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800 Burrard Street, 12th floor
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Vancouver
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V6Z 2V8
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SOLICITATION AMENDMENT MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution
Public Works and Government Services Canada -
Pacific Region
800 Burrard Street, 12th floor
800, rue Burrard, 12e étage
Vancouver
British C
V6Z 2V8

Title - Sujet New 50 Man Living Units - Ferndale	
Solicitation No. - N° de l'invitation EZ899-131401/A	Amendment No. - N° modif. 004
Client Reference No. - N° de référence du client	Date 2012-11-02
GETS Reference No. - N° de référence de SEAG PW-\$PWY-005-6794	
File No. - N° de dossier PWY-2-35164 (005)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2012-11-09	Time Zone Fuseau horaire Pacific Daylight Saving Time PDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Pillay, Sal (PWY)	Buyer Id - Id de l'acheteur pwy005
Telephone No. - N° de téléphone (604) 775-9386 ()	FAX No. - N° de FAX (604) 775-6633
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: CSC - Ferndale Institution - Mission, BC	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Solicitation No. - N° de l'invitation

EZ899-131401/A

Client Ref. No. - N° de réf. du client

Amd. No. - N° de la modif.

004

File No. - N° du dossier

PWY-2-35164

Buyer ID - Id de l'acheteur

pw005

CCC No./N° CCC - FMS No/ N° VME

Les documents français seront disponibles sur demande

The following changes in the tender documents are effective immediately. This addendum will form part of the contract documents.

SPECIFICATIONS

.1 Section 01 01 50 - General Instructions

Paragraph 1.2

- (1) **Add:** new subparagraph 1.2.2:

.2 Modifications to the existing proprietary Security Door Supervision System described in Section 28 will be performed by Status Automation via a separate contract administered by the Departmental Representative. The General Contractor is responsible for coordination of the work performed by Status Automation and for health and safety of their personnel when on site, in accordance with Section 01 35 33. The intent is for Status Automation's work to be coordinated with the Work of this Contract.

.2 Section 08 11 14 - Steel Doors and Frames

Clause 2.5 Frames

- (2) **Add:** new paragraph 2.5.10:

.10 Provide electrical metal junction box in frame and 20 mm ϕ steel electrical conduit stub to accommodate doors with Door Position Switches specified in Section 08 71 10 (see addendum Item (3)).

.3 Section 08 71 10 - Door Hardware

Clause 2.2 Door Hardware

- (3) **Add:** new paragraph 2.2.21.

.21 Door Position Switches: to section 28 13 27 Security Door Supervision paragraph 2.1.2.

Clause 2.4.1 Door Schedule:

Item 39 and 40:

- (4) **Add:** 1 door position switch to Hardware Description column. (All 50 bedroom doors require door position switches)

Item 39:

- (5) **Revise:** words "East & West Pods" in Door # column to read: "West, North and East"

- (6) **Replace:** "&" in first line of Rm to Rm column with letter "N"

Item 40:

- (7) **Revise:** Rm to Rm column to read; "Rm N116 to Rm N109" and " Rm N216 to Rm N209"

.4 Section 14 24 23 - Hydraulic Elevator

Paragraph 2.2.2.17;

- (8) **Revise:** power supply to 600 V - 3 phase.
-

.5 Section 25 05 01 - EMCS: General Requirements

(9) **Add:** new clause 1.17 as follows:

1.17 Remote Operator Terminal Communication

- .1 The remote DDC workstation (as specified in Clause 2.1) located in the Institution Services Building (Building 3, Facilities Management – Mr Glenn Roberts' office) and portable laptop (as specified in Clause 2.2) shall be provided with access to the DDC systems for the new building. Refer to the attached sketch for the DDC infrastructure and scope of work under Division 25 and Division 27.
- .2 The Controls Contractor shall provide the following:
 - .1 One (1) Fibre to Ethernet media converter in Communications Room 009 of the new building, and a CAT5 cable run between the media converter and the main DDC panel Ethernet switch (furnished by Division 25). The media converter will be installed by Division 27.
 - .2 Two (2) Fibre to Ethernet media converters and one (1) 16-port Ethernet switch in the Communications Room of the Administration Building (Building 1). The media converters and Ethernet switch will be installed by Division 27.
 - .3 One (1) Fibre to Ethernet media converter in the Communications Room of Institutional Services Building (Building 3). The media converter will be installed by Division 27. Division 27 will provide a CAT5 cable run from the media converter to the DDC workstation Ethernet switch (furnished by Division 25).

.6 Section 25 30 11 - EMCS: Building Controllers

(10) **Add:** new clauses 2.6 to 2.9 as follows:

2.6 Custom Application Controllers

- .1 An AAC (B-AAC) is a general purpose, field programmable controller capable of carrying out a variety of building automation and control tasks.
- .2 Custom Application Controllers shall communicate on the main BACnet Ethernet LAN or BACnet MSTP subLAN. In addition to main or subLAN communications, the controller shall support PC and/or modem communications.
- .3 Programming the controller shall be accomplished over the LAN or directly via PC and will not require the mandatory use of any other special interface hardware or a Building Controller.
- .4 Operator Control Language shall be fully supported with this controller. FIRMWARE BASED FUNCTIONS OR PROGRAMMING WILL NOT BE ACCEPTED.

2.7 Application Specific Controllers:

- .1 ASC BACnet overview: An ASC (B-ASC) is a controller with limited resources relative to a AAC. It is intended for use in a specific application and supports limited programmability.
-

- .2 Application Specific Controllers shall be used for the following mechanical systems:
 - .1 VAV, Fan Coils, radiation and reheat.
 - .2 Radiant heating and reheat control.
- .3 Application Specific Controllers shall communicate on the main LAN or subLAN using EIA-485 (MSTP). In addition to main or subLAN communications, the controller shall support PC and/or modem communications and intelligent thermostat communications.
- .4 Programming the controller shall be accomplished over the LAN or directly via PC and will not require the mandatory use of any other special interface hardware or a Building Controller. Operator Control Language programming and editing shall be fully supported with this controller. **FIRMWARE BASED FUNCTIONS WILL NOT BE ACCEPTED.**

2.8 Stand Alone Controllers:

- .1 Stand Alone Controllers common requirements (B-BC, B-AAC) (Peer to Peer): Provide a fully distributed processing system such that each major piece of mechanical equipment is controlled by its own stand-alone controller. The DDC system shall operate independently from the Host Computer. Mount all stand alone controllers at locations where indicated on drawings. Provide an outlet port for plug in of a portable PC in each mechanical room containing stand-alone controllers.
- .2 The stand-alone digital control panel shall be 16-bit microcomputer based, providing a multi-tasking operating system for simultaneous operation and control of:
 - .1 facility management functions
 - .2 DDC control functions
 - .3 energy management functions
 - .4 man-machine interface
 - .5 system communications
- .3 Analog to digital and digital to analog conversions shall have a minimum 10 bit resolution.
- .4 Panel input points shall be universal allowing each point to be defined as an analog input, or digital input.
- .5 The control panel shall contain a real time clock capable of being synchronized with other real time clocks in the network.
- .6 Control panel software shall be protected from loss due to power failure for a minimum period of 72 hours.
- .7 All sensing inputs shall be provided via the following industry standards:
 - .1 0 to 20 mA
 - .2 4 to 20 mA
 - .3 0 to 5 VDC
 - .4 0 to 10 VDC

.5 10k type 3 thermister resistance signals

.8 Modulating outputs shall be fully proportional. Pulse width modulation, without analog feedback, shall not be used for analog output signals. Outputs must be capable of being scaled and produce a 0% to 100% output with a fractional PID control algorithm.

.9 Digital outputs shall be capable of directly switching the following voltages. This contractor shall provide solid state relays that will accept this signal:

.1 24 VAC @ 36 VA operating

.2 120 VAC @ 120 VA operating

2.9 Field Panels

.1 Provide local panels of unitized cabinet type for relays/devices. Mount relays, switches, transducers and controllers with set point adjustment in cabinet and pilot lights, push buttons, and switches flush on cabinet panel face.

.2 Fabricate panels from 3.0 mm furniture steel with baked enamel finish and removable hinged key lock door.

.3 Mount panels adjacent to associated equipment on vibration free walls or free standing angle iron supports.

.4 Field panels are not to be located in ceiling spaces.

.5 All main panels are to be located in Mechanical/Fan Rooms only.

.6 All panels serving microzone controllers (reheat/radiation) should be located in fully recessed panels located in mechanical rooms, fan rooms, storage rooms or janitors' rooms. The panel locations are to be approved by the consultant during the shop drawing stage.

.7 All field panels shall be labelled with lamicoid labels.

Clause 3.1 General

(11) **Add:** new paragraphs 3.1.5 to 3.1.13 as follows:

.5 System Expansion: Provide five spare input and five spare output points in each Mechanical Room for future expansion and renovations. In addition, further expansion of the system shall be possible by simply adding more controllers to the network. The system shall be expandable to a maximum capacity in excess of 2500 points without making any of the original equipment redundant. The central control console shall directly support a minimum of 99 stand alone controllers.

.6 The DDC panel points shall be defined such that the primary input sensor for a PID loop resides on the same panel as the output.

.7 Application specific controllers shall only be used where specified.

- .8 Controller Memory: The non-volatile ROM, EPROM, EEPROM memory will, as a minimum, support all performance and technical specifications, communications, operating system, executive, application subroutines, etc. and other configuration description software. Tape or disk media systems are not acceptable. All control algorithms, application functions, and operating data or software shall reside in EEPROM or battery backed RAM. That is, data or control program (such as I/O point characteristics, schedules, setpoints, alarm limits, and control sequences) must remain in EEPROM and/or RAM and hence modifiable on-line through an operators terminal connected to any panel on the system. RAM must include battery or other backup for a minimum of 72 hours to eliminate operating data reload in case of power failure.
- .9 Controller Diagnostics: Control panel diagnostics, for both the primary controller and the micro-controllers, shall consist of built-in, continuous operational and board level tests, software control sequence analysis and alarm exception logging. Light emitting diodes and/or the alphanumeric display shall annunciate hardware failures, and control program errors or problems.
- .10 All micro-controllers and central communications controllers shall be located in Mechanical rooms, Electrical rooms or Janitor rooms. Locations elsewhere shall be subject to Engineer's prior approval.
- .11 Application specific controllers shall have a minimum of one spare universal input and one spare universal output point for future connections. Point expander cards are not to be used in the original installation.
- .12 All controllers shall contain ports to interface to a Person Computer. This access port shall provide full capabilities including programming.
- .13 The control system shall operate independently from the Host Computer Workstation. All control, inter-panel communications and data collection functions shall continue to operate when the Host Computer Workstation is taken off line.

.7 Section 26 33 53 – Static Uninterruptable power supply

- (12) **Delete:** paragraph 1.1.4.

Clause 1.3 Requirements
- (13) **Revise:** paragraph 1.3.1 to read, "Provide one rack mounted 5 kVA, 208 V, single phase, 2-wire input, 120/208 V, single phase, 3 wire and ground output, 60 Hz static uninterruptible power supply (UPS) system. Provide all equipment and installation materials necessary to make a complete functional system when installed as indicated on the drawings."
- (14) **Delete:** paragraph 1.3.2.1.2.
- (15) **Revise:** paragraph 1.3.2.1.8 to read, "Output filter."
- (16) **Delete:** paragraph 1.3.2.1.10.
- (17) **Delete:** paragraph 1.3.2.7 (All UPS equipment.....)

- Clause 1.6 Maintenance Materials
- (18) **Delete:** clause 1.6 and paragraphs 1.6.1 & 1.6.2.

Clause 2.1 Rating and Performance Requirements:

- (19) **Revise:** paragraph 2.1.1.1 to read, "UPS continuous Output Rating (100% load): when serving up to 100% non-linear loads having a peak current up to 3 times fundamental RMS current i.e.; Crest Factor (CF) = 3:1."
- (20) **Revise:** paragraph 2.1.1.2.1 to read, "Output frequency: +/- 0.5%."
- (21) **Revise:** Item 2.1.1.2.2 to read, "Output voltage regulation: +/- 2%."
- (22) **Revise:** Item 2.1.1.2.5 to read, "Output voltage distortion: THDU +/- 3%."
- (23) **Revise:** Item 2.1.3 to read, "Input inrush current at initial energization limited to 200 A for 1 ms."

.8 Section 27 11 19 – Structured Cabling for Communication Systems

- (24) **Replace:** Specification section 27 11 19 with footer reference 'Issued for Tender' (9 pages) with new section 27 11 19, with footer reference 'Issued for Electrical Addendum 2' (9 pages).

.9 Section 27 53 23 – Rf Television Distribution

- (25) **Replace:** Specification section 27 53 23 with footer reference 'Issued for Tender' (4 pages) with new section 27 53 23 with footer reference 'Issued for Electrical Addendum 2' (4 pages).

.10 Section 28 13 27 – Security Door Supervision

- (26) **Replace:** Specification section 28 13 27 with footer reference "Issued for Tender" (3 pages) with new section 281327 with footer reference 'Issued for Electrical Addendum 2' (3 pages).

DRAWINGS

ARCHITECTURAL

.1 Drawing A-300 - South and West Elevations

West Elevation

- (27) **Delete:** retaining wall at gridline 3. Note: other retaining walls at East and West end of building were deleted under Addendum No 1 item (15).

.2 Drawing A-401 - Sector Plan Ground Floor Core

Drawing Scale

- (28) **Revise:** scale to 1:50
- (29) **Revise:** elevator north wall type to read PTN-4.

.3 Drawing A-402-1 - Sector Plan Second Floor East Residential Pod

Drawing Title

- (30) **Revise:** title to read "**Sector Plan Second Floor East West Residential Pod**".

.4 Drawing A-402-2 - Sector Plan Second Floor North Residential Pod

- (31) **Clarification:** partition type for west wall of Living Dining room N200 is PTN-1.
-

.5 Drawing A-403 - Sector Plan Second Floor Core and Common Area
Elevator

(32) **Add:** wall type PTN-4 to elevator north wall.

.6 Drawing A-900 - Finishes Plan Basement

NOTE (below legend)

(33) **Revise:** P2 to read: P3 for interior walls of staircases

STRUCTURAL

.7 New Drawings

(34) **Add:** new drawings attached to this addendum:

- | | | |
|----|----------|---|
| .1 | S-AD-S03 | Second Floor Framing Plan Revised |
| .2 | S-AD-S04 | Second Floor Framing Plan Revised |
| .3 | S-AD-S05 | Shear wall Schedule Revised (Xref Dwg. SF-401) |
| .4 | S-AD-S06 | Shear wall SW7 & SW8 Elevation Revised (Xref Dwg. SF-401) |

.8 Drawing SF201 - Basement and Foundation Plan

(35) **Revise:** the 450 deep footing under Stair #1 to be 500 deep reinforced with 20M@250 each way top and bottom plus supplementary rebar shown on the plan. Provide hooks at footing edges/ends or extend bars minimum 900mm pass the 500 deep footing.

.9 Drawing SF202 - Ground Floor Framing Plan

(36) **Revise:** the thickness for HSS columns for column types C1, C2 & C3 to be 6.4mm from Ground Floor to Roof on Column Schedule.

.10 Drawing SF203 - Second Floor Framing Plan:

(37) **Clarification:** Drag struts to shear walls types SW3, SW4 & SW5 as per attached addendum sketch AD-S03.

.11 Drawing SF204 - Roof Framing Plan:

(38) **Clarification** Drag struts to shear walls types SW3, SW4 & SW5 as per attached addendum sketch AD-S04.

.12 Drawing SF401, Shear Wall Schedule & Wall Elevations

(39) **Revise:** Shear Wall Schedule for wall types SW3/SW5, SW7 & SW8 as per attached addendum sketch AD-S05.

(40) **Revise:** Shear Wall Elevations for wall types SW7 & SW8 as per attached addendum sketch AD-S06.

(41) **Clarification:** the Typical Hold-down Anchor Detail at Wall Intersections, the bolts through built-up studs shall be screws as per the specified Hold-down Anchor Types.

ELECTRICAL

.13 New Drawings .

- (42) **Add:** new drawings attached to this addendum:
ESK-E004-01 Part Drawing E004 Issued for Add E2
ESK-E004-02 Part Drawing E004 Issued for Add E2
ESK-E004-03 Part Drawing E004 Issued for Add E2
ESK-E005-01 Part Drawing E500 Issued for Add E2
ESK-E005-02 Part Drawing E500 Issued for Add E2
ESK-E005-03 Part Drawing E500 Issued for Add E2

.14 Drawing E002 - Electrical Single Line Diagram and Generator Room Layout.

- (43) **Revise:** Detail C 'MEDIUM FEEDER AMPACITY' reference to read, "MINIMUM FEEDER AMPACITY."

.15 Drawing E-003 - Services Room Layout

- (44) **Revise:** Detail B – Mechanical Room 006 Layout, Key Note 1 to read, "DDC Control Panel connection. Provide one Category 6A cable from the control panel to the telecommunications rack in Communication Room 009. Provide one 6F, MM, 50/125, OM3, inside/outside plant fibre from the Administration Building Communication Room to a location in the Institutional Services Building for connection to the existing DDC System; allow for 120 m of fibre to be installed above the existing ceiling spaces within the buildings and underground in existing ducts. Fibre shall be terminated and tested. Network equipment and patch panels will be supplied and installed by Division 25. Coordinate work with Mechanical Contractor on site."
- (45) **Revise:** Detail C 'SUB-MASTER GROUND BUS' reference to read, "TELECOMMUNICATIONS MAIN GROUNDING BUS (TMGB)."

.16 Drawing E-004 - System Riser Diagram

- (46) **Replace:** Detail B with detail shown in ESK-E004-01.
- (47) **Replace:** Detail C with detail shown in ESK-E004-02.
- (48) **Replace:** Detail D with detail shown in ESK-E004-03.

END OF ADDENDUM No 1

Bidding Questions and Answers

The following questions received from bidders are listed for general reference only. Answers provided by PWGSC are intended to direct the bidder to a specific part of the Bid documents area, to answer their questions, or an Addendum Item reference number will be noted to direct the Bidder where a change to the Bid document is necessary to answer the question.

- | | | |
|----|-----------|---|
| .1 | Question: | West elevation 1/A-300 shows concrete retaining walls next to the double doors between lines 2 & 3, as well as on gridline 3. The latter is not shown on the Basement Floor Plan A-200. Please clarify. |
| | Answer: | See Addendum Item (27) |
| .2 | Question: | "Typical hold-down anchor detail at wall intersections" shown on SF401 show a bolt connecting the double HD's, but the shearwall schedule and elevations show SDS2.5 screws at all hold-downs. Please clarify? |
| | Answer: | See Addendum Item (41) |
| .3 | Question: | The Shearwall Schedule on SF401 indicates "12mm PLYWOOD BOTH SIDES " for SW7, but the elevation for SW7 indicates "12mm THK. PLYWOOD SHEATHING ONE SIDE ". Please clarify – one side or both? |
| | Answer: | See Addendum Items (39) & (40). |
| .4 | Question: | Drawing A-401 shows a "PT-4" wall on the north side of the elevator shaft (presumably same on the 2 nd floor level, although not marked with a wall type on A-403). According to SF202, this is a bearing 2x4 wall, not 22nn furring as per PTN-4. Please clarify. |
| | Answer: | See Addendum Item (29) & (32) |
| .5 | question: | SF202 & SF 203 show a 2x4 bearing wall along the west wall of the elevator shaft. Architectural drawings A-401 and A-402-1 do not show a wall type here. Please clarify. |
| | Answer: | See Addendum Item (29) & (32) |
| .6 | Question: | The scale on drawing A-401 is noted as 1:75. It should read 1:50. |
| | Answer: | See Addendum Item (28) |
| .7 | Question: | Ref. drwg A-402-2 – what is the wall type on the west Living Rm/Dining Rm wall against the corridor? |
| | Answer: | See addendum Item (31) |
| .8 | Question: | Shearwall Schedule on SF401 shows 3-38x140 studs at each end of the SW8 walls at the second floor level to roof, but the elevation shows 2-38x140 studs. Please clarify. |
| | Answer: | See addendum Item (39) & (40) |
| .9 | Question: | On page A900 - it says P2 for interior walls of staircase, but on the actual plan it has P3 pointing at the stairway walls. Please clarify which color is to be used.. |
| | Answer: | See addendum Item (33) |
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- .10 Question: Also on A900 - the 3 future storage area rooms, are these also painted P1, cause they are not noted (looking at the note in the box all un noted walls are P1) But just want to make sure, because it says "future" storage.
Answer: All walls are P1 unless noted otherwise.
- .11 Question: On page A903 - says residential typical pod, but the bottom left hand corner says "basement floor plan". Is this a mistake? There are no residential pods in the basement, please clarify..
Answer: See Addendum No 1 Item (27)
- .12 Question: Also on A903 - the note says "wall paint schedule for all living unit pods; What does this mean, and what color does this refer to.
Answer: There are six Residential Pods. The plan on A-903 is a Typical Residential Pod Finishes Plan. Each P# refers to a different colour. The colour scheme will be selected for all surface finishes after the contract is awarded and all colour samples are received by the Departmental Representative.
- .13 Question: The paint colors it's talking about (P1, P2, P3, ect.) is there actual colors for these?
Answer: They represent different colours. See answer to question 12.
- .14 Question: I cannot find, in the mechanical specifications/prints, the electrical specifications/prints or the addendum #002, where is specifies the a fibre connection required for the HVAC system. The assumption is that the HVAC network would be connected to the Building IT network so that the Facilities Manager would be able to access the HVAC system via the IT infrastructure. Is this a correct assumption?
Answer: See Addendum items (9), (10) & (11)
- .15 Question: The operator work station is located in the office location of the Facilities Manager Mr. Glenn Roberts which we think is located in building 1 Administration Case Management, V& C? If it is not, can you please clarify the office location.
Answer: See addendum item (9)
- .16 Question: We assumed the following items are not to be included in the tender price. Please confirm:
 Course of Construction / Wrap-up Liability Insurance.
 Building Permit
 Permanent Utility Connection Fees (Hydro, Fortis Gas, Shaw, Telus, etc)
 Night Watchman / Patrol Security
Answers: Insurance is included in Contract price. See General Conditions R2910D Insurance Terms.
 Building Permit is included in Contract price See General Conditions GC 1.8.
 All utilities are CSC owned and all connections are included in the contract.
 A construction escort may be utilized by Departmental Representative to control site movement and monitor security at no cost to the Contract.
- .17 Question: Is the sediment / erosion control already in place by the current Civil Contractor on Site (dwg C8 mentions for reference only?)
Answer: The civil contract has been completed. See clause 3.3 Dewatering in Section 31 23 10 Excavation, Trenching and Backfilling for control of runoff water and erosion.
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- .18 Question: We note Asphalt Paving in Specification Manual, however don't see a site plan that shows the extent of paving areas. Can we assume there is no paving required for this project?
- Answer: See Section 31-23-10 Excavation, Trenching and Backfilling Clause 3.8 Restoration and Addendum No 2 attached drawing ESK-E100-01. A good portion of the restoration work is due to the installation of new underground electrical duct banks and manholes to new Living Unit Building originating from the existing Generator building and from the existing Administration Building. Most of the duct banks are located within paved areas and some duct banks traverse through landscaped areas. The intent is to restore the paved and landscaped areas to as new condition as specified in clause 3.8.
- .19 Question: Please confirm that there is no Landscaping or Fencing for this project.
- Answer: See answer above for restoration of landscaped areas. No new chain link fencing is shown in the tender documents.
- .20 Question: Please find attached our request for equal for the rolling counter door at the Ferndale institution. Please forward to the consultants for me, for approval.
- Answer: Bid as specified. It is the supplier's responsibility to ensure the products supplied complies with the specification. Products that conform to the performance specification, descriptive data and referenced standards will be considered acceptable.
- .21 Question: Where and what do the sump drains tie into?
- Answer: Connect Manholes 'MH C3' and 'MH C4' sump drains to Drain Manhole 'DMH 2'. Connect Manholes 'MH P5' and 'MH P6' to Drain Manhole 'DMH 1'. Manhole drain pipes shall be 103 mm.
- .22 Question: For steel columns to be rated with intumescent fireproofing, the minimum steel size to meet the ULC design must be 6.4mm wall thickness. (i.e. 127x127x6.4). Column types C2 and C3 shown on structural plan SF202 must be upgraded to 6.4mm wall thickness.
- Answer: See Addendum Item (36).
- .23 Question; Door Holders/Closers mentioned on Section 08 71 10 of Addendum #2. Are these going to be supplied by the security supplier and we will supply only the control relays for them? Or is it your vision that we will supply the holders/closers and the control relays?
- Answer: The intent was for Edwards to provide the control relay. The closer/holders are specified in Section 08 71 10. See Addendum No2 Item (11).
- .24 Question: Is it fair to assume that the POD doors will be controlled by the security system? Should we provide control relays for those doors individually or just a connection to the security system so the security system has full control over those doors?
- Answer; POD door fire alarm interface is not required.
- .25 Question: What is the distance between the existing panel and the planned location of the FireWorks workstation?
- Answer: GENIVAR: Both the main fire alarm panel and workstation are located in the Duty Office (Administration Building). Distance between them is 10 m.
-

- .26 Question: There are sounder bases and horn/strobes on the same areas. Should we remove either the horn/strobes or the sounder bases in the PODs' corridors? Or do we keep both, even though they will produce two different sounding signals?
- Answer: GENIVAR: The following POD devices shall be equipped with sounder bases: Beds, Mechanical/Electrical and Laundry. Activation of any of these devices will sound the bases and the local horns and strobes. Revisions to specification will be issued as part of next Addendum.
- .27 Question: I have not been able to find a Fire Alarm Zone Schedule? Is there one? If not, I can probably figure it out
- Answer: GENIVAR: There are 9 fire alarm zones; 1 for each POD (total of 6), Basement, Ground Floor Administration and Second Floor Administration.
- .28 Question: In the mechanical/electrical rooms there are two devices marked: one smoke/heat detector and a CO detector. You might want to keep the functions and activation of sounder bases separate, but I am not sure. Do you want to keep them separate? Or should we use a smoke/heat/CO combo?
- Answer: GENIVAR: Combination smoke, sounder base and CO detector is acceptable.
- .29 Question: On the existing graphic annunciator, do you want to show all the floor and areas of the new building? Or just a graphic indicating the new building?
- Answer: GENIVAR: Fire workstations shall include site plan and 50 Man Unit Floor Plans.

END OF Q & A

1 GENERAL

1.1 SCOPE

- .1 Supply and install complete Category 6A telephone and data cabling system as indicated on the drawings and specified herein.
- .2 System to be complete with all data/telephone outlets, patch panels, equipment racks, cable management systems, punch-down blocks, wire and cable to form a complete system.
- .3 Entire system to be approved to Category 6A Standard.
- .4 Systems installer to coordinate all labelling with Departmental Representative.

1.2 APPLICABLE STANDARDS

- .1 ANSI/TIA/EIA-568-C.0, C.1, C.2, C.3 Commercial Building Telecommunications Cabling Standard
- .2 ANSI/TIA-569-C Telecommunications Pathways and Spaces
- .3 ANSI/TIA-606-B Administration Standard for the Telecommunications Infrastructure
- .4 ANSI/TIA/EIA-607-B Generic Telecommunications Bonding and Ground (Earthing) for Customer Premises
- .5 ANSI/TIA/EIA-758-B Customer Owned Outside Plant Telecommunications Cabling Standard
- .6 CSA C22.1-09 Canadian Electrical Code
- .7 Building Industries Consulting Services, International (BICSI) Telecommunications Distribution Methods Manual (TDMM), Latest Issue.

1.3 SHOP DRAWINGS

- .1 Shop drawings in accordance with Division 01.
- .2 Shop drawings to include a complete material list with manufacturer, style, model number and quantity. Wire and cable to be included in material list.
- .3 Shop drawings to include manufacturer's specification sheets with photographic depiction of all system components. Specification and descriptive data to include dimension, weight, appearance, connection provisions, materials, metal gauges and operating specification, characteristics, features and controls.

- .4 Shop drawings to include the following diagrams:
 - .1 Front backboard punchdown block elevations for each backboard. Elevations to indicate component layouts, cable routing and component functions.
 - .2 System room plan drawings depicting backboards and cable routing.
 - .3 Layout drawings for patch panels and jackfields.
 - .4 Cable details, including type and electrical characteristics.
 - .5 Complete engineering drawings of all custom made components indicating all materials, gauges, finishes and wiring diagrams.
 - .6 Complete system block diagrams indicating all components, interconnection and cabling.
 - .7 Complete detailed system circuit diagrams depicting how components are interconnected component functions, cable terminations, terminal identification and cable designation.
 - .8 Complete system wire and cable designation schedule indicating origin, terminus, origin terminal identification, terminus terminal identification, cable function, cable type and cable designation, at each demarcation point.
 - .9 Under no circumstances will wiring schematics or typical wiring details be considered as circuit diagrams.

1.4 APPROVALS

- .1 Submit in accordance with Section 26 05 00 – Common Work.

1.5 OPERATING MANUALS

- .1 Operating manuals to be furnished as specified in Section 26 05 00 – Common Work. Operating instructions to consist of following:
 - .1 Individual factory issued manuals containing all technical information on each type of equipment installed. In event such manuals are not available from the factory, system installer to establish same and compile within the manual to satisfaction of the Departmental Representative.
 - .2 Each manual to contain a system parts list, a parts list for individual components, detailed schematics and recommended maintenance procedures. Advertising brochures or operational instructions shall not be considered as technical manuals.
 - .3 Engineering drawings depicting layout and interconnection of all system components and as-built conduit layout.
- .2 In addition to the above described manuals, system installer to include all shop and circuit drawings, wiring schedules and single line block drawings in the manuals.

1.6 GENERAL REQUIREMENTS

- .1 System to be complete with all necessary components to provide functions required whether or not each and every item is necessarily mentioned. All components to be production proven models. Custom designed units will only be considered for those items that are not currently available on commercial market. System to be supplied and installed by an established communications contracting firm that is Vendor approved for the System supplied.

- .2 Selection of system to be made on the basis of quality and suitability of equipment, service facilities, and past performance of contracting firm.
- .3 Before proceeding with installation, successful system installer to submit to Departmental Representative for approval a complete detailed proposal.
- .4 All conduit, pullboxes, junction boxes and terminal panels are to be installed to provide a complete conduit system for the communication system.
- .5 All wiring for systems to be PVC insulated, unshielded, twisted pair.
- .6 All wiring to be installed in conduit and cable tray system unless otherwise specified.
- .7 The system, when complete, must perform to complete satisfaction of Departmental Representative and must be free of all interference from cross-talk, hum, switch and relay noise, etc. All wiring in Communication Rooms to be terminated on punchdown blocks and to be neatly installed and tagged.
- .8 Personnel installing communications cabling shall be trained and conversant with communications cabling practices required for this project. Proof of certification must be provided prior to commencement of work.
- .9 The system shall be certified. The system shall be installed by a contractor designated and trained by the manufacturer of being capable to do so and shall provide written confirmation of this fact.

1.7 SYSTEM DESCRIPTION

- .1 The communication cabling data system consists of horizontal and vertical wiring.
 - .1 **Horizontal:** 4-pair Category 6A UTP unshielded twisted pair FT4 cables from patch panels in Communication Rooms to computer outlets as shown on drawings.
 - .2 **Riser / Back Bone:** Multi pair Cat 3 unshielded twisted pair and MM OM3 Fibre Optic cabling from patch panels interconnecting communication rooms.
 - .3 Multi-pair unshielded twisted pair from IDC Termination blocks interconnecting communications rooms.

1.8 WARRANTY/SERVICE

- .1 The System installer is to include with his base tender price a guarantee that:
 - .1 The Manufacturer's Warranty shall be a 25 year performance warranty and component warranty and shall be applied to all work performed.
 - .2 Submit these warranties on each item in list form with shop drawings. Detail specific parts within the equipment list that are subject to separate conditional warranty. Warranty proprietary equipment and systems involved in this contract during the guarantee period. Final payment shall not relieve the Contractor of these obligations.
- .2 The Contractor shall supply all supporting documentation as follows:
 - .1 Shall cover all material and labour.
 - .2 The Warranty is directly from the Manufacturer to the Owner
 - .3 The Warranty is based on Industry Standards.

- .4 Service to be provided on system within 24 hours of call origination during the warranty period.
- .5 During warranty period system installer at his expense to repair and replace all such defective work and other work to new system damaged thereby which fails or becomes defective during term of warranty, provided that such failure is not caused by improper usage or physical damage.
- .6 Warranty date to commence from date of Final Acceptance of this work.
- .7 System to be certified to meet and or exceed Category 6A Standards of performance for the duration of the warranty as specified by the manufacturer.

1.9 TRAINING

- .1 System installer to conduct training program for designated maintenance and operating personnel. This program to include but not be limited to the following:
 - .1 Operation: designated personnel to be trained to accomplish and understand all aspects of system operation.
 - .2 Maintenance: designated personnel to be trained to perform routine maintenance on the system.
 - .3 Training period schedule to be established by Departmental Representative. Training periods to take place after building completion and prior to system use.

2 PRODUCTS

2.1 CABLE

- .1 Horizontal Cabling
 - .1 All horizontal data and telephone cable to be 4 pair Cat6A UTP. Cable to be UL listed type NEC-CMR
- .2 Backbone Cabling Copper:
 - .1 Provide Telephone Backbone cables as shown on the plans.
 - .2 Telephone Backbone to be approved inter-building Backbone OSP Flooded Cable, minimum 50 pairs per run.
- .3 Backbone Cabling Fibre:
 - .1 Provide Fibre Optic Backbone cables as shown on the plans.
 - .2 All fibre optic cabling to be OSP (Loose Tube) multi-mode LO OM3

2.2 COMMUNICATIONS OUTLET ASSEMBLIES COMMUNICATIONS OUTLET - BOXES

- .1 Double gang recessed box, 63 mm minimum depth comes with 19 mm deep two-device ring. Single gang wallboard adapter ring, 1.6 mm 16 AWG thickness.
 - .1 27 mm EMT, stubbed from box to cable tray as part of communications conduit system Grommeted or bushed cable exit(s).
- .2 Communications Faceplates
 - .1 To be SS to match electrical outlet plates complete with TORX screws
- .3 Accepts minimum of 4 modular inserts.

- .4 Mounts to standard one-device, two-device, electrical box, or adapter ring opening.
- .5 Communications Outlet - Jacks:
 - .1 Category 6A Modular Jacks
 - .2 Side or regular entry as appropriate
 - .3 Clamp & integrated strain relief
 - .4 Colour to match electrical

2.3 WIRING HARDWARE

- .1 Communications Rack:
 - .1 Free standing 2075 mm (84") high rack units, gang-able.
 - .2 Shall be Certified NEBS-Telcordia GR-63-Core Compliant Zone 4. Shall be secured with seismic bolt down kit.
 - .3 Shall be equipped with 2 sets rails.
 - .4 Must provide 482.6 mm (19") rack mount capability for rack mountable components.
 - .5 Must provide 1925mm (77") of vertical mounting space. (44U)
 - .6 Shall be 30" deep.
 - .7 Must have threaded mounting holes (EIA) front and rear.
 - .8 Shall be black in colour.
 - .9 Shall be equipped with side panels, perforated door on the front & louvered Door on the rear, both equipped with locks.
 - .10 Shall be equipped with a vented top.
- .2 Vertical Cable management.
 - .1 Rack to be equipped each side with 152 mm by 178 mm hinged vertical cable management systems E/W doors and access cut-outs.
- .3 Rack Power Bar:
 - .1 Vertically mounted complete with 6 – 5-20RA receptacles mounted on the rear post, 2400 mm shielded cord, two power bars per communication rack.
- .4 Patch Panels: Copper
 - .1 48 Port high density Modular 2U Panels, ports may be individually replaced.
 - .2 Category 6A Patch Panels
 - .3 Rear-mount Cable Management Bracket
 - .4 Grounding: grounding lug hardware kit.
- .5 Patch Panels: Fibre Optic
 - .1 Shall be 1U LC Rack Mount Patch Enclosure
 - .2 E/W LC Duplex 12 fibre snap-in Adapter Plate E/W 12 fibre MM LC 50/125 OM3 Adapters.
 - .3 Provide 24" Fibre Optic Cable Managers at each end of the Fibre Cable to manage the service loop.

2.4 TELEPHONE BACKBONE CABLING

- .1 Provide BIX IDC punch down blocks for telephone riser cabling.
- .2 Mount neatly adjacent the communication racks.

- .3 Provide a voice tie terminated on BIX blocks for cross connection between the voice backbone terminated on BIX to the patch panels on the relay racks.
- .4 Voice tie to be 25 pair, sized as one pair per outlet shown, in each communication room.

2.5 PATCH CABLES

- .1 UTP Type:
 - .1 Cat 6A UTP Patch Cables
 - .2 Fire Rating: CSA FT-4 compliant.
 - .1 4-Pair stranded, F/UTP 26AWG conductors.
 - .2 Color matched snagless boots.
 - .3 Provide 100 – 4.6 m patch cables. Confirm lengths with Departmental Representative before ordering.
- .2 Optical Fibre Type:
 - .1 LC Duplex LO, 50/125 OM3, Aqua in Colour
 - .2 Provide 10 – 4.6 m fibre patch cables. Confirm lengths and quantity with Departmental Representative before ordering.

3 EXECUTION

3.1 INSTALLATION

- .1 Cable Installation:
 - .1 Install data cable and telephone cable in conduit and cable trays, wireways and surface raceways indicated on drawings.
- .2 Cable Trays, Wireways and Surface Raceways:
 - .1 Install cable management raceway on both sides of racks and on backboard in Communications Rooms.
- .3 Boxes and Fittings:
 - .1 Ensure in advance that outlet box/data outlet installation methods yield vertically-mounted data outlets.
- .4 Cabinets, Enclosures, Racks, Backboards:
 - .1 Install at locations and heights indicated on drawings.
 - .2 Use green insulated 6 AWG ground conductors for grounding racks. Use grounding bushing, solderless lug, clamp, or cup washer and screw.
 - .3 Protect ground conductors from mechanical injury.
 - .4 Install ground conductors such that neither ground conductors nor data cables interfere with one another in regards to future servicing of patch panel rear connections.
 - .5 Anchor or stabilize racks. Must be secured with seismic bolt down kit. Seismic report from a qualified Seismic Engineer is required

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- .5 Wire and Cable:
 - .1 Swab raceway system before installing wiring.
 - .2 Do not exceed manufacturer's maximum pulling force specifications.
 - .3 Maintain not less than minimum bending radius for fiber and copper conductors.
 - .4 Install cable along or at right angles to building lines unless impractical to do so. Verify specific cases of deviation in advance with Departmental Representative.
 - .5 Maintain open copper-conductor cable at maximum practical distance from fluorescent ballasts and other EMF - or discharge-generating equipment.
 - .6 Ensure that cable is not flattened, squeezed, or crimped at any point along entire run. No splices or intermediate terminations in cable runs.
 - .7 Install cables in raceway in communications room and fan individual cables to applicable patch panels in neat, logical fashion.
 - .8 Tie wrap cables neatly into logical bundles. No nylon tie straps acceptable use only Velcro style tie wraps.
 - .9 Minimum 3 m of slack cable per run.
 - .6 Connectors:
 - .1 Use tooling specific to connector types in use.
 - .2 Use connectors suitable for nature of conductor in cable, e.g. stranded vs. solid copper.
 - .3 Ensure that connectors' strain relief provisions are used. Strip jackets only amount required.
 - .4 Maintain pair twists within 13 mm of termination.
 - .7 Patch Panels:
 - .1 Mount patch panels in orderly fashion. Submit rack layouts for approval prior to installation.
 - .2 Ground as required by system.
 - .3 Attach horizontal wiring in an ordered fashion following grid numbering of outlets, alpha character first, e.g. a-1, a-2, etc.
 - .4 Attach horizontal wiring in order of grid number of outlets.
 - .5 Mount panels to racks with as many screws as there are mounting holes or slots in panels.
 - .6 Provide and install necessary strain reliefs and cable support brackets, plus trays for fibre cable loop behind panel and install cables utilizing such devices.
 - .7 UTP Connection Configuration in accordance with ANSI/TIA/EIA 568.
 - .8 Cabling System Labelling:
 - .1 The contractor shall develop and submit for approval a labelling system for the cable installation. Customer will negotiate an appropriate labelling scheme with the successful contractor. At a minimum, the labelling system shall clearly identify all components of the system: racks, cables, panels, and outlets. The labelling system shall designate the cables origin and destination and a unique identifier for the cable within the system. Racks and patch panels shall be labelled to identify the location within the cabling system infrastructure. All labelling information shall be recorded on the as-built drawings and all test documents shall reflect the appropriate labelling scheme.

- .2 All label printing will be machine generated using indelible ink ribbons or cartridges. Self-laminating labels will be used on cable jackets, appropriately sized to the OD of the cable, and placed within view at the termination point on each end and behind each faceplate. Outlet labels will be the manufacturer's labels provided with the outlet assembly.

3.2 TESTING

- .1 Test all runs upon completion of permanent terminations, using instrumentation acceptable to the Departmental Representative. Before commencing testing, submit sample test data sheets and information with respect to test instrumentation to be used.
- .2 Random testing on all cabling mediums may be done by the Consultant or IMIS Group. Where any portion of the system does not meet the specifications, the Contractor shall correct the deviation and repeat all applicable testing at no additional cost to the Owner.
- .3 Supply a complete set of tests in CD format of all ScTP and fibre optic tests performed.
- .4 The Contractor shall submit printed test results that will be compared with the cable manufacturer's specifications.
- .5 The Contractor shall document the manufacturers name and model of power meter and light sources used.
- .6 Equipment used shall be factory calibrated. Calibration Certificates shall be provided to the Consultant upon request.
- .7 Category 6A:
 - .1 Test Instrument shall be Fluke DSX-1800, Cable Analyser.
 - .2 The latest Fluke revision upgrade shall be installed on all testers. Permanent link testing procedures shall be used to certify the system. NO SUBSTITUTE TESTERS WILL BE ALLOWED. The tester shall be calibrated within the calibration period recommended by the vendor.
 - .3 All installed horizontal and data riser cables and associated termination hardware shall be tested (Permanent Link Test) to ensure a full compliance with Category 6A testing procedures.
 - .4 Autotest settings provided in the field tester shall be set to default parameters for the cable used (NVP shall be properly set for the type of cable being tested).
 - .5 Any autotest settings that have been modified to change testing parameters may disqualify the test results.
 - .6 Category 6A ScTP Testing shall conform to current ANSI/TIA/EIA-568-C.2 & C.2.1
 - .7 All "PASS" test results shall be downloaded into the database software that has been provided from the field tester manufacturer and saved on a DVD. The software must be Fluke Networks Link Ware.
 - .8 100% of the installed cabling links must be tested and must pass. Conditional passes will not be accepted. Any failing link must be diagnosed and corrected.
 - .9 Data drops not meeting TIA 568-C.2 requirements for 4-pair category 6A cabling shall be repaired and retested at no additional cost to Departmental Representative.

- .8 Category 3 UTP:
 - .1 Multi-pair Category 3 backbone cable testing shall consist of testing each cable pair for continuity and polarity only. Examine any open and shorted pairs to determine if the problem is caused by improper termination. If termination is proper, tag bad pairs at both ends and note on termination sheets. A maximum allowable pair failure is 2%. Failure rates in excess of this shall require replacement of damaged or faulty cables or connectors at no cost to the Owner.
 - .2 A wiremap test is to be done on all Cat 3 cables.
- .9 Fibre Optic Cabling:
 - .1 Initially test every fibre within the fibre optic cable with a light source and power meter utilizing procedures as stated in:
 - .2 ANSI/TIA/EIA-526-14A: OFSTP-14 Optical Power Loss Measurements of Installed Multimode Fibre Cable Plant.
 - .3 ANSI/TIA/EIA-526-7 (currently Standard Proposal Number 2974-B): OFSTP-7 Measurement of Optical Power Loss of installed Single-mode Fibre Cable Plant
 - .4 Measured results shall be within manufacturers' loss budget calculations. If loss figures are outside this range, test cable with optical time domain reflectometer to determine cause of variation. Correct improper splices and replace damaged cables or connectors at no cost to the Owner.
 - .5 All fibre cables (each strand) are to be tested for length, continuity and attenuation, including the connectors and patch panel adapters.
 - .6 Attenuation shall be measured at 850 and 1300 nm for multi-mode fibre.
 - .7 Attenuation shall be measured at 1300 and 1550 nm for single-mode fibre.
 - .8 Testing procedures shall utilize "Method B" – one jumper reference.
 - .9 Bi-directional testing of optical fibres is required.
 - .10 Each spool of fibre optic cable shall be tested for continuity prior to being installed.

3.3 REPORT

- .1 Record results in tabular form.
- .2 Segregate horizontal runs, inter-room runs, and risers by category or run and by type of cable.
- .3 Present horizontals - results in ascending order.
- .4 Report Submission:
 - .1 Submit three (3) reports printed on 215 mm by 280 mm white paper.
 - .2 Submit two (2) reports prepared in electronic form on CD-R's housed in jewel cases using Microsoft Excel.

END OF SECTION

1 GENERAL

1.1 SCOPE

- .1 Provide expanded television distribution system as indicated on the drawings and specified herein. Provide cable and equipment required to connect to CATV distribution network at existing institution. Provide cable from the main Communications Room to all outlets shown. Provide all necessary cabinets, conduit, amplifier / splitters and run individual cables to each T.V. outlet shown.
- .2 Television distribution system to include all required components to provide a complete operating system with signal levels at minimums that meet industry standards as described herein.

1.2 SHOP DRAWINGS

- .1 Refer to Section 26 05 00 – Common Work.

1.3 APPROVALS

- .1 Refer to Section 26 05 00 – Common Work.

1.4 GENERAL REQUIREMENTS

- .1 System to be complete with all necessary components to provide functions required whether or not each and every item is necessarily mentioned. All components to be production proven models. Custom designed units will only be considered for those items that are not currently available on commercial market. System to be supplied and installed by an established communications contracting firm that is approved by the Departmental Representative.
- .2 Selection of system to be made on the basis of quality and suitability of equipment, service facilities available, experience, capabilities, and past performance of the contracting firm.
- .3 Division 26 to be responsible for supply and installation of all backboards, cabinets, conduit and pullboxes, and installation of junction boxes, device boxes and terminal panels where required to provide a complete conduit system. Substantial corrosion resistant pullwires to be installed in all conduit runs.
- .4 If a particular contracting firm requires more or larger conduit, boxes or panels than that shown on the drawings, firm is to allow for such changes in tender price. No extras will be allowed for additional conduit or increased conduit, boxes or panel size required to accommodate any particular make of system.
- .5 Under no circumstances will Division 26 be allowed to reduce conduit and panel sizes.
- .6 All wiring for systems to be installed in conduit.

1.5 TESTS AND ADJUSTMENTS

- .1 Upon completion of system installation, tests to be conducted by the system installer to determine system conformity to the requirements of the specification. Tests to be conducted in presence of Departmental Representative and/or his representative who may suspend or discontinue tests at any time performance is considered unsatisfactory. Resumption of testing to cover the previously untested elements and any completed elements at the discretion of the Departmental Representative.
- .2 All equipment or wiring provided by system installer which tests prove to be defective or operating improperly to be corrected or replaced promptly at no additional cost to the owner.
- .3 Contractor to furnish all equipment and personnel required for test as follows:
 - .1 Use field strength meter and measure signal level at any tap-off in the system at random. Signal on each channel to read not less than 8 dbmV or more than 15dbmV with minimum of 33 db signal to noise ratio 98per cent of the time. Connect a television set to outlet in the system at random. Picture and audio quality must be equal or superior to reception normally available in the area.
 - .2 Signal to noise test to employ Jerrold 704B field strength meter or equivalent. Measurements to be made at the output of last amplifier in system. With normal levels in system, the field strength meter to be tuned to picture carrier of each channel in turn and readings obtained on the meter noted. Signal to then be removed and the input of headend amplifier to be terminated in 70 ohms, and field strength meter again read in absence of signal. Difference between two readings will give system signal to noise ratio and shall not be less than 50 db.
 - .3 Signal level at the receivers will be well balanced throughout the system. System levels will be termed balanced when the difference between any two adjacent low bank VHF channels (2 to 6) does not exceed 2 db, and the difference across the entire low band VHF channels or frequency range does not exceed 6 db, and the difference between any high band VHF channel does not exceed 2 db. Maximum difference across the entire high band VHF frequency range not to exceed 4 db.

1.6 SYSTEM REQUIREMENTS

- .1 Prior to system takeover Division 26 to conduct an operating test for approval. System to be demonstrated to operate in accordance with requirements of these specifications.
- .2 System to allow for future provisioning of outlets.
- .3 System to include 120 volt AC power service to each RFTV cabinet.
- .4 Minimum signal available at output of any receptacle making use of specific normally viewed open circuit channels will be 8 dbmV.
- .5 Maximum signal available at any receptacle making use of normally viewed open circuit television channels will not exceed 15 dbm.
- .6 Signal on a specific channel measured at any television receptacle in the system will be within 6 db of the same signal measured at any other receptacle in the system.

- .7 There shall be a minimum RF isolation between the receivers attached to the system of 18 db.
- .8 System as installed to be capable of distributing future VHF channels.

2 PRODUCTS

2.1 CABLE

- .1 All cable used to be coaxial 75 ohm, with 100% foil shield and minimum 60% braid. Centre conductor to be 18 gauge solid. Cable from existing headend to new distribution to be sized as required for minimum signal loss.
- .2 Cable selection to be on basis of maximum permissible tilt incurred when providing a riser with individual distribution terminal points with an operating signal level of +10 dbmV \pm 2 db over frequency range of 40 to 1000 MHz at each outlet location. Distribution system to be set up for 2 db forward output tilt at the input to each distribution riser between 40 and 1000 MHz and the cable type and lengths to be selected to comply with the above. Minimum cable size to be RG-6.
- .3 Horizontal cabling run length criteria:
 - .1 RG11 trunk cable 45m to 60m
 - .2 RG 6 drop cable 10m to 45m

2.2 PASSIVE COMPONENTS

- .1 All passive components, i.e. splitters, directional couplers, matching networks, matching transformers, etc. to be of the 75 ohm back matched variety with band pass capability of 5 to 1000 MHz with flatness of 1 dB or better over the entire frequency range of each unit measured. Input and output return loss to be 20 dB or greater for each component over the complete frequency range.

2.3 ACTIVE COMPONENTS

- .1 Distribution amplifiers to be broadband with +34 dB of operational gain for 54 MHz to 1000 MHz, with variable gain control of \pm 15 dB complete with power supply. Amplifiers to have a channel loading of 135 channels, impedance of 75 ohms per port, push-pull discrete amplifier stages and flatness of 1 dB.
- .2 Acceptable products: Holland HAD-1000 or approved equal.

2.4 WALL PLATES

- .1 Only "back matched", "flat loss" 75 ohm directional coupler wall plates to be used in distribution system and these to meet following technical specifications:
 - .1 Minimum frequency band pass capability of 5 to 1000 MHz with output flatness of 1 dB or better for each unit over the entire frequency range.
 - .2 Each unit to have 20 dB return loss or greater over entire frequency range.

- .3 Each unit to have 32 dB output to tap isolation or greater over entire frequency range.
- .4 Each unit to have 20 dB directivity or greater over entire frequency range.
- .5 Wall plates to be stainless steel.

3 EXECUTION

3.1 INSTALLATION

- .1 All terminal cabinets shown on the drawings and as required are to be provided by the system installer to suit their individual distribution requirements.
- .2 All outlets to have separate home run to amplifier/splitter cabinet located in communications room. Location of splitters and amplifiers in areas other than communication room is not permitted.
- .3 Make all connections, terminations, tests and put system into operation.
- .4 All cabling and outlets to be labelled with room number and outlet number at both ends.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Division 01 - Submittal Procedures
- .2 Section 26 05 00 – Common Work
- .3 Section 26 05 31 - Splitters, Junction Boxes, Pull Boxes, and Cabinets

1.2 REFERENCES

- .1 C22.1-09 – Canadian Electrical Code, Part 1

1.3 SCOPE OF WORK

- .1 An existing Security Door Supervision System is being used to monitor the doors of various inmate living units at Ferndale Institution. The supervised doors installed under this contract will be connected to the existing system. Modifications to the existing proprietary system are required to be performed by Status Automation via a separate contract. The intent is for Status Automation's work to be co-ordinated with the work of this Contract. Refer to Division 01 for details on the co-ordination of work.
- .2 Status Automation shall be responsible for the following:
 - .1 Supply and install the security control panel complete with terminal strips in Security Room 019.
 - .2 Provide the Contractor with a terminal strip wiring diagram.
 - .3 Provide all necessary hardware and software upgrades for a complete and fully operational system.
 - .4 Connection to the existing system, modifications of the screen interface, system programming, testing, verification and commissioning.
 - .5 Provide product submittals, operational and maintenance manuals and update existing as-built drawings.
- .3 Contractor shall be responsible for the following:
 - .1 Supply, install, terminate and test the dedicated fibre from the security control panel to the Administration Building Communications Room.
 - .2 Provide conduit, junction boxes, back boxes and wire from the security control panel (provided by Status Automation) in Security Room 019 to the door position switches (supplied by Division 08).
 - .3 Terminate wires in the security control panel. Coordinate work with Status Automation.
 - .4 Terminate wires to the field devices.
- .4 Field devices and corresponding door frame junction boxes shall be provided by the door manufacturer. Coordinate door rough-in requirements with door manufacturer/door installer on site.

1.4 SYSTEM DESCRIPTION

- .1 System is PLC based utilizing a touch screen LCD monitor located in the Duty Office. The system is to:
 - .1 Arm and disarm doors individually or in groups.
 - .2 Annunciate all door alarms via audible tones and data logs.
 - .3 Annunciate all faults in the system via audible tones and data logs.
- .2 Human Machine Interface (HMI) software and programmable hardware shall be used for the System. All hardware and software shall be commercially available from local electrical wholesalers. No proprietary hardware or software products will be acceptable.
- .3 Software programs and HMI screen shots shall be provided in a form acceptable to the Departmental Representative. Operating system and development software necessary to operate, maintain, troubleshoot, modify and extend the system shall be supplied to the Departmental Representative.
- .4 Provide a complete data network that will connect the system, monitoring station, I/O modules and devices in accordance with Division 27.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Division 01.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Division 01.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Division 01.
- .4 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Departmental Representative.
- .5 Fold up metal banding, flatten, and place in designated area for recycling.

2 PRODUCTS

2.1 DOOR POSITION SWITCHES

- .1 Door position switches and magnets suitable for flush mounting on doors in high security locations, non-biased, Form C, 25 mm diameter, 25 mm gap.
- .2 Acceptable products: General Electric Magnetic Steel Door Contact, Model No.: 1076W.
- .3 Door position switches and magnets will be supplied and installed by Division 08. Termination of door position switches shall be by Division 26.

2.2 CABLING

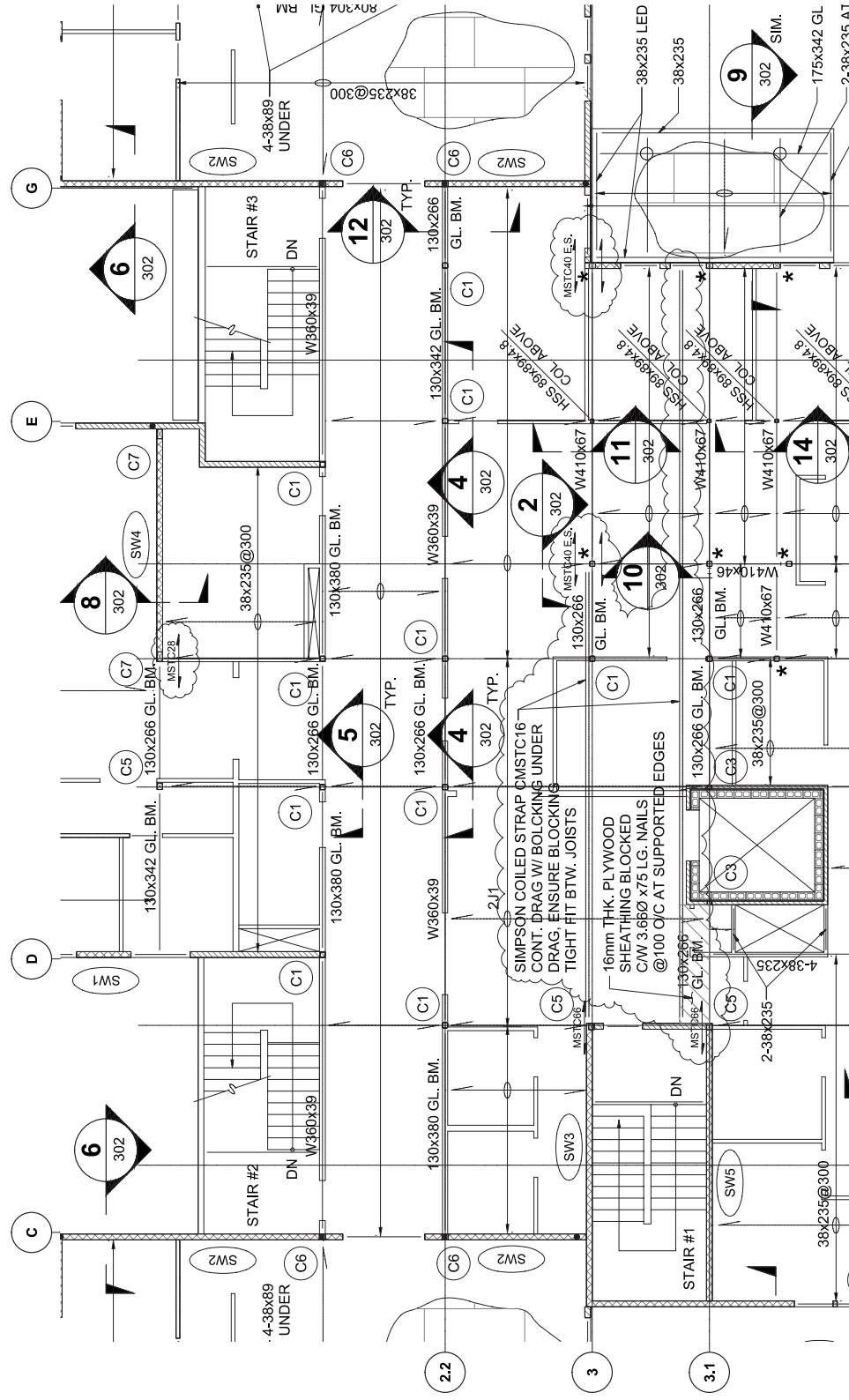
- .1 4 conductor, #18 AWG twisted, PVC jacket.

3 EXECUTION

3.1 TESTING AND COMMISSIONING

- .1 Status Automation shall provide a detailed Acceptance Test Procedure (ATP) to the Departmental Representative for approval at least two weeks prior to the start of the installation of the Door Supervision System.
- .2 Status Automation shall complete all the tests outlined in the ATP prior to the ATP testing being carried out by the Departmental Representative.
- .3 The equipment warranty will commence on the date the ATP test is carried out by the Departmental Representative.

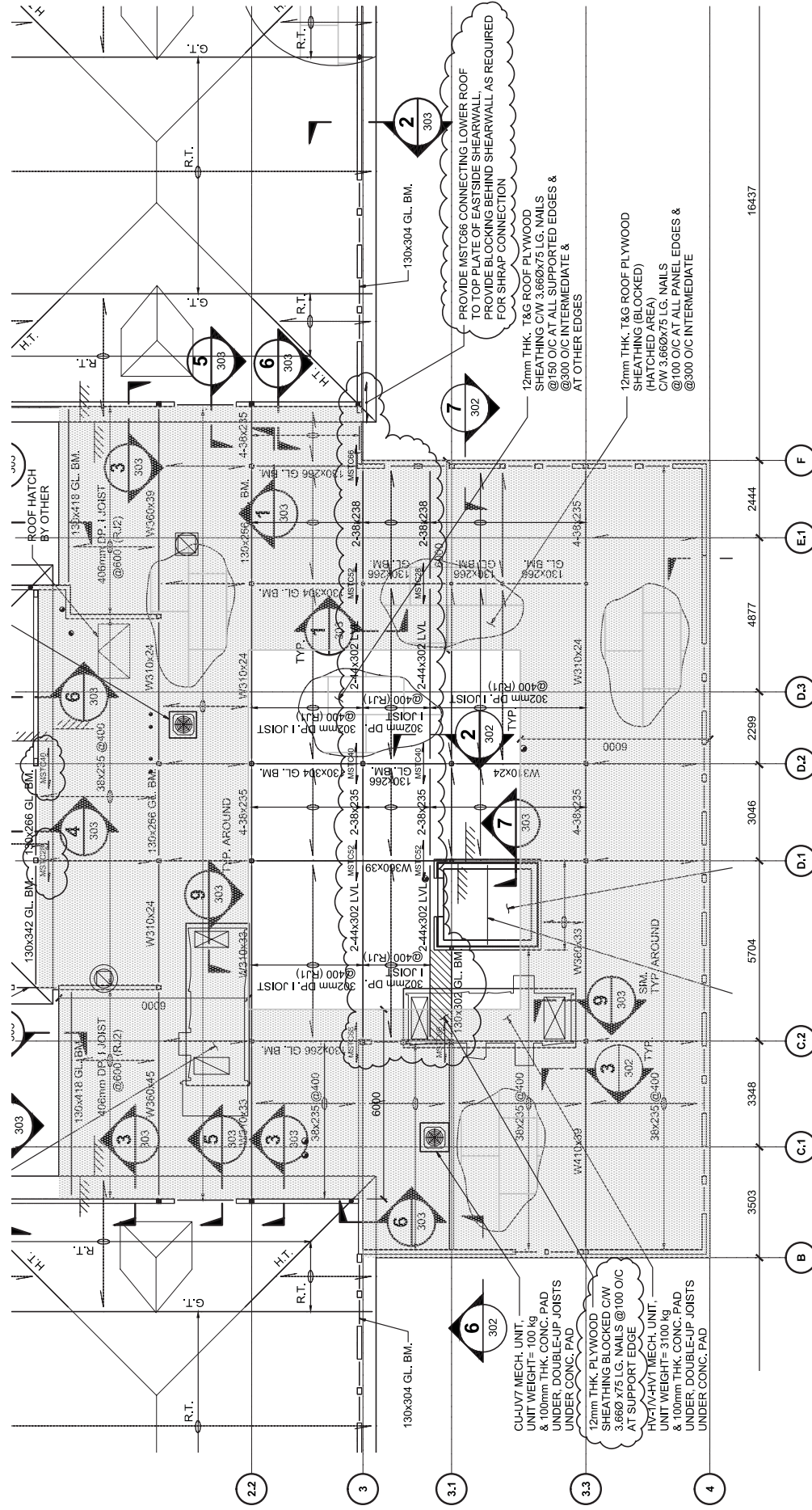
END OF SECTION



SECOND FLOOR FRAMING PLAN

1:100

Client/client	CORRECTIONAL SERVICE OF CANADA	Project title/Titre du projet MISSION, B.C. 33737 DEWDNEY TRUNK ROAD FERNDALE INSTITUTION	Drawing title/Titre du dessin SECOND FLOOR FRAMING PLAN REVISED	Consultant Signature & Date Only	PWQSC Project Manager/Administrateur de Projets TPSCC Tony Tang	Project No./No. du projet R 044494.001
			Designed by/Conçue par SZ	PWQSC Project Manager/Administrateur et Ingénieur/Service/ Destinataire régionale, Services d'encadrement et de plan, TPSCC		
			Drawn by/Dessiné par LH	Date/Date 2012-11-01		
			PARTIAL BUILDING SECTIONS			Sheet/Feuille S-AD-03
						Revision/ Révision OE




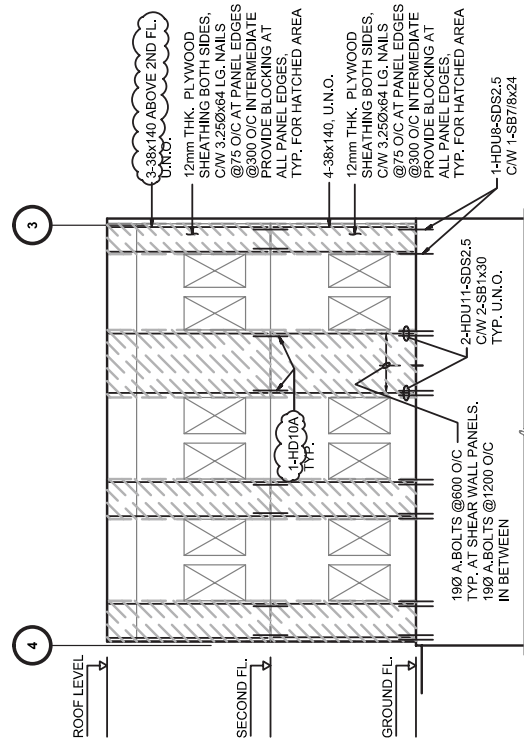
Client/client	Project title/Titre du projet	Drawing title/Titre du dessin	Consultant Signature & Date Only	PWOSC Project Manager/Administrateur de Projets TS20C Tony Tang	Project No./No. du projet R 044494.001	
CORRECTIONAL SERVICE OF CANADA	MISSION, B.C. 33737 DEWDNEY TRUNK ROAD FERNDALD INSTITUTION	SECOND FLOOR FRAMING PLAN REVISED	Designed by/Concept par SZ	PWOSC Building Manager, Architectural and Engineering Services Qualifications requises: Ingénieur en construction de bois, TS20C PARTIAL BUILDING SECTIONS	Sheet/Feuille S-AD-04	
			Drawn by/Dessiné par LH			Date/Date 2012-11-01

SHEARWALL SCHEDULE

TYPE	STUD SIZE		BASEMENT - GROUND FLOOR	GROUND - SECOND FLOOR	SECOND FLOOR - ROOF
<div>SW3</div> <div>SW5</div>	38 x140	SHEATHING		12mm PLYWOOD BOTH SIDES	12mm PLYWOOD BOTH SIDES
		NAILING @ PANEL EDGES		3.25Ø x 64 LG. NAILS @75 O/C	3.25Ø x 64 LG. NAILS @100 O/C
		BUILT-UP STUDS EA. END		SEE ELEVATION	SEE ELEVATION
		HOLD DOWN EACH END		SEE ELEVATION	SEE ELEVATION
		BLOCKING TO WALL TOP PLATE		3.66Ø x 75 LG. TOE NAILS @100 O/C E.S. STAGG. + SIMPSON FRAMING ANCHOR A35 @400 O/C	3.66Ø x 75 LG. TOE NAILS @100 O/C E.S. STAGG.
		WALL BOTTOM PLATE		2-ROWS 3.66Ø x 75 LG. NAILS @75 O/C STAGG.	2-ROWS 3.66Ø x 75 LG. NAILS @100 O/C STAGG.
<div>SW7</div>	38 x140	SHEATHING		12mm PLYWOOD BOTH SIDES	12mm PLYWOOD BOTH SIDES
		NAILING @ PANEL EDGES		3.25Ø x 64 LG. NAILS @100 O/C	3.25Ø x 64 LG. NAILS @150 O/C
		BUILT-UP STUDS EA. END		4-38x140	3-38x140
		HOLD DOWN EACH END		SEE ELEVATION	SEE ELEVATION
		BLOCKING TO WALL TOP PLATE		3.66Ø x 75 LG. TOE NAILS @100 O/C E.S. STAGG. + SIMPSON FRAMING ANCHOR A35 @400 O/C	3.66Ø x 75 LG. TOE NAILS @100 O/C E.S. STAGG. + SIMPSON FRAMING ANCHOR A35 @600 O/C
		WALL BOTTOM PLATE		19Ø A.BOLTS @600 O/C	2-ROWS 3.66Ø x 75 LG. NAILS @150 O/C STAGG.
<div>SW8</div>	38 x140	SHEATHING		12mm PLYWOOD BOTH SIDES	12mm PLYWOOD BOTH SIDES
		NAILING @ PANEL EDGES		3.25Ø x 64 LG. NAILS @75 O/C	3.25Ø x 64 LG. NAILS @100 O/C
		BUILT-UP STUDS EA. END		4-38x140	3-38x140
		HOLD DOWN EACH END		SEE ELEVATION	SEE ELEVATION
		BLOCKING TO WALL TOP PLATE		3.66Ø x 75 LG. TOE NAILS @100 O/C E.S. STAGG. + SIMPSON FRAMING ANCHOR A35 @400 O/C	3.66Ø x 75 LG. TOE NAILS @100 O/C E.S. STAGG. + SIMPSON FRAMING ANCHOR A35 @600 O/C
		WALL BOTTOM PLATE		19Ø A.BOLTS @600 O/C	2-ROWS 3.66Ø x 75 LG. NAILS @150 O/C STAGG.

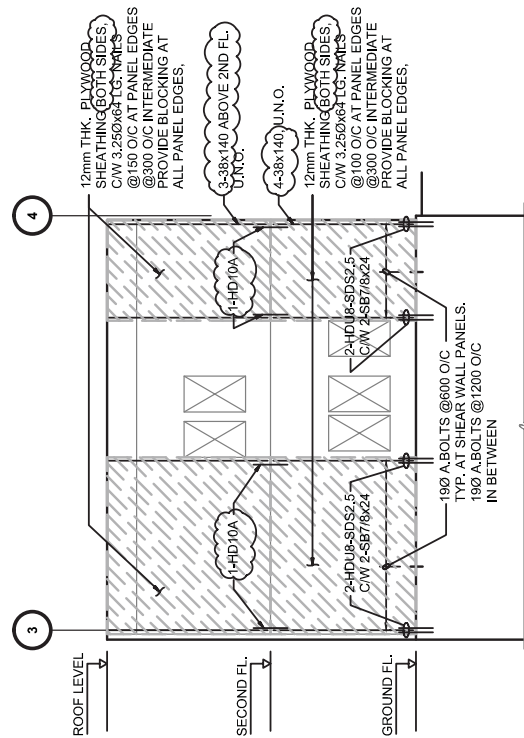
11568

project title		titre du projet		drawing title		titre du dessin							
FERNDALE INSTITUTION 33737 DEWDNEY TRUNK ROAD MISSION, B.C.				SHEARWALL SCHEDULE REVISED (XREF. DWG. SF-401)									
	Public Works and Government Services Canada		Travaux publics et Services gouvernementaux Canada		designed by	concu par	drawn by	dessine par	scale	echelle	date	date	
					SZ		LH		N.T.S.		2012-11-01		
					approved by		approuve par		project no.		projet no.		
					PL				R 044494.001				
	REAL PROPERTY SERVICES Pacific Region				PWGSC Project Manager		Administrateur de Projets TPSGC		sheet	feuille		S-AD-05	
				Tony Tang									



SHEAR WALL SW8 ELEVATION

1:100



SHEAR WALL SW7 ELEVATION

1:100

11568

project title

FERNDAL INSTITUTION
33737 DEWDNEY TRUNK ROAD
MISSION, B.C.

titre du projet

drawing title

SHEARWALL SW7 & SW8
ELEVATION REVISED
(XREF. DWG. SF-401)

titre du dessin



Public Works and
Government Services
Canada

Travaux publics et
Services gouvernementaux
Canada

REAL PROPERTY SERVICES
Pacific Region

designed by

conçu par

SZ

drawn by

dessiné par

LH

scale

N.T.S.

date

2012-11-01

approved by

PL

approuvé par

project no.

projet no.

R 044494.001

PWGSC Project
Manager

Administrateur de Projets
TPSGC

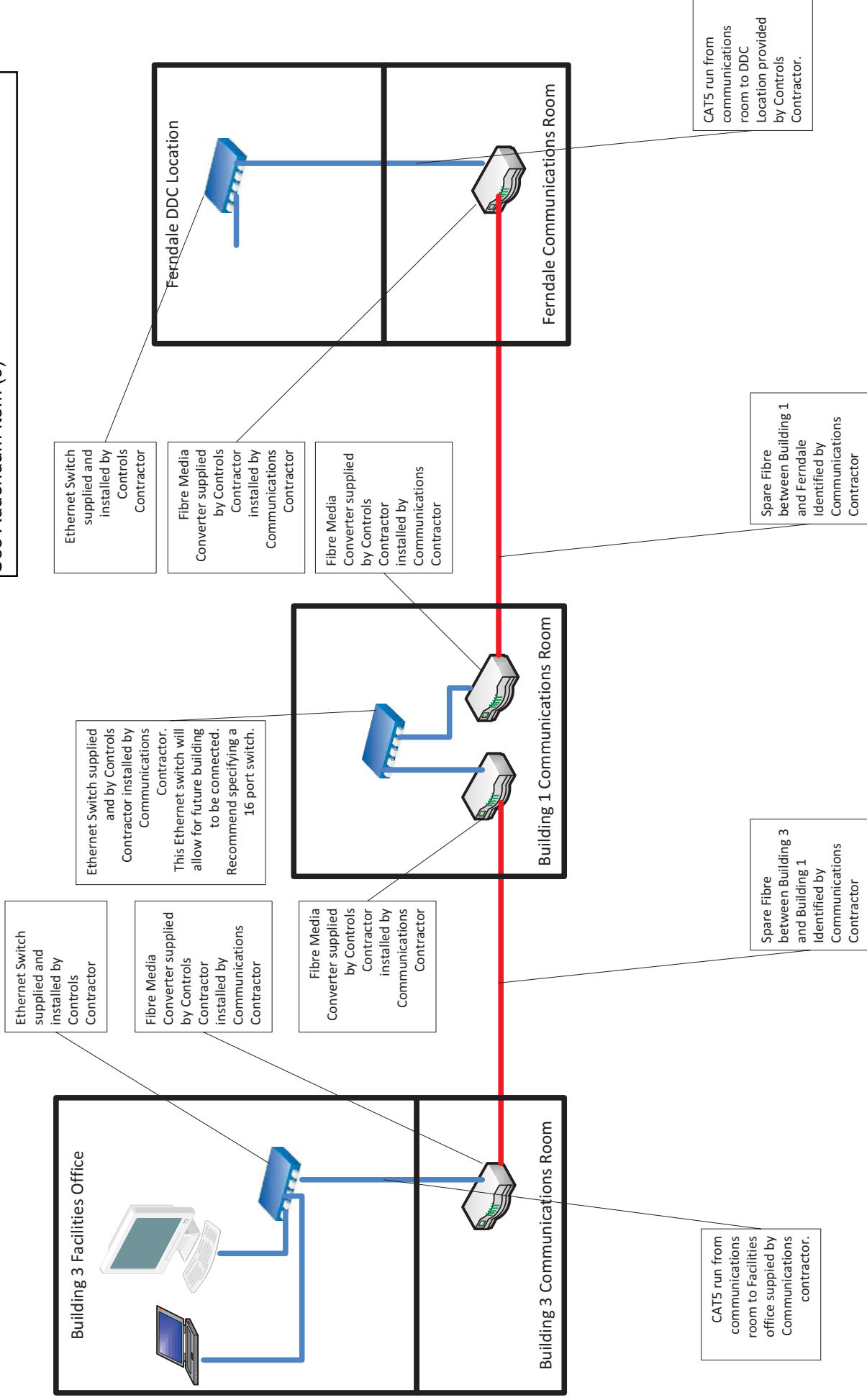
Tony Tang

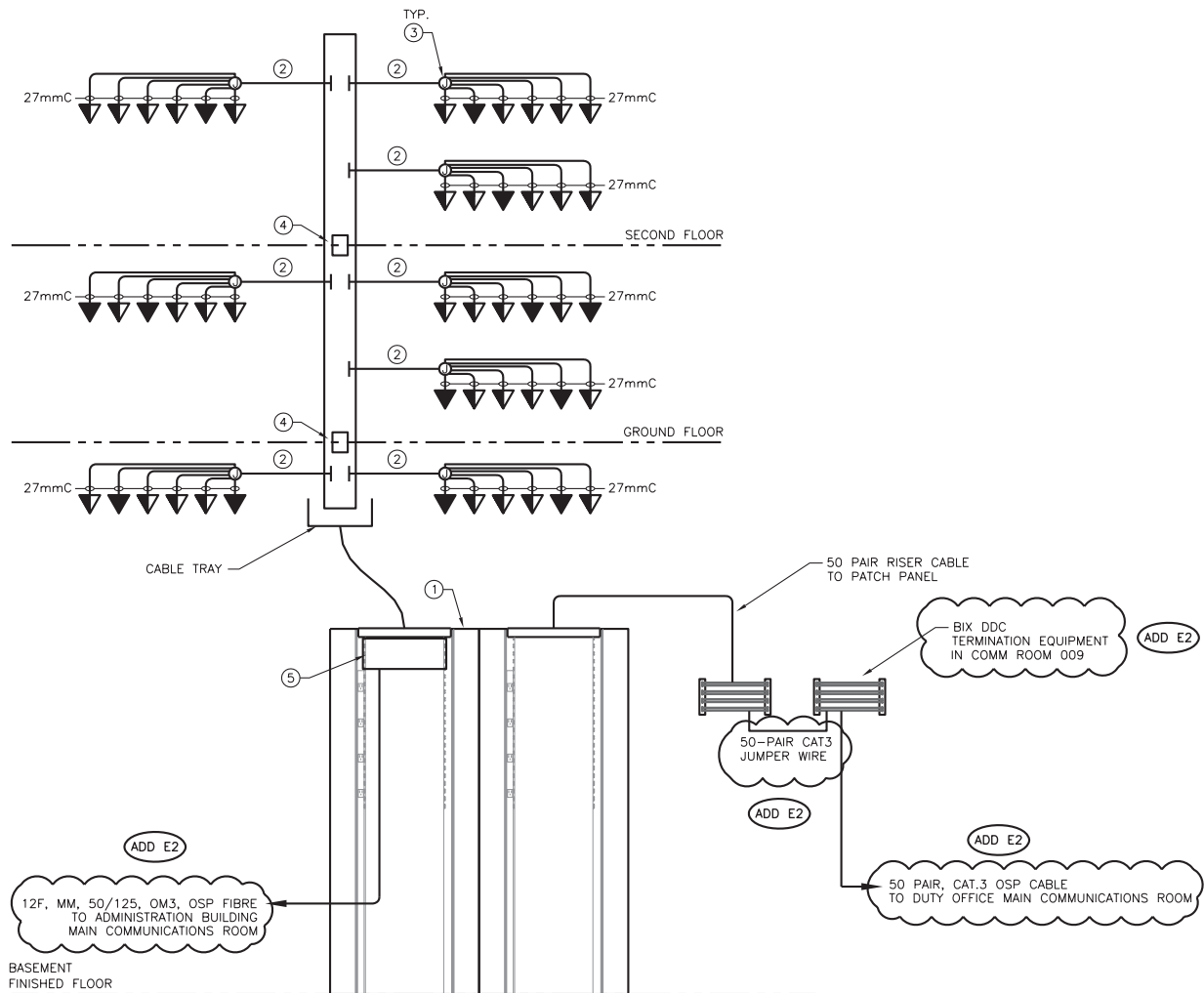
sheet

S-AD-06

feuille

DDC infrastructure
See Addendum Item (9)





EQUIPMENT:

- ① FLOOR MOUNTED COMMUNICATIONS RACKS
② REFER TO CONDUIT FILL TABLE FOR CONDUIT SIZE
③ COLLECTOR BOX TO BE MINIMUM 150x150x150mm
④ 4-129mm SLEEVES BETWEEN FLOORS
⑤ 1 ETHERNET ROUTING SWITCH WITH 48-10/100 BASE TX PORTS PLUS 2 COMBO 10/100/1000 SFP PORT (MODEL No. AVAYA AL4500 E02-E6) C/W 2-1 PORT 100 BASE PX SMALL FORM FACTOR LC CONNECTOR FIBER MODULE (MODEL No. AVAYA AA1419074-E6). SWITCH CONFIGURATION BY OTHERS.

CONDUIT FILL TABLE COMM. WIRE				
CABLE TYPE \ CONDUIT	27	35	41	53
NO. OF CAT6	4	7	10	18
NO. OF CAT6A	3	5	7	13
NO. OF RG6	3	6	9	15

NOTES:

1. REFER TO NUMBER OF VOICE AND DATA OUTLETS INDICATED ON PLANS FOR QUANTITY OF PATCH PANELS AND PORTS REQUIRED
2. FIBRE TO BE PULLED VIA NEW MANHOLES MH C4, MH C3, MH C2, MH C1 AND THE EXISTING COMMUNICATIONS MANHOLE LOCATED ON THE EAST SIDE OF THE ADMINISTRATION BUILDING. EXISTING ADMINISTRATION CATV CABLE TO BE DISCONNECTED, REMOVED, RE-PULLED WITH THE TELECOMMUNICATIONS CABLES AND RE-TERMINATED. COORDINATE OUTAGE WITH THE INSTITUTION.
3. REFER TO DRAWING E500 FOR COMMUNICATIONS RACK PROFILE.



TELECOMMUNICATION RISER DIAGRAM
SCALE: NONE



GENIVAR
1985 WEST BROADWAY, SUITE 200
VANCOUVER, BRITISH COLUMBIA, CANADA V6J 4Y3
TELEPHONE: (604) 736-5421
FAX: (604) 736-1519

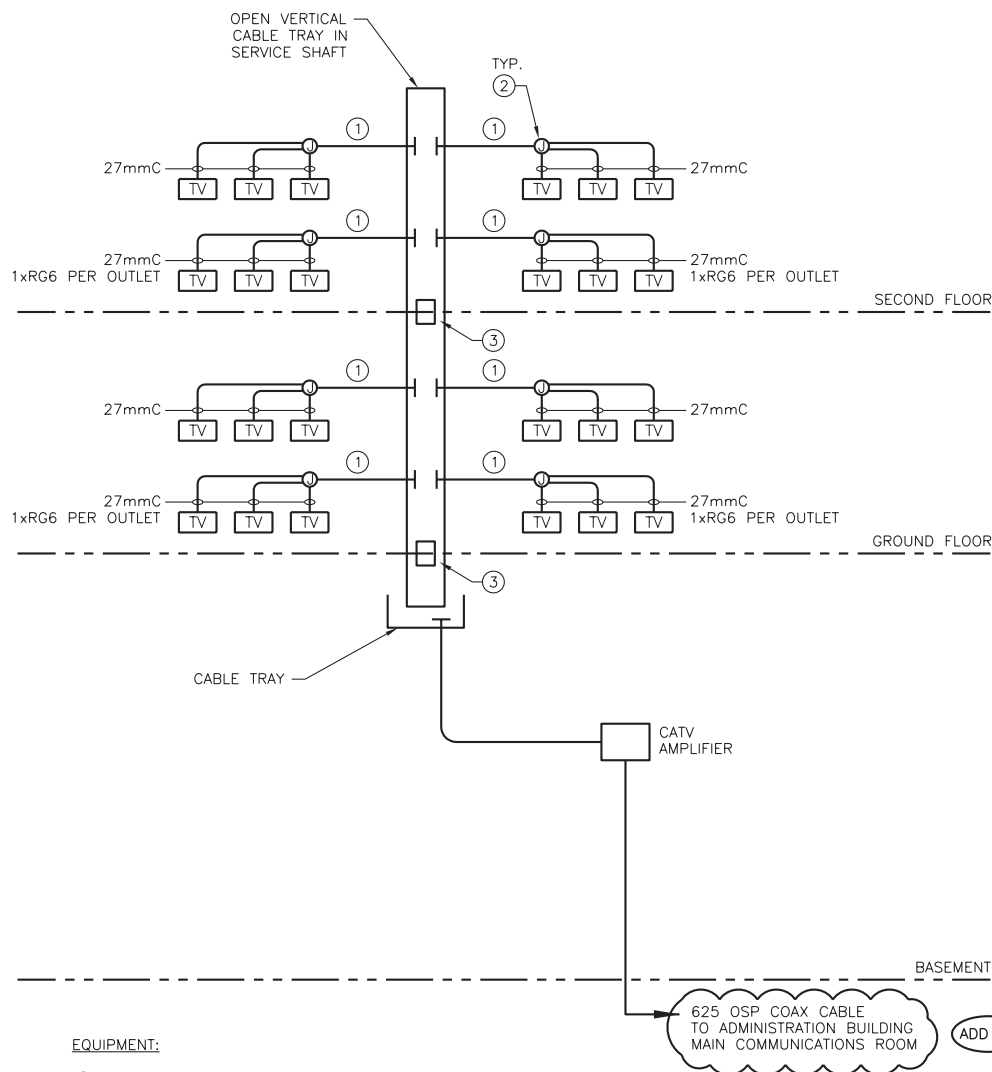
CORRECTIONAL SERVICE OF CANADA - FERNDAL INSTITUTION
MISSION, B.C. - FIFTY MAN LIVING UNIT

PART DRAWING E004
ISSUED FOR ADD-E2

Proj. No. R04494.001	Scale: N.T.S.	Date: 12Oct31	Designed: K.B.	Drawing No.: ESK-E004-01
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Oct 31, 2012 - 1:43pm

M:\PROJECTS\2011\11-14084-00 Ferndale Institution 50 Bed Unit\2 DESIGN\2.7 DWG\Elect\Ferndale\Issued\011-ADD-E2-(12Oct31)\Esk-004-1-2-3 (System Riser Dia).dwg



EQUIPMENT:

- ① REFER TO CONDUIT FILL TABLE FOR CONDUIT SIZE.

CONDUIT FILL TABLE COMM. WIRE				
CABLE TYPE \ CONDUIT	27	35	41	53
NO. OF CAT6	4	7	10	18
NO. OF CAT6A	3	5	7	13
NO. OF RG6	3	6	9	15
NO. OF RG11	1	3	5	8

- ② COLLECTOR BOX TO BE MINIMUM 150x150x150mm
 ③ 4-129mm SLEEVES BETWEEN FLOORS



CATV RISER DIAGRAM
 SCALE NONE

NOTES:

1. REFER TO FLOOR PLANS FOR QUANTITY OF CATV OUTLETS.
 2. CATV TO BE PULLED VIA NEW MANHOLES MH C4, MH C3, MH C2, MH C1 AND THE EXISTING COMMUNICATIONS MANHOLE LOCATED ON THE EAST SIDE OF THE ADMINISTRATION BUILDING. EXISTING ADMINISTRATION CATV CABLE TO BE DISCONNECTED, REMOVED, RE-PULLED WITH THE CATV CABLE AND RE-TERMINATED. COORDINATE OUTAGE WITH THE INSTITUTION.
 3. REFER TO FLOOR PLANS FOR LIVING UNIT COLLECTOR BOX ACCESS PANELS. COORDINATE PANEL LOCATIONS WITH GENERAL CONTRACTOR ON SITE.



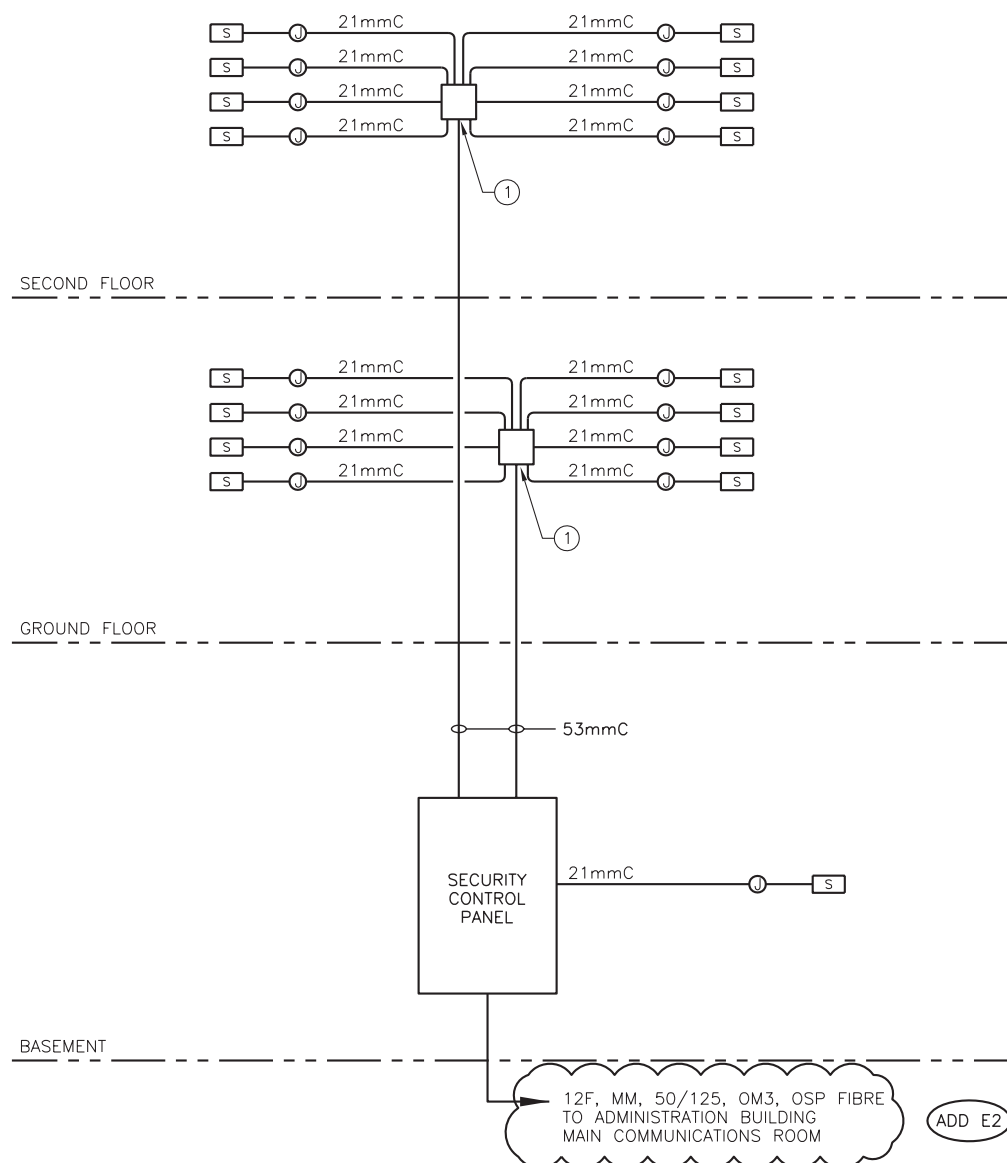
GENIVAR

1985 WEST BROADWAY, SUITE 200
 VANCOUVER, BRITISH COLUMBIA, CANADA V6J 4Y3
 TELEPHONE: (604) 736-5421
 FAX: (604) 736-1519

CORRECTIONAL SERVICE OF CANADA - FERNDAL INSTITUTION
 MISSION, B.C. - FIFTY MAN LIVING UNIT

PART DRAWING E004
 ISSUED FOR ADD-E2

Proj. No. R04494.001	Scale: N.T.S.	Date: 12Oct31	Designed: K.B.	Drawing No.: ESK-E004-02
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NOTES:

1. REFER TO PLANS FOR QUANTITY OF SECURITY DEVICES.
2. MONITORING AND ANNUNCIATION IN DUTY OFFICE BUILDING.
3. REFER TO SITE PLAN FOR SERVICE ROUTING.
4. REFER TO FLOOR PLANS FOR LIVING UNIT COLLECTOR BOX ACCESS PANELS.
COORDINATE PANEL LOCATIONS WITH GENERAL CONTRACTOR ON SITE.

EQUIPMENT:

- ① COLLECTOR BOX TO BE MINIMUM 150x150x150mm



SECURITY RISER DIAGRAM

SCALE NONE



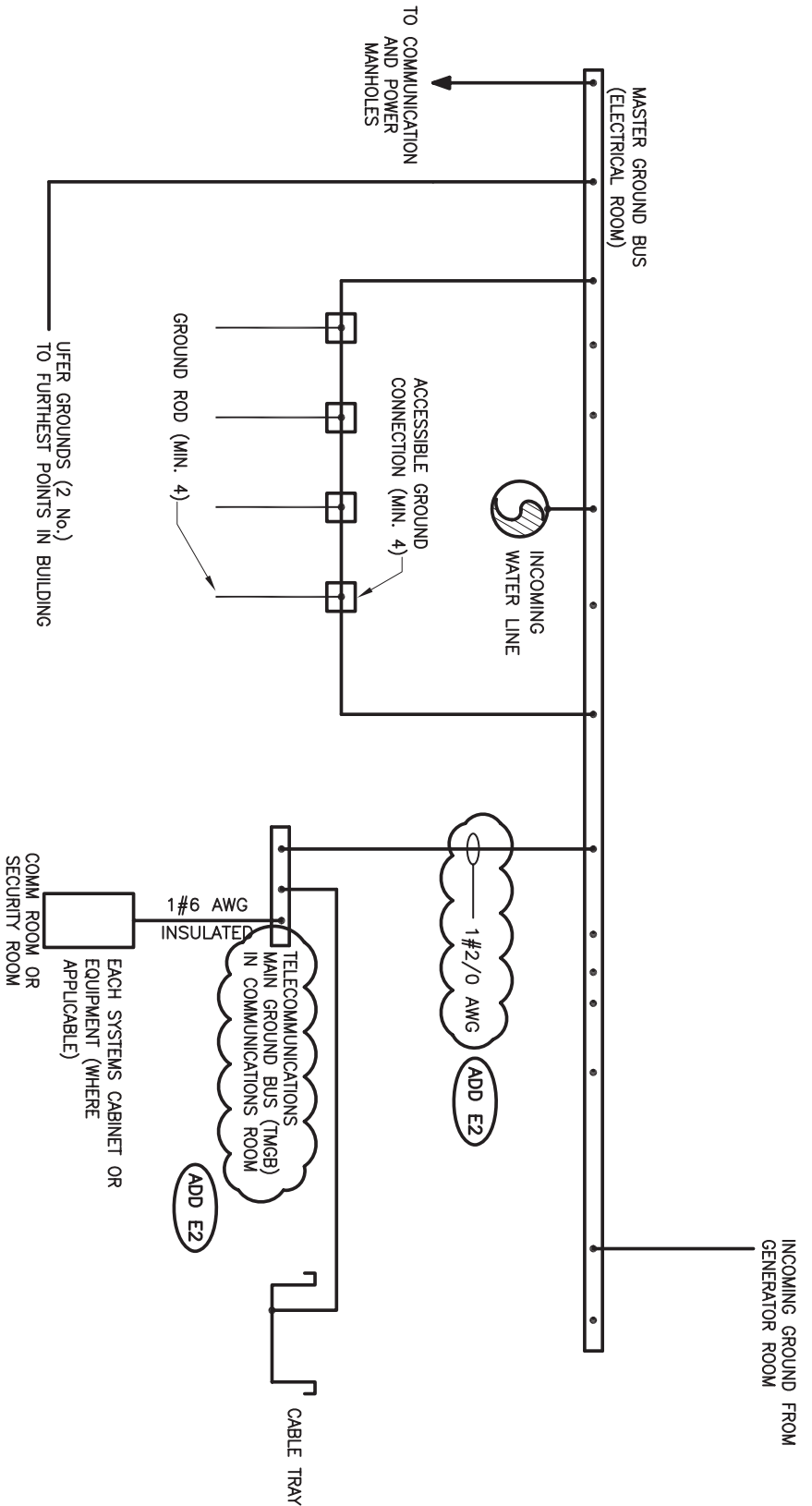
GENIVAR

1985 WEST BROADWAY, SUITE 200
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FAX: (604) 736-1519

CORRECTIONAL SERVICE OF CANADA - FERNDALE INSTITUTION
MISSION, B.C. - FIFTY MAN LIVING UNIT

PART DRAWING E004
ISSUED FOR ADD-E2

Proj. No. R04494.001	Scale: N.T.S.	Date: 12Oct31	Designed: K.B.	Drawing No.: ESK-E004-03
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NOTES:

1. EQUIPMENT GROUNDING, WHERE NOT INDICATED, SHALL BE IN ACCORDANCE WITH THE CEC.
2. ALL GROUND WIRES SHALL BE BARE # 4/0 AWG UNLESS OTHERWISE NOTED.
3. ALL STAR POINT NEUTRAL CONNECTIONS SHALL BE GREEN INSULATED AND SIZED PER THE CEC EXCEPT THAT NO CONDUCTOR SHALL BE SMALLER THAN #6 AWG.



GROUNDING SCHEMATIC DIAGRAM TYPICAL SOLIDLY GROUNDED SYSTEM

SCALE: NONE



GENIVAR

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FAX: (604) 736-1519

CORRECTIONAL SERVICE OF CANADA - FERNDAL INSTITUTION
MISSION, B.C. - FIFTY MAN LIVING UNIT

PART DRAWING E500
ISSUED FOR ADD-E2

Proj. No. R04494.001	Scale: N.T.S.	Date: 12Oct31	Designed: K.B.	Drawing No.: ESK-E500-01
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		Power Strip		Power Strip	
		8 CCT Power Strip		8 CCT Power Strip	
		Mount Rear of Cabinet		Mount Rear of Cabinet	
Rack	Vertical		Vertical		Vertical
Units	CM	Cab 2	CM (4)	Cab 1	CM
1		Rack Mount Fibre PP (3)		24 Port Cat 5e Modular PP (1)(2)	
2		Cable Manager		Cable Manager	
3		48 port Modular Cat 6A PP		24 Port Cat 5e Modular PP (1)(2)	
4		(2)		Cable Manager	
5		Cable Manager		24 Port Cat 5e Modular PP (1)(2)	
6		48 port Modular Cat 6A PP		Cable Manager	
7		(2)			
8		Cable Manager			
9		48 port Modular Cat 6A PP			
10		(2)			
11		Cable Manager			
12					
13					
14					
15					
16					
17					
18					
19		48 Port Switch			
20		Cable Manager			
21		48 Port Switch			
22		Cable Manager			
23		Reserve Future Switch			
24		Cable Manager			
25					
26					
27					
28		Reserve for Future Electronics			
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40		UPS			
41					
42					
43					
44					
Notes					
1)	25pr Cat3-Voice Patch to Bix. Terminate 1 pair per jack				
2)	Provide cable management bracket behind each PP				
3)	E/W -1 snap in adapter plate, E/W LC duplex, 12 fibre, MM, LO, 50/125, OM3 aqua adpaters				
4)	Provide (2) 2 single CM or (1) double wide CM				

ADD E2



COMMUNICATIONS RACK PROFILE

SCALE NONE



GENIVAR

1985 WEST BROADWAY, SUITE 200
VANCOUVER, BRITISH COLUMBIA, CANADA V6J 4Y3
TELEPHONE: (604) 736-5421
FAX: (604) 736-1519

CORRECTIONAL SERVICE OF CANADA - FERNDAL INSTITUTION
MISSION, B.C. - FIFTY MAN LIVING UNIT

PART DRAWING E500
ISSUED FOR ADD-E2

Proj. No.
R04494.001

Scale:
N.T.S.

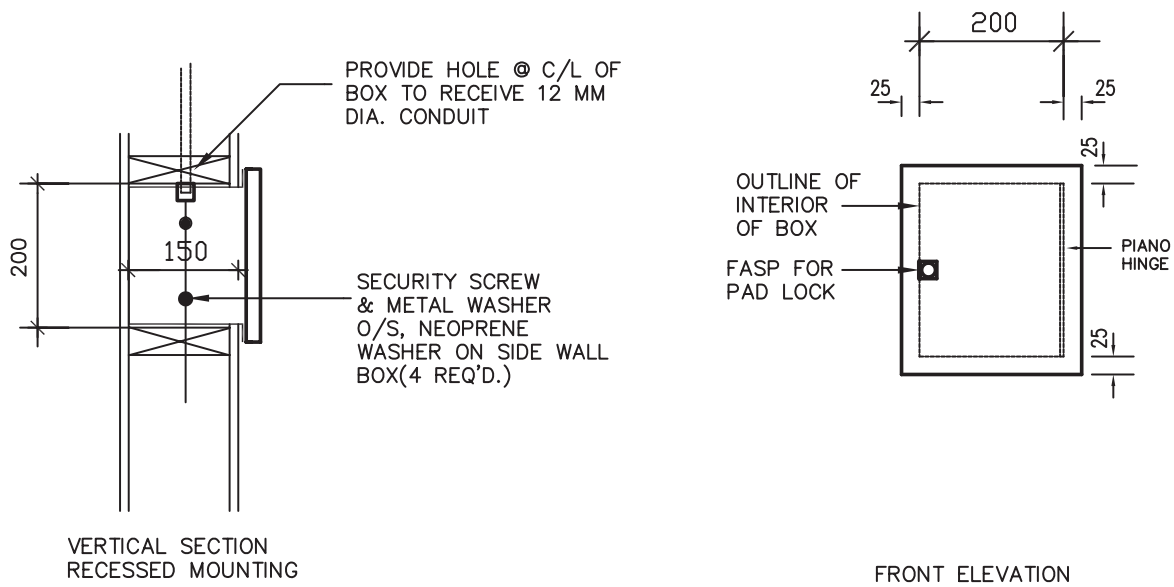
Date:
12Oct31

Designed:
K.B.

Drawing No.:
ESK-E500-02

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M:\PROJECTS\2011\11-14084-00 Ferndale Institution 50 Bed Unit\2 DESIGN\2.7 DWG\Elect\Ferndale\Issued\011-ADD-E2-(12Oct31)\E-500-1-2-3 (Door Security Elevations).dwg

ADD E2



NOTES:

1. FABRICATE BOX C/W SILL AND DOOR OF 1 MM THICK SHEET STEEL, CONSTRUCT OF 1mm THICK STEEL, ALL WELDED CONSTRUCTION, GROUND SMOOTH AND SHOP PRIME PAINT LAN OUTLET BOX IN THREE COATS OF HIGH CLOSS ALKLYD ENAMEL.
2. PROVIDE WOOD BLOCKINGS BEHIND BOX FOR SUPPORTS
3. PROVIDE LAN OUTLET SECURITY BOX FOR EACH STRUCTURED CABLING OUTLET ON THE GROUND FLOOR OF THE ADMINISTRATION WING.



LAN OUTLET SECURITY BOX

SCALE NONE



GENIVAR

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FAX: (604) 736-1519

CORRECTIONAL SERVICE OF CANADA - FERNDAL INSTITUTION
MISSION, B.C. - FIFTY MAN LIVING UNIT

PART DRAWING E500
ISSUED FOR ADD-E2

Proj. No.
R04494.001

Scale:
N.T.S.

Date:
12Oct31

Designed:
K.B.

Drawing No.:
ESK-E500-03