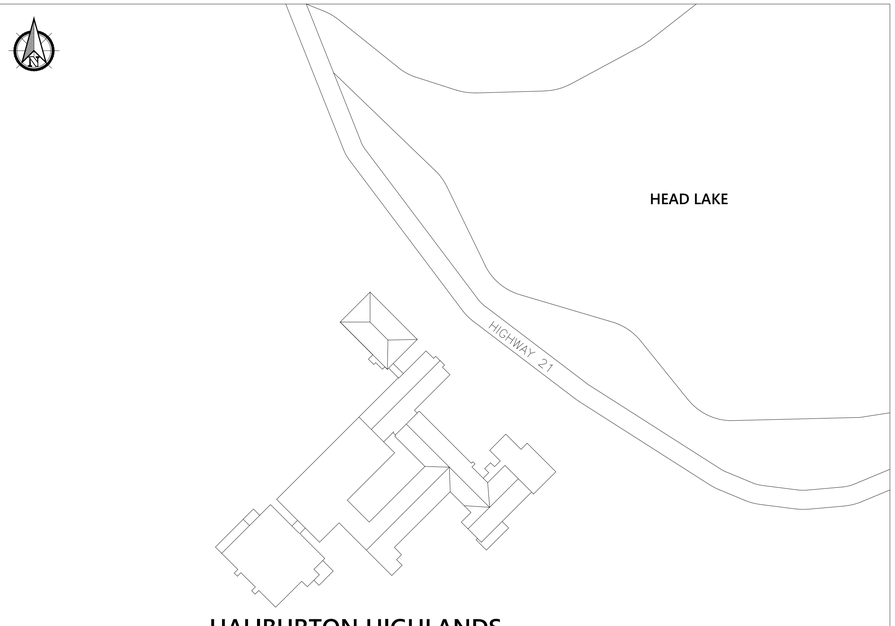
TLDSB

HALIBURTON HIGHLANDS S.S.

HVAC UPGRADE (CAFETERIA & KITCHEN)

5358 HALIBURTON COUNTRY RD. 21
HALIBURTON, ON K0M 1S0

ISSUED FOR TENDER
APRIL 2025

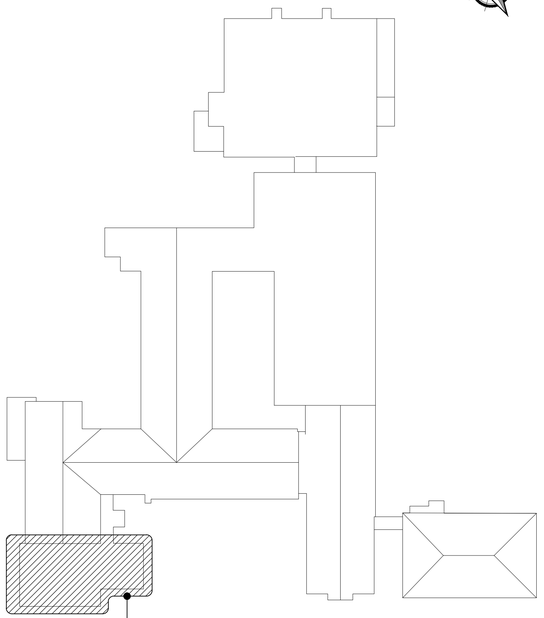


HALIBURTON HIGHLANDS SECONDARY SCHOOL

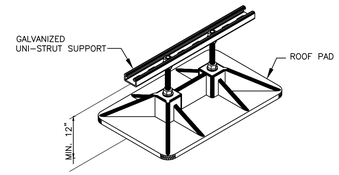
DRAWING LIST

NO.	DRAWING TITLE
M-1	KEY PLAN, SYMBOLS LIST, DETAILS & EQUIPMENT SCHEDULES – MECHANICAL
M-2	CAFETERIA & KITCHEN LAYOUT – EXISTING & DEMOLITION WORKS – MECHANICAL
M-3	ATTIC MECHANICAL ROOM LAYOUT – EXISTING & DEMOLITION WORKS – MECHANICAL
M-4	CAFETERIA & KITCHEN LAYOUT – NEW WORKS – MECHANICAL
M-5	CAFETERIA & KITCHEN ELEVATION LAYOUT – NEW WORKS – MECHANICAL
M-6	PART OF ROOF LAYOUT – NEW WORKS – MECHANICAL
M-7	CONTROL DIAGRAM
E-1	KEY PLAN, SYMBOLS, GENERAL NOTES & WIRING SCHEDULES – ELECTRICAL
E-2	POWER PLAN – EXISTING & DEMOLITION WORK – ELECTRICAL
E-3	POWER PLAN – NEW WORK – ELECTRICAL
S-101	GENERAL NOTES
S-102	TYPICAL DETAILS
S-103	TYPICAL DETAILS
S-201	KEY PLAN, AND PART OF ROOF FRAMING PLAN
S-401	OWSJ REINFORCEMENT ELEVATION AND SECTION

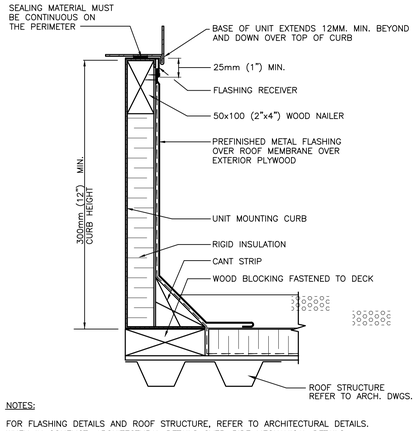
SAB ENGINEERING Inc.



KEY PLAN
N.T.S.



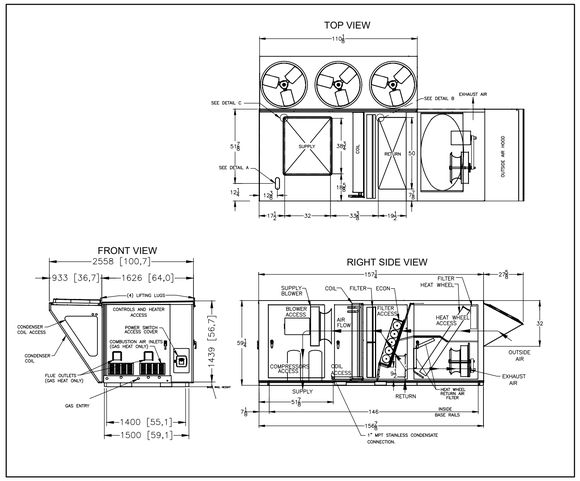
TYPICAL PIPE SUPPORT ON THE ROOF
N.T.S.



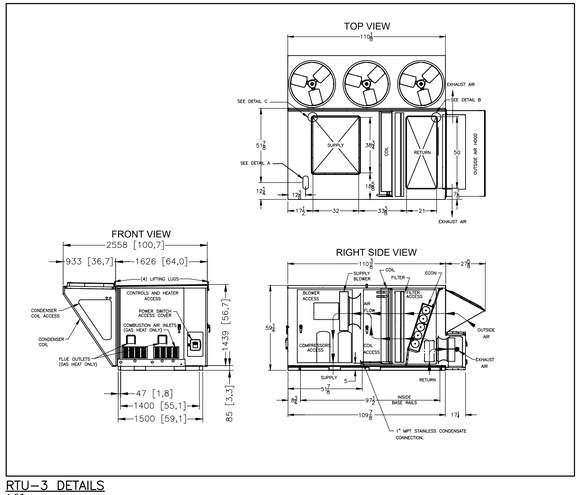
NOTES:

FOR FLASHING DETAILS AND ROOF STRUCTURE, REFER TO ARCHITECTURAL DETAILS.
WHEN IN CONFLICT, ARCHITECTURAL DETAILS OVER-RIDE MECHANICAL DETAILS.

CURB DETAIL FOR ROOF TOP UNIT
N.T.S.



RTU-2 DETAILS
1:50



RTU-3 DETAILS
1:50

	SYMBOLS
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
	DOMESTIC COLD WATER SUPPLY
	DOMESTIC HOT WATER SUPPLY
	DOMESTIC HOT WATER RECIRC.
LPG	PROPANE GAS PIPE
RG	REFRIGERANT GAS
RL	REFRIGERANT LIQUID
D	CONDENSATE DRAIN PIPE
	PLUMBING TRAP
	PIPE TURNING DOWN
	PIPE TURNING UP
FD	FLOOR DRAIN
CTE	DENOTES: CONNECT TO EXISTING
CUT	DENOTES: CUT POINT OF EXISTING SERVICE
H	HUMIDISTAT/HUMIDITY SENSOR
T	ROOM THERMOSTAT
	DENOTES: EQUIPMENT OR PIPING TO BE REMOVED
	UNION
	MANUAL AIR VENT
	PUMP
	AUTOMATIC CONTROL VALVE – TWO WAY
	MIXING OR DIVERTER VALVE (3-WAY)
	VALVE
	BALANCING VALVE
	CHECK VALVE
	STRAINER – OVER 50mm PROVIDE WITH VALVED FLUSHING DRAIN
300x150	SHEET METAL DUCT – FIRST FIGURE INDICATES DIMENSION SHOWN
A.D.	ACCESS DOOR
	SHEET METAL RISER UP – SUPPLY
	SHEET METAL RISER UP – RETURN AND EXHAUST
	SHEET METAL RISER DOWN – SUPPLY
	SHEET METAL RISER DOWN – RETURN AND EXHAUST
	SQUARE ELBOW WITH AIR TURNING VANES
F/D	FUSIBLE LINK FIRE DAMPER WITH ACCESS DOOR IN DUCT
MD	MOTORIZED DAMPER
BD	BALANCING DAMPER
	FLEXIBLE CONNECTION
HC#24	HEATING COIL#24
AV	DENOTES: AIR VENT
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
PG	PRESSURE GAUGE
TG	THERMOMETER
U/S 2000	DENOTES: UNDER SIDE OF DUCT 2000mm
S/A; R/A;	DENOTES: SUPPLY AIR; RETURN AIR
E/A; F/A;	DENOTES: EXHAUST AIR; FRESH AIR

SCHEDULE OF ROOFTOP UNITS

TAG	SUPPLY FAN PERFORMANCE				RETURN FAN PERFORMANCE				MIN. OUTSIDE AIR (CFM)	REFRIGERANT	DX COOLING				DX HEATING		BACK-UP PROPANE HEATING			HEAT RECOVERY SUMMER		HEAT RECOVER WINTER		UNIT POWER			UNIT WEIGHT KG [LBS]	DIMENSIONS L x W x H [IN]	REMARKS
	AIR FLOW (CFM)	E.S.P. Pa [IN]	SPEED RPM	HP	AIR FLOW (CFM)	E.S.P. Pa [IN]	SPEED RPM	HP			TOTAL CLG. CAP. kW [MBH]	SEN. CLG. CAP. kW [MBH]	EDBT/EWBT C [F°]	LDBT/LWBT C [F°]	CAP. kW [MBH]	OA TEMP C [F°]	INPUT kW [MBH]	OUTPUT kW [MBH]	TEMP. RISE F°	EDBT/EWBT °C [°F]	LDBT/LWBT °C [°F]	EDBT/EWBT °C [°F]	LDBT/LWBT °C [°F]	VOLTAGE	AMPS (MCA)	MOCP (A)			
RTU-2	7,500	312.5 [1.25]	1278	7.5	7,500	155 [0.62]	1604	7.5	2800	R454B	91 [310.5]	60.3 [205.8]	29 [75.6]/20.6 [69]	11.3 [52.4]/10.5 [50.9]	48.4 [165]	-3.8 [27]	119 [405]	96 [328]	40	29/20.5 [84/69]	24.8/17.6 [76.7/63.7]	-28.3/-28.8 [-19/-20]	10.9/5.2 [51.7/41.3]	208/3/60	127	150	1873 [4129]	185x64x60	C/W ROOF CURB
RTU-3	4,300	250 [1.0]	1054	3.0					550	R454B	67 [228]	44 [151]	29 [84]/20.6 [69]	11.2 [52.2]/10.8 [51.4]	52.8 [180]	-3.8 [27]	158 [540]	128 [437]	94					208/3/60	81	110	1425 [3140]	138x64x60	C/W ROOF CURB

NOTES:
CONNECT NEW UNITS TO FIRE ALARM FOR SHUT-DOWN.
RTU-3 FRESH AIR DAMPER TO BE INTERLOCKED WITH KITCHEN EXHAUST FAN.

SCHEDULE OF DIFFUSERS

TYPE	SERVICE	MANUFACTURER	MODEL	TYP.	VOLUME CONTROL	FINISH	REMARKS
A	SUPPLY	E.H. PRICE	RCD	ROUND 24" DIA., FIXED PATTERN	YES	B12	FIRE RATED
B	SUPPLY	E.H. PRICE	SCDA-FR	24"x24" SQUARE, FIXED PATTERN	YES	B12	FIRE RATED

GENERAL NOTES :

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No.	REVISION	DD/MM/YY
1.	ISSUED FOR TENDER	14/04/25

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal

LICENSED PROFESSIONAL ENGINEER
APR., 2025
O. STRASHUN
100568831
PROVINCE OF ONTARIO

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

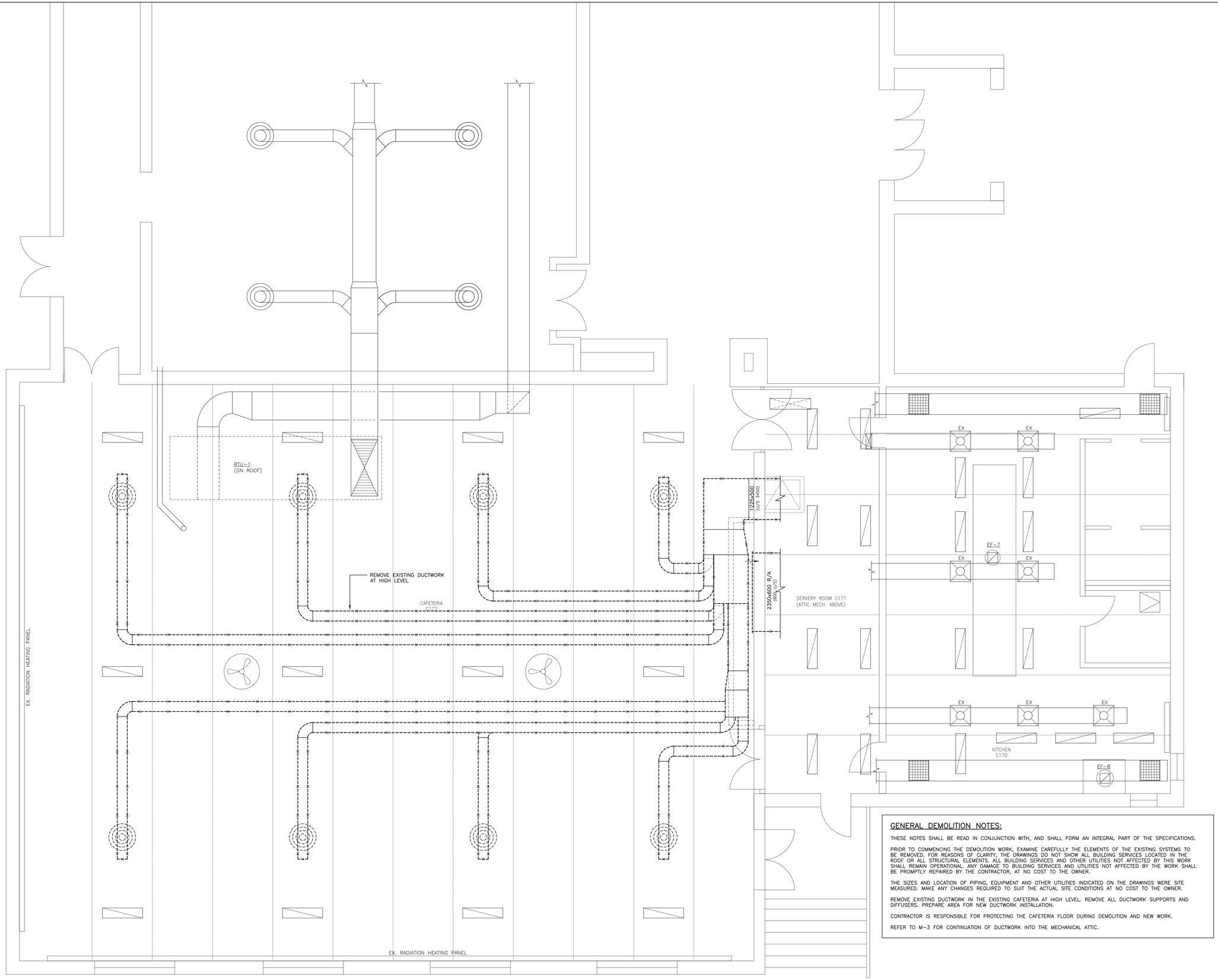
Trillium Lakelands DISTRICT SCHOOL BOARD

Project
HALIBURTON HIGHLANDS S.S.
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD. 21
HALIBURTON, ON K0M 1S0

Drawing Title
KEY PLAN, SYMBOLS LIST, DETAILS & EQUIPMENT SCHEDULES – MECHANICAL

Checked: O.S.
Date: FEB 2025
Drawn: P.N.
Scale: AS SHOWN
File Number: 2025-07
Dwg Number: M-1



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GENERAL DEMOLITION NOTES:

THESE NOTES SHALL BE READ IN CONJUNCTION WITH, AND SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS.

PRIOR TO COMMENCING THE DEMOLITION WORK, EXAMINE CAREFULLY THE ELEMENTS OF THE EXISTING SYSTEMS TO BE REMOVED. FOR REASONS OF CLARITY, THE DRAWINGS DO NOT SHOW ALL BUILDING SERVICES LOCATED IN THE ROOF OR ALL STRUCTURAL ELEMENTS. ALL BUILDING SERVICES AND OTHER UTILITIES NOT AFFECTED BY THIS WORK SHALL REMAIN OPERATIONAL. ANY DAMAGE TO BUILDING SERVICES AND UTILITIES NOT AFFECTED BY THE WORK SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR, AT NO COST TO THE OWNER.

THE SIZES AND LOCATION OF PIPING, EQUIPMENT AND OTHER UTILITIES INDICATED ON THE DRAWINGS WERE SITE MEASURED. MAKE ANY CHANGES REQUIRED TO SUIT THE ACTUAL SITE CONDITIONS AT NO COST TO THE OWNER.

REMOVE EXISTING DUCTWORK IN THE EXISTING CAFETERIA AT HIGH LEVEL. REMOVE ALL DUCTWORK SUPPORTS AND DIFFUSERS. PREPARE AREA FOR NEW DUCTWORK INSTALLATION.

CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE CAFETERIA FLOOR DURING DEMOLITION AND NEW WORK.

REFER TO M-3 FOR CONTINUATION OF DUCTWORK INTO THE MECHANICAL ATTIC.

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Trillium Lakelands DISTRICT SCHOOL BOARD

Project

HALIBURTON HIGHLANDS S.S.
HVAC UPGRADE (CAFETERIA & KITCHEN)

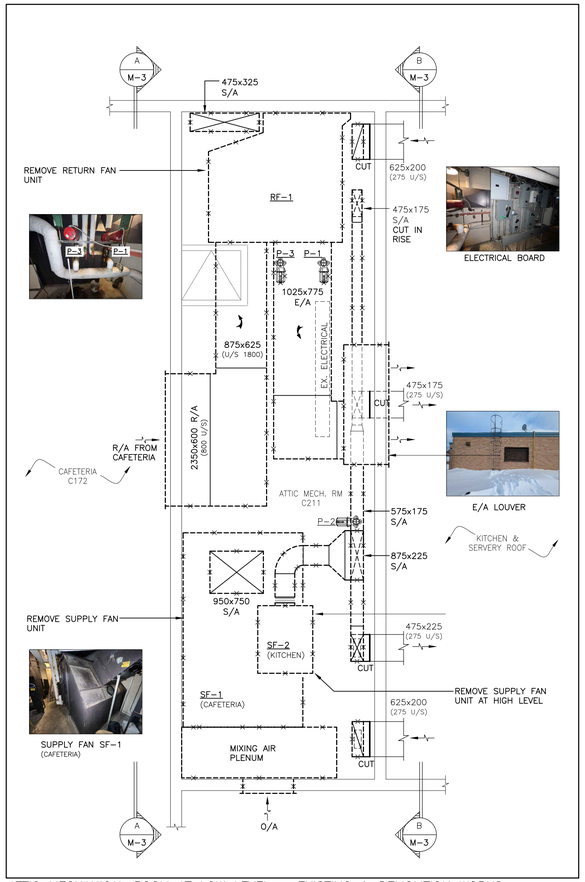
Location

5358 HALIBURTON COUNTY RD. 21
HALIBURTON, ON K0M 1S0

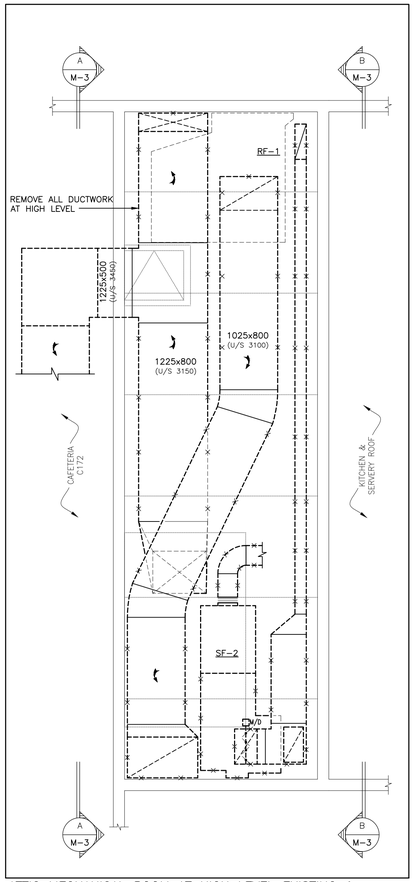
Drawing Title

CAFETERIA & KITCHEN LAYOUT – EXISTING & DEMOLITION WORKS

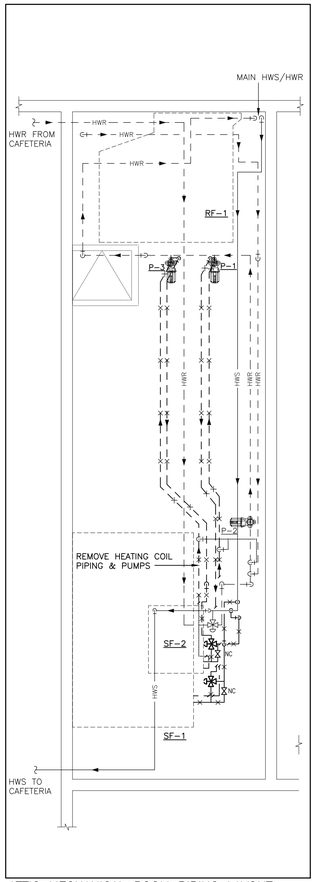
Checked: O.S.	Date: FEB 2025
Drawn: K.N.	Scale: 1:50
File Number: 2025-07	Dwg Number: M-2



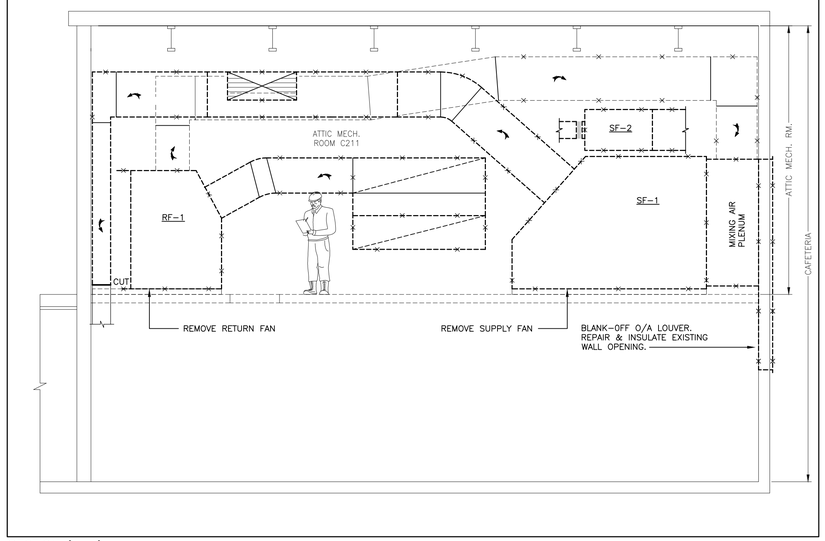
ATTIC MECHANICAL ROOM AT LOW LEVEL – EXISTING & DEMOLITION WORKS
SCALE: 1:50



ATTIC MECHANICAL ROOM AT HIGH LEVEL EXISTING & DEMOLITION WORKS
SCALE: 1:50



ATTIC MECHANICAL ROOM PIPING LAYOUT – EXISTING & DEMOLITION WORKS
SCALE: 1:50



SECTION 'A–A'
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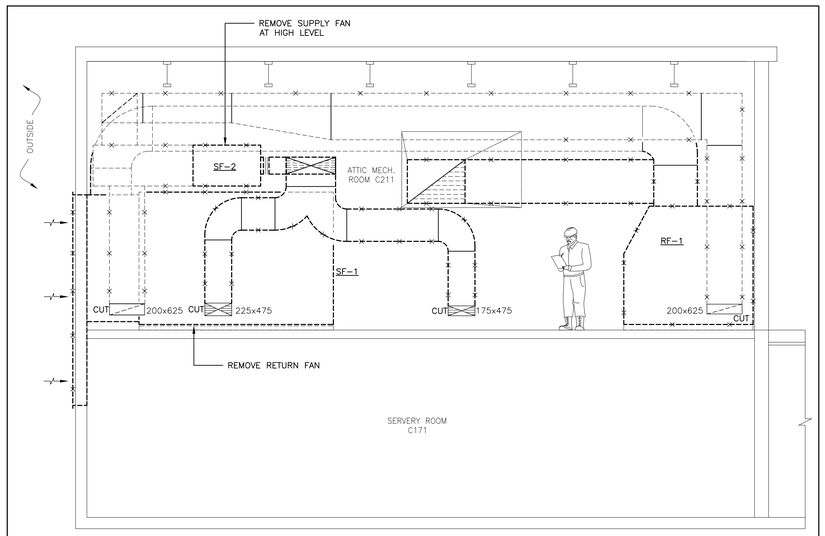

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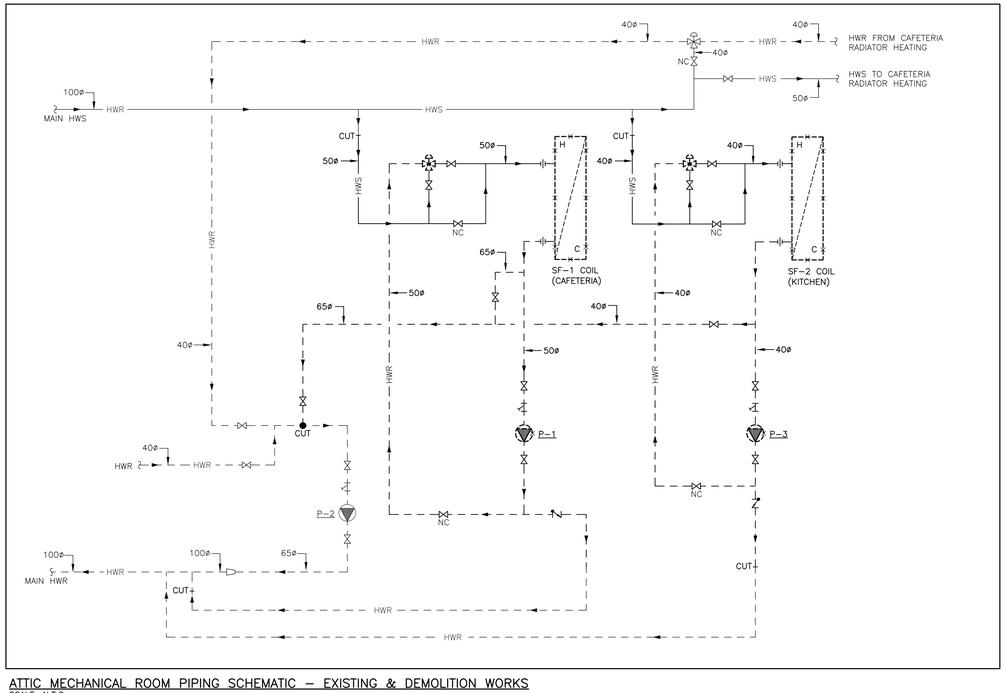

ATTIC MECHANICAL ROOM PIPING SCHEMATIC – EXISTING & DEMOLITION WORKS
SCALE: N.T.S

GENERAL DEMOLITION NOTES:

THESE NOTES SHALL BE READ IN CONJUNCTION WITH, AND SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS.

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THE SIZES AND LOCATION OF PIPING, EQUIPMENT AND OTHER UTILITIES INDICATED ON THE DRAWINGS WERE SITE MEASURED. MAKE ANY CHANGES REQUIRED TO SUIT THE ACTUAL SITE CONDITIONS AT NO COST TO THE OWNER.

REMOVE EXISTING DUCTWORK IN THE EXISTING MECHANICAL ATTIC APPROXIMATELY AS SHOWN. DISCONNECT EXISTING DUCTWORK FROM EXISTING SUPPLY AND RETURN FANS. REMOVE ALL ASSOCIATED HANGERS & SUPPORTS

REMOVE EXISTING BASE MOUNTED SUPPLY & RETURN FANS, AND SUSPENDED SUPPLY FAN IN THE MECHANICAL ATTIC. DISCONNECT FROM POWER, DUCTWORK, CONTROLS, AND HEATING PIPING. REMOVE ASSOCIATED SUPPORTS.

REMOVE EXISTING HEATING PIPING IN THE MECHANICAL ATTIC APPROXIMATELY AS SHOWN. DISCONNECT PIPING FROM DEMOLISHED UNITS, AND REMOVE ALL ASSOCIATED VALVES, PUMPS, AND OTHER ACCESSORIES. MAINTAIN EXISTING HEATING PIPING TO THE GYMNASIUM RADIATORS.

CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL REMOVED EQUIPMENT AND MATERIALS. ALLOW FOR THE REMOVAL OF DEMOLISHED MATERIAL THROUGH THE EXISTING EXHAUST AIR LOUVER. TEMPORARILY REMOVE LOUVER AND ENLARGE WALL OPENING IF REQUIRED. UPON COMPLETION, RE-INSTATE LOUVER, CAP ON THE INSIDE COMPLETE WITH INSULATION.

CONTRACTOR SHALL COORDINATE ALL UTILITY SHUT-DOWNS WITH THE SCHOOL BOARD. ENSURE ANY UTILITY SHUT-DOWNS DO NOT AFFECT THE OPERATION OF OTHER EXISTING SERVICES IN THE BUILDING DURING OCCUPIED HOURS.

ALLOW FOR PARTIAL DRAINAGE OF THE BUILDING'S EXISTING HEATING LOOP AS REQUIRED TO COMPLETE THE DEMOLITION. FLUSH & CLEAN UPON COMPLETION OF THE WORK.

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Project
HALIBURTON HIGHLANDS S.S.
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD. 21
HALIBURTON, ON K0M 1S0

Drawing Title
ATTIC MECHANICAL ROOM LAYOUT – EXISTING & DEMOLITION WORKS – MECHANICAL

Checked: O.S. Date: FEB 2025
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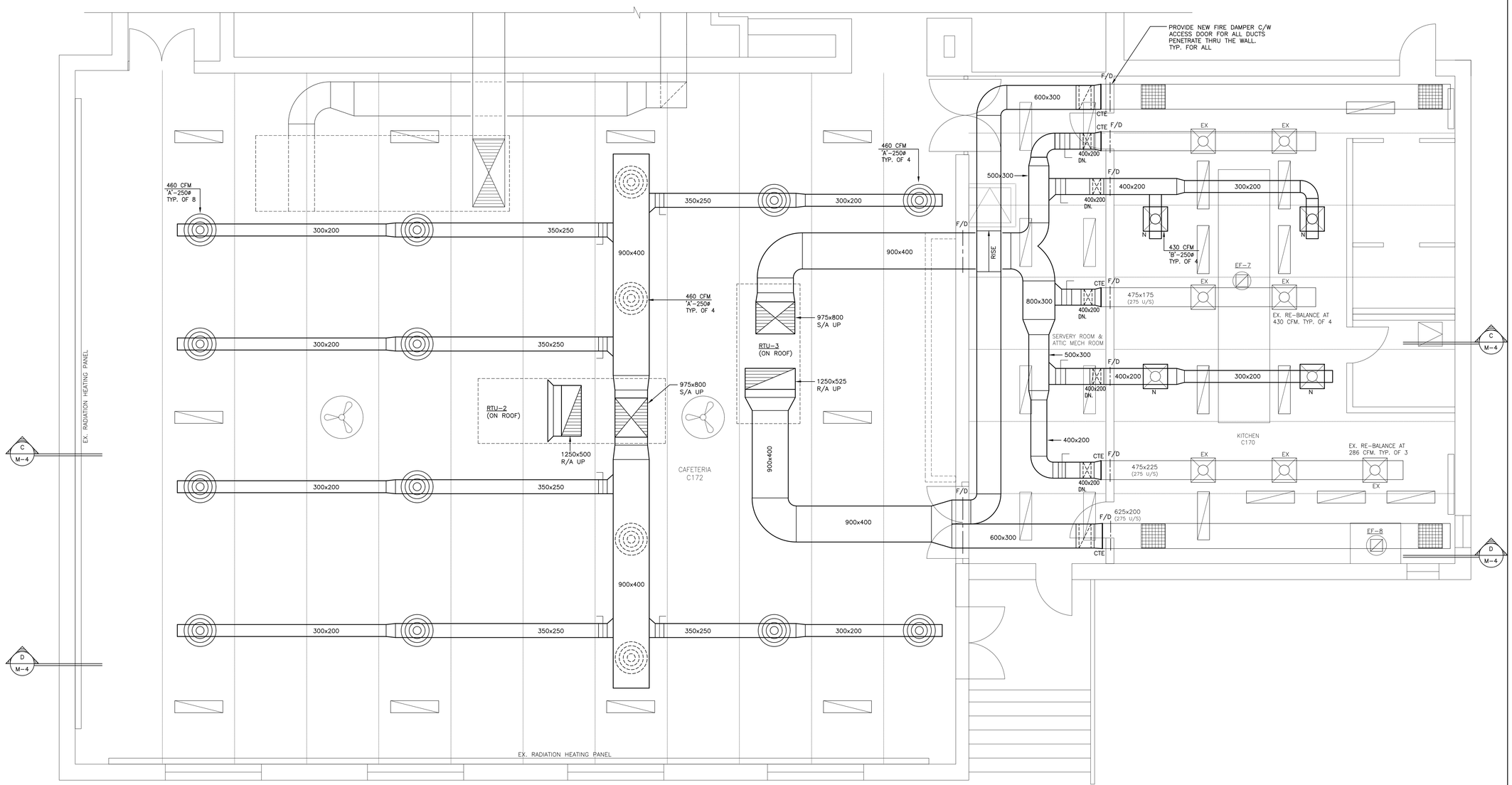
Dwg Number: M-3



CAFETERIA, ATTIC MECH. ROOM & KITCHEN LAYOUT – NEW WORKS

SCALE: 1:50

GENERAL NEW WORK NOTES:

THE DRAWINGS DO NOT SHOW ALL STRUCTURAL ELEMENTS AND BUILDING SERVICES LOCATED ON THE ROOF.

THE SIZES AND LOCATION OF PIPING, EQUIPMENT AND DUCTWORK SHOWN ON THE DRAWINGS WERE SITE MEASURED. MAKE ANY CHANGES REQUIRED TO SUIT THE ACTUAL SITE CONDITIONS AT NO COST TO THE OWNER.

ALL TEMPORARY INTERRUPTION OF SERVICES SHALL BE COORDINATED WITH THE OWNER.

INSTALL NEW ROOFTOP UNITS (RTU-2 SERVING CAFETERIA; RTU-3 SERVING KITCHEN) ON TOP OF NEW ROOF CURBS. CONNECT NEW UNITS TO NEW DUCTWORK BELOW. REFER TO M-6 FOR ROOF WORK AREA. PROVIDE STRUCTURAL REINFORCEMENT AS PER STRUCTURAL DRAWINGS.

PROVIDE NEW SUPPLY & RETURN DUCTWORK IN THE CAFETERIA & KITCHEN APPROXIMATELY AS SHOWN. CONTRACTOR TO VERIFY EXACT DUCT ROUTING ON SITE AND MAKE ADJUSTMENTS AS NECESSARY. ALLOW FOR ADDITIONAL OFFSETS, TRANSITIONS, AND ELBOWS AS REQUIRED TO COMPLETE THE INSTALLATION. INSULATE ALL NEW SUPPLY DUCTWORK IN THE MECHANICAL ATTIC SPACE.

COORDINATE DUCTWORK INSTALLATION WITH EXISTING SERVICES IN THE CEILING SPACE SUCH AS STRUCTURAL AND ELECTRICAL ELEMENTS. RUN NEW DUCTWORK IN THE CAFETERIA THROUGH OWSJ WHERE POSSIBLE TO CONSERVE HEADROOM.

CONTRACTOR TO ALLOW FOR TEMPORARY REMOVAL OF EXISTING DRYWALL CEILING IN THE KITCHEN AREA, AS REQUIRED TO INSTALL NEW DUCTWORK BRANCHES. REMOVE EXISTING SERVICES IN THE CEILING AS REQUIRED SUCH AS LIGHTS, FIRE ALARM DEVICES, ETC. UPON COMPLETION OF THE WORK RE-INSTATE THE DRYWALL CEILING IN THE AREAS OF WORK AND PAINT TO MATCH EXISTING. RE-INSTALL ANY SERVICES THAT WERE REMOVED BACK INTO THE CEILING. RE-VERIFY ANY FIRE ALARM DEVICES THAT WERE RE-INSTALLED.

PERFORM AIR BALANCING AND MAKE ALL NECESSARY ADJUSTMENTS SO AS TO ENSURE THAT THE UNITS OPERATES AS PER SPECIFIED PARAMETERS. ALL COMPONENTS OF THE NEW UNIT AIR SYSTEM SHALL BE ADJUSTED AND STARTED-UP BY THE MANUFACTURER; PROVIDE START-UP REPORT UPON PROJECT COMPLETION.

PROVIDE NEW SUPPLY & RETURN DIFFUSERS/GRILLES APPROXIMATELY AS SHOWN.

PROVIDE ADEQUATE SUPPORT FOR ALL NEW DUCTWORK.

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Drawing Title

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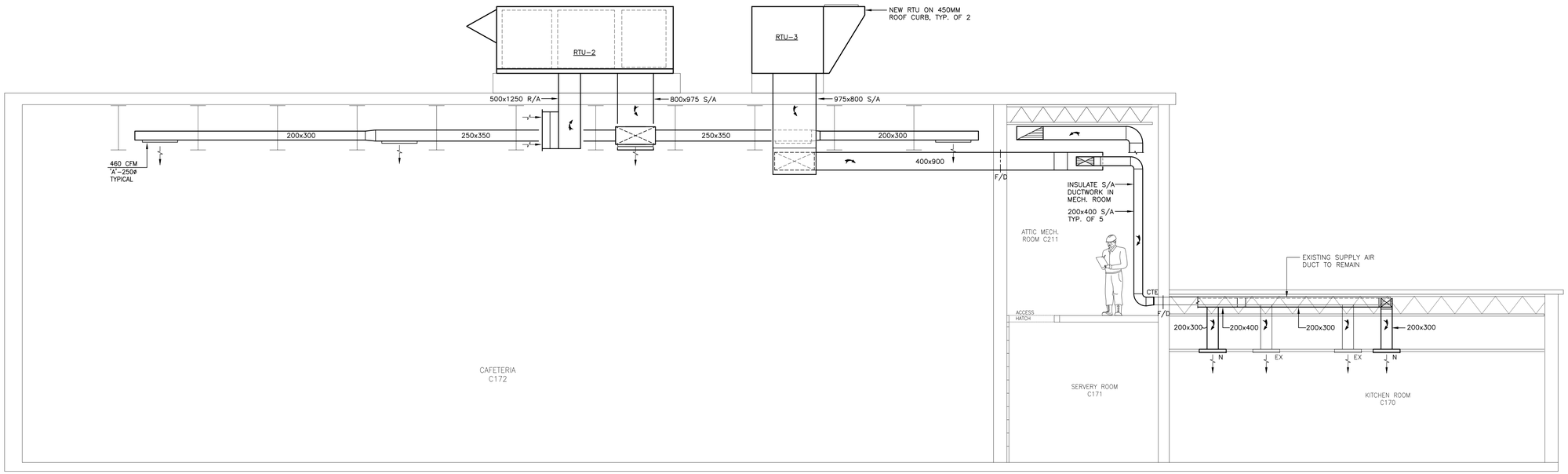
Drawn:	Scale:
K.N.	1:50
File Number:	Dwg Number:
2025-07	M-4



SECTION 'C-C'
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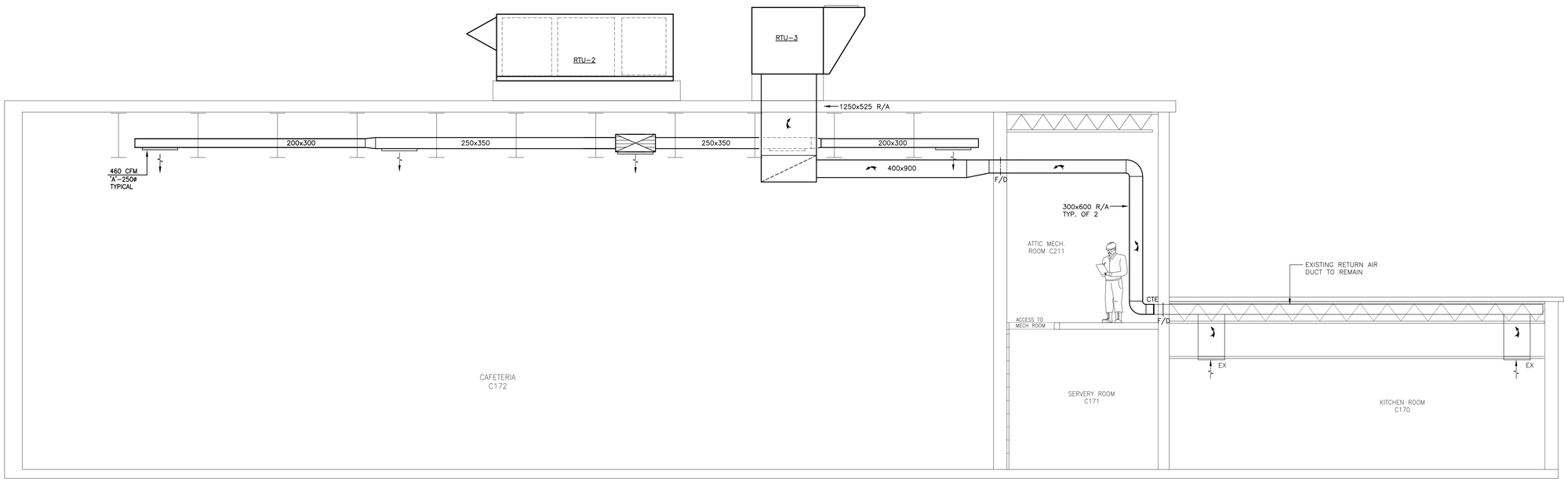


SECTION 'D-D'
SCALE: 1:50

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

No.	REVISION	DD/MM/YY
1.	ISSUED FOR TENDER	14/04/25

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal

LICENSED PROFESSIONAL ENGINEER
APR., 2025
O. STRASHUN
100568831
PROVINCE OF ONTARIO

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

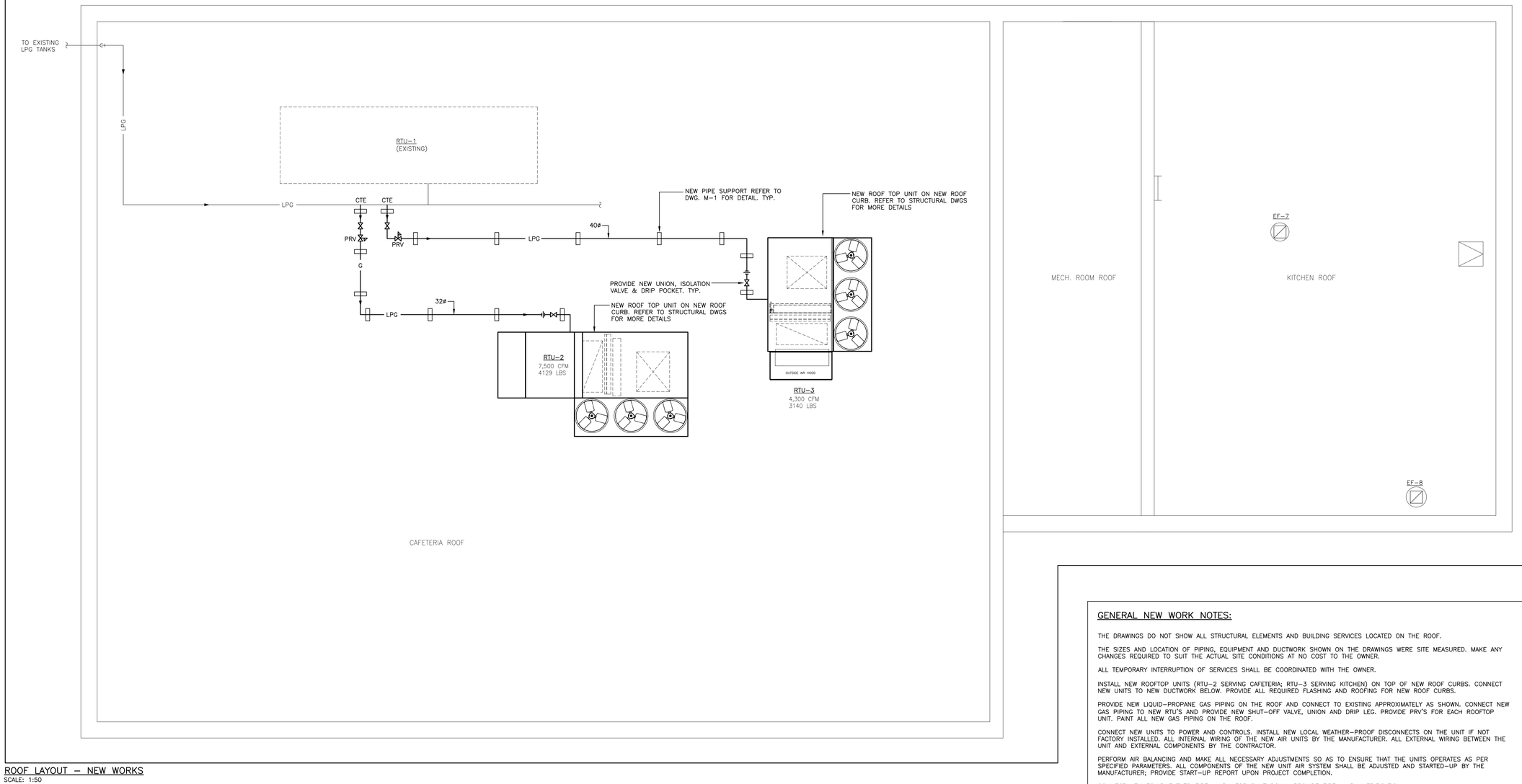
Trillium Lakelands DISTRICT SCHOOL BOARD

Project
HALIBURTON HIGHLANDS S.S.
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD. 21
HALIBURTON, ON K0M 1S0

Drawing Title
CAFETERIA & KITCHEN ELEVATION LAYOUT - NEW WORKS - MECHANICAL

Checked:	Date:
O.S.	FEB 2025
Drawn:	Scale:
T.N.	1:50
File Number:	Dwg Number:
2025-07	M-5



ROOF LAYOUT – NEW WORKS
SCALE: 1:50

GENERAL NEW WORK NOTES:

THE DRAWINGS DO NOT SHOW ALL STRUCTURAL ELEMENTS AND BUILDING SERVICES LOCATED ON THE ROOF.

THE SIZES AND LOCATION OF PIPING, EQUIPMENT AND DUCTWORK SHOWN ON THE DRAWINGS WERE SITE MEASURED. MAKE ANY CHANGES REQUIRED TO SUIT THE ACTUAL SITE CONDITIONS AT NO COST TO THE OWNER.

ALL TEMPORARY INTERRUPTION OF SERVICES SHALL BE COORDINATED WITH THE OWNER.

INSTALL NEW ROOFTOP UNITS (RTU–2 SERVING CAFETERIA; RTU–3 SERVING KITCHEN) ON TOP OF NEW ROOF CURBS. CONNECT NEW UNITS TO NEW DUCTWORK BELOW. PROVIDE ALL REQUIRED FLASHING AND ROOFING FOR NEW ROOF CURBS.

PROVIDE NEW LIQUID–PROPANE GAS PIPING ON THE ROOF AND CONNECT TO EXISTING APPROXIMATELY AS SHOWN. CONNECT NEW GAS PIPING TO NEW RTU'S AND PROVIDE NEW SHUT–OFF VALVE, UNION AND DRIP LEG. PROVIDE PRV'S FOR EACH ROOFTOP UNIT. PAINT ALL NEW GAS PIPING ON THE ROOF.

CONNECT NEW UNITS TO POWER AND CONTROLS. INSTALL NEW LOCAL WEATHER–PROOF DISCONNECTS ON THE UNIT IF NOT FACTORY INSTALLED. ALL INTERNAL WIRING OF THE NEW AIR UNITS BY THE MANUFACTURER. ALL EXTERNAL WIRING BETWEEN THE UNIT AND EXTERNAL COMPONENTS BY THE CONTRACTOR.

PERFORM AIR BALANCING AND MAKE ALL NECESSARY ADJUSTMENTS SO AS TO ENSURE THAT THE UNITS OPERATES AS PER SPECIFIED PARAMETERS. ALL COMPONENTS OF THE NEW UNIT AIR SYSTEM SHALL BE ADJUSTED AND STARTED–UP BY THE MANUFACTURER; PROVIDE START–UP REPORT UPON PROJECT COMPLETION.

CONNECT NEW EQUIPMENT TO FIRE ALARM FOR SHUT DOWN. PROVIDE FIRE ALARM VERIFICATION.

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

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HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
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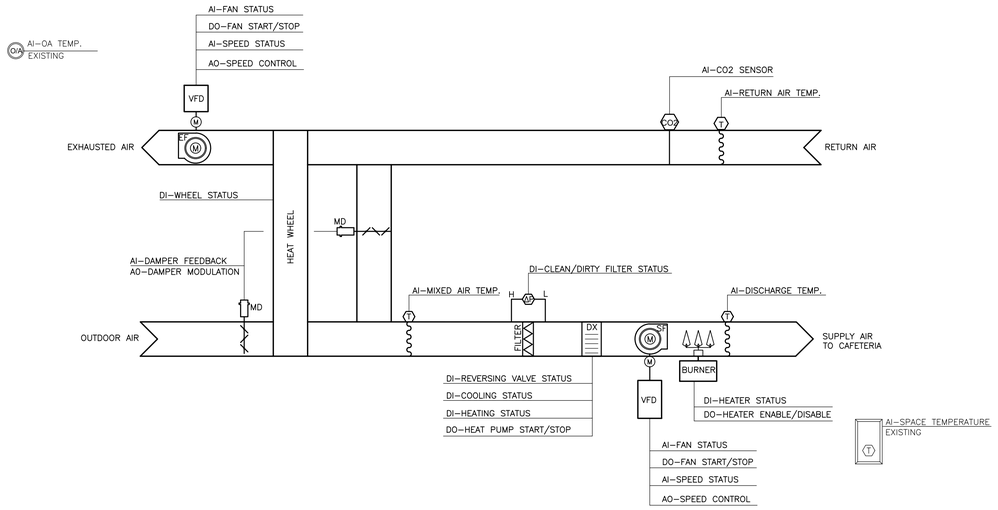
HALIBURTON, ON K0M 1S0

Drawing Title
PART OF ROOF LAYOUT – NEW WORKS – MECHANICAL

Checked:	Date:
O.S.	FEB 2025
Drawn:	Scale:
T.N.	1:50
File Number:	Dwg Number:
2025–07	M-6



ADDITIONAL BAS COMMAND POINTS
DO–ROOF–TOP UNIT ON/OFF
AO–SUPPLY AIR TEMPERATURE RE–SET
DO–HEAT/COOL MODE SELECT

NOTES:

ALL VALUES TO BE MADE ADJUSTABLE BY THE OPERATOR.

ALL SENSORS AND DEVICES TO BE NEW.

ALL SENSORS TO BE SUPPLIED AND INSTALLED BY THE CONTROLS CONTRACTOR PROVIDE NEW WIRING IN CONDUIT AS REQUIRED.

SUMMARY OF CONTROL POINTS				
AI	AO	DI	DO	TOTAL
9	3	6	4	22

SEQUENCE OF OPERATION

GENERAL

*NOTES: THE REQUIRED MINIMUM POSITION OF THE OUTDOOR AIR INTAKE DAMPER SHALL BE DETERMINED DURING THE AIR BALANCING STAGE, BASED ON THE MINIMUM OUTSIDE AIR FLOW REQUIREMENT SHOWN ON THE EQUIPMENT SCHEDULE. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR DOCUMENTING THE MINIMUM POSITION OF THE OUTDOOR INTAKE AIR DAMPER DURING THE EQUIPMENT BALANCING STAGE AND RELAYING THE INFORMATION TO THE BAS CONTRACTOR. FAILURE TO DO SO WILL RESULT IN ADDITIONAL AIR BALANCING AT THE EXPENSE OF THE MECHANICAL CONTRACTOR.

HEATING/COOLING MODE SWITCHOVER

THE SYSTEM SHALL BE CONSIDERED IN HEATING MODE WHEN THE HEATING PLANT IS ENABLED, AT ALL OTHER TIMES, THE SYSTEM SHALL BE IN COOLING MODE.

OCCUPIED/UNOCCUPIED SCHEDULE SHALL REMAIN AS PER THE CURRENT BAS STRATEGY.

THE SIMULTANEOUS OPERATION OF THE HEATING AND COOLING SECTIONS OF ANY UNIT SHALL NOT BE PERMITTED.

HEATING MODE – OCCUPIED PERIODS

AT THE BEGINNING OF THE HEATING–OCCUPIED MODE, THE FRESH AIR DAMPERS SHALL OPEN TO THE MIN. POSITION (AS SHOWN ON ROOF–TOP UNIT SCHEDULE ON M–1), THE RETURN & EXHAUST AIR DAMPERS WILL RE–POSITION AS REQUIRED TO MAINTAIN THE TOTAL AIR FLOW ACROSS THE UNIT. THE SUPPLY FAN SHALL SWITCH TO CONTINUOUS OPERATION.

FOR OAT TEMPERATURES >9°C:

THE DX REVERSING VALVE SHALL ENERGIZE INTO HEATING MODE BY THE UNIT'S CONTROLLER. THE DX HEAT PUMP SHALL STAGE/MODULATE AS REQUIRED TO MAINTAIN A RETURN TEMPERATURE FROM THE SPACE OF 21°C (ADJ.). THE UNIT'S GAS BURNER SHALL BE DISABLED DURING THIS TIME.

FOR OAT TEMPERATURES <0°C:

THE DX HEAT PUMP OPERATION SHALL BE DISABLED DURING ALL PERIODS WHEN OAT<5°C. THE GAS FIRED HEAT EXCHANGER SHALL BE STAGED BY THE UNIT'S CONTROLLER AS REQUIRED TO MAINTAIN THE OCCUPIED HEATING RETURN AIR TEMPERATURE SETPOINT OF 21°C (ADJ.). EACH STAGE SHALL RUN FOR A MINIMUM OF 5 MIN. (ADJUSTABLE) AS TO AVOID CYCLING.

THE CO2 SENSOR SHALL MONITOR THE AIR QUALITY OF THE RETURN AIR. IF THE CO2 SENSOR EXCEEDS THE CONCENTRATION SETPOINT (DEFAULT: 800 PPM, ADJ.), THE FRESH AIR DAMPERS SHALL GRADUALLY OPEN AND CORRESPONDINGLY, THE RETURN AIR DAMPER SHALL GRADUALLY CLOSE, TO MAINTAIN THE TOTAL AIR FLOW ACROSS THE UNIT AND LIMIT THE RISE IN CO2 CONCENTRATION. THE POWER EXHAUSTER SHALL BE ENABLED BY THE BAS IF THE FRESH AIR DAMPER OPENS BEYOND 35% (ADJUSTABLE) TO AVOID SPACE OVER–PRESSURIZATION.

THE MODULATION OF THE FRESH AIR AND RETURN DAMPERS SHALL BE SUBJECT TO A LOW LIMIT MIXED AIR TEMPERATURE (DEFAULT VALUE: OF 8°C). IF THE MIXED AIR TEMPERATURE DROPS BELOW THE LOW LIMIT VALUE, NO FURTHER OPENING OF THE FRESH AIR DAMPER SHALL BE ALLOWED, IRRESPECTIVE OF THE CO2 SENSOR READING.

THE BAS SHALL MONITOR THE DISCHARGED AIR TEMPERATURE OF THE UNIT.

THE UNIT'S CONTROLLER SHALL ENERGIZE THE HEAT RECOVERY WHEEL DURING OCCUPIED PERIODS.

HEATING MODE – UNOCCUPIED PERIODS

THE UNIT SHALL BE DE–ENERGIZED; THE FANS WILL STOP, FRESH AIR DAMPERS WILL CLOSE, THE RETURN AIR DAMPERS SHALL OPEN.

COOLING MODE – OCCUPIED PERIODS

AT THE BEGINNING OF THE COOLING–OCCUPIED MODE, THE FRESH AIR DAMPERS SHALL OPEN TO THE MIN. POSITION (AS SHOWN ON ROOF–TOP UNIT SCHEDULE ON M–1), THE RETURN & EXHAUST DAMPERS WILL RE–POSITION AS REQUIRED TO MAINTAIN THE TOTAL AIR FLOW ACROSS THE UNIT. THE SUPPLY FAN SHALL SWITCH TO CONTINUOUS OPERATION.

THE DX COOLING SECTION SHALL BE MODULATED BY UNIT CONTROLLER AS REQUIRED TO MAINTAIN THE RETURN TEMPERATURE AT THE OCCUPIED COOLING SETPOINT (DEFAULT 24°C). EACH DX COOLING STAGE SHALL HAVE A MINIMUM RUN TIME OF 5 MINUTES (ADJUSTABLE).

DISCHARGE AIR TEMPERATURE SHALL BE RE–SET BY THE UNIT'S CONTROLLER IN ORDER TO MAINTAIN RETURN TEMPERATURE SETPOINT AT 24°C (ADJUSTABLE), SUBJECT TO A LOW LIMIT OF 10°C.

THE CO2 SENSOR SHALL MONITOR THE AIR QUALITY OF THE RETURN AIR. IF THE CO2 SENSOR EXCEEDS THE CONCENTRATION SETPOINT (DEFAULT: 1,000 PPM), THE FRESH AIR DAMPERS SHALL GRADUALLY OPEN AND CORRESPONDINGLY, THE RETURN AIR DAMPER SHALL GRADUALLY CLOSE, TO MAINTAIN THE TOTAL AIR FLOW ACROSS THE UNIT AND LIMIT THE RISE IN CO2 CONCENTRATION. THE POWER EXHAUSTER SHALL BE ENABLED BY THE BAS IF THE FRESH AIR DAMPER OPENS BEYOND 35% (ADJUSTABLE) TO AVOID SPACE OVER–PRESSURIZATION.

THE UNIT'S CONTROLLER SHALL ENERGIZE THE HEAT RECOVERY WHEEL DURING OCCUPIED PERIODS.

ECONOMIZER CYCLE

IF THE OUTDOOR TEMPERATURE DROPS IS BELOW 18°C FOR MORE THAN 30 MIN., THE FRESH AIR DAMPERS SHALL OPEN UP TO 100% AND THE RETURN DAMPERS SHALL CORRESPONDINGLY CLOSE DOWN TO 100% SUCH THAT THE MIXED AIR TEMPERATURE IS MAINTAINED AT 15°C (ADJUSTABLE). THE POWER EXHAUSTER SHALL BE ENABLED BY THE BAS IF THE FRESH AIR DAMPER OPENS BEYOND 35% (ADJUSTABLE) TO AVOID SPACE OVER–PRESSURIZATION. DURING THE ECONOMIZER CYCLE, THE MECHANICAL COOLING SECTION SHALL BE DISABLED. IF THE OUTDOOR TEMPERATURE RISES ABOVE 18°C FOR MORE THAN 30 MIN., THE UNIT SHALL REVERT TO COOLING MODE–OCCUPIED PERIODS SEQUENCE.

COOLING MODE – UNOCCUPIED PERIODS

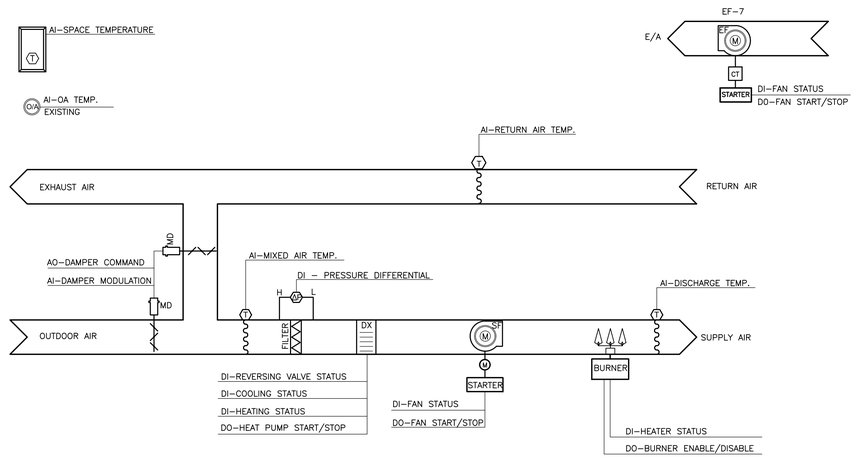
DURING THE COOLING MODE UNOCCUPIED PERIODS, THE ROOFTOP UNIT SHALL BE DISABLED (FAN OFF, FRESH AIR, RETURN DAMPER OPEN).

ALARMS

THE BAS SHALL GENERATE ALARMS IN CASE OF:

- ANY SUPPLY FAN FAILURE;
- ANY HEATING SECTION (OR STAGE) FAILURE;
- ANY COOLING SECTION (OR STAGE) FAILURE;
- ANY FRESH AIR DAMPER FAILURE TO OPEN DURING OCCUPIED PERIODS;
- ANY SPACE TEMPERATURE ±2°C DEVIATION FROM SETPOINT;
- ANY MIXED AIR TEMPERATURE LOWER THAN 5°C (FRESH AIR DAMPERS SHALL CLOSE, RETURN DAMPERS SHALL FULLY OPEN);
- ANY CO2 SENSOR READING ABOVE 1,100 PPM FOR MORE THAN 15 MIN DURING OCCUPIED PERIODS;
- ANY DISCHARGED AIR TEMPERATURE ABOVE 50°C OR BELOW 10°C.

RTU–2 CONTROL DIAGRAM
N.T.S.



UNITS TO BE SUPPLIED WITH OEM UNIT CONTROLLER FOR BAS CONNECTION AND CONTROL

ALL CONTROL POINTS AND PARAMETERS TO BE ADJUSTABLE BY THE OPERATOR.

ALLOW FOR CONNECTION TO THE FIRE ALARM FOR SHUT–DOWN. PROVIDE ALL REQUIRED DUCT SMOKE SENSORS.

SUMMARY OF CONTROL POINTS				
AI	AO	DI	DO	TOTAL
4	1	7	4	16

ADDITIONAL BAS COMMAND POINTS
DO–ROOF–TOP UNIT ON/OFF
AO–SUPPLY AIR TEMPERATURE RE–SET
DO–HEAT/COOL MODE SELECT

SEQUENCE OF OPERATION

GENERAL

*NOTES: THE REQUIRED MINIMUM POSITION OF THE OUTDOOR AIR INTAKE DAMPER SHALL BE DETERMINED DURING THE AIR BALANCING STAGE, BASED ON THE MINIMUM OUTSIDE AIR FLOW REQUIREMENT SHOWN ON THE EQUIPMENT SCHEDULE. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR DOCUMENTING THE MINIMUM POSITION OF THE OUTDOOR INTAKE AIR DAMPER DURING THE EQUIPMENT BALANCING STAGE AND RELAYING THE INFORMATION TO THE BAS CONTRACTOR. FAILURE TO DO SO WILL RESULT IN ADDITIONAL AIR BALANCING AT THE EXPENSE OF THE MECHANICAL CONTRACTOR.

HEATING/COOLING MODE SWITCHOVER

THE SYSTEM SHALL BE CONSIDERED IN HEATING MODE WHEN THE HEATING PLANT IS ENABLED, AT ALL OTHER TIMES, THE SYSTEM SHALL BE IN COOLING MODE.

OCCUPIED/UNOCCUPIED SCHEDULE SHALL REMAIN AS PER THE CURRENT BAS STRATEGY.

THE SIMULTANEOUS OPERATION OF THE HEATING AND COOLING SECTIONS OF ANY UNIT SHALL NOT BE PERMITTED.

HEATING MODE – OCCUPIED PERIODS

AT THE BEGINNING OF THE HEATING–OCCUPIED MODE, THE FRESH AIR DAMPERS SHALL OPEN TO THE MIN. POSITION (AS SHOWN ON ROOF–TOP UNIT SCHEDULE ON M–1), THE RETURN & EXHAUST AIR DAMPERS WILL RE–POSITION AS REQUIRED TO MAINTAIN THE TOTAL AIR FLOW ACROSS THE UNIT. THE SUPPLY FAN SHALL SWITCH TO CONTINUOUS OPERATION.

FOR OAT TEMPERATURES >5°C:

THE DX REVERSING VALVE SHALL ENERGIZE INTO HEATING MODE BY THE UNIT'S CONTROLLER. THE DX HEAT PUMP SHALL STAGE/MODULATE AS REQUIRED TO MAINTAIN A SPACE TEMPERATURE OF 21°C (ADJ.). THE UNIT'S GAS BURNER SHALL BE DISABLED DURING THIS TIME.

FOR OAT TEMPERATURES <5°C:

THE DX HEAT PUMP OPERATION SHALL BE DISABLED DURING ALL PERIODS WHEN OAT<5°C. THE GAS FIRED HEAT EXCHANGER SHALL STAGE/MODULATE BY THE UNIT'S CONTROLLER AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT OF 21°C (ADJ.). EACH STAGE SHALL RUN FOR A MINIMUM OF 5 MIN. (ADJUSTABLE) AS TO AVOID CYCLING.

THE OPERATION OF THE UNIT'S FRESH AIR DAMPER SHALL BE INTERLOCKED WITH THE KITCHEN HOOD EXHAUST FAN, EF–7. UPON CONFIRMATION THAT EF–7 IS COMMANDED ON (EITHER BY BAS OR BY MANUAL USER) THE UNIT'S FRESH AIR DAMPER SHALL OPEN TO 100% AND THE RETURN AIR DAMPER SHALL FULLY CLOSER. BASED ON THE OUTSIDE AIR TEMPERATURE THE UNIT'S HEATING SOURCE SHALL ENERGIZE TO MAINTAIN THE SPACE TEMPERATURE SETPOINT.

THE BAS SHALL MONITOR THE DISCHARGED AIR TEMPERATURE OF THE UNIT.

HEATING MODE – UNOCCUPIED PERIODS

THE UNIT SHALL BE DE–ENERGIZED; THE FANS WILL STOP, FRESH AIR DAMPERS WILL CLOSE, THE RETURN AIR DAMPERS SHALL OPEN.

COOLING MODE – OCCUPIED PERIODS

AT THE BEGINNING OF THE COOLING–OCCUPIED MODE, THE FRESH AIR DAMPERS SHALL OPEN TO THE MIN. POSITION (AS SHOWN ON ROOF–TOP UNIT SCHEDULE ON M–1), THE RETURN & EXHAUST DAMPERS WILL RE–POSITION AS REQUIRED TO MAINTAIN THE TOTAL AIR FLOW ACROSS THE UNIT. THE SUPPLY FAN SHALL SWITCH TO CONTINUOUS OPERATION.

THE DX COOLING SECTION SHALL BE MODULATED BY UNIT CONTROLLER AS REQUIRED TO MAINTAIN THE SUPPLY TEMPERATURE AT THE OCCUPIED COOLING SETPOINT (DEFAULT 15°C). EACH DX COOLING STAGE SHALL HAVE A MINIMUM RUN TIME OF 5 MINUTES (ADJUSTABLE).

THE OPERATION OF THE UNIT'S FRESH AIR DAMPER SHALL BE INTERLOCKED WITH THE KITCHEN HOOD EXHAUST FAN, EF–7. UPON CONFIRMATION THAT EF–7 IS COMMANDED ON (EITHER BY BAS OR BY MANUAL USER) THE UNIT'S FRESH AIR DAMPER SHALL OPEN TO 100% AND THE RETURN AIR DAMPER SHALL FULLY CLOSER. THE UNIT'S DX COOLING SECTION SHALL CONTINUE TO MODULATE AS REQUIRED TO MAINTAIN THE SUPPLY TEMPERATURE SETPOINT.

ECONOMIZER CYCLE

THE UNIT'S CONTROLLER SHALL CONTINUOUSLY COMPARE THE DRY BULB VALUES OF RETURN AIR AND OUTSIDE AIR. IF THE CONDITIONS ARE FAVOURABLE, THE UNIT'S CONTROLLER SHALL ENERGIZE THE UNIT'S ECONOMIZER FUNCTION. THE ECONOMIZER FUNCTION SHALL ALLOW THE FRESH AIR DAMPER TO OPEN BEYOND THE MINIMUM POSITION UP TO 100% TO ACHIEVE FREE COOLING FUNCTION. THE RETURN & EXHAUST DAMPERS SHALL MODULATE ACCORDINGLY TO MAINTAIN THE TOTAL AIRFLOW OF THE SYSTEM. DURING THE ECONOMIZER CYCLE, THE MECHANICAL COOLING SECTION SHALL BE DISABLED.

COOLING MODE – UNOCCUPIED PERIODS

DURING THE COOLING MODE UNOCCUPIED PERIODS, THE ROOFTOP UNIT SHALL BE DISABLED (FAN OFF, FRESH AIR, RETURN DAMPER OPEN).

ALARMS

THE BAS SHALL GENERATE ALARMS IN CASE OF:

- ANY SUPPLY FAN FAILURE;
- ANY HEATING SECTION (OR STAGE) FAILURE;
- ANY COOLING SECTION (OR STAGE) FAILURE;
- ANY FRESH AIR DAMPER FAILURE TO OPEN DURING OCCUPIED PERIODS;
- ANY SPACE TEMPERATURE ±2°C DEVIATION FROM SETPOINT;
- ANY MIXED AIR TEMPERATURE LOWER THAN 5°C (FRESH AIR DAMPERS SHALL CLOSE, RETURN DAMPERS SHALL FULLY OPEN);
- ANY DISCHARGED AIR TEMPERATURE ABOVE 50°C OR BELOW 10°C.

RTU–3 CONTROL DIAGRAM
N.T.S.

GENERAL NOTES :

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Project

HALIBURTON HIGHLANDS S.S.
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location

5358 HALIBURTON COUNTY RD. 21
HALIBURTON, ON K0M 1S0

Drawing Title

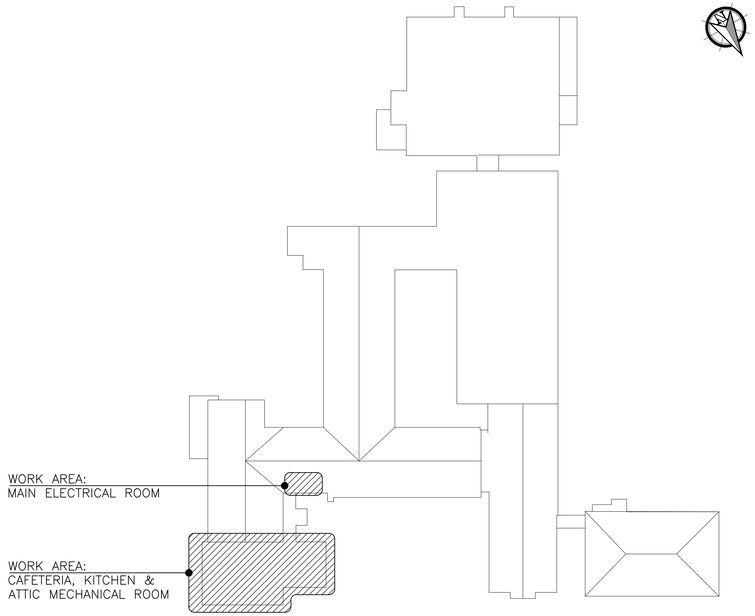
CONTROL DIAGRAMS – MECHANICAL

Checked: O.S. Date: FEB 2025

Drawn: K.N. Scale: N.T.S.

File Number: 2025–07

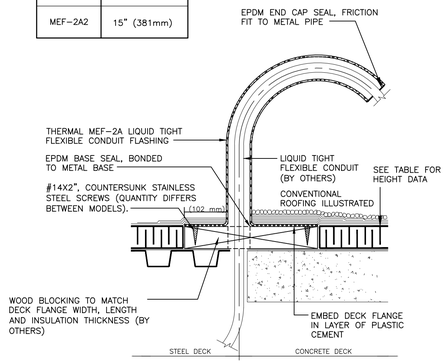
Dwg Number: M–7



KEY PLAN
N.T.S.

TABLE

MODEL	HEIGHT
MEF-2A	12" (305mm)
MEF-2A1	12" (305mm)
MEF-2A2	15" (381mm)



MEF-2A/MEF-2A1/MEF-2A2 LIQUID TIGHT FLEXIBLE CONDUIT FLASHING
N.T.S.

ELECTRICAL LEGENDS

---x---x---	DEMOLITION
	DIRECT POWER OUTLET FOR USE AS NOTED INCLUDING FINAL CONNECTION.
	DISCONNECT SWITCH
	DISCONNECT SWITCH WITH OVER-CURRENT PROTECTION
	COMBINATON MAGNETIC MOTOR STARTER WITH DISCONNECT SWITCH
	MAGNETIC MOTOR STARTER
	COMBINATON MAGNETIC MOTOR STARTER WITH DISCONNECT SWITCH & OVERCURRENT PROTECTION
	SINGLE POLE TOGGLE SWITCHES WITH ONE GANG
	15A, 120V U-GROUND DUPLEX RECEPTACLE
EX	DENOTES EXISTING TO REMAIN
R	DENOTES EXISTING TO BE REMOVED ENTIRELY U.N.O.
N	DENOTES NEW
WP	WEATHERPROOF
VFD	VARIABLE FREQUENCY DRIVE

GENERAL NOTES :

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MECHANICAL EQUIPMENT WIRING SCHEDULE

EQUIPMENT DESCRIPTION	POWER SOURCE	STARTER TYPE	MCA/FLA/HP	VOLTS/PH,/ FREQUENCY	BREAKER SIZE OR FUSE SIZE	FEEDER SIZE	REMARKS	CONNECT TO FIRE ALARM	CONNECT TO BAS
ROOF TOP UNIT RTU-2	MAIN SWITCHGEAR UNIT (MAIN ELECTRICAL RM.)	VFD	SF: 7.5 HP RF: 3.0 HP	208/3/60	150A-3P	3xAWG#0+G-53mmC	PROVIDE NEW BREAKER IN EXISTING SWITCHGEAR IN MAIN ELECTRICAL ROOM. PROVIDE NEW WIRING IN NEW METALLIC CONDUIT FROM SWITCHGEAR TO UNIT VIA LOCAL DISCONNECT & VFD CONTROLLER LOCATED ON THE ROOF (REFER TO DWG. E-3 FOR EXACT LOCATION). PROVIDE FLEXIBLE LIQUID TIGHT CONDUIT FOR THE LAST 900 MM. REFER TO SPECIFICATIONS.	YES	YES
ROOF TOP UNIT RTU-3	MAIN SWITCHGEAR UNIT (MAIN ELECTRICAL RM.)	VFD	SF: 3.0 HP RF: 2.0 HP	208/3/60	110A-3P	3xAWG#2+G-41mmC	PROVIDE NEW BREAKER IN EXISTING SWITCHGEAR IN MAIN ELECTRICAL ROOM. PROVIDE NEW WIRING IN NEW METALLIC CONDUIT FROM SWITCHGEAR TO UNIT VIA LOCAL DISCONNECT & VFD CONTROLLER LOCATED ON THE ROOF (REFER TO DWG. E-3 FOR EXACT LOCATION). PROVIDE FLEXIBLE LIQUID TIGHT CONDUIT FOR THE LAST 900 MM. REFER TO SPECIFICATIONS.	YES	YES

NOTES:

PROVIDE CONNECTION TO MECHANICAL EQUIPMENT TO ENSURE THAT FULL OPERATIONAL SYSTEMS ARE DELIVERED TO THE BOARD.

PROVIDE POWER CONNECTION TO ALL EQUIPMENT LISTED IN THE SCHEDULE. REFER TO ELECTRICAL AND MECHANICAL LAYOUTS FOR EXACT LOCATION OF EQUIPMENT.

PROVIDE SEPARATE DISCONNECTS FOR INDIVIDUAL MECHANICAL EQUIPMENT. SIZE AS INDICATED IN THE SCHEDULE.

DISCONNECTS LOCATIONS SHALL BE VERIFIED AND CO-ORDINATED ON SITE. ALL MAGNETIC STARTERS (WHERE REQUIRED) SHALL BE C/W OVERLOAD PROTECTION, H/O/A SWITCH AND GREEN-RUN AND RED-STOP PILOT LAMPS.

PROVIDE POWER FOR CONTROLS AND STEPDOWN TRANSFORMER AS REQUIRED.

PROVIDE ALL REQUIRED WIRING AND DEVICE FOR CONNECTION TO THE FIRE ALARM. INCLUDE FOR FIRE ALARM TESTING AS REQUIRED.

ELECTRICAL GENERAL NOTES

1. OBTAIN ALL APPROVALS FROM PUBLIC AUTHORITIES HAVING JURISDICTION, BEFORE COMMENCING WORK AND PAY ALL ASSOCIATED INSPECTION FEES AND ALL PERMITS.
2. EXAMINE ARCHITECTURAL, STRUCTURAL AND MECHANICAL CONDITIONS AND AVAILABLE DRAWINGS BEFORE PROCEEDING WITH THE WORK. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS MUST BE REFEREED TO THE CONSULTANT BEFORE ANY AFFECTED WORK IS COMMENCED.
3. ALL CUTTING AND PATCHING REQUIRED FOR THE ELECTRICAL WORK SHALL BE INCLUDED. NO CHASING BLOCKWORK WILL BE ALLOWED. PROVIDE FIRE-STOPPING TO SUIT FT RATING OF THE FLOOR OR WALL PENETRATION TO SUIT. MAKE GOOD ALL BUILDING ELEMENTS AFFECTED BY THIS WORK TO THEIR ORIGINAL CONDITION OR BETTER.
4. ALL MATERIAL USED THROUGHOUT SHALL BE NEW, OF BEST QUALITY CSA APPROVED AND OF ONE MANUFACTURE.
5. PROVIDE ALL CONDUIT, WIRING, BOXES, SWITCHES, OUTLETS, DEVICES, ETC., AS REQUIRED. MAKE FINAL CONNECTIONS TO VIBRATING EQUIPMENT WITH LIQUID TIGHT FLEXIBLE CONDUIT. ALSO REFER TO SECTION 15241.
6. PROVIDE ALL HANGERS, INSERTS AND SUPPORTS OF APPROVED TYPES REQUIRED FOR THE ELECTRICAL WORK. PROVIDE CONDUIT FOR ALL SERVICES PENETRATING THE FLOOR SLAB. SEAL ALL PENETRATIONS THROUGH FLOOR SLABS WITH AN APPROVED NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT.
7. ALL CONDUIT SHALL BE EMT THINWALL WITH STEEL SET SCREW COUPLINGS AND CONNECTORS WITH INSULATED THROATS UNLESS OTHERWISE NOTED. PAINT CONDUIT TO MATCH EXISTING SURFACE THEY ARE INSTALLED ON. IN FINISHED AREA, RUN PARALLEL TO BUILDING WALLS AND CONCENTRIC RIGHT ANGLE BENDS ONLY SHALL BE USED.
8. ALL WIRING SHALL BE MINIMUM #12 GAUGE COPPER, EXCEPT AS OTHERWISE NOTED. ALL WIRING SHALL BE 600 VOLT TYPE RW90 AND RUN IN CONDUITS. MINIMUM SIZE WIRING FOR DC WIRING SHALL BE #10 GAUGE. MAXIMUM VOLTAGE DROP NOT EXCEED 2 PERCENT. PROVIDE GROUND WIRES WITH ALL FEEDERS AND BRANCH CIRCUITS IN ACCORDANCE WITH APPLICABLE CODES AND ONTARIO ELECTRICAL SAFETY CODE REQUIREMENTS. PROVIDE MAIN GROUND TO ESA APPROVAL.
9. PROVIDE ALL CONDUIT, WIRING, SPLITTERS, OUTLET BOXES AND DISCONNECT SWITCHES AS SHOWN AND AS REQUIRED TO MAKE THE EQUIPMENT FULLY OPERATIONAL. SUPPLY AND INSTALL ALL STARTERS AND WIRE COMPLETE. COORDINATE THE FINAL LOCATION OF DISCONNECT SWITCHES AND VFD DEVICES SUCH AS TO MAINTAIN THE PRESCRIBED CLEARANCES AND AVOID INTERFERENCE WITH OTHER EQUIPMENT.
10. CONTRACTORS SHALL NOTE THAT THIS CONTRACT IS AN ALTERATION TO AN EXISTING BUILDING AND SHALL THOROUGHLY INVESTIGATE THE EXISTING ELECTRICAL INSTALLATION AND CONDITIONS.
11. DEMOLITION OF EXISTING SERVICES: REMOVE POWER CONNECTIONS AS SHOWN ON DRAWINGS C/W CONDUIT AND WIRING TO SOURCE.
12. ALL WORK SHALL BE DONE WITH MINIMUM POSSIBLE INTERRUPTION TO EXISTING BUILDING SYSTEMS AND IN THE TIME SCHEDULE PERMITTED BY THE PROJECT MANAGER. INCLUDE FOR AFTER HOURS/WEEKEND WORK FOR POWER SHUTDOWN & CONNECTION WORK.
13. PROVIDE LAMACOID LABEL AT EACH EQUIPMENT DISCONNECT SWITCH STATING PANEL SOURCE, OVER-CURRENT PROTECTION AND BRANCH WIRING SIZE.

ELECTRICAL GENERAL NOTES

GENERAL

EXAMINE ARCHITECTURAL, STRUCTURAL AND MECHANICAL CONDITIONS AND AVAILABLE DRAWINGS BEFORE PROCEEDING WITH THE WORK. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS MUST BE REFERRED TO THE PRIME CONSULTANT BEFORE ANY AFFECTED WORK IS COMMENCED.

ALL MATERIALS USED THROUGHOUT SHALL BE NEW, OF BEST QUALITY CSA APPROVED AND OF ONE MANUFACTURER.

OBTAIN AND PAY FOR APPROVALS AND PERMITS FROM AUTHORITIES HAVING JURISDICTION.

PROVIDE ALL CONDUIT, WIRING, BOXES, SWITCHES, OUTLETS, DEVICES, ETC, AS REQUIRED. MAKE UP TO THE LAST 3 FT OF FINAL CONNECTIONS TO ROTATING EQUIPMENT WITH LIQUID TIGHT FLEXIBLE CONDUIT.

CONTRACTORS SHALL NOTE THAT THIS CONTRACT IS AN ALTERATION TO AN EXISTING BUILDING AND SHALL THOROUGHLY INVESTIGATE THE EXISTING ELECTRICAL INSTALLATION AND CONDITIONS.
DEMOLITION. REMOVE POWER CONNECTIONS AS SHOWN ON DRAWINGS C/W CONDUIT AND WIRING TO SOURCE.

CONDUCTORS AND CABLES

CONDUCTORS AND CABLES SHALL BE IN ACCORDANCE WITH NEMA WC-70 AND AS SPECIFIED HEREIN.

CONDUCTORS SHALL BE ANNEALED COPPER, STRANDED FOR SIZES NO. 8 AWG AND LARGER, SOLID FOR SIZES NO. 10 AWG AND SMALLER. CONDUCTORS SHALL BE MINIMUM SIZE NO. 12 AWG, EXCEPT WHERE SMALLER SIZES ARE SPECIFICALLY SHOWN ON THE DRAWINGS. MINIMUM SIZE WIRING FOR DC WIRING SHALL BE #10 GAUGE.

ALL WIRING SHALL BE 600 VOLT TYPE RW90 AND RUN IN METALLIC CONDUIT EXCEPT WHERE ALLOWED IN FLEXIBLE LIQUID-TIGHT FLEXIBLE ENCLOSURE (SEE SECTION 15241). MAXIMUM VOLTAGE DROP SHALL NOT EXCEED 2%. PROVIDE GROUND WIRES WITH ALL FEEDERS AND BRANCH CIRCUITS IN ACCORDANCE WITH APPLICABLE CODES AND ONTARIO ELECTRICAL SAFETY CODE REQUIREMENTS. PROVIDE MAIN GROUND TO ESA APPROVAL.

INSULATION:

THHN-THWN SHALL BE IN ACCORDANCE WITH NEMA WC-70, UL 44, AND UL 83.

CONDUITS

ALL CONDUIT SHALL BE RIGID ALUMINUM (OUTDOORS) OR EMT THINWALL (INDOORS) WITH STEEL SET SCREW COUPLINGS AND CONNECTORS WITH INSULATED THROATS UNLESS OTHERWISE NOTED. RUN CONDUITS PARALLEL TO BUILDING LINES AND CONCENTRIC RIGHT ANGLE BENDS ONLY SHALL BE USED.

SEAL ALL PENETRATIONS THROUGH FLOOR WALLS OR SLABS WITH AN APPROVED NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT.

NEW CONDUIT HANGERS SHALL BE SUPPORTED FROM BUILDING STRUCTURE AND INDEPENDENTLY FROM OTHER EXISTING ELEMENTS SUCH AS DUCTWORK, CONDUITS, PIPING ETC.

POWER DISTRIBUTION SYSTEM

THE POWER DISTRIBUTION SYSTEM SHALL BE MODIFIED AS SHOWN ON THE PLANS AND AS HEREINAFTER SPECIFIED. BREAKERS RATING SHALL MATCH EXISTING EQUIPMENT TO WHICH THEY ARE INSTALLED.

SPLICES AND JOINTS

IN ACCORDANCE WITH UL 486A, C, D, E, AND NEC.

CONNECTORS: SOLDERLESS, SCREW ON, REUSABLE PRESSURE CABLE TYPE, RATED 600 V, 220° F [105° C], WITH INTEGRAL INSULATION, APPROVED FOR COPPER CONDUCTORS. THE INTEGRAL INSULATOR SHALL HAVE A SKIRT TO COMPLETELY COVER THE STRIPPED WIRES. THE NUMBER, SIZE, AND COMBINATION OF CONDUCTORS, AS LISTED ON THE MANUFACTURER'S PACKAGING, SHALL BE STRICTLY FOLLOWED.

CONNECTORS SHALL BE INDENT, HEX SCREW, OR BOLT CLAMP TYPE OF HIGH CONDUCTIVITY AND CORROSION RESISTANT MATERIAL, LISTED FOR USE WITH COPPER AND ALUMINUM CONDUCTORS. FIELD-INSTALLED COMPRESSION CONNECTORS FOR CABLE SIZES 250 MCM AND LARGER SHALL HAVE NOT FEWER THAN TWO CLAMPING ELEMENTS OR COMPRESSION INDENTS PER WIRE.

INSULATE SPLICES AND JOINTS WITH MATERIALS APPROVED FOR THE PARTICULAR USE, LOCATION, VOLTAGE, AND TEMPERATURE. SPLICE AND JOINT INSULATION LEVEL SHALL BE NOT LESS THAN THE INSULATION LEVEL OF THE CONDUCTORS BEING JOINED. PLASTIC ELECTRICAL INSULATING TAPE: PER ASTM D2304, FLAME-RETARDANT, COLD AND WEATHER RESISTANT.

LOW VOLTAGE FUSED AND NON-FUSED DISCONNECT SWITCHES RATED 600 AMPERES AND LESS

IN ACCORDANCE WITH UL 98, NEMA KS1, AND NEC. SHALL HAVE NEMA CLASSIFICATION GENERAL DUTY (GD) FOR 240 V SWITCHES AND NEMA CLASSIFICATION HEAVY DUTY (HD) FOR 600 V SWITCHES. SHALL BE HP RATED.

LOCATE IN THE PROXIMITY OF THE EQUIPMENT SERVED, IN ACCORDANCE WITH NEC REQUIREMENTS.

SHALL HAVE THE FOLLOWING FEATURES:

- SWITCH MECHANISM SHALL BE THE QUICK-MAKE, QUICK-BREAK TYPE.
- COPPER BLADES, VISIBLE IN THE OFF POSITION.
- AN ARC CHUTE FOR EACH POLE.
- EXTERNAL OPERATING HANDLE SHALL INDICATE ON AND OFF POSITION AND HAVE LOCK OPEN PADLOCKING PROVISIONS.
- MECHANICAL INTERLOCK SHALL PERMIT OPENING OF THE DOOR ONLY WHEN THE SWITCH IS IN THE OFF POSITION, DEFEATABLE TO PERMIT INSPECTION.
- FUSE HOLDERS FOR THE SIZES AND TYPES OF FUSES SPECIFIED (WHERE APPLICABLE).
- WHERE APPLICABLE, FUSIBLE DISCONNECT SWITCHES SHALL BE FURNISHED COMPLETE WITH FUSES. ARRANGE FUSES SUCH THAT RATING INFORMATION IS READABLE WITHOUT REMOVING THE FUSE.
- SOLID NEUTRAL FOR EACH SWITCH BEING INSTALLED IN A CIRCUIT WHICH INCLUDES A NEUTRAL CONDUCTOR.
- GROUND LUGS FOR EACH GROUND CONDUCTOR.

ENCLOSURES:

SHALL BE THE NEMA TYPES SHOWN ON THE DRAWINGS FOR THE SWITCHES. WHERE THE TYPES OF SWITCH ENCLOSURES ARE NOT SHOWN, THEY SHALL BE THE NEMA TYPES MOST SUITABLE FOR THE AMBIENT ENVIRONMENTAL CONDITIONS. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL OUTDOOR SWITCHES SHALL BE NEMA 3R. SHALL BE FINISHED WITH MANUFACTURER'S STANDARD GRAY BAKED ENAMEL PAINT OVER PRE-TREATED STEEL (FOR THE TYPE OF ENCLOSURE REQUIRED).

GENERAL NOTES

1. IT IS MANDATORY FOR THE ELECTRICAL CONTRACTOR TO VISIT SITE AND REVIEW EXISTING CONDITIONS AND DEMOLITION SCOPE OF WORK TO SUIT EXISTING ARCHITECTURAL AND STRUCTURAL CONDITIONS AND MECHANICAL DRAWINGS.
2. CAREFULLY EXAMINE OTHER EXISTING UTILITY LINES SUCH AS GAS, WATER ETC. PRIOR TO START THE ELECTRICAL CONSTRICTION WORKS AND COORDINATE WITH OTHER TRADES AND REPORT OF ANY DISCREPANCY PRIOR TO PROCEEDING.
3. REFER TO ELECTRICAL AND MECHANICAL LAYOUTS FOR EXACT LOCATION OF ALL EQUIPMENT.
4. LOCATIONS OF ALL NEW ELECTRICAL EQUIPMENT SHALL BE CONFIRMED WITH DIVISION 15 PRIOR TO INSTALLATION.

No.	REVISION	DD/MM/YY
1.	ISSUED FOR TENDER	14/04/25

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal

LICENSED PROFESSIONAL ENGINEER
APR., 2025
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100568831
PROVINCE OF ONTARIO

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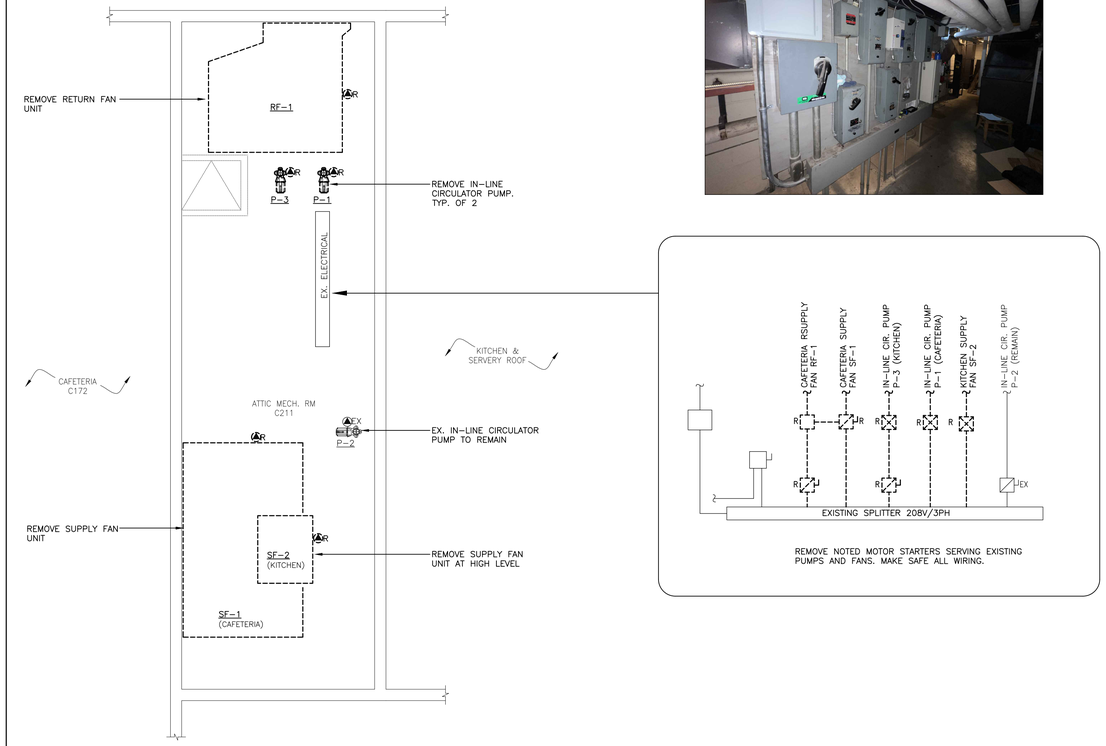
Trillium Lakelands DISTRICT SCHOOL BOARD

Project
HALIBURTON HIGHLANDS S.S.
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD. 21
HALIBURTON, ON K0M 1S0

Drawing Title
KEY PLAN, LEGENDS, EQUIPMENT WIRING SCHEDULES & GENERAL NOTES - ELECTRICAL

Checked: O.S.
Date: FEB 2025
Drawn: P.N.
Scale: N.T.S.
File Number: 2025-07
Dwg Number: E-1



REMOVE NOTED MOTOR STARTERS SERVING EXISTING PUMPS AND FANS. MAKE SAFE ALL WIRING.

ATTIC MECHANICAL ROOM POWER PLAN – EXISTING & DEMOLITION WORKS
SCALE: 1:50

DEMOLITION NOTES:

ELECTRICAL TRADE TO CAREFULLY REVIEW MECHANICAL & STRUCTURAL DRAWINGS AND CONFIRM EXTENT OF STEEL REINFORCEMENT WORK. COORDINATE WITH SHEET METAL & STRUCTURAL TRADES TO TEMPORARILY REMOVE ANY ELECTRICAL DEVICES/CONDUITS SUCH AS LIGHTING, FIRE ALARM DEVICES, CIRCULATION FANS, ETC. CURRENTLY ATTACHED TO THE OWSJ THAT REQUIRE REINFORCEMENT OR IN THE KITCHEN SERVERY CEILING. UPON COMPLETION OF THE STRUCTURAL STEEL WORK AND KITCHEN CEILING WORK, REINSTALL ALL REMOVED ELECTRICAL DEVICES/CONDUITS BACK TO THE OWSJ AND KITCHEN CEILING.

FOR CAFETERIA & KITCHEN LAYOUT REFER DRAWING M-2, M-4, S-201, S-401.

ANY FIRE ALARM DEVICES THAT HAVE BEEN RE-INSTALLED SHALL BE RE-VERIFIED.

IT IS THE ELECTRICIAN'S RESPONSIBILITY TO CAREFULLY REVIEW THE EXISTING CEILING CONDITIONS PRIOR TO SUBMITTING A BID.

EXISTING 1600A, 120/208V 3PH, 4 WIRES
SWITCHGEAR UNIT (MAIN ELECTRICAL ROOM)

BUS DUCT	600A-3P		MAIN SWITCH
DP-1	400A-3P		
LP-AC	400A-3P		
ERV-2	100A-3P	80A-3P RTU-1 (EXISTING)	
ERV-1	100A-3P	SPARE	
SPARE		SPARE	
SPARE		SPARE	
SPARE		SPARE	
SPARE		SPARE	
SPARE		SPARE	
SPARE		SPARE	
SPARE		SPARE	
SPARE		SPARE	

EXISTING SWITCHGEAR UNIT IN MAIN ELECTRICAL ROOM
SCALE: N.T.S.

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

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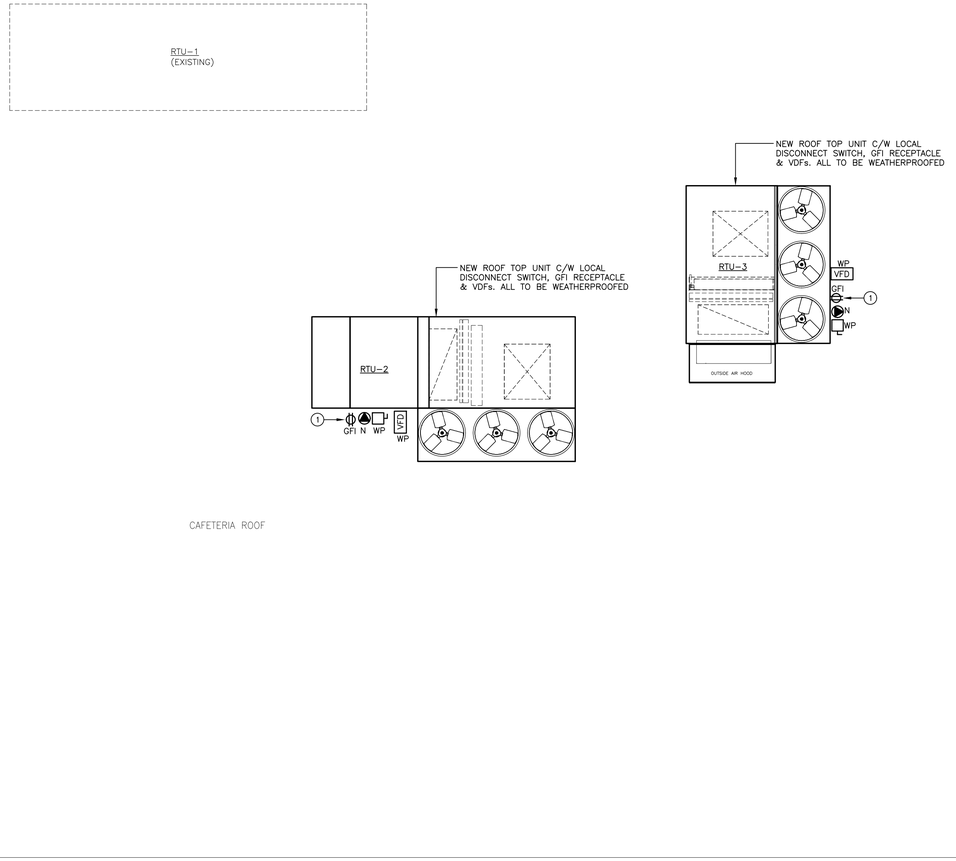
Trillium Lakelands DISTRICT SCHOOL BOARD

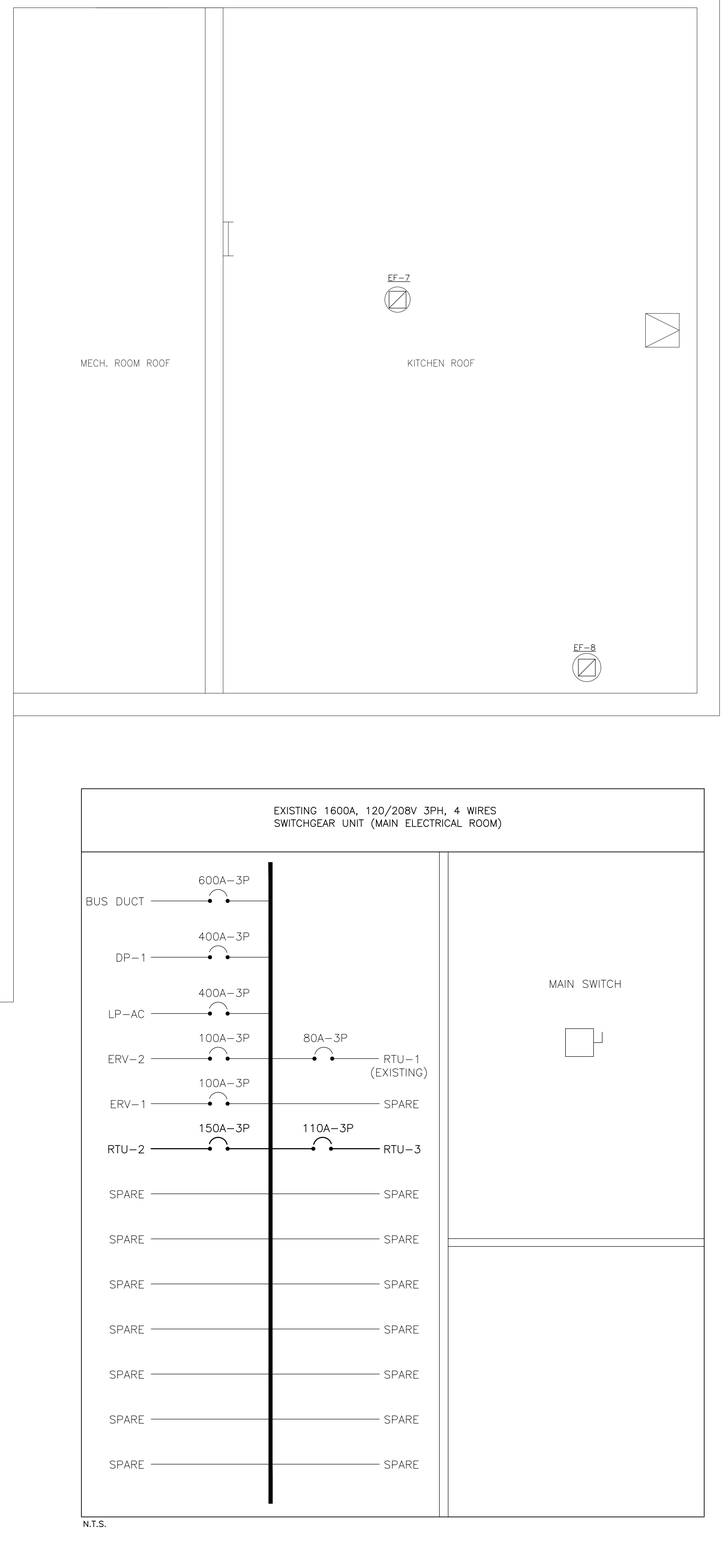
Project
HALIBURTON HIGHLANDS S.S.
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD. 21
HALIBURTON, ON K0M 1S0

Drawing Title
POWER PLAN – EXISTING & DEMOLITION WORK – ELECTRICAL

Checked:	Date:
O.S.	FEB 2025
Drawn:	Scale:
T.N.	AS SHOWN
File Number:	Dwg Number:
2025-07	E-2





N.T.S.

DRAWING NOTE:

① PROVIDE 115V/1PH POWER TO NEW GFI RECEPTACLE FROM NEAREST POWER SOURCE. POWER SOURCE TO BE SEPARATE FROM THE ONE POWERING THE ROOF-TOP UNIT. PROVIDE ALL REQUIRED ROOF PENETRATION, FLASHING CONE AND WEATHER PROOFING.

PROVIDE ALL REQUIRED ROOF CONES FOR ELECTRICAL AND CONTROL CONDUITS. PROVIDE ALL REQUIRED ROOFING.

POWER PLAN – NEW WORKS – ELECTRICAL
SCALE: 1:50

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

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Contractors shall verify all dimensions at the job.

North Arrow

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APR., 2025
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Trillium Lakelands DISTRICT SCHOOL BOARD

Project
HALIBURTON HIGHLANDS S.S.
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD. 21
HALIBURTON, ON K0M 1S0

Drawing Title
POWER PLAN – NEW WORK – ELECTRICAL

Checked:	Date:
O.S.	FEB 2025
Drawn:	Scale:
T.N.	AS SHOWN
File Number:	Dwg Number:
2025-07	E-3

GENERAL NOTES

A. GENERAL INFORMATION

1. READ STRUCTURAL DOCUMENTS IN CONJUNCTION WITH CONTRACT DOCUMENTS, WHICH INCLUDE, BUT ARE NOT LIMITED TO, ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DOCUMENTS.

2. CONTRACTOR TO BE RESPONSIBLE FOR CHECKING SITE CONDITIONS AGAINST DOCUMENTS BEFORE PROCEEDING WITH THE WORK, AND REPORT DISCREPANCIES TO THE CONSULTANT.

3. CONTRACTOR TO PROVIDE LABOUR, MATERIALS, AND EQUIPMENT TO COMPLETE ALL STRUCTURAL WORK INDICATED.

4. CARRY OUT CONSTRUCTION OPERATIONS, INCLUDING THE INSTALLATION OF TEMPORARY GUYING AND SHORING REQUIRED, ENSURING THAT THE EXISTING STRUCTURE OR MEMBERS ALREADY ERECTED ARE NOT LOADED IN EXCESS OF THEIR SAFE LOAD CARRYING CAPACITY.

5. STRUCTURAL DOCUMENTS DO NOT NECESSARILY SHOW ALL OPENINGS REQUIRED. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR THE EXACT LOCATION, NUMBER, AND SIZE OF OPENINGS. PROVIDE STRUCTURAL FRAMING AT THESE LOCATIONS IN ACCORDANCE WITH THE APPLICABLE TYPICAL DETAIL.

B. REFERENCE STANDARDS / CODES AND ACTS

1. CONFORM WITH THE 2012 BUILDING CODE (ONTARIO REGULATION 332/12, AMENDED BY ONTARIO REGULATION 89/23), AND ANY APPLICABLE ACTS OF ANY AUTHORITY HAVING JURISDICTION, AND THE FOLLOWING:

REF	CODE	TITLE
a)	CAN/CSA A23.3	DESIGN OF CONCRETE STRUCTURES
b)	CSSBI 10M	STEEL ROOF DECK
c)	CAN/CSA-S16	LIMIT STATES DESIGN OF STEEL STRUCTURES
d)	CAN/CSA G40.20/G40.21	STRUCTURAL QUALITY STEEL
e)	CSA-A371	MASONRY CONSTRUCTION FOR BUILDINGS
f)	S304.1	DESIGN OF MASONRY STRUCTURES

2. ALL STANDARDS AND PUBLICATIONS REFERENCED BY THE STANDARDS NOTED ABOVE ARE TO APPLY.

3. WHERE THERE ARE DIFFERENCES BETWEEN THE DOCUMENTS AND THE STANDARDS, CODES AND ACTS, THE MOST STRINGENT SHALL GOVERN.

C. SUBMITTALS

1. SUBMIT FOR REVIEW BY THE VARIOUS CONSULTANTS, DETAILED INFORMATION FOR ALL TEMPORARY AND PERMANENT STRUCTURAL WORK. THIS INCLUDES, BUT IS NOT LIMITED TO:

ITEM	SUBMISSION REQUIRED	SUBMISSION TO BE SEALED BY PROFESSIONAL ENGINEER	COMMENTS
STRUCTURAL STEEL SHOP DRAWINGS	YES	YES	
STEEL DECK SHOP DRAWINGS	YES	YES	
MISCELLANEOUS METALS SHOP DRAWINGS	YES	YES	FOR LADDERS, STAIRS, GUARD / HAND RAILS, LADDERS AND MECHANICAL ACCESS PLATFORMS
POST-INSTALLED ANCHORS	YES	NO	SUBMIT CUT SHEETS AND PHOTOGRAPHS OF ANCHORS AND ASSOCIATED ADHESIVE. PROVIDE LIST OF LOCATIONS ANCHORS TO BE USED

1.1. CONTRACTOR SHALL ALLOW FOR A TURN AROUND TIME OF FIVE WORKING DAYS FOR THE REVIEW OF THESE SUBMISSIONS.

2. OUR REVIEW OF THE SHOP DRAWINGS IS ONLY FOR GENERAL CONFORMITY WITH STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS. COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS, NOR DO THEY AUTHORIZE ANY CHANGES TO THE CONTRACT. REVIEW OF A SPECIFIC ITEM SHALL NOT INCLUDE REVIEW OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. THE CONTRACTOR'S RESPONSIBILITIES INCLUDE ALL QUANTITIES, DETAIL DIMENSIONS, FIELD MEASUREMENTS, FABRICATION PROCESS, MEANS, METHODS, SEQUENCES, AND PROCEDURES OF CONSTRUCTION, COORDINATION OF WORK WITH ALL TRADES AND PERFORMING ALL WORK IN A SAFE AND SATISFACTORY MANNER. THE REVIEW OF SHOP DRAWINGS DOES NOT IMPLY ANY CHANGE IN ANY OTHER CONSULTANTS' OR PROFESSIONALS' RESPONSIBILITY RELATED TO DESIGN OF SPECIFIC ITEMS AS OUTLINED BY THE SPECIFICATIONS (SUCH AS STRUCTURAL STEEL CONNECTIONS, STEEL JOISTS, PRECAST ELEMENTS, ETC.). AFTER REVIEW, THE DRAWINGS WILL BE STAMPED AND RETURNED TO SHOW ONE OF THE FOLLOWING:

NOT REVIEWED	SHOWS WORK WHICH IS NOT WITHIN THE SCOPE OF STRUCTURAL CONSULTING SERVICES.
REVIEWED	NO DEVIATIONS FROM THE CONTRACT DOCUMENTS NOTED.
NOTED	WE HAVE MADE COMMENTS TO BE REVIEWED / INCORPORATED. SUBMIT RECORD PRINT.
RESUBMIT	REVISE AND RE-SUBMIT FOR REVIEW.

D. MATERIALS

1. PROVIDE ONLY NEW STRUCTURAL MATERIALS IN ACCORDANCE WITH THE REFERENCE STANDARDS AND THE FOLLOWING, UNLESS OTHERWISE NOTED.

1.1. STRUCTURAL STEEL:

1.1.1. STRUCTURAL WIDE FLANGE (W) AND WELDED WIDE FLANGE SHAPES (WWF) TO CONFORM TO CAN/CSA G40.20/G40.21 GRADE 350W.

1.1.2. ANGLES (L), CHANNELS (C), AND PLATES TO CONFORM TO CAN/CSA-G40.20/G40.21 GRADE 300W.

1.1.3. HOLLOW STRUCTURAL SECTIONS (HSS) TO CONFORM TO ASTM A500 GRADE C.

1.2. PRIME PAINT: CONFORM TO CISC/CPMA STANDARD 2-75.

1.3. HOT DIP GALVANIZING: CONFORM TO CSA-G164, MINIMUM ZINC COATING OF 600 g/m^2.

1.4. STRUCTURAL BOLTS, NUTS, AND WASHERS: CONFORM TO ASTM A325M.

1.5. ANCHOR RODS: CONFORM TO THE REQUIREMENTS OF ASTM F1554 GRADE.

1.6. STEEL DECK: CONFORM TO ASTM A653M GRADE A OR B. MINIMUM STEEL CORE THICKNESS OF 0.76 MM (0.030"), EXCEPT WHERE UNDERSIDE OF STEEL DECK IS EXPOSED TO VIEW WHERE MINIMUM STEEL CORE THICKNESS SHALL BE 0.91 MM (0.036"). ACTUAL STEEL CORE THICKNESS IS TO BE DETERMINED BY THE SUPPLIER'S ENGINEER AND SHALL SATISFY ALL REQUIRED DESIGN CRITERIA. PROTECTIVE COATING - WIPE COATED STEEL DESIGNATION ZF075.

1.7. NON-SHRINK GROUT = COMPRESSIVE STRENGTH OF 35 MPa AT 24 HOURS.

1.8. BLOCK: CONFORM TO CAN3-A165 SERIES, MINIMUM COMPRESSIVE STRENGTH = 15.0 MPa BASED ON NET AREA.

1.9. MORTAR: CONFORM TO CSA A179 TYPE S FOR LOAD-BEARING WALLS UNLESS NOTED.

1.10. MASONRY GROUT: CONFORM TO CSA A179, 15 MPa MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, 250 mm (10") SLUMP, MAXIMUM AGGREGATE SIZE 10 mm (3/8").

1.11. POST-INSTALLED ANCHORS: PROVIDED BY HILTI (CANADA) CORPORATION. CONTACT HILTI AT (800) 363-4458 FOR PRODUCT RELATED QUESTIONS.

E. EXECUTION

1. STRUCTURAL STEEL

1.1. PAINT ALL STRUCTURAL STEEL TO REQUIREMENTS OF CISC/CPMA 2-75. TOUCH UP ALL FIELD WELDS.

1.2. ALL STRUCTURAL STEEL EXPOSED TO WEATHER SHALL BE GALVANIZED IN ACCORDANCE WITH CSA G164.

1.3. ALL WELDS SHALL CONFORM TO CSA STANDARD W59.

1.4. ANY ORGANIZATION UNDERTAKING TO WELD UNDER THIS CONTRACT SHALL BE CERTIFIED BY THE CANADIAN WELDING BUREAU UNDER REQUIREMENTS OF DIVISION 1 OR DIVISION 2.1 OF W47.1.

1.5. UNLESS A REINFORCED MASONRY OR CONCRETE LINTEL IS SHOWN IN MASONRY WALLS OR MASONRY PARTITIONS, PROVIDE LOOSE STEEL LINTELS IN ACCORDANCE WITH REQUIREMENTS OF DOCUMENTS OVER ALL DOORWAYS, OTHER OPENINGS, AND RECESSES, INCLUDING THOSE FOR MECHANICAL OR ELECTRICAL SERVICES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE LOCATION, SIZE, AND NUMBER OF OPENINGS REQUIRED BY THE MECHANICAL AND ELECTRICAL CONSULTANT.

1.6. DO NOT SPLICE STRUCTURAL STEEL SECTIONS WITHOUT PRIOR APPROVAL OF THE CONSULTANT. ALL SPLICES SHALL DEVELOP THE FULL CAPACITY OF THE SECTION AND ARE TO BE TESTED BY NON DESTRUCTIVE METHODS, BY AN INDEPENDENT INSPECTION AND TESTING COMPANY, AT THE CONTRACTOR'S EXPENSE.

1.7. COMPLETELY FILL VOIDS BENEATH STEEL BASES ON CONCRETE WITH AN APPROVED NON-SHRINK 36 MPa (5 ksi) GROUT.

1.8. SEE ARCHITECTURAL DRAWINGS FOR FIREPROOFING REQUIREMENTS. CONFIRM COMPATIBILITY OF FIREPROOFING MATERIAL WITH STEEL PAINT.

2. STEEL DECK

2.1. LAP ENDS OF DECK UNITS NOT RECEIVING CONCRETE SLAB A MINIMUM OF 50 mm (2") AND ONLY OVER SUPPORTING MEMBERS.

2.2. AS A MINIMUM, FASTEN SIDE JOINTS OF DECK UNITS BETWEEN SUPPORTS WITH HILTI #10 HWH SCREWS AT 600 mm (2'-0") INTERVALS. DECK SUPPLIER TO VERIFY THIS MINIMUM REQUIREMENT BASED ON THE DESIGN LOADING LISTED ON PLANS AND/OR TYPICAL DETAILS.

2.3. AS A MINIMUM, FASTEN 76 mm (3") STEEL FLOOR DECK TO SUPPORTS AND PERIMETER ELEMENTS WITH MECHANICAL DECK FASTENERS IN A 24/5 PATTERN, PER TABLE 5.1 BELOW. DECK SUPPLIER TO VERIFY THIS MINIMUM REQUIREMENT BASED ON THE DESIGN LOADING LISTED ON THE PLANS AND/OR TYPICAL DETAILS.

TABLE 5.1 - DECK FASTENERS

MEMBER TYPE	BASE MATERIAL THICKNESS	FASTENER TYPE
OWSJ	3 mm ≤ tf ≤ 10 mm	HILTI X-HSN 24
STRUCTURAL STEEL BEAM	tf ≥ 6 mm	HILTI X-ENP 19 L15

2.4. DESIGN DECK FOR NET WIND UPLIFT PRESSURES INDICATED IN THE GENERAL NOTES OR ON DRAWINGS. MINIMUM DESIGN UPLIFT PRESSURE SHALL BE 0.5 kPa FOR FLOORS AND 1.0 kPa FOR ROOFS.

2.5. MAKE CONNECTION OF DECK TO SUPPORTING MEMBERS WELL WITHIN BEARING WIDTH OF SUPPORTING MEMBERS.

2.6. SUPPLY AND INSTALL STEEL PACKING AS REQUIRED TO PRODUCE AN EVEN BEARING PRESSURE AT SUPPORTS.

2.7. FOR ALL STEEL DECK WHICH DOES NOT RECEIVE A CONCRETE COVER SLAB, IMMEDIATELY TOUCH UP

2.8. CUT OPENINGS AND REINFORCE EDGES AS REQUIRED FOR PIPES, DUCTS, AND THE LIKE. INDICATE OPENINGS AND REINFORCEMENT FOR OPENINGS ON FABRICATION AND ERECTION DRAWINGS. THE MAXIMUM SIZE OF AN UNREINFORCED OPENING IS 150 mm (6") SQUARE OF IN DIAMETER.

2.9. DESIGN FRAMING FOR 450 MM (1'-6") OR SMALLER OPENINGS IN ROOF DECK, AND 300 mm (1'-0") OR SMALLER OPENINGS IN FLOOR DECK. FOR ROOF OPENINGS GREATER THAN 450 mm (1'-6") AND FLOOR OPENINGS GREATER THAN 300 mm (1'-0") INSTALL REINFORCING IN ACCORDANCE WITH THE STRUCTURAL FRAMING DETAILS SHOWN ON PLANS OR TYPICAL DETAILS.

2.10. THE SUSPENSION OF ELEMENTS INCLUDING, BUT NOT LIMITED TO: ARCHITECTURAL FINISHES, MECHANICAL AND ELECTRICAL PIPING, DUCTWORK, CONDUIT, ETC. FROM STEEL ROOF DECK IS NOT PERMITTED.

3. POST-INSTALLED ANCHORS

3.1. MATERIALS

3.1.1. EXCEPT WHERE INDICATED ON THE DRAWINGS, POST-INSTALLED ANCHORS SHALL CONSIST OF THE FOLLOWING ANCHOR TYPES AS PROVIDED BY HILTI (CANADA) CORPORATION. CONTACT HILTI AT (800) 363-4458 FOR PRODUCT RELATED QUESTIONS.

3.2. QUALITY ASSURANCE

3.2.1. POST-INSTALLED ANCHORS SHALL ONLY BE EXECUTED BY TRAINED PERSONNEL. INSTALLATION OF ALL POST-INSTALLED ANCHORS SHALL BE PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII) AND THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS SPECIFIED. A RECORD OF TRAINING SHALL BE KEPT ON SITE AND MADE AVAILABLE TO THE STRUCTURAL CONSULTANT OR THE INDEPENDENT TESTING AND INSPECTION COMPANY UPON REQUEST.

3.3. DESIGN

3.3.1. ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO USE. CONTRACTOR SHALL PROVIDE CALCULATIONS THAT HAVE BEEN SEALED BY ANOTHER LICENSED ENGINEER DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF MEETING THE PERFORMANCE OF THE SPECIFIED PRODUCT. SUBSTITUTIONS WILL BE EVALUATED BY THEM HAVING AN ICC-ES ESR SHOWING COMPLIANCE WITH THE RELEVANT BUILDING CODE FOR SEISMIC USES, LOAD RESISTANCE, INSTALLATION CATEGORY, AND AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS. ADHESIVE ANCHOR EVALUATION WILL ALSO CONSIDER CREEP, IN-SERVICE TEMPERATURE, INSTALLATION TEMPERATURE, MOISTURE CONDITION OF CONCRETE, AND DRILLING METHODS.

3.3.2. ANCHOR CAPACITY IS DEPENDANT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.

3.4. EXECUTION

3.4.1. AT A MINIMUM, THE FOLLOWING ITEMS MUST BE VERIFIED DURING INSPECTION:

3.4.1.1. HOLE DRILLING METHOD IN ACCORDANCE WITH MPII.

3.4.1.2. ANCHOR EDGE DISTANCE AND SPACING.

3.4.1.3. HOLE DIAMETER AND DEPTH.

3.4.1.4. HOLE CLEANING IN ACCORDANCE WITH THE MPII.

3.4.1.4. ANCHOR ELEMENT TYPE, MATERIAL, DIAMETER, AND LENGTH.

3.4.1.5. ADHESIVE IDENTIFICATION AND EXPIRATION DATE.

3.4.1.6. ADHESIVE INSTALLATION IN ACCORDANCE WITH THE MPII.

3.4.2. EXISTING REINFORCING BARS, EMBEDDED CONDUIT, AND OTHER ELEMENTS CAST IN CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. NO EMBEDDED CONDUITS SHALL BE CUT AT ANY TIME. UNLESS NOTED ON THE DRAWINGS THAT THE REINFORCING CAN BE CUT, THE CONTRACTOR SHALL REVIEW THE EXISTING CONTRACT DOCUMENTS AND SHALL UNDERTAKE LOCATING THE POSITION OF THE REINFORCING, CONDUITS, OR OTHER EMBEDDED ITEMS AT THE LOCATIONS OF THE CONCRETE ANCHORS BY A NON-DESTRUCTIVE TESTING METHOD SUCH AS HILTI FERROSCAN, HILTI PS 1000, GPR, X-RAY, OR BY AN ALTERNATE APPROVED METHOD.

3.4.3. CONCRETE SHALL HAVE CURED FOR A MINIMUM OF 21 DAYS PRIOR TO THE INSTALLATION OF ANY ADHESIVE ANCHORS.

4. ALTERATIONS AND/OR CONNECTIONS TO EXISTING STRUCTURE

4.1. INSPECT THE EXISTING BUILDING AND BECOME THOROUGHLY FAMILIAR WITH THE EXISTING CONDITIONS.

4.2. PRIOR TO FABRICATION OF STRUCTURAL STEEL, OPEN UP ALL AREAS WHERE CONNECTIONS ARE TO BE MADE TO EXISTING WORK AND TAKE FIELD MEASUREMENTS. MODIFY METHODS FOR CONNECTING TO SUIT SITE CONDITIONS FOUND AND TO THE APPROVAL OF THE CONSULTANT. CARRY OUT LOCAL REPAIRS TO THE EXISTING WORK AS NECESSARY AND AS DIRECTED BY THE CONSULTANT.

4.3. SHORE EXISTING WORK AS REQUIRED UNTIL ALL NEW WORK HAS BEEN COMPLETED AND REVIEWED BY THE CONSULTANT.

4.4. SHORE FLOORS AS REQUIRED TO SUPPORT CRANES, HOISTS AND OTHER CONSTRUCTION EQUIPMENT.

4.5. DO NOT CUT CONCRETE REINFORCEMENT UNLESS REVIEWED AND APPROVED BY THE CONSULTANT.

4.6. WHERE REQUIRED TO AVOID CUTTING EXISTING REINFORCEMENT, MODIFY THE LAYOUT OF NEW THROUGH BOLTS, EXPANSION ANCHORS AND OTHER ANCHORING DEVICES.

4.7. MAKE GOOD THE EXISTING WORK.

5. CUTTING AND CORING OF EXISTING STRUCTURE

5.1. PRIOR TO CUTTING AND CORING ANY OPENINGS IN THE EXISTING BUILDING, PROVIDE THE CONSULTANT WITH A SLEEVING DRAWING INDICATING THE SIZE AND LOCATION OF OPENINGS RELATIVE TO BUILDING GRID LINES. EXISTING OPENINGS IN THE VICINITY OF THE NEW OPENING MUST ALSO BE SHOWN.

5.2. ALL DIMENSIONS PROVIDED TO THE CONSULTANT ARE TO BE CONFIRMED WITH THE APPROPRIATE CONTRACTOR (MECHANICAL OR ELECTRICAL) PRIOR TO CUTTING / CORING.

5.3. ANY REVISIONS TO THE DIMENSIONS BY THE CONSULTANT MUST BE REVIEWED BY THE APPROPRIATE CONTRACTOR PRIOR TO CUTTING / CORING.

5.4. THE CONSULTANT MAY IDENTIFY AREAS WHERE EXISTING REINFORCEMENT AND EMBEDDED SERVICES MUST BE LOCATED PRIOR TO CUTTING / CORING. THIS REINFORCEMENT IS TO BE LOCATED BY A POSITIVE MEANS, (I.E. X-RAYING OR SCANNING OF SLAB).

5.5. AFTER REINFORCEMENT AND EMBEDDED SERVICES HAS BEEN LOCATED IN THESE AREAS, NOTIFY CONSULTANT WHO WILL REVIEW AND APPROVE OF LOCATION PRIOR TO CUTTING / CORING. MAKE ANY NECESSARY ADJUSTMENTS TO THE HOLE LOCATION AS DIRECTED BY THE CONSULTANT.

5.6. FOR ANY OPENINGS WHICH ARE TO BE SAW-CUT INTO THE EXISTING STRUCTURE, PRE-DRILL THE CORNERS USING A 100 mm (4") Ø CORE DRILL. DO NOT OVER-CUT CORNERS OF OPENING.

5.7. ALL PRICES FOR CUTTING / CORING ARE TO INCLUDE ANY COSTS ASSOCIATED WITH X-RAYING, SCANNING, ETC.

5.8. FOR ANY AREAS WHERE REINFORCEMENT IS CUT, THE CONTRACTOR SHALL INDICATE THE DIRECTION AND LAYER OF REINFORCEMENT ON THE AS-BUILT SLEEVING DRAWINGS.

F. QUALITY CONTROL

2. GENERAL

2.1. IMPLEMENT A SYSTEM OF QUALITY CONTROL TO ENSURE THAT THE MINIMUM STANDARDS SPECIFIED HEREIN ARE ATTAINED.

2.2. BRING TO THE ATTENTION OF THE CONSULTANT ANY DEFECTS IN THE WORK OR DEPARTURES FROM THE CONTRACT DOCUMENTS, WHICH MAY OCCUR DURING CONSTRUCTION. THE CONSULTANT WILL DECIDE UPON CORRECTIVE ACTION AND GIVE RECOMMENDATIONS IN WRITING.

2.3. THE CONSULTANT'S GENERAL REVIEW DURING CONSTRUCTION AND INSPECTION AND TESTING BY INDEPENDENT INSPECTION AND TESTING AGENCIES REPORTING TO THE CONSULTANT ARE BOTH UNDERTAKEN TO INFORM THE OWNER / CLIENT OF THE CONTRACTOR'S PERFORMANCE AND SHALL IN NO WAY AUGMENT THE CONTRACTOR'S QUALITY CONTROL OR RELIEVE THE CONTRACTOR OF CONTRACTUAL RESPONSIBILITY.

3. NOTIFICATION

3.1. PRIOR TO COMMENCING SIGNIFICANT SEGMENTS OF THE WORK, GIVE THE CONSULTANT AND INDEPENDENT INSPECTION AND TESTING COMPANIES APPROPRIATE NOTIFICATION (MINIMUM 24 HOURS) SO AS TO AFFORD THEM REASONABLE OPPORTUNITY TO REVIEW THE WORK. FAILURE TO MEET THIS REQUIREMENT MAY BE CAUSE FOR THE CONSULTANT TO CLASSIFY THE WORK AS DEFECTIVE.

4. INSPECTION AND TESTING

4.1. AN INDEPENDENT INSPECTION AND TESTING COMPANY SHALL MAKE INSPECTIONS OR PERFORM TESTS AS THE CONSULTANT DIRECTS. THE INDEPENDENT INSPECTION AND TESTING COMPANIES SHALL BE RESPONSIBLE ONLY TO THE CONSULTANT AND SHALL MAKE ONLY SUCH INSPECTIONS OR TESTS AS THE CONSULTANT MAY DIRECT.

4.2. THE FOLLOWING ITEMS REQUIRE TESTING AND/OR INSPECTION BY A CERTIFIED, INDEPENDENT INSPECTION AND TESTING COMPANY UNLESS OTHERWISE NOTED. THE TESTING FIRM SHALL SUBMIT COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS TO THE CONSULTANT FOR REVIEW:

ITEM	REQUIRED	COMMENTS
STRUCTURAL STEEL ERECTION	YES	REVIEW MEMBER SIZE, PLUMPNESS, BOLTED CONNECTIONS, ETC
STRUCTURAL STEEL WELDING	YES	VISUALLY INSPECT ALL FIELD WELDING
STEEL DECK	YES	

5. DEFECTIVE MATERIALS AND WORK

5.1. WHERE EVIDENCE EXISTS THAT DEFECTIVE WORK HAS OCCURRED OR THAT WORK HAS BEEN CARRIED OUT INCORPORATING DEFECTIVE MATERIALS, THE CONSULTANT MAY HAVE TESTS, INSPECTIONS OR SURVEYS PERFORMED, ANALYTICAL CALCULATIONS OF STRUCTURAL STRENGTH MADE, AND THE LIKE, IN ORDER TO HELP DETERMINE WHETHER THE WORK MUST BE CORRECTED OR REPLACED. TESTS, INSPECTIONS OR SURVEYS, OR CALCULATIONS CARRIED OUT UNDER THESE CIRCUMSTANCES WILL BE MADE AT THE CONTRACTOR'S EXPENSE, REGARDLESS OF THEIR RESULTS, WHICH MAY BE SUCH THAT, IN THE CONSULTANT'S OPINION, THE WORK MAY BE ACCEPTABLE.

5.2. ALL TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2012 BUILDING CODE (ONTARIO REGULATION 332/12), EXCEPT WHERE THIS WOULD, IN THE CONSULTANT'S OPINION, CAUSE UNDUE DELAY OR GIVE RESULTS NOT REPRESENTATIVE OF THE REJECTED MATERIAL IN PLACE. IN THIS CASE, THE TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE STANDARDS GIVEN BY THE CONSULTANT.

5.3. MATERIALS OR WORK, WHICH FAIL TO MEET SPECIFIED REQUIREMENTS, MAY BE REJECTED BY THE CONSULTANT WHENEVER FOUND AT ANY TIME PRIOR TO FINAL ACCEPTANCE OF THE WORK REGARDLESS OF PREVIOUS INSPECTION. IF REJECTED, DEFECTIVE MATERIALS OR WORK SHALL BE PROMPTLY REMOVED AND REPLACED OR REPAIRED TO THE SATISFACTION OF THE CONSULTANT, AT NO EXPENSE TO THE OWNER.

LIST OF STRUCTURAL DRAWINGS

engineeringlink
building envelope & structure
375 University Ave., Suite 901
Toronto, ON M5G 2J5
416-599-(LINK) 5465
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Project No. 25-1870

No.	REVISION	DD/MM/YY
1.	ISSUED FOR PERMIT	14/04/25

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal

LICENSED PROFESSIONAL ENGINEER
F. INFANTE
APR 14,2025
PROVINCE OF ONTARIO

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

Project
HALIBURTON HIGHLANDS S.S
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD.21
HALIBURTON, ON, K0M 1S0

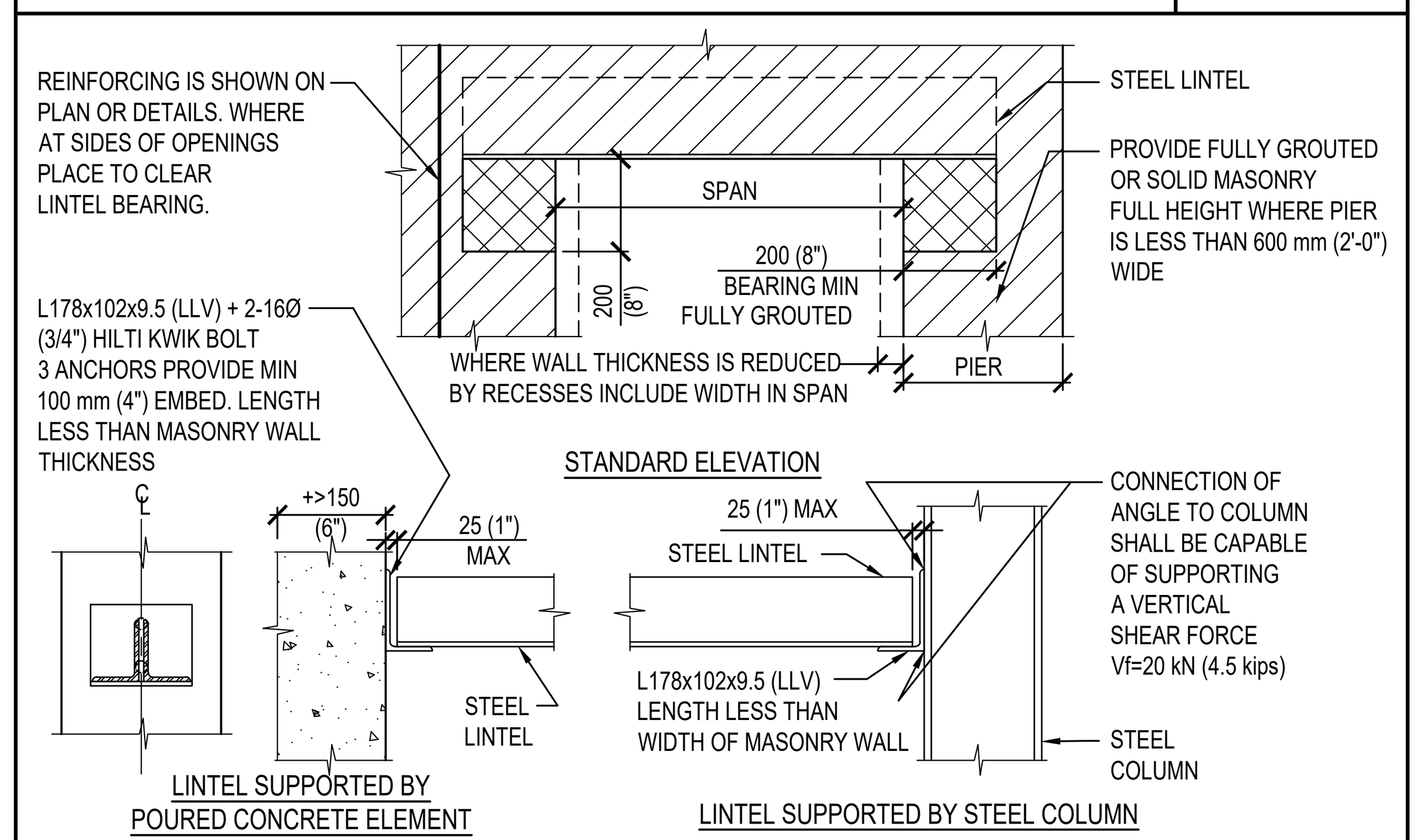
Drawing Title
GENERAL NOTES

Checked:	Date:
FRI	APRIL 2025
Drawn:	Scale:
NAZ	N/A
File Number:	Dwg Number:
2025-07	S-101

STRUCTURAL ABBREVIATIONS — TD-G01

A BOLT	ANCHOR BOLT	f'c	28 DAYS CONCRETE	OF	OUTSIDE FACE
ADJ	ADJUSTABLE		COMPRESSIVE STRENGTH	OPEN	OPENING
AFF	ABOVE FINISHED FLOOR	FDN	FOUNDATION	OWSJ	OPEN WEB STEEL JOIST
AIFB	ASPHALT IMPREGNATED	FF	FAR FACE	Pf	AXIAL FORCE (FACTORED)
	FIBREBOARD	FIN	FINISHED	PC	PRECAST
ALT	ALTERNATE	FL	FLOOR	PL	PLATE
ARCH	ARCHITECTURAL	ft	FOOT, FEET	PLF	POUNDS PER LINEAR FOOT
ASL	ADDITIONAL ACCUMULATED	FTG	FOOTING	PROJ	PROJECTION
	SNOW LOAD	Fy	YIELD STRENGTH	psf	POUNDS PER SQUARE FOOT
@	AT	GA	GAUGE	PT	PRESSURE TREATED
B, BOTT	BOTTOM	GALV	GALVANIZED	RD	ROOF DRAIN
B/B	BACK TO BACK	GEN	GENERAL	Rf	REACTION (FACTORED)
BEW	BOTTOM EACH WAY	HEF	HORIZONTAL EACH FACE	RAD	RADIUS
BH	BOREHOLE	Hf	HORIZONTAL FORCE (FACTORED)	REINF	REINFORCED, REINFORCEMENT
BLL	BOTTOM LOWER LAYER	HH	HOOK EACH END	REF	REFERENCE
BLDG	BUILDING	HIF	HORIZONTAL INSIDE FACE	RE	RIGHT END
BM	BEAM	HOF	HORIZONTAL OUTSIDE FACE	REQ'D	REQUIRED
BPL	BEARING/BASE PLATE	H, HORZ	HORIZONTAL	REV	REVISION, REVISED
BRDG	BRIDGING	HSC	HORIZONTALLY SLOTTED CONNECTION	R/W	REINFORCED WITH
BUL	BOTTOM UPPER LAYER	HSS	HOLLOW STEEL SECTION	SAD	SEE ARCHITECTURAL DRAWINGS
c	CAMBER	IF	INSIDE FACE	SDF	STEP DOWN FOOTING
C	EPOXY COATED	IN	INCH(ES)	SECT	SECTION
c/c, o/c	CENTRE TO CENTRE	INT	INTERIOR	SIM	SIMILAR
CA	COLUMN ABOVE	JT	JOINT	SL	SLAB
CB	COLUMN BELOW	K	KIP, 1000 LBS	SOG	SLAB ON GRADE
CANT	CANTILEVER	K-ft	KIP FEET	SPDD	STANDARD PROCTOR DRY DENSITY
Cf	COMPRESSIVE FORCE (FACTORED)	kg	KILOGRAM(S)	ST	STRAIGHT
CJ	CONTROL JOINT	KLF	KIPS PER LINEAR FOOT	STIFF	STIFFENER
℄	CENTRELINE	kN	KILONEWTON	STIR	STIRRUP
COL	COLUMN	kN-m	KILONEWTON METRE	STRUCT	STRUCTURAL
COMP	COMPOSITE	kN/m	KILONEWTON PER METRE	STD	STANDARD
CONC	CONCRETE	kPa	KILOPASCAL	SQ	SQUARE
CONT	CONTINUOUS	KSF	KIPS PER SQUARED FOOT	T	TOP
C/W	COMPLETE WITH	KSI	KIPS PER SQUARED INCH	Tf	TENSILE FORCE (FACTORED)
DEMO	DEMOLITION	L	SINGLE ANGLE	TEMP	TEMPORARY, TEMPERATURE
DET	DETAIL	LE	LEFT END	TEW	TOP EACH WAY
DIA, Ø	DIAMETER	LG	LONG	TJ	TIE JOIST
DIAG	DIAGONAL	LL	LIVE LOAD, LOWER LAYER	TLL	TOP LOWER LAYER
DIM	DIMENSION	LLH	LONG LEG HORIZONTAL	TMf	TORSIONAL MOMENT (FACTORED)
DL	DEAD LOAD	LLV	LONG LEG VERTICAL	TOD	TOP OF DECK
DP	DEEP	LSH	LONG SIDE HORIZONTAL	TOS	TOP OF STEEL/SLAB
DWG(S)	DRAWING(S)	LSV	LONG SIDE VERTICAL	TRANS	TRANSVERSE
DWL(S)	DOWEL(S)	m	METRE	TUL	TOP UPPER LAYER
DN	DOWN	MC ▶	MOMENT CONNECTION	TYP	TYPICAL
EA	EACH		(FULL MOMENT UNLESS NOTED)	UL	UPPER LAYER
EE	EACH END	MECH	MECHANICAL	U/N	UNLESS NOTED OTHERWISE
EF	EACH FACE	Mf	MOMENT (FACTORED)	U/S	UNDERSIDE
ELEC	ELECTRICAL	ML	MIDDLE LAYER	V, VERT	VERTICAL
EL	ELEVATION	mm	MILLIMETRE	Vf	VERTICAL SHEAR FORCE (FACTORED)
ELEV	ELEVATOR	MPa	MEGAPASCAL	VBF	VERTICAL BRACED FRAME
EMBED	EMBEDMENT	Mxf	BENDING MOMENT	VEF	VERTICAL EACH FACE
EQ	EQUAL		ABOUT x-x AXIS (FACTORED)	VIF	VERTICAL INSIDE FACE
ES	EACH SIDE	Myf	BENDING MOMENT	VOF	VERTICAL OUTSIDE FACE
EX, EXIST	EXISTING		ABOUT y-y AXIS (FACTORED)	VSC	VERTICALLY SLOTTED CONNECTION
EJ, EXP JT	EXPANSION JOINT	NF	NEAR FACE	W	WIDE FLANGE BEAM
E-W	EAST WEST	NIC	NOT IN CONTRACT	WT	WEIGHT, STRUCTURAL TEE
EW	EACH WAY	N-S	NORTH-SOUTH	WWF	WELDED WIRE FABRIC OR WELDED WIDE FLANGE
EXT	EXTERIOR	NTS	NOT TO SCALE	W.P.	WORKING POINT

STEEL LINTELS FOR NON-LOAD BEARING MASONRY WALLS — TD-S01

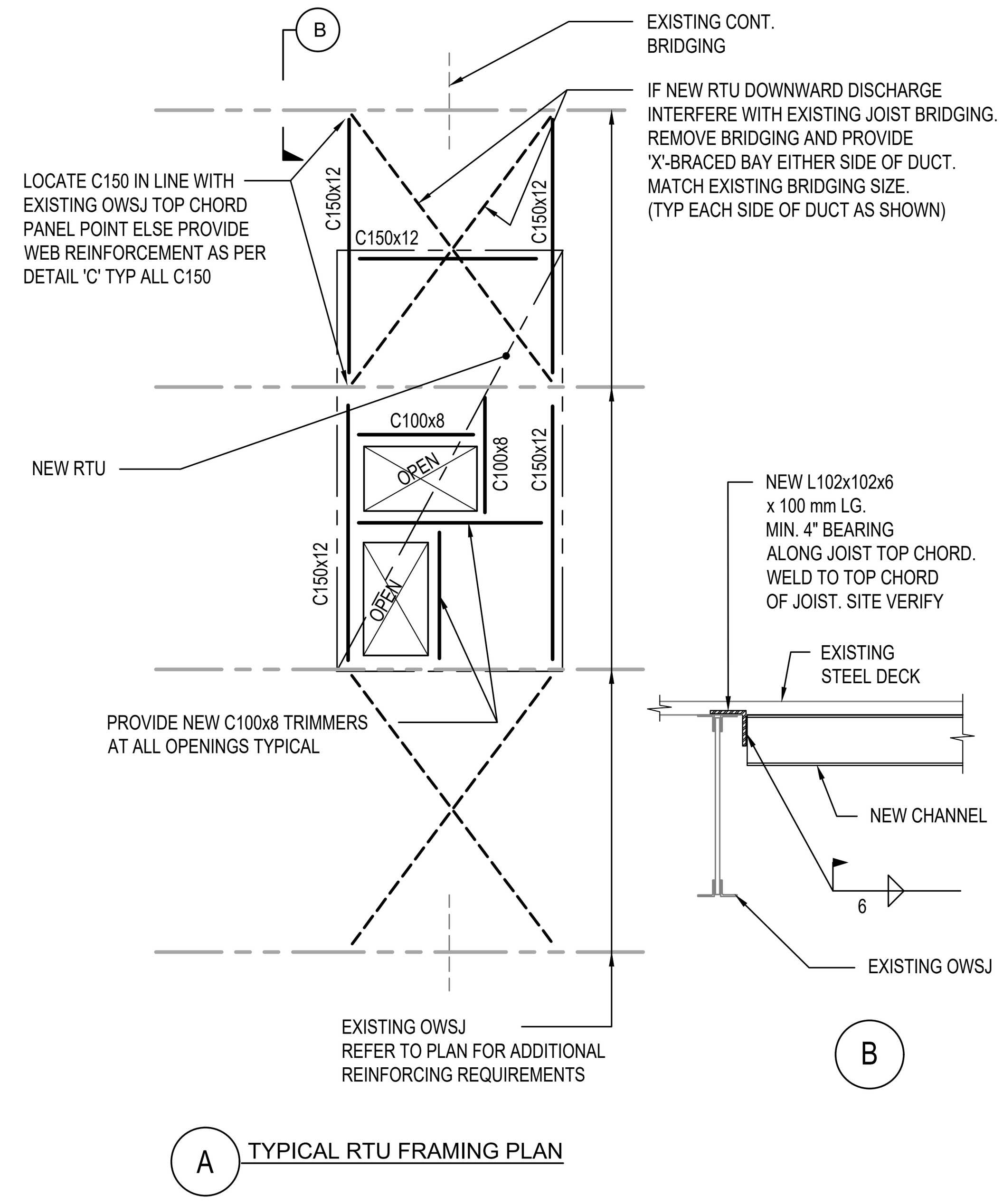


CLEAR SPAN	WALL THICKNESS				
	90 (3 1/2") VENEER	140 (5 1/2")	190 (7 1/2")	240 (9 1/2")	290 (11 1/2")
UP TO 1200 (4'-0")	L89x89x6.4	2-L64x64x6.4	2-L76x89x6.4 (LLH)	L76x102x6.4 + L76x127x6.4 (LLH)	3-L76x89x6.4 (LLH)
1200 (4'-0") TO 1800 (6'-0")	L127x89x6.4 (LLV)	2-L89x64x6.4 (LLV)	2-L89x89x6.4	L102x102x6.4 + L76x127x6.4 (LLH)	3-L89x89x6.4
1800 (6'-0") TO 2400 (8'-0")	L127x89x6.4 (LLV)	2-L89x64x7.9 (LLV)	2-L102x89x7.9 (LLV)	L102x102x9.5 + L89x127x7.9 (LLH)	3-L102x89x6.4 (LLV)
2400 (8'-0") TO 3000 (10'-0")	L127x89x9.5 (LLV)	2-L89x64x9.5 (LLV)	2-L152x89x7.9 (LLV)	L152x102x7.9 (LLV) + L127x127x7.9	3-L127x89x6.4 (LLV)
DETAIL	∟	⅃∟	⅃∟	⅃∟	⅃∟∟

NOTES:

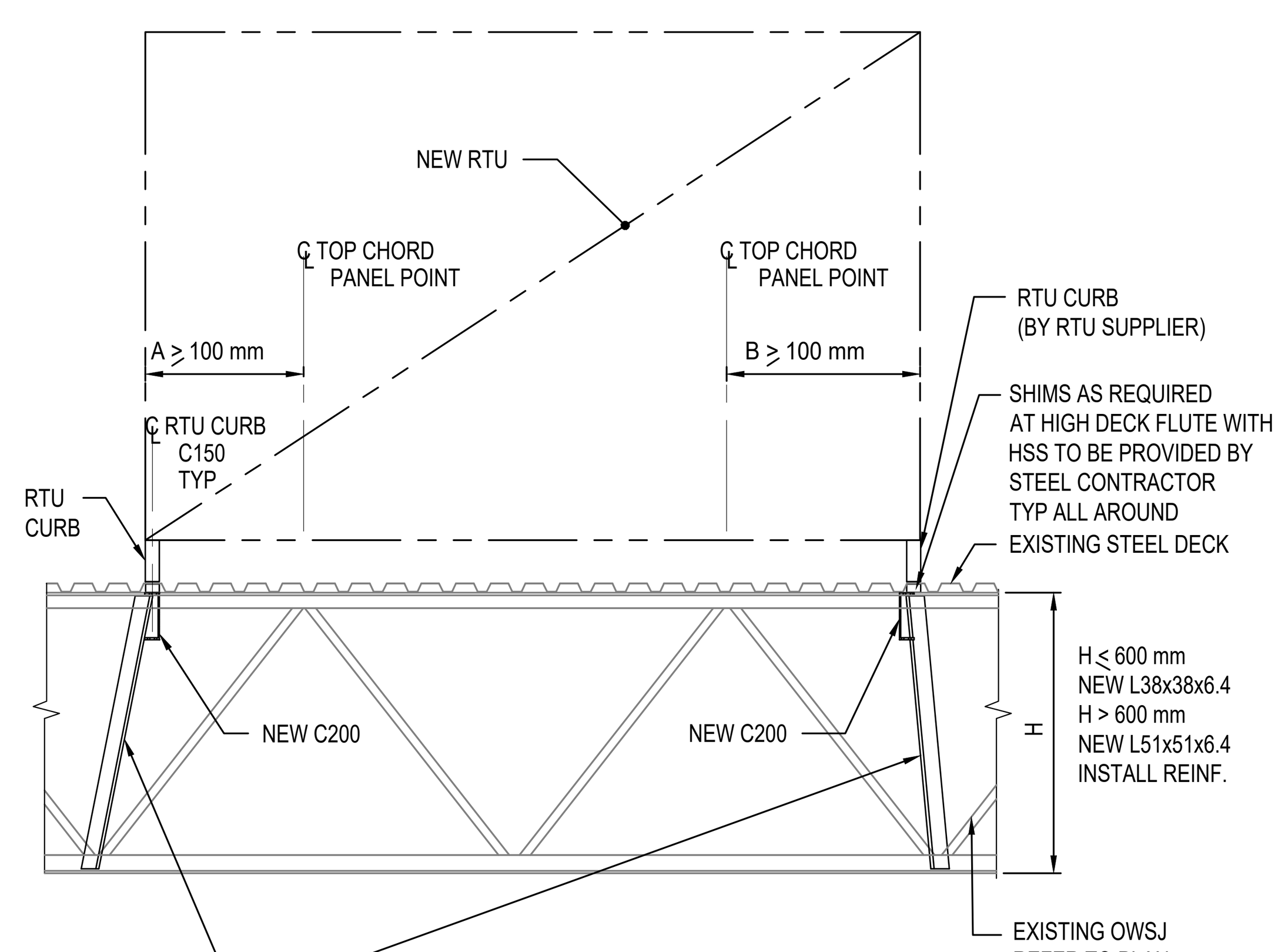
1. CONNECT BACK TO BACK DOUBLE ANGLE LINTELS USING 16 mm (5/8") Ø BOLTS AT 450 mm (18") c/c MAX OR BY WELDING AT TOP AND BOTTOM USING 6 mm (1/4") WELDS x 50 mm (2") LONG AT 450 mm (18") c/c MAX. FIRST BOLT OR WELD TO BE A MAX OF 75 mm (3") FROM END OF LINTEL
2. FULLY PACK LINTEL ENDS WITH STEEL SHIMS TO ENSURE EVEN BEARING.
3. LINTELS AS COVERED UNDER THIS DETAIL ARE NOT NECESSARILY SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR OPENING LOCATIONS AND SIZES.

DETAILS RELATED TO RTU's ON OWSJ — PD-S101



NOTES:

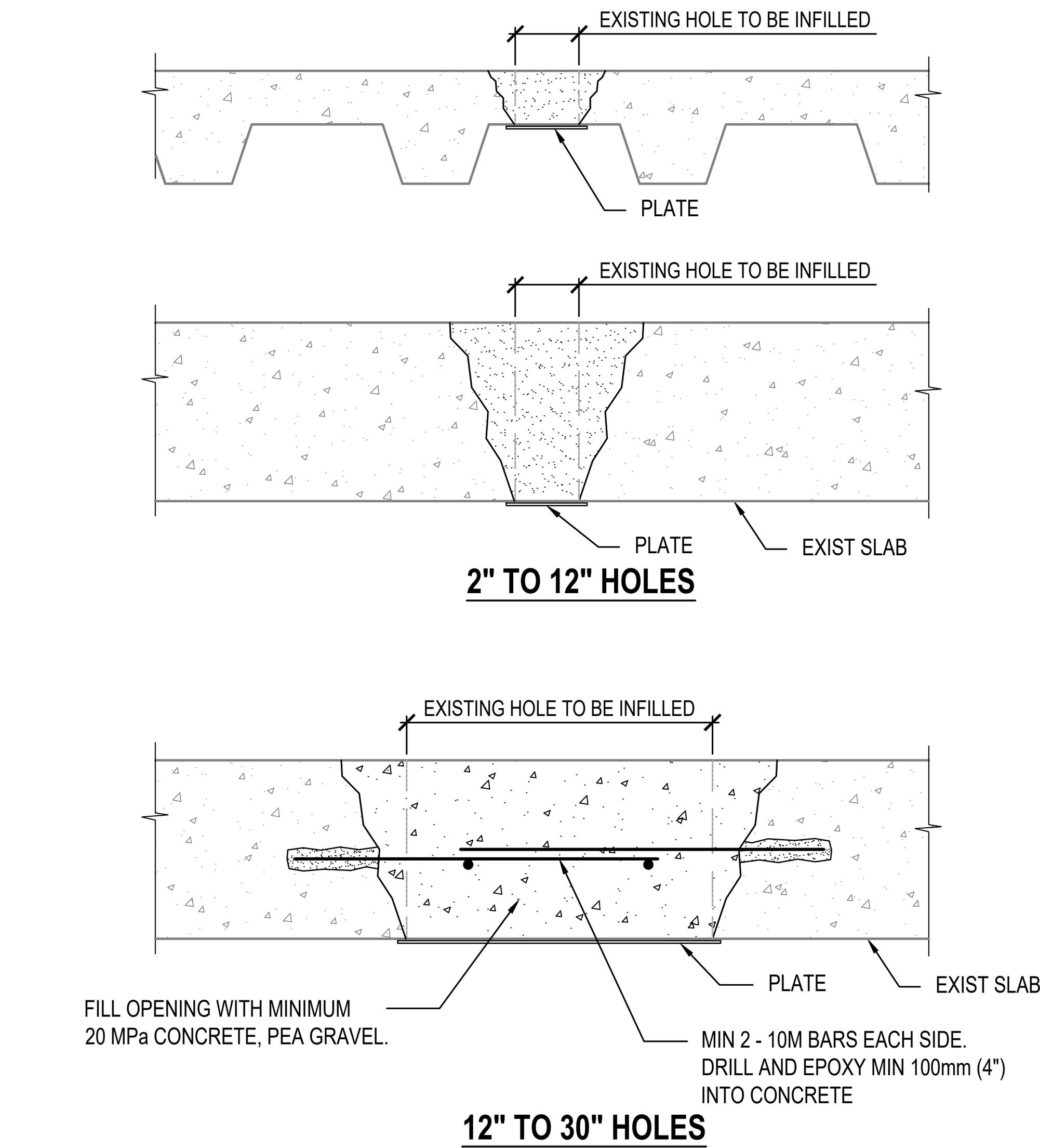
1. CENTRE ALL NEW C150x12 DIRECTLY BELOW UNDERSIDE OF RTU CURB. LOCATE TIGHT TO UNDERSIDE OF ROOF DECK. IF C150 LOCATED BELOW HIGH DECK FLUTE PROVIDE STEEL SHIMS OR FULLY DRY PACK TIGHT TO FILL GAP AS PER DETAIL 'C'. SITE VERIFY REQUIREMENT.
2. REFER TO PLAN FOR ADDITIONAL REINFORCING REQUIREMENTS.
3. CONNECT RTU TO CURB AND CURB TO BASE STRUCTURE AS PER MANUFACTURER'S SPECIFICATIONS.
4. REFER TO RTU SHOP DWGS FOR ROOF OPENING REQUIREMENTS.



1. ANGLES NS + FS OF JOIST (TOTAL 2 MEMBERS PER LOCATION) TO BE FULLY WELDED TO TOP AND BOTTOM CHORD OF JOIST. Tf=Cf= 25 kN (6 kips). DO NOT WELD TO EXISTING WEB MEMBER. SHIM AS REQUIRED.
2. WEB REINFORCING IS NOT REQUIRED IF DIM 'A' OR 'B' EQUAL OR LESS THAN 100 mm.

C

INFILL OF EXISTING SLEEVE OPENINGS — TD-CM6

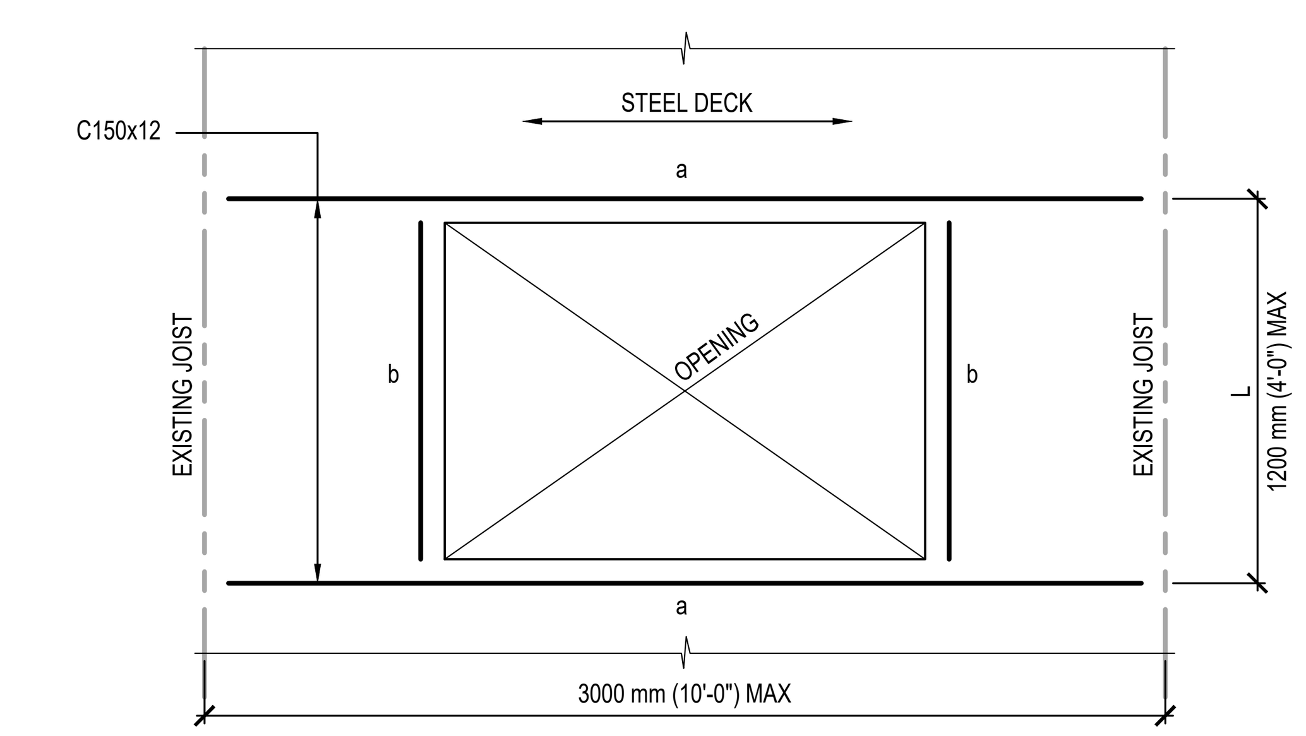


NOTES:

1. CHIP SIDE OF HOLE TO CREATE SLOPE
2. INSTALL BOTTOM PLATE (HANG OR SCREW TO UNDERSIDE AND OR SIDE OF SLOPE)
3. FILL WITH NON SHRINK GROUT AND FINISH TO MEET LANDLORD REQUIREMENTS
4. REINSTATE FIREPROOFING AS REQUIRED BY LANDLORD

FRAMING AT OPENINGS IN STEEL ROOF DECK — TD-S02

	SPAN L	a	b
EXISTING ROOF DECK	150 mm (6") < L ≤ 450 mm (18")	C150x12	L65x65x6
	450 mm (18") < L ≤ 1200 mm (4'-0")	C150x12	C100x8
NEW ROOF DECK	150 mm (6") < L ≤ 450 mm (18")	BY DECK SUPPLIER	BY DECK SUPPLIER
	450 mm (18") < L ≤ 1200 mm (4'-0")	C150x12	C100x8



NOTES:

1. REINFORCING IS NOT REQUIRED AT OPENING LESS THAN 150 mm (6") SQUARE OR IN DIAMETER.
2. TOP OF OPENING TRIMMING STEEL TO BE TIGHT TO U/S OF STEEL DECK.
3. STANDARD OPENING TRIMMING STEEL IS NOT NECESSARILY SHOWN ON STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR OPENING SIZES AND LOCATIONS, AS WELL AS EXACT NUMBER OF OPENINGS.
4. IF OPENING DIMENSIONS "L" EXCEEDS 1200 mm (4'-0") SEE PLAN FOR TRIMMER FRAMING.

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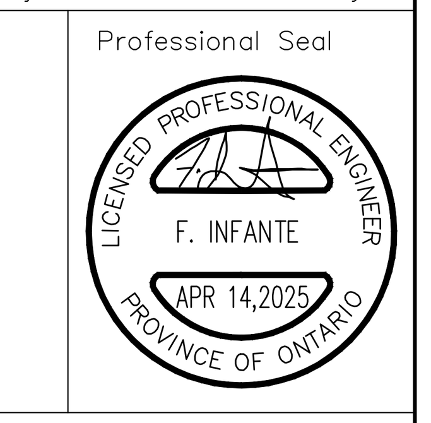
Project No. 25-1870

No.	REVISION	DD/MM/YY
1.	ISSUED FOR PERMIT AND TENDER	14/04/25

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal



SAB ENGINEERING Inc.
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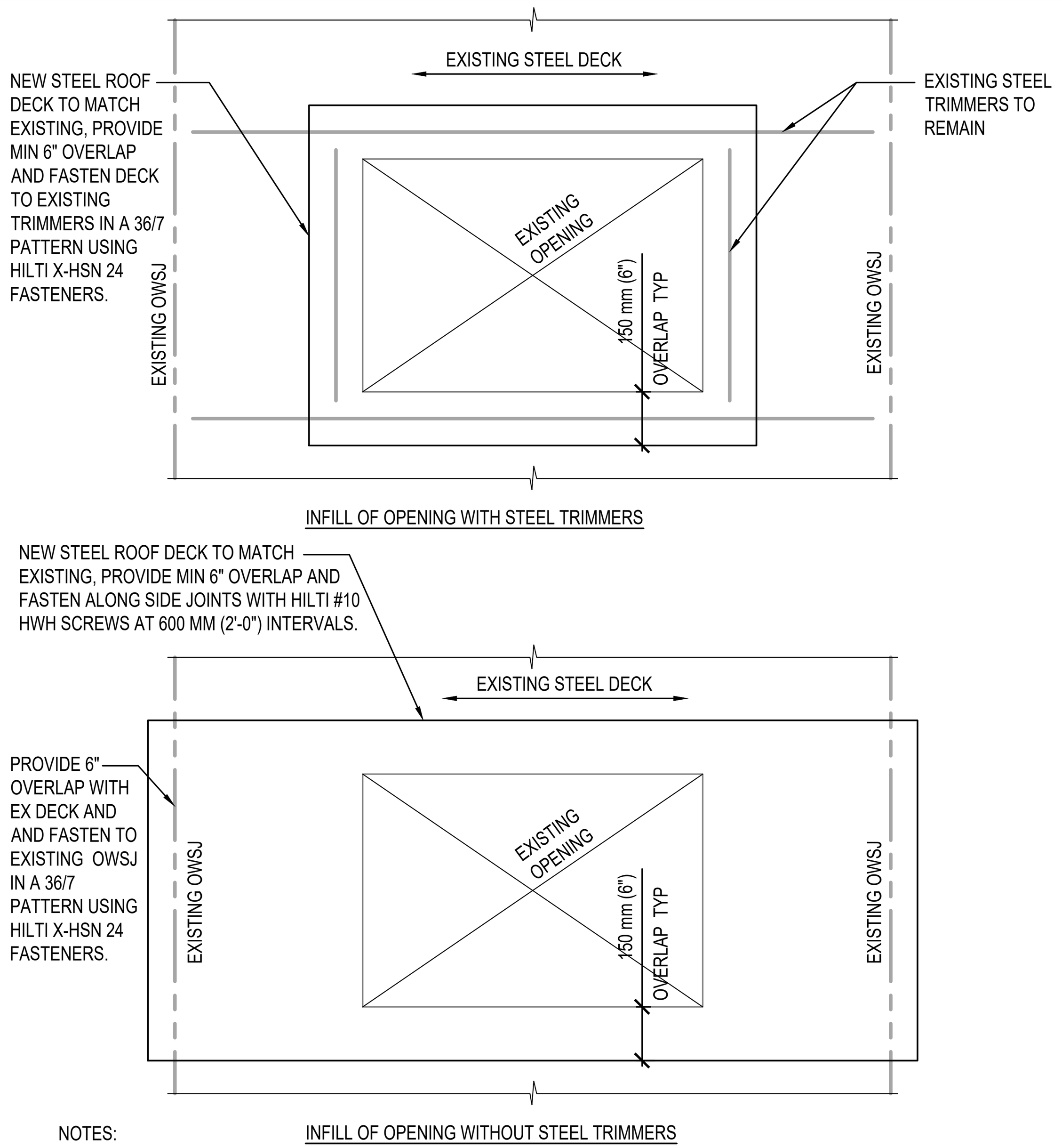
Project
HALIBURTON HIGHLANDS S.S
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD.21
HALIBURTON, ON, K0M 1S0

Drawing Title
TYPICAL DETAILS

Checked: FRI	Date: APRIL 2025
Drawn: NAZ	Scale: N/A
File Number: 2025-07	Dwg Number: S-102

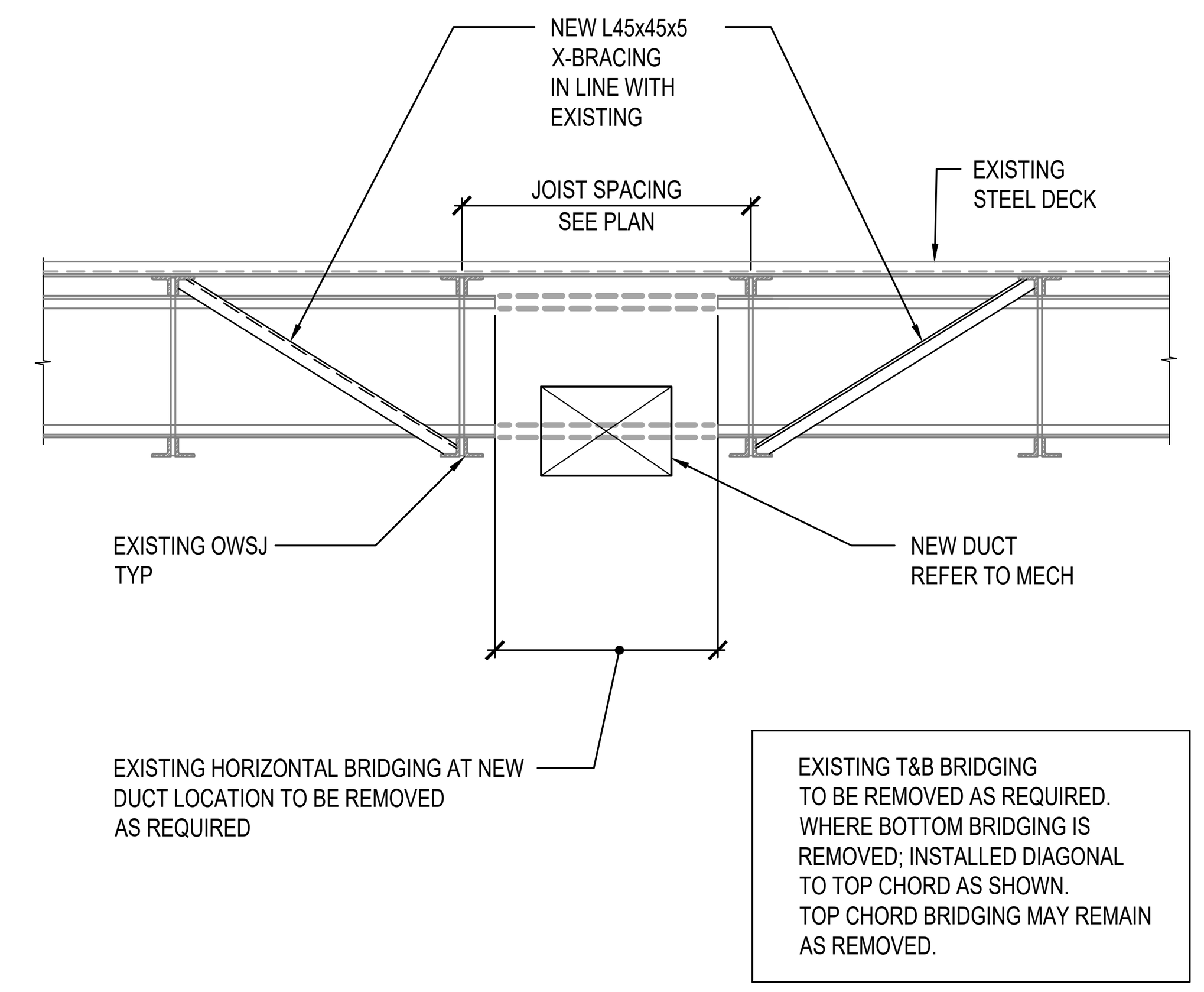
INFILL OF EXISTING OPENINGS IN STEEL ROOF DECK — TD-S21R



NOTES:

1. OPEN UP EXISTING ROOFING AS REQUIRED TO INSTALL STEEL DECK INFILL AND MAKE GOOD AFTER.
2. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF EXISTING OPENINGS.
3. IF NEW STEEL DECK CANNOT BE SOURCED TO MATCH EXISTING, CONTRACTOR TO PROPOSE ALTERNATE DECK PROFILE FOR REVIEW AND APPROVAL BY STRUCTURAL ENGINEER.

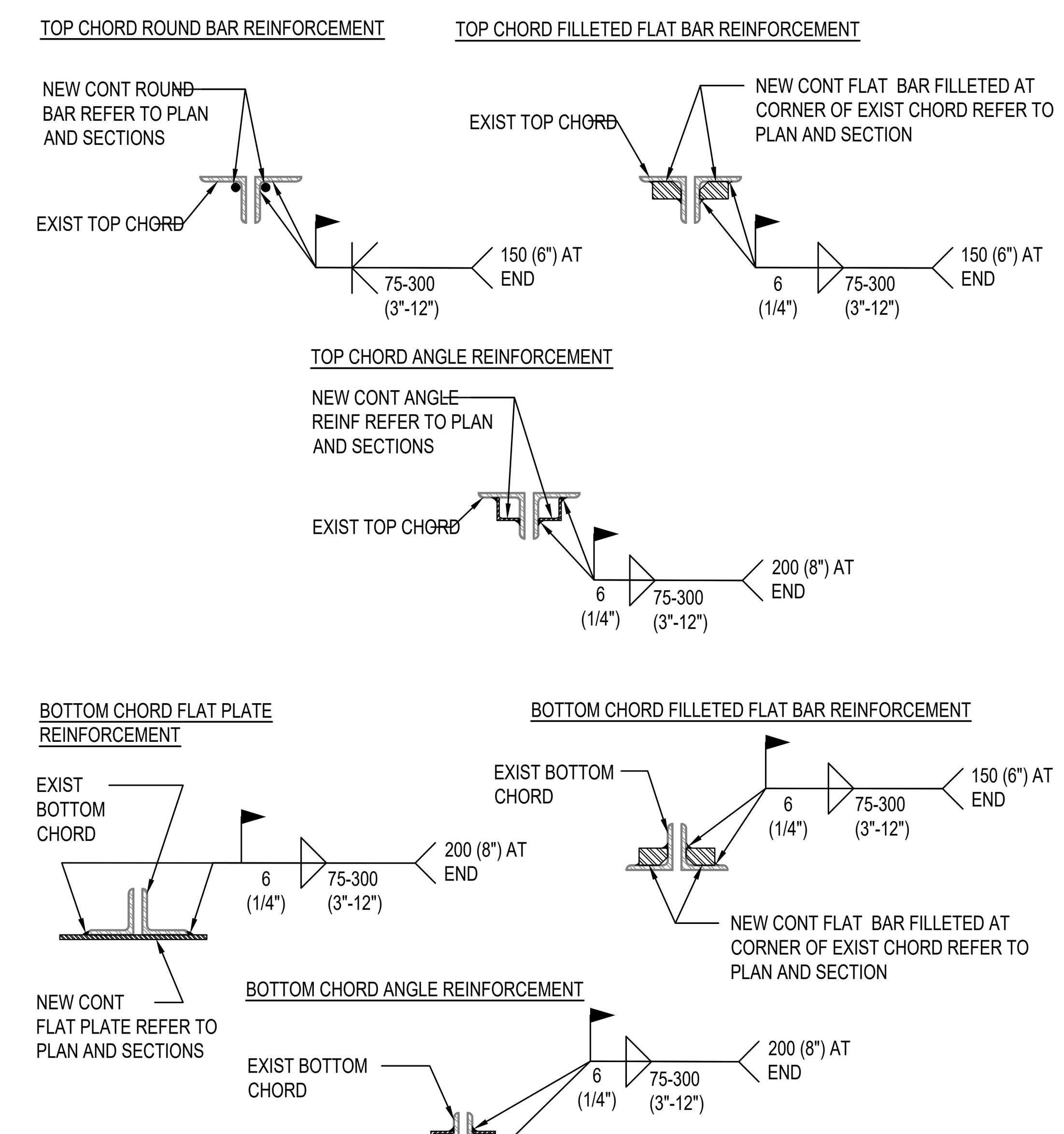
MODIFICATION OF EXISTING HORIZONTAL BRIDGING AT NEW MECHANICAL DUCT LOCATION TYPICAL DETAIL — TD-S26



NOTE:

1. SITE VERIFY NUMBER OF AFFECTED BRIDGING LINES.

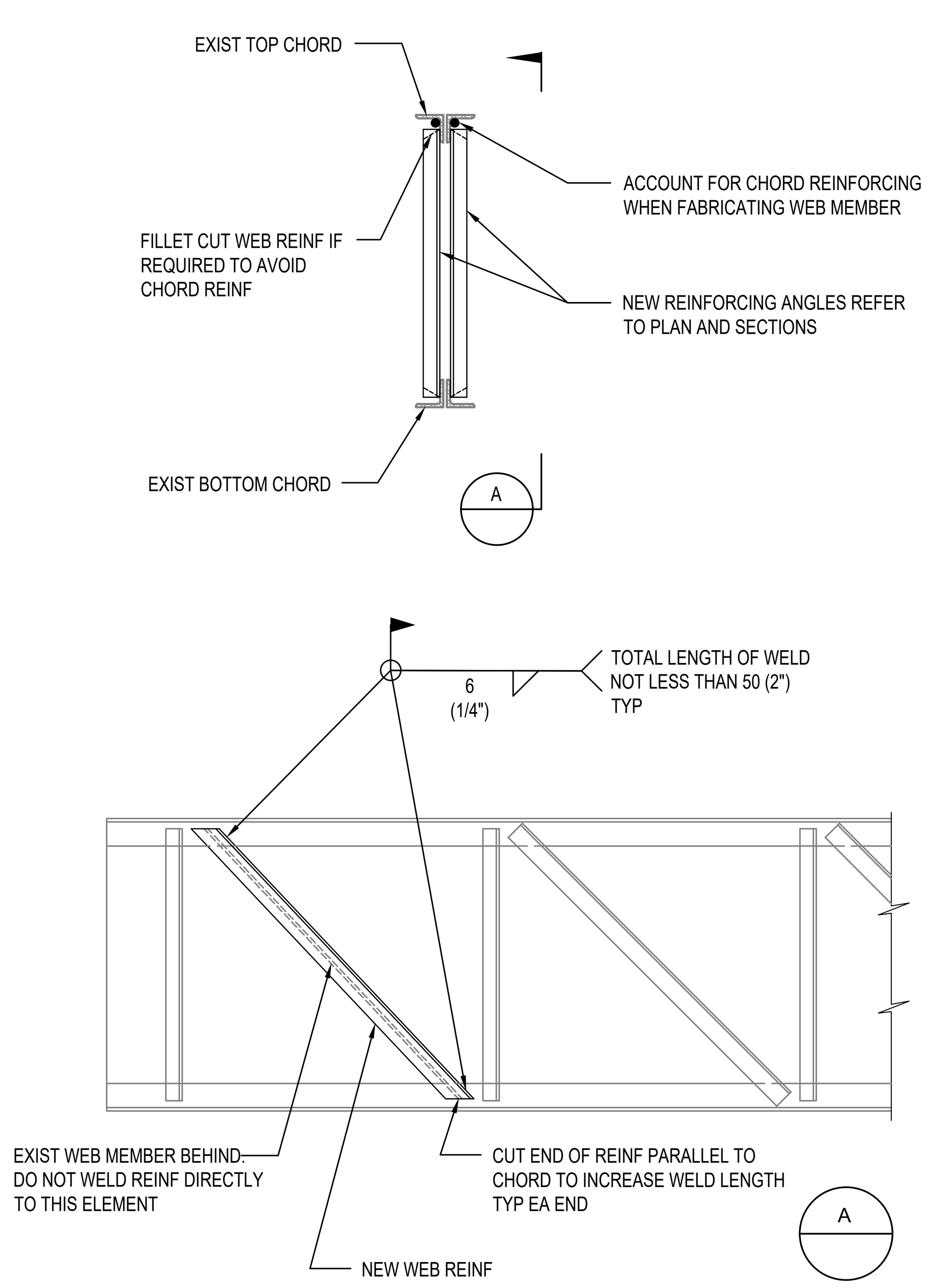
TYPICAL OWSJ REINFORCING — TD-S34



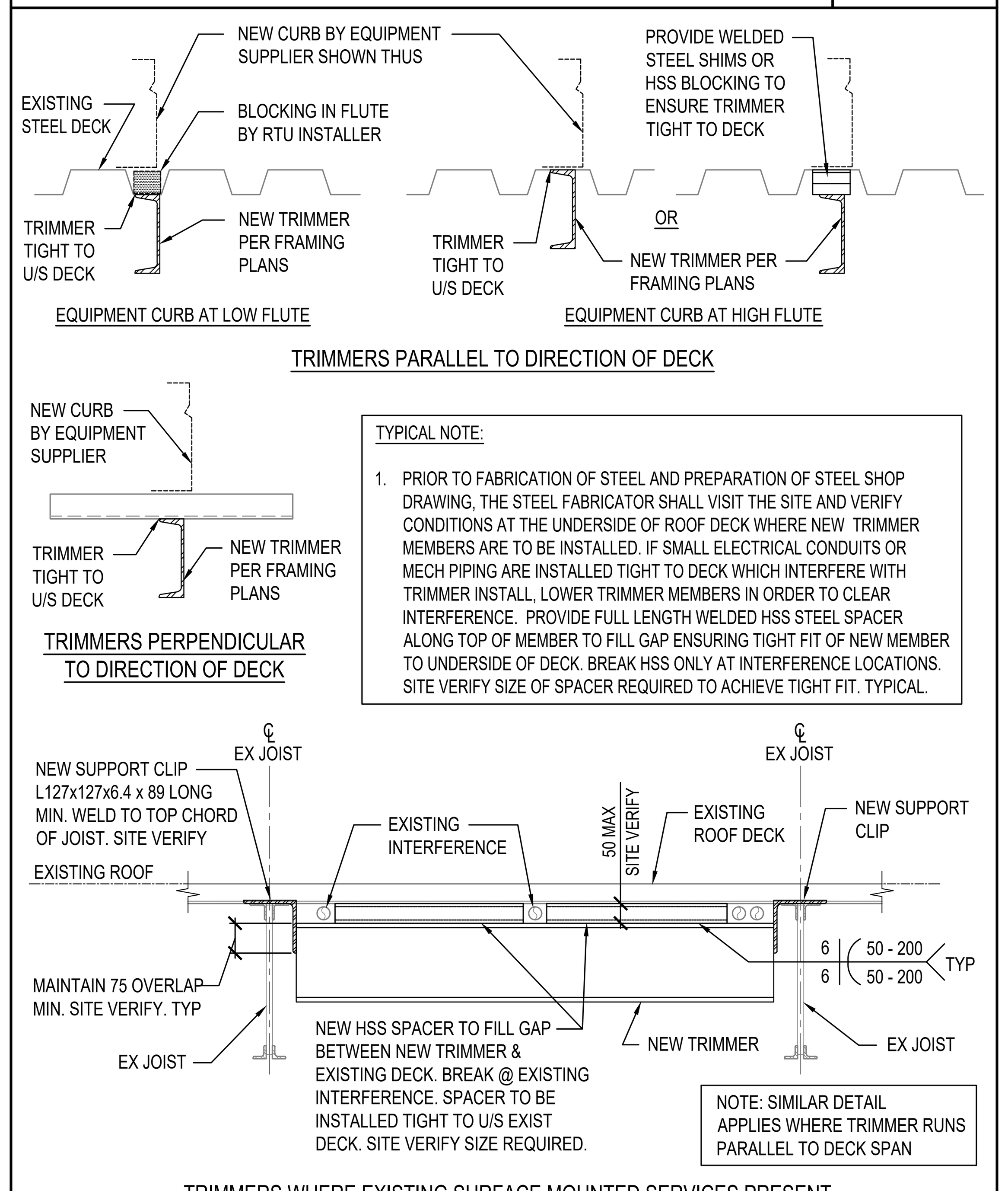
NOTE:

1. SPLICING OF CHORD REINFORCING IS NOT ACCEPTABLE WITHOUT AN ENGINEERED SPLICING DETAIL. CONTRACTOR TO PROVIDE A DETAIL SPLICE SHOP DRAWING, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER FOR ALL SPLICES.

WEB REINFORCING — TD-S35



NEW STEEL TRIMMER FRAMING BELOW STEEL DECK AND BELOW EQUIPMENT CURBS — TD-S37



TYPICAL NOTE:

1. PRIOR TO FABRICATION OF STEEL AND PREPARATION OF STEEL SHOP DRAWING, THE STEEL FABRICATOR SHALL VISIT THE SITE AND VERIFY CONDITIONS AT THE UNDERSIDE OF ROOF DECK WHERE NEW TRIMMER MEMBERS ARE TO BE INSTALLED. IF SMALL ELECTRICAL CONDUITS OR MECH PIPING ARE INSTALLED TIGHT TO DECK WHICH INTERFERE WITH TRIMMER INSTALL, LOWER TRIMMER MEMBERS IN ORDER TO CLEAR INTERFERENCE. PROVIDE FULL LENGTH WELDED HSS STEEL SPACER ALONG TOP OF MEMBER TO FILL GAP ENSURING TIGHT FIT OF NEW MEMBER TO UNDERSIDE OF DECK. BREAK HSS ONLY AT INTERFERENCE LOCATIONS. SITE VERIFY SIZE OF SPACER REQUIRED TO ACHIEVE TIGHT FIT. TYPICAL.

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Project No. 25-1870

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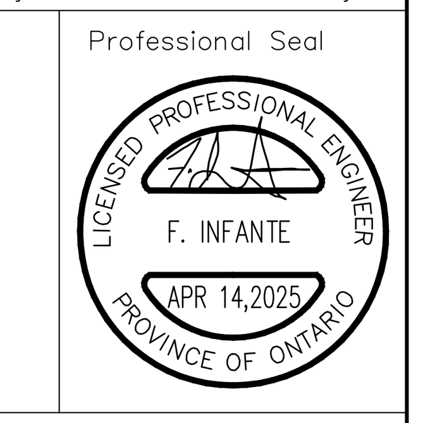
Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal



SAB ENGINEERING Inc.
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Project

HALIBURTON HIGHLANDS S.S
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location

5358 HALIBURTON COUNTY RD.21
HALIBURTON, ON, K0M 1S0

Drawing Title

TYPICAL DETAILS

Checked: FRI	Date: APRIL 2025
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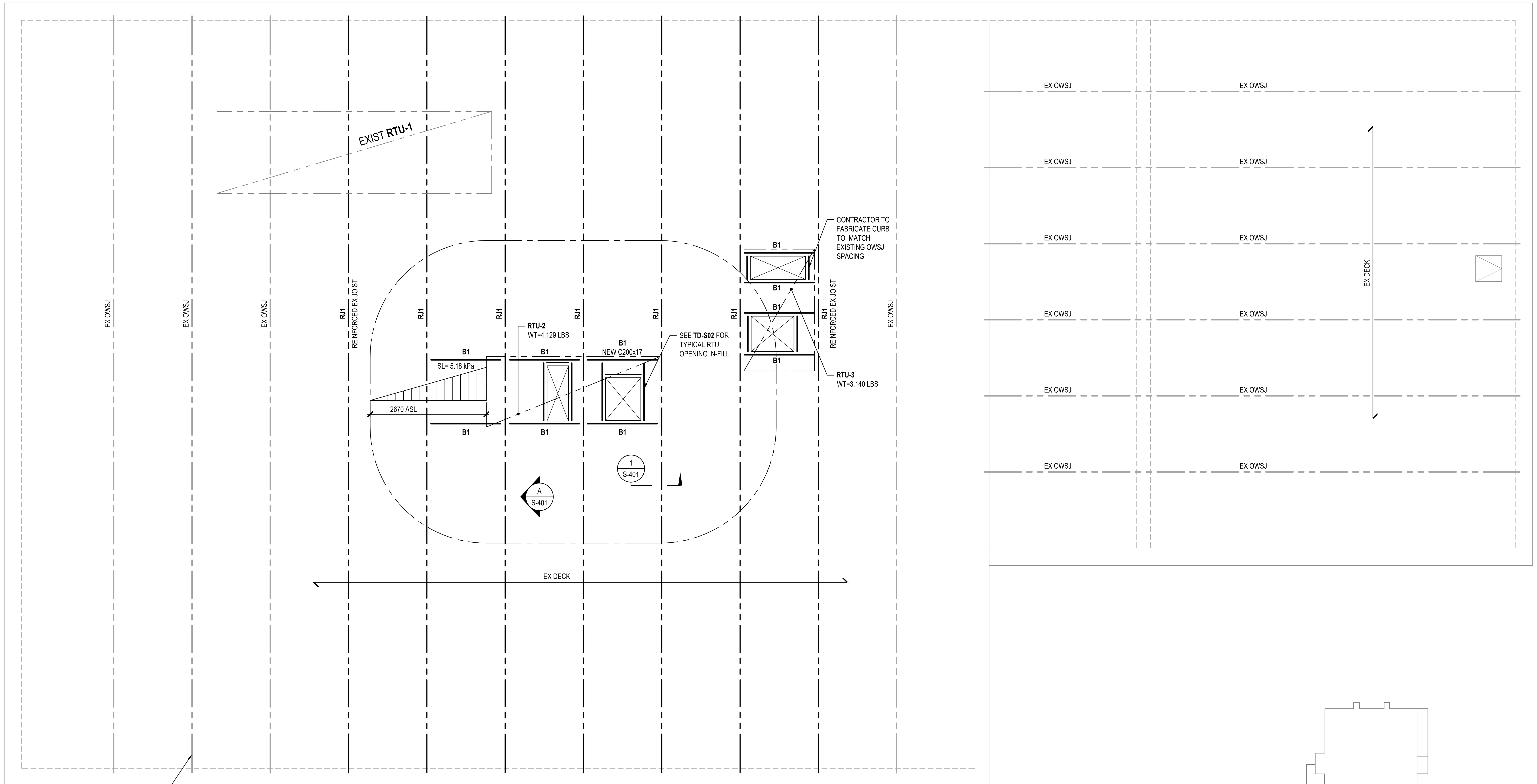
File Number: 2025-07	Dwg Number: S-103

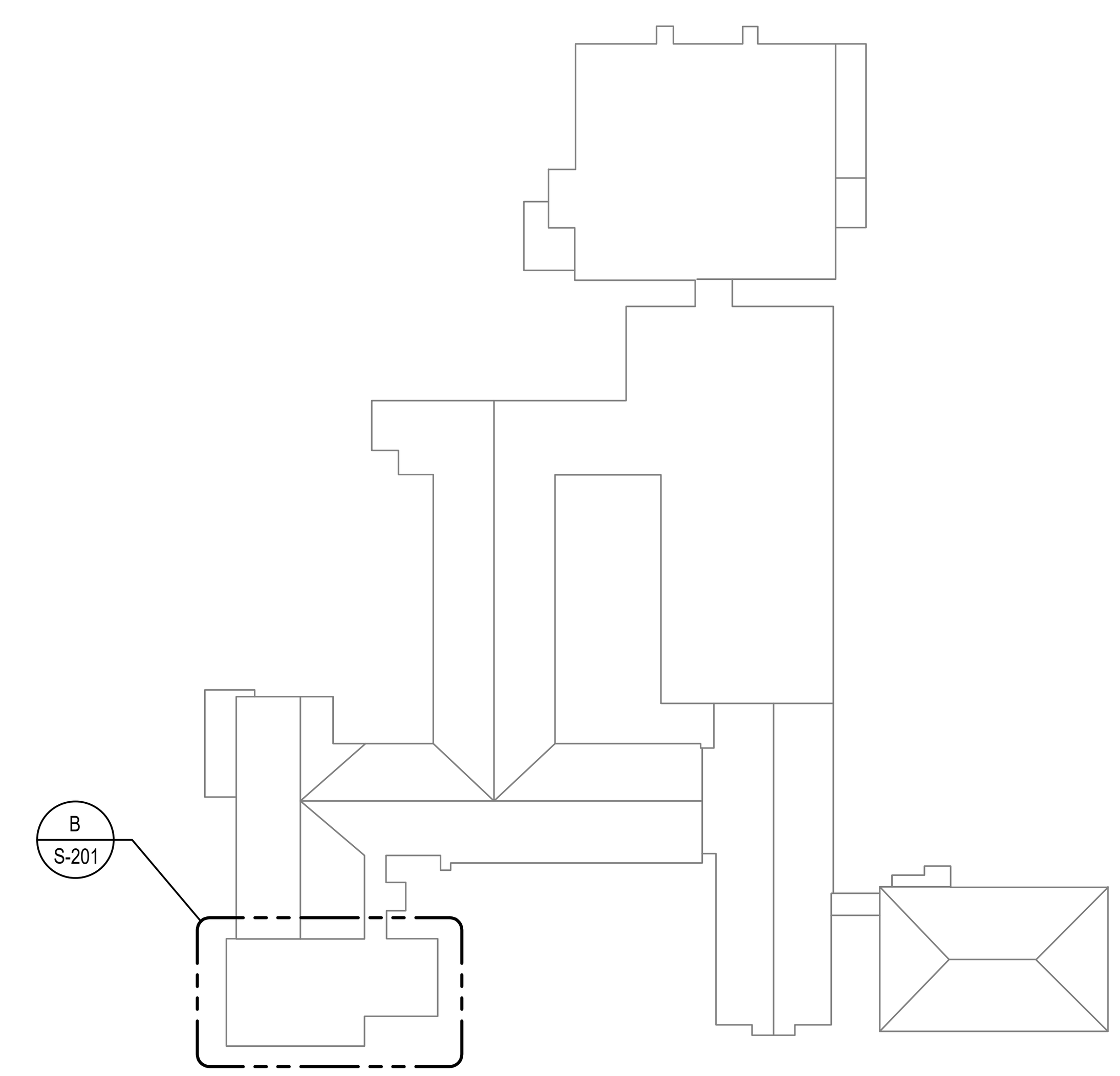


CONTRACTOR TO SITE VERIFY OWSJ DIMENSIONS AND NOTIFY ENGINEERING LINK PRIOR TO FABRICATION OF REINFORCEMENT.

B / S-201 **PART ROOF FRAMING PLAN**
1 : 50

ROOF FRAMING PLAN NOTES:

1. TOP OF ROOF DECK TO BE 0'-0" BELOW ROOF ELEVATION, SEE ARCH FOR TOP OF ROOF ELEVATION.
2. TOP OF STEEL IS 0'-0" BELOW UNDERSIDE OF ROOF DECK.
4. READ DRAWING IN COMBINATION WITH GENERAL NOTES AND TYPICAL DETAILS.
5. CONTRACTOR TO SITE VERIFY OWSJ DIMENSIONS AND NOTIFY ENGINEERING LINK PRIOR TO FABRICATION OF REINFORCEMENT.
6. THE EXISTING STRUCTURE HAS BEEN CHECKED FOR NEW LOADS IMPOSED BY THE PROPOSED NEW RTU AND FOUND TO BE SUFFICIENT WITH THE REINFORCEMENT SHOWN THUS.
6. SEE PLAN FOR NEW RTU WEIGHTS.
6. SNOW LOADS ARE 65.4 psf + ASL
   (SS = 60.6 PSF; SR = 8.4 PSF)
7. ASSUMEDSUPERIMPOSED DEAD LOADS ARE:
   ROOFING 10 psf
   M&E 10 psf
9. SEE ARCHITECTURAL DRAWINGS FOR SLOPES ETC.
10. ALL FIELD WELDS MUST BE REVIEWED BY AN INDEPENDENT INSPECTION AND TESTING COMPANY SUBMIT COPIES OF ALL TESTING REPORTS TO THE CONSULTANT
11. EXISTING BRIDGING AND BRACING WHICH INTERFERES WITH NEW STRUCTURAL TO BE REMOVED AND REINSTATED AFTER INSTALLATION OF NEW RTU UNIT IS COMPLETE. THE CONTRACTOR SHALL INCLUDE NOTED WORK INTO PRICE. REFER TO TYPICAL DETAIL TD-S26 FOR NEW BRIDGING AND REPLACEMENT BRIDGING.
12. REMOVE EXISTING CEILING FINISHES, MECHANICAL SERVICES AND THE LIKE TO COMPLETE THE STRUCTURAL WORK. PATCH AND MAKE GOOD.



A / S-201 **KEY PLAN**
NTS

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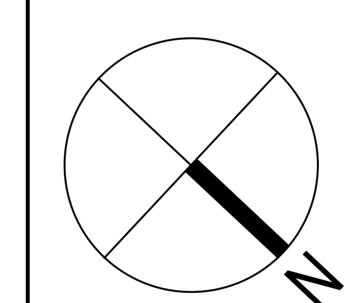

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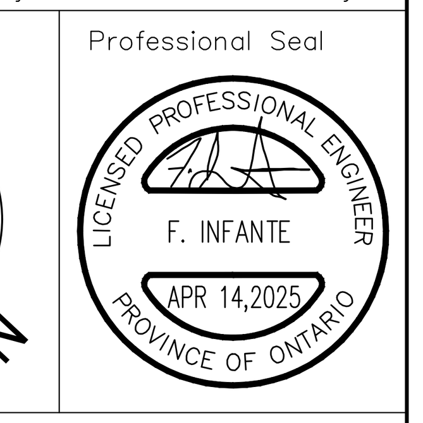

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Project
HALIBURTON HIGHLANDS S.S
HVAC UPGRADE (CAFETERIA & KITCHEN)

Location
5358 HALIBURTON COUNTY RD.21
HALIBURTON, ON, K0M 1S0

Drawing Title
KEY PLAN,
PART ROOF FRAMING PLAN

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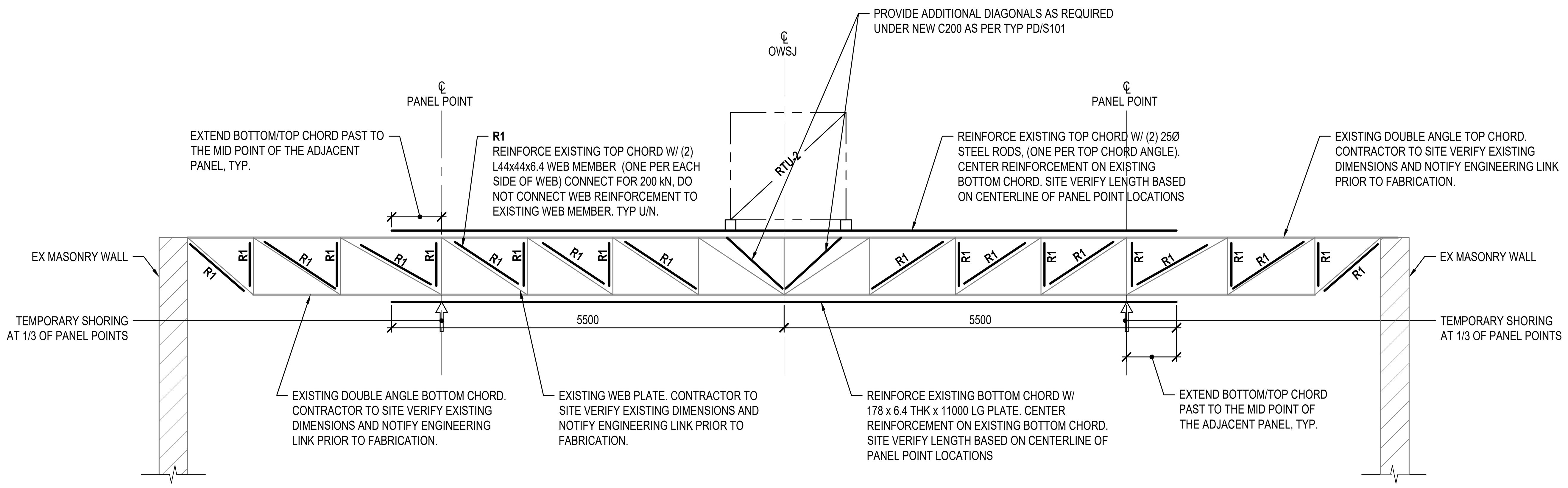
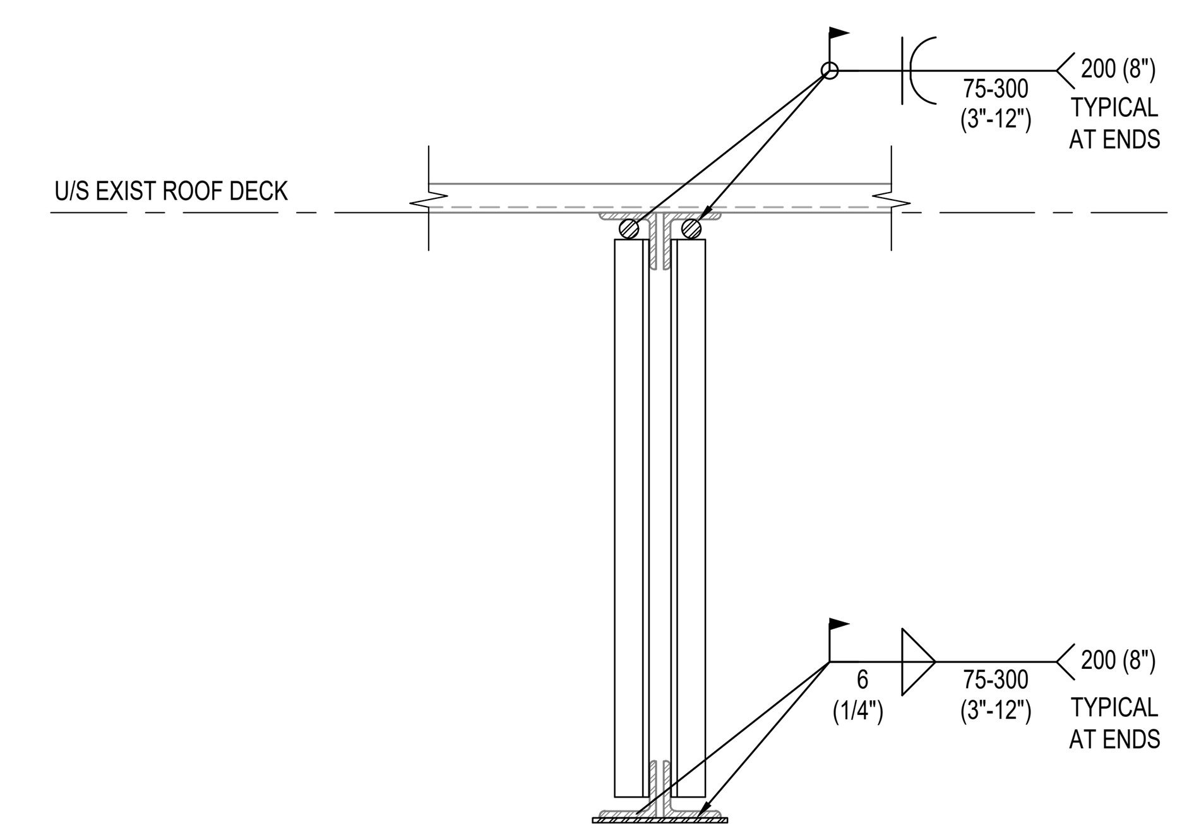


A / S-401 'RJ1' REINFORCEMENT OF EXISTING OWSJ ELEVATION

1:50



1 / S-401 SECTIONS

1 : 10

NOTES:

1. CONTRACTOR TO SUBMIT STEEL SHOP DRAWINGS, SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO, TO THE CONSULTANT DETAILING ALL REINFORCING WORK PRIOR TO THE ON-SET OF FIELD WORK.
2. PRIOR TO THE START OF STRUCTURAL STEEL SHOP DRAWING PREPARATION, THE CONTRACTOR SHALL OPEN ALL AREAS WHERE MEASUREMENTS ARE REQUIRED TO BE MADE AND VERIFY ALL NECESSARY DIMENSIONS.
   a. SIZE AND THICKNESS OF EXISTING TOP CHORD, BOTTOM CHORD, DIAGONALS AND VERTICAL.
   b. SIZE AND LENGTH OF WELD BETWEEN EX DIAGONALS AND JOIST TOP /BOTTOM CHORD.
   c. SIZE AND LENGTH OF WELD BETWEEN EX VERTICALS AND JOIST TOP /BOTTOM CHORD.
3. SHORE EXISTING JOISTS AT 1/3 POINTS OF SPAN DURING REINFORCING WORK TO PREVENT DEFLECTION DUE TO HEATING OF MEMBERS DURING WELDING. REMOVE SHORING PRIOR TO INSTALLATION OF NEW ROOFTOP EQUIPMENT.
4. DURING REINFORCING WORK, KEEP ROOF AREAS ABOVE THE AFFECTED AREA CLEAR OF SNOW AND CONSTRUCTION EQUIPMENT. THE CONTRACTOR SHALL CLEAR AREAS AS NECESSARY.
5. ALL WEB REINFORCING MEMBERS MUST EXTEND AND BE CONNECTED TO THE EXISTING JOIST'S TOP AND BOTTOM CHORDS. DO NOT CONNECT NEW WEB REINFORCING TO EXISTING WEB MEMBERS.
6. SPLICING OF TOP AND BOTTOM CHORD REINFORCING IS NOT PERMITTED UNLESS AN ENGINEERED SPLICE DETAILS IS SUPPLIED BY THE CONTRACTOR.
7. EXISTING JOIST BRIDGING/BRACING WHICH INTERFERES WITH INSTALLATION OF NEW JOIST REINFORCING SHALL BE TEMPORARILY REMOVED TO PERMIT WORK TO BE COMPLETED. REINSTATE BRIDGING/BRACING FOLLOWING COMPLETION OF WORK. THE CONTRACTOR SHALL INCLUDE THE NOTED WORK IN THEIR PRICE.
8. THE CONTRACTOR IS RESPONSIBLE FOR OPENING ALL EXISTING CEILING AND/OR OTHER FINISHES, AS REQUIRED, TO COMPLETE THE REINFORCING WORK. FURTHER THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TEMPORARY REMOVAL/RELOCATION OF ANY CONDUIT, DUCTWORK, OR OTHER EXISTING SERVICES THAT INTERFERE WITH THE INSTALLATION OF REINFORCING AND/OR WITH ACCESS TO THE AREA. ALL ELEMENTS OPENED OR TEMPORARILY REMOVED AND/OR RELOCATED SHALL BE MADE GOOD TO THE OWNER'S SATISFACTION. THE CONTRACTOR IS RESPONSIBLE FOR SURVEYING THE SITE DURING THE TENDER PERIOD TO IDENTIFY ALL SUCH WORK REQUIRED, AND SHALL INCLUDE THE ASSOCIATED COSTS IN THEIR PRICE.
9. ALL FIELD WELDING SHALL BE REVIEWED BY A QUALIFIED INSPECTION AND TESTING COMPANY WITH REPORTS SUBMITTED TO THE STRUCTURAL CONSULTANT IMMEDIATELY UPON AVAILABILITY.
10. EXISTING DUCT WORK WILL HAVE TO BE REMOVED TO ALLOW FOR REINF OF OWSJ. MAKE GOOD.
11. EX FLOOR IS TO BE PROTECTED. RECOMMENDATION, INSTALL PLYWOOD TO PROTECT THE EXISTING FLOOR.

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Professional Seal: LICENSED PROFESSIONAL ENGINEER, F. INFANTE, APR 14,2025, PROVINCE OF ONTARIO

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