



## **Section 13**

# **Test Results/As-Built Drawings**

WESCAN  
ELECTRICAL MECHANICAL SERVICES



# WESCAN Electrical Mechanical Services

## RECORD MEGGER READING ON CABLES

Job Name: South West Rapid Transit Corridor

Job No: E779

| FROM              | TO              | VOLTAGE | GROUND TO PHASE |     |     | PHASE TO PHASE | PHASE TO NEUTRAL |     | DATE       | TESTED BY |
|-------------------|-----------------|---------|-----------------|-----|-----|----------------|------------------|-----|------------|-----------|
|                   |                 |         | A-G             | B-G | N-G | A-B            | A-N              | B-N |            |           |
| Hydro Transformer | Main Disconnect | 120/240 | ∞               | ∞   | ∞   | ∞              | ∞                | ∞   | 11/14/2012 | R. Wilson |
| Main Disconnect   | Panel A         | 120/240 | ∞               | ∞   | ∞   | ∞              | ∞                | ∞   | 11/14/2012 | R. Wilson |
| Panel A           | Panel L         | 120/240 | ∞               | ∞   | ∞   | ∞              | ∞                | ∞   | 11/14/2012 | R. Wilson |



# WESCAN Electrical Mechanical Services

## VOLTAGE / CURRENT READINGS ON CABLES

Job Name: South West Rapid Transit Corridor

Job No:

E779

Date: 3/30/2012

Time: 11:00am

| FROM              | TO              | AMPACITY LOAD |     |      | VOLTAGE PHASE TO PHASE | VOLTAGE PHASE TO NEUTRAL |     | VOLTAGE PHASE TO GROUND |     |     | Size         | Ground |
|-------------------|-----------------|---------------|-----|------|------------------------|--------------------------|-----|-------------------------|-----|-----|--------------|--------|
|                   |                 | A             | B   | N    | A-B                    | A-N                      | B-N | A-G                     | B-G | N-G |              |        |
| Hydro Transformer | Main Disconnect | 191           | 230 | 34   | 237                    | 118                      | 117 | 118                     | 117 | 0   | 2x(3x250mcm) | 2 x #4 |
| Main Disconnect   | Panel A         | 191           | 230 | 34   | 237                    | 118                      | 117 | 118                     | 117 | 0   | 3x500mcm     | #2     |
| Panel A           | Panel L         | 69            | 101 | 29.3 | 237                    | 118                      | 117 | 118                     | 117 | 0   | 3 x 3/0      | #6     |



**BUS DETECTION AND WARNING SYSTEM**

- Provide a complete and operational bus detection and warning system to the complete satisfaction of the Contract Administrator. Electrical provisions include, but are not necessarily limited to the following:
- Provision of the supply and install of directional probe system to detect inbound vehicles only. Probes to be located in the roadway 200m from the entrance to the station. All wiring to be in minimum 1.5" conduit. Provide 18"x24" splice pit at curb to CoW standards. Provide connection to probe. Wiring to be 14/4 shielded buried cable. One probe will be required west of the station (in east-bound lane) and one will be required east of the station (in west-bound lane). Coordinate conduit routing with Contract Administrator prior to road work or rough-in.
  - Each probe is to be connected to a processor c/w power supply in heated electrical room. Upon detection of vehicle, processor is to signal a timed relay which will activate the following after a programmable delay:
    - signal devices at east end of station are to operate upon activation of west-bound (inbound) vehicles only. Devices at west end of station to operate similarly.
    - audible chime at north and south pedestrian gates.
    - illuminate flashing LED lights mounted on top of pedestrian gates (both sides of pedestrian crossing). Lights are to continue flashing for a programmable duration. Initial setting to be 30 seconds from activation. LED signals to be Edwards 103 series, NEMA 4X rated weather-proof and vandal-resistant.
    - chime is to sound every time a vehicle passes the detector and lights to flash for full duration after each vehicle.
  - Manufacturers: Probes to be Sure Action Incorporated P8000 c/w 212 Processor or approved equal.
  - Equipment is to be supplied by local manufacturer's rep, such as National Industrial Communications Inc. Final connections to be performed by manufacturer's representative.
  - Provide complete commissioning and training of system to Contract Administrator's satisfaction.

**GENERAL ELECTRICAL NOTES**

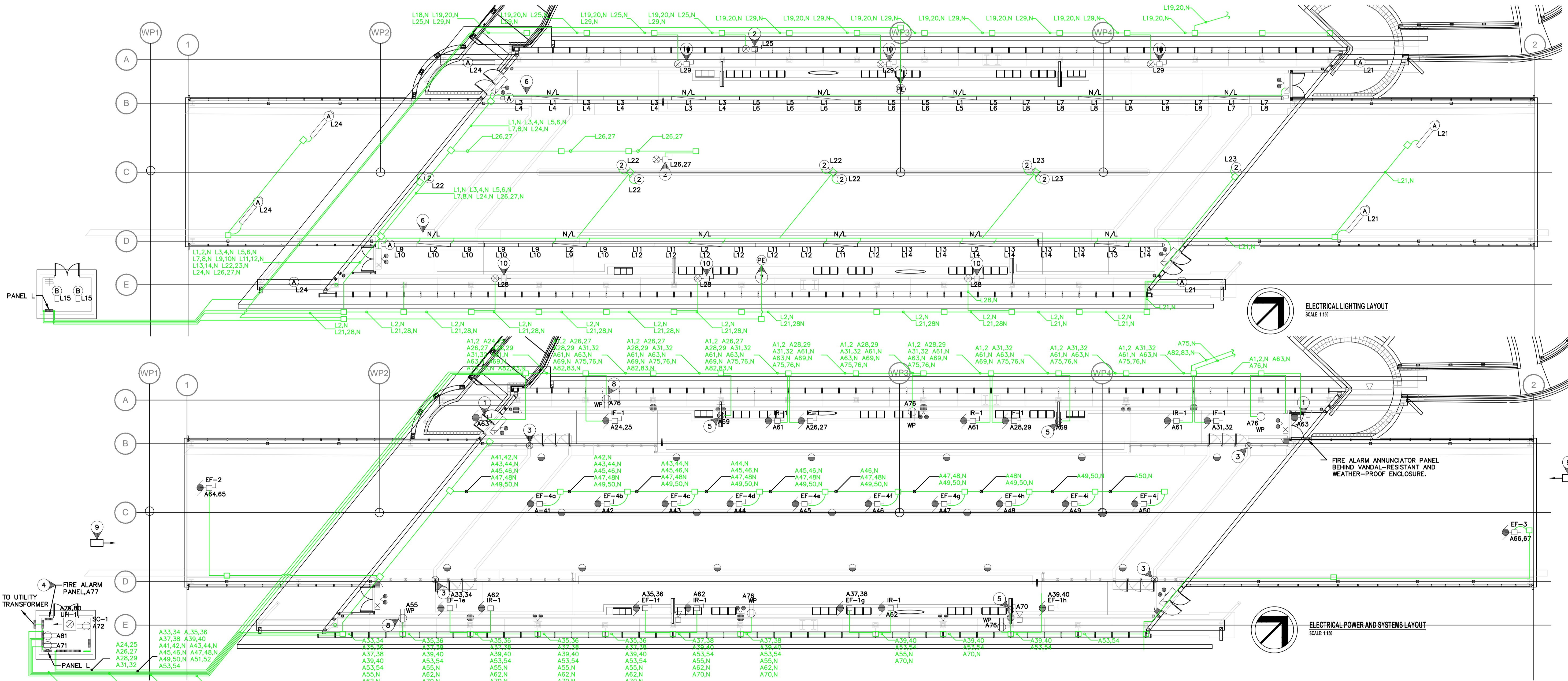
- ALL WIRING AND ELECTRICAL WITHIN STATION TO BE IP65 RATED DUST TIGHT AND WATER TIGHT CONSTRUCTION.
- ELECTRICAL CONDUIT THROUGHOUT THE BUILDING IS TO BE CONCEALED BY STRUCTURE WHERE POSSIBLE. EXPOSED CONDUIT IS ONLY TO BE RUN WHERE ABSOLUTELY NECESSARY AND ONLY AFTER RECEIVING WRITTEN APPROVAL FROM CONTRACT ADMINISTRATOR. CONDUIT IS NOT TO BE RUN IN ROADBED, EXCEPT FOR CONDUIT REQUIRED FOR BUS DETECTION AND WARNING SYSTEM AND FOR CONDUIT FROM THE ELECTRICAL ROOM ARE TO BE RUN UNDERGROUND BETWEEN WP1 AND WP2. E.C. TO CONFIRM PIPE LAYOUT PRIOR TO ROUGH-IN. PROVIDE ANTICIPATED PIPE LAYOUT FOR CONTRACT ADMINISTRATOR'S APPROVAL PRIOR TO POURING OF BRIDGE ROADWAY SLAB OR PLATFORMS.

**SPECIFIC ELECTRICAL NOTES**

- WIRE AND CONNECT AUTOMATIC DOOR OPERATOR AND ALL RELATED CONTROLS.
- WIRE AND CONNECT EXTERIOR SIGNAGE AS REQUIRED.
- PROVIDE BUS WARNING FLASHING LIGHTS AT TOP OF POSTS OF CROSSING GATES. WIRE AND CONNECT TO BUS DETECTION AND WARNING SYSTEM. PROVIDE AUDIBLE CHIME AT NEAREST COLUMN.
- TIE ALL SPRINKLER FLOW, TAMPER, PRESSURE AND LOW TEMP SWITCHES TO FIRE ALARM PANEL.
- PROVIDE POWER TO TRANSIT EBBD.
- EACH TYPE A LUMINAIRE WITHIN BUILDING TO HAVE BALLASTS WIRING TO DIFFERENT CIRCUITS AS INDICATED. FOR DAYLIGHT HARVESTING, FIXTURES TO BE REDUCED TO SINGLE BALLAST OPERATION AND OFF AS DICTATED BY LIGHTING CONTROL SYSTEM.
- INTERIOR MOUNTED PHOTOCELL FOR DAYLIGHT HARVESTING. TIE TO LIGHTING CONTROL PANEL.
- MOUNTED ON COLUMN IN MECHANICAL SERVICE CHASE. (TYPICAL 3 PER SIDE.)
- BUS DETECTION PROBE. LOCATE 200m FROM STATION. REFER TO CIVIL DRAWINGS. TIE TO BUS DETECTION AND WARNING SYSTEM.
- WIRE AND CONNECT SIGNAGE AS REQUIRED. CONFIRM EXACT LOCATION AND REQUIREMENTS PRIOR TO ROUGH-IN.
- FUTURE CCTV MONITOR C/W HEATED VANDAL-RESISTANT ENCLOSURE (BY E.C.) CONFIRM EXACT LOCATION AND REQUIREMENTS PRIOR TO ROUGH-IN.

**SYMBOL SCHEDULE**

- B1-0 Fluorescent luminaire, B1-a - denotes panel circuit No. and switch.
- N/L Night light fluorescent luminaire. Wire one ballast to night lighting circuit, and the remainder to regular lighting circuit shown.
- Ceiling mounted luminaire.
- Wall mounted luminaire. 'A' denotes type.
- Post light
- Single pole switch.
- Duplex receptacle.
- Duplex receptacle - weather proof.
- Ground fault duplex receptacle.
- Fireguard backboard c/w power supply and #6 AWG green ground wire to building ground and c/w 1-4" entrance conduit as required by the telephone utility and 1-4" entrance conduit as required by CATV utility.
- Fire alarm pull station c/w polycarbonate cover.
- Fire alarm audible device, c/w strobe light.
- Fire alarm fixed temperature thermal detector.
- CCTV camera c/w power supply and empty conduit as required by CCTV supplier. Verify location before installation.
- Panic alarm interactive communication station.
- Panic alarm / public address system wall mounted weather-proof speaker.
- UH-1 Electric unit heater c/w built in thermostat unless otherwise indicated. 'UH-1' denotes type. See heating schedule for details.
- Junction box.
- Motor. Refer to mechanical for exact location.
- Disconnect switch to suit application. By div. 16.
- Emergency double head fixture. Wire to battery bank. Weather-proof and vandal-resistant.
- Universal LED exit sign. Wire to emergency battery bank. Weather-proof and vandal-resistant.
- Photo-cell.



|   |   |  |   |   |   |  |
|---|---|--|---|---|---|--|
| <p>LOCATION UNDERGROUND</p> <p>APPROVED STRUCTURES</p> <p>DATE</p> <p>NOTE: LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE, BUT NO GUARANTEE IS GIVEN THAT THE GIVEN LOCATIONS ARE EXACT. CONTRACTOR TO VERIFY EXISTING AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE ENGINEER AND ARCHITECT BEFORE PROCEEDING WITH CONSTRUCTION.</p> | <p>DESIGNED BY</p> <p>DRAWN BY</p> <p>CHECKED BY</p> <p>APPROVED BY</p> <p>HOR. SCALE</p> <p>VERTICAL</p> | <p>B.M. ELEV.</p> <p>NO. REVISIONS</p> <p>DATE</p> <p>BY</p> | <p>NOVA 3 ENGINEERING LTD. CONSULTING ENGINEERS</p> <p>DILLON CONSULTING</p> <p>RELEASED FOR CONSTRUCTION</p> <p>DATE</p> | <p>ENGINEER'S SEAL</p> <p>CONSULTANT PROJECT NO. 088813</p> | <p>THE CITY OF WINNIPEG TRANSIT DEPARTMENT</p> <p>SOUTHWEST RAPID TRANSIT CORRIDOR - STAGE 1</p> <p>OSBORNE STATION &amp; ASSOCIATED WORKS</p> <p>ELECTRICAL STATION LAYOUT</p> | <p>CITY DRAWING NUMBER B237-10-91</p> <p>SHEET 91 OF 121</p> <p>CONSULTANT DRAWING NUMBER C5-E2200-T</p> |
|---|---|--|---|---|---|--|

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AS-BUILT DRAWING

Completed By: Rob Wilson

Date: March 2012

NOVA 3 JOB NUMBER: 29-187

REFER TO WWW.NOVA3.CA FOR CAUTIONARY NOTES.

WESCAN

1049 LOGAN AVE  
WINNIPEG, MANITOBA  
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gpparchitecture



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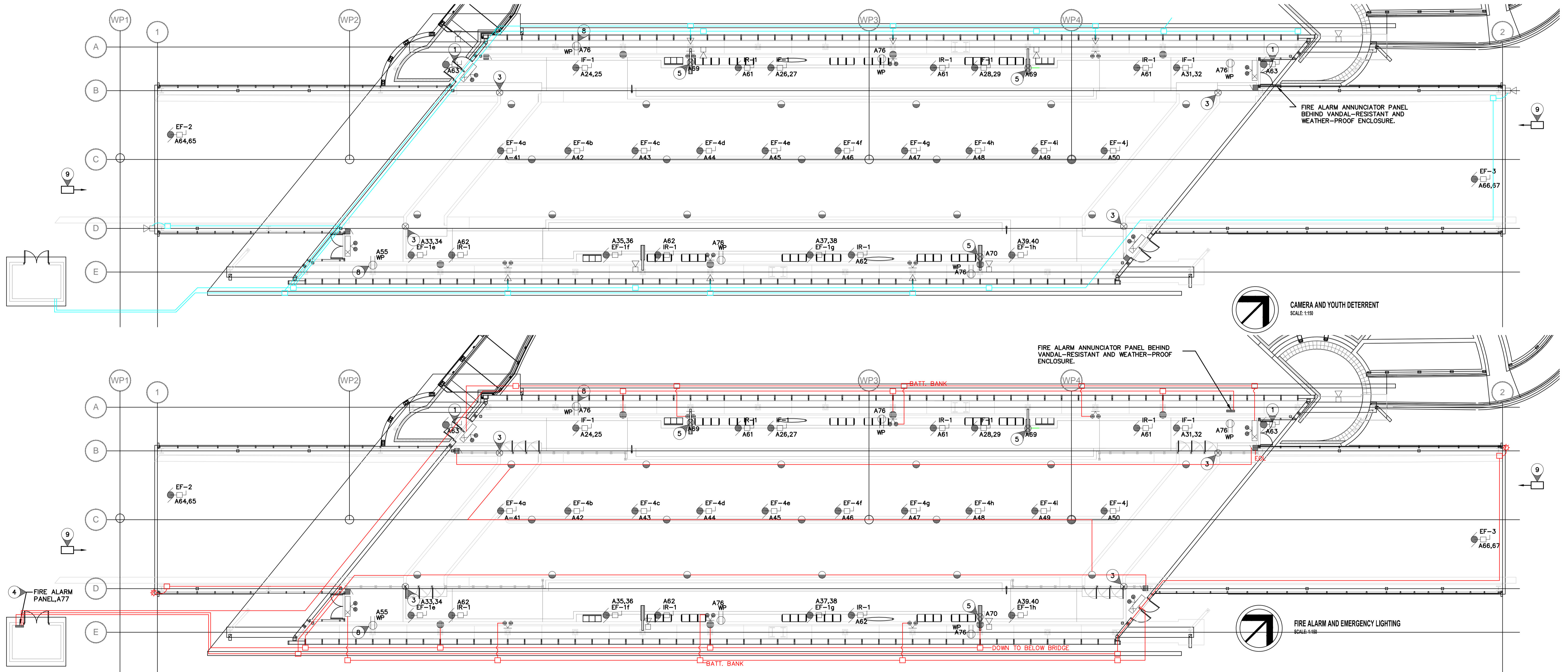
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**AS-BUILT DRAWING**  
 Completed By: Rob Wilson  
 Date: March 2012  
 1049 LOGAN AVE  
 WINNIPEG, MANITOBA  
 TEL: 786-3384  
 FAX: 783-2750  
 www.wescan-services.com

NOVA 3 JOB NUMBER: 29-187  
 REFER TO WWW.NOVA3.CA FOR CAUTIONARY NOTES.



|  |                     |               |
|--|---------------------|---------------|
| LOCATION UNDERGROUND   | APPROVED STRUCTURES | B.M. ELEV.    |
| SUPPLY U/G STRUCTURES COMMITTEE  | DATE                |               |
| NOTE:<br>LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION. |                     |               |
| 1  | ISSUED FOR TENDER   | 2010-05-14 DZ |
| NO.  | REVISIONS           | DATE BY       |

|             |  |
|-------------|--|
| DESIGNED BY | NOVA 3 ENGINEERING LTD. CONSULTING ENGINEERS |
| DRAWN BY    |  |
| CHECKED BY  |  |
| APPROVED BY |  |
| HOR. SCALE  | RELEASED FOR CONSTRUCTION                    |
| VERTICAL    | DATE 2010.04.12                              |

**NOVA 3 ENGINEERING LTD. CONSULTING ENGINEERS**

**DILLON CONSULTING**

RELEASED FOR CONSTRUCTION

DATE

|                        |        |
|------------------------|--------|
| ENGINEER'S SEAL        |        |
| CONSULTANT PROJECT NO. | 088813 |

**THE CITY OF WINNIPEG TRANSIT DEPARTMENT**

**Winnipeg**

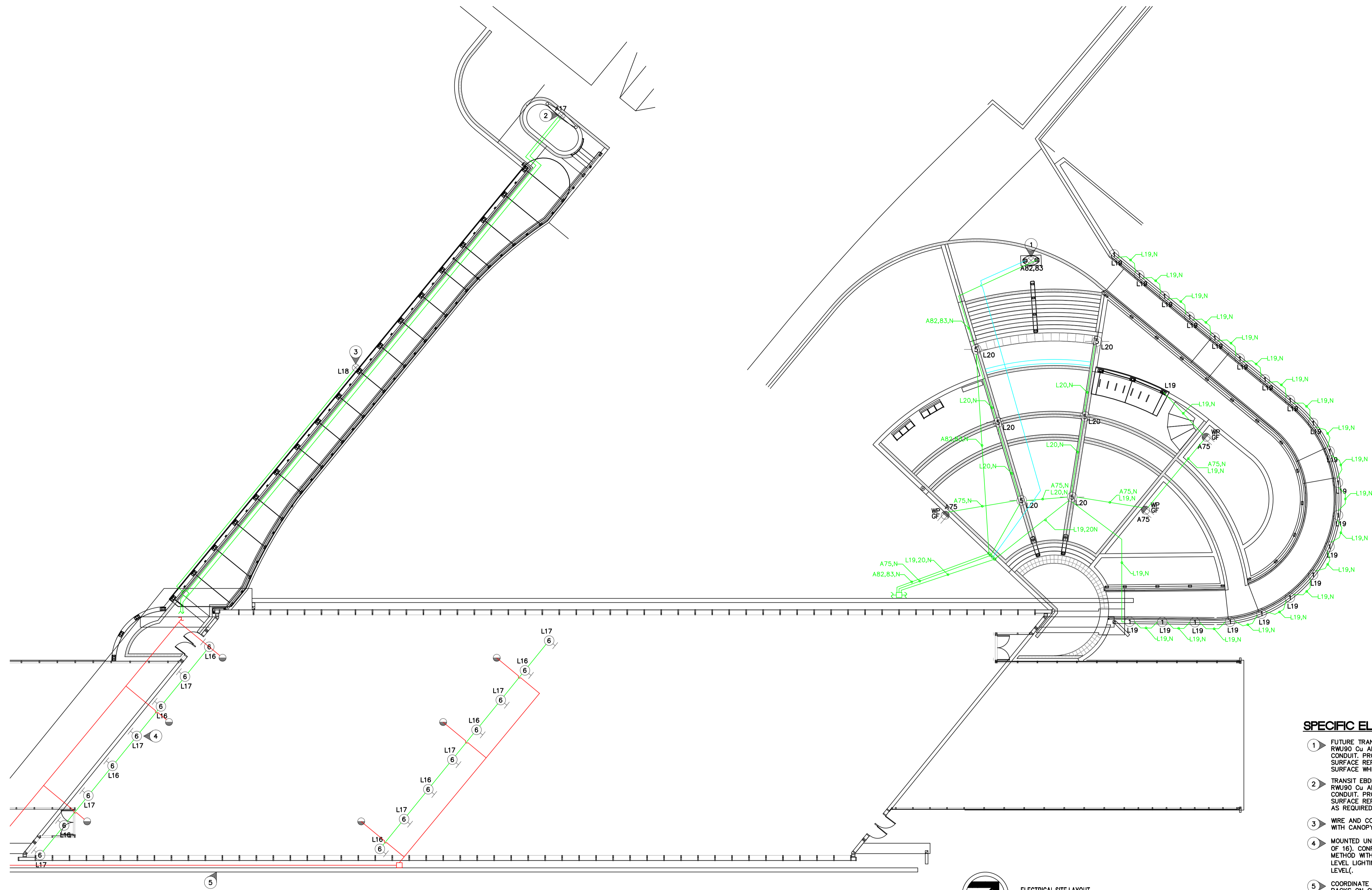
SOUTHWEST RAPID TRANSIT CORRIDOR - STAGE 1  
 OSBORNE STATION & ASSOCIATED WORKS

FIRE ALARM, EMERGENCY LIGHTING, CAMERAS AND YOUTH DETERRENT

CITY DRAWING NUMBER: B237-10-91  
 SHEET: 91a OF 121  
 CONSULTANT DRAWING NUMBER: C5-E2200-T



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**ELECTRICAL SITE LAYOUT**  
SCALE: 1:50

**SPECIFIC ELECTRICAL NOTES**

- 1 FUTURE TRANSIT SIGN. PROVIDE BURIED 2 #12 RWU90 Cu AND GROUND IN A 25mm RIGID PVC CONDUIT. PROVIDE TRENCHING, BACKFILLING AND SURFACE REPAIR AS REQUIRED. PUSH BELOW SURFACE WHERE PRACTICAL.
- 2 TRANSIT EBDO AND TOTEM. PROVIDE BURIED 2 #12 RWU90 Cu AND GROUND IN A 25mm RIGID PVC CONDUIT. PROVIDE TRENCHING, BACKFILLING AND SURFACE REPAIR AS REQUIRED. WIRE & CONNECT AS REQUIRED.
- 3 WIRE AND CONNECT CANOPY LIGHTING SUPPLIED WITH CANOPY TO CIRCUIT A18.
- 4 MOUNTED UNDERNEATH NEW OVERPASS (TYPICAL OF 16). CONFIRM MOUNTING LOCATIONS AND METHOD WITH CONTRACT ADMINISTRATOR. NIGHT LEVEL LIGHTING TO BE ONE CIRCUIT ONLY (HALF LEVEL).
- 5 COORDINATE REMOVAL OF SIX (6) EXISTING WALL PACKS ON CN UNDERPASS WITH MANITOBA HYDRO. PAY ALL CHARGES. PROVIDE (8) NEW TYPE 6 LUMINAIRES AT CN UNDERPASS. COORDINATE INSTALLATION WITH MB HYDRO AND CONTRACT ADMINISTRATOR. WIRE & CONNECT TO EXISTING LIGHTING CIRCUITS.

**AS-BUILT DRAWING**  
Completed By: Rob Wilson  
Date: March 2012  
1049 LOGAN AVE  
WINNIPEG, MANITOBA  
TEL: 786-3384  
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|   |                     |            |
|---|---------------------|------------|
| LOCATION UNDERGROUND  | APPROVED STRUCTURES | B.M. ELEV. |
| SUPPLY, U/G STRUCTURES COMMITTEE  | DATE                |            |
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|             |   |            |    |      |
|-------------|---|------------|----|------|
| DESIGNED BY | NOVA 3 ENGINEERING LTD.<br>CONSULTING ENGINEERS |            |    |      |
| DRAWN BY    |   |            |    |      |
| CHECKED BY  |   |            |    |      |
| APPROVED BY |   |            |    |      |
| HOR. SCALE  | RELEASED FOR CONSTRUCTION                       |            |    |      |
| VERTICAL    |   |            |    |      |
| NO.         | REVISIONS                                       | DATE       | BY | DATE |
| 1           | ISSUED FOR TENDER                               | 2010-05-14 | DZ |      |

|                        |        |
|------------------------|--------|
| ENGINEER'S SEAL        |        |
| CONSULTANT PROJECT NO. | 088813 |

|  |  |
|--|--|
|  |  |
| SOUTHWEST RAPID TRANSIT CORRIDOR - STAGE 1 |  |
| OSBORNE STATION & ASSOCIATED WORKS         |  |
| ELECTRICAL SITE LAYOUT                     |  |

|                           |            |
|---------------------------|------------|
| CITY DRAWING NUMBER       | B237-10-92 |
| SHEET                     | 92 OF 121  |
| CONSULTANT DRAWING NUMBER | C5-E2201-T |



| PANEL MOUNTING LOCATION   | 'A' SURFACE MECH. ROOM | VOLTAGE MAIN BUS | 120/240V-1PH-3W 400A TUB 1     |
|---------------------------|------------------------|------------------|--------------------------------|
| DESCRIPTION               | BKR                    | CIRCUIT          | DESCRIPTION                    |
| HEAT TRACE (NORTH) GFCI   | 15                     | 31               | EF-1d                          |
| HEAT TRACE (NORTH) GFCI   | 2                      | 32               | EF-1e                          |
| HEAT TRACE (NORTH) GFCI   | 15                     | 33               | EF-1e                          |
| HEAT TRACE (NORTH) GFCI   | 4                      | 34               | EF-1f                          |
| HEAT TRACE (NORTH) GFCI   | 15                     | 35               | EF-1f                          |
| SPACE                     | 6                      | 36               | EF-1g                          |
| SPACE                     | 7                      | 37               | EF-1g                          |
| SPACE                     | 8                      | 38               | EF-1h                          |
| TELEPHONE RECEPTACLE      | 15                     | 39               | EF-1h                          |
| SPACE                     | 10                     | 40               | EF-4a                          |
| SPACE                     | 11                     | 41               | EF-4b                          |
| SPACE                     | 12                     | 42               | EF-4c                          |
| SPACE                     | 13                     | 43               | EF-4c                          |
| SPACE                     | 14                     | 44               | EF-4d                          |
| SPACE                     | 15                     | 45               | EF-4e                          |
| SPACE                     | 16                     | 46               | EF-4f                          |
| WEST PEDESTRIAN RAMP SIGN | 15                     | 47               | EF-4g                          |
| HVAC CONTROL PANEL        | 15                     | 48               | EF-4h                          |
| SPARE                     | 15                     | 49               | EF-4i                          |
| SPARE                     | 15                     | 50               | EF-4j                          |
| SPARE                     | 15                     | 51               | EF-2                           |
| SPACE                     | 22                     | 52               | EF-3                           |
| SPACE                     | 23                     | 53               | EF-3                           |
| EF-1a                     | 40                     | 54               | RECEPTACLE SOUTH SERVICE CHASE |
| EF-1b                     | 40                     | 55               | SPACE                          |
| EF-1c                     | 40                     | 57               | SPACE                          |
| SPACE                     | 27                     | 58               | SPACE                          |
| SPACE                     | 40                     | 58               | SPACE                          |
| SPACE                     | 29                     | 59               | SPACE                          |
| SPACE                     | 30                     | 60               | SPACE                          |

| PANEL MOUNTING LOCATION         | 'A' SURFACE MECH. ROOM | VOLTAGE MAIN BUS | 120/240V-1PH-3W 400A TUB 2 |
|---------------------------------|------------------------|------------------|----------------------------|
| DESCRIPTION                     | BKR                    | CIRCUIT          | DESCRIPTION                |
| 1R-1 RADIANT HEAT (NORTH)       | 15                     | 61               | SPACE                      |
| 1R-1 RADIANT HEAT (SOUTH)       | 15                     | 62               | SPACE                      |
| DOORS AND ANNUNCIATOR HEATER    | 15                     | 63               | SPACE                      |
| SPACE                           | 64                     | 94               | SPACE                      |
| SPACE                           | 65                     | 95               | SPACE                      |
| SPACE                           | 66                     | 96               | SPACE                      |
| SPACE                           | 67                     | 97               | SPACE                      |
| BUS DETECTION                   | 15                     | 68               | SPACE                      |
| EBBD NORTH                      | 15                     | 69               | SPACE                      |
| EBBD SOUTH                      | 15                     | 70               | SPACE                      |
| SPACE                           | 71                     | 101              | SPACE                      |
| SPRINKLER COMPRESSOR            | 15                     | 72               | SPACE                      |
| SPACE                           | 73                     | 103              | SPACE                      |
| SPACE                           | 74                     | 104              | SPACE                      |
| GFCI RECEPTACLE EAST COURT YARD | 15                     | 75               | SPACE                      |
| RECEPTACLE NORTH SERVICE CHASE  | 15                     | 76               | SPACE                      |
| FIRE ALARM PANEL                | 15                     | 77               | SPACE                      |
| YOUTH DETERRENT                 | 78                     | 108              | SPACE                      |
| UNIT HEATER CONTROL BUILDING    | 30                     | 79               | SPACE                      |
| SPACE                           | 80                     | 110              | SPACE                      |
| SPACE                           | 81                     | 111              | SPACE                      |
| EAST PYLON MESSAGE BOARD        | 30                     | 82               | SPACE                      |
| EAST PYLON SIGN                 | 15                     | 83               | SPACE                      |
| SPACE                           | 84                     | 114              | SPACE                      |
| NORTH HEAT TRACE                | 15                     | 85               | SPACE                      |
| NORTH HEAT TRACE                | 86                     | 116              | SPACE                      |
| NORTH HEAT TRACE                | 15                     | 87               | SPACE                      |
| NORTH HEAT TRACE                | 88                     | 118              | SPACE                      |
| NORTH HEAT TRACE                | 15                     | 89               | SPACE                      |
| SPACE                           | 90                     | 120              | RECEPTACLE BELOW PANEL A   |

| PANEL MOUNTING LOCATION | 'L' SURFACE MECH. ROOM | VOLTAGE MAIN BUS | 120/240V-1PH-3W 200A LIGHTING CONTROL PANEL |
|-------------------------|------------------------|------------------|---|
| DESCRIPTION             | BKR                    | CIRCUIT          | DESCRIPTION                                 |
| N/L LIGHTING            | 20                     | 1                | UP LIGHTING                                 |
| N/L LIGHTING            | 20                     | 2                | UP LIGHTING                                 |
| LIGHTING                | 20                     | 3                | EXTERIOR LIGHTING                           |
| LIGHTING                | 20                     | 4                | EXTERIOR SIGNAGE                            |
| LIGHTING                | 20                     | 5                | EXTERIOR SIGNAGE FACING NORTH               |
| LIGHTING                | 20                     | 6                | EXTERIOR SIGNAGE FACING SOUTH               |
| LIGHTING                | 20                     | 7                | INTERIOR SIGNAGE SOUTH                      |
| LIGHTING                | 20                     | 8                | INTERIOR SIGNAGE NORTH                      |
| LIGHTING                | 20                     | 9                | ROADWAY LIGHTING BELOW BRIDGE               |
| LIGHTING                | 20                     | 10               | ROADWAY LIGHTING BELOW BRIDGE               |
| LIGHTING                | 20                     | 11               | SPACE                                       |
| LIGHTING                | 20                     | 12               | SPACE                                       |
| LIGHTING                | 20                     | 13               | SPACE                                       |
| LIGHTING                | 20                     | 14               | SPACE                                       |
| LIGHTING                | 20                     | 15               | SPACE                                       |
| SPACE                   | 20                     | 16               | SPACE                                       |
| LIGHTING CONTROL        | 20                     | 17               | SPACE                                       |
| CANOPY LIGHTING         | 20                     | 18               | SPACE                                       |
| STEP LIGHTS             | 20                     | 19               | SPACE                                       |
| POST LIGHTS             | 20                     | 20               | SPACE                                       |
| EXTERIOR LIGHTING       | 20                     | 21               | SPACE                                       |

| NO.  | DESCRIPTION        | LOCATION | VOLT-PH. | HP/W/MCA | C.B.   | COND. | STARTER  | NOTE     |
|------|--------------------|----------|----------|----------|--------|-------|----------|----------|
| EF-1 | INLINE FAN         | WALL     | 240V-1PH | 2.37HP   | 40A-2P | #10   | MAGNETIC | NOTE 1,2 |
| EF-4 | EXHAUST FAN        | ROOF     | 120V-1PH | 0.22HP   | 15A-1P | #12   | MAGNETIC | NOTE 1,2 |
| EF-2 | EXHAUST FAN        | ROOF     | 240V-1PH | 2.14HP   | 40A-2P | #10   | MAGNETIC | NOTE 1,2 |
| EF-3 | EXHAUST FAN        | ROOF     | 240V-1PH | 2.14HP   | 40A-2P | #10   | MAGNETIC | NOTE 1,2 |
| IR-1 | GAS RADIANT HEATER | WALL     | 120V-1PH | 145W     | 15A-1P | #12   | -        | NOTE 1   |
| AC-1 | AIR COMPRESSOR     | MECH RM  | 120V-1PH | 1/3HP    | 15A-1P | #12   | MANUAL   | NOTE 1,3 |

**SPECIFIC NOTES**

- WIRE AND CONNECT AS REQUIRED. REFER TO MECHANICAL.
- MAGNETIC STARTER BY DIV. 16.
- MANUAL STARTER BY DIV. 16.
- WIRE ALL CONTROL ALARMS AS REQUIRED (SEE MECHANICAL).

**GENERAL NOTES**

- MANUAL STARTERS TO BE C/W OVERCURRENT PROTECTION.
- ALL DISCONNECT SWITCHES TO BE SUPPLIED BY DIV. 16.
- ELECTRICAL CONTRACTOR TO PROVIDE CIRCUIT BREAKERS AND WIRING ACCORDING TO THE FINAL NAMEPLATES OF ALL THE MECHANICAL EQUIPMENT.
- ALL LOW VOLTAGE CONTROL WIRING BY DIV. 15.
- ALL LINE VOLTAGE CONTROL WIRING BY DIV. 16 - REFER TO MECHANICAL SECTION. COORDINATE EXACT REQUIREMENTS WITH DIV. 15.

**SPECIFIC ELECTRICAL NOTES**

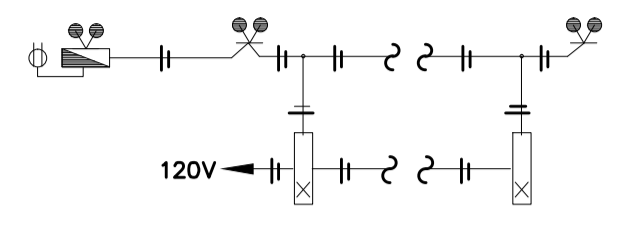
- FOR CONNECTION TO GROUND LOOP, PROVIDE 7 METRE LONG TAIL
- GROUND LOOP TO RUN INSIDE STRUCTURE ABOVE ROADWAY.
- TYPICAL CONNECTION TO STRUCTURAL COLUMN VIA CADWELD.
- ALLOW ADEQUATE CABLE FOR CONNECTION TO ELECTRICAL SERVICE GROUND.
- TYPICAL #4/0 BARE COPPER BURIED 1 METRE BELOW GRADE.
- TYPICAL GROUND ROD - SEE GENERAL ELECTRICAL NOTE 3.
- #4/0 BARE COPPER RUN UP/DOWN COLUMNS AND OVER ROADBED IN CEILING STRUCTURE.

| TYPE | WATTS | VOLTAGE  | DESCRIPTION | MANUFACTURER | CATALOGUE # | REMARK |
|------|-------|----------|-------------|--------------|-------------|--------|
| UH-1 | 5000  | 240V-1PH | UNIT HEATER | CHROMALOX    | EUH05B31T   | NOTE 1 |

**HEATING SCHEDULE**

**SPECIFIC HEATING NOTES**

- C/W BUILT-IN THERMOSTAT. MOUNT SECURELY WHERE INDICATED TO THE SATISFACTION OF THE ENGINEER.
- (GENERAL) VOLTAGE TO BE AS INDICATED ABOVE UNLESS OTHERWISE NOTED ON DRAWINGS.
- (GENERAL) APPROVED EQUAL: OUELLET.

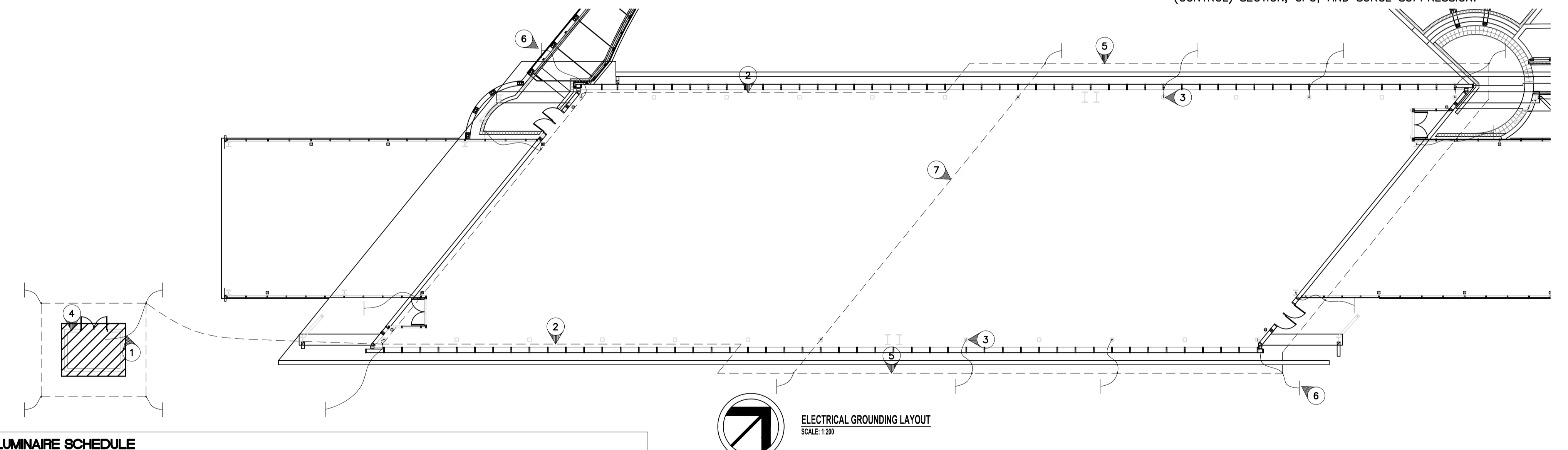


**EMERGENCY LIGHTING AND SIGNAGE**

- N.T.S.
- CONDUCTORS SIZED TO MANUFACTURERS RECOMMENDATIONS. MAXIMUM 5% VOLTAGE DROP.
  - WIRE AND CONNECT DC TO ALL COMPONENTS.
  - PROVIDE 60 MINUTE CAPACITY UNDER FULL LOAD.
  - INTERLOCK WITH NORMAL LIGHTING CIRCUIT TO ACTIVATE EMERGENCY LIGHTING UPON LOSS OF NORMAL LIGHTING.

**GENERAL ELECTRICAL NOTES**

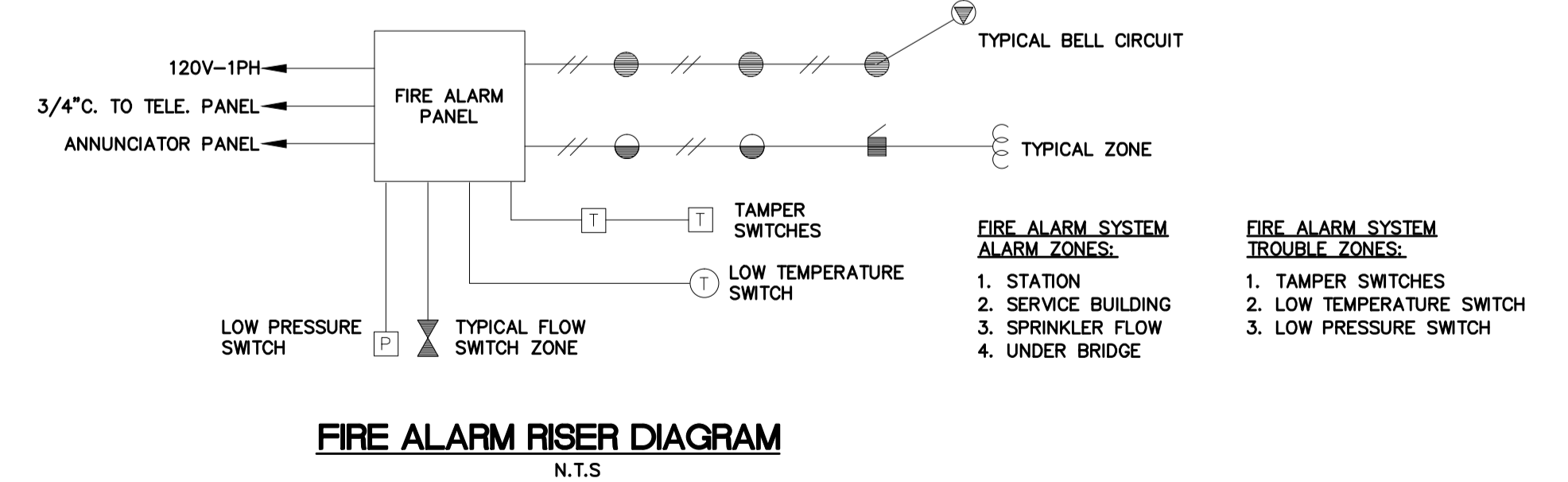
- PROVIDE A GRID NETWORK TYPE OF GROUNDING SYSTEM, AS SHOWN ON THIS DRAWING, HAVING A MAXIMUM RESISTANCE OF FIVE (5) OHMS. AFTER TESTING WITH A GROUNDING MEGGER, WHERE NECESSARY, ADDITIONAL GROUND RODS SHALL BE PROVIDED TO OBTAIN THIS RESISTANCE.
- TAPS AND CONNECTIONS WHICH ARE NORMALLY INACCESSIBLE AFTER INSTALLATION SHALL BE MADE USING A CADWELD CONNECTION TYPE "TA". SOLDER SHALL NOT BE USED.
- GROUND RODS SHALL BE 3/4" (19mm) DIAMETER BY 10'-0" (3050mm) LONG COPPER WELD RODS INSTALLED 2'-6" (760mm) BELOW GRADE. GROUND CABLE FOR THE NETWORK SHALL BE #4/0 BARE STRANDED COPPER INSTALLED 3'-0" (910mm) BELOW GRADE. NO MECHANICAL PROTECTION IS REQUIRED.



| TYPE | DESCRIPTION  | CATALOG NUMBER            | LAMPS                 |
|------|--|---------------------------|-----------------------|
| A    | 8' FLUORESCENT SURFACE MOUNTED - IP65 RATED C/W 3" STEM        | PEERLESS STATION          | 4-54W TSHO/8' SECTION |
| B    | 4' FLUORESCENT   | LITHONIA UNS              | 1-54W TSHO            |
| 1    | STEP LIGHT MOUNTED IN POSTS - REFER TO LANDSCAPE ARCH DWGS     | FC LIGHTING FCSL400       | 3-3W LED              |
| 2    | HID FLOODLIGHT MTD. IN STRUCTURE - INDIRECT                    | LITHONIA WFL-2            | 1-150W MH             |
| 5    | POST MOUNTED LIGHT C/W 18" POST (5" ROUND)                     | REBELLE CYL-003           | 1-150W MH             |
| 6    | ROADWAY LIGHTING   | HOLLOPHANE PREDATOR       | 1-100W HPS            |
| 9    | EMERGENCY DOUBLE HEAD FIXTURE - VANDAL RESISTANT, WEATHERPROOF | SEE SPEC SECTION 26 52 01 | 2-20W MR16            |

**LUMINAIRE SCHEDULE NOTES:**

- ALL FLUORESCENT BALLASTS TO BE ELECTRONIC, MB HYDRO "POWER SMART" APPROVED.
- ALL FLUORESCENT LAMPS TO BE 4100K & 85 CRI, UNLESS OTHERWISE NOTED.
- REFER ALSO TO SPECIFICATION SECTION 26 50 00.



| LOCATION UNDERGROUND            | APPROVED STRUCTURES | B.M. ELEV. |
|---------------------------------|---------------------|------------|
| SUPPLY U/G STRUCTURES COMMITTEE | DATE                |            |

**NOTE:**  
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE, BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

| DESIGNED BY                                  | DRAWN BY | CHECKED BY | APPROVED BY | HOR. SCALE | VERTICAL |
|--|----------|------------|-------------|------------|----------|
| NOVA 3 ENGINEERING LTD. CONSULTING ENGINEERS |          |            |             |            |          |

| ENGINEER'S SEAL | RELEASED FOR CONSTRUCTION | CONSULTANT PROJECT NO. |
|-----------------|---------------------------|------------------------|
|                 |                           | 088813                 |

**THE CITY OF WINNIPEG TRANSIT DEPARTMENT**

SOUTHWEST RAPID TRANSIT CORRIDOR - STAGE 1  
OSBORNE STATION & ASSOCIATED WORKS

CITY DRAWING NUMBER: B237-10-93  
SHEET: 93 OF 121  
CONSULTANT DRAWING NUMBER: C5-E2202-T