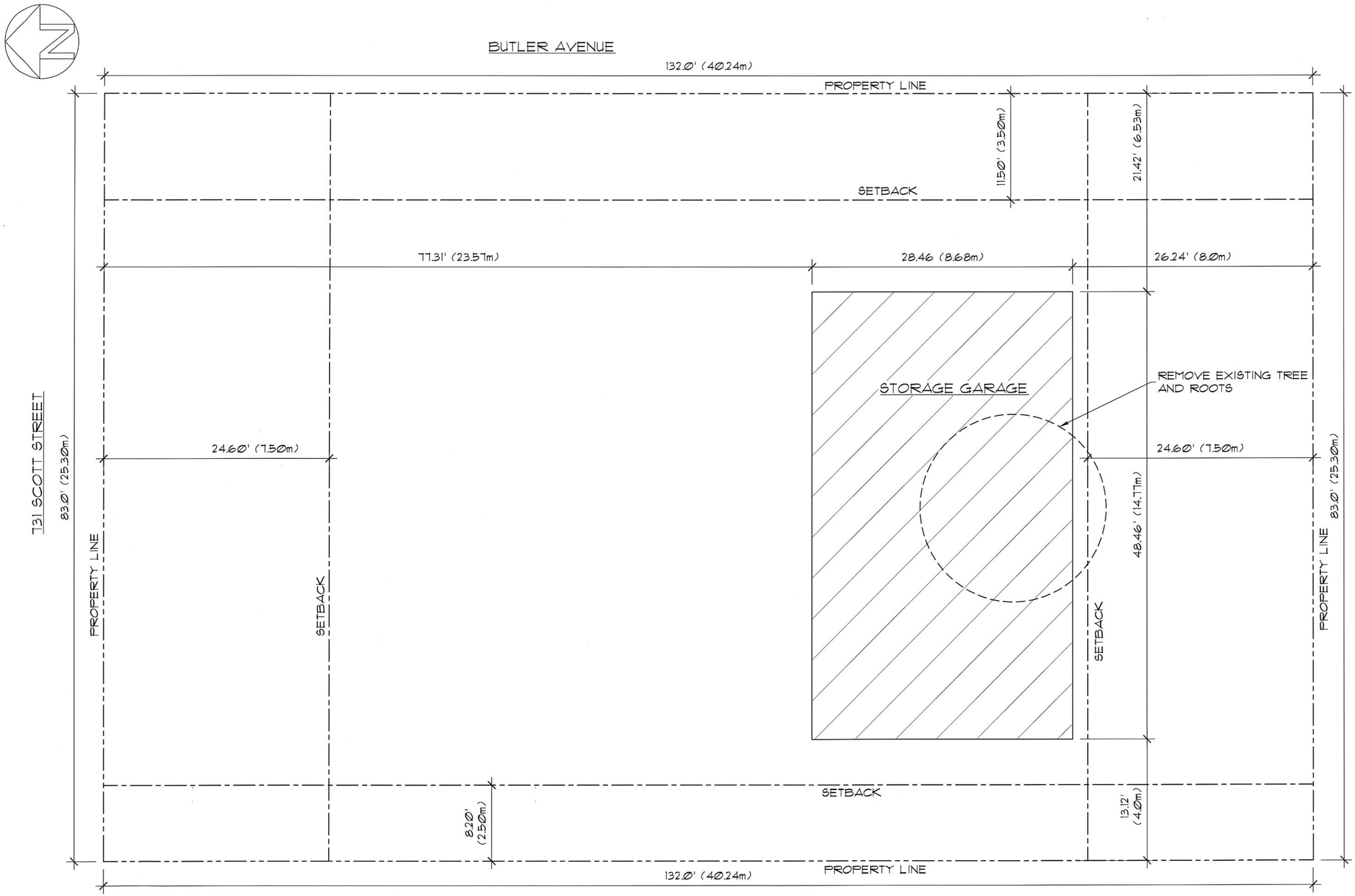


SITE PLAN
SCALE: 1" = 10'-0"

MARK	DESCRIPTION	DATE	BY
1	ISSUED FOR TENDER/CONSTRUCTION	19.10.03	DZ

REVISION RECORD

SAULTEAUX CONSULTING & ENGINEERING
SITE 206-207 RR#2
FORT FRANCES, ONTARIO
P9A 3M3
1-807-274-7114

SCE

BCIN: 43291

SHEET TITLE: SITE PLAN

PROJECT TITLE: STORAGE GARAGE FOR RRDSSAB
731 SCOTT ST., FORT FRANCES, ON

DRAWN BY:	DATE:
M.S.	19/07/03
CHECKED BY: T.K.B. D.Z.	PROJECT NO. 18-050
SHEET NO. SP1	REV. NO. -

1. GENERAL NOTES:

1.1. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE 2012 ONTARIO BUILDING CODE (AS AMENDED).

1.2. CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK. DO NOT SCALE THESE DRAWINGS.

1.3. DRAWINGS OF A LARGER SCALE SHALL TAKE PRECEDENCE OVER DRAWINGS OF A SMALLER SCALE.

1.4. THESE DRAWINGS ARE THE PROPERTY OF SAULTEAUX CONSULTING & ENGINEERING (SCE). UNAUTHORIZED REPRODUCTIONS OF THESE DRAWINGS IS PROHIBITED WITHOUT THE CONSENT OF SCE.

2. SOIL AND EXCAVATION:

2.1. EXCAVATION SHALL BE DOWN TO UNDISTURBED SOIL. REMOVE TOPSOIL AND ORGANIC MATERIAL.

2.2. WHERE ORGANIC MATERIAL IS ENCOUNTERED BELOW THE EXCAVATION LEVEL, EXCAVATE TO THE DEPTH OF THE MATERIAL AND REMOVE. REPLACE WITH GRANULAR "A" MATERIAL AND COMPACT TO 98% PROCTOR IN 6" LIFTS.

2.3. BEARING CAPACITY OF SOIL IS ASSUMED TO BE 75 KPa (1500 PSF) UNLESS OTHERWISE NOTED. FOOTINGS SHALL BEAR ON SIMILAR TYPE OF SOIL THROUGHOUT.

3. WOOD, FRAMING AND FASTENERS:

3.1. ALL STRUCTURAL FRAMING MEMBERS SHALL BE #1 OR #2 GRADE SPRUCE/PINE/FIR.

3.2. ALL WOOD IN CONTACT WITH CONCRETE SHALL EITHER BE PRESSURE TREATED OR PROTECTED BY 6 MIL CGSB VAPOUR BARRIER.

3.3. ALL WOOD IN CONTACT WITH THE GROUND SHALL BE PRESSURE TREATED.

3.4. ROOF TRUSSES SHALL BE DESIGNED AND APPROVED BY A PROFESSIONAL ENGINEER LICENSED IN ONTARIO, AND ACCOMPANIED BY STAMPED DRAWINGS. BRACING SHALL BE INSTALLED AS PER TRUSS SHOP DRAWINGS. SUBMIT SHOP DRAWINGS TO SCE FOR REVIEW PRIOR TO FABRICATION.

3.5. ANCHOR BOLTS SHALL BE MIN. 1/2" DIA. x 7" LONG SIMPSON WEDGE-ALL ANCHORS OR EQUIVALENT, SPACED AT 48" O/C.

3.6. ALL WINDOW AND DOOR LINTELS TO BE MIN. 2 PLY 2x10, C/W SINGLE 2x6 CRIPPLE STUD ON EITHER SIDE OF OPENING, UNLESS OTHERWISE NOTED. WHERE 3 PLY HEADERS OR ENGINEERED LINTELS ARE NOTED, THEY SHALL BEAR ON DOUBLE CRIPPLE STUDS ON EITHER SIDE OF THE OPENING.

3.7. USE SIMPSON STRONG TIE TRUSS CLIPS (OR EQUIVALENT) WHERE REQUIRED. INSTALL AS PER MANUFACTURERS REQUIREMENTS.

4. STEEL:

4.1. ALL REINFORCING STEEL SHALL HAVE A MINIMUM YIELD STRENGTH OF 400 MPa. LAP ALL REINFORCING STEEL A MINIMUM 45 BAR DIAMETERS.

4.2. PROVIDE A MINIMUM OF 3" CONCRETE COVER OVER REINFORCING STEEL WHERE CONCRETE IS IN CONTACT WITH SOIL AND A MINIMUM 2" COVER ELSEWHERE.

5. CONCRETE:

5.1. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH OF 32 MPa.

5.2. WHEN THE AIR TEMPERATURE IS BELOW 5°C, CONCRETE SHALL BE KEPT AT A TEMPERATURE OF NOT LESS THAN 10°C OR MORE THAN 25°C WHILE BEING MIXED AND PLACED.

5.3. FOR THE FIRST 72 HOURS AFTER PLACING, CONCRETE SHALL BE MAINTAINED AT A TEMPERATURE OF NOT LESS THAN 10°C.

5.4. WHEN MIXING CONCRETE, NO FROZEN MATERIAL OR ICE SHALL BE USED.

6. ENVIRONMENTAL SEPARATION:

6.1. INSTALL EXTERIOR WALL AND ROOF CLADDING AS PER MANUFACTURERS REQUIREMENTS.

6.2. WALL CLADDING TO BE WESTMAN STEEL 26 GAUAGE TOUGH RIB PRE-FINISHED METAL (COLOUR TO BE SELECTED)

6.3. ROOF CLADDING TO BE WESTMAN 29 GAUGE TOUGH RIB METAL (GALVALUME).

6.4. EAVESTROUGH TO BE 5" CONTINUOUS ALUMINUM C/W DOWNSPOUTS AS SHOWN. (COLUR TO MATCH FASCIA)

6.5. EVERY VAPOUR BARRIER JOINT SHALL LAP NO LESS THAN 4" AND SHALL BE SEALED OR SUPPORTED BY FRAMING.

6.6. DRIP FLASHING SHALL BE APPLIED OVER EXTERIOR WALL OPENINGS WHERE THE VERTICAL DISTANCE FROM THE BOTTOM OF THE EAVE TO THE TOP OF THE TRIM IS MORE THAN 1/4 OF THE HORIZONTAL OVERHANG OF THE EAVE.

6.7. FLASHING SHALL BE INSTALLED SO THAT IT EXTENDS UPWARDS NOT LESS THAN 2" BEHIND THE AIR BARRIER AND FORMS A DRIP ON THE OUTSIDE EDGE, C/W END DAMS.

7. ENERGY EFFICIENCY REQUIREMENTS:

7.1. AS PER 1.1.1.1.(3)(d) OF SB-10, DIVISION 5, THE BUILDING IS NOT INTENDED FOR OCCUPANCY ON A CONTINUING BASIS DURING THE WINTER MONTHS. THEREFORE, IT IS EXEMPT FROM THE REQUIREMENTS OF SB-10 OF THE OBC (AS AMENDED).

7.2. RIGID INSULATION TO BE MIN. TYPE II, EXTRUDED POLYSTYRENE, WITH A MINIMUM COMPRESSIVE STRENGTH OF 15 PSI AND SHALL BE IN ACCORDANCE WITH CAN/ULC-S701 "THERMAL INSULATION, POLYSTYRENE, BOARDS AND PIPE COVERING".

8. OVERHEAD DOORS:

8.1. D1 AND D2 ARE TO BE OVERHEAD DOOR INSULATED SECTIONAL STEEL-BACK DOOR 470 C/W 2-24"X12" DOUBLE GLAZED WINDOWS.

8.2. D5 SHALL BE WAYNE DALTON GARAGE DOORS CLASSIC STEEL DOOR 9100 C/W 2-24"X12" DOUBLE GLAZED WINDOWS.

MARK	DESCRIPTION	YR/M/D	BY
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	ISSUED FOR TENDER/CONSTRUCTION	19/07/03	DZ

REVISION RECORD

SAULTEAUX CONSULTING & ENGINEERING
SITE 206-207 RR#2
FORT FRANCES, ONTARIO
P9A 3M3
1-807-274-7114

SCE

BCIN: 43291

SHEET TITLE: GENERAL NOTES

PROJECT TITLE: STORAGE GARAGE FOR RRDSSAB
737 SCOTT ST., FORT FRANCES, ON

DRAWN BY:	DATE:
M.S.	19/07/03
CHECKED BY: TKB/D.Z.	PROJECT NO. 18-050
SHEET NO. 1	REV. NO. –

48'-0" O/O CONC.

A

4'-0"

1'-6"
SF2

SLOPE TO DOOR

SLAB CONSTRUCTION
4" CONC. SLAB (32 MPa) R/W
10M BARS @ 24" O/C E/W
6 MIL CGSB VAPOUR BARRIER
2" RIGID INSULATION
MIN. 10" COMPACT GRANULAR
"B" MATERIAL
UNDISTURBED SOIL

SLOPE TO DOOR

1'-0"
SF1

28'-0" O/O CONC.

1'-0"
SF1

FOUNDATION NOTES:

SF1:
1'-0"x1'-6"D CONC. CLUB FOOTING R/W 2 ROWS 15M BARS T&B C/W 10M STIRRUPS @ 24" O/C

SF2:
1'-6"x1'-6"D CONC. CLUB FOOTING R/W 3 ROWS 15M BARS T&B C/W 10M STIRRUPS @ 24" O/C

SLOPE TO DOOR

1'-6"
SF2

LICENSED PROFESSIONAL ENGINEER
T. K. BRUYERE
19/07/03
PROVINCE OF ONTARIO

OUTLINE OF 2" THICK RIGID INSULATION (TYP. ALL AROUND)

A

OVERLAP INSULATION @ CORNERS (TYP.)

FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

MARK	DESCRIPTION	BY
1	ISSUED FOR TENDER/CONSTRUCTION 19/07/03	DZ
1		TRMID
1		
1		
1		

REVISION RECORD

SAULTEAUX CONSULTING & ENGINEERING
SITE 206-207 RR#2
FORT FRANCES, ONTARIO
P9A 3M3
1-807-274-7114

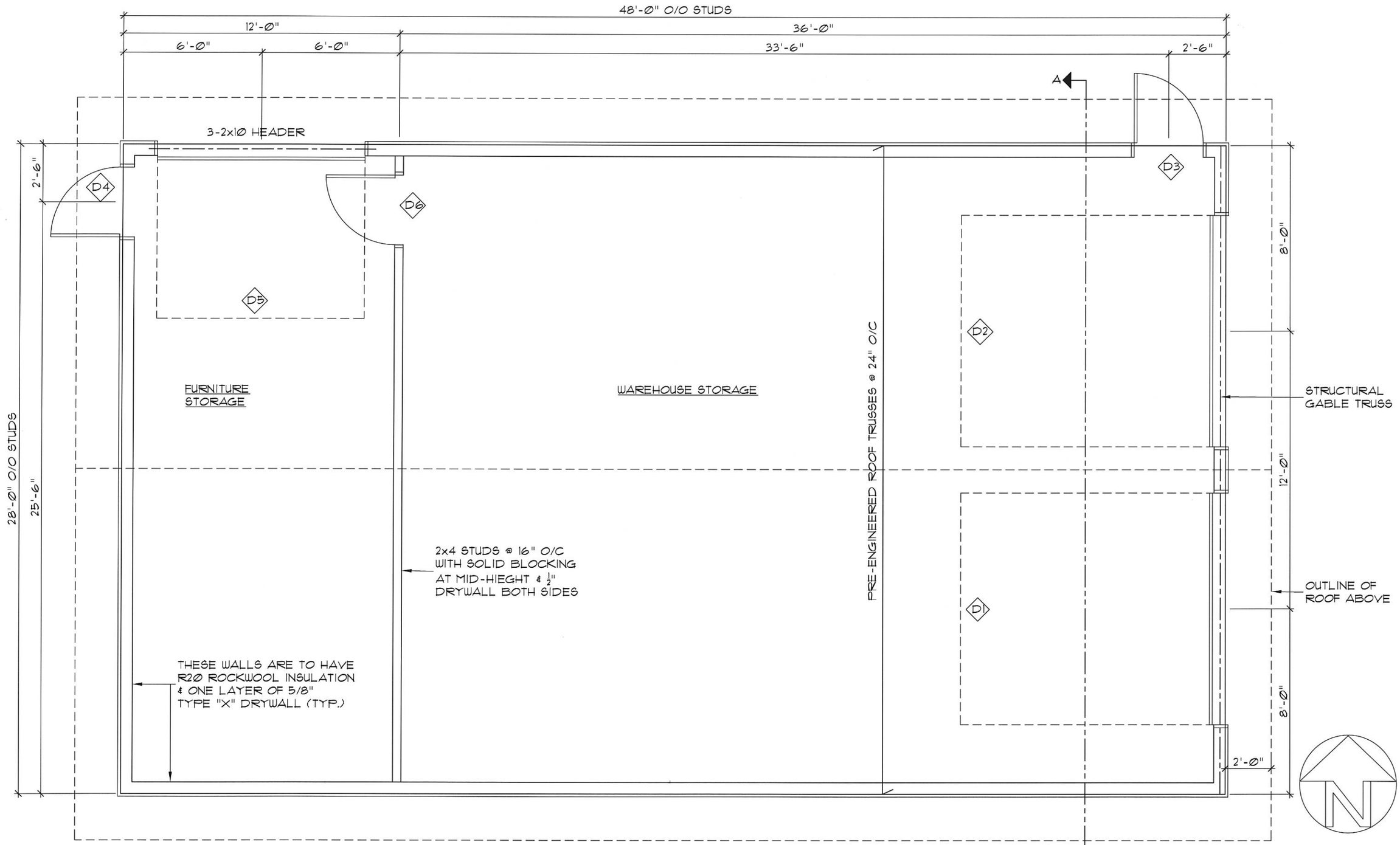
SCE

BCIN: 43291

SHEET TITLE: FOUNDATION PLAN

PROJECT TITLE: STORAGE GARAGE FOR RRDSSAB 737 SCOTT ST., FORT FRANCES, ON

DRAWN BY:	DATE:
M.S.	19/07/03
CHECKED BY: TKB. D.Z.	PROJECT NO. 18-050
SHEET NO. 2	REV. NO. -



FLOOR PLAN

SCALE: 1/4" = 1'-0"

MARK	DESCRIPTION	BY
	ISSUED FOR TENDER/CONSTRUCTION 19/07/03	DZ

REVISION RECORD

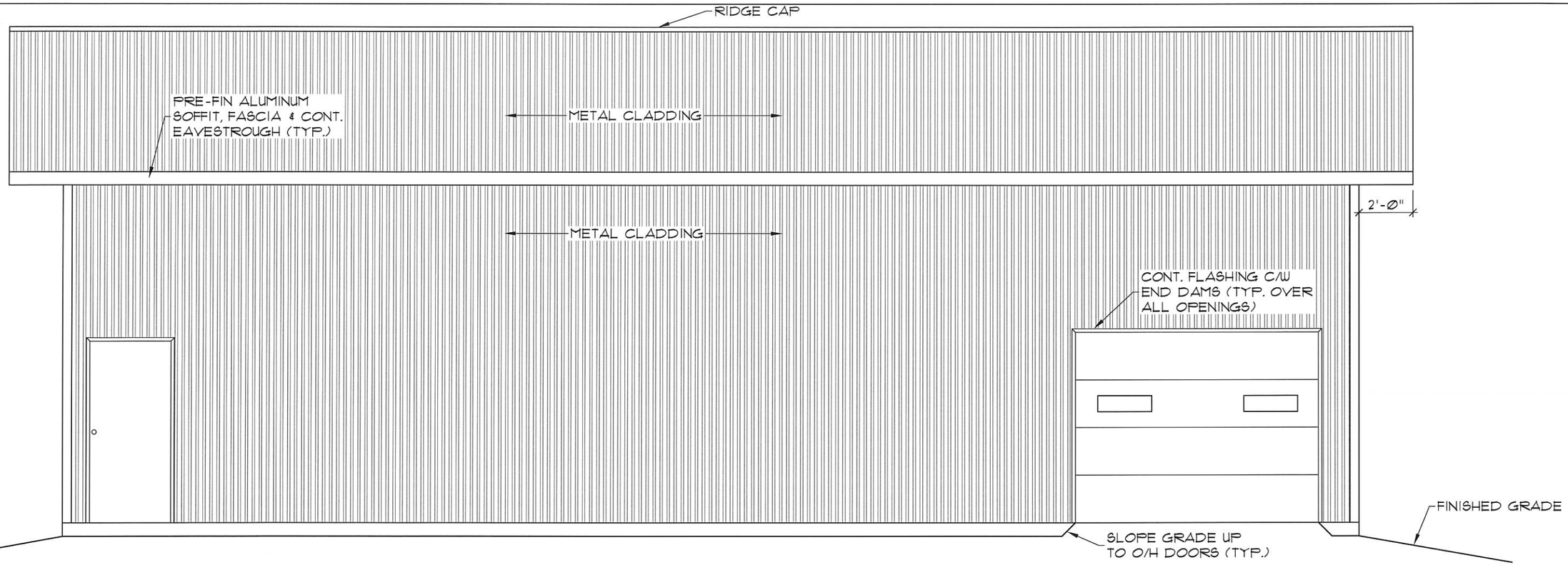
SAULTEAUX CONSULTING & ENGINEERING
SITE 206-207 RR#2
FORT FRANCES, ONTARIO
P9A 3M3
1-807-274-7114
SCE

BCIN: 43291

SHEET TITLE: FLOOR PLAN

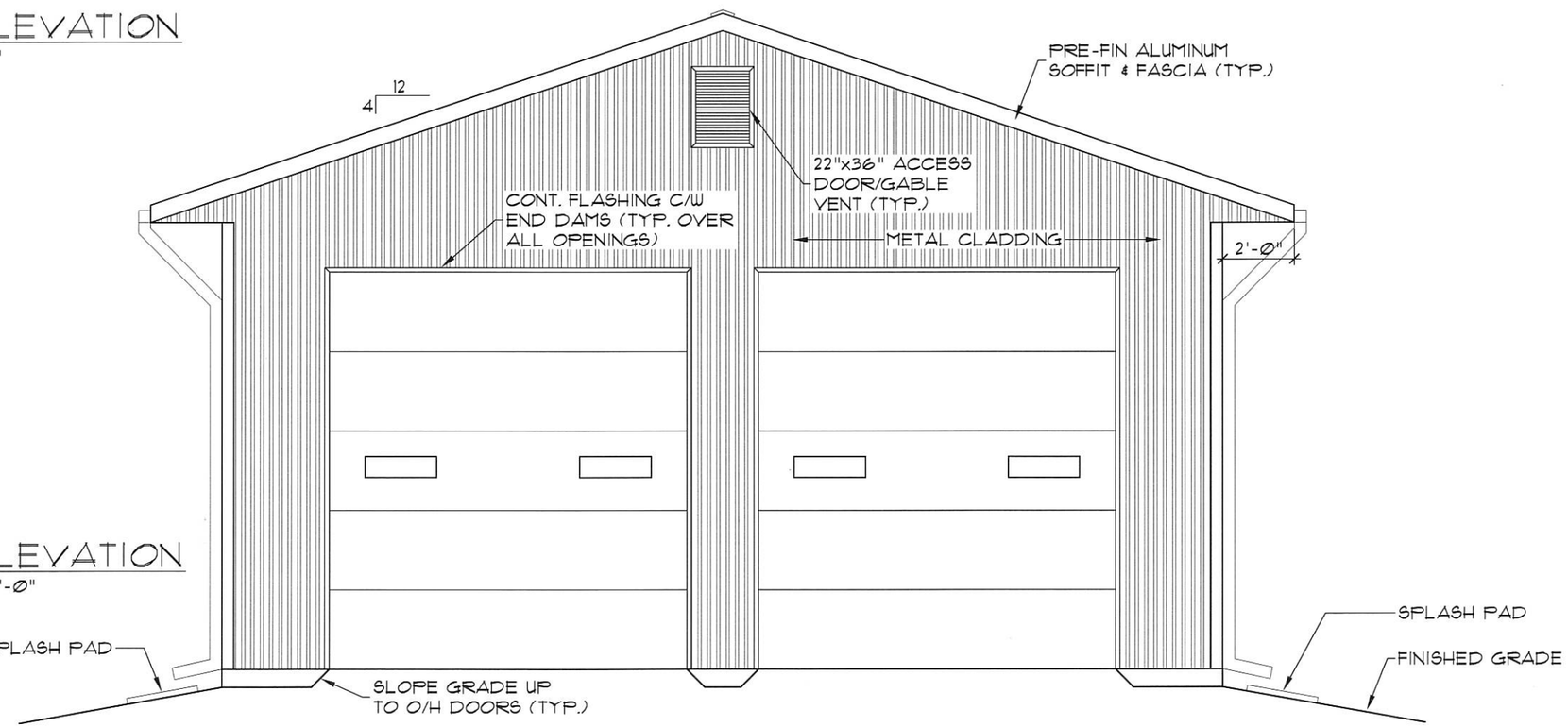
PROJECT TITLE: STORAGE GARAGE FOR RRDSSAB 737 SCOTT ST., FORT FRANCES, ON

DRAWN BY:	DATE:
M.S.	19/07/03
CHECKED BY: T.K.B. D.Z.	PROJECT NO. 18-050
SHEET NO. 3	REV. NO. -



NORTH ELEVATION

SCALE: 1/4" = 1'-0"



EAST ELEVATION

SCALE: 1/4" = 1'-0"

MARK	DESCRIPTION	BY
	ISSUED FOR TENDER/CONSTRUCTION 19/07/03	DZ

REVISION RECORD

SAULTEAUX CONSULTING & ENGINEERING

SITE 206-207 RR#2
FORT FRANCES, ONTARIO
P9A 3M3
1-807-274-7114

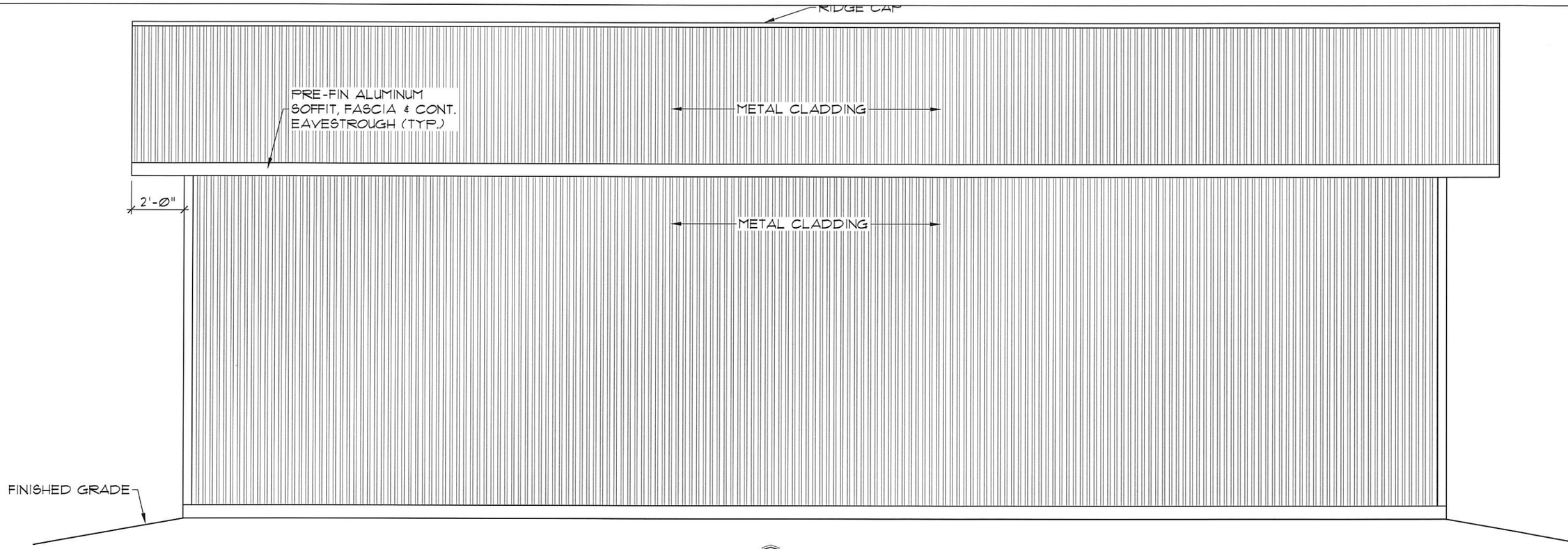
SCE

BCIN: 43291

SHEET TITLE: NORTH AND EAST ELEVATIONS

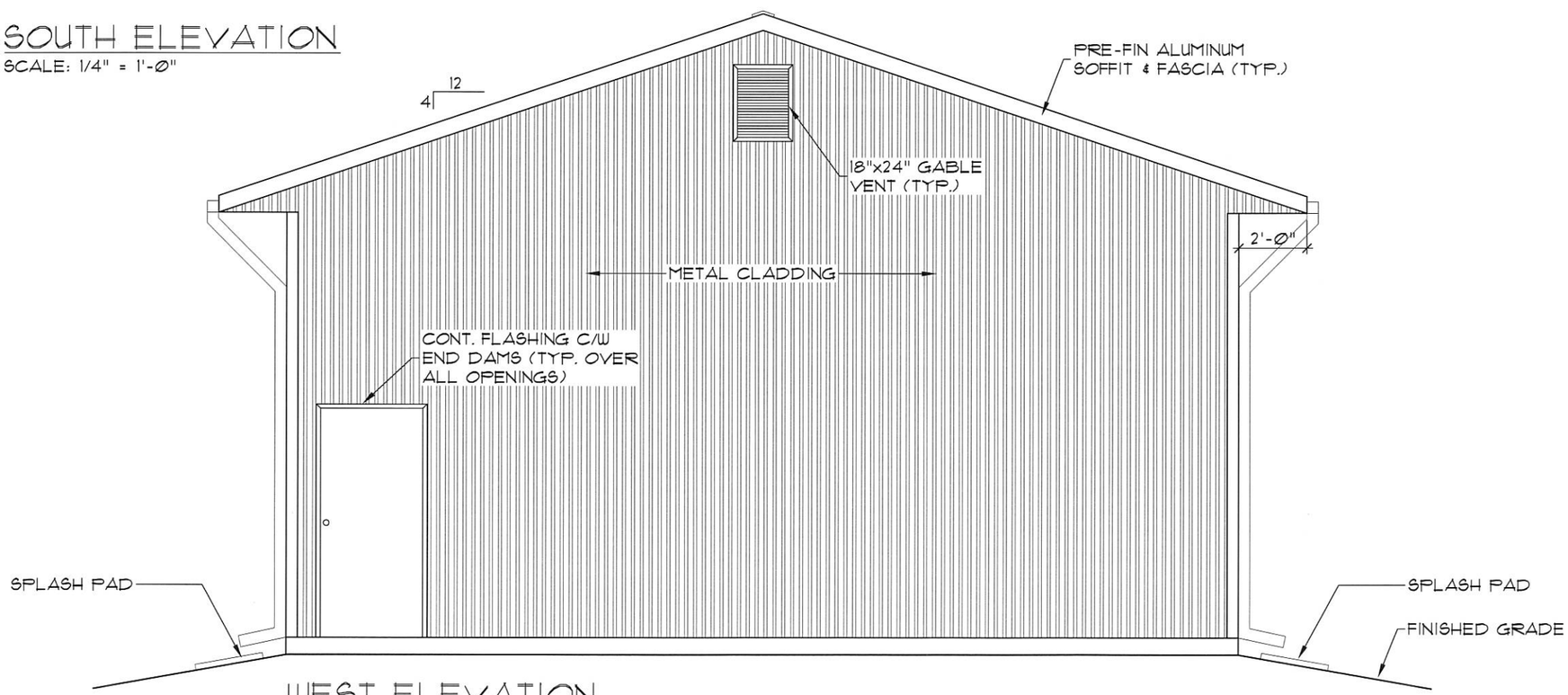
PROJECT TITLE: STORAGE GARAGE FOR RRDSSAB 737 SCOTT ST., FORT FRANCES, ON

DRAWN BY: M.S.	DATE: 19/07/03
CHECKED BY: T.K.B. D.Z.	PROJECT NO. 18-050
SHEET NO. 4	REV. NO. -



SOUTH ELEVATION

SCALE: 1/4" = 1'-0"



WEST ELEVATION

SCALE: 1/4" = 1'-0"

MARK	DESCRIPTION	YR M D	BY
	ISSUED FOR TENDER/CONSTRUCTION	19 07 03	DZ

REVISION RECORD

SAULTEAUX CONSULTING & ENGINEERING
SITE 206-207 RR#2
FORT FRANCES, ONTARIO
P9A 3M3
1-807-274-7114

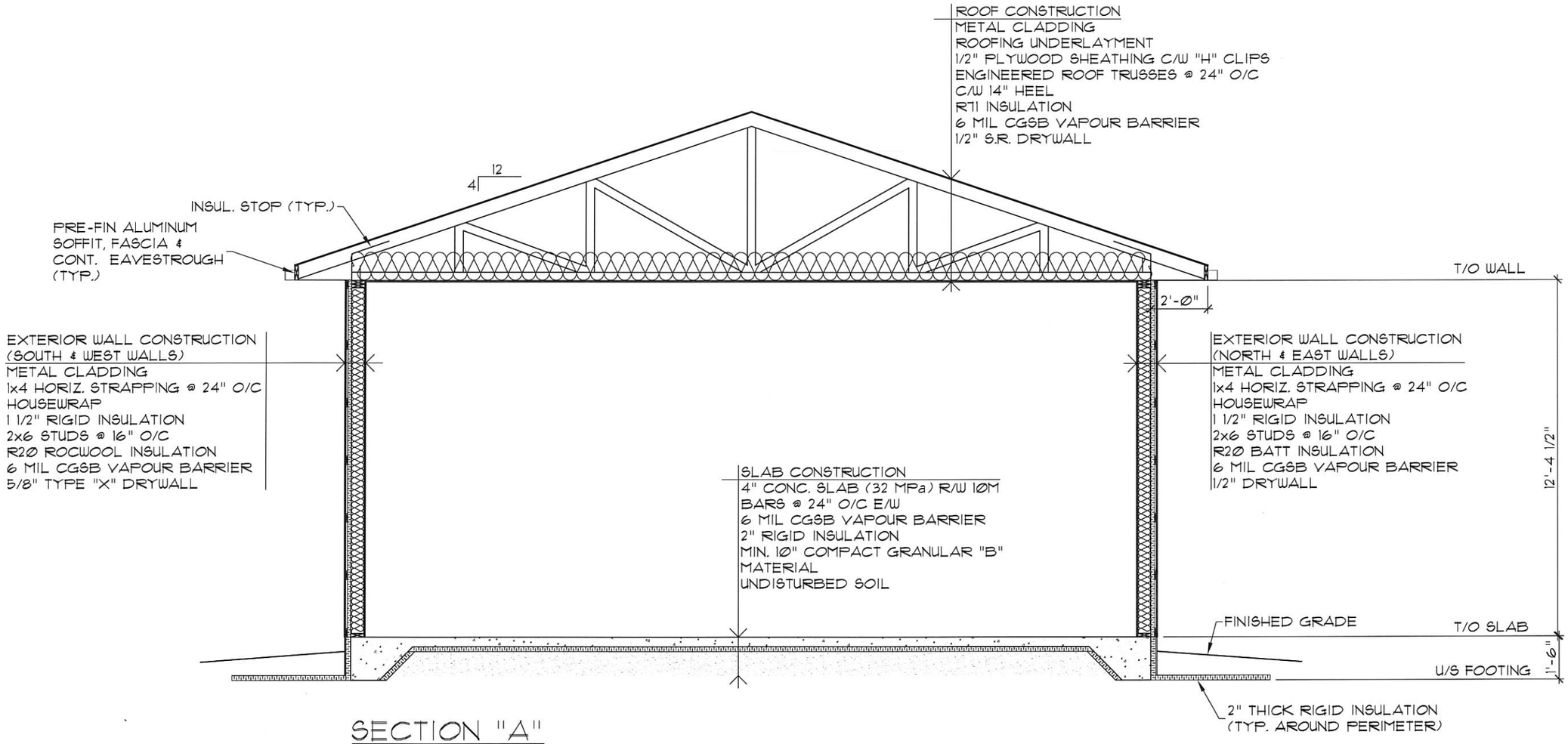
SCE

BCIN: 43291

SHEET TITLE: SOUTH AND WEST ELEVATIONS

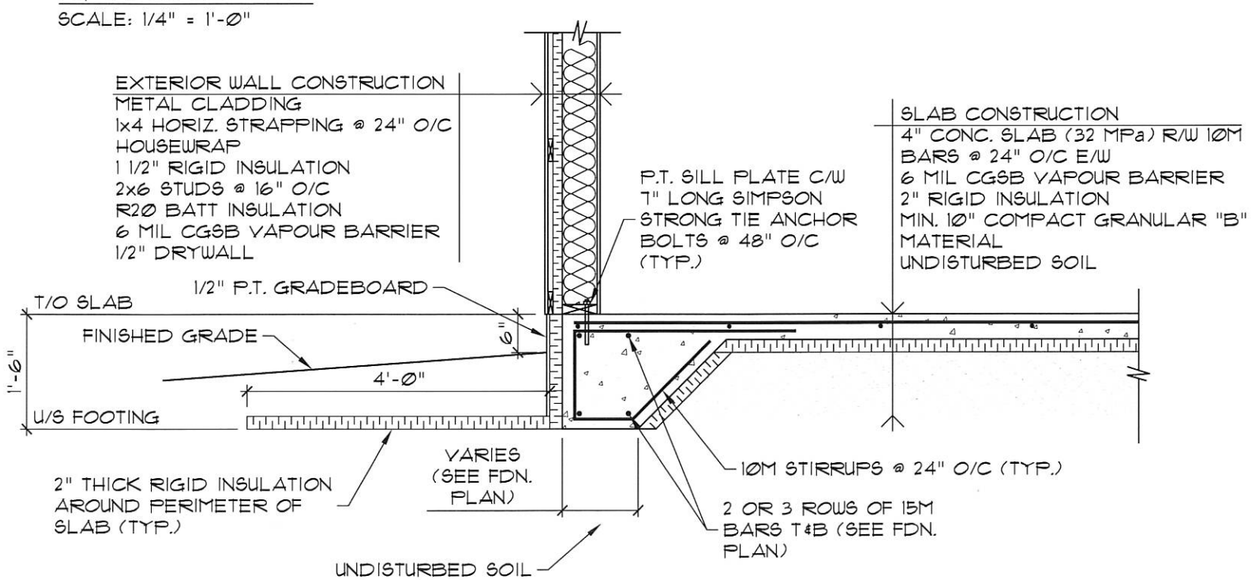
PROJECT TITLE: STORAGE GARAGE FOR RRDSSAB 737 SCOTT ST., FORT FRANCES, ON

DRAWN BY:	DATE:
M.S.	19/07/03
CHECKED BY: T.K.B. D.Z.	PROJECT NO. 18-050
SHEET NO. 5	REV. NO. -



SECTION "A"

SCALE: 1/4" = 1'-0"



FOUNDATION DETAIL

SCALE: 1/2" = 1'-0"

MARK	DESCRIPTION	YR/MO/DY	BY
1	ISSUED FOR TENDER/CONSTRUCTION	19/07/03	DZ
1			
1			
1			

REVISION RECORD

SAULTEAUX CONSULTING & ENGINEERING
SITE 206-207 RR#2
FORT FRANCES, ONTARIO
P9A 3M3
1-807-274-7114

SCE

BCIN: 43291

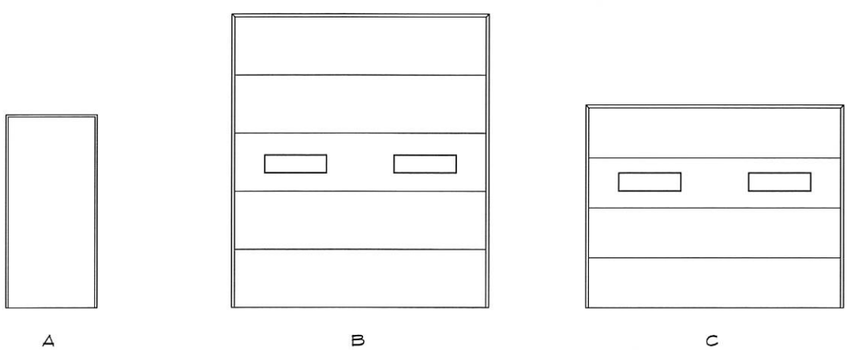
SHEET TITLE: BUILDING SECTION A, FOUNDATION DETAIL

PROJECT TITLE: STORAGE GARAGE FOR RRDSSAB 737 SCOTT ST., FORT FRANCES, ON

DRAWN BY:	DATE:
M.S.	19/07/03
CHECKED BY: TKB. D.Z.	PROJECT NO. 18-050
SHEET NO. 6	REV. NO. -

DOOR SCHEDULE

DOOR								FRAME		
DOOR #	SIZE	THICKNESS	TYPE	MATERIAL	FINISH	GLAZING	DOOR HARDWARE	MATERIAL	FINISH	REMARKS
D1	10'-0"x11'-0" OVERHEAD	2"	B	INSULATED SECTIONAL STEEL	PRE-FINISHED	2-24"x12" SEALED GLASS	3" TRACK, STANDARD LIFT, 25,000 CYCLES, GALV. STEEL HINGES, BALL BEARING ROLLERS, WEATHERSTRIPPING, CHAIN HOIST, SLIDE LOCK W/ INTERLOCK SWITCH FOR OPERATOR	METAL CLAD WOOD	PRE-FINISHED	INSTALL LIFTMASTER MODEL RBH7511 3/4 HP. HEAVY DUTY JACKSHAFT OPERATOR C/W PHOTO EYES, SOLENOID BRAKE, CHAIN HOIST BACKUP AND TWO (2) REMOTES
D2	10'-0"x11'-0" OVERHEAD	2"	B	INSULATED SECTIONAL STEEL	PRE-FINISHED	2-24"x12" SEALED GLASS	3" TRACK, STANDARD LIFT, 25,000 CYCLES, GALV. STEEL HINGES, BALL BEARING ROLLERS, WEATHERSTRIPPING, CHAIN HOIST, SLIDE LOCK W/ INTERLOCK SWITCH FOR OPERATOR	METAL CLAD WOOD	PRE-FINISHED	INSTALL LIFTMASTER MODEL RBH7511 3/4 HP. HEAVY DUTY JACKSHAFT OPERATOR C/W PHOTO EYES, SOLENOID BRAKE, CHAIN HOIST BACKUP AND TWO (2) REMOTES
D3	3'-0"x7'-0"	1 3/4"	A	HOLLOW METAL INSULATED	PAINT		LOCKSET, 1 1/2 PR. NRP HINGES, DOOR CLOSER, WEATHERSTRIPPING, DOOR SWEEP, THRESHOLD	PRESSED STEEL FRAME	PAINT	
D4	3'-0"x7'-0"	1 3/4"	A	HOLLOW METAL INSULATED	PAINT		LOCKSET, 1 1/2 PR. NRP HINGES, DOOR CLOSER, WEATHERSTRIPPING, DOOR SWEEP, THRESHOLD	PRESSED STEEL FRAME	PAINT	
D5	9'-0"x7'-0" OVERHEAD	2"	C	INSULATED SECTIONAL STEEL	PRE-FINISHED	2-24"x12" SEALED GLASS	STANDARD GARAGE DOOR HARDWARE	METAL CLAD WOOD	PAINT	LIFTMASTER 8165W OVERHEAD DOOR OPERATOR
D6	3'-0"x6'-8"	1 3/4"	A	HOLLOW METAL	PAINT		PASSAGE SET, 1 1/2 PR. HINGES	PRESSED STEEL FRAME	PAINT	



DOOR TYPES

MARK	DESCRIPTION		BY
	ISSUED FOR TENDER/CONSTRUCTION	19/07/03	DZ

REVISION RECORD

SAULTEAUX CONSULTING & ENGINEERING

SITE 206-207 RR#2
FORT FRANCES, ONTARIO
P9A 3M3
1-807-274-7114

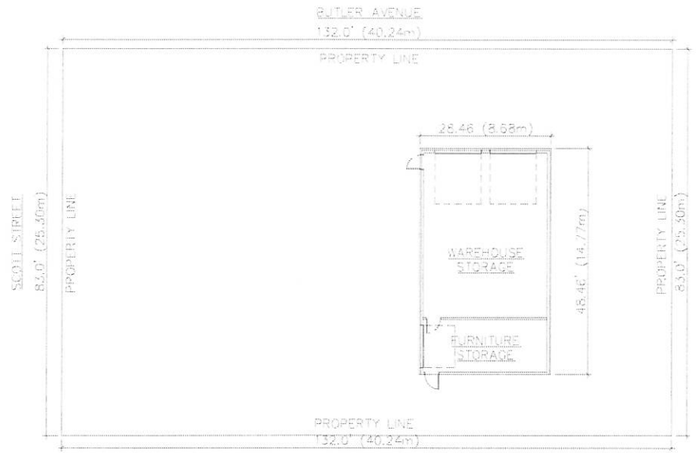
SCE

BCIN: 43291

SHEET TITLE: DOOR SCHEDULE

PROJECT TITLE: STORAGE GARAGE FOR RRDSSAB
737 SCOTT ST., FORT FRANCES, ON

DRAWN BY:	DATE:
M.S.	19/07/03
CHECKED BY: T.K.B. D.Z.	PROJECT NO. 18-050
SHEET NO. 7	REV. NO. -



N SITE PLAN
1/32"-1'-0"

GENERAL NOTES:

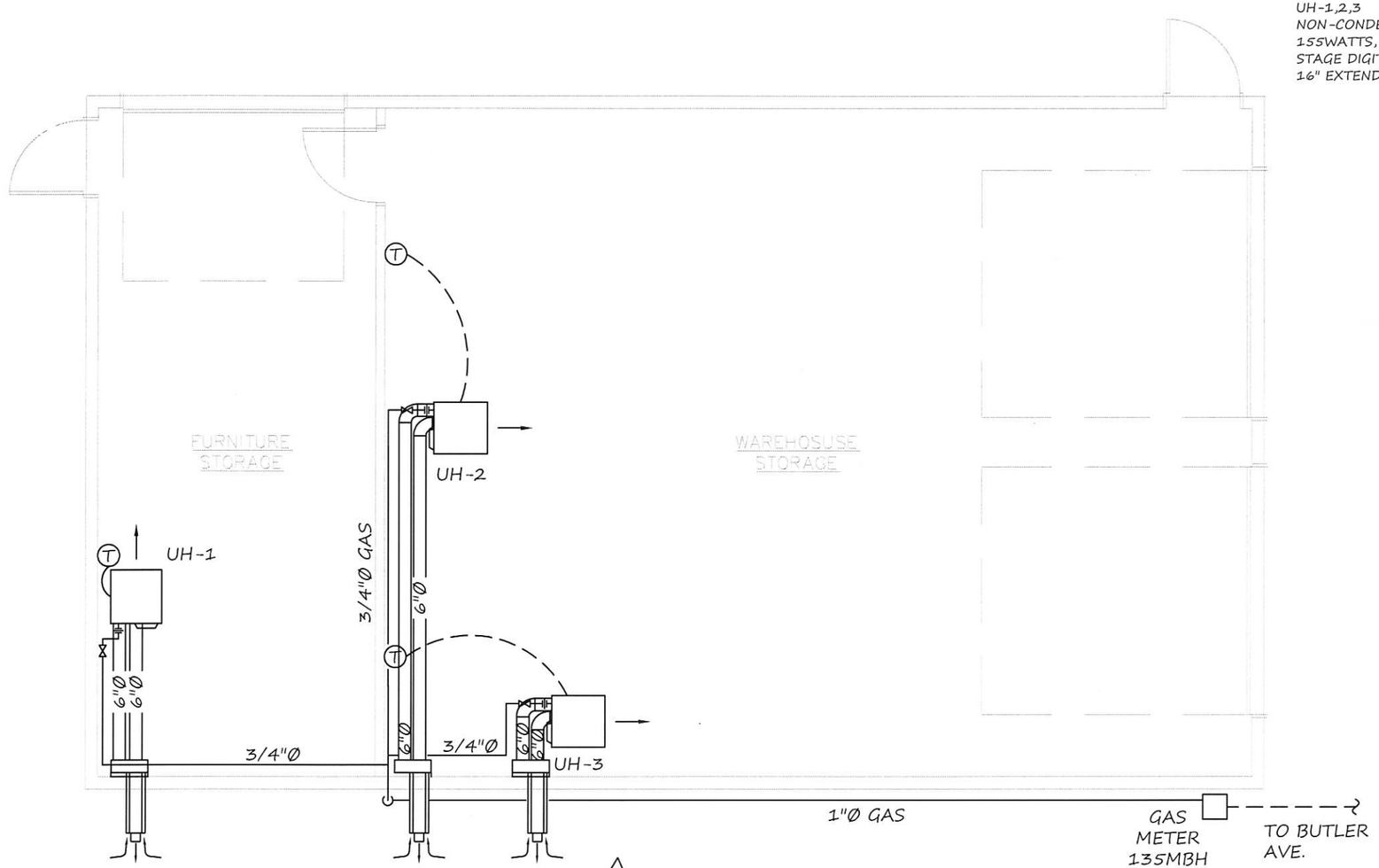
1. ALL MATERIAL SHALL BE NEW AND BE CSA APPROVED OR ULC LISTED.
2. THE CONTRACTOR SHALL ENSURE THAT ALL MATERIALS AND EQUIPMENT ARE INSTALLED IN FULL COMPLIANCE WITH THE CURRENT ONTARIO FIRE CODE AND ONTARIO BUILDING CODE.
3. PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOUR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
4. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS, FEES AND INSPECTIONS.
5. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
6. CONTRACTOR IS RESPONSIBLE FOR SEALING ALL PENETRATIONS THROUGH FIRE RATED WALLS AND ASSEMBLIES WITH RATED FIRE STOP RATED EQUAL TO THAT OF THE ADJACENT MATERIALS. ALL FIRE STOP MATERIALS AND INSTALLATION SHALL CONFORM TO UL 1479 AND ASTM E-814-10.
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL INSTALLED EQUIPMENT FOR APPROVAL BY ENGINEER PRIOR TO ORDERING ANY EQUIPMENT.
8. CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ANY OR ALL DEFECTS IN WORKMANSHIP WHICH MAY ARISE FOR A PERIOD OF 12 MONTHS FROM SUBSTANTIAL COMPLETION.
9. CONTRACTOR SHALL PROVIDE 3 HARD COPIES (OR DIGITAL PDF FORMAT) OF OPERATION AND MAINTENANCE MANUALS TO THE OWNER PRIOR TO FINAL PAYMENT IS REQUESTED. THE MANUALS WILL BE APPROVED BY THE ENGINEER.

PIPING NOTES:

1. MECHANICAL CONTRACTOR TO SUBMIT REQUEST FOR ACTION TO ENBRIDGE (UNION GAS) FOR INCREASED GAS LOAD TO EXISTING METER.
2. SUPPLY & INSTALL NEW GAS PIPING SUPPORTS AT SPACING AS SPECIFIED IN TABLE 6.2 IN CSA B149.1.
3. STEEL GAS PIPE TO ASTM A53/A53M, SCHEDULE 40, SCREWED. COPPER PIPE: TO ASTM B75M.
4. INSTALL PIPING & IDENTIFICATION IN ACCORDANCE TO APPLICABLE PROVINCIAL CODES, CAN/CSA-B149.1, SUPPLEMENTED AS SPECIFIED.
5. SLOPE PIPING DOWN IN DIRECTION TO FLOW TO LOW POINTS.
6. INSTALL DRIP POINTS AT LOW POINTS IN PIPING SYSTEM. PROVIDE COMPLETE WITH BLOWDOWN VALVE I.E. MANUAL SHUT-OFF VALVE AS SPECIFIED ABOVE. MINIMUM 3" IN LENGTH FROM TEE CONNECTION IN RISER TO TOP OF VALVE. MIN. 3/4"Ø. PROVIDE COMPLETE WITH THREADED END CAP.
7. FIELD ENDING OF PIPING TO BE PROHIBITED. NESTING OF BUSHINGS TO BE PROHIBITED. UTILIZE PROPERLY SIZED REDUCING FITTINGS
8. ABOVE GROUND GAS PIPING TO BE PRIMED AND PAINTED YELLOW ALONG ITS ENTIRE LENGTH.

EQUIPMENT NOTES:

UH-1,2,3 REZNOR MODEL UDAP NATURAL-GAS FIRED UNIT HEATER. 83% EFF. NON-CONDENSING. TITANIUM-STABILIZED HEAT EXCHANGER, 629CFM, 115V, 155WATTS, 24V CONTROL. 25"Lx26"Wx12"H, 60LBS. C/W 24V TRANSFORMER, SINGLE STAGE DIGITAL WALL THERMOSTAT, SET AT 60F. HORIZONTAL DIRECT-VENT KIT, 6"Ø, 16" EXTENDED FLUE FROM WALL & THIMBLE.



N HEATING & GAS PIPING PLAN
3/16"-1'-0"

No.	Revision/Issue	MM/DD/YY
0	ISSUED FOR PERMIT & TENDER	06/26/19

Firm Name: ABLE Energy Management & Design

www.ableenergy.ca
807-627-4259
info@ableenergy.ca

Drawing Description
HEATING PLAN & GAS PIPING FOR NEW WAREHOUSE/STORAGE GARAGE

Project Name and Address
STORAGE GARAGE-RAINY RIVER DISTRICT SOCIAL SERVICES ADMINISTRATION BOARD, FORT FRANCES, ON

Project: AE-1946
Date: JUNE 26, 2019
Scale: AS SHOWN
Sheet: M-1

2019 ABLE 24X36.dwg

PART 1 SCOPE OF WORK

SCOPE
1. WORK SHALL CONSIST OF THE SUPPLY AND INSTALLATION OF ALL NECESSARY EQUIPMENT, CONDUIT, WIRING AND CONNECTION FOR A COMPLETE INSTALLATION OF THE PLANS AND SPECIFICATIONS AS FOLLOWS:
   1. LIGHTING AND POWER DISTRIBUTION AND ASSOCIATED CONTROLS
   2. EMERGENCY LIGHTS AND EXIT SIGNS
   3. ALL INCOMING ELECTRICAL SERVICES AND HYDRO COORDINATION

DELIVERABLES TO THE ENGINEER:
1. COPY OF ELECTRICAL SAFETY AUTHORITY NOTICE OF INSPECTION AND COMPLETION CERTIFICATE.
2. CONTRACTOR LETTER OF COMPLETION TO CERTIFY WORK IS COMPLETE IN ACCORDANCE WITH THE DRAWINGS.

GENERAL
1. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, SERVICES, TOOLS, EQUIPMENT, AND FIXTURES NECESSARY TO PERFORM AND COMPLETE IN A GOOD AND WORKMANLIKE MANNER THE WORK DESCRIBE. ALL WORK SHALL BE DONE IN ACCORDANCE WITH, ALL LAWS, ORDINANCES, BUILDING CODES, RULES AND REGULATIONS APPLYING TO THE WORK, INCLUDING, BUT NOT LIMITED TO, THE ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT, ENVIRONMENTAL REGULATIONS AND THE OCCUPATIONAL SAFETY AND HEALTH ACT, AS AMENDED. CONTRACTOR SHALL HAVE CONTROL OVER, AND BE SOLELY RESPONSIBLE FOR, ALL MEANS, METHODS AND SEQUENCES FOR PERFORMING THE WORK. ANY DISCREPANCIES BETWEEN SUPPLEMENTARY SPECIFICATION SECTIONS OR DRAWING PACKAGES SHOULD BE NOTIFIED TO THE ENGINEER OF RECORD IN WRITING. ALL INFORMATION INCLUDED IN SUPPLEMENTARY DIVISION SECTIONS SHALL FORM PART OF THIS DIVISION SECTION AS APPLICABLE. ANY SMALL ITEMS REQUIRED TO FURNISH A COMPLETE INSTALLATION, BUT ARE NOT SPECIALLY CALLED OUT, ARE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE NOT CONSIDERED AS EXTRA.
2. VERIFY ALL COUNT QUANTITIES PRIOR TO TENDER CLOSE.

REFERENCES
1. ONTARIO ELECTRICAL SAFETY CODE (LATEST EDITION)
2. ONTARIO BUILDING CODE
3. CSA C22.1, CANADIAN ELECTRICAL CODE, PART 1, SAFETY STANDARD FOR ELECTRICAL INSTALLATIONS.
4. CAN/CSA-22.3 NO. 1, OVERHEAD SYSTEMS.
5. CAN3-C235, PREFERRED VOLTAGE LEVELS FOR AC SYSTEMS, 0 TO 50,000 V.
6. CAN/ULC-S537 STANDARD FOR VERIFICATION OF FIRE ALARM SYSTEMS
7. CAN/ULC-S524-14 STANDARD FOR THE INSTALLATION OF FIRE ALARM SYSTEMS

CARE, OPERATION AND START-UP
1. INSTRUCT OWNER'S REPRESENTATIVE AND OPERATING PERSONNEL IN THE OPERATION, CARE AND MAINTENANCE OF SYSTEMS, SYSTEM EQUIPMENT AND COMPONENTS.
2. AS REQUIRED TO MAINTAIN MANUFACTURER'S WARRANTY, ARRANGE AND PAY FOR SERVICES OF MANUFACTURER'S FACTORY SERVICE ENGINEER TO SUPERVISE START-UP OF INSTALLATION, CHECK, ADJUST, BALANCE AND CALIBRATE COMPONENTS AND INSTRUCT OPERATING PERSONNEL.
3. PROVIDE THESE SERVICES FOR SUCH PERIOD, AND FOR AS MANY VISITS AS NECESSARY TO PUT EQUIPMENT IN OPERATION AND ENSURE THAT OPERATING PERSONNEL ARE CONVERSANT WITH ALL ASPECTS OF ITS CARE AND OPERATION.

SUBMITTALS
1. ALL ALATERNATES OR SUBSTITUTIONS FOR PRODUCTS LISTED SHALL BE SUBMITTED TO THE PROJECT TEAM AT LEAST ONE (1) WEEK PRIOR TO TENDER CLOSE.
2. SUBMIT SHOP DRAWINGS, OR MANUFACTURERS PRODUCT DATA, FOR TRANSFORMERS, PANELBOARDS, BREAKERS, DISCONNECTS, RECEPTACLES, COVERPLATES, HEATING EQUIPMENT, EXIT AND EMERGENCY LIGHTING, LUMAIRE CUT SHEETS, FIRE ALARM, AND SPECIAL SYSTEMS. SUBMISSIONS SHALL BE IN THE SAME UNIT OF MEASURE AS USED ON THE DRAWINGS.
3. FOR LUMINAIRES, SUBMIT CUT SHEETS FROM THE MANUFACTURER WITH SPECIFIC CATALOGUE NUMBERS IN THE SAME ORDER AS THE LUMINAIRE SCHEDULE.
4. DETAILS OF CONSTRUCTION, DIMENSIONS, CAPACITIES, WEIGHTS, AND ELECTRICAL PERFORMANCE SHALL BE INDICATED ON THE SUBMITTALS.
5. WHERE APPLICABLE, WIRING OR SINGLE LINE DIAGRAMS SHALL BE PROVIDED.
6. EACH SHOP DRAWING SHALL BE STAMPED AS CORRECT BY THE CONTRACTOR TO INDICATE THEIR APPROVAL, AS THE TRADE PURCHASING THE ITEMS.
7. IF THE ABOVE HAS NOT BE MET, THE SHOP DRAWING WILL BE RETURNED AS "REJECTED".
8. THE REVIEW IS FOR THE SOLE PURPOSE OF IDENTIFYING GENERAL CONFORMANCE TO THE DESIGN CONCEPT. APPROVAL OF DESIGN DETAILS IS THE REPONSIBILITY OF THE CONTRACTOR. ENGINEER'S REVIEWS DOES NOT RELIEVE THE CONTRACTOR OF THEIR REQUIREMENTS TO MEET THE INTENT OF THE DESIGN DOCUMENTS.

QUALITY CONTROL
1. PROVIDE CSA CERTIFIED EQUIPMENT AND MATERIAL. WHERE CSA CERTIFIED EQUIPMENT AND MATERIAL IS NOT AVAILABLE, SUBMIT SUCH EQUIPMENT AND MATERIAL TO AUTHORITY HAVING JURISDICTION FOR APPROVAL BEFORE DELIVERY TO SITE.
2. SUBMIT CERTIFICATE OF ACCEPTANCE FROM AUTHORITY HAVING JURISDICTION UPON COMPLETION OF WORK TO OWNER'S REPRESENTATIVE.
3. MANUFACTURER'S FIELD REPORTS: SUBMIT TO OWNER'S REPRESENTATIVE WITHIN SEVEN (7) WORKING DAYS OF REVIEW, VERIFYING COMPLIANCE OF WORK AND ELECTRICAL SYSTEM AND INSTRUMENTATION TESTING, INSPECT AND TEST THE FOLLOWING SYSTEMS TO DEMONSTRATE OPERATION OF SYSTEMS, DEMONSTRATE TO THE SATISFACTION TO THE OWNER, THEIR REPRESENTATIVES, AND ENGINEERING TEAM AS REQUIRED.:
   1. POWER DISTRIBUTION INCLUDING PHASING AND LOAD BALANCING WITH ALL NORMAL OPERATING LOADS. ADJUST AS REQUIRED.
   2. BRANCH CIRCUIT CONNECTIONS.
   3. LIGHTING AND LIGHTING CONTROLS
   4. EMERGENCY LIGHT AND EXIT SIGNS.
   5. MOTORS AND CONTROL EQUIPMENT
   6. FIRE ALARM SYSTEM.

FIELD QUALITY CONTROL
1. SINGLE LINE ELECTRICAL DIAGRAMS
   1. PROVIDE SINGLE LINE ELECTRICAL DIAGRAMS IN GLAZED FRAMES AS FOLLOWS:
      1. ELECTRICAL DISTRIBUTION SYSTEM: LOCATE IN MAIN ELECTRICAL ROOM.
      2. ELECTRICAL POWER GENERATION AND DISTRIBUTION SYSTEMS: LOCATE IN POWER PLANT ROOMS.

PERMITS, FEES AND INSPECTION
1. SUBMIT TO ELECTRICAL SAFETY AUTHORITY AND SUPPLY AUTHORITY NECESSARY NUMBER OF DRAWINGS AND SPECIFICATIONS FOR EXAMINATION AND APPROVAL PRIOR TO COMMENCEMENT OF WORK.
2. PAY ASSOCIATED FEES.
3. THE ELECTRICAL ENGINEER OF RECORD WILL PROVIDE DRAWINGS AND SPECIFICATIONS REQUIRED BY ELECTRICAL INSPECTION DIVISION AND SUPPLY AUTHORITY AT NO COST
4. IF SPECIALIZED THIRD PARTY DESIGNERS ARE REQUIRED BY THE SUPPLY AUTHORITY, THE CONTRACTOR SHALL COORDINATE AND PAY FOR THIS SERVICE. THE ELECTRICAL ENGINEER OF RECORD SHALL SUPPLY INFORMATION REQUIRED FOR THE THIRF PARTY SERVICE TO COMPLETE THIER WORK.
5. NOTIFY ELECTRICAL ENGINEER OF RECORD OF CHANGES REQUIRED BY ELECTRICAL SAFETY AUTHORITY PRIOR TO MAKING CHANGES.
6. FURNISH CERTIFICATES OF ACCEPTANCE FROM ELECTRICAL SAFETY AUTHORITY OR AUTHORITIES HAVING JURISDICTION ON COMPLETION OF WORK TO ENGINEER OF RECORD

CO-ORDINATION
1. CO-ORDINATE WORK WITH WORK OF OTHER DIVISIONS TO AVOID CONFLICT.
2. LOCATE DISTRIBUTION SYSTEMS, EQUIPMENT, AND MATERIALS TO PROVIDE MINIMUM INTERFERENCE AND MAXIMUM USABLE SPACE.
3. LOCATE ALL EXISTING UNDERGROUND SERVICES AND MAKE ALL PARTIES AWARE OF THEIR EXISTENCE AND LOCATION.
4. WHERE INTERFERENCE OCCURS, ELECTRICAL ENGINEER OF RECORD MUST APPROVE RELOCATION OF EQUIPMENT AND MATERIALS REGARDLESS OF INSTALLATION ORDER.
5. NOTWITHSTANDING THE REVIEW OF SHOP DRAWINGS, THE ELECTRICAL CONTRACTOR MAY BE REQUIRED TO RELOCATE ELECTRICAL EQUIPMENT WHICH INTERFERES WITH THE EQUIPMENT OF OTHER TRADES, DUE TO LACK OF CO-ORDINATION BY THE CONTRACTOR THE COST OF THIS RELOCATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER'S REPRESENTATIVE SHALL DECIDE THE EXTENT OF RELOCATION REQUIRED.

CUTTING AND PATCHING
1. INFORM ALL OTHER DIVISIONS IN TIME, CONCERNING REQUIRED OPENINGS. WHERE THIS REQUIREMENT IS NOT MET, BEAR THE COST OF ALL CUTTING. OBTAIN WRITTEN APPROVAL OF STRUCTURAL ENGINEER BEFORE DRILLING ANY BEAMS OR FLOORS.
2. MAKE GOOD OF ALL TRADES AND FINISHES
3. COORDINATE LOCATION AND SIZE OF ALL ACCESS HATCHES. SUBMIT SHOP DRAWINGS FOR REVIEW FROM OWNER'S ARCHITECTURAL REPRESENTATIVE PRIOR TO INSTALLATION. SPECIALLIZED FINISHES MAY BE REQUIRED IN SPECIFIC AREAS

PROTECTION
1. PROTECT EXPOSED LIVE EQUIPMENT DURING CONSTRUCTION FOR PERSONNEL SAFETY.
2. SHIELD AND MARK ALL LIVE PARTS (I.E. "LIVE 120 VOLTS"), OR WITH APPROPRIATE VOLTAGE IN ENGLISH.
3. ARRANGE FOR INSTALLATION OF TEMPORARY DOORS FOR ROOMS CONTAINING ELECTRICAL DISTRIBUTION EQUIPMENT. KEEP THESE DOORS LOCKED EXCEPT WHEN UNDER DIRECT SUPERVISION OF ELECTRICIAN.

RECORD DRAWINGS
1. OBTAIN AND PAY FOR THREE SETS OF WHITE PRINTS. AS THE JOB PROGRESSES, MARK THESE PRINTS TO ACCURATELY INDICATE INSTALLED WORK. HAVE THE WHITE PRINTS AVAILABLE FOR INSPECTION AT THE SITE AT ALL TIMES AND PRESENT FOR SCRUTINY AT EACH JOB MEETING.
2. SHOW ON THE RECORD DRAWINGS THE INSTALLED INVERTS OF ALL SERVICES ENTERING AND LEAVING THE BUILDING AND THE PROPERTY. DIMENSION UNDERGROUND SERVICES AT KEY POINTS OF EVERY RUN IN RELATION TO THE STRUCTURE AND BUILDING.
3. INDICATE EXACT LOCATION OF ALL SERVICES FOR FUTURE WORK. SHOW AND DIMENSION ALL WORK EMBEDDED IN THE STRUCTURE.
4. SUBMIT RECORD DRAWINGS WITHIN 30 DAYS PRIOR TO START OF COMMISSIONING.

INSPECTION OF WORK
1. THE ENGINEER OF RECORD WILL MAKE PERIODIC VISITS TO THE SITE DURING CONSTRUCTION TO ASCERTAIN REASONABLE CONFORMITY TO THE DRAWINGS PLANS AND SPECIFICATIONS BUT WILL NOT EXECUTE QUALITY CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXECUTION OF HIS WORK IN CONFORMITY WITH THE CONSTRUCTION DOCUMENTS AND WITH THE REQUIREMENTS OF THE INSPECTION AUTHORITY.
2. THE ENGINEER OF RECORD SHALL BE NOTIFIED THROUGHOUT CONSTRUCTION OF THE PROGRESS OF THE PROJECT AND INVITED FOR PERIODIC VISITS. AT A MINIMUM THE ENGINEER OF RECORD SHALL VISIT AT ROUGH-IN COMPLETION (WITH ALL ELECTRICAL WORK EXPOSED), AND ONCE FINAL CONNECTIONS ARE MADE. IF THE PROJECT REQUIRED STAGING OF ELECTRICAL WORK, THE ENGINEER OF RECORD SHALL BE NOTIFIED BEFORE ELECTRICAL WORK IS CLOSED IN BY OTHER CONTRACTORS WORK.
3. PHOTOGRAPHS OF INSTALLATION PROGRESS SHALL BE DOCUMENTED BY THE CONTRACTOR AND MADE AVAILABLE TO THE ENGINEER OF RECORD UPON REQUEST.

PART 1 SCOPE OF WORK (CONTINUED)

SCHEDULING OF WORK
1. WORK SHALL BE SCHEDULED IN PHASES AS PER OTHER DIVISIONS OF THE ARCHITECTURAL SPECIFICATIONS.
2. BECOME FAMILIAR WITH THE PHASING REQUIREMENTS FOR THE WORK AND COMPLY WITH THESE CONDITIONS.
3. NO ADDITIONAL MONIES WILL BE PAID FOR CONTRACTOR'S REQUIREMENT TO COMPLY WITH WORK PHASING CONDITIONS.
4. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE THE DELIVERY DATES OF ALL EQUIPMENT. MAJOR EQUIPMENT, INCLUDING LUMINAIRES, SHOULD BE INVESTIGATED AT THE START OF THE PROJECT AND LIST OF DELIVERY DATES SHALL BE PROVIDED WITHIN 7 DAYS OF THE START OF THE CONTRACT. THE OWNER SHALL RESERVE THE RIGHT TO RENEGOTIATE OR CANCEL THE CONTRACT AT NO COST, SHOULD THE DELIVERY DATES OF EQUIPMENT CARRIED NOT MEET THE PROJECT SCHEDULE.

FIRE RATING OF PENETRATIONS
1. MAINTAIN FIRE RATINGS AROUND CONDUITS PASSING THROUGH FLOORS, CEILINGS AND FIRE RATED WALLS.
2. USE 3M BRAND OR EQUAL FIRE BARRIER PRODUCTS AT EACH PENETRATION.
3. ACCEPTABLE PRODUCTS FOR FIRE BARRIER PRODUCTS SHALL BE 3M: #CP25 FIRE BARRIER CAULK, #303 PUTTY, #FS 195 WRAP AND #CS195 SHEET.
4. ACCEPTABLE MANUFACTURERS: NELSON, FIRE STOP SYSTEMS, 3M OR APPROVED EQUAL. MATERIAL OF SAME MANUFACTURER TO BE USED THROUGHOUT PROJECT.

PART 2 PRODUCTS

EXAMINATION OF SITE
1. THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE THEMSELVES WITH THE SITE CONDITIONION.
2. DEVIATIONS FROM THE PLANS DUE TO CONFLICTS ON SITE SHALL BE NOTIFIED TO THE ENGINEER IN WRITING PRIOR TO THE TENDOR
3. DO NOT SCALE THE DRAWINGS.
4. PRIOR TO STARTING WORK, EXAMINE THE SITE VERIFY THE LAYOUT AND ARANGEMENT OF ALL ELECTRICAL EQUIPMENT AND FEEDERS.
5. NOTIFY ENGINEER IN WRITING OF ANY CONFLICTS OR DISCREPANCIES TO THE DRAWINGS PRIOR TO THE TENDOR CLOSE.
6. CLAIMS FOR EXTRA PAYMENT AS A RESULT OF NOT THROUGHLY EXAMINING THE SITE WILL NOT BE GRANTED.

WARRANTIES
1. INSTALLATION OF ALL EQUIPMENT SHALL BE IN A MANNER TO MAINTAIN ALL MANUFACTURERS WARRANTIES.
2. WARRANTY ALL WORKMANSHIP AND LABOUR FOR A MINIMUM OF ONE (1) YEAR OUTSIDE OF MANUFACTURERS WARRANTIES.

ELECTRIC MOTORS, EQUIPMENT AND CONTROLS
1. SUPPY AND INSTALL AS INDICATED IN MOTOR, CONTROL AND EQUIPMENT SCHEDULES ON ELECTRICAL AND MECHANICAL DRAWINGS.
2. CONTROL WIRING AND CONDUIT IS PART OF THE ELECTRICAL SCOPE OF WORK, EXCEPT FOR CONDUIT, WIRING AND CONNECTIONS BELOW 50 V WHICH ARE RELATED TO CONTROL SYSTEMS SHOWN ON MECHANICAL DRAWINGS. MECHANICAL CONTROLS CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT, WIRING AND CONNECTIONS BELOW 50V WHICH ARE RELATED TO THE CONTROL SYSTEMS AND SHALL COMPLY WITH THE REQUIREMENTS OF ELECTRICAL FOR STANDARD OF QUALITY.

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 INDOOR SWITCHGEAR AND DISTRIBUTION ENCLOSURES LIGHT GREY TO EEMAC 2Y-1.

WIRING TERMINATIONS
1. LUGS, TERMINALS, SCREWS USED FOR TERMINATION OF WIRING TO BE SUITABLE FOR EITHER COPPER OR ALUMINUM CONDUCTORS.

EQUIPMENT IDENTIFICATION
1. IDENTIFY ELECTRICAL EQUIPMENT WITH NAMEPLATES AND LABELS AS FOLLOWS:
   1. NAMEPLATES: LAMICOID 3 MM THICK PLASTIC ENGRAVING SHEET, BLACK FACE, WHITE CORE, MECHANICALLY ATTACHED WITH SELF TAPPING SCREWS. SIZES AS FOLLOWS:

SIZE 1	10 X 50MM	1 LINE	3MM HIGH LETTERS
SIZE 2	12 X 70MM	1 LINE	5MM HIGH LETTERS
SIZE 3	12 X 70MM	2 LINES	3MM HIGH LETTERS
SIZE 4	20 X 90MM	1 LINE	8MM HIGH LETTERS
SIZE 5	20 X 90MM	2 LINES	5MM HIGH LETTERS
SIZE 6	25 X 100MM	1 LINE	12MM HIGH LETTERS
SIZE 7	25 X 100MM	2 LINES	6MM HIGH LETTERS

   2. LABELS:
      1. EMBOSSED PLASTIC LABELS WITH 6 MM HIGH LETTERS UNLESS SPECIFIED OTHERWISE.
2. WORDING ON NAMEPLATES AND LABELS TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO MANUFACTURE.
3. ALLOW FOR AVERAGE OF TWENTY-FIVE (25) LETTERS PER NAMEPLATE AND LABEL.
4. IDENTIFICATION TO BE ENGLISH (AND FRENCH WHERE APPLICABLE).
5. NAMEPLATES FOR TERMINAL CABINETS AND JUNCTION BOXES TO INDICATE SYSTEM NAME AND VOLTAGE CHARACTERISTICS.
6. DISCONNECTS, STARTERS AND CONTACTORS: INDICATE EQUIPMENT BEING CONTROLLED AND VOLTAGE.
7. TERMINAL CABINETS AND PULL BOXES: INDICATE SYSTEM NAME AND VOLTAGE.
8. TRANSFORMERS: INDICATE CAPACITY, PRIMARY AND SECONDARY VOLTAGES AND TRANSFORMER NUMBER.
9. NAMEPLATE FOR EACH PANELBOARD SIZE 4 ENGRAVED AS INDICATED.
10. NAMEPLATE FOR EACH CIRCUIT IN DISTRIBUTION PANELBOARDS SIZE 2 ENGRAVED AS INDICATED.
11. COMPLETE CIRCUIT DIRECTORY WITH TYPEWRITTEN LEGEND SHOWING LOCATION AND LOAD OF EACH CIRCUIT.

WIRING IDENTIFICATION
1. IDENTIFY WIRING WITH PERMANENT IDENTIFYING MARKINGS, EITHER NUMBERED OR COLOURED PLASTIC TAPES, ON BOTH ENDS OF PHASE CONDUCTORS OF FEEDERS AND BRANCH CIRCUIT WIRING.
2. MAINTAIN PHASE SEQUENCE AND COLOUR CODING THROUGHOUT.
3. COLOUR CODE: TO CSA C22.1, CANADIAN ELECTRICAL CODE.
4. USE COLOUR CODED WIRES IN COMMUNICATION CABLES, MATCHED THROUGHOUT SYSTEM.

CONDUIT AND CABLE IDENTIFICATION
1. COLOUR CODE CONDUITS, BOXES AND METALLIC SHEATHED CABLES.
2. CODE WITH PLASTIC TAPE OR PAINT AT POINTS WHERE CONDUIT OR CABLE ENTERS WALL, CEILING, OR FLOOR, AND AT 15 M INTERVALS.
3. COLOURS: 25 MM WIDE PRIME COLOUR AND 20 MM WIDE AUXILIARY COLOUR.
4. COLOUR CODING TO MATCH EXISTING WHERE APPLICABLE.

FUSED SWITCHES RATED 600 AMPERES AND LESS
1. SWITCHES SHALL BE IN ACCORDANCE WITH NEMA, NEC, UL, AS SPECIFIED, AND AS SHOWN ON THE DRAWINGS.
2. SHALL BE NEMA CLASSIFIED HEAVY DUTY
3. SHALL BE HORSEPOWER (HP) RATED.
4. SHALL HAVE THE FOLLOWING FEATURES:
   1. SWITCH MECHANISM SHALL BE THE QUICK-MAKE, QUICK-BREAK TYPE.
   2. COPPER BLADES, VISIBLE IN THE OPEN POSITION.
   3. AN ARC CHUTE FOR EACH POLE.
   4. EXTERNAL OPERATING HANDLE SHALL INDICATE OPEN AND CLOSED POSITIONS, AND HAVE LOCK-OPEN PADLOCKING PROVISIONS.
   5. MECHANICAL INTERLOCK SHALL PERMIT OPENING OF THE DOOR ONLY WHEN THE SWITCH IS IN THE OPEN POSITION. DEFEATABLE TO PERMIT INSPECTION.
   6. FUSE HOLDERS FOR THE SIZES AND TYPES OF FUSES SPECIFIED.
   7. SOLID NEUTRAL FOR EACH SWITCH BEING INSTALLED IN A CIRCUIT WHICH INCLUDES A NEUTRAL CONDUCTOR.
   8. GROUND LUGS FOR EACH GROUND CONDUCTOR.
   9. ELECTRICALLY OPERATED SWITCHES SHALL ONLY BE INSTALLED WHERE SHOWN ON THE DRAWINGS.

ENCLOSURES
1. SHALL BE THE NEMA TYPES SHOWN ON THE DRAWINGS.
2. WHERE THE TYPES OF SWITCH ENCLOSURES ARE NOT SHOWN, THEY SHALL BE THE NEMA TYPES MOST SUITABLE FOR THE AMBIENT ENVIRONMENTAL CONDITIONS.
3. SHALL BE FINISHED WITH MANUFACTURER'S STANDARD GRAY BAKED ENAMEL PAINT OVER PRETREATED STEEL.
4. PROVIDE NEMA 2-S FOR ALL SPRINKLERED BUILDINGS

MOTOR RATED TOGGLE SWITCHES
1. TYPE 1, GENERAL PURPOSE FOR SINGLE-PHASE MOTORS RATED UP TO 1 HORSEPOWER.
2. QUICK-MAKE, QUICK-BREAK TOGGLE SWITCH WITH EXTERNAL RESET BUTTON AND THERMAL OVERLOAD PROTECTION MATCHED TO NAMEPLATE FULL-LOAD CURRENT OF ACTUAL PROTECTED MOTOR.

CARTRIDGE FUSES
1. SHALL BE IN ACCORDANCE WITH NEMA FU 1, AND DESIGNED TO FIT THE ENCLOSURE THE FUSES ARE HOUSED IN, WITHOUT SPECIAL CLIPS. FUSE TYPES TO BE COORDINATED WITH THE SPECIFIC PIECE OF EQUIPMENT OR AS OUTLINED BELOW.
2. SERVICE ENTRANCE: CLASS L, TIME DELAY OR CLASS J, TIME DELAY UNLESS OTHERWISE NOTED
3. FEEDERS: CLASS L, TIME DELAY OR CLASS J, TIME DELAY UNLESS OTHERWISE NOTE
4. MOTOR BRANCH CIRCUITS: CLASS RK1 OR CLASS RK5, TIME DELAY. UNLESS OTHERWISE NOTED
5. OTHER BRANCH CIRCUITS: CLASS J, TIME DELAY UNLESS OTHERWISE NOTED
6. CONTROL CIRCUITS: CLASS CC

PANELBOARDS
1. PANELBOARDS: TO CSA C22.2 NO.29 AND PRODUCT OF ONE MANUFACTURER.
   1. INSTALL CIRCUIT BREAKERS IN PANELBOARDS BEFORE SHIPMENT.
   2. IN ADDITION TO CSA REQUIREMENTS, MANUFACTURER'S NAMEPLATE MUST SHOW FAULT CURRENT THAT PANEL, INCLUDING BREAKERS HAVE BEEN BUILT TO WITHSTAND.
2. 250 AND 600 V PANELBOARDS: BUS AND BREAKERS RATED FOR 10,000 AND 18,000 A (SYMMETRICAL) MINIMUM INTERRUPTING CAPACITY RESPECTIVELY OR AS INDICATED ON ELECTRICAL DRAWINGS.
3. SEQUENCE PHASE BUSSING WITH ODD NUMBERED BREAKERS ON LEFT AND EVEN ON RIGHT, WITH EACH BREAKER IDENTIFIED BY PERMANENT NUMBER IDENTIFICATION AS TO CIRCUIT NUMBER AND PHASE.
4. PANELBOARDS: MAINS, NUMBER OF CIRCUITS, AND NUMBER AND SIZE OF BRANCH CIRCUIT BREAKERS AS INDICATED.
5. TWO KEYS FOR EACH PANELBOARD AND KEY PANELBOARDS ALIKE.
6. TIN PLATED ALUMINUM BUS WITH NEUTRAL OF SAME AMPERE RATING AS MAINS.
7. MAINS: SUITABLE FOR BOLT-ON BREAKERS.
8. TRIM WITH CONCEALED FRONT BOLTS AND HINGES.
9. TRIM AND DOOR FINISH: BAKED GREY ENAMEL.

PART 2 PRODUCTS (CONTINUED)

BREAKERS
1. BREAKERS: MOULDED CASE CIRCUIT BREAKERS.
2. BREAKERS WITH THERMAL AND MAGNETIC TRIPPING IN PANELBOARDS EXCEPT AS INDICATED OTHERWISE.
3. MAIN BREAKER: SEPARATELY MOUNTED ON TOP OR BOTTOM OF PANEL TO SUIT CABLE ENTRY. WHEN MOUNTED VERTICALLY, DOWN POSITION SHOULD OPEN BREAKER.
4. LOCK-ON DEVICES FOR 10% OF 15 TO 30 A BREAKERS INSTALLED AS INDICATED. TURN OVER UNUSED LOCK-ON DEVICES.
5. LOCK-ON DEVICES FOR RECEPTACLES, FIRE ALARM CLOCK OUTLET, EMERGENCY, DOOR SUPERVISORY, INTERCOM, STAIRWAY, EXIT AND NIGHT LIGHT CIRCUITS AS INDICATED.

BREAKERS GENERAL
1. BOLT-ON MOULDED CASE CIRCUIT BREAKER: QUICK- MAKE, QUICK-BREAK TYPE, FOR MANUAL AND AUTOMATIC OPERATION WITH TEMPERATURE COMPENSATION FOR 40°C AMBIENT.
2. COMMON-TRIP BREAKERS: WITH SINGLE HANDLE FOR MULTI-POLE APPLICATIONS.
3. MAGNETIC INSTANTANEOUS TRIP ELEMENTS IN CIRCUIT BREAKERS TO OPERATE ONLY WHEN VALUE OF CURRENT REACHES SETTING. TRIP SETTINGS ON BREAKERS WITH ADJUSTABLE TRIPS TO RANGE FROM 3-8 TIMES CURRENT RATING.
4. CIRCUIT BREAKERS WITH INTERCHANGEABLE TRIPS AS INDICATED.
5. CIRCUIT BREAKERS TO HAVE MINIMUM OF 10,000 A SYMMETRICAL RMS INTERRUPTING CAPACITY RATING.

THERMAL MAGNETIC BREAKERS
1. MOULDED CASE CIRCUIT BREAKER TO OPERATE AUTOMATICALLY BY MEANS OF THERMAL AND MAGNETIC TRIPPING DEVICES TO PROVIDE INVERSE TIME CURRENT TRIPPING AND INSTANTANEOUS TRIPPING FOR SHORT CIRCUIT PROTECTION.

OPTIONAL FEATURES
1. INCLUDE:
   1. SHUNT TRIP.
   2. AUXILIARY SWITCH.
   3. MOTOR-OPERATED MECHANISM C/W TIME DELAY UNIT.
   4. UNDER-VOLTAGE RELEASE.
   5. ON-OFF LOCKING DEVICE.
   6. HANDLE MECHANISM.

BUILDING WIRES
1. CONDUCTORS: STRANDED FOR 10 AWG AND LARGER. MINIMUM SIZE: 12 AWG. INCREASE WIRE SIZE WHERE NEEDED TO MEET VOLTAGE DROP REQUIREMENTS.
2. COPPER AND ACM ALLOY CONDUCTORS: SIZE AS INDICATED, WITH 600 V INSULATION OF CROSS-LINKED ——THERMOSETTING POLYETHYLENE MATERIAL RATED RW90 XLPE AND RWU90 XLPE AS INDICATED. PROVIDE RWU90 XLPE RATED CABLE FOR UNDERGROUND WIRING, RELATED TO NEW SERVICE ENTRANCE FEEDERS AND SITE LIGHTING CIRCUITS.
3. COPPER CONDUCTORS: SIZE AS INDICATED, WITH THERMOPLASTIC INSULATION TYPE TWH RATED AT 600 V, TYPICALLY USED FOR INSULATED GROUND WIRES.
4. WIRING FOR 120V BRANCH CIRCUITS SHALL BE #12AWG UP TO 22M AND #10AWG UP TO 35M. INCREASE WIRE SIZES FOR THE FULL RUN LENGTH STARTING AT THE OVERCURRENT DEVICE. INCREASE WIRE SIZE TO LIMIT VOLTAGE DROP TO 3% WHILE CARRYING 80% OF THE CIRCUIT LOAD.

ARMOURED CABLES
1. CONDUCTORS: INSULATED, COPPER, SIZE AS INDICATED.
2. TYPE: AC90.
3. ARMOUR: INTERLOCKING TYPE FABRICATED FROM ALUMINUM STRIP.
4. CONNECTORS: STANDARD AS REQUIRED, COMPLETE WITH ANTI-SHORT RINGS.

CONTROL CABLES
1. TYPE LVT: 2 SOFT ANNEALED COPPER CONDUCTORS, SIZED AS INDICATED, WITH THERMOPLASTIC INSULATION, OUTER COVERING OF THERMOPLASTIC JACKET.
2. LOW ENERGY 300 V CONTROL CABLE: STRANDED ANNEALED COPPER CONDUCTORS SIZED AS INDICATED, WITH PVC INSULATION TYPE TW -40° C POLYETHYLENE INSULATION WITH SHIELDING OF TAPE COATED WITH PARAMAGNETIC MATERIAL WIRE BRAID OVER EACH CONDUCTOR AND OVERALL COVERING OF PVC JACKET.

OUTLET AND CONDUIT BOXES GENERAL
1. SIZE BOXES IN ACCORDANCE WITH CSA C22.1.
2. 102 MM SQUARE OR LARGER OUTLET BOXES AS REQUIRED FOR SPECIAL DEVICES.
3. GANG BOXES WHERE WIRING DEVICES ARE GROUPED.
4. BLANK COVER PLATES FOR BOXES WITHOUT WIRING DEVICES.
5. 347 V OUTLET BOXES FOR 347 V SWITCHING DEVICES.
6. COMBINATION BOXES WITH BARRIERS WHERE OUTLETS FOR MORE THAN ONE SYSTEM ARE GROUPED.

GALVANIZED STEEL OUTLET BOXES
1. ELECTRO-GALVANIZED STEEL SINGLE AND MULTI GANG FLUSH DEVICE BOXES FOR FLUSH INSTALLATION, MINIMUM SIZE 76 X 50 X 38 MM OR AS INDICATED. 102 MM SQUARE OUTLET BOXES WHEN MORE THAN ONE CONDUIT ENTERS ONE SIDE WITH EXTENSION AND PLASTER RINGS AS REQUIRED.
2. ELECTRO-GALVANIZED STEEL UTILITY BOXES FOR OUTLETS CONNECTED TO SURFACE-MOUNTED EMT CONDUIT, MINIMUM SIZE 102 X 54 X 48 MM.
3. 102 MM SQUARE OR OCTAGONAL OUTLET BOXES FOR LIGHTING FIXTURE OUTLETS.
4. 102 MM SQUARE OUTLET BOXES WITH EXTENSION AND PLASTER RINGS FOR FLUSH MOUNTING DEVICES IN FINISHED PLASTER WALLS.

MASONRY BOXES
1. ELECTRO-GALVANIZED STEEL MASONRY SINGLE AND MULTI GANG BOXES FOR DEVICES FLUSH MOUNTED IN EXPOSED BLOCK WALLS.

CONCRETE BOXES
1. ELECTRO-GALVANIZED SHEET STEEL CONCRETE TYPE BOXES FOR FLUSH MOUNT IN CONCRETE WITH MATCHING EXTENSION AND PLASTER RINGS AS REQUIRED.

FITTINGS - GENERAL
1. BUSHING AND CONNECTORS WITH NYLON INSULATED THROATS.
2. KNOCK-OUT FILLERS TO PREVENT ENTRY OF DEBRIS
3. CONDUIT OUTLET BODIES FOR CONDUIT UP TO 32 MM AND PULL BOXES FOR LARGER CONDUITS.
4. DOUBLE LOCKNUTS AND INSULATED BUSHINGS ON SHEET METAL BOXES.
5. DOUBLE SPLIT RINGS FOR AC-90 TERMINATIONS.

SURFACE MOUNT FITTINGS
1. EXPOSED CONDUITS AND FITTINGS TO BE LEGRAND WIREMOLD 500/700 SERIES STEEL RACEWAY OR EQUIVALENT LOW-PROFILE METALIC RACEWAY.

HANGERS AND SUPPORTS
1. SECURE EQUIPMENT TO HOLLOW OR SOLID MASONRY, TILE AND PLASTER SURFACES WITH LEAD ANCHORS OR NYLON SHIELDS.
2. SECURE EQUIPMENT TO POURED CONCRETE WITH EXPANDABLE INSERTS.
3. SECURE EQUIPMENT TO HOLLOW MASONRY WALLS OR SUSPENDED CEILINGS WITH TOGGLE BOLTS.
4. SECURE SURFACE MOUNTED EQUIPMENT WITH TWIST CLIP FASTENERS TO INVERTED T BAR CEILINGS. ENSURE THAT T BARS ARE ADEQUATELY SUPPORTED TO CARRY WEIGHT OF EQUIPMENT SPECIFIED BEFORE INSTALLATION.
5. SUPPORT EQUIPMENT, CONDUIT OR CABLES USING CLIPS, SPRING LOADED BOLTS, CABLE CLAMPS DESIGNED AS ACCESSORIES TO BASIC CHANNEL MEMBERS.
6. FASTEN EXPOSED CONDUIT OR CABLES TO BUILDING CONSTRUCTION OR SUPPORT SYSTEM USING STRAPS.
   1. ONE-HOLE STEEL STRAPS TO SECURE SURFACE CONDUITS AND CABLES 50 MM AND SMALLER.
   2. TWO-HOLE STEEL STRAPS FOR CONDUITS AND CABLES LARGER THAN 50 MM.
   3. BEAM CLAMPS TO SECURE CONDUIT TO EXPOSED STEEL WORK.
   4. STRAP AC-90 CABLE AT BOX LOCATION PLUS EVERY 900 MM.
7. SUSPENDED SUPPORT SYSTEMS.
   1. SUPPORT INDIVIDUAL CABLE OR CONDUIT RUNS WITH 6 MM DIA THREADED RODS AND SPRING CLIPS.
   2. SUPPORT 2 OR MORE CABLES OR CONDUITS ON CHANNELS SUPPORTED BY 6 MM DIA THREADED ROD HANGERS WHERE DIRECT FASTENING TO BUILDING CONSTRUCTION IS IMPRACTICAL.
8. FOR SURFACE MOUNTING OF TWO OR MORE CONDUITS USE CHANNELS AT 1.5 M ON CENTRE SPACING.
9. PROVIDE METAL BRACKETS, FRAMES, HANGERS, CLAMPS AND RELATED TYPES OF SUPPORT STRUCTURES WHERE INDICATED OR AS REQUIRED TO SUPPORT CONDUIT AND CABLE RUNS
10. ENSURE ADEQUATE SUPPORT FOR RACEWAYS AND CABLES DROPPED VERTICALLY TO EQUIPMENT WHERE THERE IS NO WALL SUPPORT.
11. DO NOT USE WIRE LASHING, WOOD BLOCKING, PLASTIC STRAP OR PERFORATED STRAP TO SUPPORT OR SECURE-RACEWAYS OR CABLES.
12. DO NOT USE SUPPORTS OR EQUIPMENT INSTALLED FOR OTHER TRADES FOR CONDUIT OR CABLE SUPPORT EXCEPT WITH PERMISSION OF OTHER TRADE AND APPROVAL OF OWNER'S REPRESENTATIVE.
13. INSTALL FASTENINGS AND SUPPORTS AS REQUIRED FOR EACH TYPE OF EQUIPMENT CABLES AND CONDUITS, AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION RECOMMENDATIONS.

EXIT SIGNAGE AND EMERGENCY LIGHTS
1. REFER TO DRAWINGS FOR EMERGENCY LIGHTS AND BATTERY PACK SCHEDULES. VERIFY ALL COUNTS AND QUANTITIES PRIOR TO TENDER CLOSE.
2. SELF POWERED UNITS ARE NOT ACCEPTABLE WHERE DC CIRCUITS ARE SHOWN WITH REMOTE FIXTURES.
3. USE NO.10 AWG AS THE MINIMUM WIRE SIZE FROM BATTERY UNITS TO DC REMOTE FIXTURES.
4. LOCATE ALL EXIT SIGNS FOR MAXIMUM LINE OF SITE AND AVOID CONFLICTS WITH LIGHTING, MECHANICAL, AND STRUCTURAL ELEMENTS.
5. ENSURE THE NEW EMERGENCY BATTERY PACK IS AUTOMATICALLY ACTUATED UPON FAILURE OF POWER SUPPLY TO THE NORMAL LIGHTING IN THE AREA OF THE LIGHTING COVERED BY THE UNIT IN ACCORDANCE OESC 46-304.
6. EXIT SIGNS MUST BE CONTINUOUSLY ILLUMINATED AND CONSTRUCTED IN CONFORMANCE WITH SECTION 46 OF THE ONTARIO ELECTRICAL SAFETY CODE.

PART 2 PRODUCTS (CONTINUED)

LIGHT FIXTURES
1. REFER TO DRAWINGS FOR LUMINAIRE SCHEDULE. PROVIDE LIGHT FIXTURES AS OUTLINED WITH ALL ASSOCIATED FITTINGS, HANGERS, LAMPS, AND SUPPORTS.
2. ALTERNATE FIXTURES MUST BE EQUIVELENT IN ALL RESEPCTS (I.E. LENS, LUMEN PERFORMANCE, DISTRIBUTION, QANTITY, LOCATION, ETC). ALTERNATE FIXTURES MUST BE PROVIDED AT TIME OF TENDER CLOSE WITH AN ALTERNATE PRICE TO THE BASE BID TO SUBSTITUTE THE FIXTURES. THE TENDER PRICE WILL BE EVALUATED ON THE SPECIFIED FIXTURES, NOT THE ALTERNATES SUBMITTED.
3. COORDINATE ALL LOCATIONS OF FIXTURES FOR INTERFERANCES WITH OTHER TRADES TO AVOID CONFLICTS. THIS INCLUDES FIXTURES LOCATED IN MECHANICAL AND ELECTRICAL ROOMS. SUPPORT ALL T-BAR FIXTURES FROM STRUCTURE, IN OPPOSITE CORNERS, WITH INDEPENDANT HANGERS

WIRING DEVICES
1. THE OWNER RESERVES RIGHT TO RELOCATE RECEPTACLE SHOWN ON THE PLANS UP TO 3000MM IN ANY DIRECTION FREE OF CHARGE. COORDINATE ALL RECEPTACLES WITH OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
2. LOCATE LIGHT SWITCHES ON LATCH SIDE OF DOOR, AND IN SEQUENCE ORDER OF LIGHTING DRAWINGS

RECEPTACLES
1. DUPLEX RECEPTACLES, CSA TYPE 5-15 R, 125 V, 15 A, U GROUND, TO: CSA-C22.2 NO.42 WITH FOLLOWING FEATURES:
   1. IVORY THERMOPLASTIC MOULDED HOUSING, SUITABLE FOR NO. 10 AWG FOR BACK AND SIDE WIRING, BREAK-OFF LINKS FOR USE AS SPLIT RECEPTACLES, EIGHT BACK WIRED ENTRANCES, FOUR SIDE WIRING SCREWS, TRIPLE WIPE CONTACTS AND RIVETTED GROUNDING CONTACTS, SPECIFICATION GRADE, HOSPITAL GRADE AS INDICATED.
2. SINGLE RECEPTACLES CSA TYPE 5-15 R, 125 V, 15 A, U GROUND WITH FOLLOWING FEATURES:
   1. IVORY THERMOPLASTIC MOULDED HOUSING, SUITABLE FOR NO. 10 AWG FOR BACK AND SIDE WIRING, FOUR BACK WIRED ENTRANCES, 2 SIDE WIRING SCREWS.
3. OTHER RECEPTACLES WITH AMPACITY AND VOLTAGE AS INDICATED.
4. RECEPTACLES AND SWITCHES OF ONE MANUFACTURER THROUGHOUT THE PROJECT.

SWITCHES
1. 20 A, 120 V, SINGLE POLE, DOUBLE POLE, THREE-W-AY, FOUR-WAY SWITCHES AS INDICATED TO: CSA-C22.2 NO.55 AND CSA-C22.2 NO.111.
2. MANUALLY-OPERATED GENERAL PURPOSE AC SWITCHES WITH FOLLOWING FEATURES:
   1. TERMINAL HOLES APPROVED FOR NO. 10 AWG WIRE, SILVER ALLOY CONTACTS, UREA OR MELAMINE MOULDING FOR PARTS SUBJECT TO CARBON TRACKING, SUITABLE FOR BACK AND SIDE WIRING, WHITE TOGGLE, SPECIFICATION GRADE, HOSPITAL GRADE AS INDICATED.
3. TOGGLE OPERATED FULLY RATED FOR TUNGSTEN FILAMENT AND FLUORESCENT LAMPS, AND UP TO 80% OF RATED CAPACITY OF MOTOR LOADS.

COVER PLATES
1. COVER PLATES FOR WIRING DEVICES TO: CSA-C22.2 NO.42.1.
2. COVER PLATES FROM ONE MANUFACTURER THROUGHOUT PROJECT.
3. SHEET STEEL UTILITY BOX COVER FOR WIRING DEVICES INSTALLED IN SURFACE-MOUNTED UTILITY BOXES.
4. STAINLESS STEEL COVER PLATES AS INDICATED, THICKNESS 2.5 MM FOR WIRING DEVICES MOUNTED IN FLUSH-MOUNTED OUTLET BOX.
5. SHEET METAL COVER PLATES FOR WIRING DEVICES MOUNTED IN SURFACE-MOUNTED FS OR FD TYPE CONDUIT BOXES.
6. NEMA 3R WEATHERPROOF LATCHING COVER WITH PAD LOCK HOLES AS INDICATED.
7. ALL WIRING DEVICE COVER PLATES TO BE LABELED USING CLEAR ADHESIVE STRIPS WITH BLACK TYPE IDENTIFYING PANEL AND CIRCUIT NUMBER FOR EACH DEVICE.

PLYWOOD BACKING
1. PROVIDE PLYWOOD BACKING FOR ALL SURFACE MOUNTED ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS. PLYWOOD TO BE 21MM
2. PAINT PLYWOOD WITH TWO COATS OF LIGHT GRAY ENAMEL FIRE RETARDANT PAINT.

PART 3 EXECUTION

NAMEPLATES AND LABELS
1. ENSURE MANUFACTURER'S NAMEPLATES, CSA LABELS AND IDENTIFICATION NAMEPLATES ARE VISIBLE AND LEGIBLE AFTER EQUIPMENT IS INSTALLED.

LOCATION OF OUTLETS
1. DO NOT INSTALL OUTLETS BACK-TO-BACK IN WALL; ALLOW MINIMUM 150 MM HORIZONTAL CLEARANCE BETWEEN BOXES.
2. CHANGE LOCATION OF OUTLETS AT NO EXTRA COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED 3000 MM, AND INFORMATION IS GIVEN BEFORE INSTALLATION.
3. LOCATE LIGHT SWITCHES ON LATCH SIDE OF DOORS. LOCATE DISCONNECT DEVICES IN MECHANICAL AND ELEVATOR MACHINE ROOMS ON LATCH SIDE OF DOOR.

CONDUIT AND CABLE INSTALLATION
1. INSTALL CONDUIT AND SLEEVES PRIOR TO POURING OF CONCRETE. SLEEVES THROUGH CONCRETE: SCHEDULE 40 STEEL PIPE, SIZED FOR FREE PASSAGE OF CONDUIT, AND PROTRUDING 50 MM.
2. IF PLASTIC SLEEVES ARE USED IN FIRE RATED WALLS OR FLOORS, REMOVE BEFORE CONDUIT INSTALLATION.
3. INSTALL CABLES, CONDUITS AND FITTINGS TO BE EMBEDDED OR PLASTERED OVER, NEATLY AND CLOSE TO BUILDING STRUCTURE SO FURRING CAN BE KEPT TO MINIMUM.
4. TEMPORARILY PLUG ALL SLEEVES THROUGHOUT CONSTRUCTION.
5. CONDUITS AND CABLES SHALL BE INSTALLED AT A MINIMUM OF 150MM FROM ANY HEATING OR DOMESTIC HOT WATER PIPING.
6. NO CONDUITS OR CABLING SHALL BE INSTALLED IN FLOOR SLAB, UNLESS SPECIFICALLY NOTED, OR WITHOUT APPROVAL OF THE STRUCTURAL AND ELECTRICAL ENGINEERS OF RECORD.

MOUNTING HEIGHTS
1. MOUNTING HEIGHT OF EQUIPMENT IS FROM FINISHED FLOOR TO CENTERLINE OF EQUIPMENT UNLESS SPECIFIED OR INDICATED OTHERWISE.
2. IF MOUNTING HEIGHT OF EQUIPMENT IS NOT SPECIFIED OR INDICATED, VERIFY BEFORE PROCEEDING WITH INSTALLATION.
3. INSTALL ELECTRICAL AT FOLLOWING HEIGHTS UNLESS INDICATED OTHERWISE.
   1. LOCAL SWITCHES: 1200 MM. (1050MM IN AODA APPLICATIONS)
   2. WALL RECEPTACLES:
      1. GENERAL: 450 MM.
      2. ABOVE TOP OF CONTINUOUS BASEBOARD HEATER: 200MM.
      3. ABOVE TOP OF COUNTERS OR COUNTER SPLASH BACKS: 175 MM.
      4. IN MECHANICAL ROOMS: 1400 MM.
   3. PANELBOARDS: AS REQUIRED BY CODE OR AS INDICATED.
   4. TELEPHONE AND INTERPHONE OUTLETS: 450 MM.
   5. WALL MOUNTED TELEPHONE AND INTERPHONE OUTLETS: 1400 MM.
   6. FIRE ALARM STATIONS: 1200 MM.
   7. FIRE ALARM BELLS: 2400 MM.
   8. TELEVISION OUTLETS: 300 MM.
   9. WALL MOUNTED SPEAKERS: 2400 MM.
   10. CLOCKS: 2400 MM.
   11. DOOR BELL PUSHBUTTONS: 1200 MM. (1050MM IN AODA APPLICATIONS)
   12. EXIT LIGHTS: 2400 MM.
   13. EMERGENCY LIGHTING HEADS: 2400 MM.

CO-ORDINATION OF PROTECTIVE DEVICES
1. ENSURE CIRCUIT PROTECTIVE DEVICES SUCH AS OVERCURRENT TRIPS, RELAYS AND FUSES ARE INSTALLED TO REQUIRED VALUES AND SETTINGS.

FIELD QUALITY CONTROL
1. ALL ELECTRICAL WORK TO BE CARRIED OUT BY QUALIFIED, LICENSED ELECTRICIANS OR APPRENTICES AS PER THE CONDITIONS OF THE PROVINCIAL ACT RESPECTING MANPOWER VOCATIONAL TRAINING AND QUALIFICATION. EMPLOYEES REGISTERED IN A PROVINCIAL APPRENTICES PROGRAM SHALL BE PERMITTED, UNDER THE DIRECT SUPERVISION OF A QUALIFIED LICENSED ELECTRICIAN, TO PERFORM SPECIFIC TASKS – THE ACTIVITIES PERMITTED SHALL BE DETERMINED BASED ON THE LEVEL OF TRAINING ATTAINED AND THE DEMONSTRATION OF ABILITY TO PERFORM SPECIFIC DUTIES.
2. THE ELECTRICAL WORK TO BE CARRIED OUT BY A CONTRACTOR WHO HOLDS A VALID CODE 1 ELECTRICAL CONTRACTOR LICENSE IN THE PROVINCE OF THE PROJECT LOCATION.
3. LOAD BALANCE:
   1. MEASURE PHASE CURRENT TO PANELBOARD WITH NORMAL LOADS (LIGHTING) OPERATING AT TIME OF ACCEPTANCE. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO OBTAIN BEST BALANCE OF CURRENT BETWEEN PHASES AND RECORD CHANGES.
   2. MEASURE PHASE VOLTAGES AT LOADS AND ADJUST TRANSFORMER TAPS TO WITHIN 2% OF RATED VOLTAGE OF EQUIPMENT.
   3. SUBMIT, AT COMPLETION OF WORK, REPORT LISTING PHASE AND NEUTRAL CURRENTS ON PANELBOARDS, DRY- CORE TRANSFORMERS AND MOTOR CONTROL CENTERS, OPERATING UNDER NORMAL LOAD. STATE HOUR AND DATE ON WHICH EACH LOAD WAS MEASURED, AND VOLTAGE AT TIME OF TEST.
   4. CONDUCT AND PAY FOR FOLLOWING TESTS:
   5. POWER GENERATION AND DISTRIBUTION SYSTEM INCLUDING PHASING, VOLTAGE, GROUNDING AND LOAD BALANCING.
   6. CIRCUITS ORIGINATING FROM BRANCH DISTRIBUTION PANELS.
   7. LIGHTING AND ITS CONTROL.
   8. MOTORS, HEATERS AND ASSOCIATED CONTROL EQUIPMENT INCLUDING SEQUENCED OPERATIONS OF SYSTEMS WHERE APPLICABLE.
   9. SYSTEMS: FIRE ALARM SYSTEM, COMMUNICATIONS.
4. FURNISH MANUFACTURER'S CERTIFICATE OR LETTER CONFORMING THAT ENTIRE INSTALLATION AS IT PERTAINS TO EACH SYSTEM HAS BEEN INSTALLED TO MANUFACTURER'S INSTRUCTIONS.
5. INSULATION RESISTANCE TESTING.
   1. MEGGER AND RECORD CIRCUITS, FEEDERS AND EQUIPMENT UP TO 350 V WITH A 500 V INSTRUMENT.
   2. MEGGER AND RECORD 350 – 600 V CIRCUITS, FEEDERS AND EQUIPMENT WITH A 1000 V INSTRUMENT.
   3. CHECK RESISTANCE TO GROUND BEFORE ENERGIZING AND RECORD VALUE.
6. PROVIDE INSTRUMENTS, METERS, EQUIPMENT AND PERSONNEL REQUIRED TO CONDUCT TESTS DURING AND CONCLUSION OF PROJECT.
7. SUBMIT TEST RESULTS FOR ENGINEER OF RECORD'S REVIEW AND INCLUDE IN COMMISSIONING MANUALS
8. ALL WORK SHALL BE COMPLETED TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE, AND REPAIRS. MINIMUM WORKING CLEARANCES SHALL BE IN ACCORDANCE WITH ALL CODES AND STANDARDS AND ANY AUTHORITY HAVING JURISDICTION, BUT AT A MINIMUM 1 METER SHOULD BE MAINTAINED IN AROUND ALL ELECTRICAL EQUIPMENT AND A MINIMUM HEADROOM OF 2.2M SHALL BE MAINTAINED.
9. ALL EQUIPMENT SHALL NOT BE LOCATED UNDERNEATH PIPES THAT MAY CONTAIN LIQUIDS (THIS INCLUDES CONDENSATE DRAINS). IF SPACE CONSIDERATIONS REQUIRE ELECTRICAL EQUIPMENT TO BE LOCATED UNDER SUCH PIPPING, THE ENGINEER OF RECORD SHALL BE NOTIFIED IN WRITING FOR EACH OCCURRENCE AND CONTAINMENT PANS WITH DRAIN PIPES TO FLOOR LEVEL SHALL BE PROVIDED BY THE CONTRACTOR.

CLEANING
1. KEEP A CLEAN WORK AREA. ALL TOOLS AND EQUIPMENT SHALL BE PUT AWAY AT THE END OF EACH SHIFT IN A LOCATION AGREED TO WITH THE OWNER. ALL GARBAGE TO BE DISPOSED OF AND PAID FOR BY THE CONTRACTOR. ALL RECYCLABLE MATERIAL TO BE RECYCLED APPROPRIATELY.
2. CLEAN AND TOUCH UP SURFACES OF SHOP-PAINTED EQUIPMENT SCRATCHED OR MARRED DURING SHIPMENT OR INSTALLATION, TO MATCH ORIGINAL PAINT.
3. CLEAN AND PRIME EXPOSED NON-GALVANIZED HANGERS, RACKS AND FASTENINGS TO PREVENT RUSTING.

SEISMIC REQUIREMENTS
1. PROVIDE SEISMIC RESTRAINT FOR ALL ELECTRICAL SYSTEMS IN CONFORMANCE WITH PROVINCIAL BUILDING CODES, ELECTRICAL SAFETY AUTHORITY, AND SEISMIC RESTRAINT SYSTEMS (SRS).
2. IF CLARIFICATION OF INSTALLATION IS REQUIRED, ENGAGE A STRUCTURAL ENGINEER, REGISTERED OR LICENSESD IN THE PROVINCE OF THE PROJECT LOCATION, TO CONFIRM THAT ELECTRICAL WORK IS COMPLETED WITH ALL AUTHORITIES ON SEISMIC RESTRAINT.
3. FOR LUMINAIRES IN SUSPENDED CEILINGS, SUPPORT FIXTURES INDEPENDENTLY FROM CEILING BY A MINIMUM OF TWO CHAINS BOLTED AT OPPOSING CORNERS OF THE FIXTURE AND SECURE TO THE BUILDING STRUCTURE IN ACCORDANCE WITH SRS.

MECHANICAL EQUIPMENT
1. THIS TRADE SHALL PROVIDE ALL REQUIRED DISTRIBUTION EQUIPMENT AND WIRING FOR A COMPLETE INSTLLATION OF ALL EQUIPMENT LISTED ON THE MECHANICAL DRAWINGS AND SPECIFICATIONS.
2. THIS INCLUDES A TERMINATING DISCONNECT SWITCH AND ALL MAINTENACNE RECEPTACLES REQUIRED FOR A CODE COMPLIANT INSTALLATION.
3. ALL ELECTRIC HEATING DEVICES, WIRING, AND ASSOCIATED CONTROL EQUIPMENT SHALL BE PROVIED BY THE ELECTRICAL CONTRACTOR.
4. VERIFY ALL MOTOR CONNECTIONS FOR PHASE ROTATION AS REQUIRED.

ELECTRICAL REQUIRED REPORTS

THE FOLLOWING REPORTS MUST BE SUBMITTED, IN WRITING, TO THE ENGINEER OF RECORD PRIOR TO FINAL OCCUPANCY SITE VISIT.

1. ESA CERTIFICATE LETTER
2. EMERGENCY LIGHTING TEST LETTER
3. SIGNED FIRE ALARM VERIFICATION REPORT
4. CONTRACTOR COMPLETION LETTER

DRAWING LIST

NUMBER	NAME
E000	SPECIFICATIONS
E001	LEGEND AND MAST DETAIL
E002	SINGLE LINE DIAGRAM & PANEL SCHEDULE
E003	SITE PLAN
E100	GROUND FLOOR POWER & SYSTEMS PLAN
E201	GROUND FLOOR REFLECTIVE CEILING PLAN

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REVISION SCHEDULE

No.	DESCRIPTION	DATE
0	Issued for Permit & Tender	2019-06-26

STAMP:

LICENSED PROFESSIONAL ENGINEER
Jun 27, 2019
C. D. A. MARTYN
100222614
PROVINCE OF ONTARIO

C.D. Martyn™
ENGINEERING LTD
739B Arlington Park Pl.
Kingston, Ontario K7M 8M8
O: 613 539-4199
F: 613 653-9424
CDMartyn.com

CLIENT:

PROJECT:
STORAGE GARAGE FOR RAINY RIVER DISTRICT SOCIAL SERVICES ADMINISTRATION BOARD

737 Scott Street, Fort Frances

PROJECT NO. 19-024

SHEET NAME:
SPECIFICATIONS

DRAWN BY: MJ | CHECKED BY: CDM

REVISION: 0 2019-06-26

SCALE:

E000

ELECTRICAL SYMBOLS LEGEND

NOTE: STRIKE THROUGH INDICATES MOUNTED AT COUNTER HEIGHT AT 150MM ABOVE COUNTER OR STANDARD COUNTER BACKSPLASH TO CENTERLINE.

ELECTRICAL PANEL

xx — 120 VAC, 15A, 1Φ, 2W + GROUND, DUPLEX RECEPTACLE. MOUNTED 450MM AFF TO CENTERLINE. LETTER DENOTES TYPE IF APPLICABLE. GFI = GROUND FAULT INTERRUPTING. H = HOSPITAL GRADE. AFI = ARC FAULT INTERRUPTING. USB = COMES WITH USB CHARGING PORTS X2. F= DEDICATED FOR REFRIGERATOR. MW = DEDICATED FOR MICROWAVE. WP = GROUND FAULT INTERRUPTING IN WEATHERPROOF WHILE IN USE ENCLOSURE. TR = TAMPER RESISTANT

120 VAC, 15A, 1Φ, 2W + GROUND, SINGLE RECEPTACLE. MOUNTED IN CEILING

120 VAC,1Φ EQUIPMENT CONNECTION

120 VAC,1Φ EQUIPMENT CONNECTION c/w DISCONNECTION SWITCH

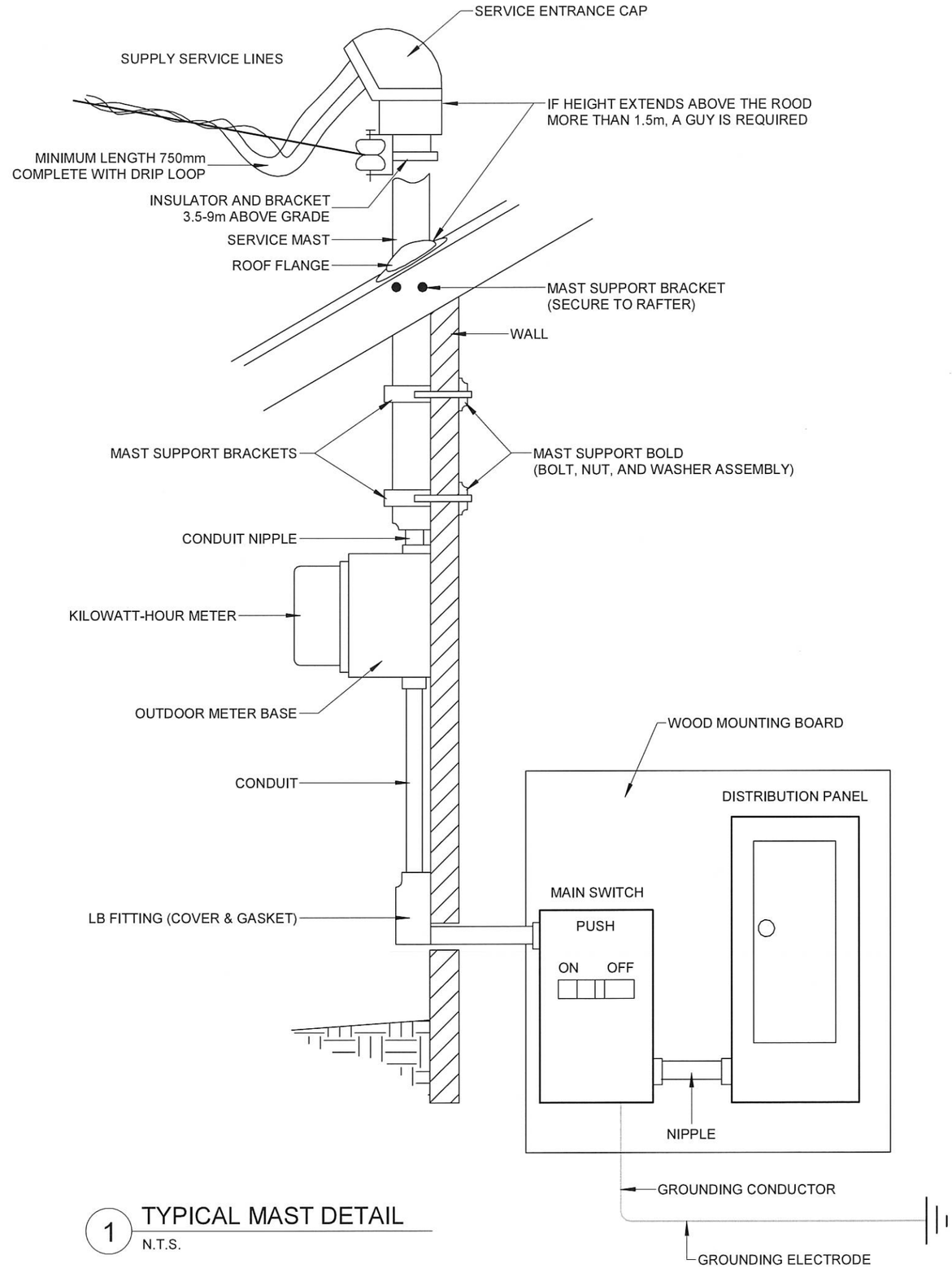
WALL MOUNTED "RUNNING MAN" STYLE EXIT SIGN WITH INTEGRAL BATTERY PACK AND TWO REMOTE HEADS. DARK QUADRANTS INDICATE LIT UP FACES. ARROWS INDICATE DIRECTIONAL ARROW ON SIGN FACE

CO — CARBON MONOXIDE ALARM

PX — WALL MOUNTED - OUTDOOR LUMINAIRE. LETTER DENOTES TYPE. SEE LUMINAIRE SCHEDULE FOR MODEL #

AX — LED LUMINAIRE. LETTER DENOTES TYPE. SEE LUMINAIRE SCHEDULE FOR MODEL #

$ — 120V, SINGLE POLE SWITCH



1 TYPICAL MAST DETAIL
N.T.S.

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C. D. A. MARTYN
100222614 0029-19
PROVINCE OF ONTARIO

C.D. Martyn™ ENGINEERING LTD

739B Arlington Park Pl,
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O: 613 539-4199
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PROJECT:

STORAGE GARAGE FOR RAINY RIVER DISTRICT SOCIAL SERVICES ADMINISTRATION BOARD

737 Scott Street, Fort Frances

PROJECT NO. 19-024

SHEET NAME:

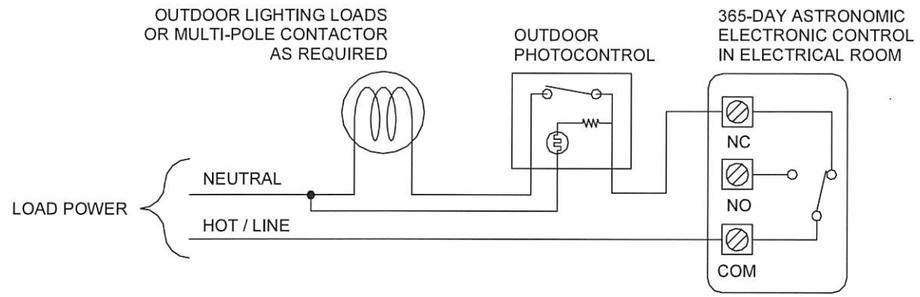
LEGEND AND MAST DETAIL

DRAWN BY: MJ | CHECKED BY: CDM

REVISION: 0 2019-06-26

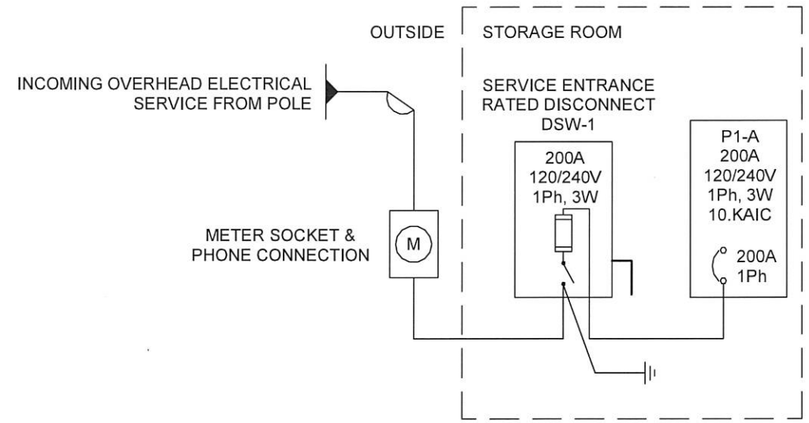
SCALE: As indicated

E001



SEQUENCE OF OPERATION

EXTERIOR LIGHTING CONTROL TO BE AUTOMATICALLY CONTROLLED IN ACCORDANCE WITH THE LATEST APPLICABLE ASHRAE 90.1 FOR EXTERIOR LIGHTING CONTROL COMPLETE WITH **HAND-OFF-AUTO SWITCH**. PHOTO-CONTROL TO TURN LUNINAIRES ON DURING ALL LOW LIGHT CONDITIONS. 365-DAY ASTRONOMIC ELECTRONIC CONTROL TO TURN ALL OUTDOOR LIMINAIRES OFF BETWEEN MIDNIGHT OR BUSINESS CLOSING, WHICHEVER IS LATER, AND BACK ON AT 6AM OR BUSINESS OPENING, WHICHEVER IS EARLIER. THE ABILITY TO BE ADJUSTED FOR NECESSARY SECURITY MEASURES AND AHJ'S ESTABLISHED REQUIREMENTS IS REQUIRED.



Panel: P1-A

Location: Storage
Mounting: Surface
Voltage: 120/240 Single

Phases: 1
Wires: 3
K.A.I.C. Rating: 10

Mains Type: Breaker
Minimum Mains Rating: 200 A
MCB Rating: 200 A

Wire Size	Circuit Description	Type	Trip	Pole	CCT#	A		B		CCT#	Pole	Trip	Type	Circuit Description	Wire Size
	Lighting & Exit Signs		15 A	1	1	66 VA	108 VA			2	1	15 A		Exterior Lighting	
	UH-1 - Furniture Storage		15 A	1	3			155 VA	360 VA	4	1	15 A		Receptacles - Furniture Storage	
	Receptacles - Furniture Storage		15 A	1	5	360 VA	1800 VA			6	1	20 A		Exterior Receptacle	
	Exterior Receptacle		20 A	1	7			1800 VA	1800 VA	8	1	20 A		Exterior Receptacle	
	Receptacles - Furniture Storage		15 A	1	9	360 VA	155 VA			10	1	15 A		UH-2 - Storage	
	UH-3 - Storage		15 A	1	11			155 VA	180 VA	12	1	15 A		Receptacles - Storage	
	Overhead Recept. - Furniture Storage		15 A	1	13	180 VA	0 VA			14	1	15 A		Other	
	OHD-2 - Storage		15 A	1	15			200 VA	360 VA	16	1	15 A		Receptacles - Storage	
	OHD-1 - Storage		15 A	1	17	200 VA				18					
	Receptacles - Storage		15 A	1	19			360 VA	360 VA	20	1	15 A		Receptacles - Storage	
	Receptacles - Storage		15 A	1	21	360 VA				22					
					23					24					
	Receptacles - Storage		15 A	1	25	360 VA				26					
					27					28					
	Receptacles - Storage		15 A	1	29	360 VA				30					
					31					32					
	Receptacles - Furniture Storage		15 A	1	33	360 VA				34					
					35					36					
					37		0 VA			38	1	15 A		Spare	--
--	Spare		15 A	1	39			0 VA	0 VA	40	1	15 A		Spare	--
--	Spare		15 A	1	41	0 VA	0 VA			42	1	15 A		Spare	--
						6469 VA		5730 VA							
					Total Amps:	54 A		48 A							

Minimum #12 Copper Wire U.N.O.

New Circuits - BLACK Existing...

GFI = Ground Fault Protection
AFI = Arc Fault Protection

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PROJECT:

STORAGE GARAGE FOR RAINY RIVER DISTRICT SOCIAL SERVICES ADMINISTRATION BOARD

737 Scott Street, Fort Frances

PROJECT NO. 19-024

SHEET NAME:

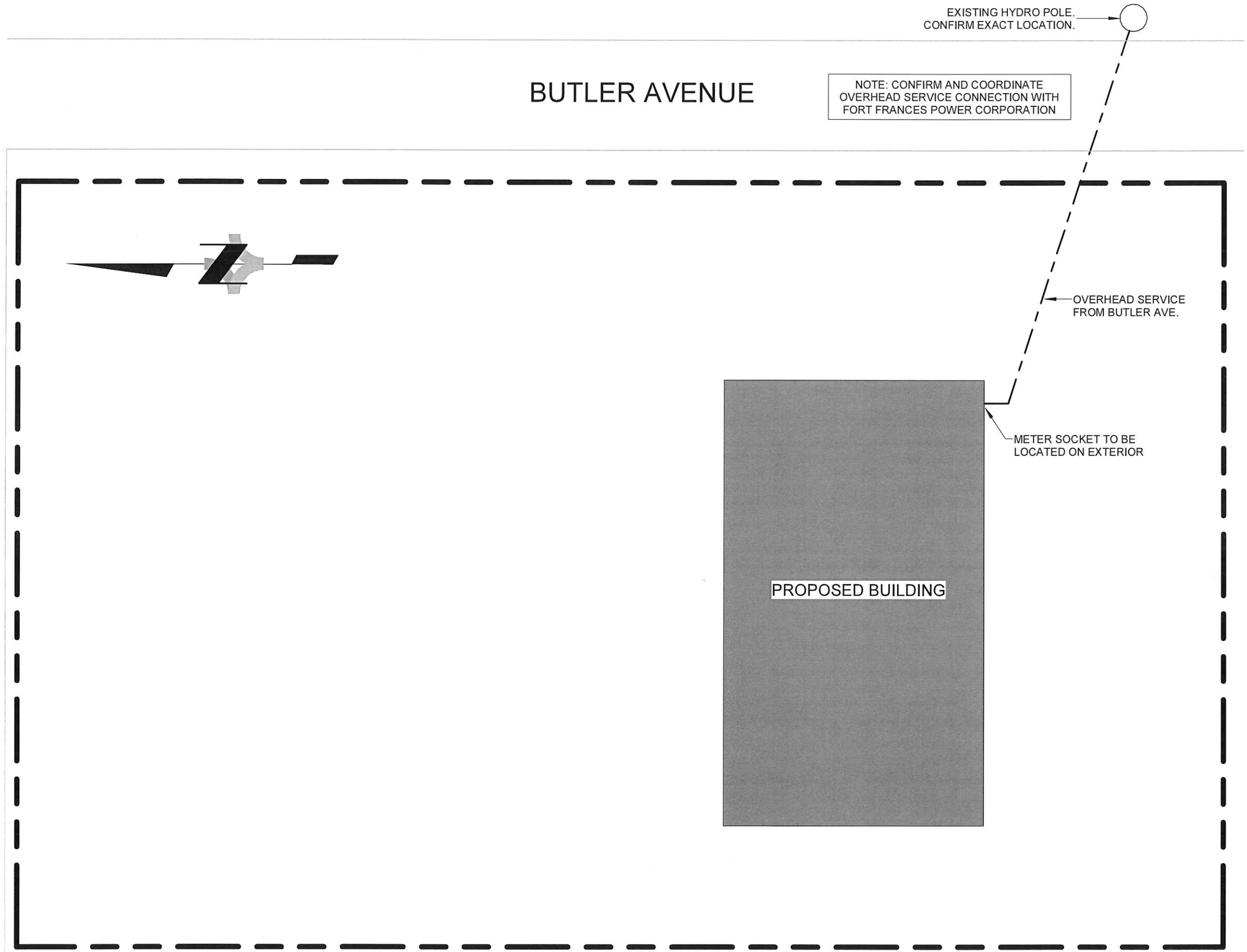
SINGLE LINE DIAGRAM & PANEL SCHEDULE

DRAWN BY: MJ | CHECKED BY: CDM

REVISION: 0 2019-06-26

SCALE: As indicated

E002



1 ELECTRICAL SITE PLAN
N.T.S.

1. DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION UNLESS STAMPED BY A PROFESSIONAL ENGINEER WITH THE LATEST APPROVED DRAWING SET MARKED "ISSUED FOR CONSTRUCTION".
2. ANY ERRORS OR OMISSIONS SHALL BE REPORTED IN WRITING TO C.D. MARTYN ENGINEERING LTD. PRIOR TO PROCEEDING.
3. DRAWINGS ARE THE PROPERTY OF THE ENGINEER OF RECORD. DO NOT REPRODUCE DRAWINGS WITHOUT PERMISSION OF THE ENGINEER OF RECORD.
4. DRAWINGS ARE NOT TO SCALE. DO NOT SCALE THE DRAWINGS. CONTRACTOR TO CHECK SITE DIMENSIONS PRIOR TO TENDER SUBMISSION AND CONSTRUCTION.

REVISION SCHEDULE

No.	DESCRIPTION	DATE
0	Issued for Permit & Tender	2019-06-26

STAMP:

LICENSED PROFESSIONAL ENGINEER
Jun 27, 2019
C. D. A. MARTYN
100222614 0029-19
PROVINCE OF ONTARIO

C.D. Martyn™
ENGINEERING LTD

739B Arlington Park Pl,
Kingston, Ontario K7M 8M8
O: 613 539-4199
F: 613 653-9424

PROJECT:

STORAGE GARAGE FOR RAINY RIVER DISTRICT SOCIAL SERVICES ADMINISTRATION BOARD

737 Scott Street, Fort Frances

PROJECT NO. 19-024

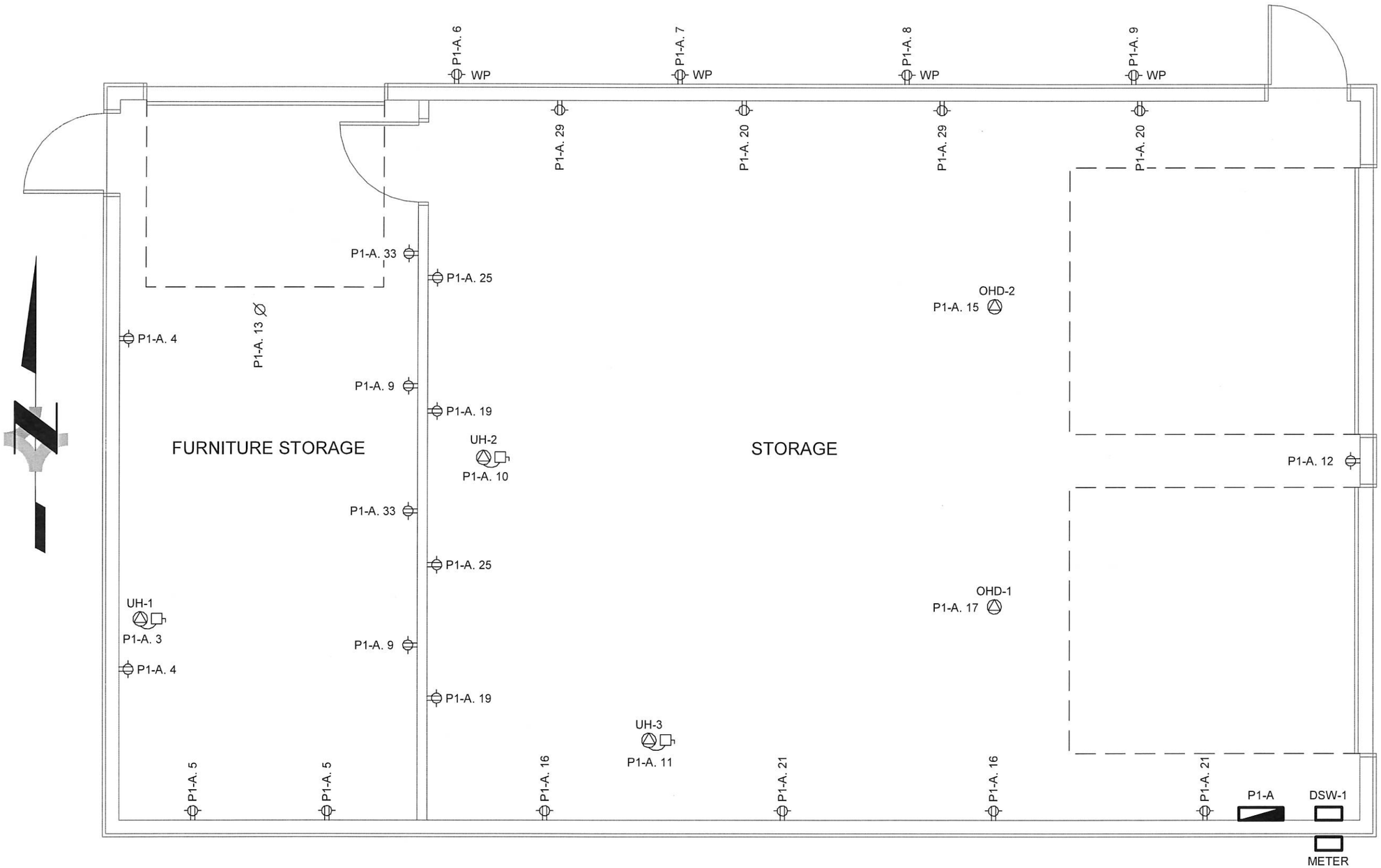
SHEET NAME:
SITE PLAN

DRAWN BY: MJ | CHECKED BY: C.D.M.

REVISION: 0 2019-06-26

SCALE: 3/32" = 1'-0"

E003



1 GROUND FLOOR POWER AND SYSTEMS PLAN

Scale: 1/4" = 1'-0"

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REVISION SCHEDULE

No.	DESCRIPTION	DATE
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STAMP:

LICENSED PROFESSIONAL ENGINEER
Jun 27, 2019
C.D.A. MARTYN
100222614
0029-19
PROVINCE OF ONTARIO

C.D. Martyn™
ENGINEERING LTD

739B Arlington Park Pl,
Kingston, Ontario K7M 8M8
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PROJECT:

STORAGE GARAGE FOR RAINY RIVER DISTRICT SOCIAL SERVICES ADMINISTRATION BOARD

737 Scott Street, Fort Frances

PROJECT NO. 19-024

SHEET NAME:

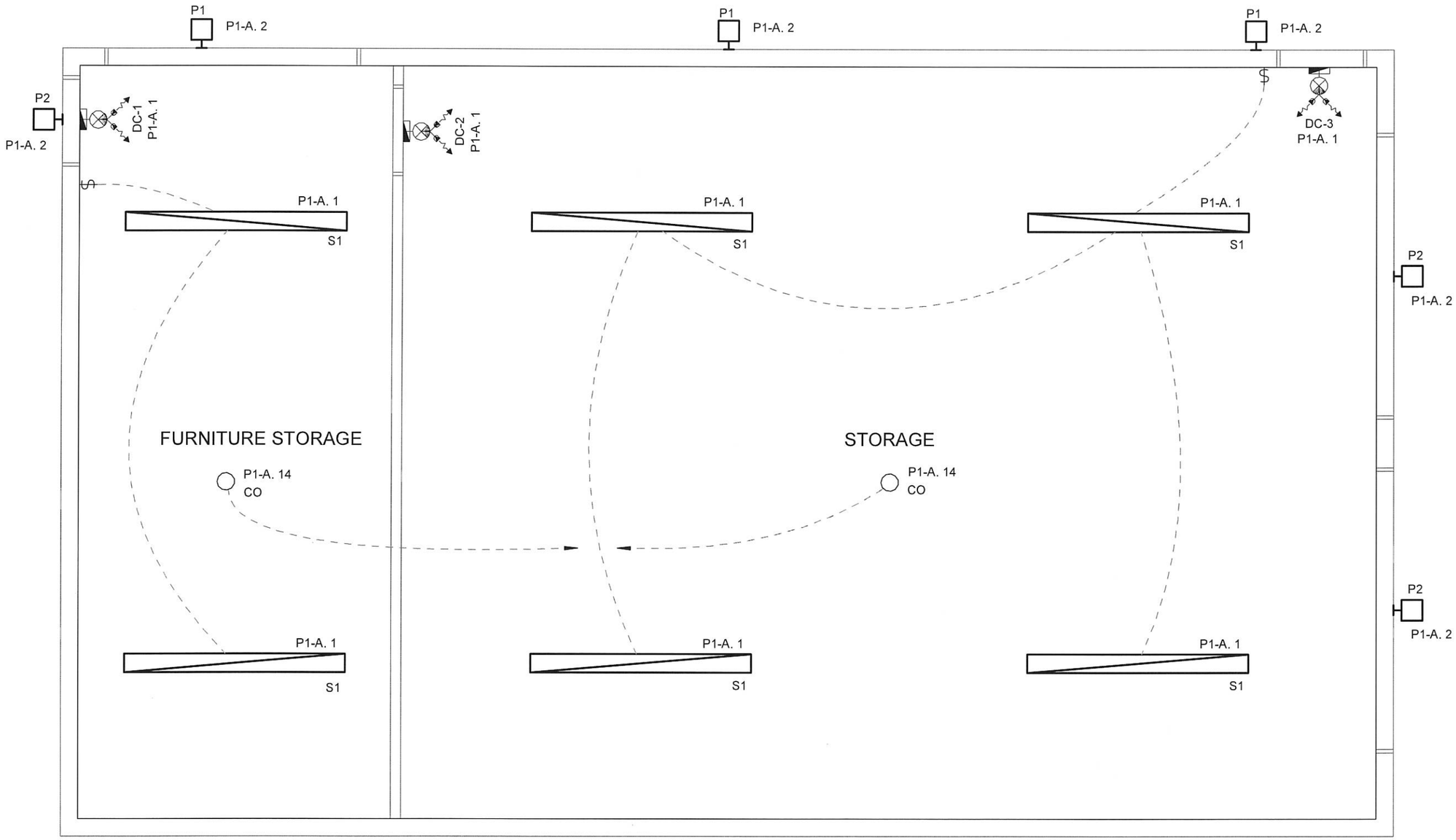
GROUND FLOOR POWER & SYSTEMS PLAN

DRAWN BY: MJ | CHECKED BY: CDM

REVISION: 0 2019-06-26

SCALE: 1/4" = 1'-0"

E100



1 MAIN FLOOR REFLECTIVE CEILING PLAN

Scale: 1/4" = 1'-0"

LUMINAIRE SCHEDULE

TYPE	MANUFACTURER	MODEL	COUNT
P1	COOPER LIGHTING	AXCS4ARL-GRF	3
P2	COOPER LIGHTING	XTOR1BW	3
S1	COOPER LIGHTING	8SLSTP11040DD-UNV	6

EXIT SIGN AND EMERGENCY LIGHT SCHEDULE

DC CIRCUIT	FIXTURE TYPE	MANUFACTURER	MODEL	COUNT	WATTAGE	TOTAL
DC-1	COMBO BATTERY/ DUAL LIGHT HEAD	EMERGI-LITE	EAC1W1250 2 LJU	1	14.5 W	14.5 W
DC-2	COMBO BATTERY/ DUAL LIGHT HEAD	EMERGI-LITE	EAC1W1250 2 LJU	1	14.5 W	14.5 W
DC-3	COMBO BATTERY/ DUAL LIGHT HEAD	EMERGI-LITE	EAC1W1250 2 LJU	1	14.5 W	14.5 W

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PROJECT:

STORAGE GARAGE FOR RAINY RIVER DISTRICT SOCIAL SERVICES ADMINISTRATION BOARD

737 Scott Street, Fort Frances

PROJECT NO. 19-024

SHEET NAME:

GROUND FLOOR REFLECTIVE CEILING PLAN

DRAWN BY: MJ CHECKED BY: CDM

REVISION: 0 2019-06-26

SCALE: 1/4" = 1'-0"

E201