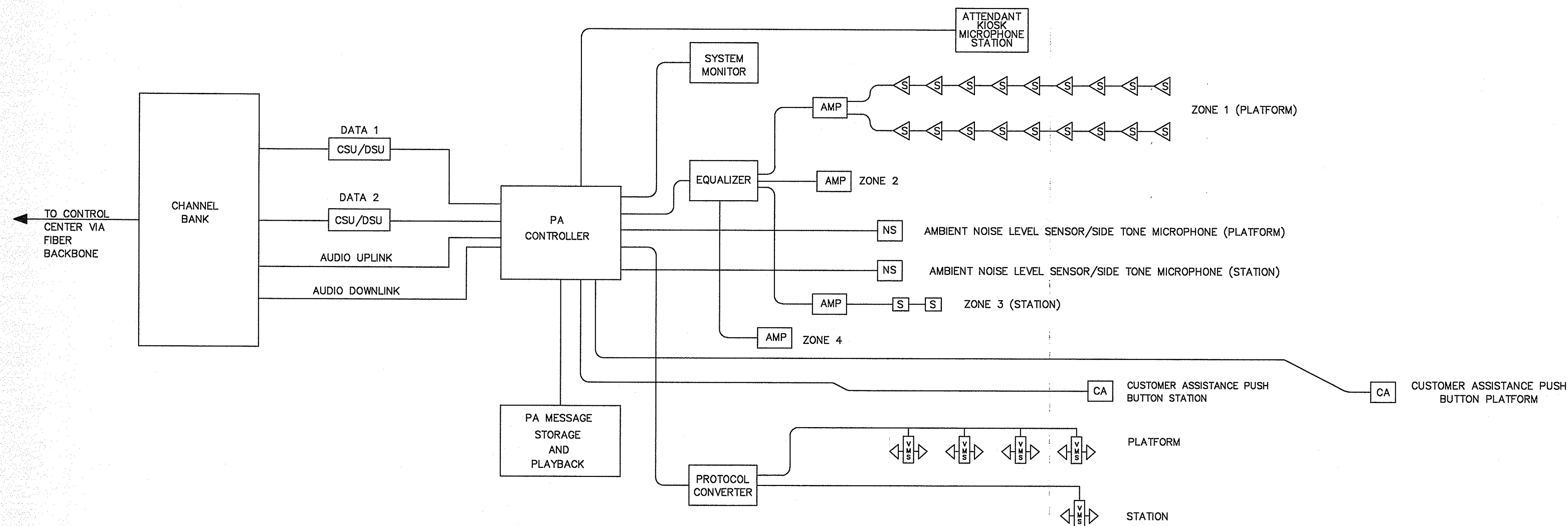
De Leuw, Cather & Company
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CHICAGO TRANSIT AUTHORITY
RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION

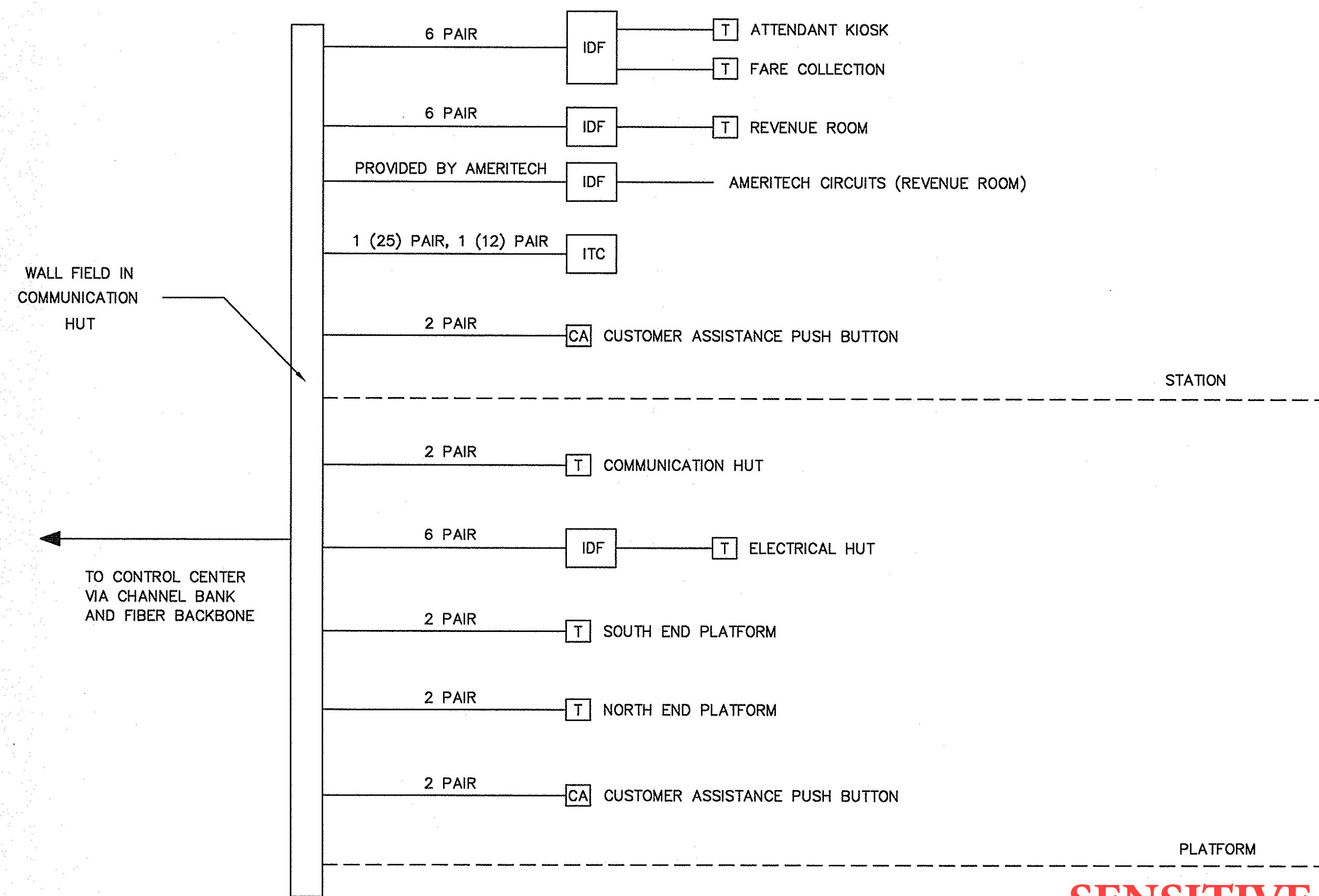


ADDISON AVENUE
COMMUNICATION PLAN
PLATFORM LEVEL
Scale: As Noted Date: 03/17/99 J.O. No.
Drawing No. **CO-1501B**

ADDISON AVENUE 3622 W. Addison Avenue, 60618



PUBLIC ADDRESS BLOCK DIAGRAM



TELEPHONE BLOCK DIAGRAM

SENSITIVE SECURITY INFORMATION

**CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET**

**CHICAGO, IL 60661
RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION**

Chicago Transit Authority



**ADDISON STATION
COMMUNICATIONS
SINGLE-LINE DIAGRAM**

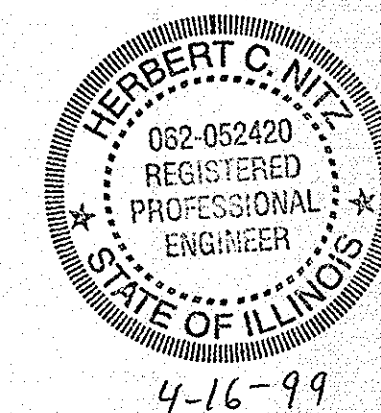
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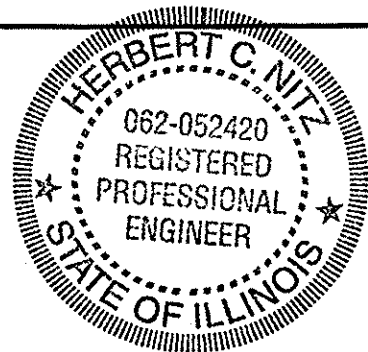
CO-1502

Scale: As Noted Date: 03/17/99 J.O. No.

In Charge	KJA			
Designed By	JMC			
Drawn By	DPA			
Checked By	HCN			
Approved By				
Revision	Date	Approved	Description	
0	3/17/99		ISSUED FOR BIDDING	

De Leuw, Cather & Company
PARSONS TRANSPORTATION GROUP
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ENVIRONMENTAL CONSULTANTS





PANEL A				PANEL B				
CABLE DESTINATION	FIBER NUMBER	TERMINATION METHOD	CONN. POSITION	FUNCTION	CONN. POSITION	TERMINATION METHOD	FIBER NUMBER	CABLE DESTINATION
LOGAN SQUARE	1	TIP/PTE	1A	OC-1 RING #OH-1 (P)	1B	TIP/PTE	1	IRVING PARK
LOGAN SQUARE	2	TIP/PTE	2A	OC-1 RING #OH-1 (P)	2B	TIP/PTE	2	IRVING PARK
LOGAN SQUARE	3	SPlice THRU		OC-3 RING #OH-1 (P)		SPlice THRU	3	IRVING PARK
LOGAN SQUARE	4	SPlice THRU		OC-3 RING #OH-1 (P)		SPlice THRU	4	IRVING PARK
LOGAN SQUARE	5	SPlice THRU		SPARE		SPlice THRU	5	IRVING PARK
LOGAN SQUARE	6	SPlice THRU		SPARE		SPlice THRU	6	IRVING PARK
LOGAN SQUARE	7	SPlice THRU		SPARE		SPlice THRU	7	IRVING PARK
LOGAN SQUARE	8	SPlice THRU		SPARE		SPlice THRU	8	IRVING PARK
LOGAN SQUARE	9	SPlice THRU		SPARE		SPlice THRU	9	IRVING PARK
LOGAN SQUARE	10	SPlice THRU		SPARE		SPlice THRU	10	IRVING PARK
LOGAN SQUARE	11	TIP/PTP	3A	STATION COMMON (FUTURE)	3B	TIP/PTP	11	IRVING PARK
LOGAN SQUARE	12	TIP/PTP	4A	STATION COMMON (FUTURE)	4B	TIP/PTP	12	IRVING PARK
LOGAN SQUARE	13	SPlice THRU		GRAND TO LAK/TFR (FUTURE)		SPlice THRU	13	IRVING PARK
LOGAN SQUARE	14	SPlice THRU		GRAND TO LAK/TFR (FUTURE)		SPlice THRU	14	IRVING PARK
LOGAN SQUARE	15	SPlice THRU		CHICAGO TO LAK/TFR (FUTURE)		SPlice THRU	15	IRVING PARK
LOGAN SQUARE	16	SPlice THRU		CHICAGO TO LAK/TFR (FUTURE)		SPlice THRU	16	IRVING PARK
LOGAN SQUARE	17	SPlice THRU		DIVISION TO LAK/TFR (FUTURE)		SPlice THRU	17	IRVING PARK
LOGAN SQUARE	18	SPlice THRU		DIVISION TO LAK/TFR (FUTURE)		SPlice THRU	18	IRVING PARK
LOGAN SQUARE	19	SPlice THRU		DAMEN TO LAK/TFR (FUTURE)		SPlice THRU	19	IRVING PARK
LOGAN SQUARE	20	SPlice THRU		DAMEN TO LAK/TFR (FUTURE)		SPlice THRU	20	IRVING PARK
LOGAN SQUARE	21	SPlice THRU		WESTERN TO LAK/TFR (FUTURE)		SPlice THRU	21	IRVING PARK
LOGAN SQUARE	22	SPlice THRU		WESTERN TO LAK/TFR (FUTURE)		SPlice THRU	22	IRVING PARK
LOGAN SQUARE	23	SPlice THRU		CALIFORNIA TO LAK/TFR (FUTURE)		SPlice THRU	23	IRVING PARK
LOGAN SQUARE	24	SPlice THRU		CALIFORNIA TO LAK/TFR (FUTURE)		SPlice THRU	24	IRVING PARK
LOGAN SQUARE	25	SPlice THRU		LOGAN SQUARE TO LAK/TFR (FUTURE)		SPlice THRU	25	IRVING PARK
LOGAN SQUARE	26	SPlice THRU		LOGAN SQUARE TO LAK/TFR (FUTURE)		SPlice THRU	26	IRVING PARK
LOGAN SQUARE	27	SPlice THRU		BELMONT TO LAK/TFR (FUTURE)		SPlice THRU	27	IRVING PARK
LOGAN SQUARE	28	SPlice THRU		BELMONT TO LAK/TFR (FUTURE)		SPlice THRU	28	IRVING PARK
LOGAN SQUARE	29	TIP/PTP	5A	ADDISON TO LAK/TFR (FUTURE)	5B	TIP/PTP	29	IRVING PARK
LOGAN SQUARE	30	TIP/PTP	6A	ADDISON TO LAK/TFR (FUTURE)	6B	TIP/PTP	30	IRVING PARK
LOGAN SQUARE	31	SPlice THRU		IRVING PARK TO LAK/TFR (FUTURE)		SPlice THRU	31	IRVING PARK
LOGAN SQUARE	32	SPlice THRU		IRVING PARK TO LAK/TFR (FUTURE)		SPlice THRU	32	IRVING PARK
LOGAN SQUARE	33	SPlice THRU		MONTROSE TO LAK/TFR (FUTURE)		SPlice THRU	33	IRVING PARK
LOGAN SQUARE	34	SPlice THRU		MONTROSE TO LAK/TFR (FUTURE)		SPlice THRU	34	IRVING PARK
LOGAN SQUARE	35	SPlice THRU		JEFFERSON PARK TO LAK/TFR (FUTURE)		SPlice THRU	35	IRVING PARK
LOGAN SQUARE	36	SPlice THRU		JEFFERSON PARK TO LAK/TFR (FUTURE)		SPlice THRU	36	IRVING PARK
LOGAN SQUARE	37	SPlice THRU		HARLEM TO LAK/TFR (FUTURE)		SPlice THRU	37	IRVING PARK
LOGAN SQUARE	38	SPlice THRU		HARLEM TO LAK/TFR (FUTURE)		SPlice THRU	38	IRVING PARK
LOGAN SQUARE	39	SPlice THRU		CUMBERLAND TO LAK/TFR (FUTURE)		SPlice THRU	39	IRVING PARK
LOGAN SQUARE	40	SPlice THRU		CUMBERLAND TO LAK/TFR (FUTURE)		SPlice THRU	40	IRVING PARK
LOGAN SQUARE	41	SPlice THRU		RIVER ROAD TO LAK/TRF (FUTURE)		SPlice THRU	41	IRVING PARK
LOGAN SQUARE	42	SPlice THRU		RIVER ROAD TO LAK/TRF (FUTURE)		SPlice THRU	42	IRVING PARK
LOGAN SQUARE	43	SPlice THRU		OHARE TO LAK/TRF (FUTURE)		SPlice THRU	43	IRVING PARK
LOGAN SQUARE	44	SPlice THRU		OHARE TO LAK/TRF (FUTURE)		SPlice THRU	44	IRVING PARK
LOGAN SQUARE	45	SPlice THRU				SPlice THRU	45	IRVING PARK
LOGAN SQUARE	46	SPlice THRU				SPlice THRU	46	IRVING PARK
LOGAN SQUARE	47	SPlice THRU				SPlice THRU	47	IRVING PARK
LOGAN SQUARE	48	SPlice THRU				SPlice THRU	48	IRVING PARK

PANEL A				PANEL B				
CABLE DESTINATION	FIBER NUMBER	TERMINATION METHOD	CONN. POSITION	FUNCTION	CONN. POSITION	TERMINATION METHOD	FIBER NUMBER	CABLE DESTINATION
LOGAN SQUARE	49	SPlice THRU		OC-1 RING #OH-1 (S)		SPlice THRU	49	IRVING PARK
LOGAN SQUARE	50	SPlice THRU		OC-1 RING #OH-1 (S)		SPlice THRU	50	IRVING PARK
LOGAN SQUARE	51	SPlice THRU		OC-3 RING #OH-1 (S)		SPlice THRU	51	IRVING PARK
LOGAN SQUARE	52	SPlice THRU		OC-3 RING #OH-1 (S)		SPlice THRU	52	IRVING PARK
LOGAN SQUARE	53	SPlice THRU		SPARE		SPlice THRU	53	IRVING PARK
LOGAN SQUARE	54	SPlice THRU		SPARE		SPlice THRU	54	IRVING PARK
LOGAN SQUARE	55	SPlice THRU		SPARE		SPlice THRU	55	IRVING PARK
LOGAN SQUARE	56	SPlice THRU		SPARE		SPlice THRU	56	IRVING PARK
LOGAN SQUARE	57	SPlice THRU		SPARE		SPlice THRU	57	IRVING PARK
LOGAN SQUARE	58	SPlice THRU		SPARE		SPlice THRU	58	IRVING PARK
LOGAN SQUARE	59	SPlice THRU		SPARE		SPlice THRU	59	IRVING PARK
LOGAN SQUARE	60	SPlice THRU		SPARE		SPlice THRU	60	IRVING PARK
LOGAN SQUARE	61	SPlice THRU		SPARE		SPlice THRU	61	IRVING PARK
LOGAN SQUARE	62	SPlice THRU		SPARE		SPlice THRU	62	IRVING PARK
LOGAN SQUARE	63	SPlice THRU		SPARE		SPlice THRU	63	IRVING PARK
LOGAN SQUARE	64	SPlice THRU		SPARE		SPlice THRU	64	IRVING PARK
LOGAN SQUARE	65	SPlice THRU		SPARE		SPlice THRU	65	IRVING PARK
LOGAN SQUARE	66	SPlice THRU		SPARE		SPlice THRU	66	IRVING PARK
LOGAN SQUARE	67	SPlice THRU		SPARE		SPlice THRU	67	IRVING PARK
LOGAN SQUARE	68	SPlice THRU		SPARE		SPlice THRU	68	IRVING PARK
LOGAN SQUARE	69	SPlice THRU		SPARE		SPlice THRU	69	IRVING PARK
LOGAN SQUARE	70	SPlice THRU		SPARE		SPlice THRU	70	IRVING PARK
LOGAN SQUARE	71	SPlice THRU		SPARE		SPlice THRU	71	IRVING PARK
LOGAN SQUARE	72	SPlice THRU		SPARE		SPlice THRU	72	IRVING PARK
LOGAN SQUARE	73	SPlice THRU		SPARE		SPlice THRU	73	IRVING PARK
LOGAN SQUARE	74	SPlice THRU		SPARE		SPlice THRU	74	IRVING PARK
LOGAN SQUARE	75	SPlice THRU		SPARE		SPlice THRU	75	IRVING PARK
LOGAN SQUARE	76	SPlice THRU		SPARE		SPlice THRU	76	IRVING PARK
LOGAN SQUARE	77	SPlice THRU		SPARE		SPlice THRU	77	IRVING PARK
LOGAN SQUARE	78	SPlice THRU		SPARE		SPlice THRU	78	IRVING PARK
LOGAN SQUARE	79	SPlice THRU		SPARE		SPlice THRU	79	IRVING PARK
LOGAN SQUARE	80	SPlice THRU		SPARE		SPlice THRU	80	IRVING PARK
LOGAN SQUARE	81	SPlice THRU		SPARE		SPlice THRU	81	IRVING PARK
LOGAN SQUARE	82	SPlice THRU		SPARE		SPlice THRU	82	IRVING PARK
LOGAN SQUARE	83	SPlice THRU		SPARE		SPlice THRU	83	IRVING PARK
LOGAN SQUARE	84	SPlice THRU		SPARE		SPlice THRU	84	IRVING PARK
LOGAN SQUARE	85	SPlice THRU		SPARE		SPlice THRU	85	IRVING PARK
LOGAN SQUARE	86	SPlice THRU		SPARE		SPlice THRU	86	IRVING PARK
LOGAN SQUARE	87	SPlice THRU		SPARE		SPlice THRU	87	IRVING PARK
LOGAN SQUARE	88	SPlice THRU		SPARE		SPlice THRU	88	IRVING PARK
LOGAN SQUARE	89	SPlice THRU		SPARE		SPlice THRU	89	IRVING PARK
LOGAN SQUARE	90	SPlice THRU		SPARE		SPlice THRU	90	IRVING PARK
LOGAN SQUARE	91	SPlice THRU		SPARE		SPlice THRU	91	IRVING PARK
LOGAN SQUARE	92	SPlice THRU		SPARE		SPlice THRU	92	IRVING PARK
LOGAN SQUARE	93	SPlice THRU		SPARE		SPlice THRU	93	IRVING PARK
LOGAN SQUARE	94	SPlice THRU		SPARE		SPlice THRU	94	IRVING PARK
LOGAN SQUARE	95	SPlice THRU		SPARE		SPlice THRU	95	IRVING PARK
LOGAN SQUARE	96	SPlice THRU		SPARE		SPlice THRU	96	IRVING PARK

NOTES:

SPlice THRU – THE FIBER STRAND SHALL BE FUSION SPliced THROUGH THE PANEL TO THE ASSIGNED OUTGOING FIBER STRAND. THE FIBER SHALL NOT APPEAR AS A CONNECTOR POSITION.

TIP (TERMINATE IN PANEL) – THE FIBER STRAND SHALL BE TERMINATED WITH A FACTORY CONNECTORIZED PIGTAIL TO THE ASSIGNED PANEL POSITION.

TIP (TERMINATE IN PANEL) / PTE (PATCH TO EQUIPMENT) – THE FIBER STRAND SHALL BE TERMINATED WITH A FACTORY CONNECTORIZED PIGTAIL TO THE ASSIGNED PANEL POSITION. AN OPTICAL PATCH CORD SHALL BE CONNECTED BETWEEN THE NODE EQUIPMENT AND THE ASSIGNED PANEL POSITION.

TIP (TERMINATE IN PANEL) / PTP (PATCH THROUGH PANEL) – THE FIBER STRAND SHALL BE TERMINATED WITH A FACTORY CONNECTORIZED PIGTAIL TO THE ASSIGNED PANEL POSITION. AN OPTICAL PATCH CORD SHALL BE CONNECTED BETWEEN THE ASSIGNED PANEL POSITIONS TO PATCH THE OPTICAL CIRCUIT THROUGH THE PANEL.

FOR LOCATIONS WHERE THE FIBER OPTIC CABLE DOES NOT EXIST, THE CONTRACTOR SHALL PROVIDE THE FIBER DISTRIBUTION PANEL AND ALL PIGTAILS, PATCHCORDS, AND OTHER INCIDENTAL MATERIALS WITHIN THE EQUIPMENT CABINET, INSTALLED AND STORED TO PROTECT THE FIBER PIGTAILS. THE PATCHCORDS SHALL BE TURNED OVER TO THE CTA ENGINEER.

FOR LOCATIONS WHERE THE FIBER OPTIC CABLE EXISTS, THE CONTRACTOR SHALL FUSION SPlice EACH FIBER TO THE DESIGNATED FIBER PIGTAIL OR PASS-THRU FIBER OF THE OUTGOING CABLE.

THE CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERATIONAL FIBER OPTIC NODE AT EACH RAPID TRANSIT STATION AND COMMUNICATION SUPPORT LOCATION. EACH LOCATION SHALL BE EQUIPPED WITH THE REQUIRED FIBER OPTIC AND COPPER TRANSMISSION EQUIPMENT AS DEFINED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL PREPARE A FINAL IMPLEMENTATION PLAN TO THE CTA FOR REVIEW AND APPROVAL PRIOR TO COMMENCEMENT OF ANY COMMUNICATIONS PROCUREMENT AND/OR CONSTRUCTION.

THE CONTRACTOR SHALL PERFORM OPTICAL ATTENUATION TESTS ON THE EXISTING FIBER OPTIC CABLE TO BE INTERCONNECTED. THE TESTS SHALL BE CONDUCTED FOR BOTH DIRECTIONS OF EACH FIBER WITH A CTA APPROVED OPTICAL TIME DOMAIN REFLECTOMETER AND POWER LOSS TEST SET. THE CONTRACTOR SHALL PROVIDE AN OTDR AND POWER LOSS TEST SET, COMPATIBLE WITH EXISTING CTA TEST EQUIPMENT AND SOFTWARE, TO THE CTA.

THE TEST RESULTS SHALL BE PROVIDED WITH THE COMMUNICATION IMPLEMENTATION PLAN. ANY OPTICAL LINKS MEASURING BELOW THE ALLOWABLE LOSS BUDGET FOR THE OPTICAL TRANSMISSION EQUIPMENT SHALL BE DOCUMENTED IN WRITING AND FORWARDED TO THE ENGINEER.

SENSITIVE SECURITY INFORMATION

CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET

CHICAGO, IL 60661

RED AND BLUE LINE

STATION RENOVATION CONSTRUCTION

In Charge _____ KJA
Designed By _____ JMC
Drawn By _____ DPA
Checked By _____ HCN
Approved By _____

0	3/17/99		ISSUED FOR BIDDING
Revision	Date	Approved	Description



De Leuw, Cather & Company
PARSONS TRANSPORTATION GROUP
In association with
ROSS BARNEY+JANKOWSKI, INC.
ARCHITECTS
KOWALENKO & BILOTTI, INC.
ENVIRONMENTAL CONSULTANTS

Chicago Transit Authority



ADDISON STATION
FIBER CABLE
SCHEDULE

Scale: As Noted

Date: 03/17/99

J.O. No.

Drawing No.

CO-1503

CIRCUIT ID	DESCRIPTION	FUNCTION	DS1/DS0 ID	SLOT/ PORT	BLOCK/ PAIR	DESTINATION	SLOT/ PORT	BLOCK/ PAIR
-	ATTENDANT KIOSK TELEPHONE #	2W FXS	-/1	-	-	CONTROL CENTER PBX	-	-
-	OB PLATFORM TELEPHONE #	2W FXS	-/2	-	-	CONTROL CENTER PBX	-	-
-	ELECTRICAL ROOM TELEPHONE #	2W FXS	-/3	-	-	CONTROL CENTER PBX	-	-
-	ELEVATOR MACHINE ROOM TELEPHONE # (FUTURE)	2W FXS	-/4	-	-	CONTROL CENTER PBX	-	-
-	STATION SCADA MAIN	2W E&M	-/5	-	-	CONTROL CENTER	-	-
-	ELEVATOR COMMUNICATION SYSTEM (FUTURE)	2W FXS	-/6	-	-	CONTROL CENTER PBX	-	-
-	PA AUDIO 1	4W E&M	-/7	-	-	CONTROL CENTER	-	-
-	PA CONTROL 56K BPS	OCU-DP	-/8	-	-	CONTROL CENTER	-	-
-	CUST ASSIST STATION, STATION PAID AREA (FUTURE)	2W FXS	-/9	-	-	CONTROL CENTER PBX	-	-
-	CUST ASSIST STATION, IB PLATFORM (FUTURE)	2W FXS	-/10	-	-	CONTROL CENTER PBX	-	-
-	WAYSIDE ADDISON NORTH X-OVER (FUTURE)	2W FXS	-/11	-	-	CONTROL CENTER PBX	-	-
-	RAIL HEATER SCADA MAIN (FUTURE)	2W E&M	-/12	-	-	CONTROL CENTER PBX	-	-
-	UNUSED		-/13	-	-		-	-
-	UNUSED		-/14	-	-		-	-
-	UNUSED		-/15	-	-		-	-
-	UNUSED		-/16	-	-		-	-
-	UNUSED		-/17	-	-		-	-
-	UNUSED		-/18	-	-		-	-
-	UNUSED		-/19	-	-		-	-
-	UNUSED		-/20	-	-		-	-
-	UNUSED		-/21	-	-		-	-
-	UNUSED		-/22	-	-		-	-
-	UNUSED		-/23	-	-		-	-
-	UNUSED		-/24	-	-		-	-
-	FARE COLLECTION AREA TELEPHONE #	2W FXS	-/1	-	-	CONTROL CENTER PBX	-	-
-	IB PLATFORM TELEPHONE #	2W FXS	-/2	-	-	CONTROL CENTER PBX	-	-
-	COMM ROOM TELEPHONE #	2W FXS	-/3	-	-	CONTROL CENTER PBX	-	-
-	REVENUE ROOM TELEPHONE #	2W FXS	-/4	-	-	CONTROL CENTER PBX	-	-
-	STATION SCADA BACKUP	2W E&M	-/5	-	-	CONTROL CENTER	-	-
-	REVENUE DATA	2W E&M	-/6	-	-	REVENUE CENTER	-	-
-	PA AUDIO 2	4W E&M	-/7	-	-	CONTROL CENTER	-	-
-	PA CONTROL 56K BPS	OCU-DP	-/8	-	-	CONTROL CENTER	-	-
-	CUST ASSIST STATION, STATION UNPAID AREA (FUTURE)	2W FXS	-/9	-	-	CONTROL CENTER PBX	-	-
-	CUST ASSIST STATION, OB PLATFORM (FUTURE)	2W FXS	-/10	-	-	CONTROL CENTER PBX	-	-
-	WAYSIDE ADDISON SOUTH X-OVER (FUTURE)	2W FXS	-/11	-	-	CONTROL CENTER PBX	-	-
-	RAIL HEATER SCADA BACK-UP (FUTURE)	2W E&M	-/12	-	-	CONTROL CENTER PBX	-	-
-	UNUSED		-/13	-	-		-	-
-	UNUSED		-/14	-	-		-	-
-	UNUSED		-/15	-	-		-	-
-	UNUSED		-/16	-	-		-	-
-	UNUSED		-/17	-	-		-	-
-	UNUSED		-/18	-	-		-	-
-	UNUSED		-/19	-	-		-	-
-	UNUSED		-/20	-	-		-	-
-	UNUSED		-/21	-	-		-	-
-	UNUSED		-/22	-	-		-	-
-	UNUSED		-/23	-	-		-	-
-	UNUSED		-/24	-	-		-	-


EXISTING AMERITECH CIRCUITS

PAY PHONES:
(2) NORTH PLATFORM
(2) SOUTH PLATFORM
(2) STATION
(2) OUTSIDE STATION

SENSITIVE SECURITY INFORMATION

CHICAGO TRANSIT AUTHORITY
ENGINEERING DEPARTMENT
567 WEST LAKE STREET

CHICAGO, IL 60661
RED AND BLUE LINE
STATION RENOVATION CONSTRUCTION

 De Leuw, Cather & Company
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ENVIRONMENTAL CONSULTANTS

Chicago Transit Authority

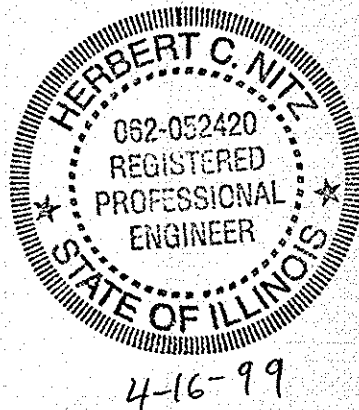


ADDISON STATION
CHANNEL ALLOCATION
TABLE

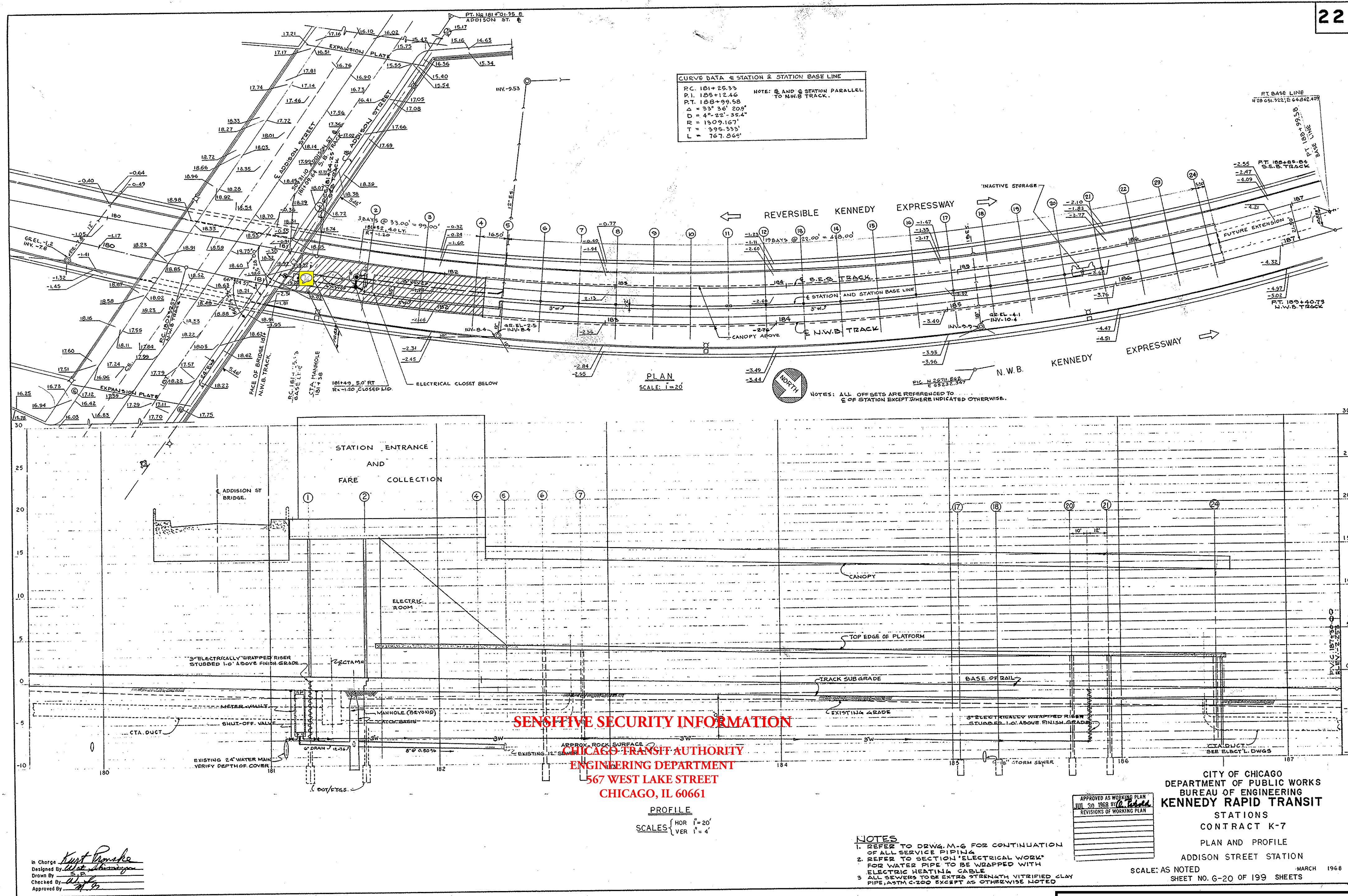
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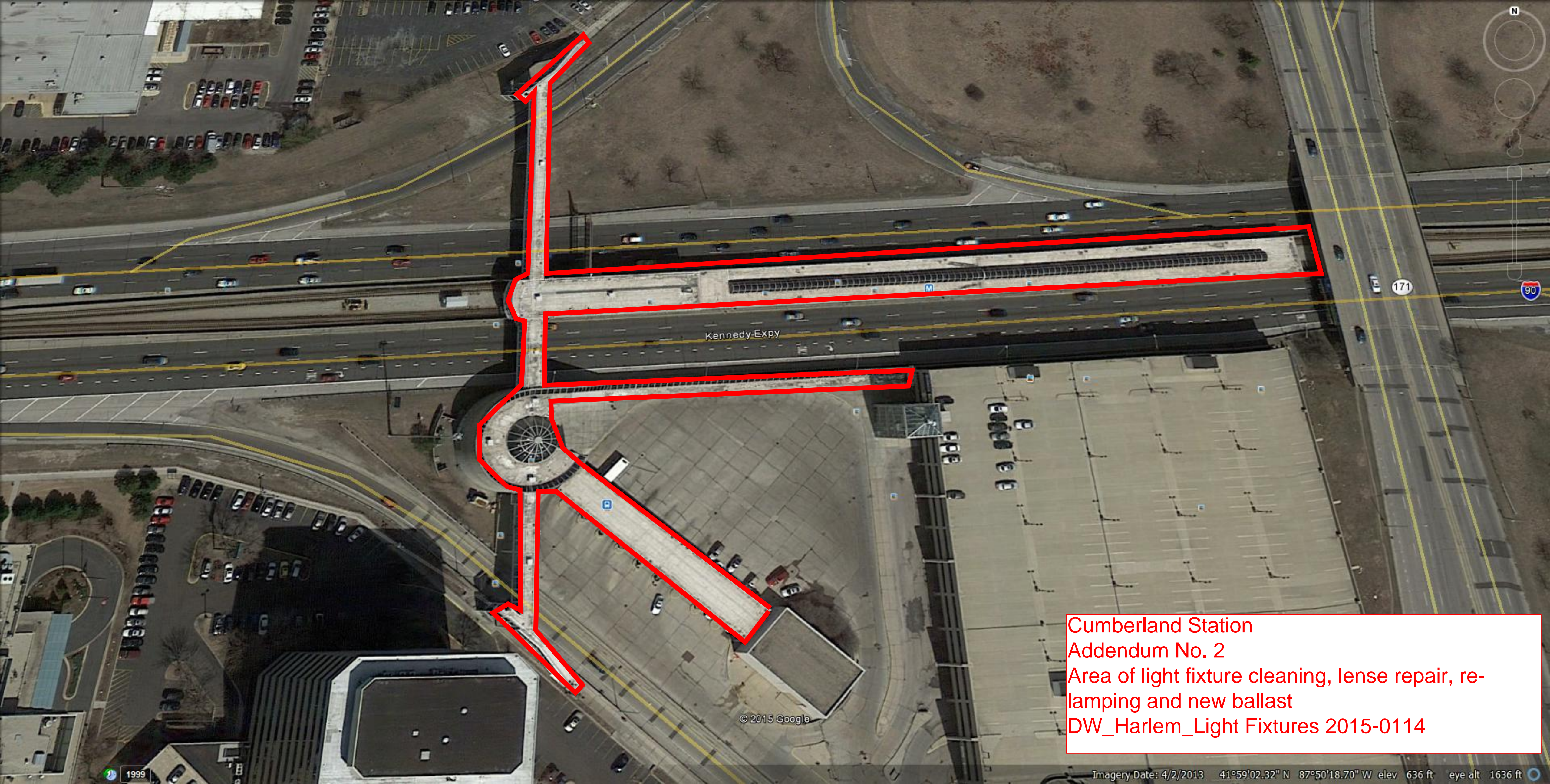
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CO-1504

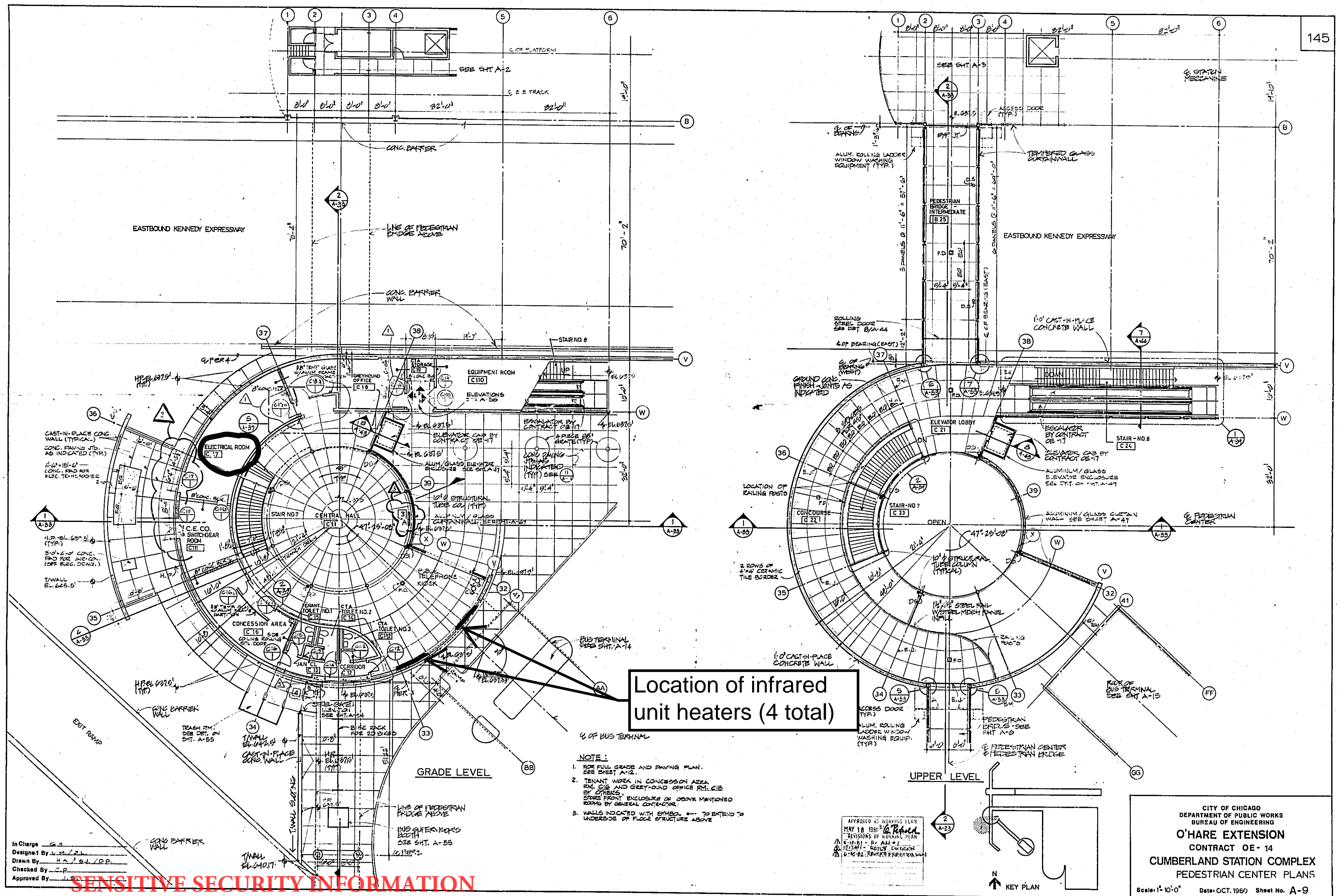


4-16-99





Cumberland Station
Addendum No. 2
Area of light fixture cleaning, lense repair, re-
lamping and new ballast
DW_Harlem_Light Fixtures 2015-0114



CHICAGO TRANSIT AUTHORITY
 ENGINEERING DEPARTMENT
 567 WEST LAKE STREET
 CHICAGO, IL 60661

R 103 150

DW_Cumberland Infrared Heaters_Plan
 2015-0113



Harlem Station, Addendum No. 2
Area of light fixture cleaning, lense repair,
re-lamping and new ballast.
DW_Harlem_light fixtures_20150114

Google™ earth

Imagery Date: 4/2/2013 41°58'55.36" N 87°48'30.97" W elev 641 ft eye alt 1294 ft



Addendum No. 2

PH_Addison Electrical Room_2015-0114_1



Addendum No. 2

PH_Addison Electrical Room_2015-0114_2



Addendum No. 2
PH_Addison Electrical Room_2015-0114_3



Addendum No. 2

PH_Addison Electrical Room_2015-0114_4



Addendum No. 2

PH_Addison Electrical Room_2015-0114_5

Addendum No. 2

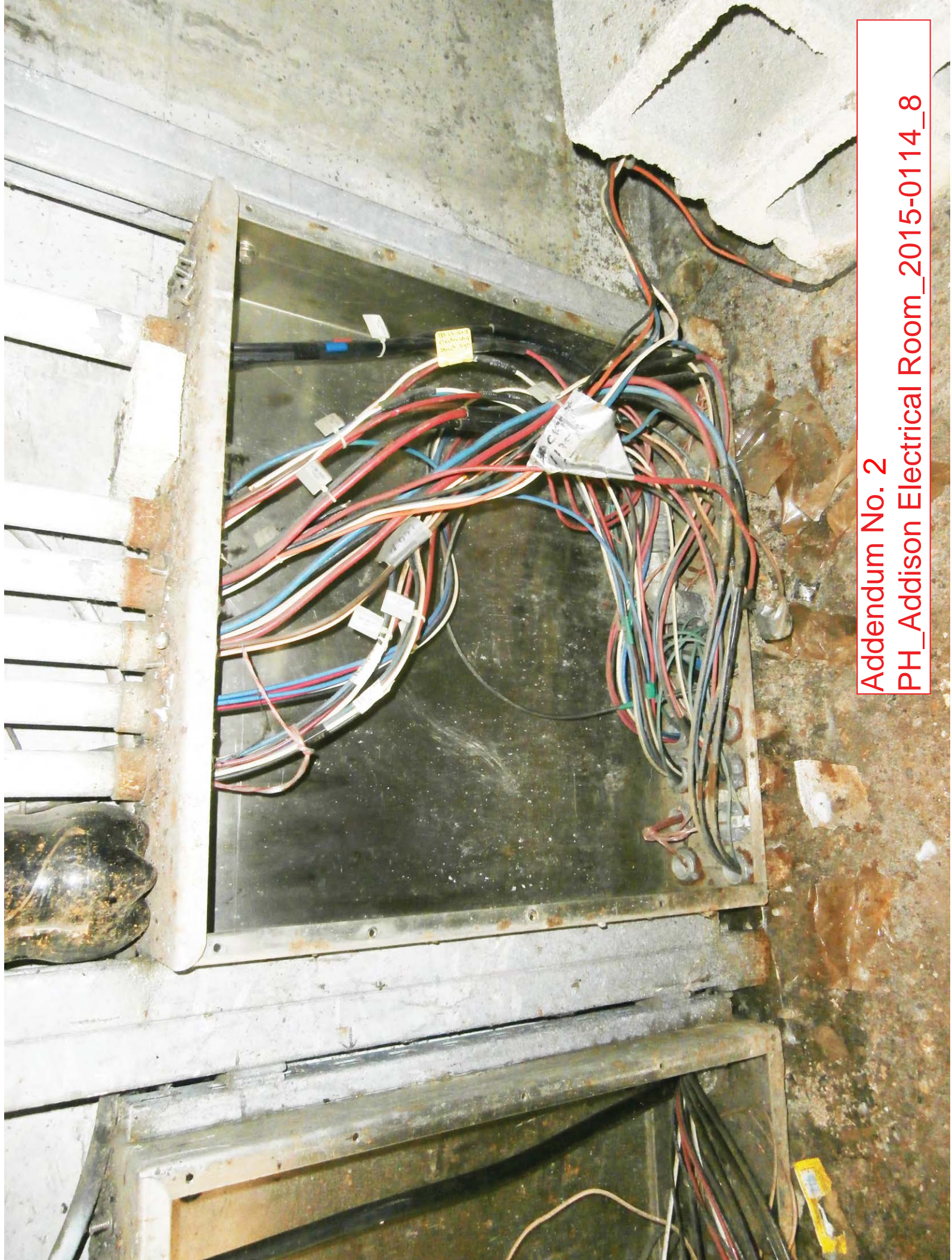
PH_Addison Electrical Room_2015-0114_6





Addendum No.2

PH_Addison Electrical Room_2015-0114_7



Addendum No. 2

PH_Addison Electrical Room_2015-0114_8

Addendum No. 2

PH_Addison Electrical Room_2015-0114_9



Addendum No. 2

PH_Addison Electrical Room_2015-0114_10





Addendum No. 2
PH_Addison Electrical Room_2015-0114_11

Addendum No. 2
PH_Addison Electrical Room_2015-0114_12



2013-0042.06

O'HARE LINE – ADDISON, IRVING PARK,
MONTROSE, HARLEM, CUMBERLAND STATIONS-
STATION RENOVATIONS (YNB)

~~ISSUED FOR RFP~~
~~December 22, 2014~~

(CTA STANDARD SPECIFICATION, REV. 0)

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Specification Sections, apply to this section.

1.02 SUMMARY

- A. This section contains a general summary of work to be performed by the Contractor under this Contract. If any conflict exists between the work described in this summary and the work defined in other specification sections or the drawings, those documents shall take precedence.
- B. The Contractor shall provide for all design services, labor, material and equipment necessary to perform all work as indicated in the Contract documents.
- C. Contractor to comply with all applicable codes, ordinances, rules, regulations, orders and legal requirements. Contractor to obtain and pay for all applicable permits and fees. Provide all required mobilization, traffic control and protection. Under no circumstances shall the Contractor be entitled to any time extension or monetary damages due to any delay in issuing any permits.
- D. The Contractor shall inspect the site to verify all existing conditions, dimensions, access, obstructions, etc.

1.03 PROJECT DESCRIPTION

- A. The Design Built Contractor (DBC) shall provide design and construction services to the CTA for the upgrade of the Addison, Irving Park, Montrose, Harlem and Cumberland stations on the Blue Line - O'Hare Branch. The DBC will provide all engineering and design services, labor, materials, tools, construction equipment, plant, facilities, services, safety provisions, bonds, obtain permits and regulatory approvals, and pay all permit costs, taxes, fees and other costs necessary or required in order to complete the Project in a safe, timely and workmanlike manner.

The stations are located on the O'Hare Branch Extension of the original Milwaukee Line of the West-Northwest Route that reached its new terminal at Jefferson Park via a new subway and median of the Kennedy Expressway and was dedicated on January 30, 1970. The route was further extended to Rosemont on February 27, 1983. The Project is included in the Your New Blue (YNB), a \$492 million capital improvement program to comprehensively upgrade the Blue Line O'Hare Branch infrastructure with a focus on signal & power upgrades, track work and station improvements. The program's goals are to improve reliability, increase capacity and reduce travel time from downtown to O'Hare. The Project will bring elements of these stations to a state of good repair. The Project will provide accessibility for people with disabilities at the Addison Blue Line station. The Harlem and Cumberland stations are currently ADA-compliant.

2013-0042.06

O'HARE LINE – ADDISON, IRVING PARK,
MONTROSE, HARLEM, CUMBERLAND STATIONS-
STATION RENOVATIONS (YNB)

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~~December 22, 2014~~

(CTA STANDARD SPECIFICATION, REV. 0)

- B. The scope of construction work includes design and construction services at the following stations:

Addison, 3622 W. Addison Avenue, Chicago, IL 60618
Irving Park, 4131 W. Irving Park Rd., Chicago, IL 60613
Montrose, 4600 W. Montrose Avenue, Chicago, IL 60641
Harlem, 5550 N. Harlem Avenue, Chicago, IL 60656
Cumberland, 5800 N. Cumberland Avenue, Chicago, IL 60631

- C. The Project includes all necessary work to provide an elevator at the Addison station. The Harlem and Cumberland stations are ADA-compliant and no additional accessibility improvements are included in the scope of construction work. For Irving Park and Montrose stations, the DBC is responsible for designing and constructing station elements that will not result in the requirement for a fully accessible station.

It is the goal of CTA to upgrade the stations as follows including but not limited to:

1. Provide new elevator, platform and platform canopy extension including related structure, electrical, lighting, signage, communication system, signal work, track signage, fare equipment, and steel stair at Addison station
2. Hazardous waste identification and mitigation for hazardous materials impacted by the scope of work.
3. Stationhouse level repairs:
 - a. Paint stationhouse interior and exterior (Addison, Irving Park, **Montrose**, Harlem, Cumberland)
 - b. Paint stationhouse exterior (Montrose)
 - c. Pressure wash stationhouse (Addison, Irving Park, Montrose, Harlem, Cumberland)
 - d. Relamp and replace ballasts of existing light fixtures (Addison, Irving Park, Montrose, Harlem, Cumberland)
 - e. Automatic Transfer Switch (**Montrose**, Harlem, **and** Cumberland)
4. Platform level repairs:
 - a. Concrete platform and edge repair and replacement including topping slab replacement
 - b. Expansion joint repair.
 - c. Tactile replacement
 - d. Granite paver grouting and resetting (Harlem)
 - e. Pressure wash platform (Harlem)
 - f.
 - g. Canopy expansion joint repair and limited skylight replacement
 - h. Curtain wall replacement and bottom sill replacement
 - i. Pressure wash canopy and skylight structure (Addison, Irving Park, Montrose, Harlem, Cumberland),

2013-0042.06

O'HARE LINE – ADDISON, IRVING PARK,
MONTROSE, HARLEM, CUMBERLAND STATIONS-
STATION RENOVATIONS (YNB)

ISSUED FOR RFP
~~December 22, 2014~~

(CTA STANDARD SPECIFICATION, REV. 0)

- j. Canopy structure painting (Addison, Irving Park, Montrose, Harlem, Cumberland),
- k. Light fixtures - clean, relamp, replace damaged lenses (Addison, Irving Park, Montrose, Harlem, Cumberland),
- l. Platform furnishings – refinish metal shelters, benches and trash receptacles, replace shelter glazing and perforated panels, refinish wood benches, replace sand boxes, clean and buff gap filler enclosures,

1.04 WORK BY OTHERS

- A. All work for this Project will be performed under this single contract.
- B. Cooperate and coordinate between and with the Authority, utility companies, City of Chicago or other agencies, and other contractors in order to ensure completion of the project without interference or delays.
- C. Cooperate and coordinate between and with other CTA contractors including, but not limited to the supply and installation of fare equipment.

1.05 WORK SEQUENCE

- A. The work shall be conducted in a scheduled sequence of installation so as to ensure the maintenance of safe operations, not to render dangerous and to provide the least possible disruption or interference to the Authority's operations.
- B. The work shall be performed under the schedule restrictions and working periods indicated in the Contract Documents. The work under this contract shall not interfere in any way with the safe and timely operation of the CTA trains, except during the hours when the system will be shut down, as indicated in the Contract Documents.
- C. No passenger stations will be closed and no tracks shall be closed during the project except during normal hours of shutdown or as described in Section 01 35 00, Special Procedures, and Attachment H-Proposal section of the Contract Documents.

1.06 BASIC STAGING FOR WORK

- A. Specific staging requirements are described in Section 01 35 00, Special Procedures, of the Contract Specifications as well as on the Contract Drawings.
- B. If applicable to this contract, track and staging areas are described in Section 01 35 00, Special Procedures..

1.07 FIELD CONDITIONS, PERSONNEL AND SERVICES

- A. Field Conditions: Examine the site of the work and adjacent premises and the various means of access; storing of materials and equipment; facilities for delivery; installing and operating the necessary construction work, and any other difficulties that may be encountered in the execution of the work.

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- B. Personnel: Employ the services of a competent superintendent at each of the construction sites during all working hours together with foremen and all skilled and common labor required to complete the work. The labor employed will be subject to the approval of the Authority, which will have the power to require the removal of any person, or persons, if in the Authority's judgment it would be in the interest of the work that such, person, or persons, be removed from the project.
- C. Furnish all temporary work required to complete this Contract. This will include all temporary work required to maintain continuous operation of all requisite lights, signal systems, traction power systems, traffic signals, guards, temporary scaffolds, sidewalks, fences and other safeguards for the protection of the work and safety of the personnel, premises and public.
- D. Provide all temporary heat required for prevention of damage of work and materials by freezing as found necessary to carry on construction operations, or for any reason as directed by the Authority.
- E. Confine plant and equipment, the storage of materials and the operations of workers to the limits of the site. In no way interfere with the work of others adjacent to the site.
- F. The Contractor shall protect the Authority's property and adjacent properties. The Contractor shall take all necessary precautions for the safety of the employees near the work.
- G. The Contractor shall secure all Contractor-owned, or Contractor-used equipment, left on the project site during hours of non-work to prevent the unauthorized use of that equipment for any purposes.
- H. Remove snow, ice and construction debris from work zones as required.
- I. CTA power, signal and communication cables must remain in continuous operation. The Contractor is responsible for ascertaining where the existing cable interferes with construction and either temporarily relocate it or adjust the installation process to avoid it. The Contractor must obtain permission by the Authority to splice existing cables. Signal cables shall not be spliced.

1.09 CONTRACTOR USE OF PREMISES

- A. General: Limit use of the premises to construction activities within the limits of the proposed improvements (contract limits).
 - 1. The limits of this project lie above public streets within the limits of City of Chicago and the any Contractor access is subject to their regulations and approval. The Contractor is solely responsible for obtaining all approvals and permits required to perform the Work and to pay all fees associated with permits, including but not limited to parking meter fees, as a part of the Contractor's Total Lump Sum Bid for Work.
 - 2. Confine operations to areas within project limits as shown on the Contract Drawings. Portions of the site beyond areas where construction operations are indicated are not to be disturbed.
 - 3. Keep driveways and entrances serving the premises clear and available to the Authority and the public at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

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- B. Use of the Existing Structures: Maintain buildings and structures noted to remain in a weather tight condition throughout that the term of the Contract. Repair damage caused by the construction operations to structures, buildings or portions of buildings. Take all precautions necessary to protect structures and buildings to remain and their occupants during the term of the Contract.
- C. Furnish, install and maintain temporary access locations for the Contractor's access to the work sites. Temporary access sites shall be approved by the Authority prior to use. Temporary modifications to permit access, such as installation of contact rail gaps, grade crossings, etc. shall be provided by the Contractor. The Contractor shall submit all proposed modifications to the Authority and obtain Authority approval prior to performing any modifications.
- D. Furnish and install temporary protection for existing equipment to permit continued operation of the existing equipment without interruption. Temporary protection measures shall not interfere with the train's operating space as well as permit normal maintenance of the equipment. All proposed temporary protection shall be approved by the Authority prior placement.

1.10 STORAGE OF MATERIALS

- A. The Contractor shall not store any material on the Authority's property or structures at any time unless approved by the Authority. All materials shall be delivered to the work site in quantities only large enough to perform the necessary tasks for each day.
- B. The Contractor assumes full responsibility for protection and security of all materials stored on the site. Materials shall be maintained by the Contractor in "as-new" condition including but not limited to immediate removal of any graffiti or posters at no additional cost to the Authority.
- C. The Contractor shall obtain and pay for the use of all storage areas required for its execution of the Contract. If it becomes necessary in the opinion of the Authority to move materials which are temporarily stored at a location, the Contractor shall move such materials to other locations as directed by the Authority at no additional cost.

1.11 CONSTRUCTION CONSTRAINTS

- A. Specific construction constraints are described in **Section 01 35 00, Special Procedures**, section of the Contract as well as on the Contract Drawings.

1.12 GENERAL REQUIREMENTS

- A. The Contractor shall limit the use of CTA property and facilities to the construction activities indicated in the Contract Documents.
- B. The Contractor assumes full responsibility for CTA procured materials once the Contractor, or one of its subcontractors, have taken delivery of the materials or have picked it up from a CTA storage location. The CTA shall not be liable for any materials or equipment stored by the Contractor on CTA property or in any staging areas.
- C. The Contractor shall not interfere with, block, or in any way encumber public right-of-way or personal property without proper permission of the person, business or agency having jurisdiction. Proof of authorization and copies of required permits shall be submitted to the CTA prior to blocking or using the property or public right-of-way.

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- D. The Contractor shall provide reasonable access to the site and shall not prohibit nor interfere with lawfully conducted inspections or site visits by properly identified representatives of the CTA, regulatory agencies or collective bargaining units.
- E. The Contractor shall perform preparation work such as temporary pavement marking, barriers, etc., and to provide and maintain traffic control and protection. Upon completion of all construction at each street, restripe the pavement and remove all traffic control and protection associated with the construction of the project.
- F. Perform clean-up routinely at the end of each work day. It is the Contractor's responsibility to make sure each trade cleans up after their work and that each work zone is cleaned daily, otherwise the Contractor shall perform the clean-up for them.
- G. The Contractor shall obtain and pay for all fees, rent or other expense for easement, for access to the work area or for storage of materials, equipment or construction operations. The Contractor shall submit proposed access plans including but not limited to access plans for additional areas, for the Authority's approval.
- H. Specific project constraints, track flagging requirements and restrictions are outlined in Section 01 35 00, Special Procedures, section of the Contract Documents.

1.13 REGULATORY REQUIREMENTS

- A. The Contractor shall immediately notify the Authority of requirements in these specifications and/or drawings, which do not strictly comply with the applicable laws, ordinances, and rules governing the work, before proceeding with that part of the work. Failure of the Contractor to do so shall be understood as an agreement on the part of the Contractor to guarantee compliance with the requirements of work covered by this Contract.

1.14 PROJECT MANAGEMENT SYSTEM

- A. The Authority is utilizing a Web-based Project Management System that will be used by all the project participants, including the Contractor, as set forth in Section 01 31 23, Project Website.

1.15 SURVEY

- A. Prior to mobilization at any site, the Contractor shall make a video record and photograph the existing condition of all areas that are to be occupied, worked on, restored or affected in any way by the project. Include conditions of adjacent buildings, structures and site improvements, including finish surfaces that may be misconstrued as damage caused by construction or demolition operations. Submit reports, digital video record, and photographs of existing conditions to the Engineer prior to mobilization of any site. The same is to occur after area or storage of the work is completed.
- B. The Contractor shall notify the Authority at least forty-eight (48) hours in advance prior to video recording and taking photographs to afford the Authority the opportunity to accompany the Contractor while performing this work.
- C. The Contractor shall be responsible for and must repair or replace any portions of such buildings, structures and site improvements damaged by *his* acts, whether negligent or

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otherwise and shall leave existing conditions in as good as existed prior to
commencement of his operations.

1.16 ALLOWANCES

- A. See Section 01 02 00, Allowances, and Appendix 2 Financial Proposal for a description of work and/or extent of work to be done and paid for as an allowance to be included as part of the base of bid.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 STAGING OF THE WORK

- A. Specific staging requirements are described in Section 01 35 00 of the Contract Specifications and Attachment H – Proposal section of the Construction Contract, as well as on the Contract Drawings.

1.01 FIELD CONDITIONS, PERSONNEL AND SERVICES

- A. Field Conditions: The Contractor shall examine the site of the work and adjacent premises and the various means of access; storing of materials and equipment; facilities for delivery; installing and operating the necessary construction work, and any other difficulties that may be encountered in the execution of the work.
- B. Personnel: Employ the services of a competent superintendent at each of the construction sites during all working hours together with foremen and all skilled and common labor required to complete the work. The labor employed will be subject to the approval of the Authority, which will have the power to require the removal of any person, or persons, if in the Authority's judgment it would be in the interest of the work that such, person, or persons, be removed from the project. Additional requirements are specified under Section 01 43 00 of the Contract.
- C. CTA power, signal and communication cables must remain in continuous operation. The Contractor is responsible for ascertaining where an existing cable interferes with construction and either temporarily relocate the cable or adjust the installation process to avoid it. The Contractor must obtain permission by the Authority to splice existing cables.

1.02 CONTRACTOR USE OF PREMISES

- A. General: Limit use of the premises to construction activities within the limits of the proposed improvements (Contract limits).
 - 1. Confine operations to areas within contract limits. Portions of the site beyond areas where construction operations are indicated are not to be disturbed.
 - 2. Confine plant and equipment, the storage of materials and the operations of workers to the limits of the site. In no way interfere with the work of others adjacent to the site.
 - 3. The Contractor shall secure all Contractor-owned, or Contractor-used equipment, left on the project site during hours of non-work to prevent the unauthorized use of that equipment for any purposes.
- B. Coordination of Site Access: The Contractor shall protect the Authority's property and adjacent properties and employ all measures required to avoid impacts to CTA

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operations and the work of other contractors working on or near the Contract limits. The Contractor shall take all necessary precautions for the safety of customers, CTA employees, other contractor personnel and the public near the work.

1. The Contractor shall obtain and pay for, without any additional cost to the Authority, any work areas, staging areas or Contractor parking areas that the Contractor requires for the execution of the Contractor's work, except as otherwise shown on the Contract Drawings. The Contractor shall provide the Authority with an executed copy of any agreements entered into regarding the temporary use of adjacent properties.
 2. Contractor employees shall not park on any private property or CTA property without prior written approval of the property owner. The Contractor shall provide the Authority with an executed copy of any agreements entered into regarding the temporary parking on adjacent properties.
 3. Keep driveways and entrances serving the premises clear and available to the Authority, other contractors and the public at all times. Do not use these areas for parking or storage of materials.
 4. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
 5. Remove snow, ice and construction debris from work zones and staging areas as required.
- C. Use of Existing CTA Facilities: Existing CTA Facilities within the Contract limits and noted to remain as well as all occupants shall be protected from damage and maintained in an operational condition by the Contractor throughout the duration of the Contract.
1. The Contractor shall take all precautions necessary to protect all facilities and their occupants during the construction period. Any damage caused by construction operations to facilities or portions of facilities noted to remain shall be restored to the satisfaction of the Authority without additional expense to the Authority.
 2. The Authority explicitly reserves the right to recover actual damages incurred, restore damaged facilities at the Contractor's expense or both.

1.03 TEMPORARY FACILITIES AND CONTROLS

- A. Furnish all temporary work required to complete this Contract. Detailed requirements are specified under Section 01 50 00 of the Contract.
- B. Provide all temporary heat required for prevention of damage of work and materials by freezing as found necessary to carry on construction operations, or for any reason as directed by the Authority.
- C. Furnish, install and maintain temporary access locations for the Contractor's access to the work sites. Temporary access sites shall be approved by the Authority prior to use. Temporary modifications to permit access, such as installation of contact rail gaps, grade crossings, etc. shall be provided by the Contractor. The Contractor shall submit all proposed modifications to the Authority and obtain Authority approval prior to performing any modifications.
- D. Furnish and install temporary protection for existing equipment to permit continued operation of the existing equipment without interruption. Temporary protection measures shall not interfere with the train's operating clearance as well as permit normal maintenance of the equipment. All proposed temporary protection shall be approved by the Authority prior placement.

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1.04 STORAGE OF MATERIALS

- A. The Authority has designated on the Contract Drawings storage and staging areas that the Authority will make available for the Contractor's use. The Contractor shall not store any material on any other of the Authority's property or structures at any time unless approved by the Authority. All materials shall be delivered to the work site in quantities only large enough to perform the necessary tasks for each day.
- B. The Contractor assumes full responsibility for protection and security of all materials stored on the site. Materials shall be maintained by the Contractor in "as-new" condition, including but not limited to immediate removal of any graffiti or posters at no additional cost to the Authority.
- C. The Contractor shall not store any hazardous materials within the limits of work, within staging areas or on any CTA property.
- D. The Contractor shall obtain and pay for the use of any other storage areas required for its execution of the Contract at no additional cost to the Authority. If it becomes necessary in the opinion of the Authority to move materials which are temporarily stored at a location, the Contractor shall move such materials to other locations as directed by the Authority at no additional cost.

END OF SECTION

SECTION 26 01 00
GENERAL PROVISIONS ELECTRICAL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this section.

1.02 SUMMARY

- A. This Section specifies the basic electrical requirements for this project.
- B. The Contractor shall provide items, articles, materials, operations and methods required by the Drawings and Specifications including labor, equipment, supplies and incidentals necessary for completion of the Work under this Contract.
- C. Any incidental accessories necessary to make the work complete and ready for operation, even though not specified or shown on the Drawings shall be furnished and installed without additional expense to the Authority.
- D. Should there be any discrepancies or a question of intent, the Contractor shall refer the matter to the Authority for decision before ordering any equipment, materials or before starting any related work.
- E. The Contractor shall furnish, erect, install, connect, clean, adjust, test and condition all manufactured articles, materials and equipment, and place in service in accordance with the equipment manufacturer's directions and specifications except as otherwise specified herein.
- F. Related work specified elsewhere:
 - 1. Section 26 03 00 Electrical Demolition.
 - 2. Section 26 05 00 Raceways and Boxes.
 - 3. Section 26 10 00 Basic Electrical Materials and Methods
 - 4. Section 26 12 30 Wires, Cables, Splices, Terminations.
 - 5. Section 26 14 10 Wiring Devices.
 - 6. Section 26 17 00 Local Control
 - 7. Section 26 17 50 Local Control Panels
 - 8. Section 26 19 00 Grounding
 - 9. Section 26 19 50 Identification
 - 10. Section 26 47 00 Panelboards
 - 11. Section 26 50 10 Lighting Fixtures
 - 12. Section 26 95 00 Electrical Testing

1.03 REFERENCES

- A. Materials and installation shall comply with codes, laws and ordinances of Federal, State, and Local governing bodies having jurisdiction.
- B. In every installation where regulations of electric utility and telephone companies apply, conformance with their regulations shall be mandatory and any costs incurred shall be

included in the Contract.

- C. In case of differences between building codes, State and Federal laws, local ordinances and utility companies regulations and the Contract Documents, the most stringent shall govern.
- D. All equipment and materials purchased for this Project shall conform to any acts, laws, rules and regulations of the following organizations:
 - 1. City of Chicago Electrical Code shall take jurisdictional precedence over all other authoritative bodies.
 - 2. National Electrical Safety Code (NESC-ANSI C2).
 - 3. American National Standards Institute (ANSI).
 - 4. National Fire Protection Association (NFPA).
 - 5. Institute of Electrical and Electronics Engineers (IEEE).
 - 6. Insulated Cable Engineers Association (ICEA).
 - 7. National Electrical Manufacturers Association (NEMA).
 - 8. Illuminating Engineering Society (IES).
 - 9. Underwriters Laboratories Inc. (UL).
 - 10. Canadian Standards Association (CSA).
 - 11. Occupational Safety and Health Administration (OSHA).
- E. Should Work be performed which does not comply with the requirements of the applicable building codes, State and Federal laws, local ordinances, industry standards and utility company regulations, changes for compliance shall be done at no additional cost to the Authority.
- F. The Contractor shall secure and pay for all required permits, governmental fees, taxes and licenses necessary for the proper execution and completion of the Electrical Work.
- G. The Contractor shall submit to governmental agencies and utility companies any shop drawings for equipment, which require their approval.
- H. The Contractor shall notify the Engineer of any proposed materials or apparatus believed to be inadequate, unsuitable, in violation of laws, ordinances, rules or regulations of authorities having jurisdiction.

1.04 SUBMITTALS

- A. The Contractor shall submit product data, brochures, cuts, specifications, maintenance data, shop drawings, installation drawings, diagrams, schedules and samples in accordance with Division 01 Section, Submittals, and supplementary requirements as stated under the sections of these specifications for equipment, materials and labor furnished under all Division 26 sections.
- B. As soon as practical and within thirty days after award of contract and before any material or equipment is ordered or purchased, the Contractor shall submit to web-based project management site all submittals for all equipment, materials or labor to be incorporated in the work.
- C. Submittals shall include manufacturers' names, catalog numbers, cuts, diagrams, product data, specifications, shop drawings and other such descriptive data as may be required to identify and approve the equipment.

- D. Extended time for submitting special shop drawings or other submittals may be requested; however, an extension of time approved does not relieve this Contractor of the responsibility of executing the work in accordance with the Contract.
- E. Any listed materials, fixtures, apparatus, or equipment that are not in accordance with the Specification requirements can and will be rejected for use in this installation and construction.
- F. Any materials, fixtures, apparatus or equipment installed without stamped or written approval shall be removed by the Contractor and replaced with specified equipment at the direction of the Authority and without recourse for additional compensation.
- G. Substitutions to listed acceptable manufacturers equipment and material will not be accepted until the Contractor has complied with the Specification Division One Section, Substitutions.
- H. Contractor shall provide all required shop drawings, reflected ceiling plans, schedules and conduit layouts.
 - 1. Contractor shall check shop drawings for accuracy and contract requirements prior to submittal. Shop drawings shall be stamped with the date checked and a statement indicating that the shop drawings conform to the specifications and drawings. This statement shall also list all exceptions to the specifications and drawings. Shop drawings not so checked and noted shall be returned.
 - 2. The Authority's check shall be for conformance with the design concept of the project and compliance with the specifications and drawings. Errors and omissions on approved shop drawings shall not relieve the Contractor from the responsibility of providing materials and workmanship required by the Contract Documents.
 - 3. All dimensions shall be field verified at the project site and coordinated with the work of all other trades.
- H. Contractor shall submit to the Authority for approval, mounting details, plan and drawings for all new proposed luminaires including pole light fixtures, interior unit heaters, smoke detectors, motion sensors, conduits and panel boards.
- I. Pre-Installation Submittals of the following types are required for the listed categories.
 - 1. Shop Drawings are required for the following.
 - a. Equipment details for switchgear, panelboards, transformers, etc.
 - b. Special systems for fire alarm, public address, security, etc.
 - c. Lighting fixtures for custom and non- standard design.
 - 2. Catalog Cuts shall cover common materials and supplies such as conduit, wire, devices, manufacturers standard lighting fixtures, etc.
 - 3. Installation drawings shall cover equipment, materials, supplies where installation is not adequately detailed on the Contract Documents. The electric room conduit and equipment layout shall be provided.
 - 4. The equipment manufacturers wiring diagrams shall show terminal blocks for external wiring.
 - 5. The equipment manufacturers internal point to point and external wiring diagrams between cubicles, panels and components within the equipment line up shall be provided.

6. Complete rating data for all equipment shall be provided.
 7. Instruction books, operation and maintenance manuals with spare parts manuals shall be provided.
- J. Post construction submittals, as required in Division One Sections, Closeout Submittals, are required for the following types of documents.
1. Shop drawing installation drawings shall be updated to "Record Document" status.
 2. Record Documents shall indicate the actual "as installed" status of all equipment, controls and materials incorporated into the facility.
 3. Test data shall be provided for all equipment and wiring as required by various sections of these Specifications.
 4. Instruction books, operations and maintenance manuals, spare parts lists shall be provided for all equipment and special systems.
 - a. The manuals shall be prepared specifically for this installation and shall include catalog data sheets, drawings, equipment lists, descriptions, parts lists, etc. to instruct operating and maintenance personnel unfamiliar with such equipment.
- K. Installation Drawings:
1. In addition to the preparation and submittal of Shop Drawings for manufactured electrical equipment and materials, the Contractor, at his expense, shall prepare and maintain in current status, a complete set of detailed, completely circuited, and dimensioned electrical construction drawings for all electrical work included under this Contract.
 2. The installation drawings shall be made under the direction and supervision of the Contractor and shall show all electrical work inclusive of conduit, wiring, grounding, electrical equipment and devices, receptacles, switches, motion sensors, monitors, smoke detectors, unit heaters, lighting fixture locations and elevations, exit signs, points where conduit enters or leaves structural slabs and walls, junction boxes, conduit supports and inserts. Provide wiring diagrams. Symbol representation for home run circuits will not be acceptable.
 3. The Contractor shall provide a separate set of installation drawings for the lighting system; a separate set of installation drawings for the power and control; and a separate set of installation drawings for the special systems.
 4. The complete electrical distribution system from source or sources up to and including each branch circuit panel board shall be shown and dimensioned exactly as installed, with all feeders located on the Drawings. Major equipment, lighting controls and apparatus shall be shown to scale and properly located; conduit home runs are not acceptable.
 5. The installation drawings shall include floor plans and reflected ceiling plans with electrical layouts drawn at a scale (or scales) as required with a minimum scale of 1/8 inch equal 1 foot, 0 inches. It is intended that installation drawings of each trade be the same scale(s) in order to permit respective plans to be superimposed upon all others of each trade.
 6. In addition to the floor plans, the layouts of all congested areas such as mechanical and/or electrical equipment rooms, and all functionally critical areas shall be drawn at a minimum scale of 1/4 inch equals 1 foot, 0 inches, and with all details of construction shown. The Authority may request additional installation drawings if in their opinion they are required to properly coordinate the project.
 7. The installation drawings shall include schedules for all panel boards. Schedules

- shall depict the bus arrangement of the panel board, the size of all circuit breakers, the connected load on each breaker, and a description of the load and its location.
8. Provide drawings for proposed mounting of wall mounted transformers.
 9. Provide a proposed equipment grounding plan.
 10. All installation drawings shall be of the same size and with the same border lines and title blocks as the Contract Drawings, with the Contractor's name added.
 11. The Contractor shall be responsible for the coordination of electrical work with the work of all other trades and shall, in preparing the installation drawings, continually check the work of all other trades (inclusive of that indicated by shop drawings) in order to avoid possible installation conflicts arising. It shall be understood that the work shown on the installation drawings has been so coordinated. In the event of conflicts or interferences that cannot be resolved in the field, the Contractor shall request a written clarification from the Authority.
 12. The installation drawings shall indicate the electrical installation exactly as constructed and therefore shall be periodically revised to reflect all changes inclusive of those required by the Authority, those which are or have been found necessary in the field, those which may be suggested by the Contractor and approved by the Authority, etc.
 13. Conduits shall be shown on the installation drawings as installed. Conduit home runs are not acceptable.
 14. Revisions shall be performed when considered necessary by the Authority or the Contractor in order to facilitate proper coordination, but shall in no event be performed at interim periods exceeding 30 days between each such revision.
 15. The initial copy of all installation drawings shall be submitted to the Authority for review. These submittals shall be considered as shop drawings and are subject to the shop drawing approval process. Subsequent revised copies shall be issued to the Authority as requested. It shall be clearly understood that these installation drawings are for installation coordination purposes only and cannot in any way alter the requirements of the Contract. Therefore, the Drawings, Specifications, and authorized revisions thereto, shall remain the only determinants of the Contract requirements.
 16. Upon completion, the initial installation drawings, and all revised installation drawings thereafter, shall be dated and certified by the Contractor as having been fully coordinated. It shall then be understood that the work shown thereupon is ready for construction.
 17. No electrical work shall begin until these installation drawings (and each revision thereof) are so drawn, and thereafter finally accepted by the Authority.
 18. All installation drawings shall be made in accordance with an approved schedule, prepared by the Contractor, and arranged to coincide with actual construction in such a manner as to allow the latter work to proceed without delay.
 19. If, in the opinion of the Authority, the installation drawings are in acceptable condition after each has been finally revised and accepted, the Contractor may submit same as the field record drawings called for elsewhere in the Specifications.
 20. The Contractor shall include wiring diagrams and schematic diagrams. Each schematic diagram shall be "JIC" ladder type. Wire numbers shall be shown on all schematic and wiring drawings.
 21. The minimum drafting letter size shall be 1/8 inch in height, block style.
- L. The Contractor shall submit test reports as described and required under this Contract.
- M. See specific specification sections for additional submittal requirements.

1.05 QUALITY ASSURANCE

- A. Materials and installation shall conform to the applicable Codes and Standards.
- B. After all equipment, devices and raceways are installed and wires and cables are in place and connected to devices and equipment, the Contractor shall test the system for continuity, proper phase rotation, short circuit, improper grounds, and other defects. If any defective conditions are present, the Contractor shall make all necessary corrections and retest for compliance.
- C. Each major component of equipment shall have the manufacturer's name, address, model number and rating on the manufacturer's nameplate securely affixed in a conspicuous place.
 - 1. The nameplate of a distributing agent is not acceptable.
 - 2. Code ratings, labels or other data, including any that are die-stamped into the surface of the equipment, shall be in a visible location.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Equipment and materials shall be delivered to the site and stored in original containers, suitably sheltered from the elements and mechanical injury, but readily accessible for inspection until installed.
 - 1. Items subject to moisture damage shall be stored in dry heated spaces.
 - 2. Manufacturer's directions shall be followed in the delivery, handling, storage, protection, installation and operation of all equipment and materials.
- B. The Contractor shall determine, from examination of the Drawings, whether any special temporary openings in the building will be required for the admission of apparatus furnished under this section, and notify the Engineer accordingly. In the event of failure to give sufficient notice in time to arrange for these openings during construction, the Contractor shall assume all costs of providing such openings thereafter.
- C. The Contractor shall coordinate with the Authority the movement of heavy machinery, equipment and heavy parts thereof brought into or onto the building or premises.
- D. Conduit openings shall be kept closed by means of plugs or caps to prevent the entrance of foreign matter.
- E. The Contractor shall cover all fixtures, equipment and apparatus as required to protect them against dirt, water, chemical, solar, or mechanical damage. The Contractor shall also provide any supplementary heating and cooling required to prevent moisture and thermal damage.
- F. Equipment shall be inherently safe and moving parts shall be covered with guards.
- G. Equipment in storage having moving parts, which may be damaged or distorted by being idle, shall be rotated or exercised periodically and all lubricants shall be properly maintained.

1.07 DRAWINGS

- A. The Drawings are diagrammatic and are intended to convey the scope of work and indicate the general arrangement and/or sizes of conduit, equipment, fixtures and other

work included in the Contract.

- B. The location of items required by the Drawings or Specifications where not definitely fixed by dimensions on the Drawings are approximate only. The exact locations necessary to secure the best conditions and results shall be determined at the site and shall be subject to the approval of the Authority.
- C. The Contractor shall coordinate the location of the lighting fixtures and intercommunication speakers with the location of the mechanical equipment.
- D. The Contractor shall lay out the work, check drawings of other trades to verify spaces in which work shall be installed, and maintain maximum headroom and space conditions at all points.
 - 1. Where headroom or space conditions appear inadequate, the Contractor shall notify the Authority before proceeding with installation.
 - 2. Any minor changes in the locations of equipment, fixtures, lighting fixtures conduits, outlets, devices, etc., from those locations as shown on the Drawings shall be made without extra charge to the Authority. A minor change in location shall be considered to be within 10'-0" of the location as may be scaled from the Drawings for all interior work and within 25'-0" for all exterior work.

1.08 EXECUTION, CORRELATION AND INTENT OF DOCUMENTS

- A. In the event that conflicts, if any, cannot be settled rapidly and amicably between the affected trades, with the Work proceeding in a workmanlike manner, then the Engineer shall decide which Work is to be relocated. The Engineers judgment shall be final and binding on the Contractor.
- B. No measurements of a Drawing by scale shall be used as a definite dimension to work by.

1.09 INSTRUCTIONS AND ADJUSTMENTS

- A. At the conclusion of the Work and before final contract payment is made, the Contractor shall demonstrate and explain to the Authority the function, operation and maintenance of all equipment and systems installed.
- B. The primary adjustments of the system(s) shall be accomplished by the Contractor to the complete satisfaction of the Authority at the time of completion of the installation.

1.10 WARRANTY

- A. The Contractor shall be responsible for all Work in this Specification. The Contractor shall make good, repair, or replace at his own costs and expense as may be necessary, any defect which in the opinion of the Engineer is due to imperfections in material, design or workmanship or if defect shows itself to be defective within one year after acceptance by the Engineer.
- B. The Contractor shall be responsible for protecting all equipment and systems against harmful exposures to, or accumulations of dust and moisture, flooding, corrosion or other forms of damage and shall clean and restore damaged finishes as may be required to place installations in a "Like New" condition before acceptance by the Authority.
- C. All manufacturers' equipment guarantees or warranties shall be included in the Maintenance Manuals.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall be new and shall be UL or CSA labeled where applicable and shall bear the manufacturer's name, model number and other identification markings.
- B. Materials and equipment shall be the best grade product of a manufacturer regularly engaged in the production of the required type of material or equipment for at least five years (unless specifically exempted by the Authority and shall be the manufacturer's latest design with published properties, that meet the specification requirements. The use of other than "prime" grades will not be accepted.
- C. Equipment and materials of the same general type shall be of the same manufacturer throughout the project to provide uniform appearance, operation and maintenance.
- D. Equipment and materials shall be without blemish or defect and shall not be used for temporary light or power purposes, including lamps, without the Authority's written authorization.
- E. In all cases, where a device or part of the equipment is herein referred to in the singular number, it is intended that such reference shall apply to as many such devices as are required to complete the installation.

2.02 ENCLOSURES FOR ELECTRICAL EQUIPMENT/FITTINGS

- A. Enclosures for Electrical Equipment shall be governed by the area classification described below or unless otherwise noted on the Drawing.
- B. NEMA Type 1A may be used in dry indoor environmental with full time filtered air supplies.
- C. NEMA Type 12 shall be used in indoor dry and non-chemical environment.
- D. NEMA Type 13 oil tight devices shall be used for all control panels.
- E. NEMA Type 3R or 4X stainless steel shall be used in exterior, interior wet areas, and corrosive environment where chemicals are stored or mixed with liquids; and in subway areas or as indicated on the contract drawings.
- F. NEMA Type 7/9 hazardous, shall be used in all hazardous areas.
- G. Specific site requirements may necessitate the use of different enclosure ratings or manufacturing techniques.

2.03 MOTOR VOLTAGE OPERATION

- A. Unless otherwise noted, all AC motors shall be operated on the following voltages:
 - 1. Motors under 1/2 horsepower shall be 115 volts AC, single phase, 60 hertz.
 - 2. Motors 1/2 horsepower and larger shall be 208 volts AC, 3 phase, 60 hertz.
- B. AC motor type, enclosure type, and other design requirements shall be as specified in these Specifications.

PART 3 EXECUTION

3.01 INSTALLATION OF WORK

- A. The Contractor shall perform all Work with trained mechanics of the particular trade involved in a neat and workmanlike manner as approved by the Authority.
- B. The Contractor shall perform all Work in cooperation with other trades and schedule to allow speedy and efficient completion of the Project.
- C. The Contractor shall furnish other trades with advance information on locations and sizes of frames, boxes, sleeves and openings needed for the work, and also furnish information and shop drawings necessary to permit trades affected to install their work properly and without delay.
- D. Where there is evidence that the work of one trade will interfere with the work of other trades, all trades shall assist in working out space conditions to make satisfactory adjustments and shall be prepared to submit and revise coordinated shop drawings and installation drawings.
- E. With the approval of the Authority and without additional cost to the Authority, the Contractor shall make minor modifications in the Work as required by structural interferences, by interferences with work of other trades or for proper execution of the Work.
- F. Minor changes in the locations of outlets, fixtures and equipment shall be made at the direction of the Authority prior to rough-in and shall be at no additional cost to the Authority.
- G. The equipment shall be installed with ample space allowed for removal, repair or changes to equipment. Ready accessibility to removable parts of equipment and to wiring shall be provided without moving other equipment which is to be installed or which is in place.
- H. Locations of electrical outlets, lighting panels, cabinets, equipment, etc. are approximate and exact locations shall be determined by the Contractor at the Project site.
- I. The Contractor shall refer to the Contract Documents for details and reflected ceiling drawings.
- J. The Contractor shall protect the materials and work of other trades from damage during installation of the work provided under this Contract.

3.02 EQUIPMENT NOISE LIMITATION

- A. Noise levels of electrical devices and equipment shall be within acceptable limits as established by NEMA or other valid noise rating agencies. Noise levels shall be subject to the Authority's acceptance which will be based on practical and reasonable considerations of occupancy requirements.
- B. The Contractor shall check and tighten the fastenings of sheet metal plates, covers, doors, and trims to prevent vibration and chatter under normal conditions of use.
- C. When located elsewhere than in high-noise-level equipment rooms, the enclosures or solenoid-operated switching devices and other noise-producing devices shall have anti-

vibration mountings and non-combustible sound-absorbing linings.

- D. Transformers, reactors, dimmers, lamp ballasts, and solenoids shall be designed and rated for "quiet" design.
- E. The Contractor shall remove and replace any individual electrical item or device that is found to produce a sound energy output exceeding that of other identical devices installed at the Project.

3.03 TRANSMISSION OF VIBRATION

- A. Electrical equipment, conduit, and fittings shall not be mounted to or supported by elements subject to vibration except by methods specified here in and/or shown on the Drawings.
- B. Where flexible conduit lengths are utilized as a means of isolating equipment and conduit systems vibration, care shall be exercised to assure continuity of ground throughout. Flexible conduit lengths shall be a maximum of 18 inches in areas where same are permitted.

3.04 PROTECTION

- A. The Contractor shall protect conduit and wireway openings against the entrance of foreign matter by means of plugs or caps.
- B. The Contractor shall cover fixtures, materials, equipment and devices furnished or installed under this Contract or otherwise protect against damage, before, during, and after installation.
- C. Fixtures, materials, equipment, or devices damaged prior to final acceptance of the Work shall be restored to their original condition or replaced.
- D. Equipment shall be inherently safe and moving parts shall be covered with guards.

3.05 INSTALLATION OF WORK FOR OTHER SECTIONS

- A. The Contractor shall coordinate all electrical work and shall complete all wiring, conduit, material and electrical equipment as required for equipment installed under other divisions of these Specifications.

END OF SECTION

SECTION 26 10 00
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this section.

1.02 SUMMARY

- A. This section includes all materials, equipment and labor required for electrical work and required for a complete and functional system.
- B. Related work specified elsewhere:
 - 1. Section 26 01 00 General Provisions Electrical
 - 2. Section 26 03 00 Electrical Demolition.
 - 3. Section 26 05 00 Raceways and Boxes.
 - 4. Section 26 12 30 Wires, Cables, Splices, Terminations.
 - 5. Section 26 14 10 Wiring Devices.
 - 6. Section 26 17 00 Local Control
 - 7. Section 26 17 50 Local Control Panels
 - 8. Section 26 19 00 Grounding
 - 9. Section 26 19 50 Identification
 - 10. Section 26 47 00 Panelboards
 - 11. Section 26 50 10 Lighting Fixtures
 - 12. Section 26 95 00 Electrical Testing

1.03 SUBMITTALS

- A. The Contractor shall submit product data, brochures, cuts, specifications, maintenance data, shop drawings, installation drawings, diagrams, schedules and samples in accordance with Division 01 Section, Submittals, and supplementary requirements as stated under the sections of these Specifications for all the materials and construction referred to in this section.
- B. See Section 26 01 00, General Provisions Electrical for additional submittal requirements.

PART 2 PRODUCTS

2.01 ACCESS PANELS

- A. Where items such as pull boxes, junction boxes, other specialties, or any piece of equipment or device requiring adjustment or service, are concealed in the construction, the Contractor shall furnish an access panel for ceilings or walls to permit adjustment or service of the concealed item. The access panel shall be of a design suitable for installation in the material forming the finished surface in which panel is mounted.
- B. Panels shall be flangeless hinged type with vandal-proof fasteners.
- C. Panels shall be furnished and installed under this Contract.

- D. Acceptable manufacturers shall be Crouse-Hinds, Miami-Carey Co., Milcor Division, Inland-Ryerson Co. Nystrom, Inc. or approved equal.

2.02 EQUIPMENT BASES

- A. The Contractor shall provide concrete pedestals, bases, pads, curbs, anchor blocks, anchor bolts, slab inserts, hangers, channels, cradles, saddles, etc., for installation of all electrical equipment and apparatus that is floor mounted.
- B. Concrete pads shall be 4 inches high, unless otherwise indicated on the Drawings, complete with steel reinforcing and necessary bolts, anchors, etc. Where concrete pad is set directly on concrete floor, dowels in floor to tie base to floor shall be provided. These pads shall be extended at least 4 inches beyond the equipment outlined on all four sides, unless otherwise indicated on the Drawings.

2.03 VIBRATION ISOLATION

- A. Suspended vibration producing equipment shall have spring elements in the hanger rods or isolation pads under the equipment.
- B. Conduit connections to vibration producing equipment shall be made with flexible conduit.
- C. Acceptable manufacturers shall be Barry Division of Barry Wright Corp, Consolidated Kinetics Corp., Crouse-Hinds, Mason Industries or approved equal.

2.04 EXPANSION FITTINGS

- A. The Contractor shall furnish and install expansion fittings and bonding jumpers for the metallic conduit system where conduit crosses each building expansion joint, at each straight uninterrupted run of surface mounted conduit, at each vertical riser in excess of 100 feet and where conduits transfer between structurally independent pipes, poles or supports. The distance between fittings as installed shall not exceed 200 linear feet.
- B. Expansion fittings shall provide for 8 inch movement and shall include bonding jumpers.
- C. Expansion fittings shall be Appleton XJ with XJB jumpers, Crouse-Hinds, OZ/Gedney, or approved equal.

2.05 FLOOR BOXES AND FITTINGS

- A. Concrete tight floor boxes shall be pressed steel boxes with adjustable brass flange and covers. Acceptable manufacturers shall be Bell F 4052, Hubbell B 2529, or approved equal.
- B. Watertight floor boxes shall be cast iron with adjustable brass flange and covers. Close up plugs and reducing bushings shall be provided as required. Acceptable manufacturers shall be Bell F122-NR, Crouse-Hinds, Hubbell B 2537, or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

- A. Interferences:

1. Locations of conduits, fixtures and equipment shall be adjusted and supported to accommodate field conditions encountered, including any potential interferences with other construction or equipment to be installed.
2. The Contractor shall determine the exact route and location of each duct bank and electrical raceway prior to fabrication.

B. Accessibility:

1. The Work shall be installed to permit removal (without damage to other parts) of parts requiring periodic replacement or maintenance.
2. Conduits and equipment shall be arranged to permit ready access to components and to clear the openings overhead doors and access panels.
3. The Contractor shall provide necessary access panels in equipment as required for inspection and maintenance.

C. Exterior Wall Openings:

1. Openings in exterior walls, particularly at or below grade, shall be kept properly plugged and caulked at all times to prevent the possibility of flooding due to storms or other causes.
2. After completion of the Work, openings shall be permanently sealed and caulked so as to provide leakproof conditions.

3.02 SLEEVES

- A. The Contractor shall provide sleeves where conduits pass through walls, floors, partitions as required by the Drawings, and/or job conditions.
- B. Sleeves shall be 18 gauge galvanized sheet metal or plastic, as approved by code, of sufficient length to finish flush with finished surfaces at both ends of sleeves.
- C. Sleeves shall be not less than 1 inch larger than outside diameter of conduit.
- D. Floor sleeves shall be galvanized steel or plastic pipe as approved by code, shall be of sufficient length to finish flush with the top and bottom of the floor, and shall be watertight.
- E. Sleeves through walls, ceilings, and floors, shall have the net openings packed with glass fiber insulation. Each sleeve shall be fire sealed to match the fire rating of the structure they penetrate. Both ends of the sleeves are caulked with waterproof mastic to prevent noise, dirt, air and water transmission.
- F. Where conduits pass through floors on grade or exterior walls, the Contractor shall provide watertight sealing fittings, OZ/Gedney Type WSK or approved equal.
- G. Sleeves shall be set true to line level plumb and shall be so maintained during construction. Where sleeve is provided in poured concrete, the Contractor shall inspect during and after concrete is poured, to insure proper position and to correct any deviation.

3.03 PAINTING

- A. All electrical equipment not specified for factory finish painting under other sections of these Specifications shall be painted as specified herein.
- B. Prime Coat:

1. Before delivery to the site, the shop fabricated and factory built equipment, which is not galvanized or protected by plating, shall be cleaned and given one shop coat of zinc-chromate primer before delivery to the site.
2. Any portions of the shop coat damaged in delivery or during construction shall be recoated.
3. Nameplates, labels, tags, stainless steel, or chromium-plated items such as motor shafts, levers, handles, trim strips, etc, shall not be painted.

C. Finish Coat:

1. Conduit and equipment shall be left cleaned and primed, ready for finish painting provided under the Painting section of this Specification.
2. All equipment shall be factory finished in baked enamel or lacquer, or as specified. Standard finishes shall be approved. All scratches shall be touched-up by the Contractor.
3. All metal work installed by the Contractor exposed to weather and not factory finished shall be painted with one coat of red lead, and two coats of lead and oil paint of color selected by the Authority.

3.04 PATCHING

- A. The Contractor shall provide all cutting and patching of building materials required for the installation of the work herein specified.
 1. No structural members shall be cut without the approval of the Engineer.
 2. Roof deck is considered a structural member.
 3. Approved cutting shall be done with concrete saws or core drills.
- B. Patching shall be provided by mechanics of the particular trade involved and done in a neat and workmanlike manner.
- C. Slots, chases, and recesses with openings in the walls, ceilings, floors and roofs shall be provided by the Contractor. The Contractor shall see that they are properly located.
- D. Slots, chases, openings and recesses in the structure shall be cut by the Contractor. The Contractor shall patch and repair as required.

3.05 CLEANING

- A. All rubbish and debris resulting from the Work of this SECTION shall be collected, removed from the site and disposed of legally on daily basis.
- B. All floors shall be kept in a broom clean condition.
- C. After completion of the electrical installations the entire system shall be thoroughly cleaned to remove all foreign materials from the conduits, boxes and enclosure, equipment, lighting fixtures, light standards, panels, cords, etc.
- D. Cleaned shall mean the thorough removal of, but not limited to, dust, dirt, oil, grease, cement, plaster, welding spatters and paint spatters.
- E. All cleaning agents and methods shall be in accordance with the electrical equipment manufacturers' recommendations and subject to approval of the Authority.

3.06 ALTERATION AND DEMOLITION

- A. A complete and accurate description of all electrical work within the affected areas cannot be accomplished through the media of Drawings and Specifications. Where existing electrical work prevents proper construction of new materials, the Contractor shall remove, reroute, relocate, or in other ways alter the existing work in order to accommodate the new work requirements. Such performance shall be as generally outlined herein and found necessary under field conditions and shall be considered as included under the Contract.
- B. The Drawings are generally instructive of the alterations which involve the existing electrical work. It is not intended that such alterations be limited to these instructions.
- C. Where existing electrical equipment must be removed as a result of the alterations, it shall be completely demolished, back to the first outlet or junction box which is left unaffected by this work. All conduit, wire, supports, hangers, etc. shall be included under this requirement. Conduit which is encased in concrete or otherwise unaccessibly positioned may be abandoned. In such cases wire shall be pulled out of conduit and the conduit itself shall be plugged and capped at each end.
- D. Existing electrical material and equipment, including lighting fixtures, switches, receptacles, conduit outlets, fittings, and other devices which are removed as a result of the alterations shall remain the property of the Authority and shall be stored on the site as directed.
- E. Existing electrical material and equipment with the exception of wire and cable, as generally outlined in the previous paragraph, shall be re-used as completely as is found practical. The Contractor shall examine the condition of such material and equipment and make a prior determination of whether it is suitable for re-use. The Contractor shall present findings periodically to the Engineer who in turn will make the final decision regarding re-usability. Wire and cable shall be new.
- F. Various signal, communications, and other services shall remain in service to provide continuous operation for the Authority's functions. No interruptions of any services will be allowed without written approval from the Authority.
- G. The Contractor shall remove or reroute electrical feeders, risers, branch circuits, and other wiring as required by the alterations or as shown on the Drawings. Wiring extending through remodeled areas but serving loads which must remain shall be rerouted as required, and reconnected to those loads.

END OF SECTION

SECTION 26 12 30
WIRES, CABLES, SPLICES AND TERMINATIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this section.

1.02 SUMMARY

- A. This section specifies all wires, cables, splices and terminations as well as appurtenances thereto required under this Contract.
- B. Related work specified elsewhere:
- | | | | |
|-----|------------------|--------------------------------|---------|
| 1. | Section 26 01 00 | General Provisions Electrical | |
| 2. | Section 26 03 00 | Electrical Demolition. | |
| 3. | Section 26 05 00 | Raceways and Boxes. | |
| 4. | Section 26 10 00 | Basic Electrical Materials and | Methods |
| 5. | Section 26 14 10 | Wiring Devices. | |
| 6. | Section 26 17 00 | Local Control | |
| 7. | Section 26 17 50 | Local Control Panels | |
| 8. | Section 26 19 00 | Grounding | |
| 9. | Section 26 19 50 | Identification | |
| 10. | Section 26 47 00 | Panel Boards | |
| 11. | Section 26 50 10 | Lighting Fixtures | |
| 12. | Section 26 95 00 | Electrical Testing | |

1.03 SUBMITTALS

- A. The Contractor shall submit product data, brochures, cuts, specifications, maintenance data, shop drawings, installation drawings, diagrams, schedules and samples in accordance with Division 01 Section, Submittals, and supplementary requirements as stated under the sections of these Specifications for all the materials and construction referred to in this section.
1. Materials – AC Wire & Cable: The Contractor shall submit for approval, before ordering or purchase of wire or cable, the following for each type and size to be furnished:
- | | |
|----|---|
| a. | Manufacturer of wire, cable, accessories. |
| b. | Number and size of strands composing each conductor. |
| c. | Conductor insulation, in 64ths of an inch. |
| d. | Sheath thickness in 64ths of an inch. |
| e. | Average overall diameter of finished cable. |
| f. | Minimum insulation resistance in megohms per 1,000 feet. |
| g. | Representative sample length including all labeling and identification. |
- B. See Section 26 01 00, General Provisions Electrical for additional submittal requirements.

PART 2 PRODUCTS

2.01 GENERAL

- A. The Drawings show the locations, type, size and number of wires and cables to be

furnished under this Contract. Each type shall comply with the Specifications contained herein.

- B. Only new cables shall be provided. Cables which have been manufactured more than two years prior to installation will not be accepted.
- C. The conductors, unless otherwise noted, shall be soft or annealed copper conforming to ANSI/ASTM B 33 if coated, ANSI/ASTM B 3 if uncoated. In addition, unless otherwise specified, stranded conductors shall have concentric stranding as per ANSI/ASTM B 8.
- D. Cables shall be supplied with both ends of each length sealed against the entry of moisture.

2.02 QUALITY ASSURANCE - AC CABLE

- A. All wires and cables shall be listed by Underwriter's Laboratories, Inc. and shall be copper.
- B. All wire and cable shall be stamped every two feet indicating, voltage, type, temperature rating, manufacturers name, etc., all in conformance with latest applicable standard.
- C. All conductors for wire and cable shall be copper based on 98 percent conductivity according to Mattheisen's Standard.

2.03 MATERIALS - AC WIRE AND CABLE

- A. Wire number 16 AWG and smaller shall be solid, wire number 14 AWG and larger shall be stranded. Control wiring shall be stranded in all sizes and color coded, as approved by the Authority.
- B. All wire Number 6 AWG and smaller, shall have color coded insulation. All wires Number 4 AWG and larger in each, pullbox, outlet, cabinet and every point where wires are accessible or visible, shall be color coded. The same color coding shall be used throughout the entire electrical system.
- C. Color as selected for the purpose of identifying circuits shall be applied to the wire. The colors shall be fast, fadeless and capable of withstanding cleaning in the event that the wire becomes soiled.
 - 1. Green shall be used only for ground wire.
 - 2. All conductors shall be color coded as follows:

	<u>240V/208V/120V AC</u>	<u>480/277V AC</u>
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	White
Ground	Green	Green

- D. All numerical references to wire size in the Specifications and on the Drawings refer to standard American Wire Gauge (AWG), or where so stated, thousands of circular mils (KCMIL).
- E. The Contractor shall submit for approval, before purchase of wire or cable, the following for each type and size to be furnished:

1. Manufacturer of wire, cable.
 2. Number and size of strands composing each conductor.
 3. Conductor insulation, in 64ths of an inch.
 4. Sheath thickness in 64ths of an inch.
 5. Average overall diameter of finished cable.
 6. Minimum insulation resistance in megohms per 1,000 feet.
 7. Representative sample length including all labeling and identification.
- F. The Contractor shall provide wire with thermoplastic insulation type "THWN/AWM." Wire insulation shall consist of a tough, elastic, flexible rubber-like synthetic insulation compound made from 105 degrees C polyvinyl chloride or, its copolymer with vinyl acetate, covered with a nylon jacket. It shall be highly resistant to oil and moisture and shall not be affected by acid or alkali conditions, and marked by UL label as "Gas and Oil Resistant II."
- G. The insulation compound shall be suitable for operating without undue injury or deterioration; under conductor temperatures not exceeding 75 degrees C wet or dry, and 75 degrees C in oil UL rating; and shall be rated 600 volts.
- H. The thermoplastic insulation and nylon jacket shall be applied to the conductor in a manner that will provide continuous walls of uniform thickness, free from defects and of high dielectric strength.
- I. Type "THWN/AWM" insulated wire and cable shall be manufactured and tested in accordance with the requirements of UL and the latest ASTM Specifications for insulated wire and cable, polyvinyl insulation compound and nylon jacket, and shall also comply with IPCEA Standard S-19-81.

2.04 MATERIAL - AERIAL AND UNDERGROUND CABLE, AC SERVICE

- A. Aerial and underground cable shall be single conductor copper. Conductor insulation shall be XLP insulation/jacket, 600V type RHH-RHW-USE. All conductors shall have an overall jacket, resistant to ozone, sunlight and weather.
- B. Cable shall be rated, for continuous full-load operation, 90 degrees C in dry locations or 75 degrees C in wet or dry locations.

2.05 MANUFACTURERS

- A. AC Wire and cables shall be as manufactured by Pirelli, Okonite, Triangle Wire & Cable, or Rome, Product of Cyprus Wire, or Carol Cable - Division of Avnet, or approved equal.

2.06 CABLE SPLICING, TERMINATING AND ARC PROOFING MATERIALS

A. TERMINATIONS - AC WIRES AND CABLES:

1. Special care shall be taken to balance the loads on all phases, at all cabinets. The panelboard schedules show the proper circuiting, the Contractor shall not change this circuiting without the approval of the Engineer. Distinguishing colors shall be used for identifying the particular phase on which the circuit belongs.
2. 600 volt cable lugs for terminations to busbar, switch studs, and terminal blocks, for Number 22 AWG to 10 AWG wire shall be color coded nylon insulated ring tongue lugs in vibration areas, and spade type in other areas. They shall have a secondary metal sleeve around the wire barrel for insulation strain relief. Type shall be Panduit Pan-Term PN series terminals.
3. 600 volt cable lugs for termination to busbar and switch studs for Number 8 AWG to 1/0 AWG wire shall be with standard barrel one hole high conductivity

seamless copper lugs with inspection holes to assure adequate wire insertion. The tongue shall be stamped with wire size, UL & CSA logos and manufacturer. The base part number and stud size should also be stamped on the tongue to assure adequate identification in application. Barrels shall contain color coded rings, die color code and/or number. Crimp locations shall be indicated to assure correct installation. For further identification, the manufacturer should also be included on the barrel. Type shall be Panduit Series LCB or LCC Power Connectors or Burndy Type YA, or approved equal.

4. 600 volt cable lugs for termination to busbar and switch studs for number 2/0 AWG and larger wire shall be terminated with long barrel, two hole high conductivity seamless copper lugs. Barrels shall contain color coded rings knurled markings indicating die color code, die index numbers, and crimp locations to assure correct usage and installation. For further identification, the manufacturer should also be included on the barrel. For Number 2/0 to 250 MCM sizes, the tongue may be stamped with wire size, UL & CSA logos and manufacturer. The base part number and stud size should also be stamped on the tongue to assure adequate identification in application. Type shall be Panduit LCC series Power Connectors or Burndy Type YA, or approved equal.

B. SPLICES - AC WIRES AND CABLES:

1. Number 10 AWG and smaller wire shall be spliced with insulated butt connectors. Connectors shall contain a center wire stop for adequate wire insertion, translucent nylon insulated housings to insure accurate crimp location, and brazed seam construction for high performance terminations. Type shall be Panduit BSN Pan-Term Butt Splices or 3M "Scotch Lock."
2. Number 8 AWG and larger wire shall be standard barrel, high conductivity seamless copper splices. Barrels shall contain color coded rings knurled markings indicating die color code, die index numbers, and crimp location to assure correct usage and installation. For further identification, the base number and manufacturer should also be included on the barrel. Type shall be Panduit SCS series Power Connectors or 3M "Scotch Lock."
3. Number 10 AWG and smaller wire taps for solid wires shall utilize insulated compression type twist wing or nut style connectors with 105 degrees C, 600 volt rating, for UL listed wire combinations. Connectors shall have a tough nylon housing with a deep skirt to prevent shorts and flashovers, funnel entry to facilitate wire insertion, expanding square wire spring design to ensure reusability, as well as markings to indicate part number UL & CSA logos, and wire range. Nut Style connectors shall be of industry nut style color coding; Blue, Orange, Yellow, and Red (small to large) with comfortable ribs for greater gripping. Industry standard Wing Style color coding shall also be used; Yellow, Red, Blue (small to large), with offset wings to ensure comfort and torquing capability. In addition, black connectors may be used for temperature applications to 150 degrees C and green connectors for grounding applications. Type shall be Panduit "P-Conn" Wire Connectors or 3M "Scotch Lock."
4. Number 10 AWG stranded and smaller, taps shall be made with insulated compression type wire joints. Type shall be Panduit Type JN or approved equal.
5. Number 8 AWG and larger wire taps for stranded wire shall utilize compression taps up through 4/0 AWG wire or parallel gutter taps for larger wire. Taps shall have part number and wire range indicated on the body of the connector. Type shall be Panduit C-Tap Power Connectors or OZ Electrical Type XTP parallel gutter taps.

PART 3 EXECUTION

3.01 INSTALLATION - AC WIRES AND CABLES

- A. Wires and cables shall be carefully handled during installation. Joints and splices shall be made in an approved manner, and shall be equivalent electrically and mechanically to the conductor itself.
- B. Conduit fill shall be based on Chicago Electric Code for "New Work."
- C. All branch circuit and control wiring, in conduit shall be not less than Number 12 AWG wire unless noted otherwise.
- D. Stranded control cables in Number 12 AWG size and smaller shall be terminated into solderless lugs, then lug shall be connected to terminal part.
- E. At least six inch loops or ends shall be left at each outlet for the installation of fixtures or devices.
- F. All wires in outlet boxes not for the connection to fixtures, devices or other wires at that outlet, shall be rolled up and the ends capped or taped.
- G. All circuits in panelboards shall be neatly grouped and tied with seine twine, or nylon wire ties.
- H. No splice or any kind shall be pulled into any raceway. All splices and taps shall be accomplished in a manhole, handhole, junction, pullbox or other accessible enclosure.
- I. Wire and cable shall be delivered to the site in marked manufactures cartons.

3.02 WIRE PULLING LUBRICANT

- A. When necessary to use a lubricant for pulling wires in steel conduit, lubricant shall be UL listed and be of such consistency that it will leave no obstruction or tackiness that will prevent pulling out old wires or pulling in new or additional wires. No soap flakes or vegetable soaps shall be permitted.

3.03 TESTING

- A. Wires and Cables:
 - 1. After wires and cables are in place and connected to devices and equipment, the system shall be tested for shorts and grounds as specified in Section 26 95 00, Electrical Testing.
 - 2. All hot wires, if shorted or grounded, shall be completely removed and replaced in kind.
 - 3. A voltage test shall be made at the last outlet on each circuit. If the drop in potential is greater than permitted by the CEC, the Contractor shall correct the condition by removing and replacing partly grounded connections or reconnecting high resistance splice.
 - 4. All grounds, shorts and high resistance splices shall be remedied immediately at the conclusion of testing for acceptance.
 - 5. Any wiring device, or electrical apparatus provided under this Contract, if grounded or shorted shall be removed, trouble corrected and reinstalled.
 - 6. All high voltage cables, after in place and connected, shall be megged, in presence of the Authority.
 - 7. All meters, cable connections, equipment or apparatus necessary for making all tests shall be furnished by the Contractor at Contractor's own expense. The Contractor shall provide copy of all tests for Authority's approval of result.
 - 8. No work shall be covered up without approval of the Authority.

3.04 IDENTIFICATION OF WIRES AND CABLES

- A. General:
 - 1. All wires and cables, shall be identified by circuits in all cabinets, boxes, manholes, hand-holes, wiring troughs and other enclosures, at all terminal points.
 - 2. The circuit designations shall be as shown on the Drawings, or as directed by the Authority. Tags shall be attached to wires and cables so that they will be readily visible.
- B. Cable/wire markers shall be installed on both ends of all conductors, both for internal and external cables. Cable/wire markers shall be as specified under Section 26 19 50 Identification.

END OF SECTION

SECTION 26 17 50
LOCAL CONTROL PANELS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this section.

1.02 SUMMARY

- A. This section specifies requirements for the furnishing and installing of local control panels. The work under this section includes furnishing all labor, materials, tools, equipment and incidentals necessary to install the local control panels.
- B. The Contractor shall furnish and install the local control panels as required by other Sections of these Specifications and as shown on the Drawings.
- C. Related work specified elsewhere:
- | | | |
|-----|------------------|--|
| 1. | Section 26 01 00 | General Provisions |
| 2. | Section 26 03 00 | Electrical Demolition. |
| 3. | Section 26 05 00 | Raceways and Boxes. |
| 4. | Section 26 10 00 | Basic Electrical Materials and Methods |
| 5. | Section 26 12 30 | Wires, Cables, Splices, Terminations. |
| 6. | Section 26 14 10 | Wiring Devices. |
| 7. | Section 26 17 00 | Local Control |
| 8. | Section 26 19 00 | Grounding |
| 9. | Section 26 19 50 | Identification |
| 10. | Section 26 47 00 | Panelboards |
| 11. | Section 26 50 10 | Lighting Fixtures |
| 12. | Section 26 95 00 | Electrical Testing |

1.03 SUBMITTALS

- A. The Contractor shall submit product data, brochures, cuts, specifications, shop drawings, conduit layouts, installation drawings, diagrams, schedules and samples in accordance with Division 01 Section, Submittals, and supplementary requirements as stated under the sections of these Specifications for all the materials and construction referred to in this section.
- B. The Contractor shall prepare and submit to the Authority, for review, before fabrication and assembly of equipment, shop drawings and other submittals including, but not limited to, the following:
1. Front and interior elevations shall be provided as required to show all equipment for each control panel.
 2. Drawings and section views shall include all dimensions for rough in work at the site.
 3. The shop drawings shall show the details of connections, terminals, etc. including the complete terminal block arrangement and enclosure ground connections.
 4. Single line diagrams where required to show equipment power distribution and control schematic diagrams shall be provided.
 5. Wiring Diagrams:

- a. Connection diagrams for the wiring of equipment in each local control panel shall be provided.
 - b. Interconnection diagrams shall show the wiring to external equipment. The terminal block points shall be clearly identified for the external wiring to be routed in or out of each local control. The wiring diagrams shall provide adequate space at the terminal blocks for the addition of cable and wire designations.
 6. Contractor shall check shop drawings for accuracy and contract requirements prior to submittal. Shop drawings shall be stamped with the date checked and a statement indicating that the shop drawings conform to the specifications and drawings. This statement shall also list all exceptions to the specifications and drawings. Shop drawings not so checked and noted shall be returned.
 7. The Authority's check shall be for conformance with the design concept of the project and compliance with the specifications and drawings. Errors and omissions on approved shop drawings shall not relieve the Contractor from the responsibility of providing materials and workmanship required by the Contract Documents.
 8. All dimensions shall be field verified at the project site and coordinated with the work of all other trades.
 9. Bills of material including all items with catalog cuts describing the electrical and physical characteristics of each item.
- C. The Contractor shall submit, for record and distribution, prior to shipment of equipment, the following for each local control panel:
1. All drawings shall be as finally reviewed and shall include any factory assembly modifications.
 2. Recommended installation and storage instructions with any special instructions shall be provided.
- D. The Contractor shall submit, for record and distribution, prior to shipment of equipment, the following for each local control panel assembly:
1. Instruction manuals shall include descriptive bulletins and operation leaflets for the control relays, switches, starters, and circuit breakers.
 - a. Each instruction manual shall be in a three ring hard binder with tabbed sections. The binder cover shall have the project name and equipment name. The lettering shall be block type and shall be a minimum height of 1/2 inch.
 - b. Each instruction manual shall contain the "Record Document" drawings, complete operating and instruction manuals, spare parts lists, certified test documents, and other special data required for this equipment.
 - c. The "Record Document" drawings larger than 8 1/2 by 11 inch shall be fan folded.
 2. Spare parts bulletins shall be included with catalog cuts for each item.
 3. For large projects control panel instructions can be combined with other project material instructions.
 4. Certified test reports shall include all assembly and subassembly test and inspection reports.
- E. The Contractor shall submit shop drawings and other data sheets that were revised or modified during installation; in accordance with Division 01 Sections, Project Closeout. These will be inserted in the previously submitted instruction manuals.

- F. See Section 26 01 00, General Provisions Electrical for additional submittal requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Local control panels furnished by the supplier of the equipment, and or the Contractor may be supplied as commercially available "Enclosed Control" as manufactured by Eaton (Cutler-Hammer), Square D, Siemens or equal, factory modified and shall conform with the requirements specified herein.
- B. Each commercially produced local control panel shall be UL listed.
- C. Each specialty local control panel shall be UL and IBEW labeled.
- D. In general, all commercially produced local control panels installed indoors shall be NEMA 12 and NEMA 4X when installed in unheated, outdoors or in subway areas. Each specialty local control panel shall be fabricated as specified below.
- E. Specific site requirements may necessitate the use of different enclosure ratings or manufacturing techniques.
- F. Specialty enclosures shall be wall-mounted single-door, with back panels, similar to Hoffman Engineering Company Type A-12 or equal, as shown in the Contract Drawings, with the following additional requirements:
1. Enclosures for indoor locations shall be formed of 12-gauge galvaneal sheet steel minimum, seams continuously welded and ground smooth, without openings or knockouts, with external wall mounting brackets, and collar studs for mounting panel. Back panels shall be formed of 12 gauge galvaneal steel, a rolled lip shall be formed on all sides of the door opening. Size shall be as shown on the Drawings.
 2. Doors shall be formed of 12-gauge galvaneal sheet steel with rolled lip along top and sides to mate with the enclosure. The door shall be fitted with a print pocket and a closed-cell neoprene gasket attached with oil-resistant adhesive and bonding stud.
 3. Cabinet door shall be equipped with a concealed full length, stainless steel continuous piano type hinge. Yale Company, Division of Eaton Security Products & Systems, Catalog Number S 1400, or Corbin Cabinet Lock Company Catalog Number 1000 vault handles with disc tumbler locks and three point latch shall be provided on doors twenty-four inches or over in height. Yale Company, Division Eaton Security Product & Systems Catalog Number T 1403, or Corbin Cabinet Lock Company Catalog Number 1001 handles with disc tumbler locks and one point latch shall be provided on doors under twenty-four inches in height.
 4. Two keys shall be furnished with each cabinet and lock. All cabinet locks shall be provided to accept a CAT 60 Master Key (Corbin Lock or H. Hoffman Co.). Lock shall be arranged to permit key removal in locked and unlocked positions.
 5. For outdoor or subway locations, enclosure including door and back panel shall be stainless steel. The cabinet shall be Type 304 stainless steel. Handle will be provided as heavy duty padlockable stainless steel and three point latch suitable for outdoor or subway installations.
 6. Enclosures less than 24" can be constructed from 14 gauge galvaneal steel or 304 stainless steel as applicable.
 7. Specialty enclosures shall bear UL-508 industrial control labels with respective UL enclosure ratings based on location of the installation and construction of the enclosure.

- E. Each stainless steel enclosure located outdoors or in unheated areas, shall have thermostatically controlled space heaters. Enclosures located in subway areas shall also be supplied with breather drains when specified.

2.02 DISCONNECT SWITCHES AND CIRCUIT BREAKERS

- A. Disconnect switches shall be provided as horsepower rated, heavy duty type, fusible or non-fusible as indicated on the drawings. Non-fusible switches shall be rated at 600 volts for 480 volt and 240 volt service. Fusible switches shall be rated at 600 volt for 480 volt service and 250 volt for 240, 208 or 120 volt service. Fusible disconnects shall be provided with rejection fuse clips. Fuses and spares to be provided as specified. External operator to be provided. Disconnect switches shall be heavy duty type, rated at 600 volts for 480 volt AC circuits and 250 volts for 208 volt AC and 120 volt AC circuits. Each disconnect switch shall be horsepower rated.
- B. Circuit breakers, shall be rated at 600 volts for 480 volt AC circuits and 240 volts AC for 208 volts AC and 120 volts AC circuits.
- C. Circuit breakers shall be the heavy duty industrial type. Circuit breakers for 480 volt and 277 volt service shall have a minimum frame size of 100 amperes and shall be rated for 600 volts. The trip settings shall be as shown on the Drawings. The breaker interrupting rating shall be 65,000 amperes, symmetrical at 480 volts AC. External operator to be provided.
- D. Circuit breakers for 120 volt and 208 volt service shall be 240 volt rated. Industrial molded case style (miniature industrial breakers or panelboard style breakers are not acceptable) shall be of the "bolt on" type and shall have an interrupting rating of 65,000 amperes at 240 volts AC. The trip settings shall be as required or as shown on the Drawings. External operator to be provided.
- E. Circuit breakers provided for motor circuit protection shall be of the motor circuit protector type, sized to coordinate with the motor starter overloads and have an interrupting rating of 65,000 amps in combination with starter overloads. External operator to be provided.
- F. Disconnects and breakers to be provided with copper terminal lugs if available.
- G. Acceptable circuit breaker and disconnect switch manufacturers shall be Square D, Eaton (Cutler-Hammer), Siemens, or approved equal.

2.03 CONTACTORS AND STARTERS

- A. Contactors and starters shall be heavy duty type, NEMA style, rated 600 Volts AC, electrically held, minimum NEMA size 1 and with the number of poles shown on the Drawings. Contactors and starters to be supplied with 120 volt AC coils (unless otherwise noted) and one (1) normally open, one (1) normally closed spare auxiliary contacts over and above the auxiliary contacts required by the control circuit.
- B. Starters to be provided with solid state overload relays with external resets.
- C. Spare contact kits and operating coils to be provided in the ratio of ten percent of each size installed, but not less than one of each size to be turned over to the Authority upon completion of the project.
- D. Acceptable manufacturers for commercially available enclosed control shall be Square D, Eaton (Cutler-Hammer), Siemens or approved equal. Acceptable manufacturers for specialty enclosed control shall be Illinois Switchboard Corporation, Panatrol, Perigon Systems, Inc. or Gus Berthold Electric Company.

2.04 CONTROL DEVICES

- A. Pushbuttons, selector switches, indicating lights, etc. shall be heavy duty oil-tight type 35MM, corrosion resistant if required by the application and UL approved. Enclosures shall be NEMA rated for the area in which they are installed.
- B. Pilot lights shall be heavy duty, oil-tight, LED type with red (on) and green (off) lenses. A push to test circuit shall be provided when more than two lights are required.
- C. Acceptable manufacturers shall be Square D, Siemens, Eaton (Cutler-Hammer), or approved equal.

2.05 CONTROL CIRCUITS

- A. Control circuits for motors shall operate at 120 volt AC, unless otherwise shown on the drawings. Control circuits for single phase 120 volt motors shall be connected phase to neutral. Control circuits for 208, 240 or 480 volt motors shall be provided with a control power transformer within the enclosure with two (2) primary and one (1) secondary fuse unless otherwise shown on the drawings. One complete set of spare control fuses to be supplied mounted within the assembly. Control power transformers to be supplied with 50 VA extra capacity over and above the capacity shown for all devices powered by the control circuit.

2.06 CONTROL RELAYS

- A. Logic Level control relays to be 3 pole double throw, 120 volt AC, and octal style base with LED indicating light, test feature, matching socket with screw clamping terminals and hold down spring. Contacts shall be rated 1/3 H.P. @ 120 volt AC, pilot duty class B300. Relays to be Eaton Cutler-Hammer type D3PF or Square D type RPM.
- B. Power control relays or relays used in circuits requiring more than three contacts shall be industrial grade, 120 volt AC operated, multi-contact, load voltage and current rated. Relays shall be rated 600 volts AC and shall have convertible, double-break silver alloy contacts with pressure wire connectors. Contacts shall be provided with normally open or normally closed status indication, rated 600 volts 10 amps, class A600. Relays to be Eaton Cutler-Hammer type AR or D26, or Square D class 8501 type X.
- C. Spare relays to be provided in the ratio of ten percent of each type installed, but not less than one of each size to be mounted in the enclosure.

2.07 TIMING RELAYS

- A. Pneumatic timing relays shall be "Off Delay" or "On Delay" type with an adjustable timing range as specified on the drawings with, instantaneous contacts if required by the application. Timers shall be rated for 120 volt 60HZ. Operation unless otherwise noted. Pneumatic timing relays shall be agastat series 7000.
- B. Solid state timing relays shall have the function specified with a fixed or adjustable timing range, plug in octal style base, matching socket with screw clamping terminals and hold down spring. Solid state timers to be Square D Class 9050 Type JCK or approved equal.
- C. Spare solid state timers to be provided in the ratio of ten percent of each type installed, but not less than one of each size to be mounted in the enclosure.

2.08 TIME CLOCKS

- A. Time clocks to be electromechanical 24 hour, with skip a day feature, contact configuration as shown. Suitable for operation at 120 volt AC, 60 HZ. With mechanical spring reserve. Time clocks to be tork 7000 series or approved equal.

2.09 DOOR SWITCHES

- A. Provide security type magnetic door switches and associated wiring where shown on the Drawings.
- B. Door switches shall be of the concealed type, 3/4 inch diameter, with plated Rhodium contacts. Door switches shall be Simplex 27760-9000 series or approved equal.

2.10 NAMEPLATES

- A. A nameplate shall be provided on the exterior of each panel to describe the panel and equipment it serves.
- B. The name of the driven equipment shall appear on each starter and breaker.
- C. Non-corrosive nameplates shall be laminated plastic with 3/8 inch black letters on a white background and shall be mechanically affixed to the front of each door with self tapping stainless steel screws. This shall not change the NEMA rating of the enclosure.
- D. Component nameplates shall be installed to designate the purpose of all switches, breakers, instruments, relays, fuses, etc.

2.11 CABLE, TERMINATIONS, AND CABLE TAGGING

- A. Where possible, compression type cable lugs for terminating cables and equipment within the panel and entering and leaving the panel shall be furnished by the equipment manufacturer. Copper compression connectors shall be crimp, type, long barrel tin plated closed end compression. All connectors shall be copper. The barrel for each cable lug shall be sized for the exact cable size specified. Copper type connectors and terminations shall be furnished. Copper-Aluminum connectors are not acceptable. Connectors shall be Burndy Type YA, Panduit Series LCB or LCC, Anderson Type VHCL, T & B Series 54800 and 54900, or approved equal.
- B. Cable lugs for terminations to busbar, switch studs, terminal blocks, and other devices, for Number 22 AWG to 10 AWG wire shall be 600 Volt, color coded nylon insulated ring tongue lugs. They shall have a secondary metal sleeve around the wire barrel for insulation strain relief. Type shall be Panduit Pan-Term PN series terminals. Locking fork-type lugs can be used for connections to devices provided with captive fasteners.
- C. Cable lugs for terminations of Number 8 AWG to 1/0 AWG wire shall be standard barrel, one hole high conductivity seamless copper lugs, with inspection holes to assure adequate wire insertion. The tongue shall be stamped with wire size, UL & CSA logos and manufacturer. The base part number and stud size should also be stamped on the tongue to assure adequate identification in application. Barrels shall contain color coded rings, die color code and/or number. Crimp locations shall be indicated to assure correct installation. For further identification, the manufacturer should also be included on the barrel. Type shall be Panduit Series LCB or LCC Power Connectors or Burndy Type YA, or approved equal.
- D. Cable lugs for terminations of number 2/0 AWG and larger wire shall be long barrel, two hole high conductivity seamless copper lugs. Barrels shall contain color coded rings knurled markings indicating die color code, die index numbers, and crimp locations to assure correct usage and installation. For further identification, the manufacturer should

also be included on the barrel. For Number 2/0 to 250 MCM sizes, the tongue may be stamped with wire size, UL & CSA logos and manufacturer. The base part number and stud size should also be stamped on the tongue to assure adequate identification in application. Type shall be Panduit LCC series Power Connectors or Burndy Type YA, or approved equal.

- E. Cable/wire markers shall be installed on both ends of all conductors, both for internal and external cables. The cable/wire markers for external connections shall comply with Section 26 19 50 Identification. The cable/wire markers for internal wires and cables shall be self-adhesive, self-laminating mechanically printed with a clear protective laminating over wrap or mechanically printed with a clear protective laminating over wrap or sleeve type tubing mechanically printed with permanent non smearing ink. Sleeve type wire markers shall be properly sized for the conductor they are being installed on.

2.12 CONTROL DEVICES AND WIRING

- A. Control devices, local instrument cables, and wiring required on the equipment shall be furnished and installed at the factory.
- B. All small wiring for control or accessory equipment shall be installed in code approved wireways as necessary.
- C. Control panel internal wiring shall be Number 14 AWG, minimum, except for incidental wiring on mass produced pre-manufactured sub-assemblies or where larger size conductors are needed for current carrying requirements. The conductors shall be stranded copper for fixed wiring and extra flexible copper for hinged wiring. The conductors shall have 600 volts, 90 degrees C, polyvinyl chloride insulation with flameproof braid covering, Type TBS, or cross-linked polyethylene, Type SIS.
- D. All control and instrument wiring, alarm leads, and instrument transformer secondaries, for connection to external cables, shall be terminated at terminal blocks. Terminal blocks shall be UL/CSA recognized, 94V-2 thermoplastic material, snap on rail mounted design, 30 amp 600 volt, with marking strip, with #6-32 terminal screws for use with crimp on ring style wire connectors. Cooper Bussmann (USD) type NSS3-WH, Eaton Cutler-Hammer type TBAL30 or equal. 10% spare terminals to be provided. Terminal blocks for current transformer secondaries shall be shorting type Cooper Bussmann type KUSC or Marathon 1500SC series.
- E. Compression, type (solderless) copper lugs shall be furnished for each terminal block for external control and instrument wires. Minimum field wire size shall be AWG No. 12. Cable lugs for terminations to busbar, switch studs, terminal blocks, and other devices, for Number 22 AWG to 10 AWG wire shall be 600 Volt, color coded nylon insulated ring tongue lugs. They shall have a secondary metal sleeve around the wire barrel for insulation strain relief. Type shall be Panduit Pan-Term PN series terminals. Locking fork-type lugs can be used for connections to devices provided with captive fasteners.
- F. Cable/wire markers shall be installed on both ends of all conductors both for internal and external cables. Cable and wire markers shall comply with this specification section.
- G. Control cables shall be neatly routed and supported in cable duct within the cabinet.
- H. The assembled control equipment, wiring and connections shall be insulated for a voltage of 600 volts and shall be subjected to a one minute dielectric test AC phase to ground at the factory after fabrication and assembly is complete. Dielectric test value shall be twice the rated voltage of the lowest rated device plus 1000 volts.
- I. Spare fuses shall be provided mounted in the assembly.

- J. The specialty assembled control equipment shall be provided with UL 508 industrial control label with respective enclosure label or equal.

2.13 TESTING

- A. The assembled control equipment, wiring and connections shall be functionally tested for operation. Copies of test reports shall be provided with the documentation package.

2.14 PAINTING

- A. All interior and exterior seams shall be carefully filled and sanded smooth for neat appearance. The equipment manufacturer shall remove oils and dirt and form a chemically and anodically neutral conversion coating, to improve the finish-to-metal bond, and to provide resistance to rust. All surfaces shall be phosphatized before any of the protective coatings are applied. The final coat for non-stainless steel surfaces shall be semi-gloss enamel to provide adhesion, resiliency, durability, color stability, and stain resistance.
- B. The exterior surface of all non stainless steel structures shall be thoroughly cleaned and given a coat of primer and a finish coat of the equipment manufacturer's standard of ANSI Standard light gray enamel color Number 61 for outside surface.
- C. The interior surface of all non stainless steel surfaces shall be given a primary coat and a finish coat of ANSI Standard light gray enamel color Number 61.
- D. Sub pans shall be painted white.
- E. The equipment manufacturer shall provide an adequate supply of touch-up paint in aerosol cans.
- F. A packaged kit of refinishing materials, with complete instructions, shall be included with each shipment for touch-up in the field.

2.11 MANUFACTURERS

- A. Each local control panel shall be assembled and manufactured by Berthold Electric Company, Illinois Switchboard Corporation, Panatrol, Perigon Systems, Inc., Siemens/ITE, Cutler-Hammer Electric, or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. The Contractor shall install the equipment in strict accordance with the approved shop drawings and the equipment manufacturer's recommendations.
- B. The Contractor shall adjust the location of equipment to accommodate the work in accordance with field conditions encountered.
- C. The equipment shall be installed with work space clearances required by the Chicago Electrical Code.
- D. The equipment shall be installed to permit maintenance and replacement of parts, and shall be clear of all openings with swinging or moving doors, partitions or access panels.
- E. Mounting bases for floor mounted control panel:

1. The Contractor shall install each floor mounted control panel on a 4 inch thick concrete housekeeping pad of sufficient size plus at least a 4 inch apron as specified in other specification sections within this division. Panels mounted in rooms with slabs on grade shall have a non-conductive fiberglass mat installed between the panel and the concrete pad. Anchor bolts or fasteners shall comply with the Authority's requirements for isolated connections.
2. Each foundation shall be level, stable, and compacted to 95 percent Standard Proctor.
3. Conduit locations shall be in accordance with equipment manufacturer's approved shop drawings.

F. Wall Mounted Control Panel:

1. Each wall mounted control panel shall be supported and mounted away from the wall with "C" shaped channel. The channel shall be fiberglass, when stray current control isolation is required, and hot dipped galvanized steel for normal applications. The minimum separation between the equipment and the wall shall be one inch.
2. Each control panel shall be mounted with the top a maximum of 6 feet 6 inches above the finished floor.

3.02 PERFORMANCE TESTING

- A. The Contractor shall test each complete local control panel installation to assure proper operation and correct sizing of all control fuses and motor overload units.

END OF SECTION

SECTION 26 19 00
GROUNDING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this section.

1.02 SUMMARY

- A. This Section specifies grounding requirements for this project.
- B. The Contractor shall furnish and install complete a grounding system as required by the Drawings and as required by these Specifications.
- C. Related work specified, elsewhere:

1.	Section 26 01 00	General Provisions
2.	Section 26 03 00	Electrical Demolition.
3.	Section 26 05 00	Raceways and Boxes.
4.	Section 26 10 00	Basic Electrical Materials and Methods
5.	Section 26 12 30	Wires, Cables, Splices, Terminations.
6.	Section 26 14 10	Wiring Devices.
7.	Section 26 17 00	Local Control
8.	Section 26 17 50	Local Control Panels
9.	Section 26 19 50	Identification
10.	Section 26 47 00	Panel Boards
11.	Section 26 50 10	Lighting Fixtures
12.	Section 26 95 00	Electrical Testing

1.03 SUBMITTALS

- A. The Contractor shall submit product data, brochures, cuts, specifications, shop drawings, conduit layouts, installation drawings, diagrams, schedules and samples in accordance with Division 01 Section, Submittals, and supplementary requirements as stated under the sections of these Specifications for all the materials and construction referred to in this section.
- B. See Section 26 01 00, General Provisions Electrical for additional submittal requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Grounding conductors, other than bus bars, shall be stranded copper wire, with type XHHW green 600 volt, rated insulation sized and installed in accordance with Code requirements, and as noted on the Drawings.
- B. Ground rods shall be 3/4 inch minimum diameter, 10ft long stainless steel type 304 rods, in 5ft threaded sections.
- C. Bare ground cable shall be bare Class A, stranded, annealed, high conductivity copper, no less than 97% IACS.

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- D. Ground bar shall be hard drawn, high conductivity rectangular copper bus bar, no less than 97.4 percent IACS and shall meet requirements of ASTM SPEC B133 166 (latest edition for copper alloy 110).
- E. Insulated grounding cable shall be 600 volt type "USE", stranded copper, 75C RHW insulation, and neoprene sheath.
- F. Ground rod connectors, cable to cable connectors and cable to bar connectors shall be high copper alloy cast body with silicon bronze hardware, manufacturer and type as established by the Contractor.
- G. Ground rods shall be complete with ground wells. The ground wells shall be high-density polyethylene type (HDPE) series 1419-18 by Carson Industries or approved equal.

2.02 GENERAL GROUNDING REQUIREMENTS

- A. The equipment ground conductor shall be distinct and separate from the system neutral ground conductor and shall not be used as a load current-carrying conductor. The equipment ground conductor shall be electrically and mechanically continuous from the transformer neutral ground to the equipment to be grounded. The equipment ground conductor shall provide a low impedance path for line-to-ground fault currents and bond all non-current carrying enclosures together including raceways, fixtures, receptacles, panels, controls, motors, disconnect switches, and exterior lighting standards.
- B. Where building type conductors are installed in a raceway, the equipment ground conductor shall have a minimum size conductor of Number 12 AWG copper. Where green insulation is not available, on large size cable, black insulation shall be used and shall be identified with green colored tape at each junction box or device enclosure.
- C. Wiring channels, cable trays, and all metallic conduit including rigid electrical metallic tubing and flexible conduits, shall be connected at each end to the equipment ground conductor utilizing a conduit grounding bushing, O-Z type BL, or approved equal.
- D. Switchboards, panel boards, motor control centers, and panels shall be provided with an equipment ground bus (including lug or screw terminals) and shall be securely bonded to the enclosure. Junction boxes and other enclosures (sizes above 5 inches by 5 inches) shall utilize an equipment ground bus or lug as required to securely bond the equipment ground conductor to the enclosure.
- E. Lighting fixtures shall be securely connected to the equipment ground conductor. A continuous row of fluorescent fixtures mechanically joined to provided good electrical contact may be considered as one fixture with the equipment ground conductor connected at only one point.
- F. Motors shall be connected to the equipment ground conductor. Bolts, nuts, and washers shall be bronze, cadmium plated steel, or other noncorrosive material.
- G. Any metallic construction on the platform located less than 6 feet from the DC negative return shall be made electrically continuous with it. Where this is not possible, it shall be covered with an insulating protective barrier. This is to reduce the possibility of shock should a person contact the two potentials at the same time. DC negative returns are the running rails and anything electrically continuous with them including the RT Car and support structure for the track. Constructions that may be at other potentials are the elevator enclosure or station platform head house.
- H. All light poles shall be grounded using a ¾" x 10' long 304 stainless steel rod.

2.03 TRANSFORMER GROUNDING

- A. The 120 volt and 277 volt system neutrals, for grounded transformers, shall be a white insulated current-carrying conductor over which unbalanced neutral load currents may flow. The neutral conductor shall originate at the grounded wye secondary of each transformer.
 - 1. The wye-connected secondary ground of each transformer shall be grounded directly to the electrical power system ground bus.

2.04 ELEVATED STATION REFERENCE GROUNDING ELECTRODES

- A. Stations on CTA track structure shall use the traction power negative return as the Reference Grounding Electrode. Isolation transformers installed between the utility and station service shall have the secondary neutral bonded to the track structure using exothermic weld. All utility metallic underground services shall be isolated where they enter the station. Inside the station all utility service shall be bonded to the Reference Grounding Electrode.
- B. All the conduits and cables referenced to the utility ground, shall be isolated from the CTA track structure, which has traction power negative reference.
- C. Insulated mounting hardware, and fiberglass unistruts shall be used to isolate the ground. Isolated pads shall be used for floor mounted equipment.

2.05 AT OR BELOW GRADE STATION REFERENCE GROUNDING ELECTRODES

- A. Stations at or below grade shall use a ground field as the Reference Grounding Electrode. The ground field is installed using three (3) $\frac{3}{4}$ " x 10' ground rods in triangular pattern at a distance of 10' between the rods. The rods are interconnected using 4/0 bare copper conductors. The ground field is then connected to the nearest steel column, as well as the copper ground bus in the electrical or communication room using 4/0 bare copper conductor. All connections shall be exothermic weld. Resistance to earth shall not exceed five (5) ohms. All utilities shall be isolated where they enter the station. Inside the station, all utility services shall be bonded to the Reference Grounding Electrode.

PART 3 EXECUTION

3.01 GROUNDING SYSTEM

- A. The intent is to set forth requirements for an effective ground system. The ground system shall be installed so that the line-to-ground circuit has an impedance sufficiently low to limit the potential above ground to a level that shall ensure freedom from dangerous electric shock-voltage exposure to the persons in the area, and to facilitate the operations of the overcurrent devices in the circuit.
- B. The entire power and lighting systems shall be permanently and effectively grounded in accordance with the latest issue of the Chicago Electrical Code. The items covered shall include but not be limited to panels, motor frames, lighting fixtures and associated switches and other exposed, non-current carrying parts of the electrical equipment and as shown on the Drawings.
- C. In general, the conduit systems shall contain an equipment ground wire.

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1. Continuity of ground shall be maintained throughout the conduit systems, in particular the PVC conduit, as required by the City of Chicago Electrical Code.
 2. Ground bushings and jumpers shall be used wherever the normal metallic conduit termination does not insure continuity of ground.
- D. Concealed or inaccessible grounding connections shall be made with exothermic process.
1. Accessible grounding connections shall be bolted or clamp type unless otherwise indicated.
 2. Soldered connections will not be permitted in the grounding system.
- E. Grounding conductors shall be protected from mechanical damage, and shall be supported in an approved manner.
- F. Grounding connections made below grade shall include the installation of waterproof tape.
- G. Where ground conductors are run in conduit or other raceway, the ground conductor shall be bonded to the conduit or raceway at each end.

3.02 CONTINUOUS GROUND BUS

- A. Switchboards, panel boards, and motor control centers shall have a continuous ground bus within the enclosure, bonding all sections together.
- B. The ground bus shall be connected to the main service ground by means of a grounding conductor run in the same conduit or raceway as the feeder conductors.
- C. When indicated on the contract drawings, a continuous ground bus 1/4 inch by 2 inches shall be surface mounted 1 foot above floor level around the perimeter of the Electrical and Communications rooms. The ground bus in the Electrical room shall be connected to the track structure by an insulated Number 4/0 AWG ground conductor, the ground bus in the Communications room shall be connected to the ground bus in the Electrical room by a 4/0 AWG ground wire.

3.03 GROUNDING SYSTEM FIELD TESTING

- A. Ground system field testing shall be witnessed by the Authority's Testing Engineers.
- B. The testing of grounding systems shall be done by an independent testing service employing the 3 point Fall-of-Potential method with a null balance instrument. Meter shall be such that lead resistance is rejected via null balance. Subtraction of lead resistance is not allowed (or necessary).
- C. The test meter shall be Associated Research Vibro-ground test set with null balance, James A. Biddle Megger Earth-Tester-Null Balance, or approved equal.
- D. A graph of instrument readings versus potential electrode distance shall demonstrate a "flat" portion on the graph. Failure to achieve this will require larger electrode spacing or different test method. Reading obtained on flat or horizontal portion of graph is taken as resistance to earth of ground under test.
- E. Ground grid shall be isolated from electrical supply neutral during test.
- F. The ground test shall verify that the resistance to ground does not exceed 5 Ohms. If resistance is in excess of 5 Ohms, the Contractor shall install additional ground rods and cable, if directed by the Authority, until resistance is brought down to 5 Ohms or less. The ground resistance test data

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shall be posted on the Authority's project management web-site for the Authority's approval.

3.04 INSTALLATION OF GROUNDING SYSTEMS

- A. Ground rods shall be installed in locations and to the depths as shown on the Contract Drawings. Round rod sections shall be connected using high strength bronze alloy couplings each tack welded to ground rod sections. Ground rods shall be installed by driving, not by drilling or jetting.
- B. All connections below grade shall be made with exothermic welds and insulated with epoxy. All connections above grade shall be made with bolted connectors. All connectors shall be high copper alloy cast body with silicon bronze hardware, manufacturer and type as selected by the Contractor and approved by Engineer.
- C. Connectors and lugs and their bolts, nuts or screws shall be furnished by the Contractor for connection to all equipment. The lugs, connectors and hardware shall be of material suitable for attachment of the copper ground system to the material to which it is being attached, without the possibility of attack by corrosive atmosphere or electrolytic action. Silver plate all bar and lug connections.
- D. Bar to bar and lug to bar, bolted connections shall be made with silicon bronze bolts, nuts and washers. All connections shall be made electrically clean. Silver plate all bar and lug connections.
- E. Use bonding jumpers and/or grounding bushing (set screw type) at all junction boxes, etc., to provide conduit ground continuity.
- F. Permanently connect the ground terminal on each receptacle to the ground conductor or grounding bushing.
- G. All grounding cable runs to equipment steel or tray device shall be securely fastened at intervals not to exceed 24 inches. All hardware for fastening shall be furnished and installed by Contractor.
- H. After the entire grounding system has been installed, including ground rods and ground loop, the ground system shall be tested.
- I. Ground grid and ground rod installations and resistance tests will be witnessed by the Authority. The Contractor shall inform the Authority three days in advance before the start of any of the above testing activities.

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GROUND ROD RESISTANCE TO EARTH TEST RECORD

- | | | |
|----|--------------------------------------|------------|
| 1. | DATE | _____ |
| 2. | PROJECT NAME | _____ |
| 3. | LOCATION OF TEST | _____ |
| 4. | DRAWING NO. | _____ |
| 5. | GROUND ROD TYPE | _____ |
| | DIAMETER | _____ |
| | LENGTH | _____ |
| 6. | TEST METHOD | _____ |
| | INSTRUMENT TYPE | _____ |
| | SERIAL NO. | _____ |
| 7. | REQUIRED MAXIMUM RESISTANCE TO EARTH | _____ |
| 8. | MEASURED RESISTANCE TO EARTH | ROD1 _____ |
| | | ROD2 _____ |
| | | ROD3 _____ |

TEST PERFORMED BY: _____
Signature

TEST WITNESSED BY: _____
Signature

END OF SECTION

SECTION 26 77 00
INFRARED HEATING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including Division 01 Specification sections, apply to this section.

1.02 SUMMARY

- A. This Section specifies electric infrared heating devices and all appurtenances thereto required under Division 23 and 26.
- B. Related work specified elsewhere:
 - 1. Section 26 01 00 General Provisions Electrical
 - 2. Section 26 10 00 Basic Electrical Materials and Methods
 - 3. Section 26 12 30 Wires, Cables, Splices, Terminations.
 - 4. Section 26 17 50 Local Control Panels

PART 2 PRODUCTS

2.01 GENERAL

- A. This Contractor shall provide power and control circuitry for the heaters shown on the Drawings, and specified herein.
- B. This Contractor shall furnish, install and connect four infrared heating units, as indicated on the Drawings.

2.02 ELECTRICAL HEATING LUMINARIES:

- A. Electrical infrared heaters, shall be designed for outdoor application, and shall utilize 2-1600 watt quartz lamps per unit. Units shall be rated 208 volts single phase 60 hertz.
- B. Housings shall be constructed of stainless steel and shall have two cast stem mounting brackets. The reflector shall be one piece, anodized aluminum and be replaceable. Internal wiring shall be SF silicon glass insulated 12 gauge wire. Push-pull butt sockets shall be provided for lamp insulations. The fixture shall have a U.L. label, and be complete with two quartz lamps and wire guards. The reflector shall be designed to provide distribution as indicated on the schedules.
- C. Infrared electric heating luminaries shall be as manufactured by Aitkens, or approved equal, and shall be provided by the mechanical contractor.

2.03 CONTROLS

- A. The system controls shall provide for turning the infrared heaters on from a local momentary contact pushbutton and automatically turning them off after a adjustable timed interval. The on-off function shall be provided from a control panel located in the Electrical Room. The on-off function of the infrared heater located above the ADA gate at passenger stations shall be controlled by the station attendant by a "T" rated switch at the kiosk.

- B. The control panel shall conform to the requirements of Section 26 17 50 Local Control Panels, and shall have a UL label.
- C. The contactor shall be a electrically operated, electrically held, 60 ampere, 600 Volt, 3 pole, with a 120 Volt coil. The contactor shall be as manufactured by Square D Series 8903, or Allen Bradley Bulletin 500L.
- D. The timing relay shall be, industrial type, with a adjustable off time delay of 1 to 10 minutes, set for 5 minutes. Switching contacts shall be rated a minimum of ten amperes. Timing relays shall be Agastat 7000 series or approved equal.
- E. The remote mounted pushbutton station shall consist of a Joslyn Clark, 1 RNG-3 heavy duty palm pushbutton in a cast iron device box or by Rees Model No. 04960-412.

PART 3 EXECUTION

3.01 INSTALLATION

- A. The infrared heating units shall be installed, at a nine foot mounting height, in the location shown on the drawings, and in accordance with the manufactures instructions.
- B. The heating control panel shall be located in the Electrical Room supplied by the Electrical Contractor.

END OF SECTION