ADDENDUM No. 5

Date:	January 23, 2026	**Project No:**	M20051
Project Name:	Request for Proposal: Town of Shelburne, Well 1 Upgrades		
To:	All Bidders		

This Addendum consists of 40 pages total.

Please make the following changes / additions to the Request for Proposal Document. Bidders are responsible to ensure that all addenda have been received. Bidders shall be required to acknowledge addenda in the space provided in Section B of the Form of Proposal.

This addendum will form part of the terms, conditions and specifications outlined in the above noted Request for Proposal Contract Document. All other components of the Bid documents shall remain unchanged.

REMINDER: BIDDERS MUST IDENTIFY THIS ADDENDA IN THE SPACE PROVIDED IN SECTION B OF THE FORM OF PROPOSAL

GENERAL INSTRUCTIONS

1. Bidders shall REMOVE AND REPLACE page 32 of Section B: Schedule of Unit Prices, Schedule D: Contingencies attached (1 page).

2. Bidders shall ADD / REMOVE & REPLACE the following Specifications:
   - REPLACE Specification 16120: Wires & Cables (5 pages)
   - REPLACE Specification 16480: Motor Control Centres (9 pages)
   - ADD Specification 16481: VFD, Harmonic Filter Transformer and dv/dt Filter (8 pages)

3. Bidders shall REMOVE & REPLACE the following Contract Drawings: (15 pages)
   - Drawing E1.1: LEGEND AND DUCTBANKS DETAILS
   - Drawing E1.2: SITE PLAN
   - Drawing E2.1: EXISTING SINGLE LINE DIAGRAM, MCC ARRANGEMENT AND LIGHTING PANEL SCHEDULE
   - Drawing E2.2: PROPOSED SINGLE LINE DIAGRAM, MCC ARRANGEMENT AND LIGHTING PANEL SCHEDULE

- Drawing E2.3: WIRING AND ELEMENTARY CONTROL DIAGRAMS
- Drawing E2.4: EXHAUST FAN ELEMENTARY CONTROL DIAGRAMS
- Drawing E2.5: UV SYSTEM ELEMENTARY CONTROL DOAGRAM
- Drawing E3.1: INSTRUMENTATION LOOP DIAGRAMS SHEET 1
- Drawing E3.2: INSTRUMENTATION LOOP DIAGRAMS SHEET 2
- Drawing E3.3: PLC PANEL DETAILS
- Drawing E4.1: EXISTING BUILDING LAYOUT
- Drawing E4.2: PROPOSED BUILDING LAYOUT - POWER & LIGHTING
- Drawing E4.3: PROPOSED BUILDING LAYOUT - INSTRUMENTATION
- Drawing E4.4: BUILDING EXTERIOR PICTURES
- Drawing E4.5: BUILDING EXTERIOR PICTURES

I have read the foregoing Addendum and have considered it in my Proposal.

_____ Bidder's Name

_____ Signature

_____ Date

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SCHEDULE OF UNIT PRICES

S. Burnett & Associates Limited

Project No. M20051

Page No. 32

Contractor:

Addendum No. 5

Address:

Contract Title: Town of Shelburne, Well 1 Upgrades

SCHEDULE D - Contingencies

ITEM NO.	DESCRIPTION	CONTRACT QUANTITY	UNIT	UNIT PRICE	CONTRACT TOTAL
D1	Supply and Installation of 150 mm dia. Watermain Shutoff Valve	2.00	Ea.		
D2	Supply, Place & Compact Granular including Excavation & Disposal of Existing Material:				
a)	Granular A	50.00	cu.m.		
b)	Granular B	50.00	cu.m.		
c)	19mm Clear Stone	25.00	cu.m.		
d)	Rip-Rap	25.00	cu.m.		
e)	Pre-mixed Concrete (25 MPA)	10.00	cu.m.		
D3	Labour Rates for Additional Work: (The rate shall include payroll burden, overhead & profit)				
a)	Project Manager	20.00	hrs		
b)	Site Supervisor / Foreman	20.00	hrs		
c)	Electrician	20.00	hrs		
d)	PLC Programmer	20.00	hrs		
e)	SCADA System Programmer	20.00	hrs		
f)	Plumber / Pipe Fitter	20.00	hrs		
g)	Ventilation System Installer	20.00	hrs		
h)	General Labourer	20.00	hrs		
i)	Operator	20.00	hrs		
D4	Supply & Install Additional Replacement Valves and Components within Pumphouse:				
a)	100 mm Gate Valve	2.00	Ea.		
b)	150 mm Gate Valve	2.00	Ea.		
c)	200 mm Gate Valve	2.00	Ea.		
D5	**Ductile Iron Pipe (100 mm dia.)**	**5.00**	**m(l)**		
D6	**Ductile Iron Elbow (100 mm dia.)**	**4.00**	**Ea.**		
D7	**Ductile Iron Elbow (200 mm dia.)**	**1.00**	**Ea.**		
D8	**Ductile Iron Tee (100x100x150 mm)**	**1.00**	**Ea.**		
D9	**Ductile Iron Reducer (200mm to 100mm dia.)**	**1.00**	**Ea.**		
D10	**Pipe Supports**	**5.00**	**Ea.**		
				SUBTOTAL:	

Wires and Cables

1 GENERAL

1.1 General Conditions

.1 All sections of Division 1 form a part of this Specification. Read and fully adhere to exactly as if repeated here in full.

.2 Refer to all other Divisions of the Specifications and these documents to determine their effect upon the work of this section.

.3 All sections of Divisions 1 to 16 inclusive form part of the Contract Documents. Refer to Section 16010 for General Electrical Requirements related to this work.

1.2 Scope

.1 Furnish all labour, materials, supervision, equipment and services specified, indicated or requested to install the complete wiring systems specified herein including, but not limited to:

.1 Low voltage wire and cables.

.2 Instrumentation wiring.

.3 Thermostat (low voltage) wiring.

.2 Include in the wiring system all wiring, terminations, wire markers, cable tags, cable ties, splice fittings, insulation tapes, connectors and miscellaneous materials necessary to complete the wiring system.

1.3 Measurement for Payment

.1 No measurement for payment will be made under this section.

1.4 Basis of Payment

.1 All labour, materials and equipment necessary for the work in this Section shall be included in the lump sum prices in the Schedule of Items and Prices.

2 PRODUCTS

2.1 Low Voltage Wire and Cable (1000V and Below)

.1 Conductors: stranded Copper conductors, with minimum power conductor size: No. 12 AWG, minimum control conductor size: No. 14 AWG.

.2 Power conductors: size as indicated, with cross linked polyethylene (XLPE) insulation rated 1000 V – RW90 or RWU90, as indicated.

.3 Provide Sunlight Resistant ("SR" type) insulated conductors where exposed to weather.

.4 Control conductors: XLPE insulation rated 600 V – RW90.

.5 Control panel wiring: copper with thermoplastic insulation type TEW rated at 600 V.

.6 Provide multi-conductor cables wrapped with interstitial fillers and an overall PVC (minus 40°C) flame retardant, low acid gas evolution jacket.

.7 Insulated ground conductors forming part of a multi-conductor cable assembly shall have green colour coding.

.8 Colour coding of insulated conductors:

.1 1-conductor cable-Black

.2 2-conductor cable-Black, White

.3 3-conductor cable-Red, Black, Blue

.4 4-conductor cable-Red, Black, Blue, White

.5 Multi-conductor cables-Number code

.6 Intrinsically safe field wiring: Yellow

.9 Teck90 Cable requirements:

.1 Conductors: Class B compressed stranded Copper conductors, size as indicated, with cross linked polyethylene (XLPE) insulation rated 1000V – RW90.

.2 Include Hazardous Locations "HL" label on cable where installed in hazardous areas.

.3 Inner jacket: Black PVC flame-retardant, moisture resistant

.4 Armour: flexible interlocking aluminum armour.

.5 Overall jacket: PVC flame-retardant, moisture and sunlight resistant, with fully printed label of cable description on jacket.

.6 Compliances: cable rated for wet and dry installation, and hazardous locations. Compliant with CSA C22.2 Nos. 131 and 174, including CSA FT1 and FT4.

.7 Armoured/Teck90 Cable connectors:

.1 Watertight connectors for non-hazardous areas.

.2 Class 1, Zone 1, Group II B rated connectors c/w sealing compound for hazardous areas.

2.2 VFD Power Cable

.1 General: suitable for VFD application, as indicated on drawing and compatible with selected motor.

.2 Conductors: annealed tinned Copper conductors, symmetrically spaced, with minimum power conductor size: No. 12AWG.

.3 Conductors: size as indicated, with cross linked polyethylene (XLPE) insulation rated minimum 1000V (confirm with VFD manufacturer), rated at 90°C wet or dry, CSA approved.

.4 Colour coded as per ICEA Method 4.

.5 Ground: Class B stranded, 3-symmetrically placed annealed tinned copper conductors in direct contact with shield

.6 Dual shield: overall tinned copper braided shield in conjunction with an aluminum/polymer tape shield.

.7 Jacket: PVC, moisture and sunlight resistant.

.8 Armour Cable (as indicated): flexible interlocking aluminum armour. Include Hazardous Locations "HL" label on cable where installed in hazardous areas.

.9 Acceptable manufacturer: General Cable, Prysmian.

2.3 Instrumentation Signal Wiring

.1 Multi-conductor type with individually colour or number coding.

.2 Twisted pairs or triplets (triads) as required. Provide grouped cables with multiple pairs or triplets as required.

.3 Each pair or triplet to be wrapped in an aluminum / mylar shield with an overall bare stranded copper drain wire

.4 Ratings: 600VAC, insulated, 90°C.

.5 Minimum conductor size: #16AWG, stranded conductors, tinned-copper.

.6 Non-armour cable: overall aluminum sheath and an outer FR-PVC jacket.

.7 Armour cable (as indicated on drawings): overall interlocking aluminum flexible armour and an outer FR-PVC jacket.

.8 Multiple pairs/triplets to incorporate an overall aluminum/mylar shield with a copper drain wire.

.9 Armour cable connectors:

.1 Watertight connectors for non-hazardous areas.

.2 Class 1 Groups C-D rated connectors c/w sealing compound for hazardous areas.

2.4 Thermostat (low voltage) Cable

.1 Low energy 300 V control cables: stranded anneal copper conductors, twisted pairs/triplets, multi-conductors as required, with PVC insulation rated 80°C, and a UV rated overall PVC jacket covering.

.2 Minimum size: #18AWG.

2.5 Wiring Accessories

.1 Wire markers: computer printed, black letters on white background, self-laminating – vinyl markers, number of markers as required.

.2 Cable markers for cables or conductors greater than 13 mm diameter: strap-on type, rigid PVC, black letters on white background, with PVC covered aluminium straps.

.3 Terminal blocks: minimum 600 V rated, modular, sized to accommodate conductor size used.

.4 Where screw-type terminals are provided on equipment field wiring: terminate with pressure-type insulated copper fork tongue terminals.

.5 Splice connectors for wire sizes Nos. 12-10 AWG inclusive: compression spring type.

.6 Splice connectors for wire sizes No. 8 AWG and larger: split-bolt type, sized to suit number and size of conductors, c/w flame retardant foot-type insulator.

.7 Cable ties shall be nylon, one-piece, self-locking type.

.8 Connectors for Teck armoured cables installed in hazardous locations: design approved for the application.

.9 Connectors for Teck armoured cables installed in wet areas or outdoors: watertight design.

.10 Cable pulling lubricant: compatible with cable covering and will not cause damage and corrosion to conduits or ducts.

3 EXECUTION

3.1 Installation – General

.1 Install all wire and cable according to the drawings, with a minimum power conductor size of No. 12 AWG and minimum control conductor size of No. 14 AWG.

.2 Pull cable into ducts and conduits in accordance with the cable manufacturer’s recommendations, using patented cable grips suitable for the type of cable or using pulling eyes to be installed directly onto the cable conductors.

.3 Limit pulling tensions to those recommended by the manufacturer to avoid overstressing cable.

.4 Utilize adequate lubricant when pulling cables through ducts and conduits to minimize wear on cable jackets.

.5 Install all through wiring in junction and pull boxes having no connection within the box with a minimum of 150 mm of slack left inside the box.

.6 Install instrument and thermocouple extension wiring separate from power and control wiring.

.7 Make connections to equipment “pig-tails” with mechanical, insulated, screw-on connectors for wire sizes Nos. 12-10 AWG. For wire sizes No. 8 AWG and larger utilize split-bolt connectors, taped with three layers minimum of insulating tape.

.8 No splices shall be permitted in cable or wiring runs, and shall only be permitted in junction boxes.

.9 Unless otherwise specified, make all wiring tapes, splices and terminations with identified compression screw type terminal blocks, securely fastened to avoid loosening under vibration or normal strain. Make connections for interior and exterior lighting circuits and 120 V, 15 amp convenience receptacle circuits using screw-on or split-bolt connectors and insulating tape.

.10 Identify each conductor by plastic slip-on markers at each termination indicating the circuit designation or wire number.

.11 Identify each cable by attaching a suitable marker, stamped or indelibly marked with the cable number, at each end of the cable and in all intermediate manholes, junction boxes and pull boxes.

END OF SECTION

Motor Control Centres

1 GENERAL

1.1 General Conditions

.1 All sections of Division 1 form a part of this Specification. Read and fully adhere to exactly as if repeated here in full.

.2 Refer to all other Divisions of the Specifications and these documents to determine their effect upon the work of this section.

.3 All sections of Divisions 1 to 16 inclusive form part of the Contract Documents. Refer to Section 16010 for General Electrical requirement related to this work.

1.2 Scope

.1 Furnish all labour, materials, supervision, equipment and services specified, indicated or requested to install the Motor Control Centres (MCC) specified herein and on the drawings.

.2 Provide dedicated section for Automatic Transfer Switch, as indicated. Refer to Section 16627 for Automatic Transfer Switch specifications.

1.3 Conflicting Requirements

.1 Any ambiguities in, or contradictions between sections of this Specification, or between this Specification and the local codes, must be resolved by the equipment manufacturer to the satisfaction of the Engineer.

1.4 Deviations from Specifications

.1 Deviations from this Specification may occur due to special design conditions. Such deviations may be permissible if they are equal to or better than the specified requirements, and only when they are approved by the Engineer.

1.5 Codes and Standards

.1 Materials and workmanship shall comply with codes and standards of the Province in which the work is located and local codes, regulation and standards.

.2 In addition, the work shall confirm to the latest editions and amendments of the applicable Codes and Standards of the following agencies:

.1 EEMAC Standard ICS2-322.

.2 CSA Standard C22.2 – 14, “Industrial Control Equipment”.

.3 CSA Standard C22.1, Canadian Electrical Code, Part I plus Provincial supplements.

.4 Applicable sections of ANSI (American National Standards Institute) Standards.

1.6 Source Quality Control (Testing)

.1 Conduct equipment inspection at manufacturer's plant.

.2 Provide manufacturer's type test certificates, and in accordance with the latest CSA, ANSI, IEEE, NEMA and EEMAC standards.

.3 Manufacturer to provide standard factory testing of complete MCC including operation of switches, circuit breakers, starters and controls.

.4 Submit certified written test results to Engineer prior to shipment.

1.7 Spare Parts and Tools

.1 Provide an itemized list of spare parts as recommended for start-up.

.2 Provide an itemized list of all recommended spare parts required for routine and minor overhauls for two (2) years of normal operation. Each piece of equipment shall have part number or designation.

.3 Use identical equipment and components where practical to permit inter-changeability of parts, minimize spare parts inventory, and to simplify maintenance.

.4 Where two or more items of equipment perform similar functions, use the same make and, where practical, the same model number and size.

.5 Provide a complete list with price list of special tools required for commissioning and servicing of the equipment.

1.8 Shop Assembly

.1 Maximize shop assembly to minimize the on-site erection work.

.2 Shipped the equipment in as few sub-assemblies as is practical and in accordance with overall erection schedule.

1.9 Packaging and Shipping

.1 Pack, crate or otherwise protect each item so that it is not damaged in transit and arrives in serviceable condition at the site. In particular, ensure accumulation of water in equipment is prevented.

.2 Include with the shipment one copy of erection drawings, instructions and maintenance manuals in English.

.3 Clearly mark all crates, boxes and cartons to indicate the purchase order number and the name of the equipment.

.4 Shipping invoice shall show the crate, box or carton number.

1.10 Guarantee

.1 The performance of the MCC equipment shall be guaranteed throughout to perform the duty stated herein.

.2 In addition, guarantee the equipment against faulty materials, construction and workmanship for a period of twelve (12) months from date of start-up (i.e., commissioning).

1.11 Metrication/Imperial

.1 All design data, drawings, calculations, etc., shall be prepared using metric units in accordance with SI practice with imperial units shown in parentheses.

1.12 Shop Drawings

.1 Indicate on the shop drawing submission:

.1 Outline dimensions and weights of each section.

.2 Configuration of identified compartments.

.3 Floor anchoring method and dimensioned foundation template.

.4 Cable entry and exit locations.

.5 Dimensioned position and size of busbars and details of provision for future extension.

.6 Elementary control diagrams, as indicated.

.2 Submit shop drawing showing the proposed floor anchor system to secure MCC to floor. Anchor system must comply with local building code to meet the seismic criteria for the project area.

1.13 Operation and Maintenance Data

.1 Provide 3-ring binder(s) and indexed copies of operating and maintenance manuals with the following:

.1 Complete parts list.

.2 Spare parts list.

.3 Installation instructions.

.4 Operating instructions.

.5 Maintenance instructions.

.6 Detailed trouble shooting procedures and fault correction schedules.

.7 Data for each type and style of starter, relays and circuit breakers.

1.14 Measurement for Payment

.1 No measurement for payment will be made under this section.

1.15 Basis of Payment

.1 All labour, materials and equipment necessary for the work in this Section shall be included in the lump sum prices in the Schedule of Items and Prices.

2 PRODUCTS

2.1 Service Entrance Supply Characteristics

.1 600/347 V, 3-phase, 3 wire, 60 Hz.

2.2 General Description

.1 Compartmentalized vertical sections with common power busbars.

.2 Floor mounting, free standing, enclosed dead front.

.3 Indoor NEMA/EEMAC 1A enclosure (gasketted).

.4 Accommodating incoming circuit breaker combination starters and feeder/branch fusible switches as indicated.

.5 Suitable for front mounting.

.6 EEMAC Class II Type B assembly.

.7 General arrangement of MCC as indicated on electrical contract drawings.

.8 The number of unassigned compartments (spaces) may be increased but not decreased. If needed, provide additional MCC section(s) to maintain the number of spares or spaces indicated on drawings.

.9 Provide all necessary warning signs as required by local Inspection Authorities.

2.3 Vertical Section Construction

.1 Independent vertical sections fabricated from rolled flat steel sheets, bolted together to form rigid, completely enclosed assembly.

.2 MCC Section dimensions: nominally 2286mm (90”) high, 508mm (20”) deep and 508mm (20”) wide. Refer to drawings for sizes of all sections.

.3 Each vertical section divided into compartment units, minimum 305 mm high, or as indicated.

.4 Each unit to have complete top and bottom steel plate for isolation between units.

.5 Horizontal wireways, equipped with cable supports, across top and bottom, extending full width of MCC, isolated from busbars by steel barriers.

.6 Vertical wireways for load and control conductors extending full height of vertical sections, minimum 100 mm wide and equipped with cable tie supports. Installation wiring to units accessible with doors open and units in place.

.7 Openings, with removable coverplates, in side of vertical sections for horizontal wiring between sections.

.8 Main incoming cables to enter at top with terminals as indicated.

.9 Provision for outgoing cables to exit via top or bottom with terminals.

.10 Removable lifting means.

.11 Provision for future extension of both ends of MCC including busbars without need for further drilling, cutting or preparation in field.

.12 Divide assembly for shipment to site, complete with hardware and instructions for re assembly.

.13 Provide each unit, including unused compartments, with a removable formed door with concealed hinges.

2.4 Sills

.1 Continuous channel iron floor sills for mounting bases with 19 mm diameter holes for bolts.

2.5 Busbars

.1 Provide main horizontal and branch vertical busbars, (three phase) of high conductivity tinned plated copper busbars in separate compartment bare self-cooled, extending entire width and height of MCC, supported on insulators and rated:

.1 Main horizontal busbars: 600 A.

.2 Branch vertical busbars: 300 A.

.2 Branch vertical busbars for distribution of power to units in vertical sections.

.3 No other cables, wires, equipment in main and branch busbar compartments.

.4 Brace buswork to withstand effects of short circuit current of 42 kA rms symmetrical.

.5 Bus supports: with high dielectric strength, low moisture absorption, high impact material and long creepage surface designed to discourage collection of dust.

2.6 Ground Bus

.1 300A Copper ground bus (tin plated) size 50 x 3 mm extending entire width of MCC, located at bottom.

.2 Provide lugs (2) suitable for a copper grounding (stranded) conductor, sized as indicated on drawings.

2.7 Motor Starter Contactors and Devices

.1 Combination magnetic full voltage starters of size, type, and rating as indicated with the following features:

.1 Contactor solenoid operated, rapid action type rated heavy duty and long life.

.2 Overload element:

.1 Integral bimetallic heater elements in each phase, with adjustable FLA current range.

.2 Manual reset from MCC unit door (exterior).

.3 Include normally open and normally closed auxiliary contacts.

.4 Motor size and FLA requirements as per drawings.

.3 Power and control terminal blocks.

.4 Elementary control diagram inside starter enclosure invisible location.

.5 Starter to include fusible switch (Class J type), properly rated for motor it is protecting.

.6 Minimum starter size: NEMA/EEMAC Size 1 (10 HP @ 600V, 3-phase).

.2 Control Transformer:

.1 Single phase, dry type, control transformer with primary voltage as indicated, and 120 V or 24 V secondary as indicated, complete with primary (2) and secondary (1) fuses.

.2 Size control transformer for control circuit load plus 20% spare capacity.

.3 Provide each starter with two normally open and two normally closed 120 V spare contacts, wired to terminal blocks, unless otherwise indicated on drawings.

2.8 Motor Starter Unit Compartments (FVNR, FVR, SS, VFD, etc.)

.1 Units NEMA/EEMAC size 3 and size 4, circuit breaker units 225 A and smaller, plug in type with self-disconnect.

.2 Units NEMA/EEMAC size 1 and 2, circuit breaker or fusible (as indicated) plug-in type, with self-disconnect.

.3 Guide rail supports for units to ensure that stabs make positive contact with vertical bus. Provision for units to be installed or removed, off load, while buses energized.

.4 Unit mounting:

.1 Engaged position – unit stabbed into vertical bus.

.2 Withdrawn position – unit isolated from vertical bus but supported by structure.

.3 Provision for positive latching in either engaged or withdrawn position and padlocking in withdrawn position.

.4 Stab on connectors free-floating silver-plated clips, self-aligning.

.5 External operating handle of circuit breaker or fusible switch interlocked with door to prevent door opening with switch in “on” position. Provision for 3 padlocks to lock operating handle in “off” position and lock door closed.

.6 Hinge unit doors on same side.

.7 Overload relays manually reset from front with door closed.

.8 Pushbuttons, ETMs and indicating lights mounted on door front.

.9 Devices and components by one manufacturer to facilitate maintenance.

.10 The number of unassigned compartments (spaces) may be increased but not decreased.

2.9 Automatic Transfer Switch (ATS) Section

.1 Provide a section suitable for ATS equipment and instruments.

.2 Provide sufficient space and all necessary structural supports to accommodate ATS equipment. Coordinate with ATS supplier.

2.10 Feeder/Branch Circuit Breakers

.1 Circuit breaker to operate by means of a handle mechanism on each unit door, with a minimum 120° rotation between ON and OFF position. Include provision for locking the disconnect in the OFF position, with up to three padlocks.

.2 Circuit breaker frame and trip rating: sizes as shown on drawings.

.3 Breaker frame: frame size as indicated on drawings, 600V, 60Hz, 3-Pole, minimum 35,000 Amp interrupting capacity (symmetrical).

.4 Mechanical interlock to prevent opening of unit door when disconnect switch is in the ON position. Also, mechanical interlock to prevent switch from closing when the unit door is open. Provide manual override for authorized personnel to defeat these two interlock conditions.

2.11 Wiring and Terminal Blocks

.1 Provide internal power wiring from the line side of each starter to the bus stabs with a minimum of #10 AWG wire, stranded copper, XLPE, 1 kV rated. Size wiring to accommodate the largest horsepower that the line starter is capable of switching.

.2 Control wiring complete wire markers: 600 V rated, XLPE insulated, minimum #14 AWG size stranded copper. Install wiring to panel doors utilizing extra flexible 49-strand conductors.

.3 Identify all wiring by means of oil-resistant markers fixed to each conductor at both ends.

.4 Wires colour code:

.1 Control circuits – Red.

.2 Power circuits – Black.

.5 Terminal blocks: compression type, modular pull-apart construction, enabling unit wiring to be easily separated from field wiring. Identify all terminal blocks with numbers identical to the wire numbers.

.6 No more than two wires per terminal screw (i.e. on terminal block).

2.12 Equipment Identification

.1 Nameplates: lamicoid 3 mm thick plastic engraving sheet, black face, white core, mechanically attached with stainless steel screws.

.2 Provide the following equipment identification:

.1 MCC main nameplate: 25 mm high white letters on black background.

.2 Individual compartment nameplates: 12 mm high white letters on black background.

2.13 Control Devices

.1 Install operator’s control devices for each starter or contactor unit on MCC units as indicated.

.2 Pushbuttons: 30mm momentary contact type, heavy duty oil tight, operator flush type, colour as indicated, 1-NO and 1-NC contacts rated 5A at 120 V AC, NEMA/EEMAC 13 rating.

.3 Selector switches: 30mm maintained contact type, 2 or 3 positions (as indicated), heavy duty oil tight (NEMA/EEMAC 13 rating), operator’s standard knob, contact arrangement as indicated, rated 5A at 120 V AC.

.4 Indicating lights: 30mm heavy duty oil tight (NEMA/EEMAC 13 rating), transformer type, push-to-test type, lens colour as indicated, 120V AC supply voltage rating, 6 V lamp voltage rating.

.5 ETMs: 8-digit, non-resettable, NEMA/EEMAC 13 rating.

.6 Control/Timing relays: plug-in type, low coil current, heavy duty contacts with multi-contact poles as indicated. Coil rating 120V AC-60 Hz, contact rating 10A @ 120V AC.

2.14 Finishes

.1 Shop finish metal enclosure surfaces by application of rust-resistant primer inside and outside, and at least two coats of finish enamel.

.2 Paint MCC exterior ASA #61 light grey and interiors white.

.3 Provide a 100 mL container of finish enamel for touch-up of scratches during installation.

2.15 MCC Manufacturers

.1 Acceptable manufacturers: Allen-Bradley.

3 EXECUTION

3.1 Installation

.1 Set and secure MCC in place on channel bases, rigid, plumb and square to building floor and wall.

.2 Make field power and control connections as indicated.

.3 Install customer instrument transformers on load side of main circuit breaker, and downstream of utility metering section.

.4 Make grounding connections between equipment ground busses and building grounding system.

.5 Check all factory-made connections for mechanical security, electrical continuity and current phasing.

.6 Provide floor anchors to secure MCC to floor. Anchor system must comply with the local building code to meet seismic criteria in the project area.

3.2 Tests

.1 Perform tests in accordance with Section 16010 – Electrical General Requirements.

.2 Ensure moving and working parts are lubricated where required.

.3 Operate starters in sequence to prove satisfactory performance of MCC during 8-hour period.

END OF SECTION

VFD, Harmonic Filter Transformer and dv/dt Filter

1 GENERAL

1.1 General Conditions

.1 All sections of Division 1 form a part of this Specification. Read and fully adhere to exactly as if repeated here in full.

.2 Refer to all other Divisions of the Specifications and these documents to determine their effect upon the work of this section.

.3 All sections of Divisions 1 to 16 inclusive form part of the Contract Documents. Refer to Section 16010 for General Electrical requirement related to this work.

1.2 Scope

.1 Furnish all labour, materials, supervision, equipment and services specified, indicated or requested to install the VFD and harmonic (mitigation) filter transformers specified herein and on the drawings.

.2 Basic Electrical Equipment, as specified in Section 16400.

.3 Refer to Section 16480 for specifications of Motor Control Centres (MCC).

1.3 Conflicting Requirements

.1 Any ambiguities in, or contradictions between sections of this Specification, or between this Specification and the local codes, must be resolved by the equipment manufacturer to the satisfaction of the Engineer.

1.4 Deviations from Specifications

.1 Deviations from this Specification may occur due to special design conditions. Such deviations may be permissible if they are equal to or better than the specified requirements, and only when they are approved by the Engineer.

1.5 Codes and Standards

.1 Materials and workmanship shall comply with codes and standards of the Country in which the work is located and local codes, regulation and standards.

1.6 Source Quality Control (Testing)

.1 Conduct equipment inspection at manufacturer’s plant.

.2 Provide manufacturer's type test certificates, and in accordance with the latest standards.

.3 Manufacturer to provide standard factory testing of complete VFD unit including operation with motor and harmonic filter (mitigation) equipment prior to shipment.

.4 Submit certified written test results to Engineer prior to shipment.

1.7 Packaging and Shipping

.1 Pack, crate or otherwise protect each item so that it is not damaged in transit and arrives in serviceable condition at the site. In particular, ensure accumulation of water in equipment is prevented.

.2 Include with the shipment one copy of equipment drawings, instructions and maintenance manuals in English.

1.8 Guarantee

.1 Guarantee the performance of the VFDs and harmonic filter transformer equipment throughout to perform the duty stated herein.

.2 In addition, guarantee the equipment against faulty materials, construction and workmanship for a period of twelve (12) months from date of start-up (i.e., commissioning).

1.9 Shop Drawings

.1 Indicate on the shop drawing submission:

.1 Outline dimensions.

.2 Configuration of identified compartments.

.3 Cable entry and exit locations.

.4 Elementary control diagrams, as indicated.

1.10 Operation and Maintenance Data

.1 Provide 3-ring binder(s) and indexed copies of operating and maintenance manuals with the following:

.1 Complete parts list.

.2 Spare parts list.

.3 Installation instructions.

.4 Operating instructions.

.5 Maintenance instructions.

.6 Detailed trouble shooting procedures and fault correction schedules.

1.11 Measurement for Payment

.1 No measurement for payment will be made under this section.

1.12 Basis of Payment

.1 All labour, materials and equipment necessary for the work in this Section shall be included in the lump sum prices in the Schedule of Items and Prices.

2 PRODUCTS

2.1 Variable Frequency Drives (VFDs)

.1 General requirements:

.1 Converts incoming fixed frequency three phase AC power into a variable frequency utilizing pulse width modulation.

.2 Full wave diode bridge rectifier, maintaining a fundamental power factor near unity regardless of speed or load. SCR front ends which produce line notching are not acceptable.

.3 Utilize DC capacitors to filter out bus ripple and provide smooth DC power to transistor section.

.4 Utilize IGBT transistors to produce a pulse width modulated output. SCRs are not acceptable.

.5 VFD must provide full rated output current continuously, providing 110% of its variable torque rating and 150% of its constant torque rating for one minute.

.6 Incorporates voltage vector control to reduce motor harmonics and torque ripple.

.7 Include a DC link reactor on all units above 55 Amps for harmonic correction. Units that are 55 Amps and above that are not supplied with a dc link reactor provide an input AC line reactor.

.8 Stand-Alone Enclosure Rating: NEMA 12, compact design suitable for floor mounting. Refer to contract drawings for space requirements.

.9 Provide a motor current rated ‘dv/dt filter’ on the output of the VFD. The filter will be located within MCC enclosure.

.10 Include a control transformer inside VFD enclosure for VFD control wiring. Size control transformer to suit load requirements plus 30% spare capacity.

.11 Enclosure: VFD to be mounted within MCC. Refer to contract drawings and section 16480 – Motor Control Centres.

.2 VFD Input/Output Requirements:

.1 Selectable speed control input signal: via a 4-20mADC or potentiometer, programmed to be inverse or direct acting.

.2 Speed output signal: one 4-20mADC, programmable to the following functions:

.1 Motor Speed, Motor Current, Output Torque, Output Power, Output Frequency, Reference Frequency, Motor Temperature, PID Feedback

.3 Discrete output signals: three Form C output contacts, programmable to the following functions:

.1 Drive Running, Running Forward Indication, Running Reverse Indication, Drive Ready, At Speed, Drive Faulted, Drive Not Faulted, Drive in Remote, Jogging, Above Set Current, In Current Limit, Loss of Reference Indication, At ZERO Speed, PID High Limit, PID Low Limit.

.4 Control wiring complete with wire markers: suitable for either two or three wire control for start/stop, see drawings.

.5 Include nine (9) inputs that are programmable. The inputs shall be programmable to the following functions:

.1 Forward Run Command, Reverse Run Command, Jog Command, Fault Reset Command, Preset Speed Selection, Alternate Accel/Decel Ramp Selection, DC Injection Enable, PID Control Enable, Torque Limit, Local/Remote Selection, Terminal/Keypad Selection, Serial Link Override, Thermister Input.

.6 Include integral PID loop to hold pressure, temperature, etc. Selectable feedback; 4-20mA, 0-10Vdc, or 0-5dc signal. PI Loops are not acceptable.

.7 Low Limit and High Limit Alarm for the PID Loop.

.8 Include a “loss of a signal” function. Upon “loss of signal” the VFD shall be field selectable to the following actions:

.1 No Action, Fault, Retain Current Speed, Run at a Preset Level.

.3 VFD Protective Functions:

.1 Adjustable overload protection to protect connected motor.

.2 Protection from input transients by utilizing MOVs (Metal Oxide Varistors).

.3 Protect and display the following faults (in English):

.1 Over Voltage, Under Voltage, Over Current, Ground Fault, Drive Over Temperature, Blown DC Bus Fuse, Overload, Motor Overload, External Trip, Input Phase Loss, DB Circuit Failure, Motor Over Temperature, Drive Under Temperature, Output Phase Loss, Precharge Circuitry Fault, Unbalance Current Fault, Loss of Reference Fault, Loss of Keypad Fault, DB Resistor Over Temperature.

.4 Adjustable Drive Stall function, lowering the drive's output frequency to prevent Over Current faults during periods of high load on variable torque applications.

.5 Single phase protection, with a field selectable fault for loss of phase protection. If not available, provide a separate Phase Loss Relay.

.6 Auto Restart function to automatically restart the drive after an Over Voltage, Over Current, Ground Fault, Overload fault or Loss of Power. Programmable Re-starts from 0-8 retry attempts.

.7 The VFD shall allow which faults will have the ability to be auto restarted. These faults will include Overload, Over Voltage, Over Current, Over Temperature and Loss of Power.

.8 Motor speed search function to match the motor speed upon restart.

.9 Cooling fan to be thermostatically controlled. Include a warning on the operator display for a loss of internal cooling fan.

.10 Allow reverse operation to be locked out for applications in which reverse operation would damage the equipment.

.11 Include an internal light duty DB resistor to eliminate nuisance overvoltage trips. VFDs without this function will be required to add an external resistor for this function.

.4 VFD Operator Interface Functions:

.1 Digital keypad for programming, monitoring, speed control, remote control and start/stop control.

.2 LCD true English display. LED keypads are not acceptable.

.3 The VFD keypad shall provide indication of the following conditions:

.1 Drive running forward, Drive running reverse, Drive stopped, Drive in a warning condition, Drive faulted.

.4 The VFD shall display:

.1 Keypad or Terminal mode for speed control, Keypad or Terminal Mode for start/stop control, Motor direction, Output frequency, Output current, Output speed, Output Power, Drive Temperature, Analog Reference, Fault condition,

Input terminal Status, Output terminal Status, Fault Diagnostics of the Past Nine Faults.

.5 Fault Reset button to clear trips/alarms.

.6 In Keypad Control, the VFD shall be able to be started in the forward and reverse direction.

.5 VFD Programming Features:

.1 Three (3) adjustable acceleration and adjustable deceleration times. Adjustable times from 0-3200 seconds.

.2 Base/nominal frequency adjustable from 25-320 Hz.

.3 Selectable Volts/Hz patterns as follows: Linear for Constant Torque Loads, Squared for Variable Torque Loads, Auto Boost to optimize the Volts/Hz curve at low speeds.

.4 Adjustable voltage boost function to provide extra torque during starting.

.5 Adjustable maximum and minimum speed settings.

.6 Adjustable carrier frequency for quiet motor operation. Adjustable range from 1-16 kHz.

.7 Auto Carrier Frequency Function to automatically select the highest carrier frequency possible without overheating the VFD.

.8 Password protection.

.9 Communication module complete with standard Allen Bradley Ethernet/IP Interface and RJ45 connector.

.10 Selectable DC injection on starting to compensate for a windmilling fan. Selectable time from 0.0 to 25.0 seconds.

.11 Five selectable skip frequencies to avoid system resonance.

2.2 Harmonic Filter (Mitigation) Transformer Equipment

.1 Equipment must treat all characteristics of low frequency harmonics generated by 3-phase VFDs and other rectifier loads (5th, 7th, 11th, 13th, etc.).

.2 Characteristic harmonics shall not utilize phase shifting against other VFDs.

.3 Suitable for application on multiple VFDs, as specified above in Section 2.1.

.4 Complies with IEEE 519 standard (1992 and 2014) for both current and voltage distortion.

.5 Power Factor: 0.98 lagging to 0.95 leading over normal operating range.

.6 Provide a capacitor “cut-out” system to be activated via digital input during generator powered operations, and will not resonate with other power system components or attract line side harmonics.

.7 Suppresses overvoltages caused by capacitor switching and other fast changing loads. Reduces RF Interference generated by VFDs.

.8 Technical Data:

.1 HP/kW rating: Refer to contract drawings for motor HP rating.

.2 Voltage and frequency: 600V, 60Hz, 3-phase.

.3 Winding material: Copper.

.4 Overload capability: 150% for 60 seconds every 10 minutes.

.5 Input Current Demand Distortion: Less than 8%, over entire operating range.

.6 Efficiency: Greater than 99% at full load.

.7 Ventilation: Convection air cooled. Filters that utilize forced air fan cooling are not acceptable.

.8 Harmonic filters that have reactors designed to saturate near full load are not acceptable.

.9 Enclosure: NEMA 12 or 3R, wall mounted.

.10 Color: Polyester powder coated, ANSI 61 grey.

.9 Acceptable Manufacturers: Mirus International Inc. and Hammond Centurion.

2.3 Output dv/dt Filter

.1 Provide an all-in-one motor protection “low-pass” filter to reduce common mode, peak voltage protection and rise time reduction to AC motors, in a small foot print with a robust design.

.2 Performance specifications to include:

.1 Input voltage: 600V, 3-Phase, 60Hz, +/- 10%

.2 Current range: refer to single line diagram for motor HP rating.

.3 Inverter operating frequency: up to 60Hz, without derating.

.4 Ambient temperature range: -40°C to +40°C

.5 Current rating: 100% RMS continuous, 150% for 5min., 200% for 10sec.

.6 Efficiency: $\geq$ 98%

.7 CSA approved or cUL listed.

.8 Common mode reduction: minimum 30% + peak current reduction.

.9 Enclosure: open style if mounted within an MCC, or Type 1, ventilated, steel enclosure if wall mounted. Verify with MCC supplier.

.3 Acceptable manufacturer: TCI V1K series, or MTE

3 EXECUTION

3.1 Installation

.1 Set and secure VFD and Harmonic Filter Transformer in place, rigid, plumb and square to building floor and wall.

.2 Make field power and control connections as indicated.

.3 Ensure field power and control connections as indicated.

.4 Make grounding connections between equipment ground and building grounding system.

3.2 Start-Up, Testing and Commissioning

.1 Perform tests in accordance with Section 16010 – Electrical General Requirements.

.2 Include services from manufacturer's technical representative to assist in setting-up and programming each VFD unit at project job site.

.3 Include all necessary site visits by manufacturer's representative to start-up and ensure "trouble-free" operation of system. Extend these services during entire length of warranty period.

.4 Verify harmonic compliance with "onsite" field measurements of both voltage and current harmonic distortion at the input terminals of the Harmonic Filter Transformer, with and without the equipment operating.

.5 Utilize a harmonic analyser (Fluke 41 or equivalent) to verify the harmonic compliance test. Provide report to engineer.

3.3 Training

.1 Refer to Division 1, 01820 – Facility Commissioning – Electrical, section 1.21.

END OF SECTION

SINGLE LINE SYMBOLS AND CONTROL DIAGRAMS

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER, MOULDED CASE WITH THERMAL & MAGNETIC TRIPS
	MOTOR CIRCUIT PROTECTOR (MCP) STYLE BREAKER, WITH MAGNETIC TRIPS ONLY
	NEMA SIZE 1 STARTER WITH THERMAL OVERLOAD TRIP
VFD, MS, BP	VARIABLE FREQUENCY DRIVE, C/W BYPASS MOTOR STARTER/CONTACTOR AND CONTROL TRANSFORMER
	CURRENT TRANSFORMER
	CAPACITOR
	CONTROL POWER TRANSFORMER (CPT)
	FUSE
	FUSIBLE DISCONNECT SWITCH
	NON-FUSIBLE DISCONNECT SWITCH
	DRY-TYPE POWER TRANSFORMER (INDOOR)
	OIL-FILLED POWER TRANSFORMER (OUTDOOR)
	SEAL (EYS) FITTING C/W CHICO POWDER
MS1	MOTOR STARTER (MS) COIL, WITH COIL SUPPRESSOR
X	PILOT LIGHT, WHERE "X" INDICATES LENS COLOR: R=RED, W=WHITE, G=GREEN
X	PUSH TO TEST STYLE PILOT LIGHT
ETM	ELAPSE TIME METER, IN HOURS
CR#	CONTROL RELAY (# DENOTES RELAY NUMBER)
	TERMINAL BLOCK
	SOLENOID VALVE
	TEMPERATURE SWITCH, N.O AND N.C.
	LIMIT OR POSITION SWITCH, N.O AND N.C.
	PRESSURE SWITCH, N.O AND N.C.
	LEVEL OR FLOAT SWITCH, N.O AND N.C.
	PUSHBUTTON DEVICE, N.O AND N.C.
	CONTACT, N.O. AND N.C.
	SELECTOR SWITCH, 2-POSITION & 3-POSITION

DRAWING LIST – ELECTRICAL

MASTER ELECTRICAL LEGEND

ALL SYMBOLS/DEVICES/ABBREVIATIONS LISTED MAY NOT APPLY

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

LIGHTING AND POWER ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
X	1'x4' FLUORESCENT LUMINAIRE. "X" DENOTES LUMINAIRE TYPE (REFER TO LUMINAIRE SCHEDULE).
A–2a	DENOTES SWITCH LEG; DENOTES BRANCH CIRCUIT NUMBER; DENOTES PANEL DESIGNATION
X	2'x4' FLUORESCENT LUMINAIRE. "X" DENOTES LUMINAIRE TYPE (REFER TO LUMINAIRE SCHEDULE)
X	CEILING MOUNTED LUMINAIRE – "x" DENOTES TYPE
X	WALL MOUNTED LUMINAIRE – "x" DENOTES TYPE
X	EXIT LIGHT – "x" DENOTES TYPE
S1	LIGHT SWITCH C/W BACK BOX: – "S" INDICATES 2–WIRE SWITCH – "S3" INDICATES 3–WIRE SWITCH – "S4" INDICATES 4–WIRE SWITCH – "D" INDICATES DIMMER (SIZE TO SUIT)
	EMERGENCY REMOTE HEADS
	EMERGENCY BATTERY UNIT WITH REMOTE HEADS AND CHARGER (BU#)
	EMERGENCY REMOTE HEADS: EXPLOSION PROOF – DIV. 1 ZONE 1
	ELECTRICAL PANEL/ENCLOSURE
	IVORY, 15A, 120V, 1ø, DUPLEX RECEPTACLE, WALL MOUNTED
	IVORY, 15A, 120V, 1ø, GFI DUPLEX RECEPTACLE, WALL MOUNTED
	IVORY, 20A, 120V, 1ø, GFI DUPLEX RECEPTACLE "T–SLOT", 5–20R, WEATHER PROOF c/w IN–USE COVER
	IVORY, 15A, 120V, 1ø, SIMPLEX RECEPTACLE, WALL MOUNTED
	SINGLE PHASE MOTOR
	THREE PHASE MOTOR
	SINGLE PHASE MANUAL STARTER SWITCH WITH LOCK–OFF AND PILOT LIGHT
	CONTROL STATION OR PANEL
#	DISCONNECT SWITCH, UN–FUSED, # DENOTES NUMBER OF POLES
K	UNAUTHORIZED ENTRY KEYPAD UNIT
DS	MAGNETIC REED DOOR SWITCH
MH	MOTION SENSOR
SD	SMOKE DETECTOR
	TELEPHONE OUTLET
JB	JUNCTION BOX
TH	THERMOSTAT
TV	THERMOSTAT (VENTILATION)

GENERAL SYMBOLS

SYMBOL	DESCRIPTION
X / YZ	DETAIL SYMBOL: X = DETAIL NUMBER; YZ = DRAWING NUMBER
▲	EQUIPMENT SUPPLIED BY ANOTHER DIVISION, INSTALLATION, WIRING AND CONDUIT BY DIVISION 26
■	EQUIPMENT NOT SUPPLIED UNDER THIS CONTRACT, INSTALLATION, WIRE AND CONDUIT BY DIVISION 26
A	SYMBOL INDICATES A DEVICE LOCATION, SEE BELOW (# DENOTES LOCATION NUMBER)
#	SYMBOL INDICATES MODIFICATION OR NEW WORK NOTE (# DENOTES NOTE NUMBER)

DEVICE LOCATIONS

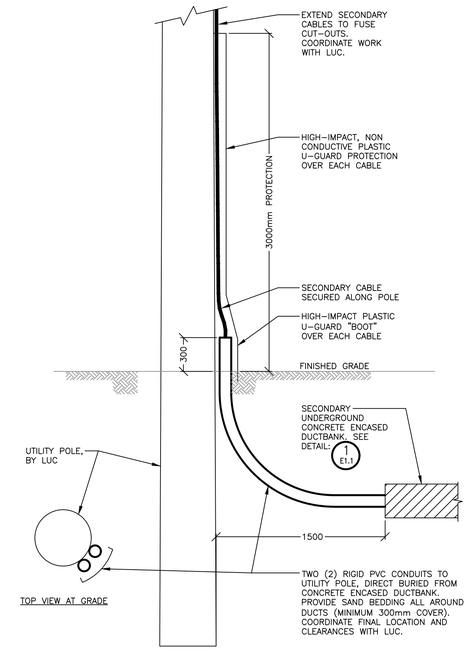
1	DEVICE LOCATED AT PLC PANEL
2	DEVICE LOCATED WITHIN BUILDING, FIELD OR NEAR MOTOR
3	DEVICE LOCATED IN MCC

STANDARD ABBREVIATIONS – ELECTRICAL

ABBREVIATION	DESCRIPTION
A	AMPERES (CONTINUOUS)
AC	ALTERNATING CURRENT
ASYM	ASYMMETRICAL
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
BU	BATTERY UNIT (EMERGENCY)
°C	DEGREE CELSIUS
C	CONDUCTOR
CCT	CIRCUIT
CEC	CANADIAN ELECTRICAL CODE
CH	COUNTER TOP HEIGHT
℄	CENTRELINE
C/W	COMPLETE WITH
CPT	CONTROL POWER TRANSFORMER
CSA	CANADIAN STANDARDS ASSOCIATION
CSTE	CUSTOMER SERVICE TERMINATION EQUIPMENT
CT	CURRENT TRANSFORMER
Cu	COPPER
CUST	CUSTOMER
DC	DIRECT CURRENT
DISC	DISCONNECT
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
EEMAC	ELECTRICAL AND ELECTRONIC MANUFACTURERS ASSOCIATION OF CANADA
EP	EXPLOSION PROOF (SUITABLE FOR CLASS I, DIV. 1)
ETM	ELAPSED TIME METER
ESA	ELECTRICAL SAFETY AUTHORITY
FLA	FULL LOAD CURRENT
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
H/O/A	HAND–OFF–AUTOMATIC
HP	HORSEPOWER
HSCI	HIGH SPEED COUNTER INPUT
HSCO	HIGH SPEED COUNTER OUTPUT
Hz	HERTZ
IEEE	INSTITUTE OF ELECTRICAL & ELECTRONIC ENGINEERS
INST	INSTANTANEOUS
I/O	INPUT/OUTPUT
ISB	INTRINSIC SAFETY BARRIER
JB	JUNCTION BOX
kAIC	KILO–AMP INTERRUPTING CAPACITY
kVA	KILOVOLTAMPERE
kW	KILOWATT
kWh	KILOWATT HOUR
LA	LIGHTNING ARRESTOR
LUC	LOCAL UTILITY COMPANY – HYDRO ONE
MAN	MANUAL
MCC	MOTOR CONTROL CENTRE
MH	MANHOLE
mm	MILLIMETRE
MOT	MOTOR
N	NEUTRAL
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
N/A	NON AUTOMATIC
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED
NP	NAMEPLATE
NTS	NOT TO SCALE
O/H	OVERHEAD
O/L	OVERLOAD
PB	PUSHBUTTON
PH. OR ø	PHASE OR DIAMETER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PS	PHOTO SENSOR
REM	REMOTE
RGS	RIGID GALVANIZE STEEL
RPVC	RIGID PVC CONDUIT
SV	SOLENOID VALVE
SN	SOLID NEUTRAL
SPD	SURGE PROTECTION DEVICE
SLD	SINGLE LINE DIAGRAM
SPDT	SINGLE POLE DOUBLE THROW
SPMDD	STANDARD PROCTOR MAXIMUM DRY DENSITY
SPST	SINGLE POLE SINGLE THROW
SW	SWITCH
SYM	SYMMETRICAL
TC	THERMOCOUPLE
TDC	TIME DELAY ON CLOSING
TDDO	TIME DELAY ON DROP–OUT
TDO	TIME DELAY ON OPENING
TDPU	TIME DELAY ON PICK–UP
TRANS	TRANSFORMER
TYP.	TYPICAL
U/G	UNDERGROUND
VA	VOLT–AMPERE
VFD	VARIABLE FREQUENCY DRIVE
VT	VOLTAGE TRANSFORMER (FORMER PT)
WP	WEATHERPROOF

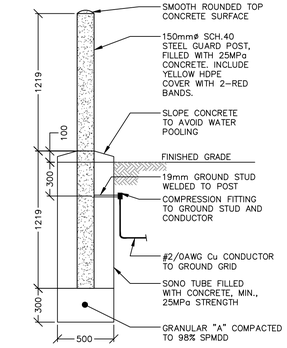
NOTES

1. GENERAL DUCTBANK NOTES:
   - DIMENSIONS SHOWN IN mm.
   - ALL DUCTS ARE 53mmø, UNLESS OTHERWISE NOTED. USE RIGID PVC CONDUIT FOR DIRECT BURIED DUCTS AND FOR EXPOSED CONDUIT INSTALLATIONS.
   - PROVIDE 915mm RADIUS "LONG SWEEP BENDS" FOR ALL BENDS: 90°, 45° AND 22.5° BENDS.
   - PROVIDE FISH ROPE IN EACH SPARE DUCT.
   - INSTALL SPACERS EVERY 1524mm TO ASSEMBLE DUCTBANK. OFFSET OR STAGGER SPACERS.
   - GLUE ALL PVC JOINTS.
   - PROVIDE END–BELLS WHEN FINISHING DUCTS IN CHAMBERS OR WALLS.
   - WHERE DUCTBANKS ARE LOCATED AT SHALLOW DEPTHS, PROVIDE A CONCRETE SLAB AT GRADE LEVEL DIRECTLY ABOVE DUCTBANK. REFER TO OESC RULING 12–012 (8). CONCRETE SLABS SHALL BE 32mpA, AIR ENTRAINED CONCRETE CONSTRUCTED TO OPSD 310.010. MINIMUM SLAB THICKNESS TO BE:
     - ** GRASSED AREAS: 125mm
     - ** ASPHALT/CURB AREAS: 200mm
2. CONTRACTOR TO COORDINATE FINAL LOCATION OF UTILITY POLE INTERFACE WITH LUC.
3. BOLLARD NOTES:
   - PROVIDE TWO FOAM SPACER STRIPS ACROSS THE TOP BETWEEN THE STEEL GUARD POST AND HDPE COVER.
   - BOLLARDS AROUND GENERATOR:
     - ** SPACE BOLLARDS NOT MORE THAN 1340mm APART, CENTER–TO–CENTER
     - ** BOLLARDS TO BE LOCATED MINIMUM 1000mm FROM GENERATOR, UNLESS OTHERWISE INDICATED ON SITE PLAN.
   - BOLLARD ALTERNATIVE: PRE–CAST BOLLARD BY UTILICON, PART No.UB696PE C/W YELLOW HDPE COVER AND TWO RED BANDS.



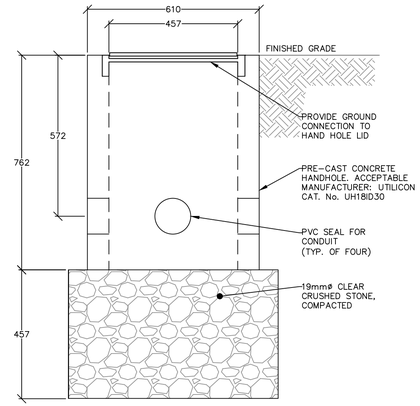
4 E1.1 **UTILITY POLE INTERFACE DETAIL** 2

- NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)
- SIMILAR DETAIL FOR COMMUNICATION DUCT(S)



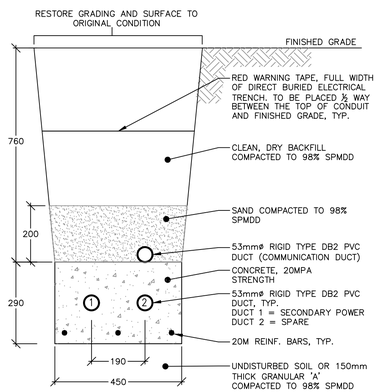
5 E1.1 **TYPICAL BOLLARD DETAIL** 3

- NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)



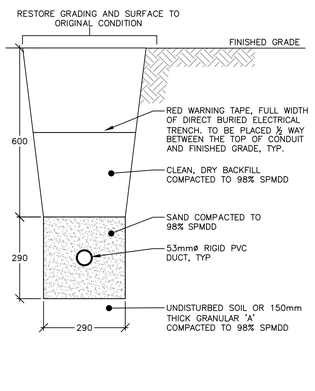
6 E1.1 **HAND HOLE DETAIL, TYPICAL**

- NTS, DIMENSIONS SHOWN IN MILLIMETERS (mm)
- REFERENCE OPSD 2112.02 AND 2117.02 STANDARDS



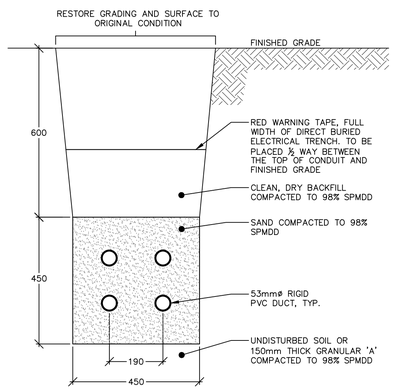
1 E1.1 **1X2 UNDERGROUND DUCTBANK** 1

- NTS, DIMENSIONS AS SHOWN



2 E1.1 **1X1 UNDERGROUND DUCTBANK** 1

- NTS, DIMENSIONS AS SHOWN



3 E1.1 **2X2 UNDERGROUND DUCTBANK** 1

- NTS, DIMENSIONS AS SHOWN

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16066F-02

TATHAM ENGINEERING

LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
22JAN'26
PROVINCE OF ONTARIO

No.	DATE	ISSUE/REVISION	No.	DATE	ISSUE/REVISION
1.	12-01-2023	ISSUED FOR CLIENT REVIEW			
2.	07-18-2025	ISSUED FOR CLIENT REVIEW			
3.	12-09-2025	ISSUED FOR TENDER			
4.	01-22-2026	ISSUED WITH ADDENDUM #5			

CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: LEGEND AND DUCTBANK DETAILS

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2940 FAX: 519-941-2036

DESIGNED BY	DRAWN BY	VERIFIED BY	DRAWING No.
S.R.T.	M.C.G.	G.G.R.	E1.1

SCALE	PROJECT No.
AS SHOWN	16066F-02

NOTES

1. CONTRACT DRAWINGS DO NOT PORTRAY THE LOCATION OF ALL EXISTING UNDERGROUND SERVICES. PRIOR TO PERFORMING ANY TRENCHING OR DIGGING WORK, CONTRACTOR IS REQUIRED TO CONTACT ALL LOCAL UTILITIES AND REQUEST A STAKING OR MARKING OF ALL SEWERS, WATERMAINS, GAS MAINS AND ALL TYPES OF CABLES AND CONDUITS. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE TO PAY FOR DAMAGES OR DISTURBANCES CAUSED TO ANY EXISTING UTILITY.
2. DUCTBANK ROUTE IS APPROXIMATE. CONTRACTOR TO COORDINATE ROUTING WITH EXISTING CONDITIONS. COORDINATE CONDUITS AT GENERATOR WITH CONTRACTOR INSTALLING CONCRETE PAD AND WITH GENERATOR SHOP DRAWINGS.
3. GENERATOR IS NEW. GENERATOR TO BE LOCATED MINIMUM 3m FROM A BUILDING AND 3m FROM A PROPERTY LINE. CONCRETE PAD TO EXTEND 1m AROUND ENTIRE GENERATOR. DIMENSIONS BASED ON CUMMINS C80D6C MODEL (80kW) AND ARE 1046mm W X 4352mm L X 2039mm H. COORDINATE STUB UP AREAS FOR CONDUITS WITH EQUIPMENT SHOP DRAWINGS.
4. REFER TO SINGLE LINE DIAGRAMS SHOWN ON DRAWINGS E2.1 AND E2.2 AS WELL AS APPLICABLE NOTES FOR ADDITIONAL INFORMATION. PROPOSED SECONDARY DUCTBANK SHOWN ON TOP OF EXISTING AS STATION WILL BE SHUTDOWN DURING CONSTRUCTION.
5. EXISTING CHLORINE CONTACT TANKS TO BE REMOVED AND REPLACED WITH CHLORINE CONTACT PIPING. REFER TO PROCESS DRAWINGS FOR ADDITIONAL INFORMATION.

DUFFERIN STREET

ANDREW STREET

EXISTING UTILITY POLE AND POLE MOUNTED TRANSFORMER ◇4

HP TRANS

EXISTING WATER MAIN

EXISTING PW2 RAW WATER LINE

SECONDARY AND COMMUNICATION CONDUIT ENTRANCE, SEE DETAIL: 1/E4.4

RELOCATED HYDRO METER

EXISTING FENCE

EXISTING UTILITY POLE 2 (TO REMAIN), SEE DETAIL: 4/E1.1 ◇4

SECONDARY UNDERGROUND DUCTBANK, SEE DETAIL: 1/E1.1 ◇2 ◇4

COMMUNICATION HAND HOLE, SEE DETAIL: 6/E1.1

GROUND GRID, SEE DETAIL: 2/E2.3

◇3 CABLE ENTRY. COORDINATE FINAL CONDUIT STUB-UP LOCATION WITH GENERATOR SHOP DRAWINGS

PROPOSED DIESEL GAS GENERATOR, SEE DETAIL: 1/E2.2

◇3 CONCRETE PAD (BY STRUCTURAL)

EXISTING BELL LINE

GENERATOR BOLLARDS (TYPICAL FOR 7), SEE DETAIL: 5/E1.1

GENERATOR UNDERGROUND DUCTBANK, SEE DETAIL: 3/E1.1 ◇2

EXISTING BELL PEDESTAL FOR FUTURE FIBER CONNECTION

COMMUNICATION UNDERGROUND DUCTBANK, SEE DETAIL: 2/E1.1

GENERATOR AND COMMUNICATION CONDUIT ENTRANCE, SEE DETAIL: 2/E4.4

PROPOSED CHLORINE CONTACT PIPING ◇5

EXISTING PUMPHOUSE

EXISTING TRANSFORMER STATION

FH

Hp

BIC

486.74 486.78 486.65 486.50 486.47 486.58 486.49 486.12 486.13 486.00 485.83 485.87 485.50 485.00 484.50

3.12% 7.46% 2.45% 3.04% 6.10% 4.75%

1/E1.2 SITE PLAN ◇1
– SCALE 1:100

16066F-02

TATHAM ENGINEERING

LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
22JAN'26
PROVINCE OF ONTARIO

No.	DATE	ISSUE/REVISION	No.	DATE	ISSUE/REVISION
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3.	12-09-2025	ISSUED FOR TENDER			
4.	01-22-2026	ISSUED WITH ADDENDUM #5			

CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: SITE PLAN

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

DESIGNED BY	DRAWN BY	VERIFIED BY	DRAWING No.
S.R.T.	M.C.G.	G.G.R.	E1.2

SCALE	PROJECT No.
AS SHOWN	16066F-02

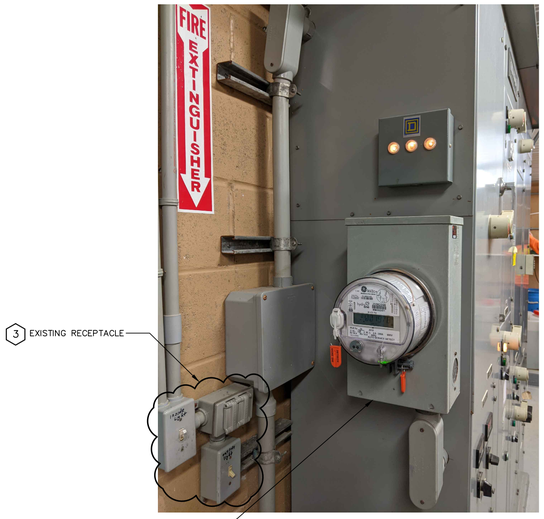
PANEL TAG NAME: 'LP–A'

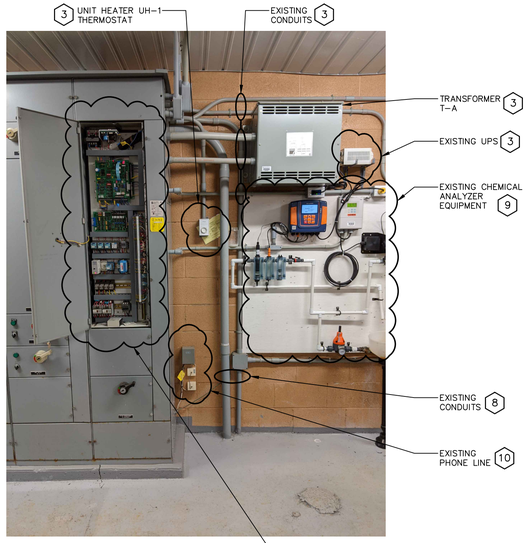
120/208V, 3ø, 4W
MAINS: 225A
MAIN LUGS ONLY

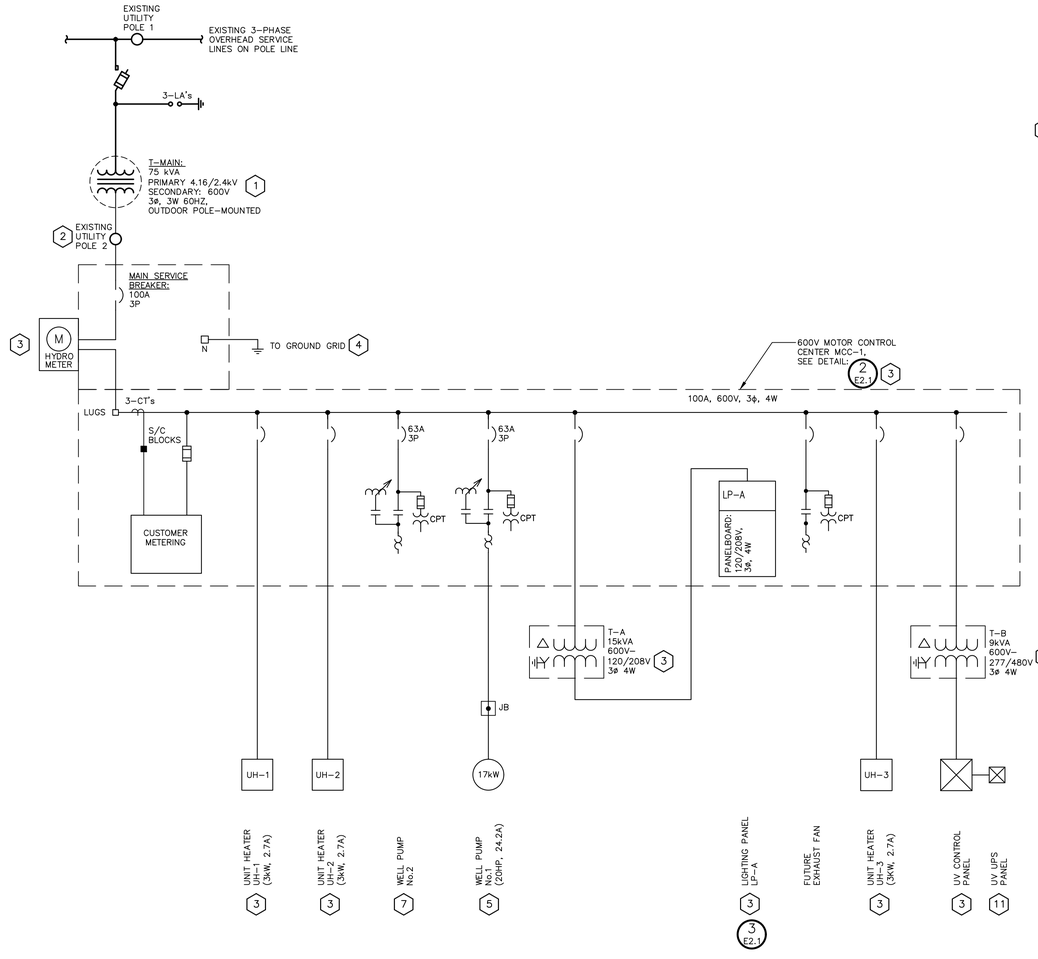
MOUNTING: PANELBOARD
LOCATION: WET WELL #1 PUMPHOUSE

LOAD–W	CIRCUIT DESCRIPTION	PROT.	CIRCUITS			PROT.	CIRCUIT DESCRIPTION	LOAD–W
6	LIGHTS	15A	1	A	2	15A	OUTSIDE LIGHTS	
	CHEM. INJECT (RECEPTACLE)	15A	3	B	4	15A	RECEPTACLES	
	CHEM. INJECT (RECEPTACLE)	15A	5	C	6	15A	CONTROLLER	
	SPARE	20A	7	A	8	15A	VENTILATION	
3	CHEM. INJECT (RECEPTACLE)	15A	9	B	10	15A	EMERGENCY LIGHTING	
	CHEM. INJECT (RECEPTACLE)	15A	11	C	12	20A	SPARE	
	SIGNAL DEVICE RECEPTACLE	15A	13	A	14	30A / 2P	HOT WATER TANK	
	RECEPTACLES	15A	15	B	16			
	RECEPTACLES	15A	17	C	18		SPACE	
	RECEPTACLES	15A	19	A	20		SPACE	
	RECEPTACLES	15A	21	B	22		SPACE	
	SPARE	15A	23	C	24		SPACE	
	SPARE	15A	25	A	26		SPACE	
	SPACE		27	B	28		SPACE	
	SPACE		29	C	30		SPACE	

3 / E2.1 EXISTING LP–A LIGHTING PANEL SCHEDULE
– NTS







1 / E2.1 EXISTING SINGLE LINE DIAGRAM
– NTS

2 / E2.1 EXISTING MCC–1 LAYOUT 3
– NTS

REMOVAL NOTES

GENERAL NOTES FOR ALL REMOVAL WORKS:

- WELL #1 PUMP HOUSE TO BE SHUTDOWN FOR CONSTRUCTION WORK. CONTRACTOR TO PROVIDE ALL NECESSARY TEMPORARY POWER REQUIRED TO PERFORM WORK.
- UNLESS OTHERWISE NOTED, "REMOVE" OR "REMOVED" INDICATES CONTRACTOR TO DISCONNECT, REMOVE AND DISPOSE OF ELECTRICAL EQUIPMENT AND/OR DEVICE INCLUDING POWER FEED CONDUCTORS, CONDUIT AND/OR CABLE. CONTRACTOR TO CONFIRM WITH OWNER IF EQUIPMENT TO BE SAVED OR DISPOSED. CONTRACTOR TO DISPOSE OF EQUIPMENT AS DIRECTED.
- CONTRACTOR TO PREPARE AN ELECTRICAL REMOVAL SCHEDULE FOR REVIEW WITH ENGINEER AND OWNER PRIOR TO BEGINNING ANY SHUT DOWN WORK.
- ALL REMOVAL WORK SCHEDULES REQUIRED BY THE CONTRACTOR ARE TO BE APPROVED BY ENGINEER AND OWNER TEN (10) WORKING DAYS PRIOR TO ANY POWER SHUTDOWN.
- CONTRACTOR IS TO INCLUDE ALL NECESSARY PREMIUM LABOUR TIME TO PERFORM REMOVAL WORK ON WEEKENDS, NIGHTS OR OTHER "NON–REGULAR" TIMES AS DIRECTED BY THE OWNER/OPERATOR.
- CONTRACTOR TO COORDINATE REMOVAL WORK AND COMMISSIONING OF ALL EQUIPMENT (NEW AND EXISTING) WITH THE INTEGRATOR AND OWNER.

1. EXISTING TRANSFORMER TO BE REPLACED AND UTILITY POLE RE–WORKED BY LUC. NEW TRANSFORMER TO BE 3x25kVA, 2.4/4.16kV – 347/600V.
2. EXISTING UTILITY POLE TO REMAIN. EXISTING SECONDARY RISER TO BE REMOVED AND NEW SECONDARY RISER TO BE INSTALLED BY LUC. CONTRACTOR TO REMOVE EXISTING UNDERGROUND SECONDARY AND PROVIDE NEW UNDERGROUND SECONDARY. REFER TO E2.2 AND APPLICABLE NOTES FOR ADDITIONAL INFORMATION. COORDINATE ALL WORK WITH LUC. REFER TO LUC LAYOUT FOR ADDITIONAL INFORMATION.
3. EXISTING EQUIPMENT, CONDUIT AND WIRING TO BE REMOVED AND REPLACED WITH NEW. REFER TO CONTRACT DRAWINGS FOR ADDITIONAL INFORMATION.
4. DETAILS OF EXISTING GROUND GRID ARE UNKNOWN. CONTRACTOR TO LOCATE AND REMOVE. NEW GROUND GRID TO BE PROVIDED WITH NEW EQUIPMENT.
5. EXISTING EQUIPMENT TO REMAIN AND BE RE–CONNECTED TO NEW MCC. EXISTING CONDUIT AND WIRING TO BE REMOVED AND REPLACED WITH NEW. REFER TO DRAWING CONTRACT DRAWINGS FOR ADDITIONAL INFORMATION.
6. EXISTING EQUIPMENT TO REMAIN AND BE RE–CONNECTED TO NEW LIGHTING PANEL. EXISTING CONDUIT AND WIRING TO BE REMOVED AND REPLACED WITH NEW.
7. EXISTING WELL PUMP No.2 NO LONGER EXISTS. ALL ASSOCIATED EQUIPMENT, CONDUIT AND WIRING TO BE REMOVED.
8. EXISTING CONDUITS APPEAR TO BE POWER AND CONTROL FOR WELL 2. SMALLER CONDUIT INCLUDES WIRING FOR PRESSURE TRANSDUCER. CONTRACTOR TO REVIEW EXISTING CONDITIONS AND DISCUSS WITH ENGINEER DURING CONSTRUCTION TO CONFIRM DIRECTION. CONTRACTOR TO ACCOUNT FOR REMOVAL OF CONDUIT AND WIRING AS PART OF SCOPE OF WORK.
9. EXISTING CHEMICAL ANALYZER EQUIPMENT TO BE RELOCATED TO NEW CHEMICAL ROOM. EXISTING RECEPTACLES FOR CONNECTED INSTRUMENTATION TO REMAIN AND BE RE–WIRED TO NEW PLC PANEL UPS.
10. EXISTING PHONE LINE APPEARS TO ENTER THE BUILDING UNDER THE MCC. THE CONTRACTOR IS TO COORDINATE THE RELOCATION OF THE EXISTING SERVICE WITH THE OWNER AND PROVIDER (WGHTMAN). PROVISIONS FOR A NEW COMMUNICATION SERVICE ARE INCLUDED IN THE CONTRACT DRAWINGS. FINAL DIRECTION REGARDING NEW OR RELOCATION TO BE CONFIRMED DURING CONSTRUCTION, AS COORDINATED BY THE CONTRACTOR.
11. EXISTING EQUIPMENT TO REMOVED AND REPLACED AND CONNECTED TO NEW UV CONTROL PANEL. WIRING REQUIREMENTS OF UPS TO BE CONFIRMED WITH NEW UV CONTROL PANEL SHOP DRAWINGS. CONTRACTOR TO COORDINATE WITH UV EQUIPMENT SUPPLIER AND ADVISE AS PART OF SHOP DRAWING SUBMISSION.

16066F–02

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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: EXISTING SINGLE LINE DIAGRAM, MCC ARRANGEMENT AND LIGHTING PANEL SCHEDULE

S.BURNETT & ASSOCIATES LIMITED
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210 BROADWAY, UNIT 203
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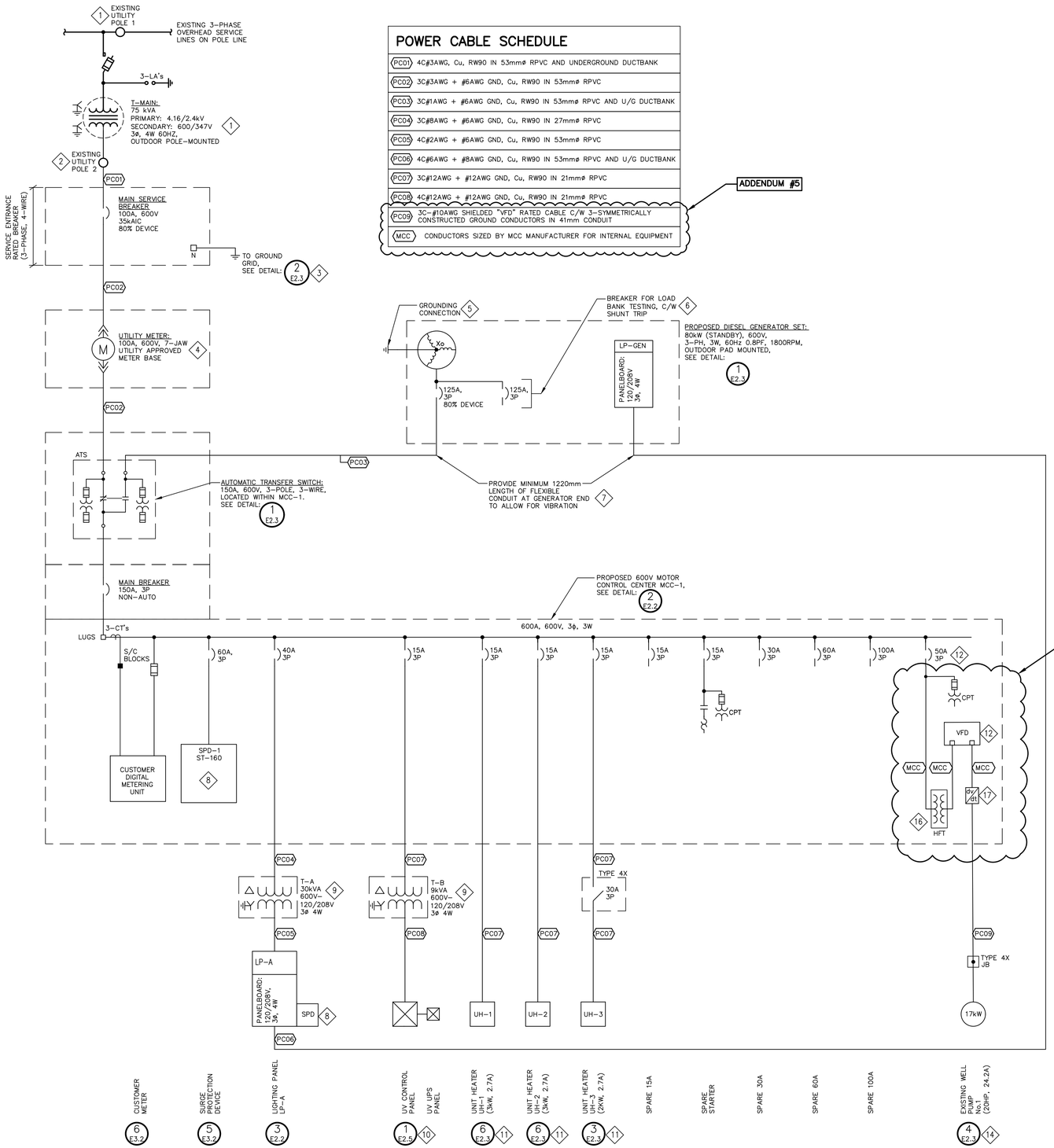
S.R.T.	M.C.G.	G.G.R.	E2.1

SCALE	PROJECT No.
AS SHOWN	16066F–02



1 PROPOSED SINGLE LINE DIAGRAM
E2.2 – NTS

POWER CABLE SCHEDULE

PC01	4C#3AWG, Cu, RW90 IN 53mmø RPVC AND UNDERGROUND DUCTBANK
PC02	3C#3AWG + #6AWG GND, Cu, RW90 IN 53mmø RPVC
PC03	3C#1AWG + #6AWG GND, Cu, RW90 IN 53mmø RPVC AND U/G DUCTBANK
PC04	3C#8AWG + #6AWG GND, Cu, RW90 IN 27mmø RPVC
PC05	4C#2AWG + #6AWG GND, Cu, RW90 IN 53mmø RPVC
PC06	4C#6AWG + #8AWG GND, Cu, RW90 IN 53mmø RPVC AND U/G DUCTBANK
PC07	3C#12AWG + #12AWG GND, Cu, RW90 IN 21mmø RPVC
PC08	4C#12AWG + #12AWG GND, Cu, RW90 IN 21mmø RPVC
PC09	3C-#10AWG SHIELDED "VFD" RATED CABLE C/W 3-SYMMETRICALLY CONSTRUCTED GROUND CONDUCTORS IN 41mm CONDUIT
MCC	CONDUCTORS SIZED BY MCC MANUFACTURER FOR INTERNAL EQUIPMENT

ADDENDUM #5

PANEL TAG NAME: 'LP-A'

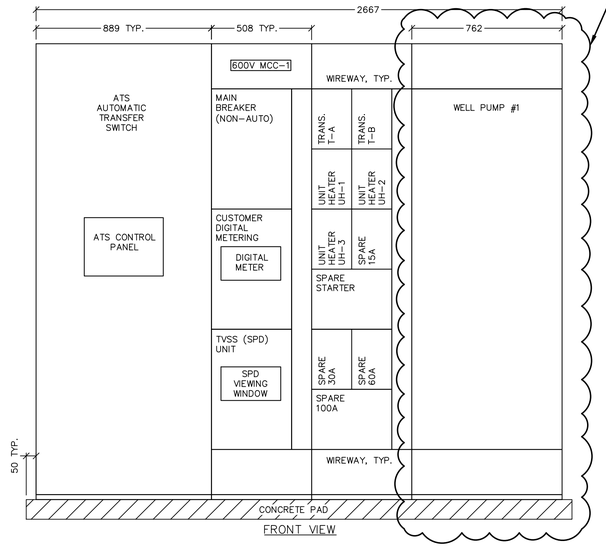
120/208V, 3ø, 4W
MAINS: 225A
MAIN LUGS ONLY

MOUNTING: PANELBOARD
LOCATION: WET WELL #1 PUMPHOUSE

LOAD-W	CIRCUIT DESCRIPTION	PROT.	CIRCUITS			PROT.	CIRCUIT DESCRIPTION	LOAD-W
600	LIGHTS – CONTROL ROOM	15A	1	A	2	15A	OUTSIDE LIGHTS	400
200	CHEM. INJECT (RECEPTACLE)	15A	3	B	4	15A	EMERGENCY LIGHTING (RECEPTACLE)	50
200	CHEM. INJECT (RECEPTACLE)	15A	5	C	6	15A	LIGHTS – CHEMICAL ROOM	100
1125	FORCED FAN HEATER (FFH-1)	15A / 2P	7	A	8	15A	ELECTRONIC TRAP SEAL PRIMER (TSP-1)	
			9	B	10	15A	SPARE	
500	CHEMICAL INJECTION SYSTEM CONTROL PANEL	15A	11	C	12	30A	PLC PANEL	2000
	SPARE	15A	13	A	14	30A / 2P	HOT WATER TANK	3000
	SPARE	15A	15	B	16			
200	INTERIOR RECEPTACLES	15A	17	C	18	60A / 3P	LP-GEN 13	
200	INTERIOR RECEPTACLES	15A	19	A	20			
200	COUNTER RECEPTACLES	15A	21	B	22			
342	VENTILATION CONTROL PANEL (CP-EF1)	15A	23	C	24	30A / 3P	SURGE PROTECTION DEVICE SPD-2, SEE DETAIL: 5 E3.2 8	
342	VENTILATION CONTROL PANEL (CP-EF2)	15A	25	A	26			
	MOTORIZED VALVE MV-101	15A	27	B	28			
	SPARE	15A	29	C	30	15A	UV SYSTEM OPTIVIEW PANEL	250
	SPARE	15A	31	A	32	15A	SPARE	
	SPARE	15A	33	B	34	20A	SPARE	
	SPARE	15A	35	C	36	20A	SPARE	
	SPARE	60A / 3P	37	A	38	20A	SPARE	
			39	B	40	20A	SPARE	
			41	C	42	30A	SPARE	

ADDENDUM #5

3 PROPOSED LP-A LIGHTING PANEL SCHEDULE 15
E2.2 – NTS



ADDENDUM #5

2 PROPOSED MCC LAYOUT
E2.2
- NTS, DIMENSIONS SHOWN IN MILLIMETRES
- PROVIDE 100mm (4") HIGH CONCRETE CURB, C/W 25mm CHAMFERED EDGE
- CONTRACTOR TO CONFIRM SHIPPING SPLITS

NOTES

1. EXISTING UTILITY POLE TO BE RE-WORKED BY LUC TO ACCEPT NEW TRANSFORMER. EXISTING SECONDARY BETWEEN UTILITY POLE 1 AND UTILITY POLE 2 TO REMAIN.
2. CONTRACTOR TO COORDINATE ALL WORK WITH LUC. REFER TO LUC LAYOUT FOR ADDITIONAL INFORMATION. CONTRACTOR TO PROVIDE THE FOLLOWING FOR INSTALLATION BY LUC.
   - RIGID PVC CONDUIT UP ALONG UTILITY POLE C/W WEATHER HEAD FITTING AND STEEL GAURD COVERING CONDUIT (MINIMUM 3M).
   - SUFFICIENT LENGTH OF SECONDARY CONDUCTORS FOR TERMINATION BY LUC.
   - TRANSFORMER SECONDARY LUGS.
   - PROVIDE ALL NECESSARY SAND AND BACKFILL TO LUC SPECIFICATIONS.
3. SOLIDLY GROUND NEUTRAL BUS (IN SERVICE ENTRANCE MAIN BREAKER ENCLOSURE) TO PROPOSED GROUND GRID AND BOND TO MCC GROUND BUS.
4. HYDRO ONE TO SUPPLY METERBASE, METER AND ENCLOSURE. CONTRACTOR TO COORDINATE WITH HYDRO ONE FOR INSTALLATION OF METERING EQUIPMENT. METERING TO BE "FEED-THROUGH" METERING. LUC LAYOUT INDICATES METER TO BE LOCATED OUTSIDE BUILDING. CONTRACTOR TO CONFIRM FINAL LOCATION WITH LUC.
5. ENSURE NEUTRAL POINT AND FRAME OF GENERATOR IS CONNECTED TO MCC GROUND BUS AS A 3-WIRE SYSTEM. PROVIDE GENERATOR Xo GROUND CONNECTION TO SYSTEM GROUND (SEPARATE GROUND PLATE OR CONNECT TO GROUND GRID), PER OESC 10-206 AND OESC BULLETIN 10-10-8 FIGURE B3.
6. LOAD BANK BREAKER TO BE SHUNT TRIPPED (S/T) FROM ATS WHEN LOSS OF NORMAL POWER IS DETECTED.
7. CONTRACTOR TO PROVIDE CONDUIT INSTALLATION AT GENERATOR END TO ALLOW FOR VIBRATION IN HORIZONTAL AND VERTICAL DIRECTIONS.
8. CONNECT POWER LEADS "AS SHORT AS POSSIBLE" BETWEEN MCC-1 AND TVSS SURGE SUPPRESSION PANEL (SPD) MODEL NO: TK-ST160-600NN-FL BY INNOSYS POWER.

   CONNECT POWER LEADS "AS SHORT AS POSSIBLE" BETWEEN LP-A AND TVSS SURGE SUPPRESSION PANEL (SPD) MODEL NO: TK-ST080-3Y208-FL BY INNOSYS POWER.

   ADDENDUM #5
9. TRANSFORMER: kVA RATING AS INDICATED, 600-120/208V, 3-PHASE, 60Hz. PROVIDE A BARE COPPER GROUND CONNECTION FROM TRANSFORMER'S (X0) TO MCC-1 GROUND BUS AS PER OESC.
10. CONTRACTOR TO PROVIDE NEW CONDUIT AND WIRING FROM MCC TO NEW TRANSFORMER AND FROM NEW TRANSFORMER TO NEW UV CONTROL PANEL. UV UPS PANEL IS NEW. REFER TO DETAIL REFERENCES FOR ADDITIONAL INFORMATION.
11. PROVIDE NEW POWER FEEDS FROM MCC FOR RELOCATED AND NEW EQUIPMENT. CONTRACTOR TO PROVIDE NEW CONDUIT AND WIRING FROM MCC TO EQUIPMENT.
12. VFD MOUNTED WITH IN MCC SECTION C/W VENTILATION LOUVRES AND FANS. VFD TO BE RATED FOR 25hp AS PROVISION FOR FUTURE PUMP UPGRADE. PROVIDE A THERMOSTATICALLY CONTROLLED EXHAUST FAN INSIDE MCC FOR COOLING OF VFD. VFD MANUFACTURER TO CONFIRM SIZE OF CIRCUIT BREAKER. CIRCUIT BREAKER TO HAVE A CURRENT RATING NOT LESS THAN 115% OF THE FULL LOAD CURRENT RATING OF THE CONNECTED LOAD IN FULL LOAD AMPS, AS PER OESC 28-602. DISCONNECT TO BE LOCKABLE IN THE OPEN POSITION FROM THE OUTSIDE OF THE MCC AND CLEARLY LABELLED TO DESCRIBE THE LOAD CONNECTED, AS PER OESC 28-604 (1)(B)(II). CONTRACTOR ENSURE VFD OVERCURRENT PROTECTION PARAMETERS ARE SET FOR THE PUMP MOTOR FLA.

   ADDENDUM #5
13. 3-POLE BREAKER IN LP-A FOR OUTDOOR GENERATOR SHORE POWER.
14. EXISTING WELL PUMP TO REMAIN AND BE RE-CONNECTED TO SOFTSTARTER IN NEW MCC. CONTRACTOR TO PROVIDE NEW CONDUIT, JUNCTION BOX AND WIRING FROM MCC TO WELL PUMP. PROVIDE NEW FLEXIBLE CONNECTION FROM JUNCTION BOX TO WELL HEAD.
15. PANELBOARD NOTES:
    - BREAKER SIZES LISTED ARE PROVIDED AS A GENERAL GUIDE. PRIOR TO INSTALLATION, CONTRACTOR TO CONFIRM ALL BREAKER SIZES WITH FINAL EQUIPMENT LOADS.
    - CONTRACTOR TO SIZE ALL FEEDER CONDUCTORS AND CONDUIT BASED ON ONTARIO ELECTRICAL SAFETY CODE – LATEST EDITION.

    ADDENDUM #5
16. HARMONIC FILTER TYPE TRANSFORMER (HFT): 600V-600V, 3-PHASE, LOCATED WITHIN MCC SECTION AND MOUNTED TO WALL. HARMONIC FILTER TO BE RATED FOR 25hp AS PROVISION FOR FYTRE PUMP UPGRADE. COORDINATE SIZE WITH VFD MANUFACTURER AND MOTOR HP RATING.
17. OUTPUT FILTER (dv/dt): 600V-600V, 3-PHASE, LOCATED WITHIN MCC SECTION AND MOUNTED TO WALL. OUTPUT FILTER TO BE RATED FOR 25hp AS PROVISION FOR FYTRE PUMP UPGRADE. COORDINATE SIZE WITH VFD MANUFACTURER AND MOTOR HP RATING.

   ADDENDUM #5

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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: PROPOSED SINGLE LINE DIAGRAM, MCC ARRANGEMENT AND LIGHTING PANEL SCHEDULE

S. BURNETT & ASSOCIATES LIMITED
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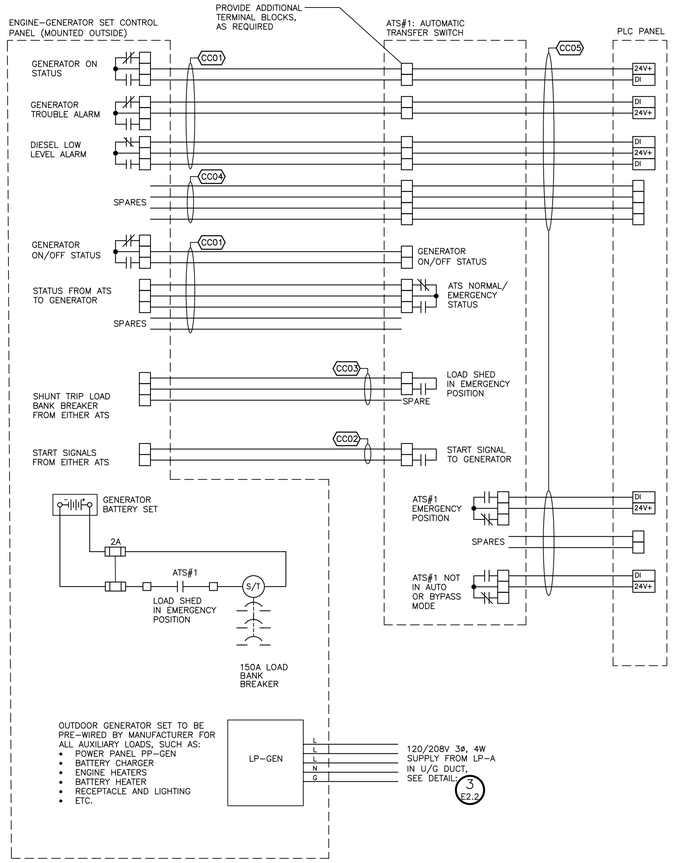
S.R.T.	M.C.G.	G.G.R.	E2.2

SCALE	PROJECT No.
AS SHOWN	16066F-02

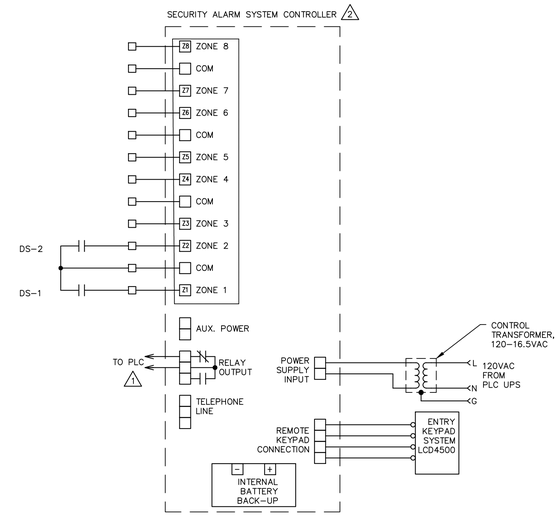
ADDENDUM #5

PROPOSED CONTROL CABLES	
CC01 7C#12AWG, Cu, PLUS GND, CONTROL CABLE	U/G DUCT
CC02 2C#12AWG, Cu, PLUS GND, CONTROL CABLE	U/G DUCT
CC03 3C#12AWG, Cu, PLUS GND, CONTROL CABLE	U/G DUCT
CC04 4C#12AWG, Cu, PLUS GND, CONTROL CABLE	U/G DUCT
CC05 17C#12AWG, Cu, PLUS GND, RW90, Cu	41mmøC



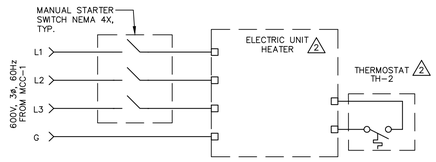
1 E2.3 ENGINE-GENERATOR & ATS: CONTROL WIRING INTERFACE DIAGRAM

- THIS IS A CONCEPT DRAWING ONLY. CONTRACTOR TO VERIFY WIRING DIAGRAM WITH GENERATOR MANUFACTURER.



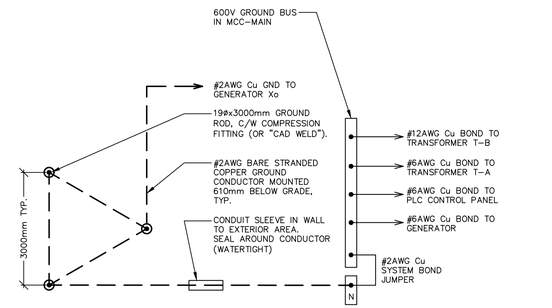
5 E2.3 ACCESS CONTROL SECURITY SYSTEM

- ALL FIELD DEVICE WIRING TO BE 4C#22AWG,Cu,STRANDED OR 2C#22AWG,Cu,STRANDED IN PVC CONDUIT
- PROVIDE "END OF LINE" RESISTORS AS PER MANUFACTURER'S RECOMMENDATIONS



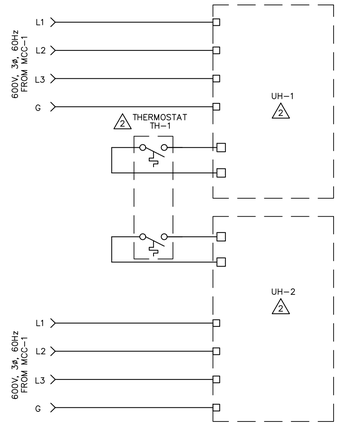
3 E2.3 UNIT HEATER ELEMENTARY WIRING DIAGRAM

- DIAGRAM FOR WELL #1 PUMPHOUSE UNIT HEATER, UH-3
- UNIT HEATER UH-3 IS LOCATED IN THE CHEMICAL ROOM AND IS TO INCLUDE LOCAL DISCONNECT, PER OESC.



2 E2.3 GROUND GRID DETAIL

- NTS, DIMENSIONS SHOWN IN mm
- ONLY MAIN ELECTRICAL EQUIPMENT SHOWN



6 E2.3 UNIT HEATER ELEMENTARY WIRING DIAGRAM

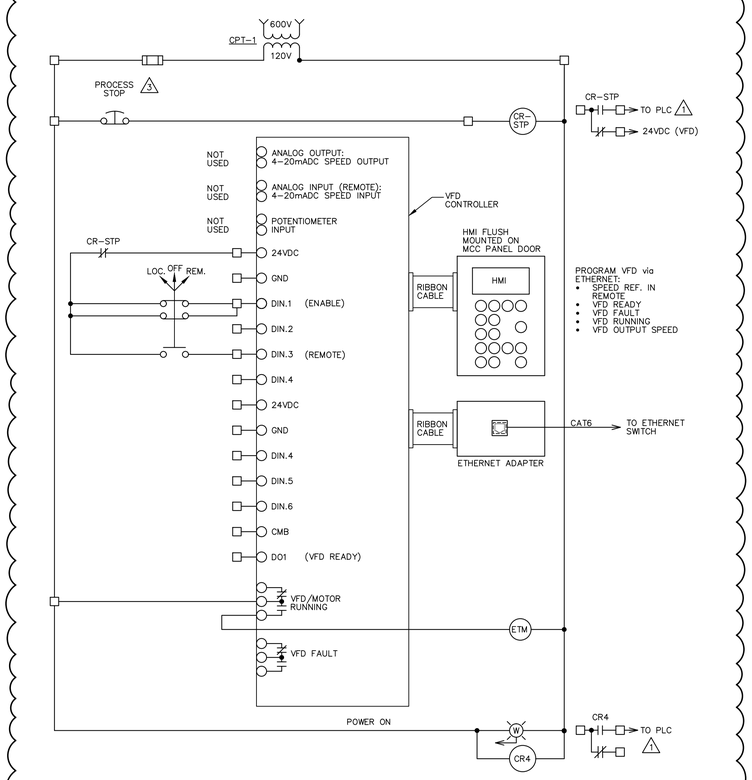
- DIAGRAM FOR WELL #1 PUMPHOUSE UNIT HEATERS UH-1 & UH-2

ADDENDUM #5

NOTES

1. LOAD BANK BREAKER TO BE SHUNT TRIPPED (S/T) BY LOAD SHED SIGNAL OF ATS WHEN LOSS OF NORMAL POWER IS DETECTED.
2. PANEL LP-G IS SUPPLIED AND INSTALLED INSIDE GENERATOR ENCLOSURE BY GENERATOR MANUFACTURER. CONFIRM FEEDER REQUIREMENT WITH MANUFACTURER.
3. VFD INTENDED SEQUENCE OF OPERATION:
   1. LOCAL MODE:
      - 1.1. VFD STARTED/STOPPED BY VFD HMI.
      - 1.2. SPEED REFERENCE ADJUSTED BY VFD HMI.
   2. REMOTE MODE:
      - 2.1. UTILIZE ETHERNET COMMUNICATIONS TO START/STOP VFD AND PROVIDE SPEED REFERENCE.
      - 2.2. VFD LOCAL/REMOTE/READY/RUNNING/FAULT COMMUNICATED TO PLC VIA ETHERNET.
   3. VFD MUST COMMUNICATE WITH ROCKWELL COMPACT LOGIX PLC.
   4. AFTER A POWER OUTAGE CONDITION OR LOSS OF COMMUNICATIONS, VFD UNIT MUST RESET AUTOMATICALLY UPON RESTORATION OF POWER SOURCE OR COMMUNICATIONS.
   5. VFD WIRING AS SHOWN IS CONCEPT ONLY. VFD MANUFACTURER TO PROVIDE ALL NECESSARY CONTROL WIRING MODIFICATIONS TO ENSURE INTENDED SEQUENCE OF OPERATION IS ACHIEVED.

ADDENDUM #5



4 E2.3 VARIABLE FREQUENCY DRIVE ELEMENTARY CONTROL DIAGRAM 3

- NTS, UNMARKED DEVICES LOCATED IN VFD ENCLOSURE
- DIAGRAM FOR WELL 1 PUMP.
- CONCEPT DRAWING ONLY.

16066F-02

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4.	01-22-2026	ISSUED WITH ADDENDUM #5			

CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: WIRING AND ELEMENTARY CONTROL DIAGRAMS

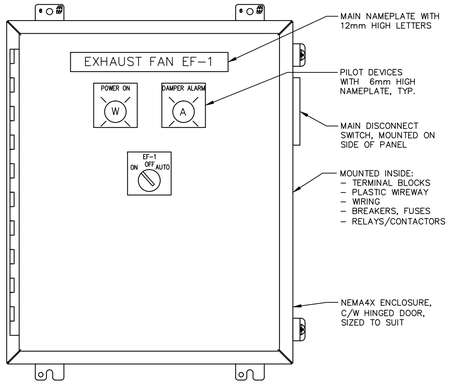
S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

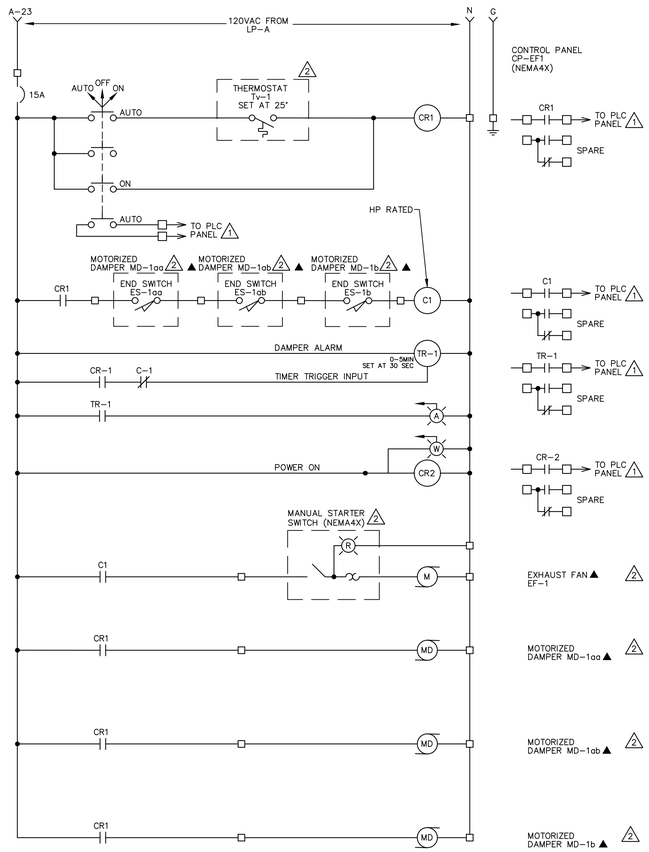
DESIGNED BY	DRAWN BY	VERIFIED BY	DRAWING No.
S.R.T.	M.C.G.	G.G.R.	E2.3

SCALE	PROJECT No.
AS SHOWN	16066F-02

NOTES

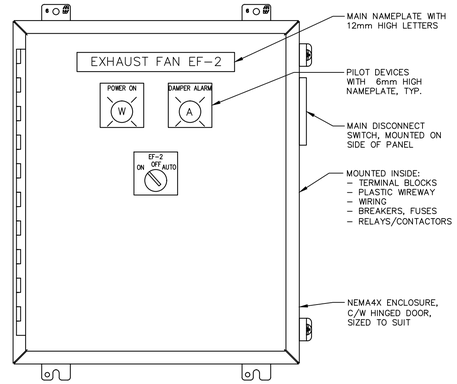
1. PROVIDE A TIMER TO CONTROL EXHAUST FAN TO RUN 10 MINUTES EVERY HOUR. THE RUN TIME IS TO BE ADJUSTABLE, EQUAL TO ALLEN BRADLEY TYPE 700-HX SERIES (REPEAT CYCLE).

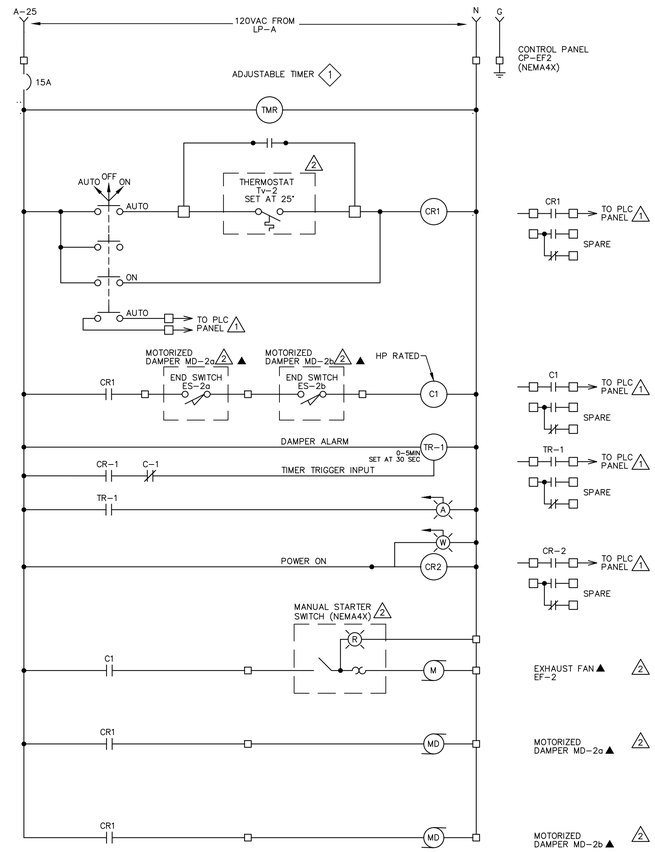




1 E2.4 **EXHAUST FAN EF-1 ELEMENTARY CONTROL DIAGRAM**

– DIAGRAM FOR CONTROL ROOM EXHAUST FAN, EF-1





2 E2.4 **EXHAUST FAN EF-2 ELEMENTARY CONTROL DIAGRAM**

– DIAGRAM FOR CHEMICAL ROOM EXHAUST FAN, EF-2

16066F-02

TATHAM ENGINEERING

LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
22JAN'26
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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: EXHAUST FAN ELEMENTARY CONTROL DIAGRAMS

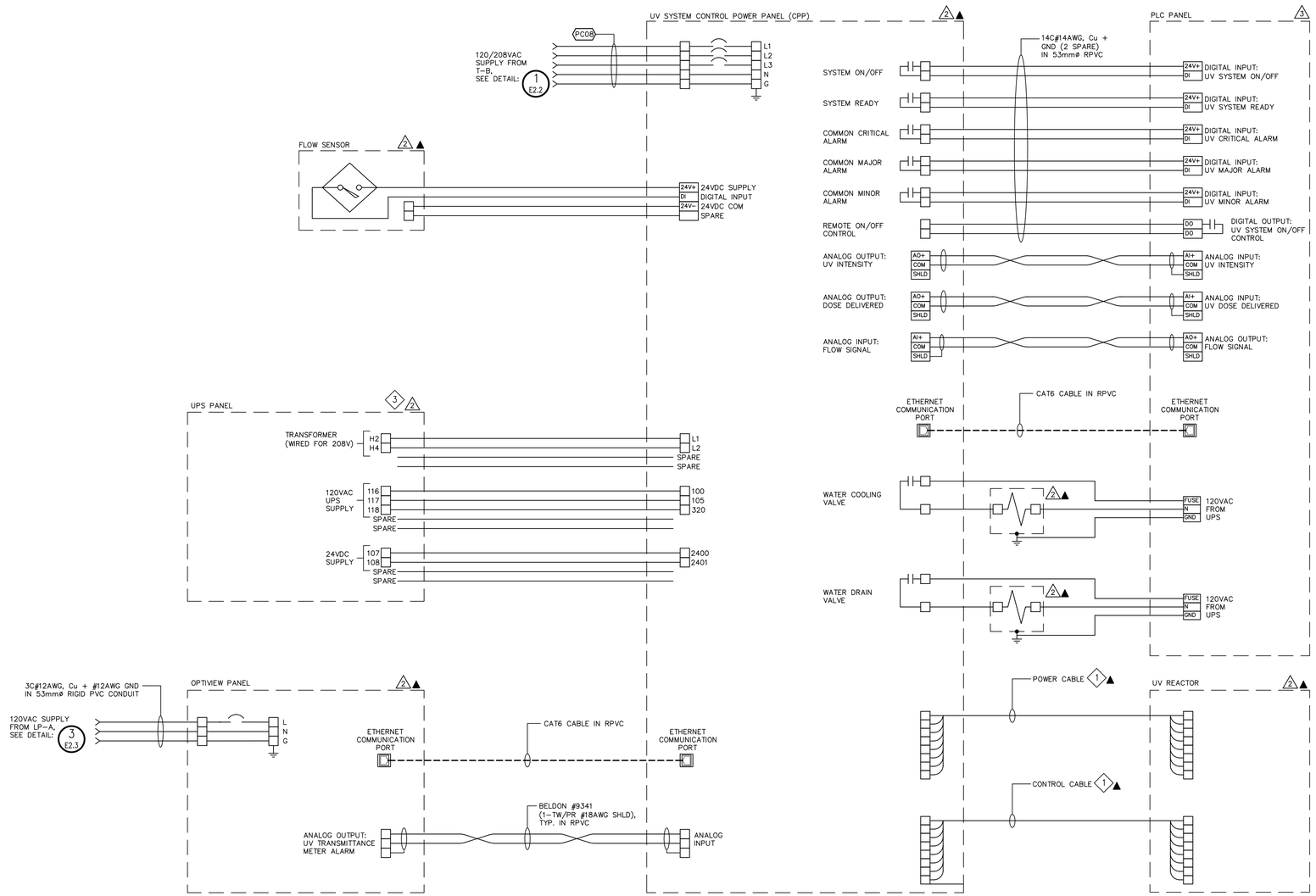
S.BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL
S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

DESIGNED BY	DRAWN BY	VERIFIED BY	DRAWING No.
S.R.T.	M.C.G.	G.G.R.	E2.4

SCALE	PROJECT No.
AS SHOWN	16066F-02

NOTES

1. POWER AND CONTROL CABLES SUPPLIED BY UV EQUIPMENT MANUFACTURER. CABLES TO BE ROUTED IN SEPARATE RPVC RACEWAYS TO UV EQUIPMENT. QUANTITY OF WIRES WITHIN CABLES IS UNCERTAIN. CONTRACTOR TO PROVIDE ALL TERMINATIONS REQUIRED AS INDICATED IN EQUIPMENT SHOP DRAWINGS AND AS DIRECTED BY EQUIPMENT MANUFACTURER. POWER AND CONTROL CABLES TO BE 6M (20ft). CONTRACTOR TO ENSURE ROUTING OF CABLES DOES NOT EXCEED PROVIDED CABLE LENGTHS.
2. FLOW SENSOR, MODEL IFM SI5000, INCLUDES M12, 4-PIN CONNECTOR. CONTRACTOR TO COORDINATE REQUIRED CABLE AND LENGTH FROM EQUIPMENT SUPPLIER AND ENSURE ADEQUATE LENGTH OF CABLE. CABLE TO BE INSTALLED WITHIN RPVC CONDUIT.
3. WIRING INDICATED BASED ON PROPOSED CONDITIONS. WIRING REQUIREMENTS OF NEW UPS PANEL TO NEW UV CONTROL PANEL TO BE CONFIRMED DURING CONSTRUCTION WITH MANUFACTURER AND EQUIPMENT SHOP DRAWINGS.



1 E2.5 UV SYSTEM CONTROL WIRING INTERFACE DIAGRAM

- NTS
- DIAGRAM BASED ON TROJAN UV SYSTEM AS SUPPLIED BY H2FLOW
- FINAL WIRING REQUIREMENTS TO BE CONFIRMED WITH EQUIPMENT SHOP DRAWINGS
- CONTRACTOR TO REVIEW SUPPLIERS SHOP DRAWINGS AND CONSULT WITH SUPPLIER PRIOR TO INSTALLATION

16066F-02

TATHAM ENGINEERING

LICENSED PROFESSIONAL ENGINEER — S. R. S. TAYLOR — 100518503 — 22JAN'26 — PROVINCE OF ONTARIO

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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: UV SYSTEM ELEMENTARY CONTROL DIAGRAM

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

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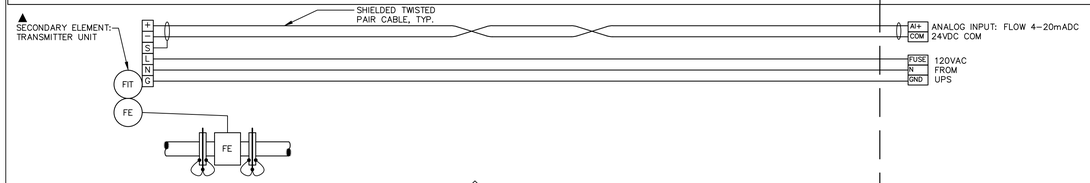
S.R.T.	M.C.G.	G.G.R.	E2.5

SCALE	PROJECT No.
AS SHOWN	16066F-02

NOTES

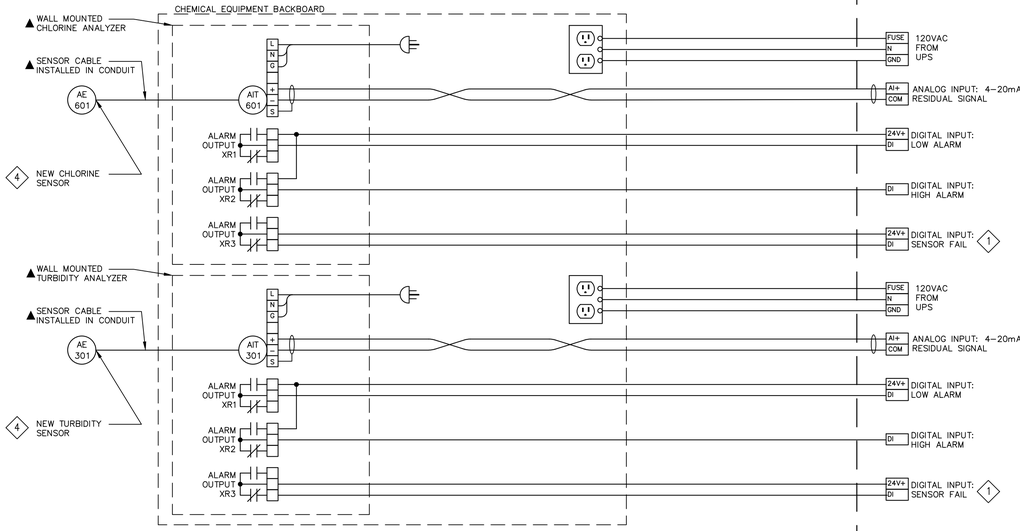
1. CONNECT ALL ALARM SIGNALS AS FAIL SAFE FROM FIELD DEVICE TO PLC PANEL (i.e. ALARM SIGNAL TO OPERATE WHEN CONTACT SIGNAL OPENS OR AN OPEN WIRE CONDITION).
2. EQUIPMENT IS EXISTING AND IS TO BE RE-CONNECTED TO NEW PLC PANEL. CONTRACTOR TO REVIEW EXISTING WIRING IN RELATION TO CONTRACT DRAWINGS AND DISCUSS WITH ENGINEER. COORDINATE REQUIRED WIRING WITH PLC SHOP DRAWING SUBMISSION. CONTRACTOR TO REMOVE EXISTING CONDUIT AND WIRING. PROVIDE NEW CONDUIT AND WIRING FROM FIELD DEVICE TO NEW PLC PANEL. CHEMICAL AND TURBIDITY ANALYZERS TO BE RELOCATED TO PROPOSED CHEMICAL ROOM.
3. PROVIDE TYPE 4X JUNCTION BOX, SIZED TO SUIT. PROVIDE COMPRESSION CONNECTIONS COMPLETE WITH HEAT SHRINK AND WRAPPED WITH VULCANIZING TAPE TO "MAKE-SAFE" ALL WIRING CONNECTIONS AS REQUIRED BY OESC.
4. CONTRACTOR TO PROVIDE NEW SENSOR COMPATIBLE WITH EXISTING TRANSMITTER EQUIPMENT.

LOCATED IN FIELD (2) | MAIN PLC PANEL (1)



1 E3.1 PLANT FLOW INSTRUMENT LOOP DIAGRAM (2)

- FLOW METER: FE/FIT-1

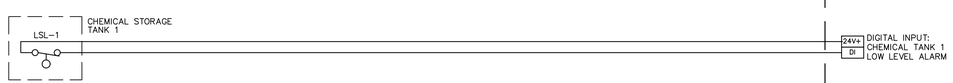


2 E3.1 TURBIDITY AND CHLORINE ANALYZER INSTRUMENT LOOP DIAGRAM (2)

- DIAGRAM FOR CHLORINE AND TURBIDITY MONITOR

3 E3.1 PRESSURE TRANSDUCER LEVEL INSTRUMENT LOOP DIAGRAM (2)

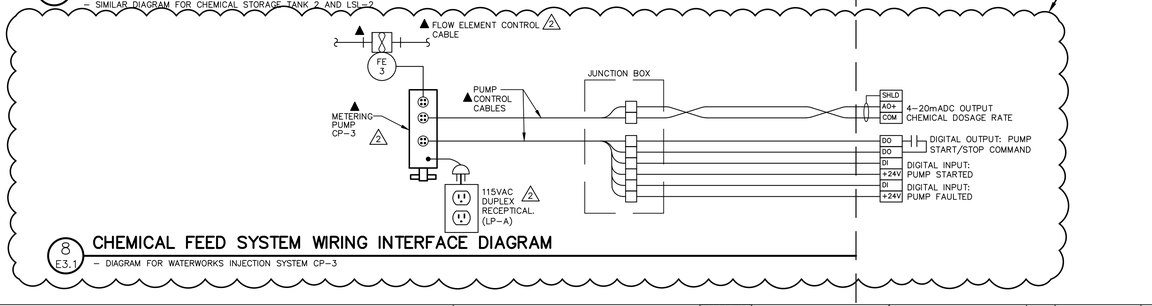
- DIAGRAM FOR WELL PUMP LEVEL: PT-1



4 E3.1 CHEMICAL STORAGE TANK WIRING INTERFACE DIAGRAM (2)

- DIAGRAM FOR CHEMICAL STORAGE TANK 1 AND LSL-1
- SIMILAR DIAGRAM FOR CHEMICAL STORAGE TANK 2 AND LSL-2

ADDENDUM #5

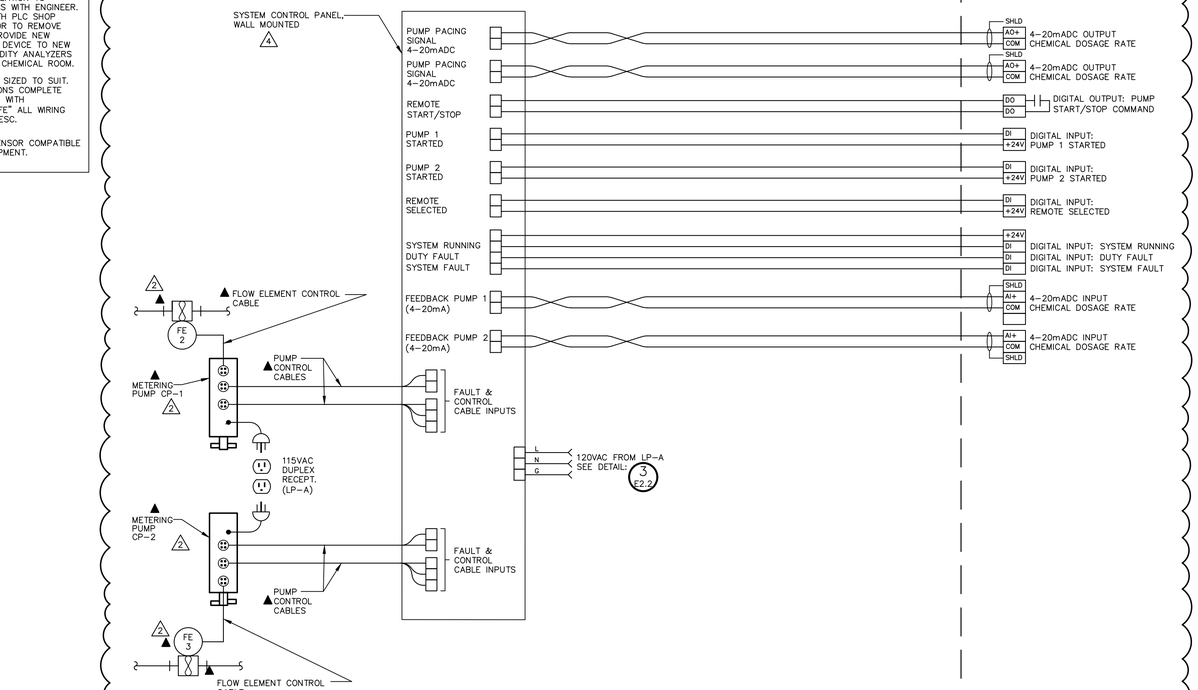


8 E3.1 CHEMICAL FEED SYSTEM WIRING INTERFACE DIAGRAM

- DIAGRAM FOR WATERWORKS INJECTION SYSTEM CP-3

LOCATED IN FIELD (2) | MAIN PLC PANEL (1)

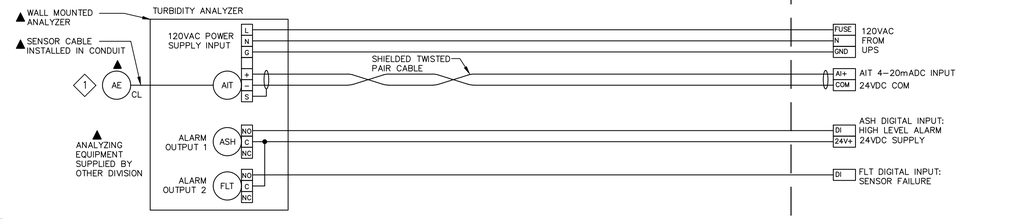
(3) LOCATE SENSOR AS PER MANUFACTURERS RECOMMENDATIONS.



5 E3.1 CHEMICAL FEED SYSTEM WIRING INTERFACE DIAGRAM

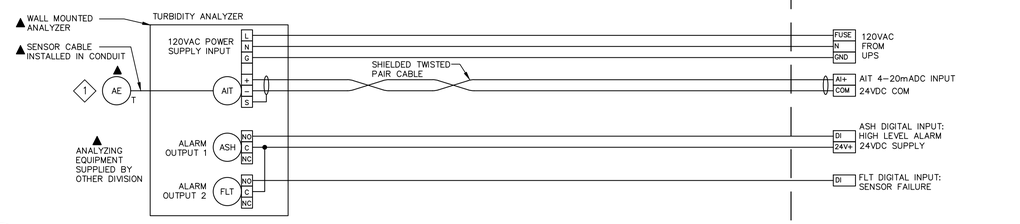
- DIAGRAM FOR DISTRIBUTION CHLORINE INJECTION SYSTEM: CP-1 & CP-2

ADDENDUM #5



6 E3.1 CHLORINE ANALYZER INSTRUMENT LOOP DIAGRAM

- DIAGRAM FOR RAW WATER CHLORINE ANALYZER: AE/AIT-501, ASH-501 & FLT-501



7 E3.1 TURBIDITY ANALYZER INSTRUMENT LOOP DIAGRAM

- DIAGRAM FOR RAW WATER TURBIDITY ANALYZER: AE/AIT-101, ASH-101 & FLT-101

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DRAWING TITLE: INSTRUMENTATION LOOP DIAGRAMS SHEET 1

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ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

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S.R.T.	M.C.G.	G.G.R.	E3.1

SCALE	PROJECT No.
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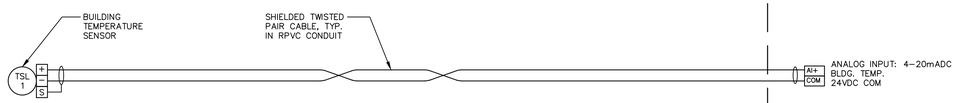
LOCATED IN FIELD ⟨2⟩ | MAIN PLC PANEL ⟨1⟩

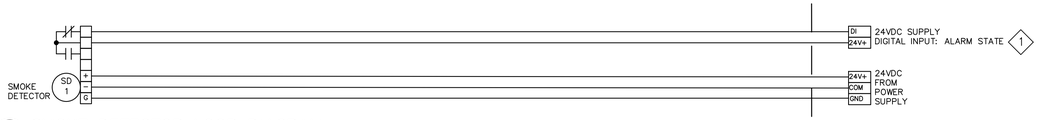
1 E3.2 FLOOD ALARM (FLOAT) SWITCH LOOP DIAGRAM

– CONTROL AREA FLOOD ALARM SWITCH: LSH-1



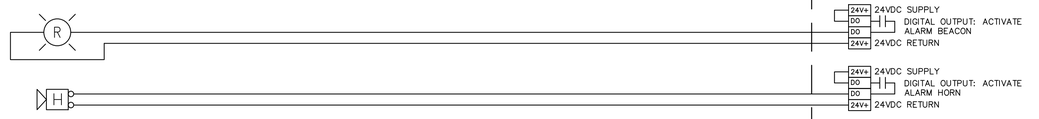
2 E3.2 BUILDING TEMPERATURE SENSOR INSTRUMENT LOOP DIAGRAM

– TEMPERATURE SENSOR FOR WELL #1 PUMPHOUSE



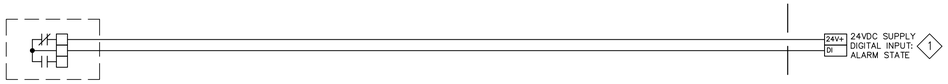
3 E3.2 SMOKE DETECTOR LOOP DIAGRAM

– WELL #1 PUMPHOUSE SMOKE DETECTOR: SD-1
– SIMILAR DIAGRAM FOR CHEMICAL ROOM SMOKE DETECTOR (SD-2)



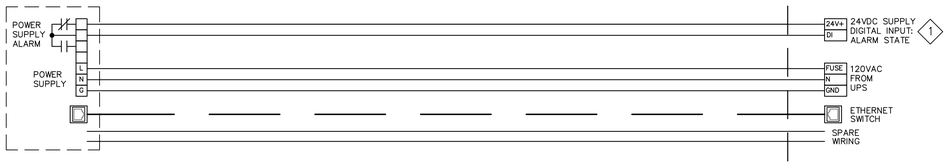
4 E3.2 ALARM CONTROL WIRING INTERFACE DIAGRAM

– DEVICES MOUNTED ON EXTERIOR WALL, SEE DRAWING E4.3



5 E3.2 SPD: SURGE PROTECTION DEVICE ALARM LOOP DIAGRAM

– DIAGRAM FOR PROPOSED MCC SPD UNIT
– SIMILAR DIAGRAM FOR LIGHTING PANEL LP-A



6 E3.2 MCC POWER METERING UNIT LOOP DIAGRAM

– METERING UNIT LOCATED IN 600V MCC

11 E3.2 PRESSURE SWITCHES INSTRUMENT LOOP DIAGRAM

• DIAGRAM FOR LOW PRESSURE SWITCH PSL-101 AND HIGH PRESSURE SWITCH PSH-101.

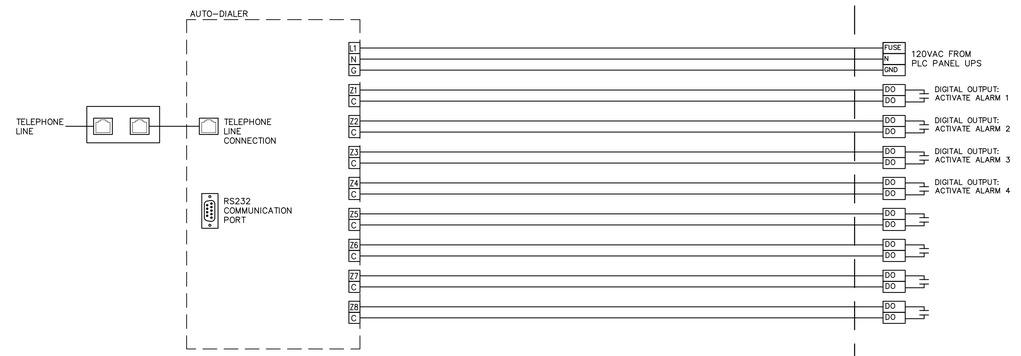
NOTES

⟨1⟩ CONNECT ALL ALARM SIGNALS AS FAIL SAFE FROM FIELD DEVICE TO PLC PANEL (i.e. ALARM SIGNAL TO OPERATE WHEN CONTACT SIGNAL OPENS OR AN OPEN WIRE CONDITION).

⟨2⟩ AUTODIALER IS NEW. CONTRACTOR TO INSTALL AUTODIALER IN WELL #1 PUMPHOUSE BUILDING AND PROVIDE ALL NECESSARY CONDUIT AND WIRING. CONTRACTOR TO PROVIDE ALL REQUIRED PROGRAMMING FOR ALARMS. ALARMS TO BE CONFIRMED DURING CONSTRUCTION.

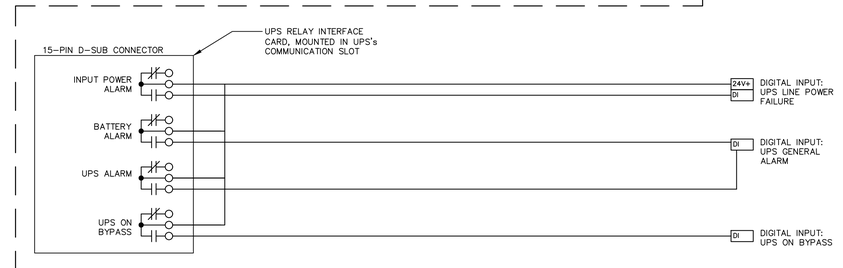
⟨3⟩ PROVIDE TYPE 4X JUNCTION BOX, SIZED TO SUIT. PROVIDE COMPRESSION CONNECTIONS COMPLETE WITH HEAT SHRINK AND WRAPPED WITH VULCANIZING TAPE TO "MAKE-SAFE" ALL WIRING CONNECTIONS AS REQUIRED BY OESC.

LOCATED IN FIELD ⟨2⟩ | MAIN PLC PANEL ⟨1⟩



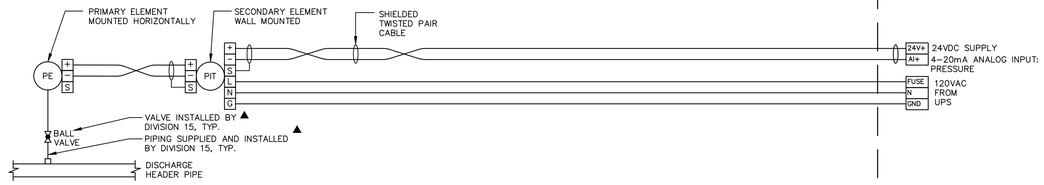
7 E3.2 AUTODIALER WIRING DIAGRAM ⟨2⟩

– NTS
– PROVIDE SPARE WIRING FOR ALL UNASSIGNED ALARMS TO PLC PANEL



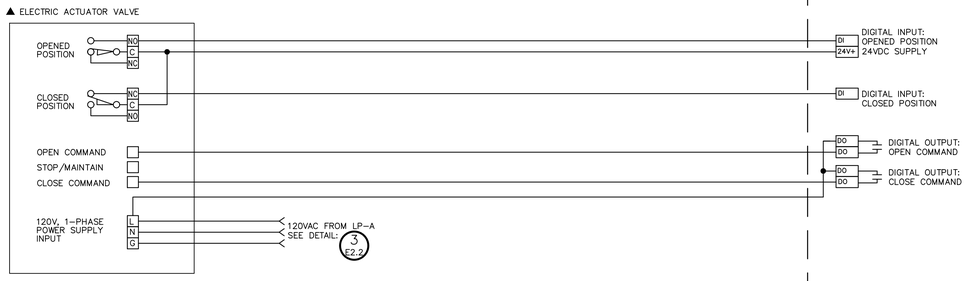
8 E3.2 PLC PANEL UPS WIRING INTERFACE DIAGRAM

– NTS
– UPS LOCATED IN PLC PANEL



9 E3.2 PRESSURE TRANSMITTER INSTRUMENT LOOP DIAGRAM

• DIAGRAM FOR PLANT DISTRIBUTION PRESSURE TRANSMITTER: PE/PIT-101



10 E3.2 ELECTRIC ACTUATED VALVE WIRING DIAGRAM

• DIAGRAM FOR MV-101

16066F-02

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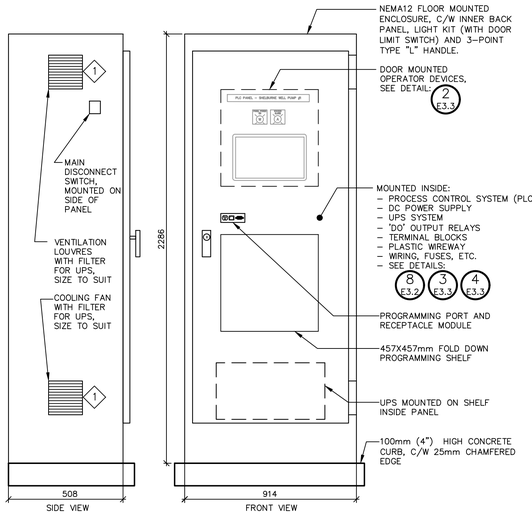
S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

DESIGNED BY	DRAWN BY	VERIFIED BY	DRAWING No.
S.R.T.	M.C.G.	G.G.R.	E3.2

SCALE	PROJECT No.
AS SHOWN	16066F-02

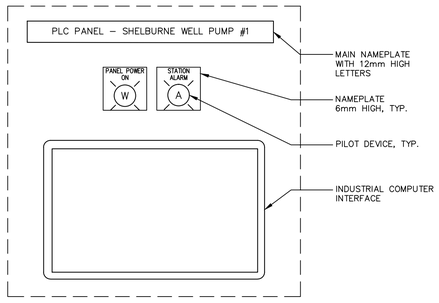
NOTES

1. CONTRACTOR TO PROVIDE PLC PANEL CIRCULATION VENTS, FAN AND FILTERS PER PANEL MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO REPLACE FILTERS AS PART OF COMMISSIONING DAY ACTIVITIES.
2. CONTRACTOR TO CONFIRM SIZE OF PLC PANEL AND INFORM ENGINEER OF ANY CHANGES BEFORE PURCHASE OF EQUIPMENT.
3. PROVIDE A TERMINAL BLOCK STYLE "CONTROL RELAY" FOR EACH PLC DIGITAL OUTPUT.
4. POWER SUPPLY FLOATING SWITCH CONTACT IS NORMALLY OPEN ENERGIZED CLOSED AND WILL OPEN WHEN POWER SUPPLY ALARM EXISTS.
5. INCLUDE AN ALARM CONTACT MODULE FOR UPS UNIT TO MONITOR FOR: LOSS OF NORMAL POWER, BATTERY ALARM, UPS ALARM AND UPS ON BYPASS.
6. PROVIDE MONITORING OF DIGITAL INPUT CARD POWER SUPPLY FOR EACH DIGITAL INPUT CARD. CONNECT TO LAST DIGITAL INPUT ON EACH CARD.
7. COMMUNICATION PROVIDER TO PROVDE MODEM. CONTRACTOR TO PROVIDE SHELF WITHIN PLC PANEL FOR MOUNTING OF MODEM. PROVIDE ALL NECESSARY WIRING FOR MODEM INCLUDING POWER CONNECTIONS AND PHONE JACKS.
8. PROVIDE INDUSTRIAL COMPUTER INTERFACE. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
9. RECEPTACLES LOCATED ON ANALYZER EQUIPMENT BACKBOARD.
10. CONTRACTOR TO COORDINATE WITH COMMUNICATIONS PROVIDER FOR FINAL LOCATION OF INCOMING TELEPHONE LINE CONNECTION. COORDINATE ALL WORK WITH ENGINEER AND MUNICIPALITY.
11. CONTROL SYSTEMS INTEGRATOR TO PROVIDE PHOENIX CONTACT CELLULAR RADIO AND ANTENNA. RADIO TO BE DIN RAIL MOUNTED WITHIN PLC PANEL. PROVIDE ALL NECESSARY WIRING INCLUDING POWER CONNECTIONS. RADIO FOR COMMUNICATION WITH THE MUNICIPALITY'S SCADA SYSTEM. FINAL MOUNTING OF ANTENNA TO BE CONFIRMED DURING CONSTRUCTION



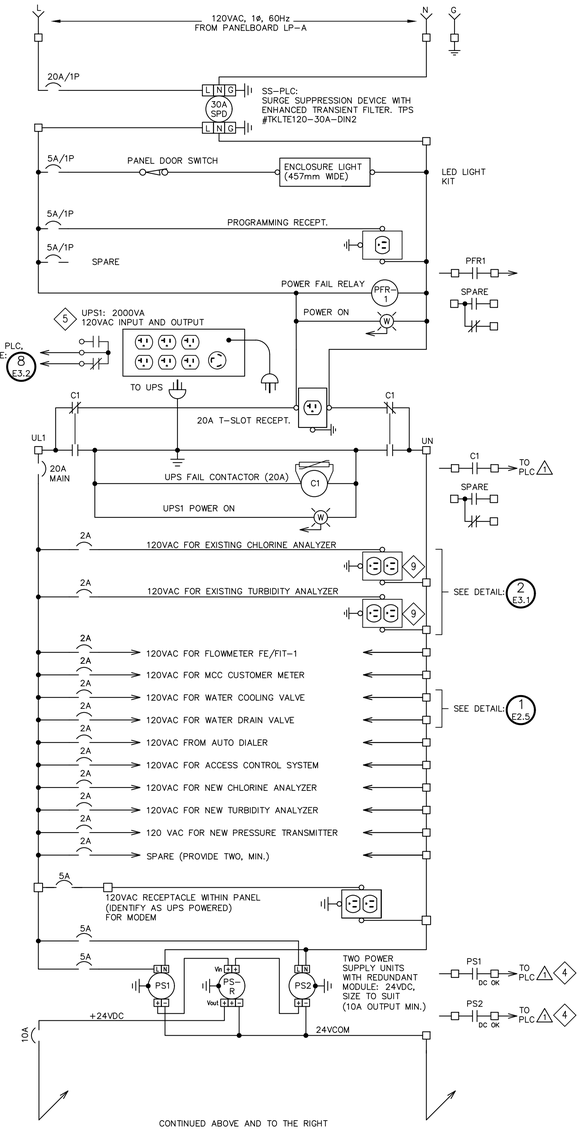
1 E3.3 PLC PANEL ARRANGEMENT 2

–NTS



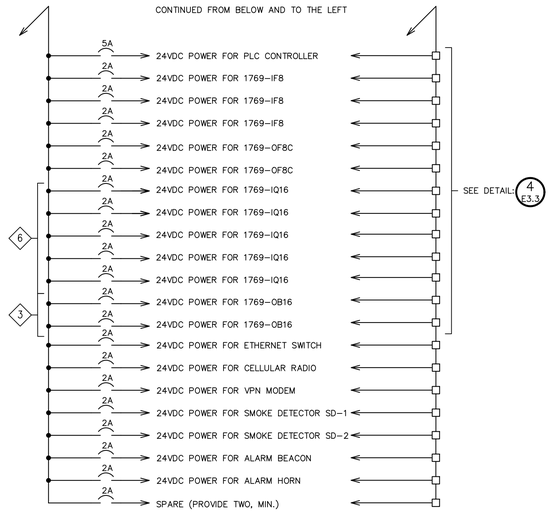
2 E3.3 PLC PANEL OPERATOR DEVICE LAYOUT

–NTS



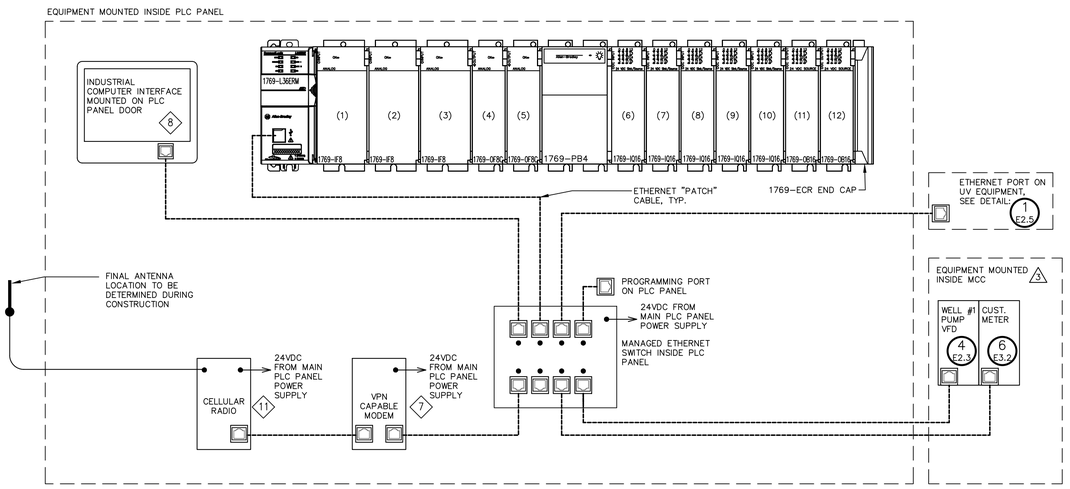
3 E3.3 PLC PANEL POWER DISTRIBUTION DIAGRAM

– ALL DEVICES SHOWN ARE LOCATED IN PLC PANEL
– CONTRACTOR TO CONFIRM ALL FUSE/BREAKER SIZES WITH EQUIPMENT SPECIFICATIONS
– POWER SUPPLY TO CELLULAR RADIO AND VPN MODEM TO BE CONFIRMED DURING CONSTRUCTION



3 E3.3 PLC PANEL POWER DISTRIBUTION DIAGRAM CONTINUED

– ALL DEVICES SHOWN ARE LOCATED IN PLC PANEL
– CONTRACTOR TO CONFIRM ALL FUSE/BREAKER SIZES WITH EQUIPMENT SPECIFICATIONS
– POWER SUPPLY TO CELLULAR RADIO AND VPN MODEM TO BE CONFIRMED DURING CONSTRUCTION



4 E3.3 PROCESS CONTROL (PLC) AND COMMUNICATION SYSTEM ARRANGEMENT DIAGRAM

– NTS

16066F-02

TATHAM ENGINEERING

LICENSED PROFESSIONAL ENGINEER — S. R. S. TAYLOR — 100518503 — 22JAN'26 — PROVINCE OF ONTARIO

No.	DATE	ISSUE/REVISION	No.	DATE	ISSUE/REVISION
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4.	01-22-2026	ISSUED WITH ADDENDUM #5			

CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: PLC PANEL DETAILS

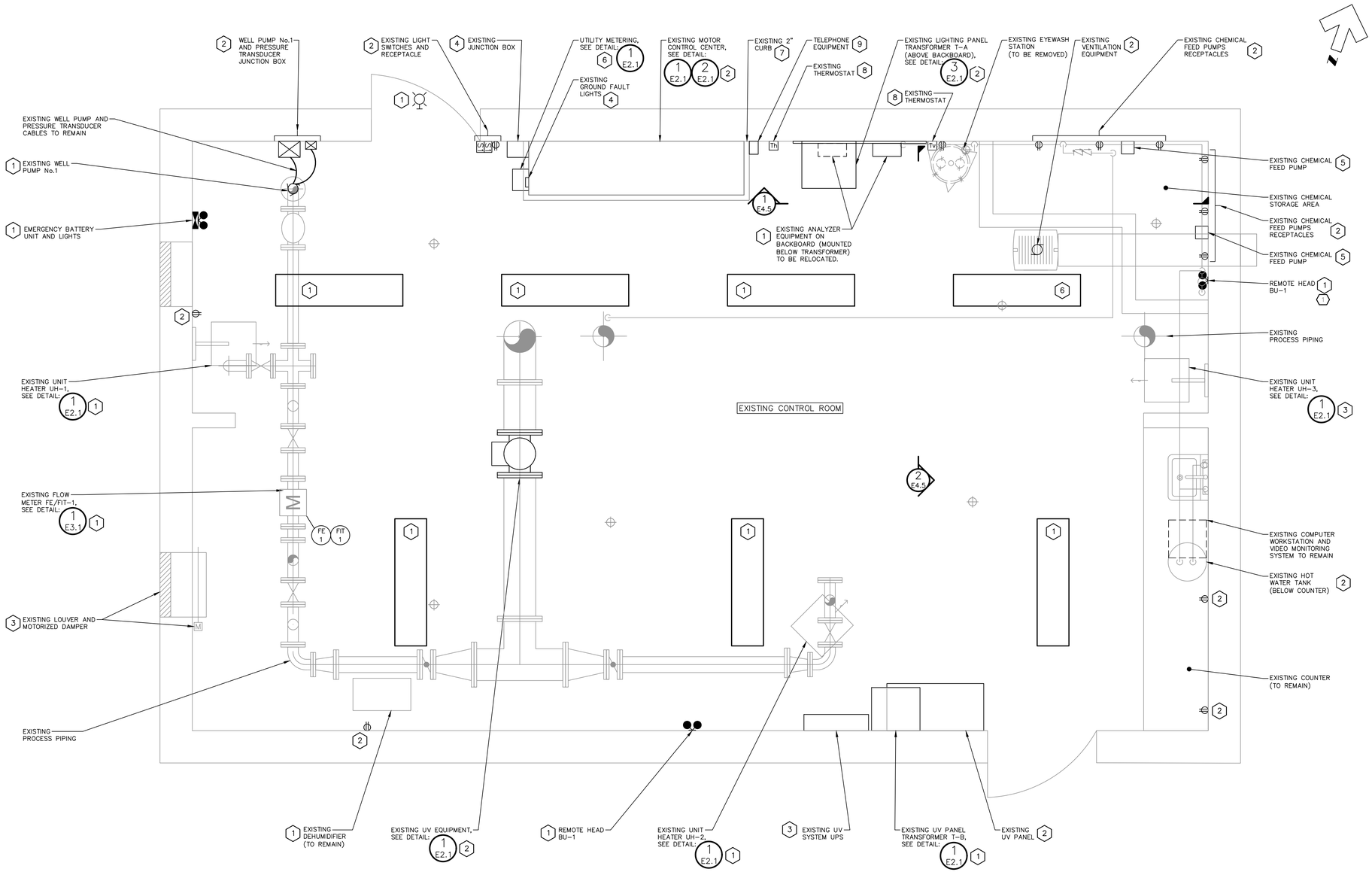
S.BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL
S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

DESIGNED BY	DRAWN BY	VERIFIED BY	DRAWING No.
S.R.T.	M.C.G.	G.G.R.	E3.3

SCALE	PROJECT No.
AS SHOWN	16066F-02

REMOVAL NOTES

1. EXISTING EQUIPMENT TO REMAIN, EXISTING CONDUIT AND WIRING TO BE REMOVED AND REPLACED WITH NEW.
2. EXISTING EQUIPMENT, CONDUIT AND WIRING TO BE REMOVED AND REPLACED WITH NEW. REFER TO CONTRACT DRAWINGS FOR ADDITIONAL INFORMATION.
3. CONTRACTOR TO INVESTIGATE EXISTING CONDITIONS AND DISCUSS WITH ENGINEER PRIOR TO PERFORMING WORK. IT IS ANTICIPATED EQUIPMENT TO REMAIN AND BE RE-CONNECTED TO NEW UV PANEL WITH NEW CONDUIT AND WIRING.
4. CONTRACTOR TO INVESTIGATE EXISTING CONDITIONS AND DISCUSS WITH ENGINEER PRIOR TO PERFORMING WORK TO CONFIRM DIRECTION. IT IS ANTICIPATED EQUIPMENT TO BE REMOVED. CONTRACTOR TO INCLUDE REMOVALS OF EQUIPMENT IN SCOPE OF WORK.
5. EXISTING CHEMICAL FEED PUMPS TO REMOVED AND REPLACED WITH NEW.
6. EXISTING EQUIPMENT TO REMAIN AND BE RELOCATED. PROVIDE NEW CONDUIT AND WIRING TO EQUIPMENT, ONCE RELOCATED.
7. EXISTING CONCRETE PAD TO BE RE-WORKED TO SUIT NEW MCC.
8. CONTRACTOR TO INVESTIGATE EXISTING CONDITIONS AND DISCUSS WITH ENGINEER PRIOR TO PERFORMING WORK TO CONFIRM DIRECTION. IT IS ANTICIPATED EQUIPMENT TO BE RELOCATED IN AN ALTERNATE LOCATION WITHIN CONTROL ROOM. CONTRACTOR TO INCLUDE RELOCATION OF EQUIPMENT IN SCOPE OF WORK. EXISTING THERMOSTAT TO OPERATE EXISTING UNIT HEATERS UH-1 AND UH-2. UH-3 TO BE PROVIDED WITH NEW THERMOSTAT.
9. CONTRACTOR TO COORDINATE THE RELOCATION OF THE EXISTING TELEPHONE EQUIPMENT WITH THE TOWN AND SERVICE PROVIDER. LOCATION TO BE CONFIRMED DURING CONSTRUCTION. LOCATION TO BE WITHIN CONTROL ROOM AND IS TO BE INCLUDED IN CONTRACTORS SCOPE OF WORK.



1/E4.1 BUILDING LAYOUT – EXISTING CONDITIONS

– NTS

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

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LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
22JAN'26
PROVINCE OF ONTARIO

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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: EXISTING BUILDING LAYOUT

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210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

DESIGNED BY	DRAWN BY	VERIFIED BY	DRAWING No.
S.R.T.	M.C.G.	G.G.R.	E4.1

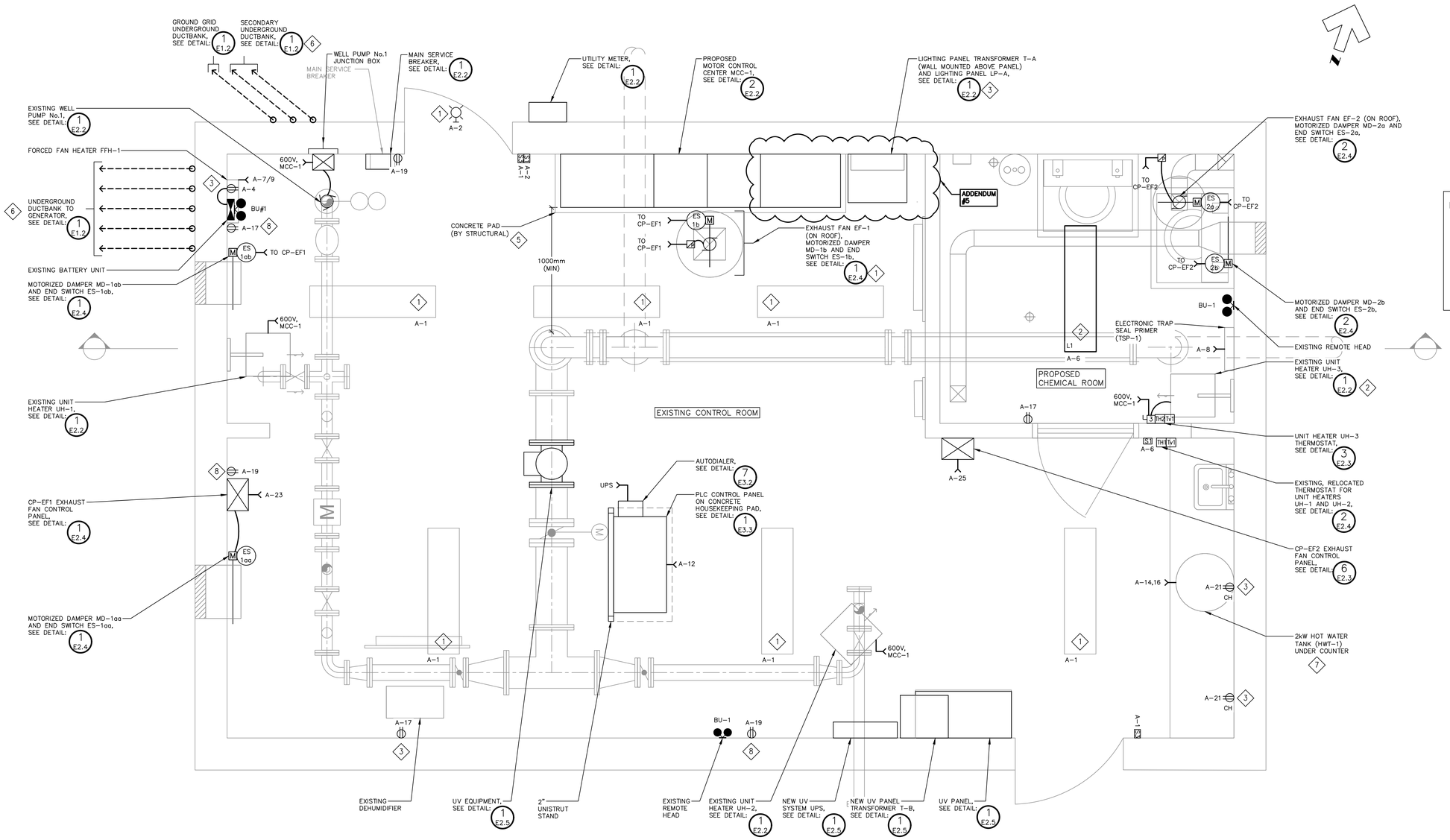
SCALE	PROJECT No.
AS SHOWN	16066F-02

NOTES

1. EXISTING EQUIPMENT TO REMAIN. PROVIDE NEW CONDUIT AND WIRE AND CONNECT TO NEW LIGHTING PANEL.
2. EXISTING EQUIPMENT TO BE RELOCATED. RELOCATE AND PROVIDE NEW CONDUIT AND WIRE AND CONNECT TO NEW LIGHTING PANEL.
3. EXISTING EQUIPMENT, CONDUIT AND WIRING TO BE REMOVED AND REPLACED WITH NEW. REFER TO CONTRACT DRAWINGS FOR ADDITIONAL INFORMATION.
4. NOT USED.
5. CONCRETE PAD TO BE RE-WORKED TO SUIT NEW MCC.
6. CONTRACTOR TO COORDINATE THE RELOCATION OF THE EXISTING TELEPHONE EQUIPMENT WITH THE TOWN AND SERVICE PROVIDER. LOCATION IS APPROXIMATE AND TO BE CONFIRMED DURING CONSTRUCTION.
7. EQUIPMENT INSTALLED BY DIVISION 15 WITH CONDUIT AND WIRING PROVIDED BY DIVISION 16.
8. EQUIPMENT IS NEW, PROVIDE NEW CONDUIT AND WIRING TO NEW EQUIPMENT FROM LIGHTING PANEL.
9. EXISTING EQUIPMENT TO REMAIN. PROVIDE NEW CONDUIT AND WIRE AND CONNECT TO NEW PLC PANEL.

LUMINAIRE SPECIFICATIONS

LUMINAIRE LABEL:	L1
MANUFACTURER:	ILP
MODEL:	WTZ AMAZON SERIES
MODEL NUMBER:	WTZ4-6L-U-40-RAFL-SS-SP10
VOLTAGE:	120V
LUMINAIRE LUMENS:	4000
WATTAGE:	47W
COLOR TEMPERATURE:	3000K
MOUNTING:	CEILING SURFACE
COLOR:	WHITE
OPTIONS:	STAINLESS STEEL BRACKETS



1 E4.2 BUILDING LAYOUT – POWER & LIGHTING PROPOSED CONDITIONS

– SCALE 1:20

16066F-02

TATHAM ENGINEERING

LICENSED PROFESSIONAL ENGINEER S. R. S. TAYLOR 100518503 22JAN'26 PROVINCE OF ONTARIO

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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: PROPOSED BUILDING LAYOUT - POWER & LIGHTING

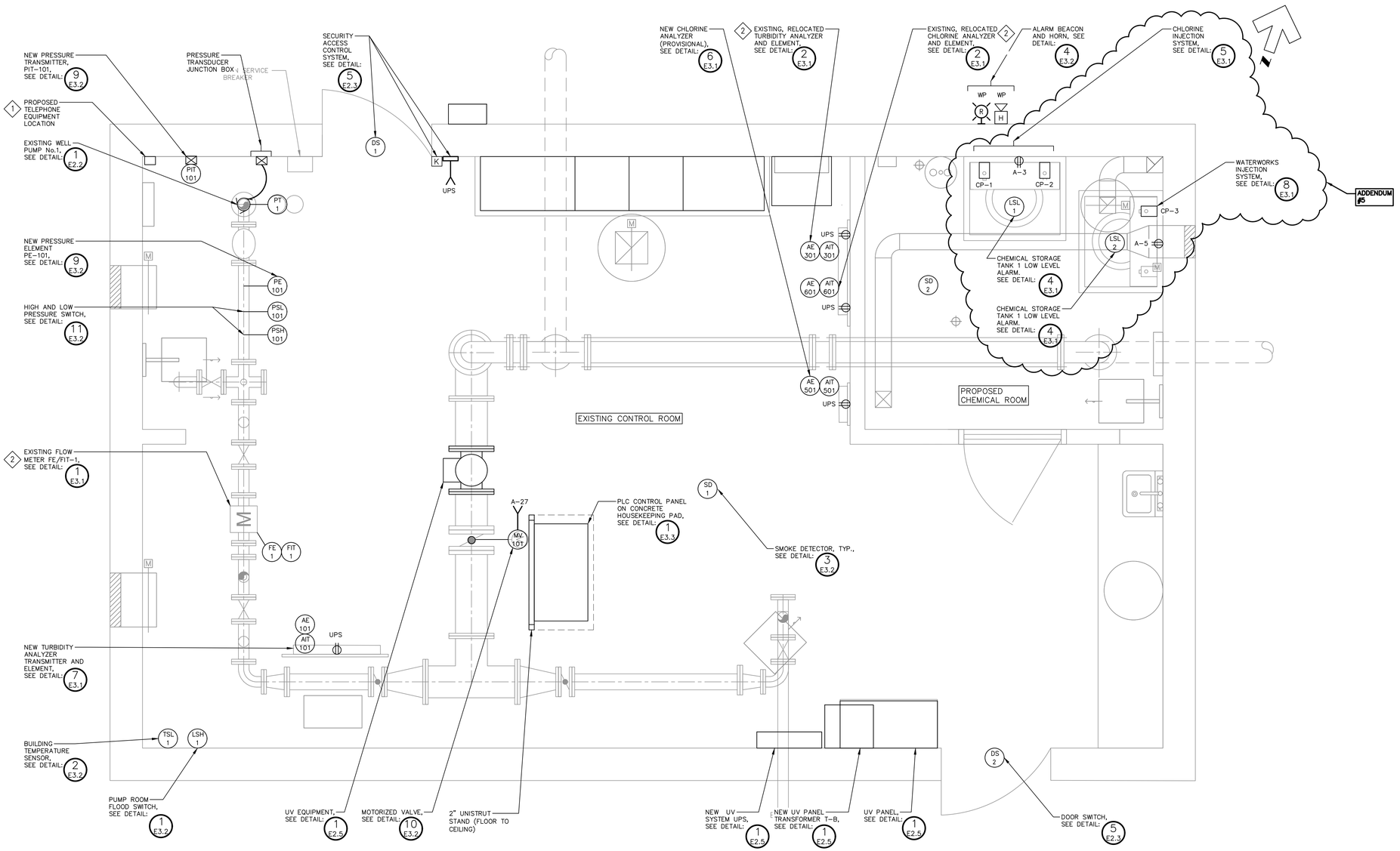
S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

DESIGNED BY	DRAWN BY	VERIFIED BY	DRAWING No.
S.R.T.	M.C.G.	G.G.R.	E4.2

SCALE	PROJECT No.
AS SHOWN	16066F-02

NOTES

1. CONTRACTOR TO COORDINATE THE RELOCATION OF THE EXISTING TELEPHONE EQUIPMENT WITH THE TOWN AND SERVICE PROVIDER. LOCATION IS APPROXIMATE AND TO BE CONFIRMED DURING CONSTRUCTION.
2. EXISTING EQUIPMENT TO REMAIN. PROVIDE NEW CONDUIT AND WIRE AND CONNECT TO NEW PLC PANEL. FINAL LOCATION TO BE CONFIRMED DURING CONSTRUCTION.



1 E4.3 **BUILDING LAYOUT – INSTRUMENTATION PROPOSED CONDITIONS**

– SCALE 1:20

16066F-02

TATHAM ENGINEERING

LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
22JAN'26
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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: PROPOSED BUILDING LAYOUT - INSTRUMENTATION

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210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

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S.R.T.	M.C.G.	G.G.R.	E4.3

SCALE	PROJECT No.
AS SHOWN	16066F-02

NOTES

1. CORE DRILL HOLE THROUGH WALL AVOIDING WOOD STUDS, WHERE APPLICABLE. PROVIDE WATERPROOF SEALANT AROUND DUCTS TO INSULATE CONTROL ROOM FROM BUILDING EXTERIOR. REFER TO STRUCTURAL FOR ADDITIONAL INFORMATION.
2. CONDUIT ENTRY INTO EXISTING CONTROL BUILDING TO BE COORDINATED DURING CONSTRUCTION TO SUIT INSTALLATION AND INTERFERENCES WITH EXISTING EQUIPMENT.

1 E4.4 BUILDING SECTION VIEW – NORTH WALL
– NTS

2 E4.4 BUILDING SECTION VIEW – EAST WALL
– NTS

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TATHAM ENGINEERING

LICENSED PROFESSIONAL ENGINEER
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100518503
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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: BUILDING EXTERIOR PICTURES

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING AND ENVIRONMENTAL SERVICES
210 BROADWAY, UNIT 203
ORANGEVILLE, ONTARIO L9W 5G4
TELEPHONE: 519-941-2949 FAX: 519-941-2036

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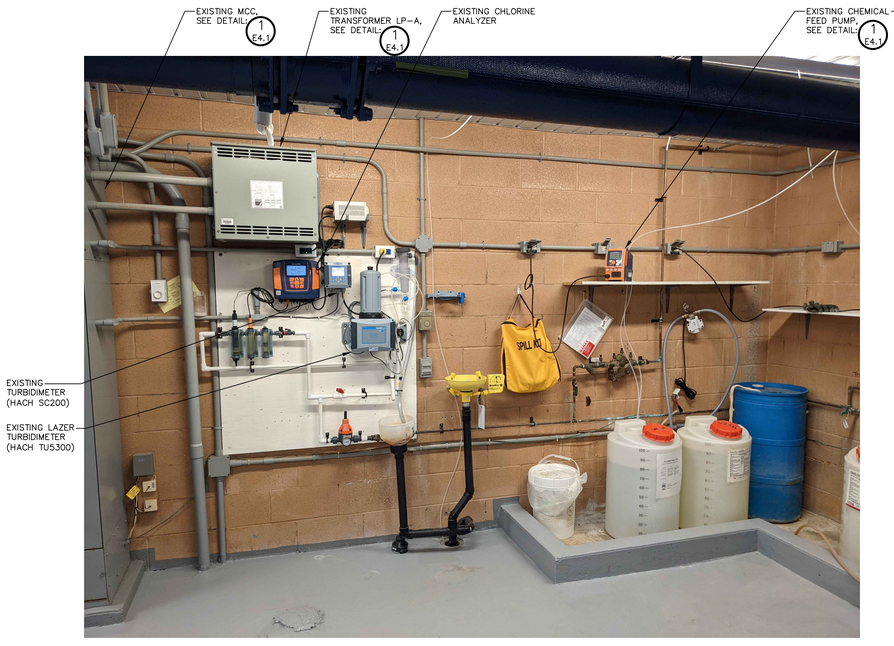

1 E4.5 CHEMICAL EQUIPMENT PICTURE – NORTH WALL
– NTS

2 E4.5 CHEMICAL EQUIPMENT PICTURE – EAST WALL
– NTS

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CLIENT: TOWN OF SHELBURNE

PROJECT: WELL #1 PUMPHOUSE EXPANSION

DRAWING TITLE: BUILDING INTERIOR PICTURES

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SCALE	PROJECT No.
AS SHOWN	16066F-02