

ARCHITECTURAL DRAWING LIST

Sheet Number	Sheet Title
A101	COVER TITLE, CODE ANALYSIS AND SITE PLAN
A102	ACCOMMODATION BUILDING
A103	OFFICE BUILDING
A104	GARAGE PLAN AND DETAILS

MECHANICAL

Sheet Number	Sheet Title
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M0.1	MECHANICAL LEGEND, CALCULATIONS AND SCHEDULES
M1.0	MECHANICAL PLUMBING - ACCOMMODATION
M1.1	MECHANICAL PLUMBING - OFFICE
M2.0	MECHANICAL HVAC - ACCOMMODATION
M2.1	MECHANICAL HVAC - OFFICE
M3.0	MECHANICAL DETAILS
M4.0	MECHANICAL SPECIFICATIONS
M4.1	MECHANICAL SPECIFICATIONS

ELECTRICAL

Sheet Number	Sheet Title
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E2.1	ELECTRICAL LIGHTING LAYOUT - OFFICE
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E5.0	ELECTRICAL SINGLE LINE DIAGRAM
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E6.1	ELECTRICAL SPECIFICATIONS

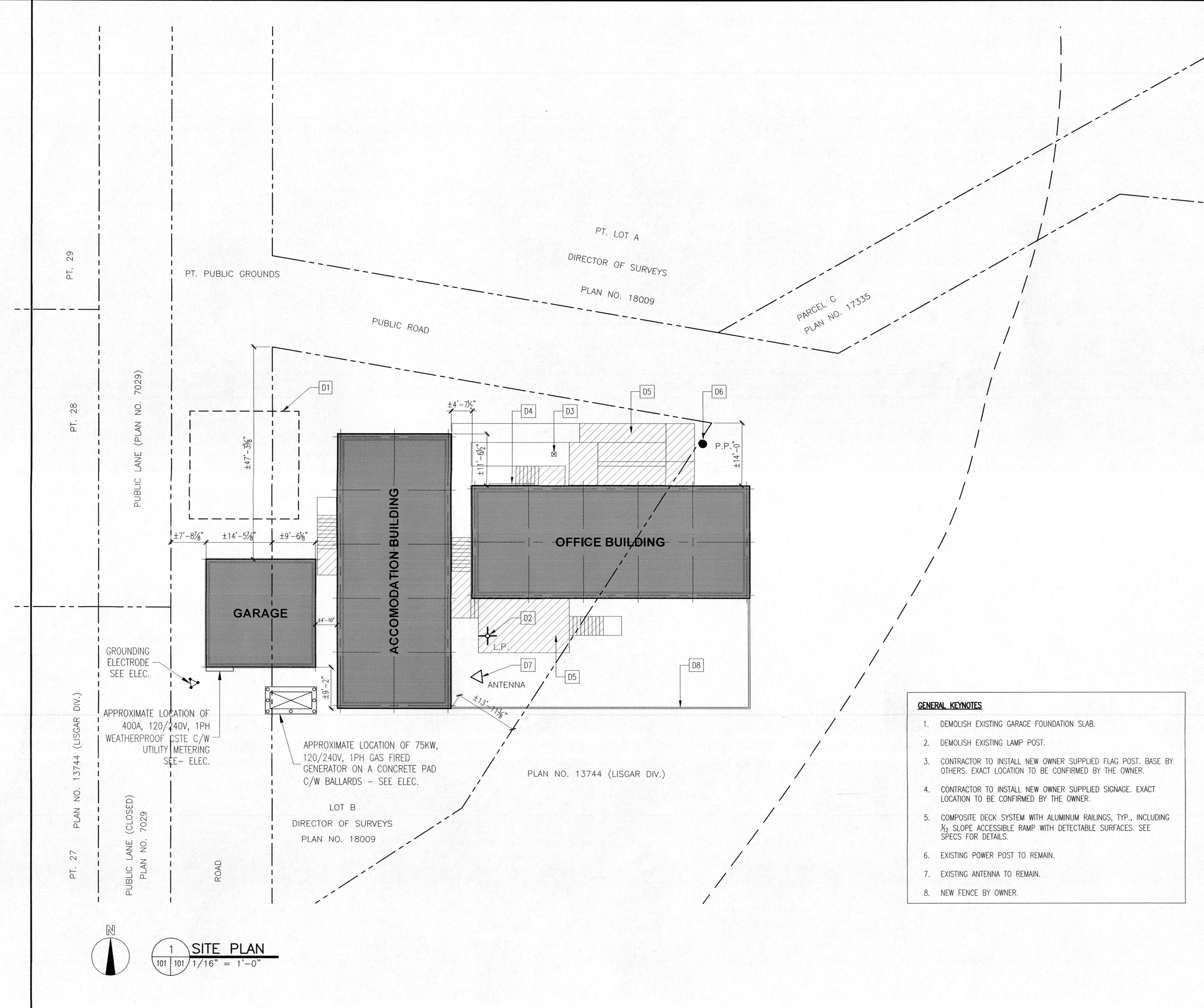
FISHERIES AND OCEANS CANADA GIMLI SEARCH AND RESCUE STATION

95 FIRST AVENUE
GIMLI, MANITOBA

ISSUED FOR CONSTRUCTION
DECEMBER 22, 2016

CODE ANALYSIS

Project Description	Office Building	Accommodations Building	Garage
Construction Type	New Construction	New Construction	Relocation / Renovation
Building Area (Gross)	1552 Sq. Ft.	1552 Sq. Ft.	576 Sq. Ft.
Floor Area (Gross)	1552 Sq. Ft.	1552 Sq. Ft.	576 Sq. Ft.
Building Height (Above Grade)	19'-2" (Existing)	19'-2" (Existing)	(Existing)
General			
Major Occupancy Classification	3.1.2.1 Group D	Group C	Group F3
Major Occupancy Separation	3.1.3.1 None	None	None
Firewalls	3.1.10 Not Required	Not Required	Not Required
Fire Blocks	3.1.11 Not Required	Not Required	Not Required
Occupant Load	3.1.17 18 People	8 People	4 People
Building Fire Safety			
Number of Storeys	3.2.1.1 1 Storey	1 Storey	1 Storey
Floor Assembly over Basement	3.2.1.4 None	None	None
Crawlspaces	3.2.2.9 Yes	Yes	None
Number of Streets	3.2.2.10 1 Street(s)	1 Street(s)	1 Street(s)
Automatic Sprinkler System	3.2.2.18 Not Required	Not Required	Not Required
Construction Article	3.2.2 3.2.2.60	3.2.2.52	3.2.2.52
Permitted Construction Type	3.2.2 Combustible and/or Non-Combustible	Combustible and/or Non-Combustible	Combustible and/or Non-Combustible
Fire Resistance: Floors	3.2.2 N/A	N/A	N/A
Fire Resistance: Mezzanine	3.2.2 N/A	N/A	N/A
Fire Resistance: Roof	3.2.2 Not Required	Not Required	Not Required
Fire Resistance: Load Bearing Structures	3.2.2 45m FRR or Non-Combustible	FRR not less than supported assembly	FRR not less than supported assembly
Spatial Separation and Exposure Protection	3.2.3 0% Unprotected Openings, 1H FRR Required	0% Unprotected Openings, 1H FRR Required	0% Unprotected Openings, 1H FRR Required
Fire Alarm	3.2.4.1 Not Required	Not Required	Not Required
Standpipe	3.2.5.8 Not Required	Not Required	Not Required
Mezzanine	3.2.8 N/A	N/A	N/A
Interconnected Floor Space	3.2.8 N/A	N/A	N/A
Safety within Floor Areas			
Suite Separation	3.3.1.1 N/A	N/A	N/A
Major Occupancy Separation	3.1.3.1 N/A	N/A	N/A
Tenant Separation	3.3.1.1 N/A	N/A	N/A
Dead End Corridor (Max) Required	3.3.1.9 N/A (Entirely Within Suite)	N/A (Entirely Within Suite)	N/A (Entirely Within Suite)
Dead End Corridor (Max) Provided	3.3.1.9 0'-0"	16'-0"	16'-0"
Dangerous Goods	3.3.6 N/A	N/A	N/A
Exits			
Number of Exits Required	3.4.2.1 1, (P < 60)	1, (P < 60)	1, (P < 60)
Number of Exits Provided	3.4.2.1 3	2	2
Distance Between Exits Required	3.4.2.3 N/A	N/A	N/A
Distance Between Exits Provided	3.4.2.3 N/A	N/A	N/A
Location of Exits (Travel Distance) Required	3.4.2.5 131'-2" (40m)	98'-5" (30m)	98'-5" (30m)
Location of Exits (Travel Distance) Provided	3.4.2.5 40'-6" (12.3m)	50'-10" (15.5m)	50'-10" (15.5m)
Exit Width Required	3.4.3.2 2'-8" (800mm)	2'-8" (800mm)	2'-8" (800mm)
Exit Width Provided	3.4.3.2 6'-0"	6'-0"	6'-0"
Exits through Lobbies	3.4.4.2 Not Applicable	Not Applicable	Not Applicable
Vertical Transportation			
Fire Separations for Elevator Hoistways	3.5.3.1 Not Applicable	Not Applicable	Not Applicable
Fire Separations for Elevator Machine Rooms	3.5.3.3 Not Applicable	Not Applicable	Not Applicable
Elevator Car Dimensions	3.5.4.1 Not Applicable	Not Applicable	Not Applicable
Service Facilities			
Fire Separations around Service Rooms	3.6.2.1 1H FRR	Not Applicable	Not Applicable
Combustible Refuse Storage	3.6.2.5 Not Applicable	Not Applicable	Not Applicable
Fire Separations for Vertical Service Spaces	3.6.3.1 Not Applicable	Not Applicable	Not Applicable
Health Requirements			
Water Closets	3.7.2.2 1 UTLR, 1 Unisex	2 Unisex	2 Unisex
Barrier Free Design			
Application	3.8.1.1 Barrier-Free Access is Required	No Barrier Free Design	No Barrier Free Design
Path of Travel	3.8.1.3 (MBC) Minimum 1100mm (3'-7") width	N/A	N/A
Designated Wheelchair Spaces	3.8.2.1 (MBC) Not Applicable	N/A	N/A
Washroom	3.8.2.3 (MBC) Minimum 1 Barrier-Free Washroom Required per Floor	N/A	N/A
Automatic Door Operators	3.8.3.3 (MBC) Automatic door operator req'd at all public entrances	N/A	N/A
Ramps	3.8.3.4 (MBC) Minimum 900mm width between calls, Slope < 1 in 12	N/A	N/A



- GENERAL KEYNOTES**
- DEMOLISH EXISTING GARAGE FOUNDATION SLAB.
 - DEMOLISH EXISTING LAMP POST.
 - CONTRACTOR TO INSTALL NEW OWNER SUPPLIED FLAG POST. BASE BY OTHERS. EXACT LOCATION TO BE CONFIRMED BY THE OWNER.
 - CONTRACTOR TO INSTALL NEW OWNER SUPPLIED SIGNAGE. EXACT LOCATION TO BE CONFIRMED BY THE OWNER.
 - COMPOSITE DECK SYSTEM WITH ALUMINUM RAILINGS, TYP., INCLUDING 1/2 SLOPE ACCESSIBLE RAMP WITH DETECTABLE SURFACES. SEE SPECS FOR DETAILS.
 - EXISTING POWER POST TO REMAIN.
 - EXISTING ANTENNA TO REMAIN.
 - NEW FENCE BY OWNER.

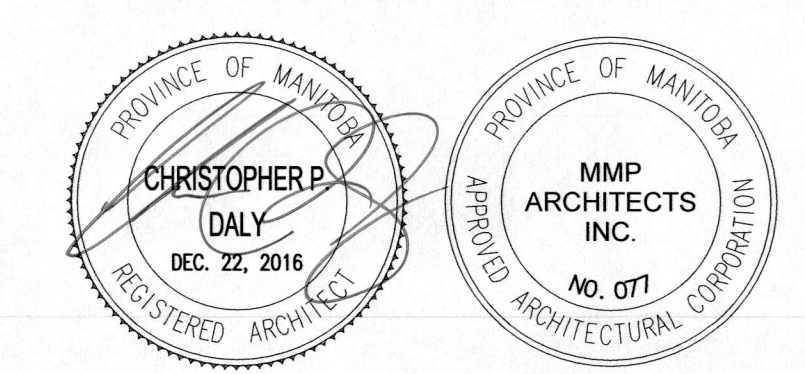
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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba

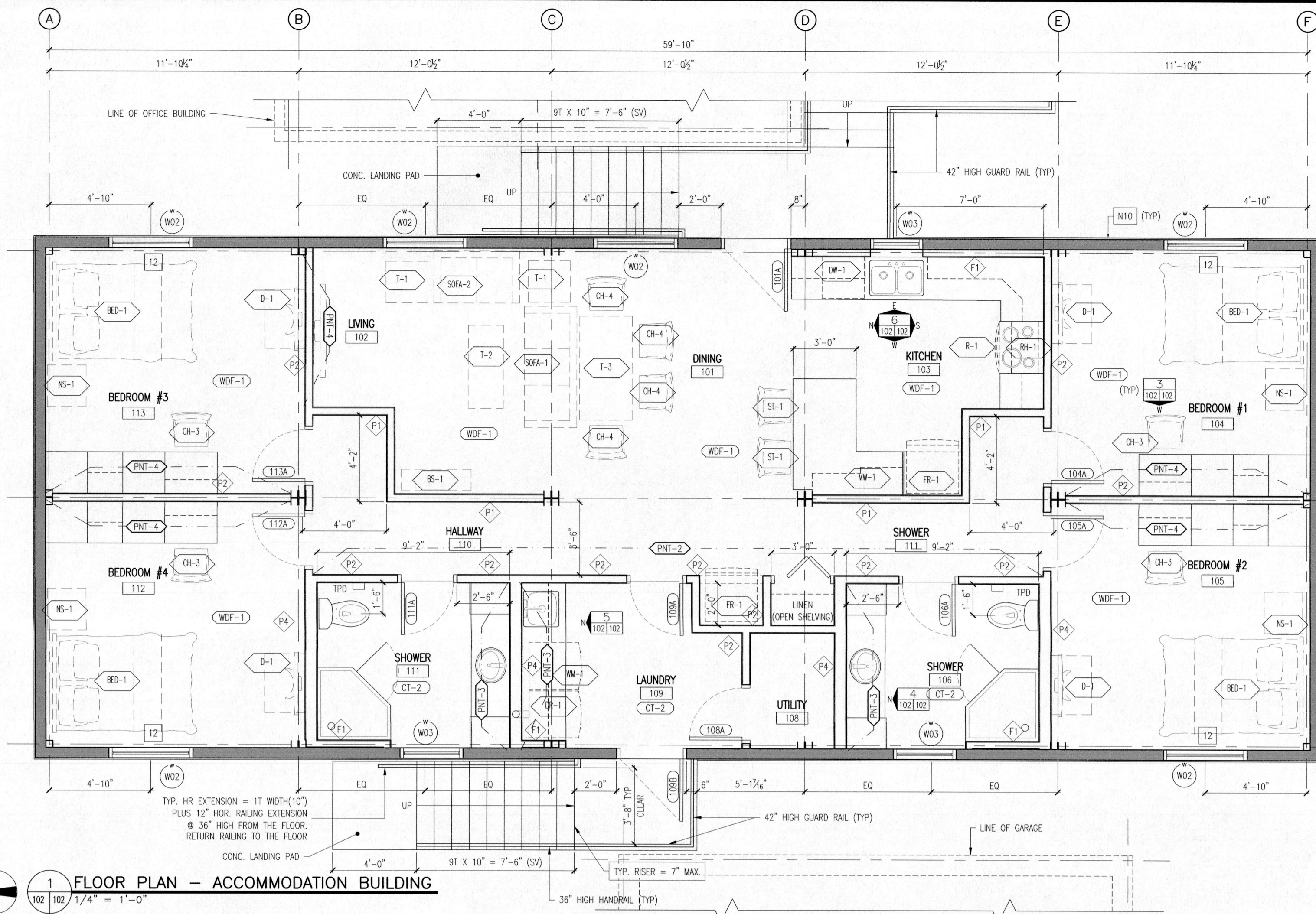
DRAWING TITLE
Cover Title, Code Review and Site Plan



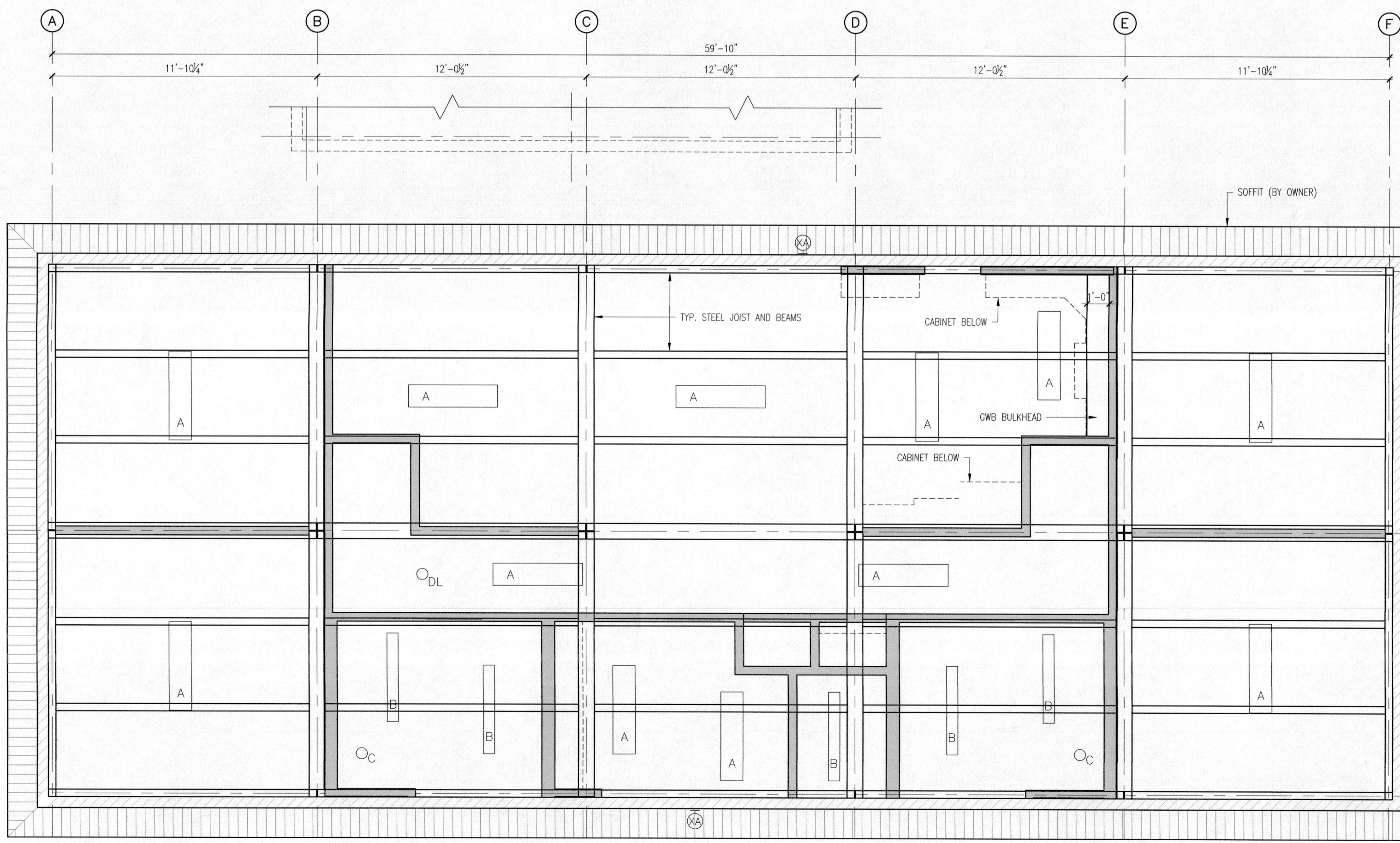
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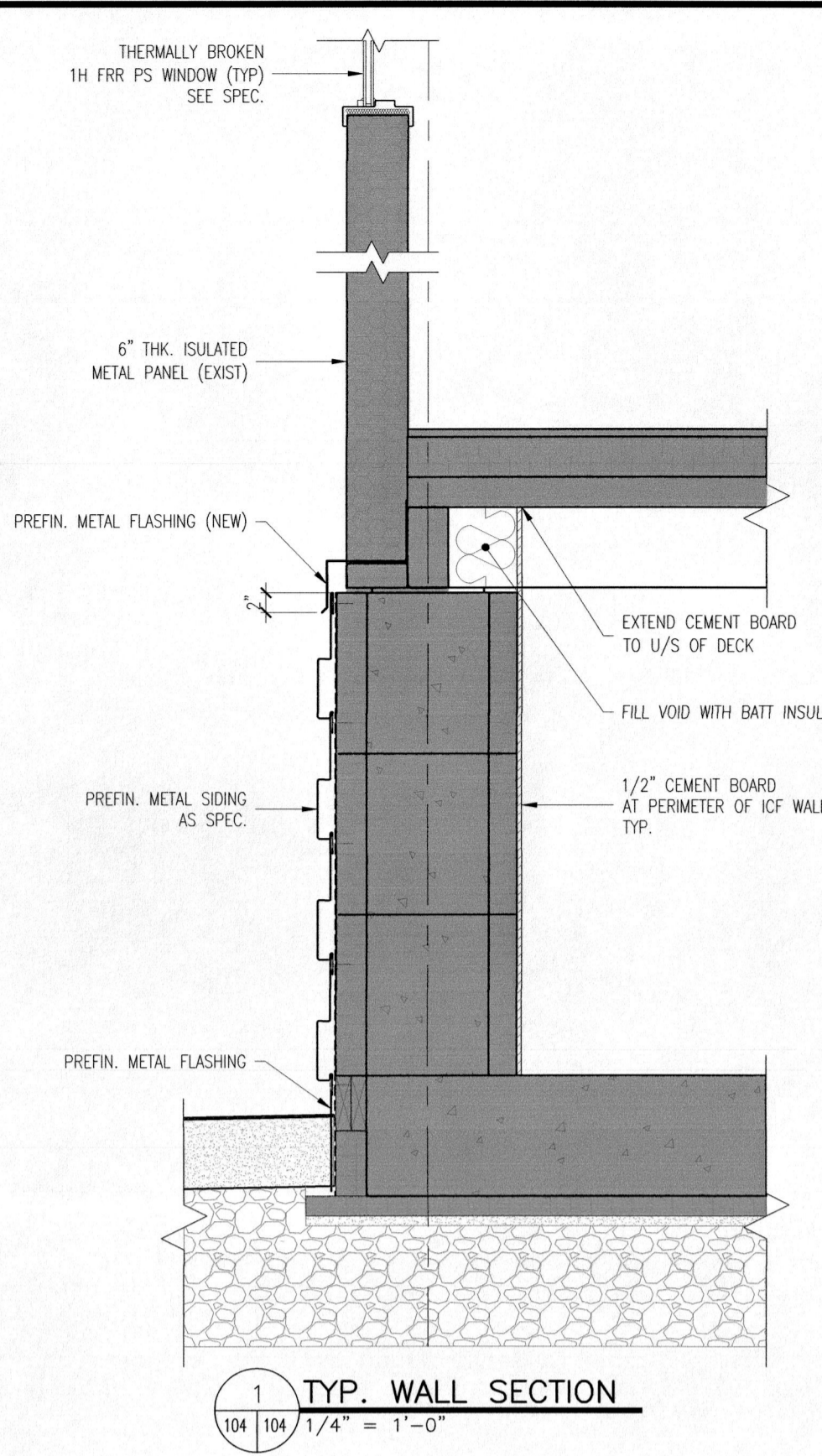
1 FLOOR PLAN - ACCOMMODATION BUILDING
102 102 1/4" = 1'-0"



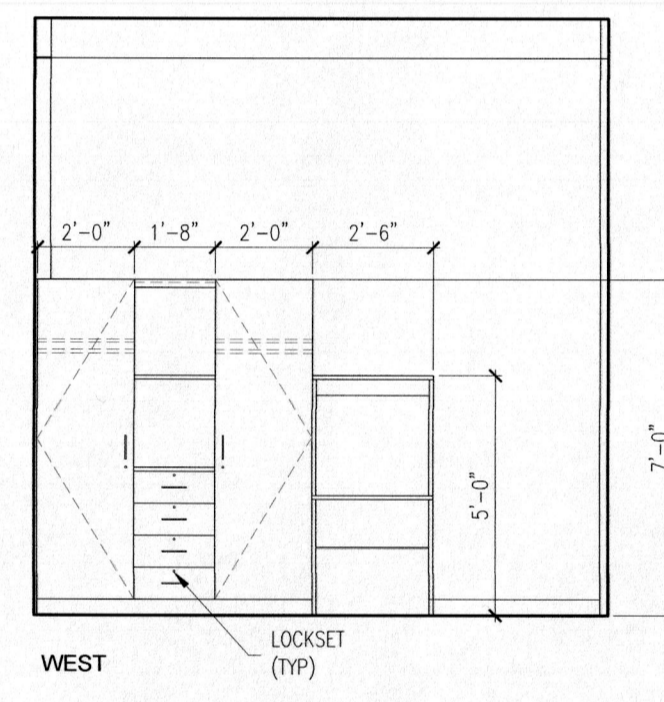
2 REFLECTED CEILING PLAN - ACCOMMODATION BUILDING
103 103 1/4" = 1'-0"

- INTERIOR PARTITION WALL**
 P1 COMPOSITE
 1/2" CWB
 3 5/8" STUD @ 16" O.C.
 1/2" CWB
- INTERIOR PARTITION WALL**
 P2 COMPOSITE
 1/2" CWB
 3 5/8" STUD @ 16" O.C.
 ACoustic BATT INSULATION
 1/2" CWB
- INTERIOR PARTITION WALL**
 P3 COMPOSITE
 1/2" CWB
 6" STUD @ 16" O.C.
 1/2" CWB
- INTERIOR PARTITION WALL**
 P4 COMPOSITE
 1/2" CWB
 6" STUD @ 16" O.C.
 ACoustic BATT INSULATION
 1/2" CWB
- FURRING WALL**
 F1 COMPOSITE
 1/2" CWB
 3 5/8" STEEL STUD @ 16" O.C.

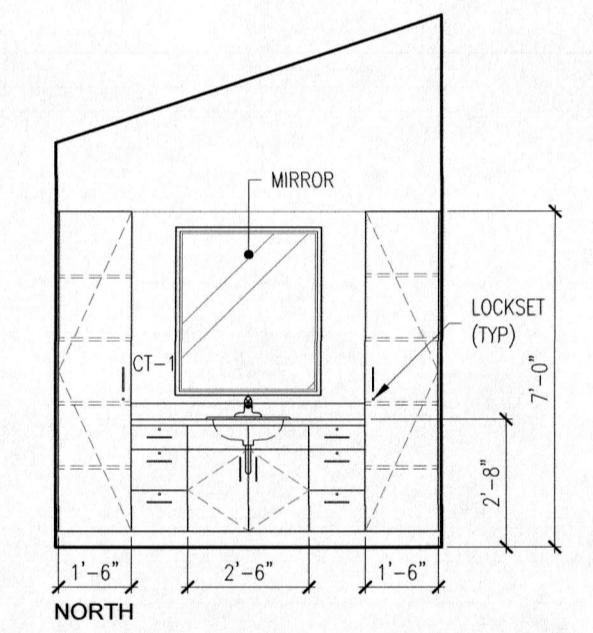
- GENERAL NOTES:
- ALL PARTITION AND FURRING WALLS:
 - ALL TO UNDERSIDE OF STRUCTURE UNLESS OTHERWISE NOTED
 - USE MOISTURE RESISTANT DRYWALL AT ALL WASHROOM WALLS WITH PAINT FINISHES
 - ALL FURNITURE, APPLIANCES AND EQUIPMENT SHOWN IN DASHED LINES ARE FOR INFORMATION ONLY.
 - ALL MILLWORK SHALL BE CONFIRMED WITH EQUIPMENT AND ACCESSORY SELECTIONS BY OWNER & TENANT'S PRIOR TO SHOP DRAWING SUBMISSION. COORDINATE WITH CONSULTANT TO ENSURE APPROPRIATE SIZING ACCOMMODATED.
 - ALL GRID LINES OF EXISTING STRUCTURE ARE FROM CENTER OF THE EXISTING FOUNDATION WALLS AND ARE FOR REFERENCE ONLY.
 - ALL NEW INTERIOR PARTITION DIMENSIONS ARE TO FACE OF FINISHED WALLS UNLESS OTHERWISE NOTED.
 - CONSTRUCTION ASSEMBLIES SHALL BE READ IN SEQUENCE AS WRITTEN FROM THE SIDE ON WHICH THE TAG IS LOCATED.
 - ALL EXTERIOR WALLS ARE NOT IN CONTRACT.
 - PROVIDE BLOCKING ON ALL WALL MOUNTED FIXTURES AND EQUIPMENTS.
 - COMPOSITE STAIR AND DECK CONSTRUCTION C/W ALLUM. RAILING. SEE SPEC. 10. INSTALL PREFIN. METAL SIDING AT PERIMETER EXTERIOR FACE OF WALL (TYPICAL).
 - ALL DRYWALL PARTITIONS TO BE PNT-1 UNLESS OTHERWISE NOTED.
 - BLACKOUT ROLLER BLINDS.



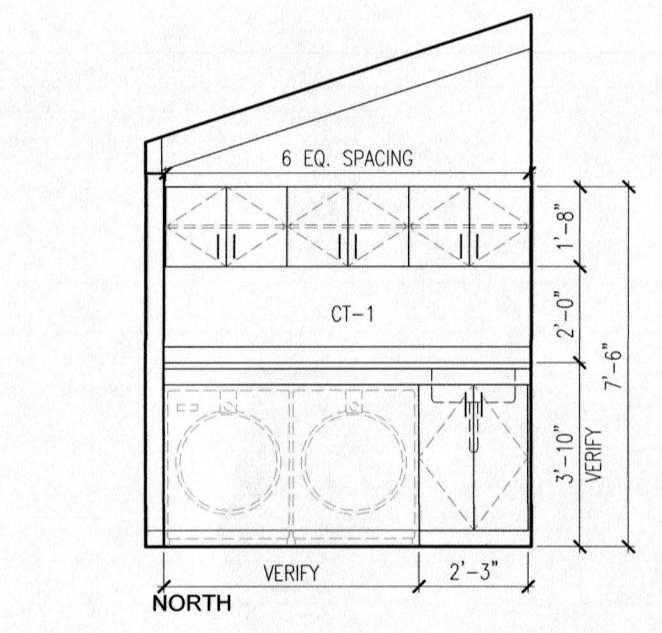
1 TYP. WALL SECTION
104 104 1/4" = 1'-0"



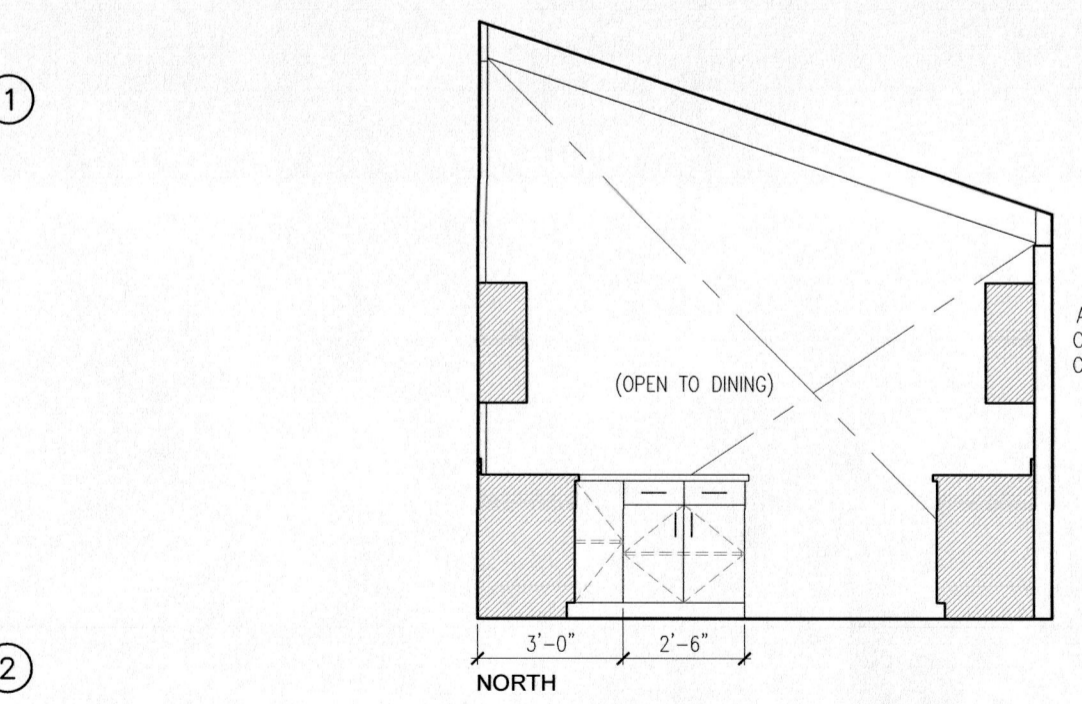
3 MWK. ELEV. - BEDROOM
102 102 1/4" = 1'-0"



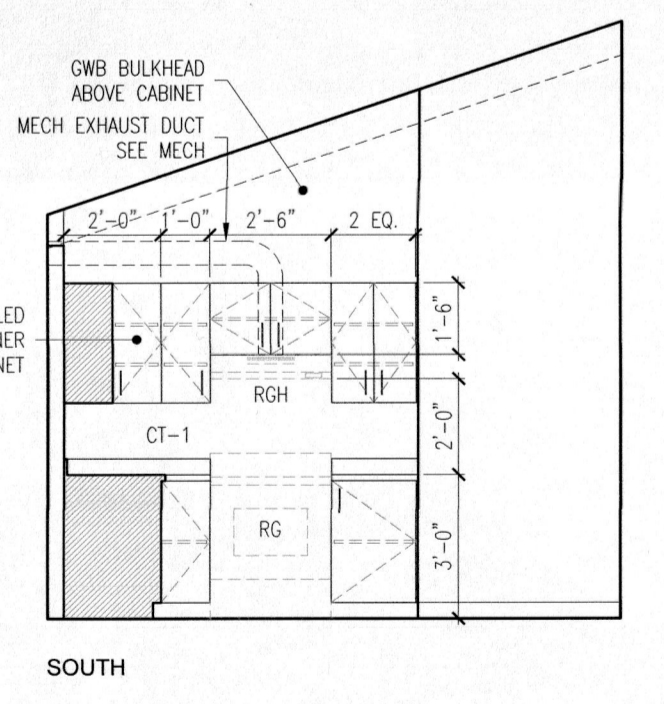
4 MWK. ELEV. - VANITY
102 102 1/4" = 1'-0"



5 MWK. ELEV. - LAUNDRY
102 102 1/4" = 1'-0"



6 MWK. ELEV. - KITCHEN
102 102 1/4" = 1'-0"



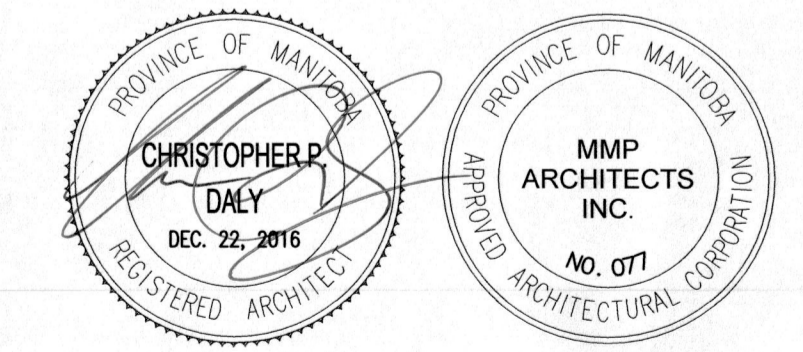
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PROJECT TITLE
Gimli Search & Rescue Station

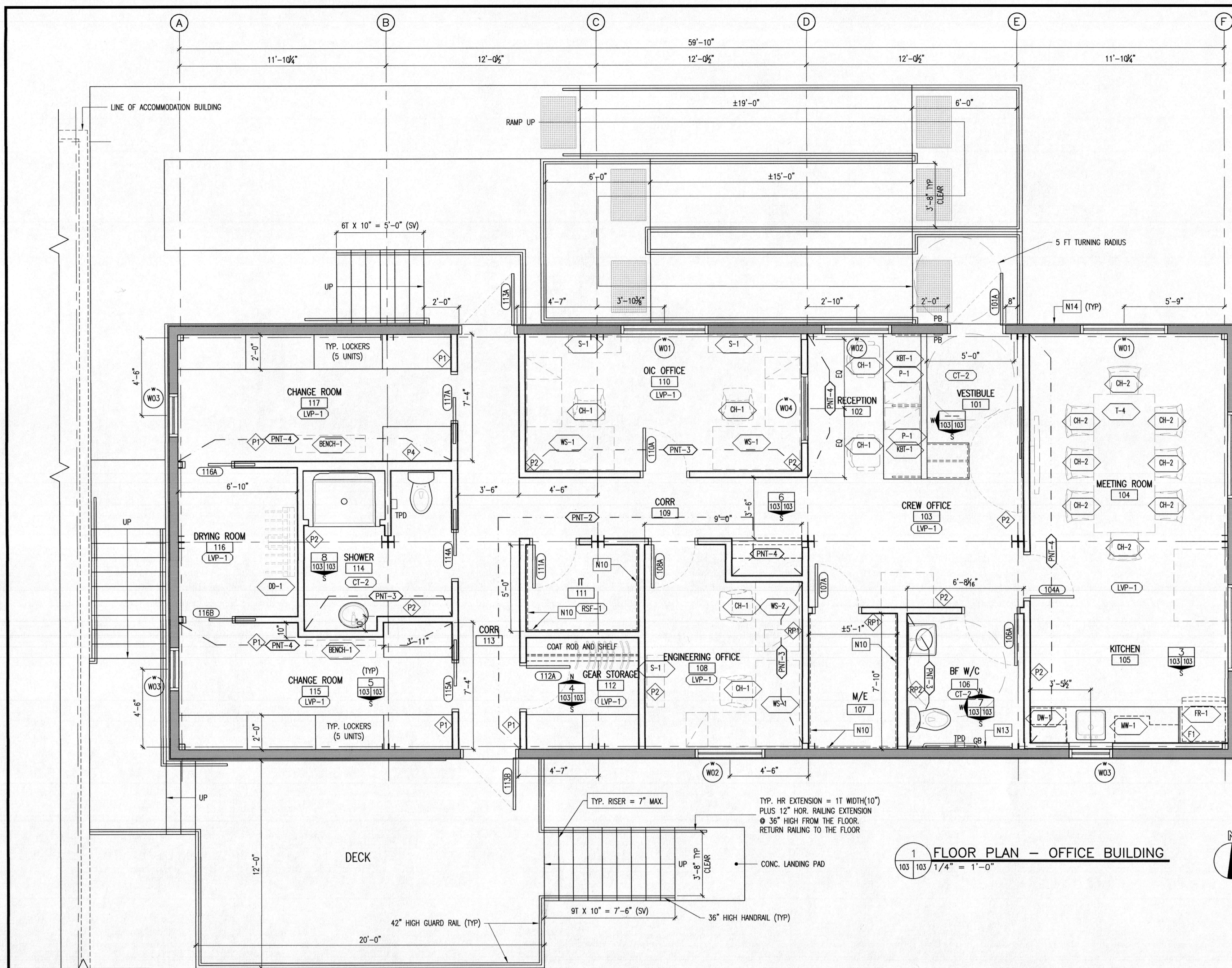
Gimli, Manitoba

DRAWING TITLE
Accommodation Building



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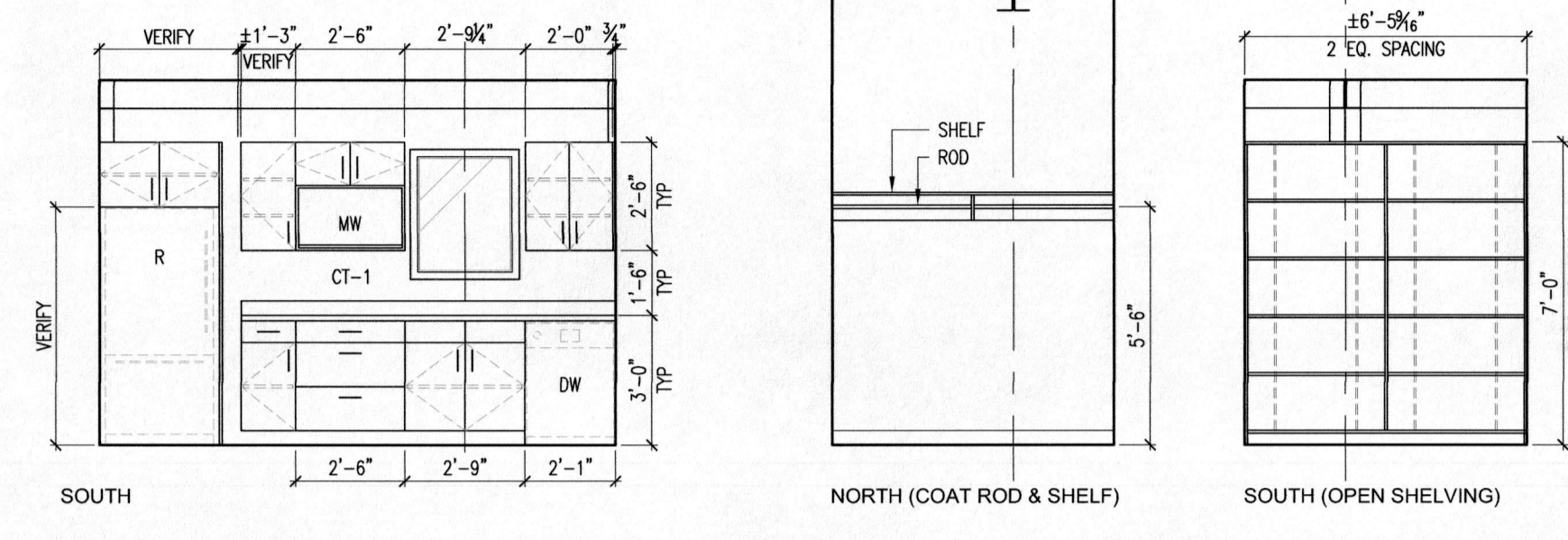
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-	16-12-22	2016-39
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A102	0	
CAD FILE: 102 Accommodation Building.dwg	DRAWER NO.:	



1 FLOOR PLAN - OFFICE BUILDING
103 103 1/4" = 1'-0"

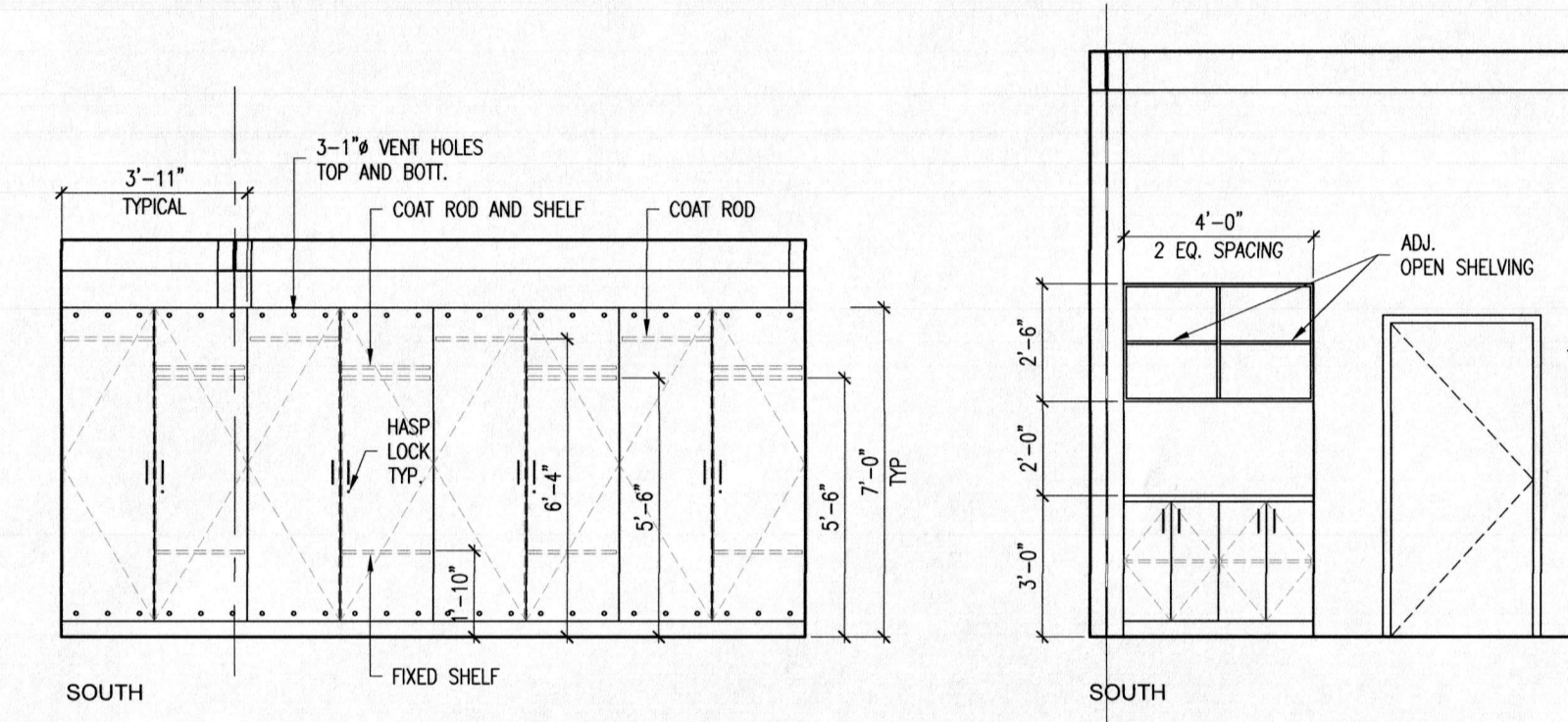
- RATED INTERIOR PARTITION WALL**
COMPOSITE: 1/2" GWB @ 16" O.C. WITH 5/8" TYPE-X GWB
3 5/8" STEEL STUD @ 16" O.C.
3 1/2" ACOUSTIC BATT INSULATION
5/8" TYPE-X GWB
- INTERIOR PARTITION WALL**
COMPOSITE: 1/2" GWB @ 16" O.C.
3 5/8" STUD @ 16" O.C.
1/2" GWB
- RATED INTERIOR PARTITION WALL**
COMPOSITE: 1/2" GWB @ 16" O.C. WITH 5/8" TYPE-X GWB
3 5/8" STEEL STUD @ 16" O.C.
3 1/2" ACOUSTIC BATT INSULATION
5/8" TYPE-X GWB
- INTERIOR PARTITION WALL**
COMPOSITE: 1/2" GWB @ 16" O.C.
3 5/8" STUD @ 16" O.C.
1/2" GWB
- FURRING WALL**
COMPOSITE: 1/2" GWB @ 16" O.C.
3 5/8" STEEL STUD @ 16" O.C.

- GENERAL NOTES:
- ALL RATED WALLS:
 - ALL TO UNDERSIDE OF STRUCTURE UNLESS OTHERWISE NOTED
 - SEAL AROUND ALL PENETRATIONS
 - FIRESTOP SEALANT TOP AND BOTTOM
 - USE TYPE-X MOISTURE RESISTANT DRYWALL AT ALL WASHROOM WALLS WITH PAINT FINISHES
 - PARTITION AND FURRING WALLS:
 - ALL TO UNDERSIDE OF STRUCTURE UNLESS OTHERWISE NOTED
 - USE MOISTURE RESISTANT DRYWALL AT ALL WASHROOM WALLS WITH PAINT FINISHES
 - INTERIOR FINISH AS SCHEDULED
 - ALL FURNITURE, APPLIANCES AND EQUIPMENT SHOWN IN DASHED LINES ARE FOR INFORMATION ONLY.
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 - ALL GRID LINES OF EXISTING STRUCTURE ARE FROM CENTER OF THE EXISTING FOUNDATION WALLS AND ARE FOR REFERENCE ONLY.
 - ALL NEW INTERIOR PARTITION DIMENSIONS ARE TO FACE OF FINISHED WALLS UNLESS OTHERWISE NOTED.
 - CONSTRUCTION ASSEMBLIES SHALL BE READ IN SEQUENCE AS WRITTEN FROM THE SIDE ON WHICH THE TAG IS LOCATED.
 - ALL EXTERIOR WALLS ARE NOT IN CONTRACT.
 - ALL RATED WALLS:
 - ALL TO UNDERSIDE OF STRUCTURE UNLESS OTHERWISE NOTED
 - SEAL AROUND ALL PENETRATIONS
 - FIRESTOP SEALANT TOP AND BOTTOM
 - USE TYPE-X MOISTURE RESISTANT DRYWALL AT ALL WASHROOM WALLS WITH PAINT FINISHES
 - PROVIDE CONTINUOUS 3/4" THK X 4 FT. WIDE PLYWOOD BACKING TO BE INSTALLED AT 2'-0" ABOVE FIN. FLOOR.
 - PROVIDE BLOCKING ON ALL WALL MOUNTED FIXTURES AND EQUIPMENTS.
 - COMPOSITE STAIR AND DECK CONSTRUCTION C/W ALUM. RAILING. SEE SPEC.
 - INSTALL 1/2" GWB ON PLYWOOD BACKING (FULL HEIGHT), PAINT FIN. (TYPICAL)
 - INSTALL PREFIN. METAL SIDING AT PERIMETER EXTERIOR FACE OF ICF WALL (TYPICAL)
 - ALL DRYWALL PARTITIONS TO BE PNT-1 UNLESS OTHERWISE NOTED.



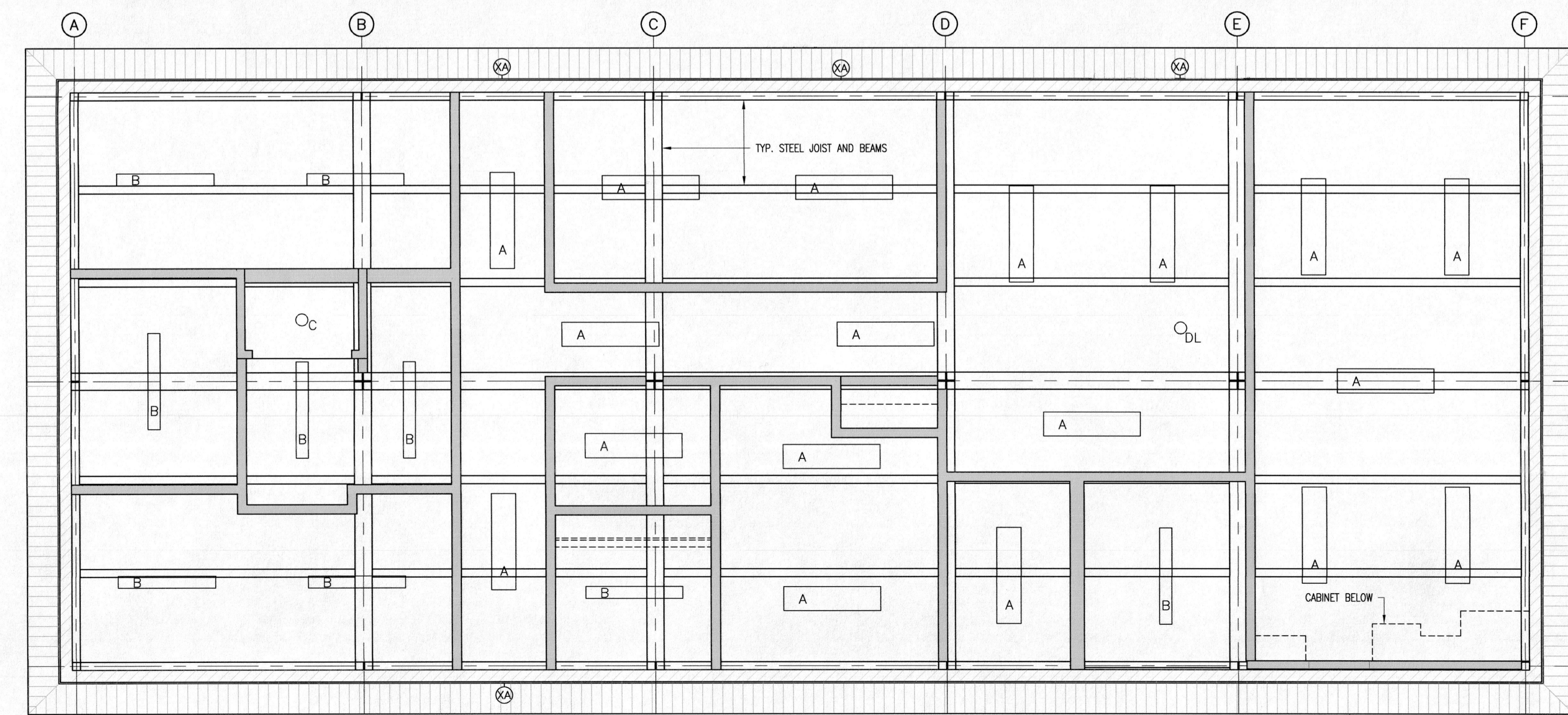
3 MWK. ELEV. - KITCHEN
103 103 1/4" = 1'-0"

4 MWK. ELEV. - GEAR STORAGE
103 103 1/4" = 1'-0"

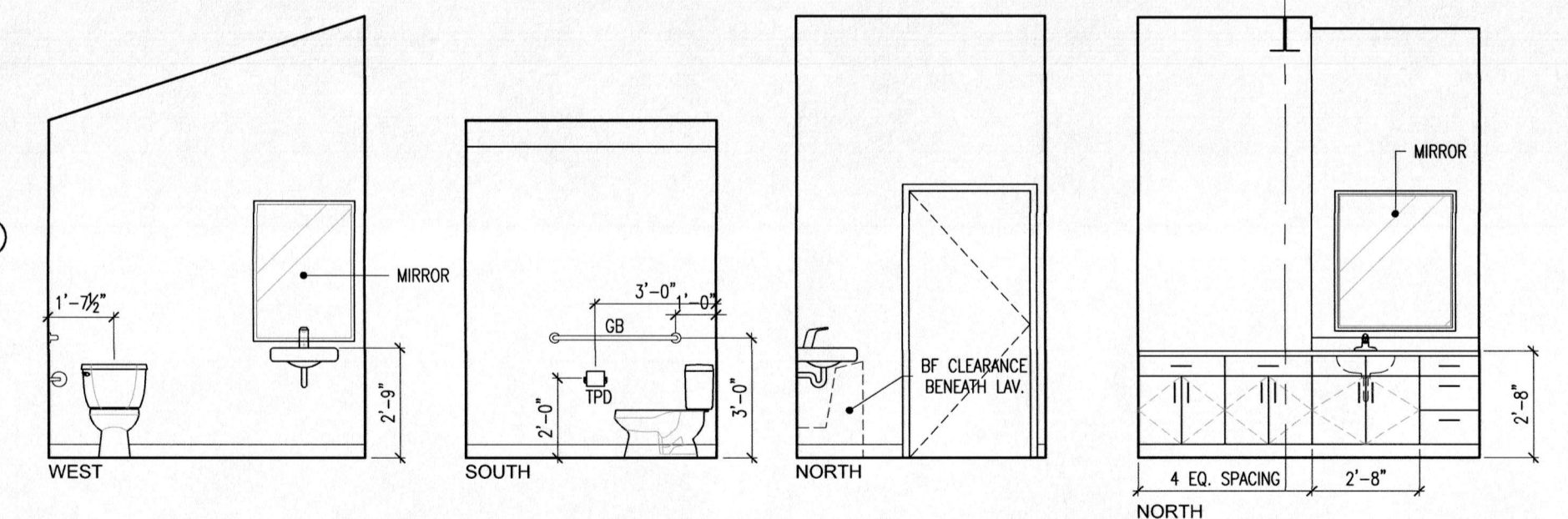


5 MWK. ELEV. - LOCKERS (TYP)
103 103 1/4" = 1'-0"

6 MWK. ELEV. - CREW OFFICE
103 103 1/4" = 1'-0"

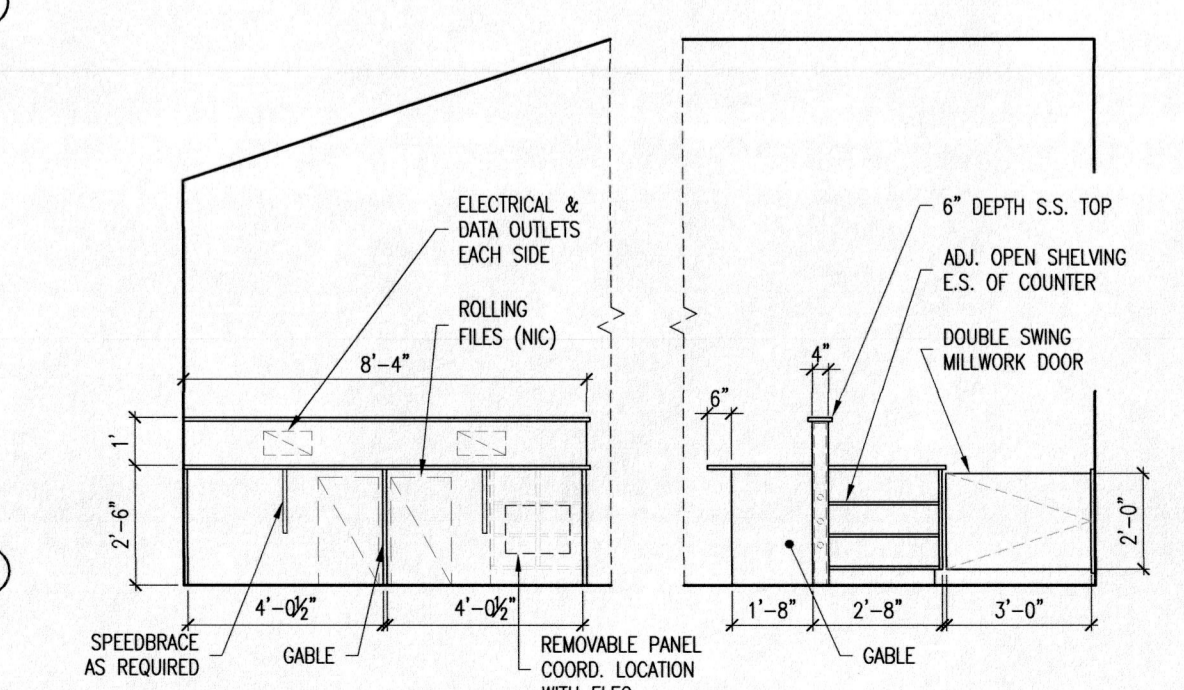


2 REFLECTED CEILING PLAN - OFFICE BUILDING
103 103 1/4" = 1'-0"



7 MWK. ELEV. - BF WC
103 103 1/4" = 1'-0"

8 MWK. ELEV. - VANITY
103 103 1/4" = 1'-0"

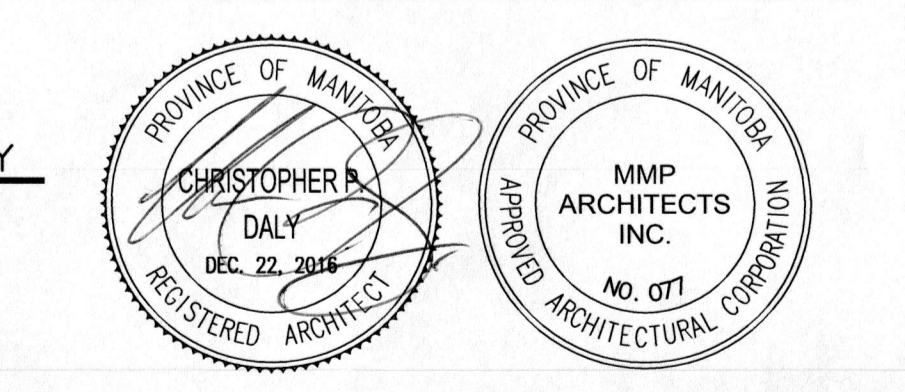


9 MWK. ELEV. - RECEPTION
103 103 1/4" = 1'-0"

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PROJECT TITLE
Gimli Search & Rescue Station
Gimli, Manitoba
DRAWING TITLE
Office Building



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GENERAL NOTES :

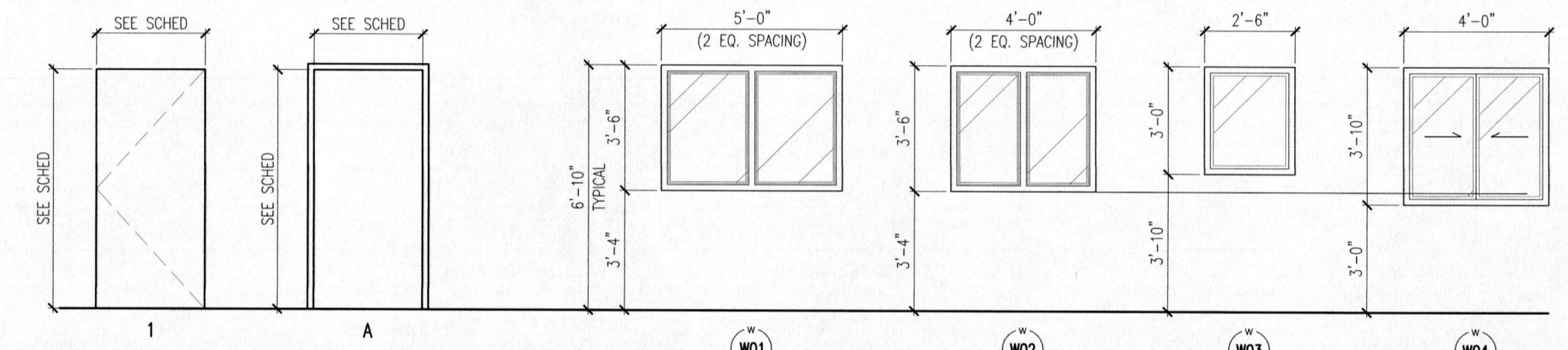
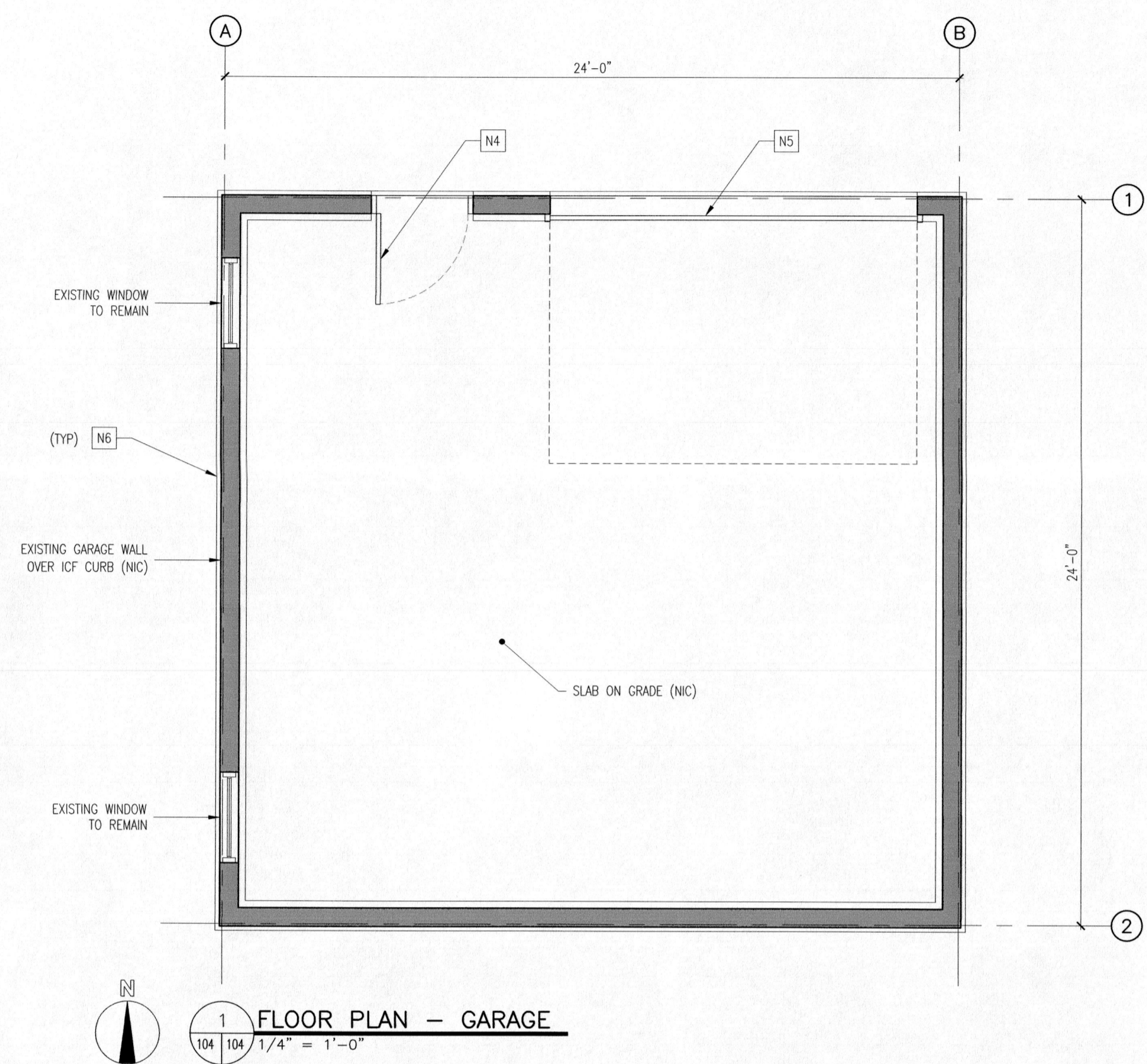
- EXISTING GARAGE BUILDING TO BE RELOCATED ON NEW FOUNDATION WALL AND CONCRETE SLAB (NOT IN CONTRACT). REFER TO SITE SURVEY FOR LOCATIONS.
- ALL GRID LINES OF EXISTING STRUCTURE ARE FROM OUTSIDE EDGE OF THE EXISTING FOUNDATION WALLS AND ARE FOR REFERENCE ONLY.
- ALL GARAGE STRUCTURE IS NOT IN CONTRACT AND ARE FOR REFERENCE ONLY.
- REPLACE EXISTING DOOR WITH NEW INSULATED HM DOOR AND FRAME. INFILL OPENING ON WALL ABOVE DOOR TO MATCH ADJACENT EXISTING FINISHES (WOOD SIDING). DOOR HARDWARE SET 6, SEE DOOR HARDWARE SCHEDULE.
- REPLACE EXISTING GARAGE DOOR AS SPECIFIED. APPROXIMATE SIZE 12' X 9'. EXACT SIZE TO BE CONFIRMED ON SITE PRIOR TO ORDER.
- INSTALL PREFIN. METAL SIDING AT PERIMETER EXTERIOR FACE OF ICF WALL (TYPICAL).

ACCOMMODATION BLDG - DOOR AND FRAME SCHEDULE

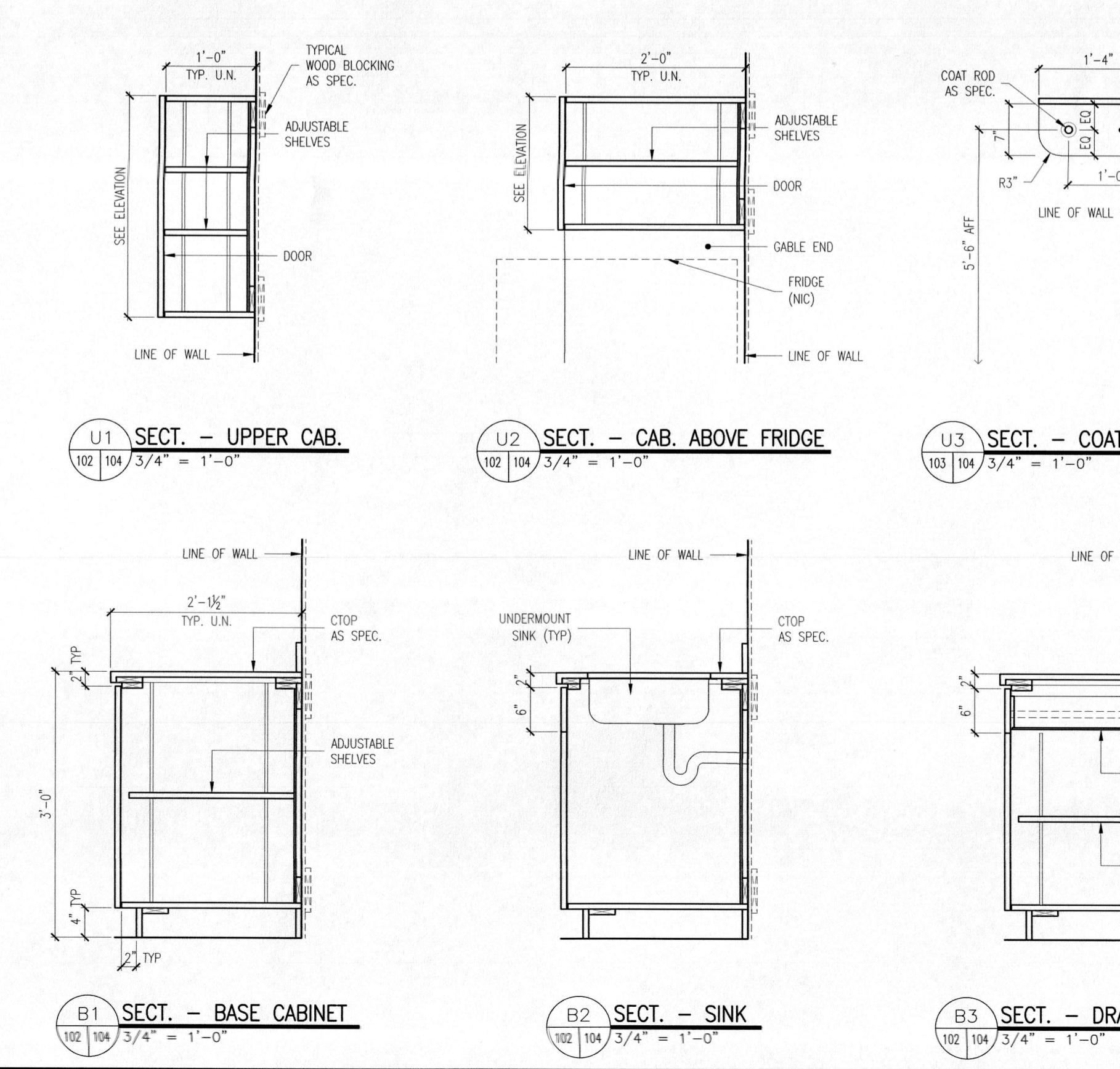
NUMBER	LOCATION	DOOR				FRAME				FIRE RATING LABEL	HARDWARE SET NO	NOTES			
		WD	HGT	THK	ELEV	MAT	CORE	FIN	GLAZ				ELEV	MAT	FIN
101A	DINING	3'-0"	6'-8"	1 3/4"	1	HM	INSUL	PNT	WG	A	HM	PNT	45MIN	7	EXISTING DOOR AND FRAME
104A	BEDROOM #1	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	4	OFFICE
105A	BEDROOM #2	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	4	OFFICE
112A	BEDROOM #3	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	4	OFFICE
113A	BEDROOM #4	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	4	OFFICE
106A	SHOWER	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	1	PRIVACY
111A	SHOWER	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	1	PRIVACY
108A	UTILITY	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	2	PASSAGE
109A	LAUNDRY	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	2	PASSAGE
109B	LAUNDRY	3'-0"	6'-8"	1 3/4"	1	HM	INSUL	PNT	WG	A	HM	PNT	45MIN	---	EXISTING DOOR AND FRAME

OFFICE BLDG - DOOR AND FRAME SCHEDULE

NUMBER	LOCATION	DOOR				FRAME				FIRE RATING LABEL	HARDWARE SET NO	NOTES			
		WD	HGT	THK	ELEV	MAT	CORE	FIN	GLAZ				ELEV	MAT	FIN
101A	VESTIBULE	3'-0"	6'-8"	1 3/4"	1	HM	INSUL	PNT	WG	A	HM	PNT	45MIN	---	EXISTING DOOR AND FRAME, ADD
104A	MEETING ROOM	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	2	PASSAGE
106A	BF W/C	3'-0"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	1	PRIVACY
107A	M/E	2'-6"	6'-8"	1 3/4"	1	HM	SC	PNT	---	A	HM	PNT	45MIN	3	STOREROOM
108A	OIC OFFICE	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	4	OFFICE
110A	OFFICE	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	4	OFFICE
111A	IT	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	3	STOREROOM
112A	GEAR STORAGE	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	4	OFFICE
113A	CORRIDOR	2'-6"	6'-8"	1 3/4"	1	HM	INSUL	PNT	WG	A	HM	PNT	45MIN	---	EXISTING DOOR AND FRAME
113B	CORRIDOR	2'-6"	6'-8"	1 3/4"	1	HM	INSUL	PNT	WG	A	HM	PNT	45MIN	---	EXISTING DOOR AND FRAME
114A	SHOWER	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	1	PRIVACY
115A	CHANGE ROOM	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	5	POCKET
117A	CHANGE ROOM	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	5	POCKET
116A	DRYING ROOM	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	5	POCKET
116B	DRYING ROOM	2'-6"	6'-8"	1 3/4"	1	WD	SC	PNT	---	A	HM	PNT	---	5	POCKET



- DOOR / WINDOW SCHEDULE ABBREVIATION**
- HC - HOLLOW CORE
 - HM - HOLLOW METAL
 - IGU - INSULATED GLAZING UNIT
 - PNT - PAINT
 - PRE - PRE-FINISHED
 - PNC - POLYVINYL CHLORIDE
 - PS - PRESSED STEEL
 - SC - SOLID CORE
 - TGL - TEMPERED GLASS
 - WG - WIRED GLASS
 -
- TYPICAL EXTERIOR WINDOWS**
FRAME TYPE - PS (SEE SPEC)
GLASS - IGU/WG (SEE SPEC)
- TYPICAL INTERIOR WINDOWS**
FRAME TYPE - PS (SEE SPEC)
GLASS - CG (SEE SPEC)

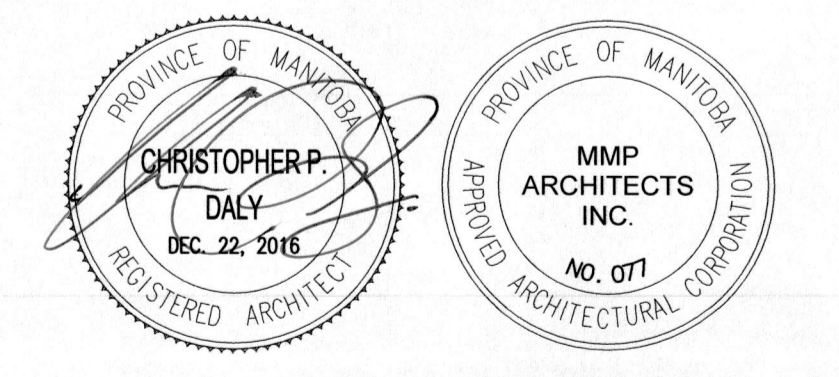


01	ISSUED FOR CONSTRUCTION	AS	16.12.22
NO.	REVISIONS	BY	YR.MNDY

The contractor shall check all dimensions and other data from the job and report any discrepancies to the architects before proceeding. This drawing and the information on it, is proprietary and confidential. Reproduction of any sort is prohibited without the written approval of MMP Architects Inc.

PROJECT TITLE
Gimli Search & Rescue Station

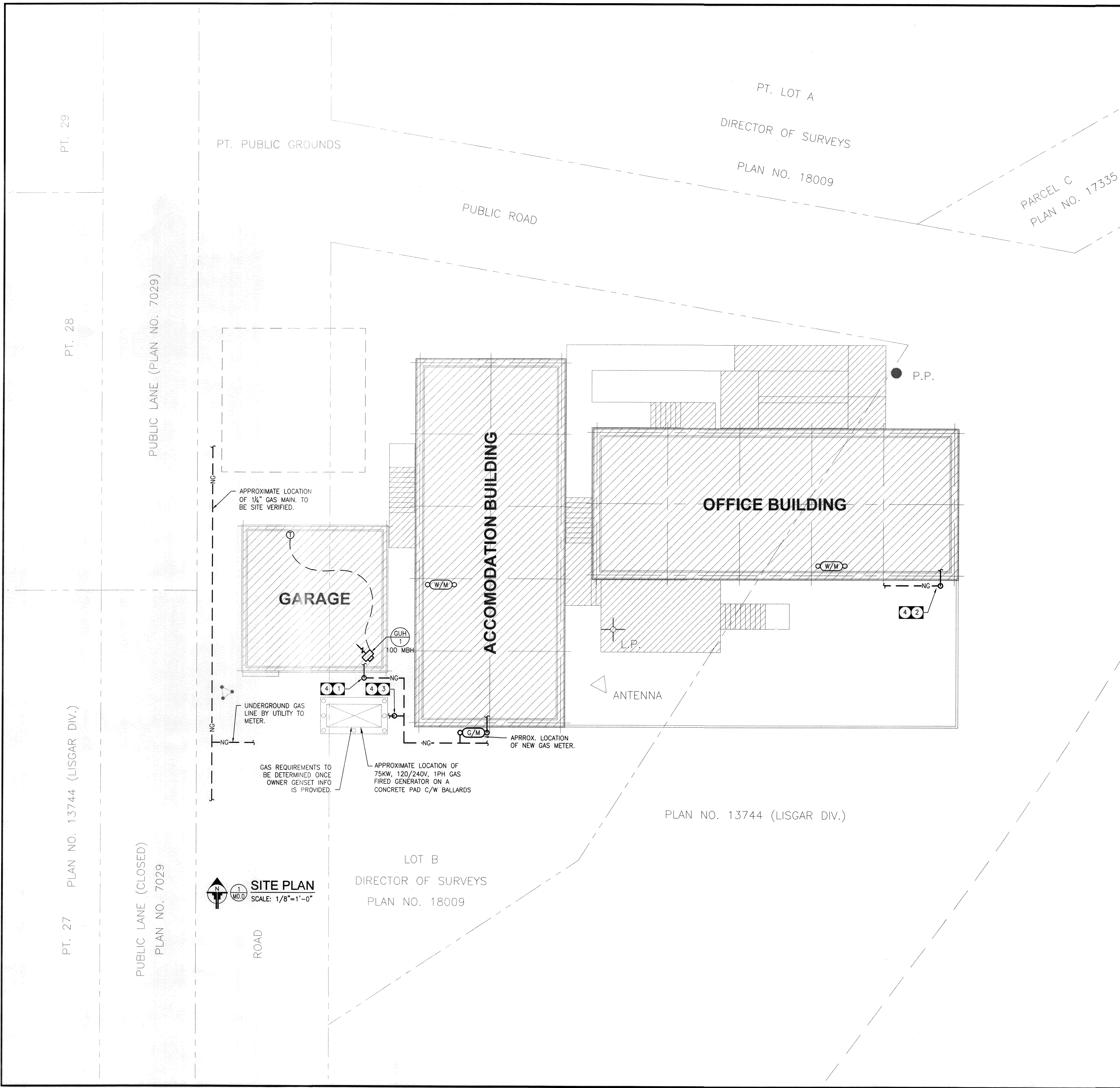
DRAWING TITLE
Garage Plan and Details



MMP ARCHITECTS
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APPROVED	CHECKED	DRAWN BY
CD	AS	NL
SCALE	DATE	FILE NO.
-	16-12-22	2016-39

DRAWING NUMBER: **A104** REVISION NUMBER: **0**
CAD FILE: 2016-39-104 Garage Plan and Details.dwg DRAWER NO.:



SITE PLAN
SCALE: 1/8"=1'-0"

GENERAL NOTES:

- MECHANICAL CONTRACTOR MUST EXAMINE THE SITE & EXISTING CONDITIONS AFFECTING THE PROJECT. EXAMINE THE COMPLETE SET OF CONTRACT DOCUMENTS TO ENSURE THAT THE WORK CAN BE CARRIED OUT WITHOUT SIGNIFICANT CHANGES TO THE INTENT OF THE DOCUMENTS. NO FUTURE ALLOWANCE WILL BE MADE FOR CHANGES UNLESS THE CONTRACT ADMINISTRATOR HAS BEEN NOTIFIED IN WRITING OF ANY DISCREPANCIES OR INTERFERENCES, PRIOR TO THE CLOSE OF TENDERS. NO ALLOWANCE WILL BE MADE FOR ITEMS THAT SHOULD HAVE BEEN NOTED DURING PRE-BID SITE INSPECTION.
- THE LOCATION ROUTING & ELEVATION OF ALL NEW AND EXISTING SERVICES & UTILITIES AS SHOWN ON THE DRAWING ARE TO BE CONSIDERED AS APPROXIMATIONS ONLY. VERIFY EXACT LOCATIONS, ROUTINGS & ELEVATIONS OF ALL SERVICES PRIOR TO COMMENCING WORK, & ASSUME RESPONSIBILITY FOR ANY DAMAGE TO EXISTING SERVICES & UTILITIES.
- MECHANICAL CONTRACTOR SHALL VERIFY EXACT LOCATIONS, CONNECTIONS, SIZES, INVERTS, ETC. PRIOR TO BID CLOSE AND COMMENCEMENT OF WORK.
- MECHANICAL CONTRACTOR SHALL REFER TO ARCHITECTURAL, STRUCTURAL, ELECTRICAL DRAWINGS, EQUIPMENT SUPPLIER SHOP DRAWINGS, ETC. FOR EXACT LOCATIONS OF ALL FIXTURES, EQUIPMENT, ETC.
- ALL PLUMBING INSTALLATIONS, ETC. SHALL BE PERFORMED IN ACCORDANCE WITH ALL CODES, REGULATIONS & AUTHORITIES HAVING JURISDICTION.
- COORDINATE PLUMBING WITH DUCT RUNS, HYDRONIC PIPING, & ALL OTHER TRADES.
- HATCHED DUCTWORK INDICATES DUCTWORK THAT IS TO BE ACOUSTICALLY LINED. ALL DUCT DIMENSIONS DENOTE INTERNAL "OPEN" AREA ON THE DUCT.
- ALL DUCTWORK PENETRATING THE EXTERIOR WALLS & ROOF SHALL BE INSULATED FOR A MINIMUM DISTANCE OF 10'-0" BACK FROM THE BUILDING PENETRATION WITH 1" THICK KNAUF FIBERGLAS DUCT WRAP INSULATION COMPLETE WITH FOIL-SKRIM-KRAFT (FSK) COVERING.
- COORDINATE THE EXACT LOCATIONS OF EQUIPMENT, AND DUCT OPENINGS WITH THE STRUCTURAL CONSULTANT.

DRAWING NOTES:

- PROVIDE NEW UNDERGROUND GAS LINE FROM ACCOMMODATION METER TO SERVE NEW GAS FIRED UNIT HEATER IN GARAGE.
- PROVIDE NEW UNDERGROUND GAS LINE FROM ACCOMMODATION METER TO SERVE NEW GAS FIRED OFFICE EQUIPMENT.
- PROVIDE NEW UNDERGROUND GAS LINE FROM ACCOMMODATION METER TO SERVE NEW GAS FIRED GENERATOR.
- INSTALLATION OF UNDERGROUND PIPING TO MEET CAN/CSA B149.6.15 REFER TO DETAILS DRAWING M3.0.

MECHANICAL DRAWING LIST

M-0.0	MECHANICAL SITE PLAN & DRAWING LIST
M-0.1	MECHANICAL LEGEND, CALCULATIONS & SCHEDULES
M-1.0	MECHANICAL PLUMBING - ACCOMMODATION
M-1.1	MECHANICAL PLUMBING - OFFICE
M-2.0	MECHANICAL HVAC - ACCOMMODATION
M-2.1	MECHANICAL HVAC - OFFICE
M-3.0	MECHANICAL DETAILS
M-4.0	MECHANICAL SPECIFICATIONS
M-4.1	MECHANICAL SPECIFICATIONS

CONSULTANT
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TOWER PROJECT NUMBER: 161364

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PROVINCE OF MANITOBA
REGISTERED PROFESSIONAL ENGINEER
J. ABIJUSI
Dec 22/10

APEGM
Certificate of Authorization
Tower Engineering Group
No. 4156 Expiry: April 30, 2017

C	ISSUED FOR CONSTRUCTION	JA	2016.12.21
B	ISSUED FOR IFR	JA	2016.12.15
A	ISSUED FOR IFR	JA	2016.12.05
NO.	REVISIONS	BY	YR.MN.DY

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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba

DRAWING TITLE
MECHANICAL SITE PLAN AND DRAWING LIST

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APPROVED	CHECKED	DRAWN BY
SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
M0.0	A	
CAD FILE: 161364 - M0.0 Mechanical Site Plan.dwg		DRAWER NO.

GENERAL LEGEND	
	ELECTRIC BASEBOARD HEATER
	ELECTRIC ENTRANCE HEATER
	ELECTRIC/GAS UNIT HEATER
	UNDERCUT DOOR
	EXISTING
	EXISTING TO BE REMOVED
	GRILLE/DIFFUSER LABEL
	RADIATION LABEL
	EQUIPMENT LABEL
	EQUIPMENT LABEL
	CALLOUT NOTE
	NOTE

VENTILATION LEGEND	
	SQUARE OR RECTANGULAR DUCT
	DRAWN DOUBLE LINE
	ROUND OR OVAL DUCT
	DRAWN DOUBLE LINE
	DUCTWORK DRAWN SINGLE LINE
	ACOUSTICALLY LINED DUCT
	THERMALLY INSULATED DUCT
	SQUARE TO ROUND TRANSITION
	TRANSITION
	FLEX CONNECTION
	LONG RADIUS ELBOW
	LONG RADIUS ELBOW C/W TURNING VANES
	SQUARE ELBOW C/W TURNING VANES
	SUPPLY DUCT UP
	SUPPLY DUCT DOWN
	RETURN OR TRANSFER DUCT UP
	RETURN OR TRANSFER DUCT DOWN
	EXHAUST DUCT UP
	EXHAUST DUCT DOWN
	OUTSIDE AIR DUCT UP
	OUTSIDE AIR DUCT DOWN
	SIDEWALL SUPPLY AIR GRILLE (TYPE NOTED)
	SIDEWALL EXHAUST, RETURN OR TRANSFER GRILLE (TYPE NOTED)
	EXHAUST WALL CAP
	BALANCING DAMPER
	OPPOSED BLADE DAMPER
	PARALLEL BLADE DAMPER
	BACK DRAFT DAMPER
	FLEXIBLE DUCT CONNECTION
	END CAP
	ACCESS DOOR
	FAN-SYMBOL (TYPE NOTED)

PLUMBING PIPING LEGEND	
	ABOVE GROUND PIPING
	BELOW GROUND PIPING
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	NATURAL GAS
	SANITARY DRAIN
	PUMPED DISCHARGE
	INDIRECT DRAIN
	PLUMBING VENT

CONTROLS LEGEND	
	WALL MOUNTED THERMOSTAT
	WALL MOUNTED TEMPERATURE SENSOR
	WALL MOUNTED HUMIDISTAT
	WALL MOUNTED DE-HUMIDISTAT
	REMOTE BULB SENSOR AND TUBE
	DUCT MOUNTED THERMOSTAT
	DUCT MOUNTED TEMPERATURE SENSOR
	DUCT MOUNTED HUMIDISTAT
	DUCT MOUNTED HUMIDITY SENSOR
	CARBON DIOXIDE SENSOR
	CARBON MONOXIDE SENSOR
	NITROGEN DIOXIDE SENSOR
	MANUAL SWITCH
	DAMPEN OR VALVE MOTOR
	ELECTRONIC SPEED CONTROLLER

GENERAL PIPE AND FITTING LEGEND	
	PIPE SLOPE - UP (OR DOWN)
	DIRECTION OF FLOW
	PIPE BREAK FOR CONTINUATION
	VENT THROUGH ROOF
	PIPE DOWN
	PIPE UP
	CAP
	CLEAN OUT
	HOSE BIBB
	UNION
	VALVE - NORMALLY OPEN
	VALVE - NORMALLY CLOSED
	PLUG VALVE
	GLOBE VALVE
	SUPERVISED VALVE
	MOTORIZED 2-WAY VALVE
	MOTORIZED 3-WAY VALVE
	PRESSURE REGULATING VALVE
	TEMPERATURE/PRESSURE RELIEF VALVE
	CHECK VALVE
	STRAINER
	FLEXIBLE CONNECTOR

HVAC EQUIPMENT SCHEDULE:

F-1, F-2 FURNACES

LENNOX MODEL EL296UH090XV36C 88,000/84,000 BTU INPUT 57,000/55,000 BTU OUTPUT, 1,200 CFM @ 0.5" S.P. 96% HIGH EFF. HORIZONTAL FLOW CONFIGURATION, VAV DIRECT DRIVE, 0.5 HP MOTOR, 120V 1PH MOCF 15. UNIT COMPLETE WITH CH33-36C-2F CASED EVAPORATOR COIL, X6661 FILTER CABINET 21x28x5.7 AND (2) SETS OF FILTERS, 44W32 VENT KIT (2" CONCENTRIC), REMOTE OUTDOOR TEMPERATURE SENSOR, CONDENSATE DRAIN HEAT CABLE KIT, HORIZONTAL SUSPENSION KIT, CRAWL SPACE VENT DRAIN KIT, 10F81 ICOMFORT Wi-Fi THERMOSTAT (Wi-Fi remote monitoring and adjustment through a home wireless network for desktop PCs, laptops and apps for smartphones or tablets. Service alerts and reminders sent via text message or e-mail. Coordinate with Mechanical Contractor). COORDINATE ELECTRICAL CHARACTERISTICS WITH THE ELECTRICAL CONTRACTOR.

CU-1 CONDENSER UNIT - ACCOMMODATION

LENNOX MODEL XC14-030-230 2.5 TON CONDENSER, 28,000 NET BTUH, 15.5 SEER, 230V 1PH MOCF 25 71(db), EXPANSION VALVE KIT, COMPRESSOR LOW AMBIENT CUT-OFF SWITCH, MOUNTING BASE AND UNIT STAND-OFF KIT. COORDINATE ELECTRICAL CHARACTERISTICS WITH THE ELECTRICAL CONTRACTOR.

CU-2 CONDENSER UNIT - OFFICE

LENNOX MODEL XC14-036-230 3.0 TON CONDENSER, 33,400 NET BTUH, 15.0 SEER, 230V 1PH MOCF 30 70(db), EXPANSION VALVE KIT, COMPRESSOR LOW AMBIENT CUT-OFF SWITCH, MOUNTING BASE AND UNIT STAND-OFF KIT. COORDINATE ELECTRICAL CHARACTERISTICS WITH THE ELECTRICAL CONTRACTOR.

HRV-1 HEAT RECOVERY VENTILATOR - ACCOMMODATION

HEALTHY CLIMATE MODEL HRV5-200-TPD HRV SUITABLE FOR 207 CFM @ 0.2" SP AT HIGH SPEED, 96W, 120V 1PH, 1/10HP MOTOR, C/W SUSPENSION KIT WITH VIBRATION ISOLATORS, LOCAL NON-FUSED DISCONNECT, DRAIN KIT, 115 V SINGLE POINT CONNECTION, EXTRA SET OF FILTERS, CONNECT TO WI-FI THERMOSTAT MONITORING SYSTEM. COORDINATE ELECTRICAL WITH ELECTRICAL CONTRACTOR.

HRV-2 HEAT RECOVERY VENTILATOR - OFFICE

HEALTHY CLIMATE MODEL HRV5-200-TPD HRV SUITABLE FOR 207 CFM @ 0.2" SP AT HIGH SPEED, 96W, 120V 1PH, 1/10HP MOTOR, C/W SUSPENSION KIT WITH VIBRATION ISOLATORS, LOCAL NON-FUSED DISCONNECT, DRAIN KIT, 115 V SINGLE POINT CONNECTION, EXTRA SET OF FILTERS, CONNECT TO WI-FI THERMOSTAT MONITORING SYSTEM. COORDINATE ELECTRICAL WITH ELECTRICAL CONTRACTOR.

EF-1 EXHAUST FAN - DRYING ROOM

BROAN MODEL 509 UTILITY WALL FAN, 150 CFM @ 0.1" SP, 120V, 1.5 AMPS @ 60Hz, 1925 RPM, HORIZONTAL DISCHARGE, C/W DE-HUMIDISTAT CONTROL. COORDINATE ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.

GS-1 GAS STOVE

KITCHEN AID MODEL KFG050DE 85,000 BTUH NATURAL GAS RANGE, 120V, 60 Hz, 15 AMP FUSED ELECTRICAL CIRCUIT IS REQUIRED. C/W TIME-DELAY FUSE OR CIRCUIT BREAKER, DEDICATED CIRCUIT. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND LOCAL GAS CODE FOR REQUIREMENTS AND CLEARANCES. COORDINATE ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.

KH-1 KITCHEN HOOD

NUTONE MODEL NTL 3025S 325 CFM @ 0.7 IN.W.G. 120V, 60 Hz, 2.0 AMP. C/W ARP6 AIR FLOW REDUCER. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND LOCAL GAS CODE FOR REQUIREMENTS AND CLEARANCES. COORDINATE ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.

GUH-1 GAS UNIT HEATER

MODINE MODEL HDS100 100,000 BTUH INPUT/80,000 BTUH OUTPUT, NATURAL GAS SEPARATED COMBUSTION UNIT HEATER, 1.490 ENTERING AIR FLOW CFM, 115V, 60 Hz, 4.7 TOTAL UNIT AMPS. C/W CONTROL OPTION 11 SINGLE STAGE COMBINATION GAS CONTROL WITH BUILT IN IGNITION CONTROL, THERMOSTAT, SUSPENDED FROM STRUCTURE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND LOCAL GAS CODE FOR REQUIREMENTS AND CLEARANCES. COORDINATE ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.

GRILLES/REGISTERS

- S-1 IMPERIAL MODEL RG FLOOR REGISTER. SIZES ON DRAWING. COORDINATE WITH ARCHITECTURAL AND OWNER.
- R-1 IMPERIAL MODEL RG BASEBOARD RETURN AIR GRILLE. SIZES ON DRAWINGS. COORDINATE WITH ARCHITECTURAL AND OWNER.
- E-1 IMPERIAL MODEL RG SIDEWALL GRILLE. SIZES ON DRAWINGS. COORDINATE WITH ARCHITECTURAL AND OWNER.

PLUMBING EQUIPMENT SCHEDULE:

TWH 1-5 GAS-FIRED TANKLESS WATER HEATERS

BRADFORD WHITE MODEL RTC-199HE-N 199,000 BTU INPUT, 0.95 EF RATING 120V, 3" CONCENTRIC VENT. COORDINATE ELECTRICAL CHARACTERISTICS WITH THE ELECTRICAL CONTRACTOR.

SP-1, SP-2 SUMP PUMP

MYERS MODEL MS33 1/3 HP AT 45 GPM, 25 FOOT SHUT-OFF HEAD, 3000 RPM, 115V, SINGLE PHASE, 60Hz, FLA=3.9. COORDINATE ELECTRICAL CHARACTERISTICS WITH THE ELECTRICAL CONTRACTOR.

SK-1 LAUNDRY SINK - ACCOMMODATION

COUNTER MOUNTED UNDER COUNTER SINK - SINGLE HANDLE FAUCET POINT OF USE THERMOSTATIC WATER MIXING VALVE KINDRED 'STEEL QUEEN' #QSU1917/B, 'STEEL QUEEN SERIES', UNDER COUNTER SINK. AMERICAN STANDARD #4175.100, 'COLONY SOFT', SINGLE HANDLE FAUCET, 8.3 LPM (2.2 GPM) OUTLET, AMERICAN STANDARD COLONY SOFT #4175.100 SINGLE HANDLE FAUCET, CHROME PLATED FINISH, CENTER HOLE ONLY, WASHERLESS CERAMIC DISC CARTRIDGE, 8.3 LPM (2.2 GPM) OUTLET, SWING SPOUT, 239 MM (9-7/16") PROJECTION REACH, METAL LEVER HANDLE, PULL-OUT SPRAY WITH ADJUSTABLE SPRAY PATTERN. AMERICAN STANDARD #605XTM1V1070, POINT OF USE THERMOSTATIC WATER MIXING VALVE, BUILT-IN CHECKS. MCGUIRE #LFH165LKN3, POLISHED BRASS FAUCET SUPPLIES. MCGUIRE #8903C, P-TRAP. FAUCET CAN BE MOUNTED WITH OR WITHOUT SUPPLIED ESCUTCHEON OR HANDSPRAY PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION. PROVIDE TEMPERED WATER TO HOT SIDE OF FAUCET.

SK-2 KITCHEN SINK - ACCOMMODATION

COUNTER MOUNTED UNDER COUNTER SINK - SINGLE HANDLE FAUCET POINT OF USE THERMOSTATIC WATER MIXING VALVE KINDRED 'STEEL QUEEN' #KSD1UA/9D, 'STEEL QUEEN SERIES', UNDER COUNTER SINK. AMERICAN STANDARD #4175.100, 'COLONY SOFT', SINGLE HANDLE FAUCET, 8.3 LPM (2.2 GPM) OUTLET, AMERICAN STANDARD COLONY SOFT #4175.100 SINGLE HANDLE FAUCET, CHROME PLATED FINISH, CENTER HOLE ONLY, WASHERLESS CERAMIC DISC CARTRIDGE, 8.3 LPM (2.2 GPM) OUTLET, SWING SPOUT, 239 MM (9-7/16") PROJECTION REACH, METAL LEVER HANDLE, PULL-OUT SPRAY WITH ADJUSTABLE SPRAY PATTERN. AMERICAN STANDARD #605XTM1V1070, POINT OF USE THERMOSTATIC WATER MIXING VALVE, BUILT-IN CHECKS. MCGUIRE #LFH165LKN3, POLISHED BRASS FAUCET SUPPLIES. MCGUIRE #8903C, P-TRAP. FAUCET CAN BE MOUNTED WITH OR WITHOUT SUPPLIED ESCUTCHEON OR HANDSPRAY PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION. PROVIDE TEMPERED WATER TO HOT SIDE OF FAUCET.

ACCESSORIES LEGEND	
	PLUMBING FIXTURE (TYPE NOTED)
	SHOWER HEAD (TYPE NOTED)
	SERVICE OUTLET (TYPE NOTED)
	FLOOR DRAIN (TYPE NOTED)
	P-TRAP
	RUNNING TRAP
	PUMP
	WATER HAMMER ARRESTOR
	PRESSURE SWITCH
	GAS METER
	WATER METER
	PRESSURE GAUGE C/W SNUBBER VALVE
	THERMOMETER

161364 GIMLI SEARCH & RESCUE		VENTILATION SUMMARY AS PER ASHRAE 62-2007 - PEAK										ACCOMMODATION				
Supply Air										Exhaust						
Space	Area ft²	# of occupants	Occupancy Density ft²/occ	ASHRAE cfm/person	ASHRAE cfm/ft²	#/1000 ft² or #/100 m²	cfm/person	ASHRAE Default Values			ASHRAE Exhaust Rates					
								Occupant Density	Combined Outdoor Air Rate		cfm/unit	cfm/ft²	Design cfm			
Bedrooms (4)	564	4	141.0	5.0	0.06						53.8	1.0	53.8			
Hallway	158	0		0.0	0.06						9.5	1.0	9.5			
Living/Dining	261	1	261.0	5.0	0.06						20.7	1.0	20.7			
Kitchen	118	0		5.0	0.06						7.1	1.0	7.1	50		50.0
Utility	32	0		0.0	0.06						1.9	1.0	1.9	25		25.0
Laundry	80	0		0.0	0.06						4.8	1.0	4.8	25		25.0
Showers/Washrooms	160	0		0.0	0.06						9.6	1.0	9.6	50		50.0
	1373	5									107.4		107.4			150.0
	sq ft	persons														
HVAC EQUIPMENT		S/A	O/A	Total Building O/A Required →							107 cfm			T/A = Transfer Air N/A = Not Applicable NIC = Not Included in Calculation		
F-1		1200	190	Total Building E/A →							150 cfm					
HRV-1			200	Total Building O/A Provided →							5 people					
CFM		1200	390								390 CFM					

161364 GIMLI SEARCH & RESCUE		VENTILATION SUMMARY AS PER ASHRAE 62-2007 - PEAK										OFFICE				
Supply Air										Exhaust						
Space	Area ft²	# of occupants	Occupancy Density ft²/occ	ASHRAE cfm/person	ASHRAE cfm/ft²	#/1000 ft² or #/100 m²	cfm/person	ASHRAE Default Values			ASHRAE Exhaust Rates					
								Occupant Density	Combined Outdoor Air Rate		cfm/unit	cfm/ft²	Design cfm			
Offices	231	4	57.8	5.0	0.06	5.0				17.0	33.9	1.0	33.9			
Corridors	142	0		0.0	0.06						8.5	1.0	8.5			
Meeting Room	280	4	70.0	5.0	0.06	50.0				6.0	36.8	1.0	36.8			
Reception	187	1	187.0	5.0	0.06	30.0				7.0	16.2	1.0	16.2			
Gear Storage	41	0		0.0	0.12						4.9	1.0	4.9			
Drying Room	64	0		0.0	0.12						7.7	1.0	7.7	180		180.0
IT Room	32	0		0.0	0.06	60.0				6.0	1.9	1.0	1.9		1	32.0
Electrical Room	40	0		0.0	0.06						2.4	1.0	2.4		1	40.0
Washroom	48											1.0		25		25.0
Change Rooms	230											1.0			0.25	57.5
Shower/Washroom	71.0											1.0		50		50.0
	1366	9									112.3		112.3			384.5
	sq ft	persons														
HVAC EQUIPMENT		S/A	O/A	Total Building O/A Required →							112 cfm			T/A = Transfer Air N/A = Not Applicable NIC = Not Included in Calculation		
F-2		1200	190	Total Building E/A →							385 cfm					
HRV-2			200	Total Building O/A Provided →							9 people					
CFM		1200	390								390 CFM					

PLUMBING EQUIPMENT SCHEDULE (CONT.):

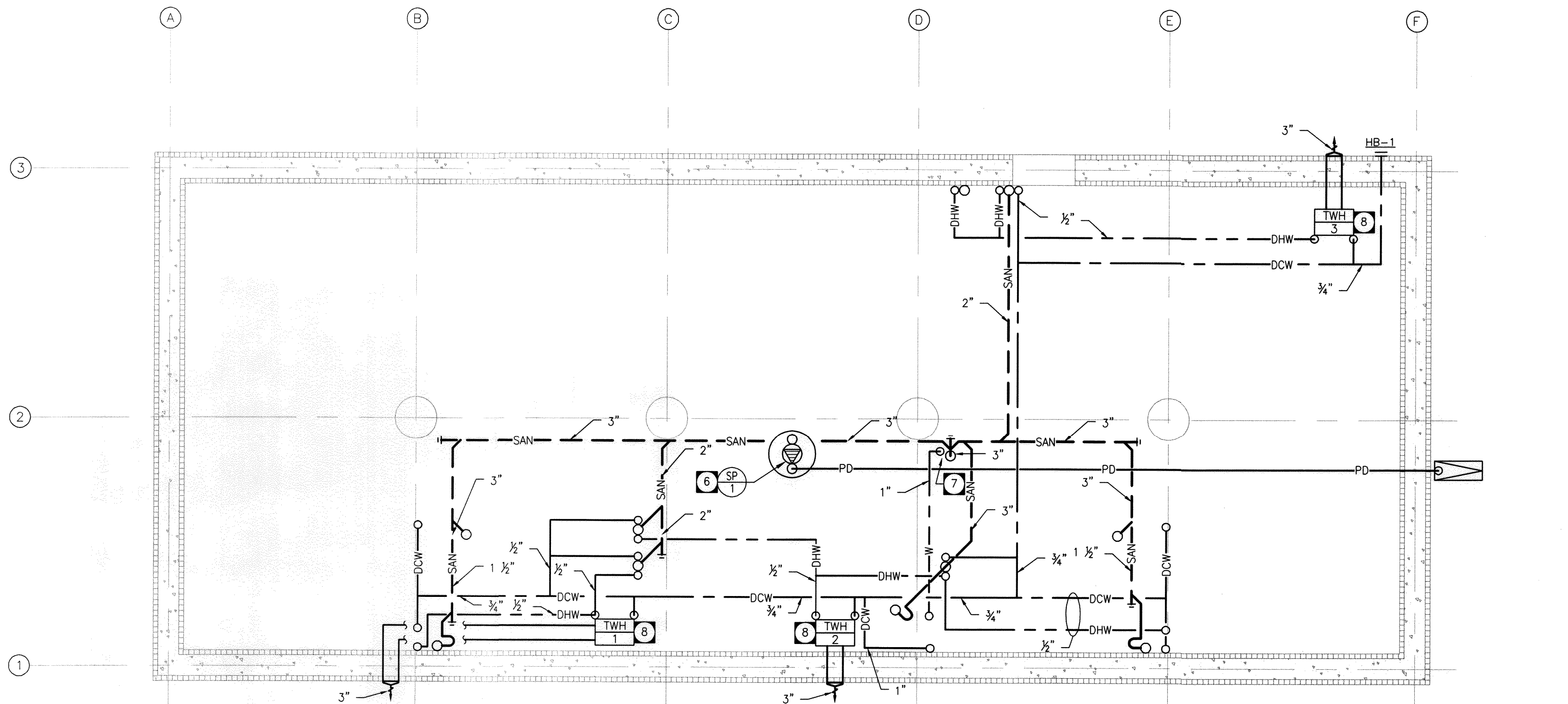
SK-3 KITCHEN SINK - OFFICE

COUNTER MOUNTED UNDER COUNTER SINK - SINGLE HANDLE FAUCET POINT OF USE THERMOSTATIC WATER MIXING VALVE KINDRED 'STEEL QUEEN' #QSU1820/B, 'STEEL QUEEN SERIES', UNDER COUNTER SINK. AMERICAN STANDARD #4175.100, 'COLONY SOFT', SINGLE HANDLE FAUCET, 8.3 LPM (2.2 GPM) OUTLET, AMERICAN STANDARD, COLONY SOFT #4175.100 SINGLE HANDLE FAUCET, CHROME PLATED FINISH, CENTER HOLE ONLY, WASHERLESS CERAMIC DISC CARTRIDGE, 8.3 LPM (2.2 GPM) OUTLET, SWING SPOUT, 239 MM (9-7/16") PROJECTION REACH, METAL LEVER HANDLE, PULL-OUT SPRAY WITH ADJUSTABLE SPRAY PATTERN. AMERICAN STANDARD #605XTM1V1070, POINT OF USE THERMOSTATIC WATER MIXING VALVE, BUILT-IN CHECKS. MCGUIRE #LFH165LKN3, POLISHED BRASS FAUCET SUPPLIES. MCGUIRE #8903C, P-TRAP. FAUCET CAN BE MOUNTED WITH OR WITHOUT SUPPLIED ESCUTCHEON OR HANDSPRAY PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION. PROVIDE TEMPERED WATER TO HOT SIDE OF FAUCET.

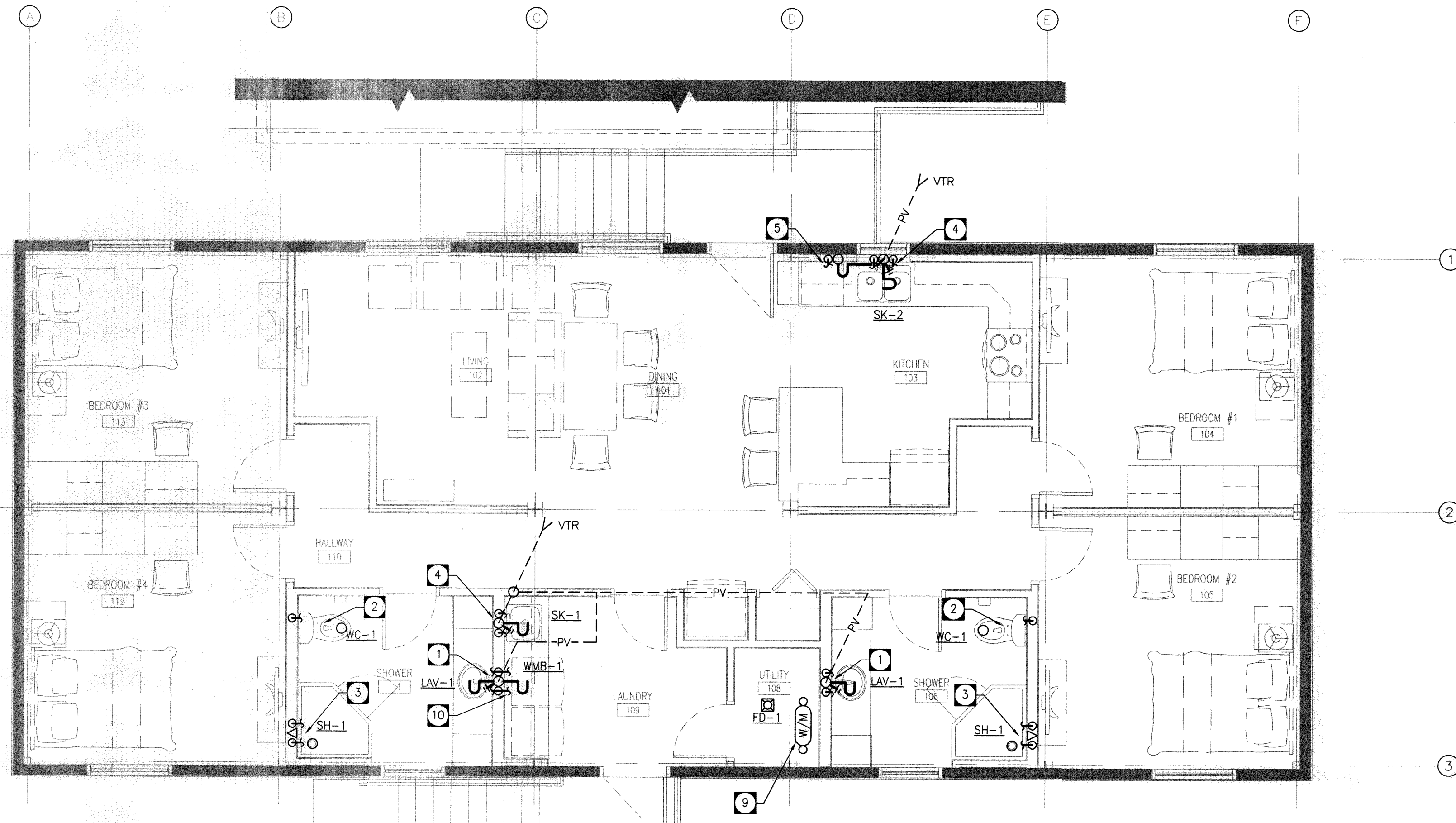
WC-1 WATER CLOSET OFFICE AND ACCOMMODATION

CONTRAC CODY 4722BEV/4721BFV 1.28GPF (4.8LPPF) 2-PIECE ELONGATED REGULAR HEIGHT WATER CLOSET, WHITE VITREOUS CHINA, CHROME TANK LEVER, 12" (305MM) ROUGH-IN, 2" (51MM) FULLY GLAZED BALL PASS TRAPWAY, 3" FLAPPER, MAP RATING CAPABLE OF 1000GRAMS. CENTOCO 5005TSCC HEAVY-DUTY ELONGATED OPEN FRONT WHITE TOILET SEAT LESS COVER. STAINLESS STEEL CHECK-HINGE WITH GASKETS. BRASSCRAFT KTC5401DLX C. 1/4 TURN CHROME TOILET SUPPLY KIT W/ 5" (127MM) EXTENSION, 1/2" (13MM) NOMINAL SWEAT X 3/8" (9.5MM) OD COMPRESSION W/ LOOSE KEY, BELL ESCUTCHEON, CHROME PLATED COPPER CLOSET FLEX SUPPLY.

WC-2 WATER CLOSET - BARRIER FREE OFFICE



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



MAIN FLOOR PLAN
SCALE: 1/4"=1'-0"

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- ALL PLUMBING INSTALLATIONS, ETC. SHALL BE PERFORMED IN ACCORDANCE WITH ALL CODES, REGULATIONS & AUTHORITIES HAVING JURISDICTION.
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- COORDINATE THE EXACT LOCATIONS OF EQUIPMENT, AND DUCT OPENINGS WITH THE STRUCTURAL CONSULTANT.

DRAWING NOTES:

- 1/2" DCW, DHW AND 1-1/2" SANITARY UP FROM CRAWL SPACE TO SERVE LAVATORY. 1-1/4" PLUMBING VENT TO RISE UP INTO CEILING SPACE. PROVIDE SHUT-OFF VALVES.
- 3/4" DCW C/W SHUT-OFF VALVE AND 3" SANITARY UP FROM CRAWL SPACE TO SERVE WATER CLOSET. 2" PLUMBING VENT TO RISE UP INTO CEILING SPACE.
- 1/2" DCW, DHW AND 2" SANITARY UP FROM CRAWL SPACE TO SERVE SHOWER. PROVIDE SHUT-OFF VALVES.
- 1/2" DCW, DHW AND 1-1/2" SANITARY UP FROM CRAWL SPACE TO SERVE SINK. PROVIDE SHUT-OFF VALVES. 1-1/4" PLUMBING VENT TO RISE UP INTO CEILING SPACE.
- NEW DISH WASHER. PROVIDE WITH 1/2" DHW AND CONNECT SANITARY INDIRECTLY UPSTREAM OF SINK "P" TRAP.
- SUMP PUMP SP-1. PUMP DISCHARGE UP AND OUT ONTO SPLASH PAD. COORDINATE WITH ELECTRICAL. SUMP PIT BY OTHERS.
- APPROXIMATE LOCATION OF MAIN SANITARY AND WATER LINES ENTERING STRUCTURE.
- PROVIDE NEW 199,000 BTUH GAS-FIRED TANKLESS WATER HEATER. VENT TO OUTSIDE WITH 3" CONCENTRIC TERMINATION.
- NEW WATER METER FOR ACCOMMODATION LOCATED IN UTILITY ROOM.
- 1/2" DCW, DHW, 1-1/2" STAND PIPE AND 2" SANITARY TO SERVE WASHER/DRYER. PROVIDE SHUT-OFF VALVES.

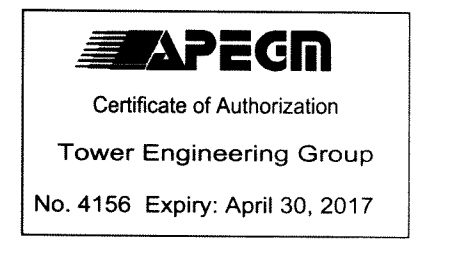
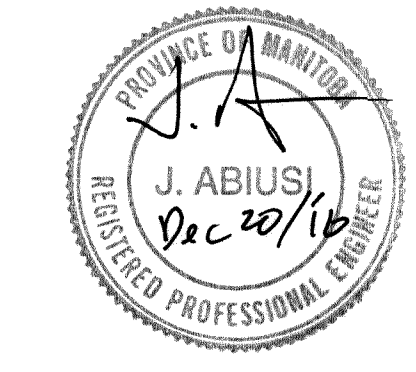
CONSULTANT

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TOWER PROJECT NUMBER: 161364



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C	ISSUED FOR CONSTRUCTION	JA	2016.12.21
B	ISSUED FOR IFR	JA	2016.12.15
A	ISSUED FOR IFR	JA	2016.12.05

NO.	REVISIONS	BY	YR.MX.DY

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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba
DRAWING TITLE
MECHANICAL PLUMBING LAYOUT - ACCOMMODATION

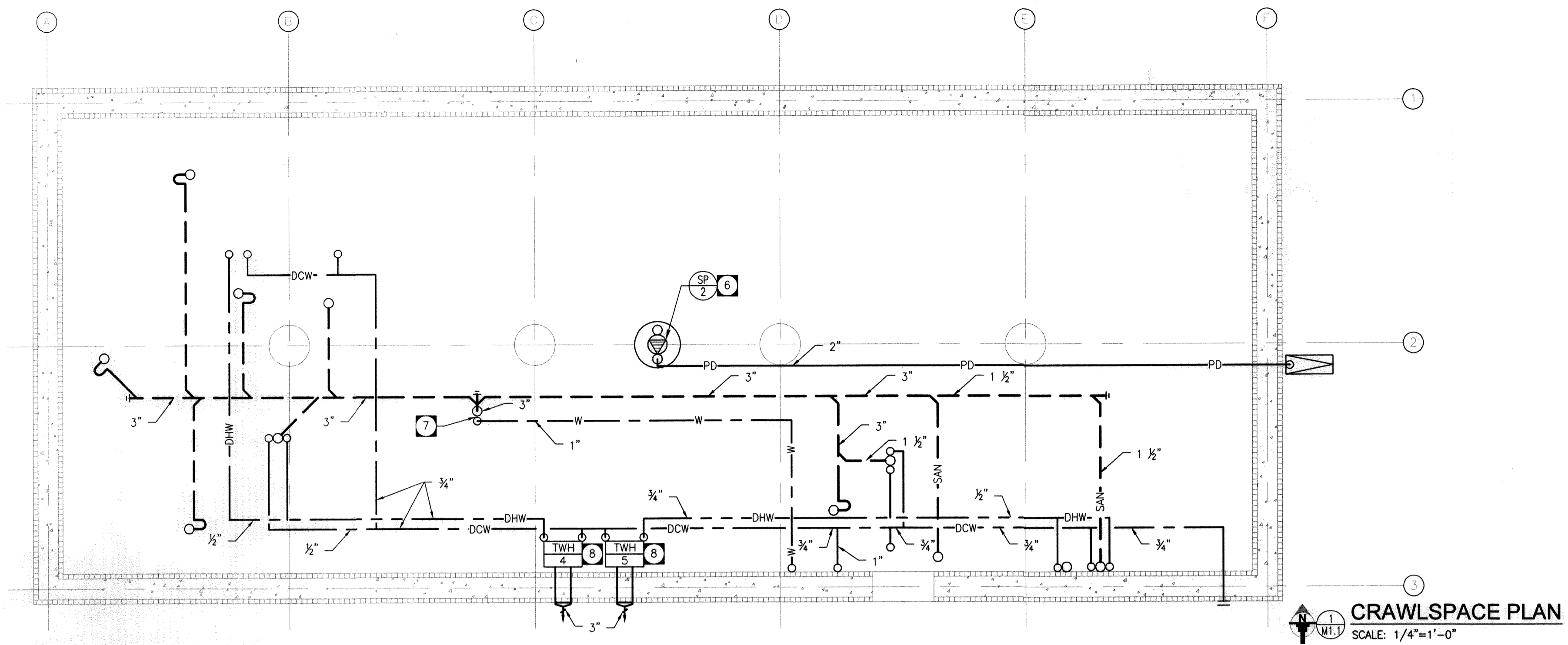


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	JA	LK
SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39

DRAWING NUMBER	REVISION NUMBER
M1.0	A

CAD FILE: 161364 - M1.0 Mechanical Plumbing - Accommodation.dwg DRAWER NO:



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- 1/2" DCW, DHW AND 1-1/2" SANITARY UP FROM CRAWL SPACE TO SERVE SINK. PROVIDE SHUT-OFF VALVES. 1-1/4" PLUMBING VENT TO RISE UP INTO CEILING SPACE.
- NEW DISH WASHER. PROVIDE WITH 1/2" Ø DHW AND CONNECT SANITARY INDIRECTLY UPSTREAM OF SINK "P" TRAP.
- SUMP PUMP SP-2 PUMP DISCHARGE UP AND OUT ONTO SPLASH PAD. COORDINATE WITH ELECTRICAL SUMP PIT BY OTHERS.
- APPROXIMATE LOCATION OF MAIN SANITARY AND WATER LINES ENTERING STRUCTURE.
- PROVIDE NEW 199,000 BTUH GAS-FIRED TANKLESS WATER HEATER. VENT TO OUTSIDE WITH 3" CONCENTRIC TERMINATION.
- NEW WATER METER FOR OFFICE LOCATED IN MECHANICAL ROOM.

CONSULTANT
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PROVINCE OF MANITOBA
REGISTERED PROFESSIONAL ENGINEER
J. ABIUSI
Dec 22/16

APEGM
Certificate of Authorization
Tower Engineering Group
No. 4156 Expiry: April 30, 2017

C	ISSUED FOR CONSTRUCTION	JA	2016.12.21
B	ISSUED FOR IFR	JA	2016.12.15
A	ISSUED FOR IFR	JA	2016.12.05

NO.	REVISIONS	BY	YR/MO/DY

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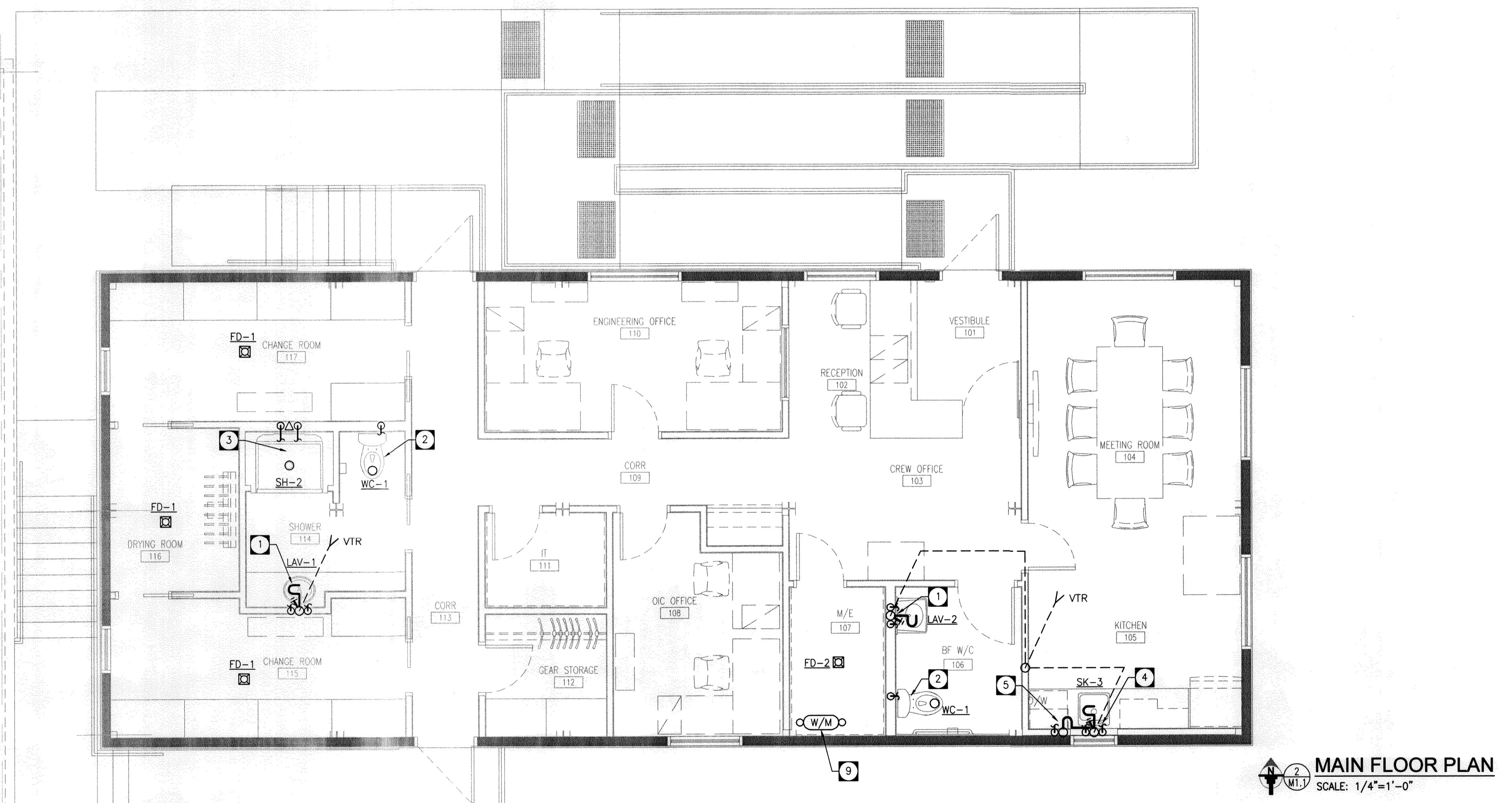
PROJECT TITLE
Gimli Search & Rescue Station

DRAWING TITLE
MECHANICAL PLUMBING LAYOUT - OFFICE

MECHANICAL PLUMBING LAYOUT - OFFICE

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SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
M1.1	A	
CAD FILE: 161364 - M1.1 Mechanical Plumbing - Office.dwg		
DRAWER NO.		



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DRAWING NOTES:

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- 7" F/A TO R/A DUCT. FULLY INSULATE ALL F/A DUCTWORK AS PER MECHANICAL SPECIFICATIONS. PROVIDE DAMPER AND BALANCE TO 190 CFM.
- ELECTRIC UNIT HEATER TO BE SUPPLIED AND INSTALLED BY ELECTRICAL DIVISION WITH HEATING CAPACITY SHOWN. COORDINATE INSTALLATION WITH ELECTRICAL.
- OPEN ENDED S/A DUCT C/W BALANCING DAMPER. BALANCE TO 50 CFM.
- OPEN ENDED E/A DUCT C/W BALANCING DAMPER. BALANCE TO 50 CFM.
- NEW HRV SUSPENDED FROM STRUCTURE WITH VIBRATION ISOLATORS. PROVIDE FLEXIBLE CONNECTIONS TO UNIT. THERMALLY INSULATE O/A AND E/A DUCTS BACK FROM WALL CAPS TO UNIT. REFER TO DETAIL.
- NEW GAS METER AT APPROX. THIS LOCATION. COORDINATE WITH UTILITIES AND ARCHITECTURAL.
- 2" PVC FOR FURNACE COMBUSTION AND EXHAUST UP THROUGH MAIN FLOOR WALL CAVITY. REFER TO DRAWING NOTE #14 FOR CONTINUATION.
- 4" METAL DRYER VENT DOWN FROM LAUNDRY ROOM TO METAL WALL CAP AT APPROX. THIS LOCATION. THERMALLY INSULATE FROM WALL CAP TO SUB FLOOR. INSTALLATION TO BE AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- PROVIDE GAS LINE UP FROM CRAWL SPACE UP TO GAS DRYER. INSTALLATION TO BE AS PER CODE AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- PROVIDE GAS LINE UP FROM CRAWL SPACE UP TO GAS RANGE. INSTALLATION TO BE AS PER CODE AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- PROVIDE 6" OR EQUIVALENT OVAL OR RECTANGULAR DUCT DOWN INSIDE WALL FROM KITCHEN HOOD KH-1 TO CRAWL SPACE. VENT OUTSIDE TO 6" METAL WALL CAP APPROX. WHERE SHOWN. THERMALLY INSULATE FROM WALL CAP BACK TO SUB FLOOR. INSTALLATION TO BE AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- PROVIDE GAS LINE TO TANKLESS WATER HEATER. INSTALLATION TO BE AS PER CODE AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 2" PVC FOR FURNACE COMBUSTION AND EXHAUST UP FROM CRAWL SPACE TO CONCENTRIC TERMINATION ON ROOF. C/W ROOF FLASHING AND THERMAL INSULATION BACK FROM ROOF PENETRATION TO CRAWL SPACE.
- EXHAUST DUCT AND GAS LINE UP FROM CRAWLSPACE TO NEW KITCHEN HOOD AND RANGE. GAS CONNECTION TO RANGE C/W VALVE AND 3 FOOT GAS FLEX. PROVIDE ANTI-TIP BRACKET AND SECURITY CHAIN.
- DRYER VENT AND GAS LINE UP FROM CRAWLSPACE TO NEW GAS DRYER C/W GAS SHUT OFF VALVE, 3' FOOT GAS FLEX, SECURITY CHAIN AND 4" FLEXIBLE METAL VENT CONNECTION.
- OFFSET SUPPLY AIR BOOT IN CRAWLSPACE AS REQUIRED TO LOCATE REGISTER CLOSER TO EXTERIOR WALL. TYPICAL.

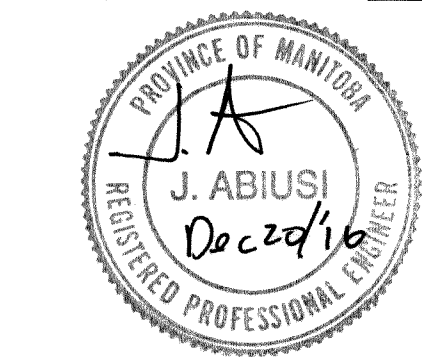
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APEGM
 Certificate of Authorization
 Tower Engineering Group
 No. 4156 Expiry: April 30, 2017

C	ISSUED FOR CONSTRUCTION	JA	2016.12.21
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A	ISSUED FOR IFR	JA	2016.12.05

NO.	REVISIONS	BY	YR/MN/DY

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PROJECT TITLE

Gimli Search & Rescue Station

Gimli, Manitoba

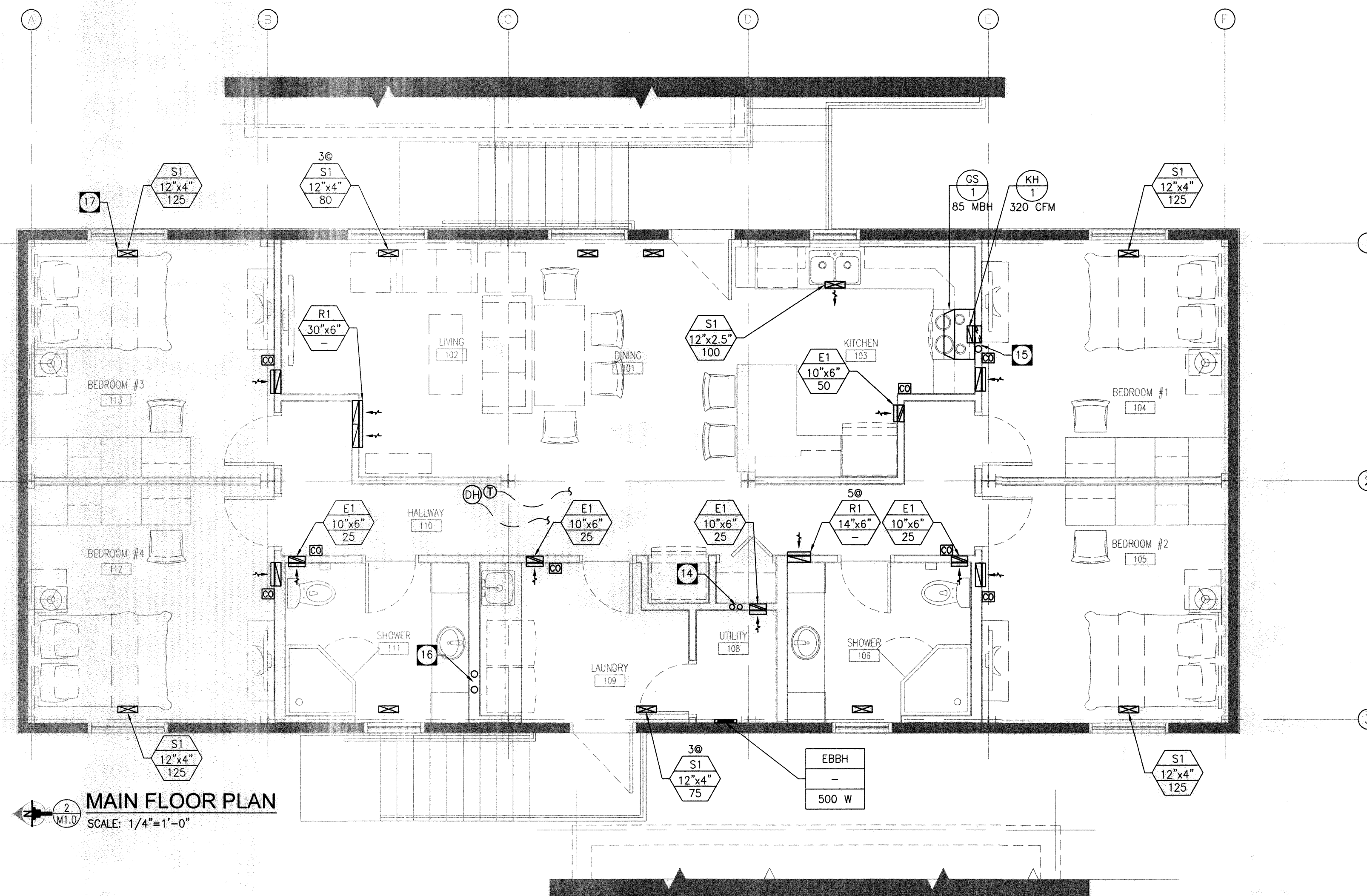
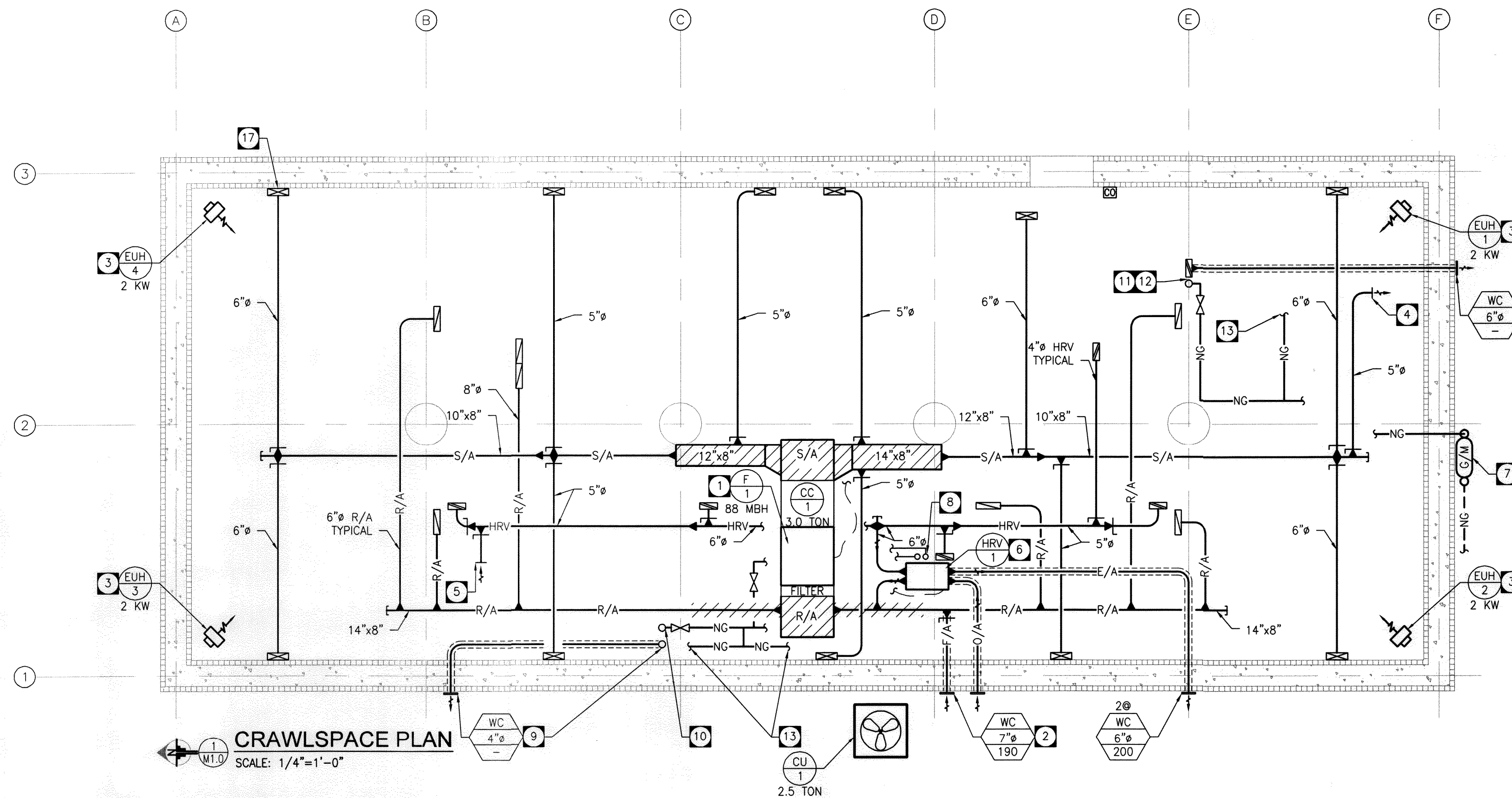
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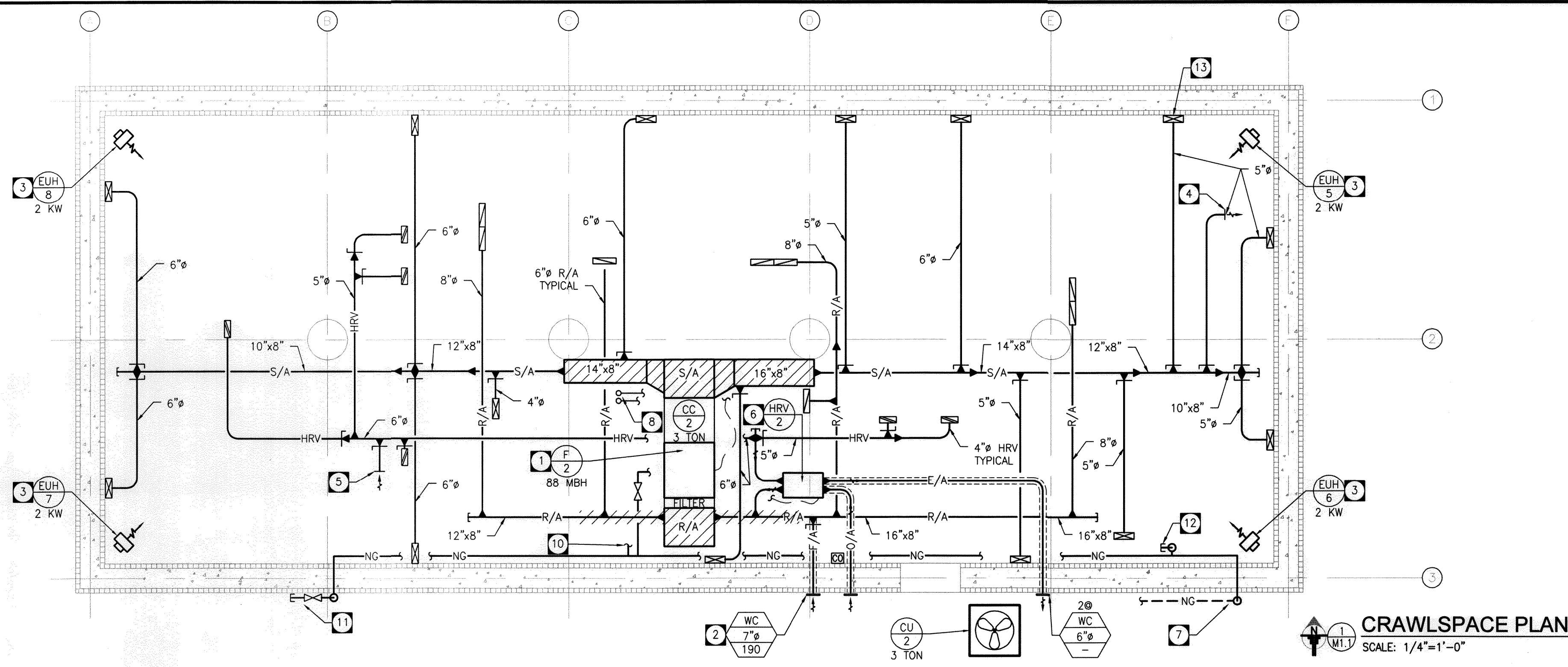
MECHANICAL HVAC LAYOUT - ACCOMMODATION



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SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
M2.0	A	
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CRAWLSPACE PLAN
SCALE: 1/4"=1'-0"

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- NEW HRV SUSPENDED FROM STRUCTURE WITH VIBRATION ISOLATORS. PROVIDE FLEXIBLE CONNECTIONS TO UNIT. THERMALLY INSULATE O/A AND E/A DUCTS BACK FROM WALL CAPS TO UNIT. REFER TO DETAIL.
- NEW UNDERGROUND GAS LINE RISER AT APPROX. THIS LOCATION. COORDINATE WITH UTILITIES AND ARCHITECTURAL.
- 2" PVC FOR FURNACE COMBUSTION AND EXHAUST UP THROUGH MAIN FLOOR WALL CAVITY. REFER TO DRAWING NOTE #9 FOR CONTINUATION.
- 2" PVC FOR FURNACE COMBUSTION AND EXHAUST UP FROM CRAWL SPACE TO CONCENTRIC TERMINATION ON ROOF. C/W ROOF FLASHING AND THERMAL INSULATION BACK FROM ROOF PENETRATION TO CRAWL SPACE.
- PROVIDE GAS LINE TO TANKLESS WATER HEATERS. INSTALLATION TO BE AS PER CODE AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- PROVIDE GAS LINE ROUGH-IN C/W VALVE AND CAP FOR FUTURE BBQ. COORDINATE WITH OWNER.
- PROVIDE GAS LINE ROUGH-IN C/W VALVE AND CAP FOR FUTURE GAS APPLIANCE. COORDINATE WITH OWNER.
- OFFSET SUPPLY AIR BOOT IN CRAWLSPACE AS REQUIRED TO LOCATE REGISTER CLOSER TO EXTERIOR WALL. TYPICAL.

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All prints to be returned.

TOWER PROJECT NUMBER: 161364

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PROVINCE OF MANITOBA
J. A. ABIUSI
REGISTERED PROFESSIONAL ENGINEER
Dec 2010

APEGM
Certificate of Authorization
Tower Engineering Group
No. 4156 Expiry: April 30, 2017

C	ISSUED FOR CONSTRUCTION	JA	2016.12.21
B	ISSUED FOR IFR	JA	2016.12.15
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NO.	REVISIONS	BY	TR. NO./DT

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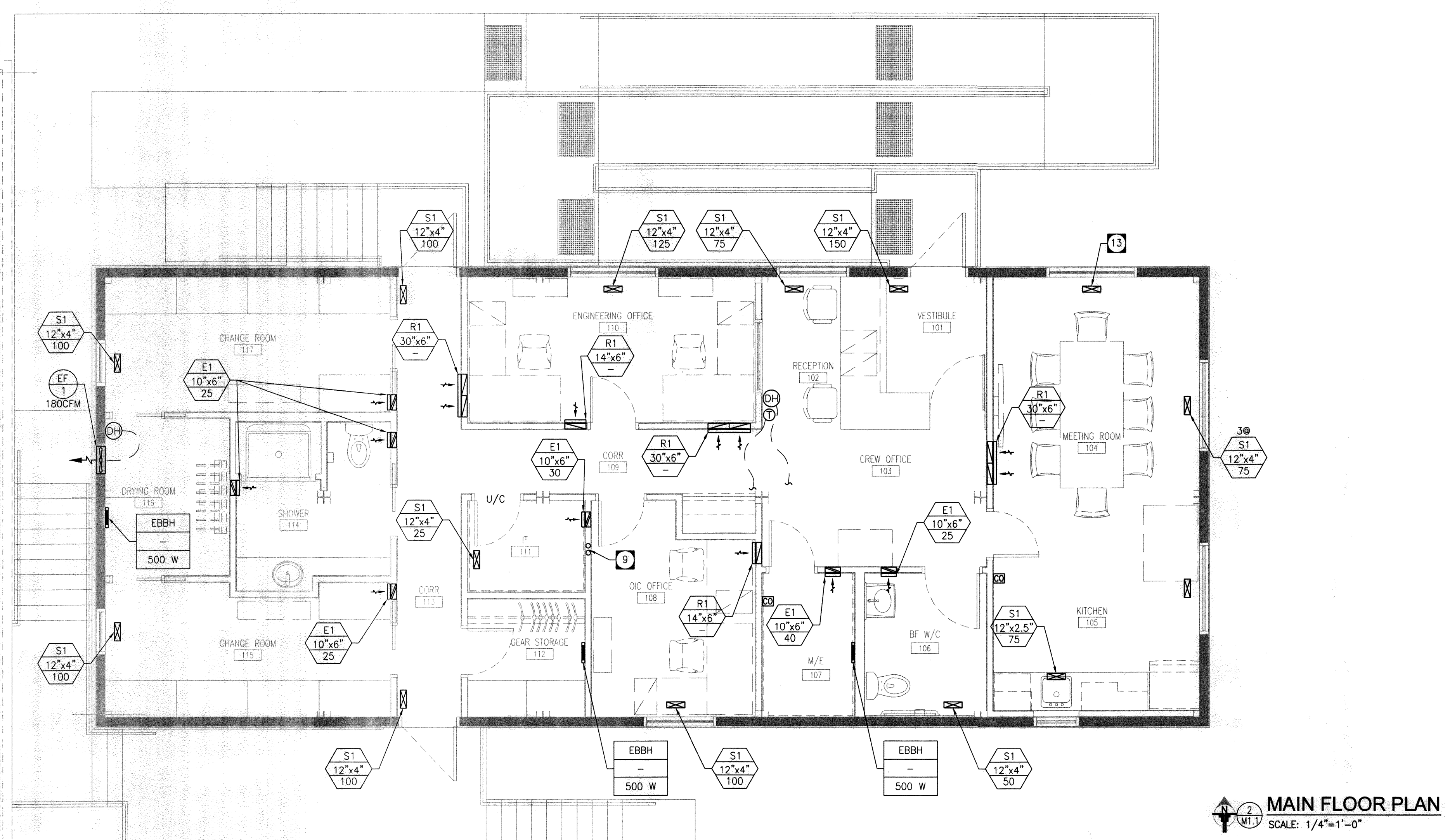
PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba

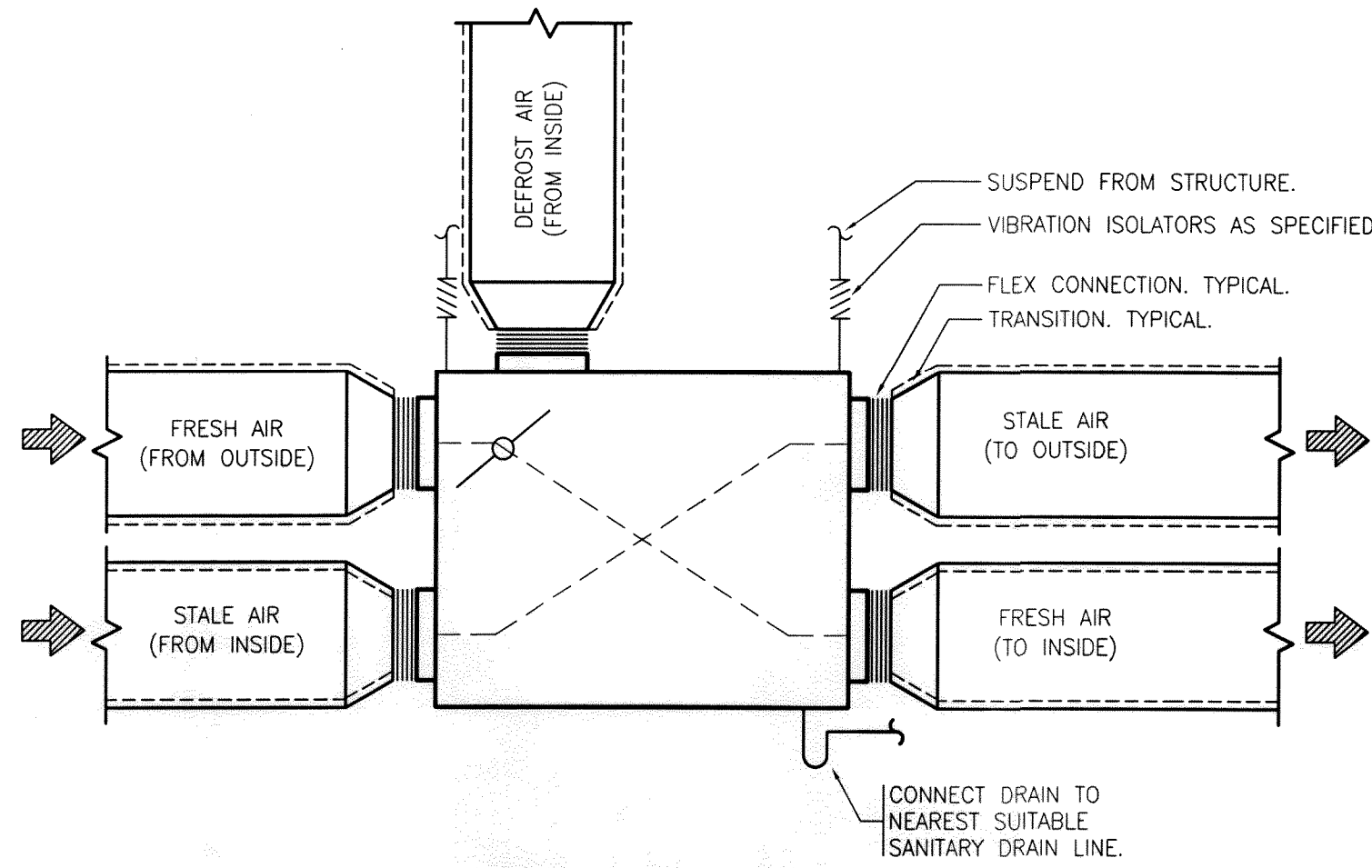
DRAWING TITLE
MECHANICAL HVAC LAYOUT - OFFICE

MMP ARCHITECTS
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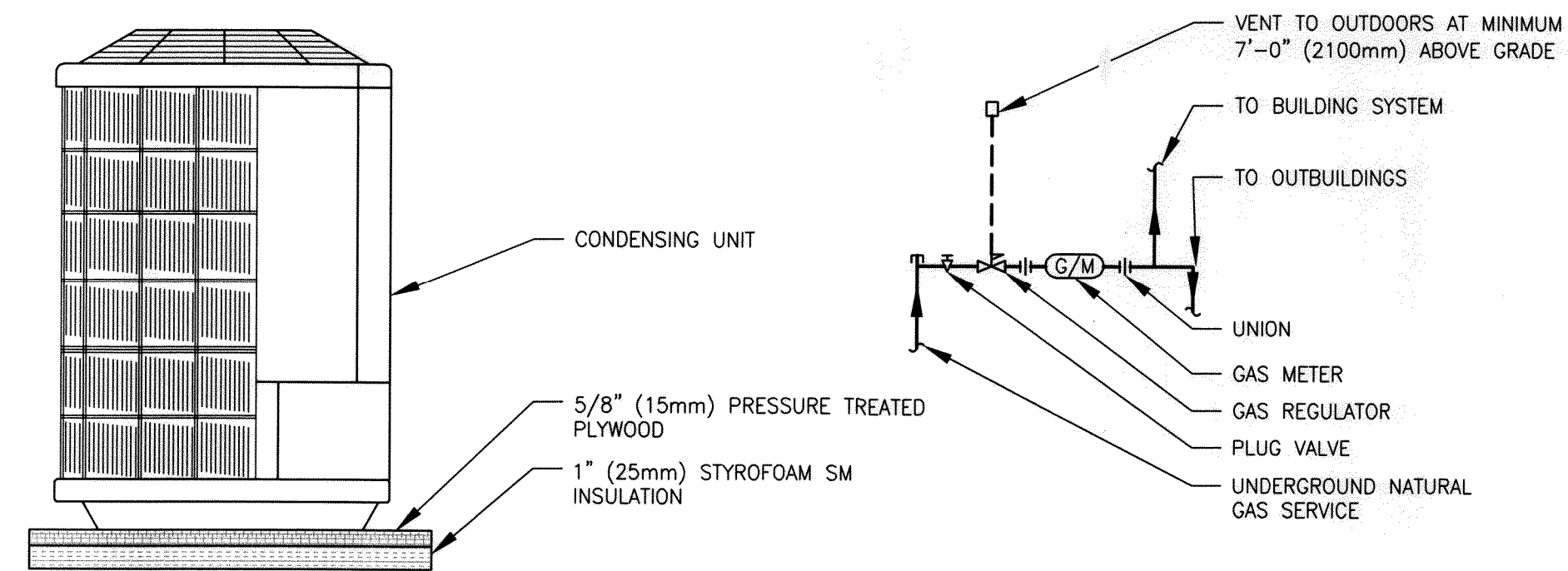
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	JA	LK
SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
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CAD FILE: 161364 - M2.1 Mechanical Hvac - Office.dwg	DRAWER NO.	



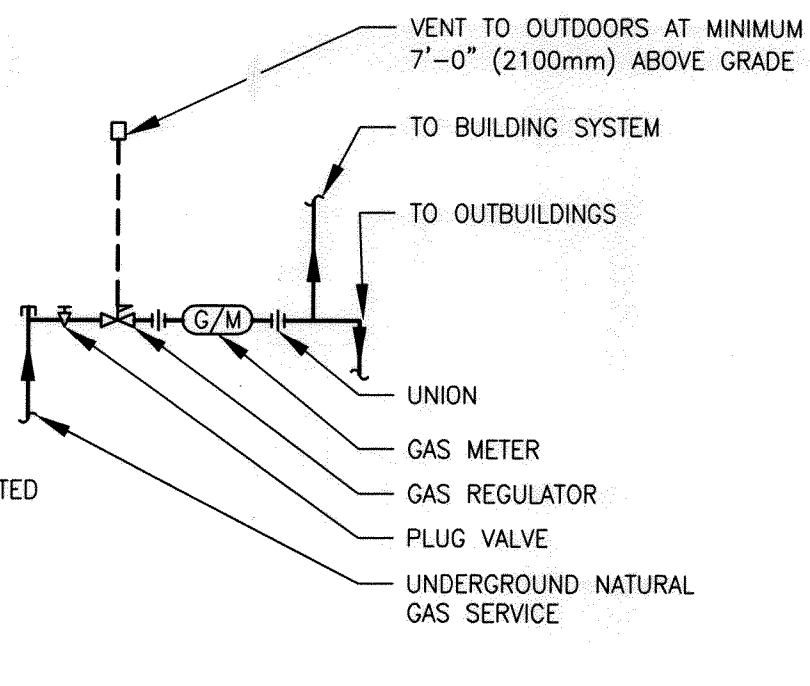
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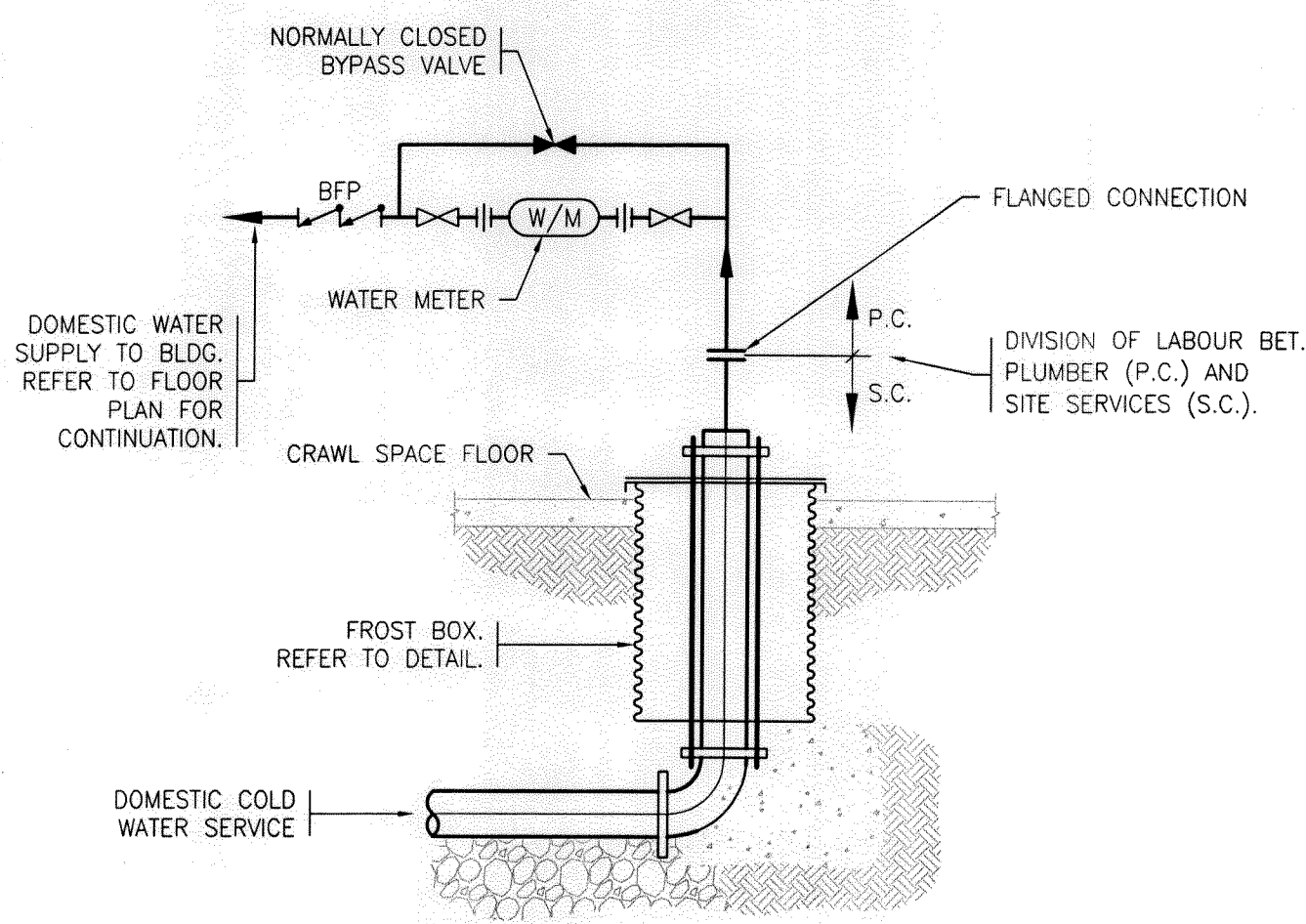
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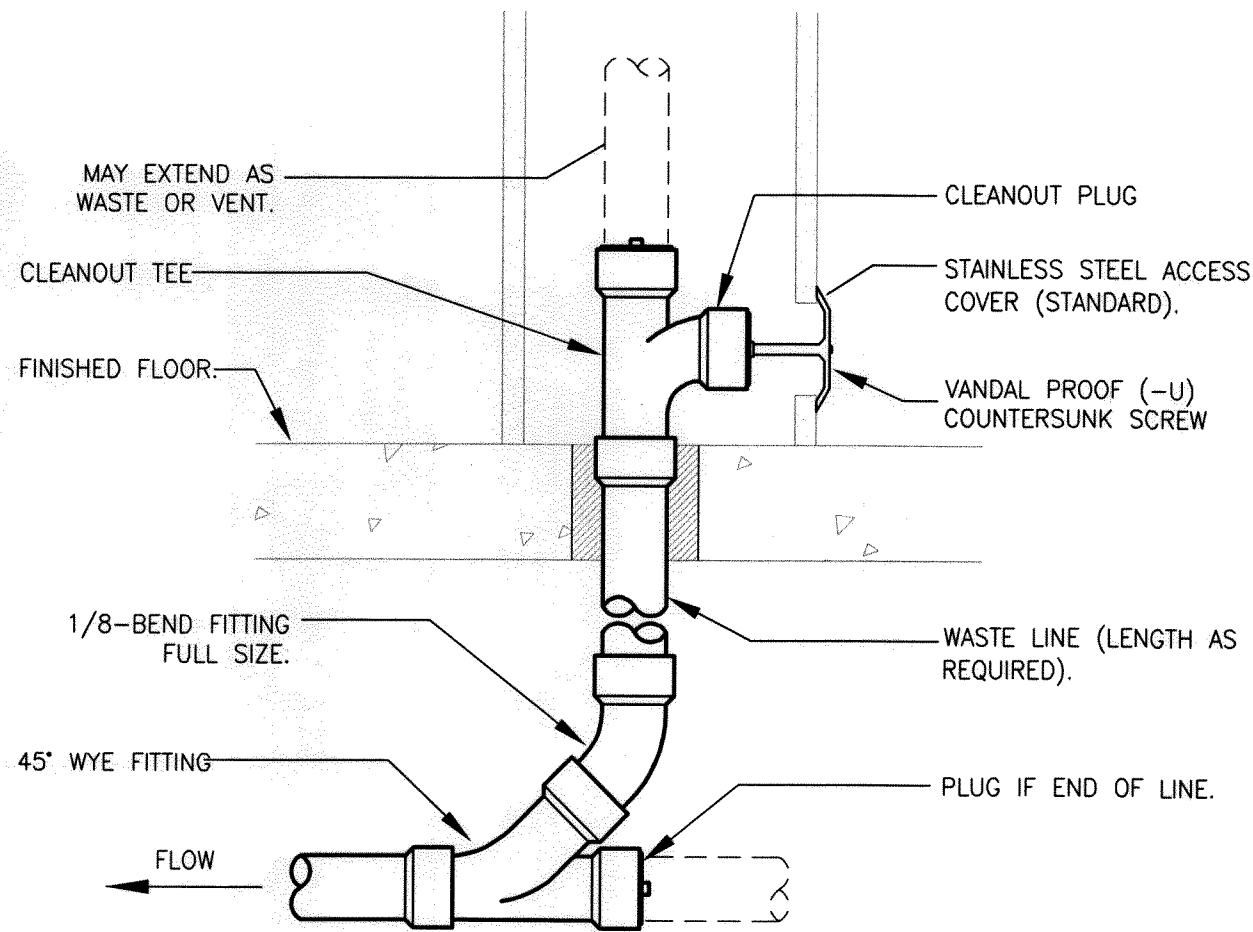
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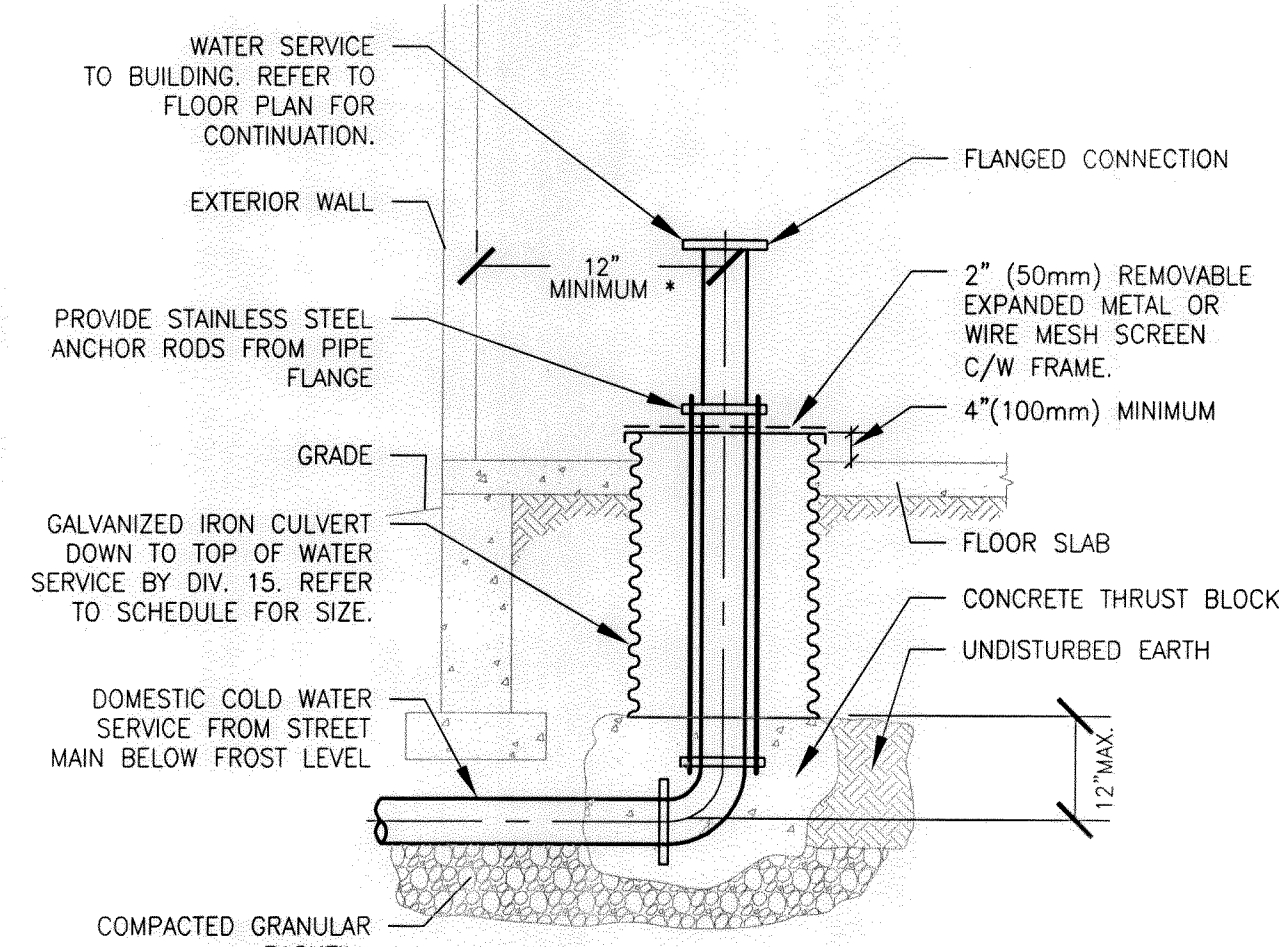
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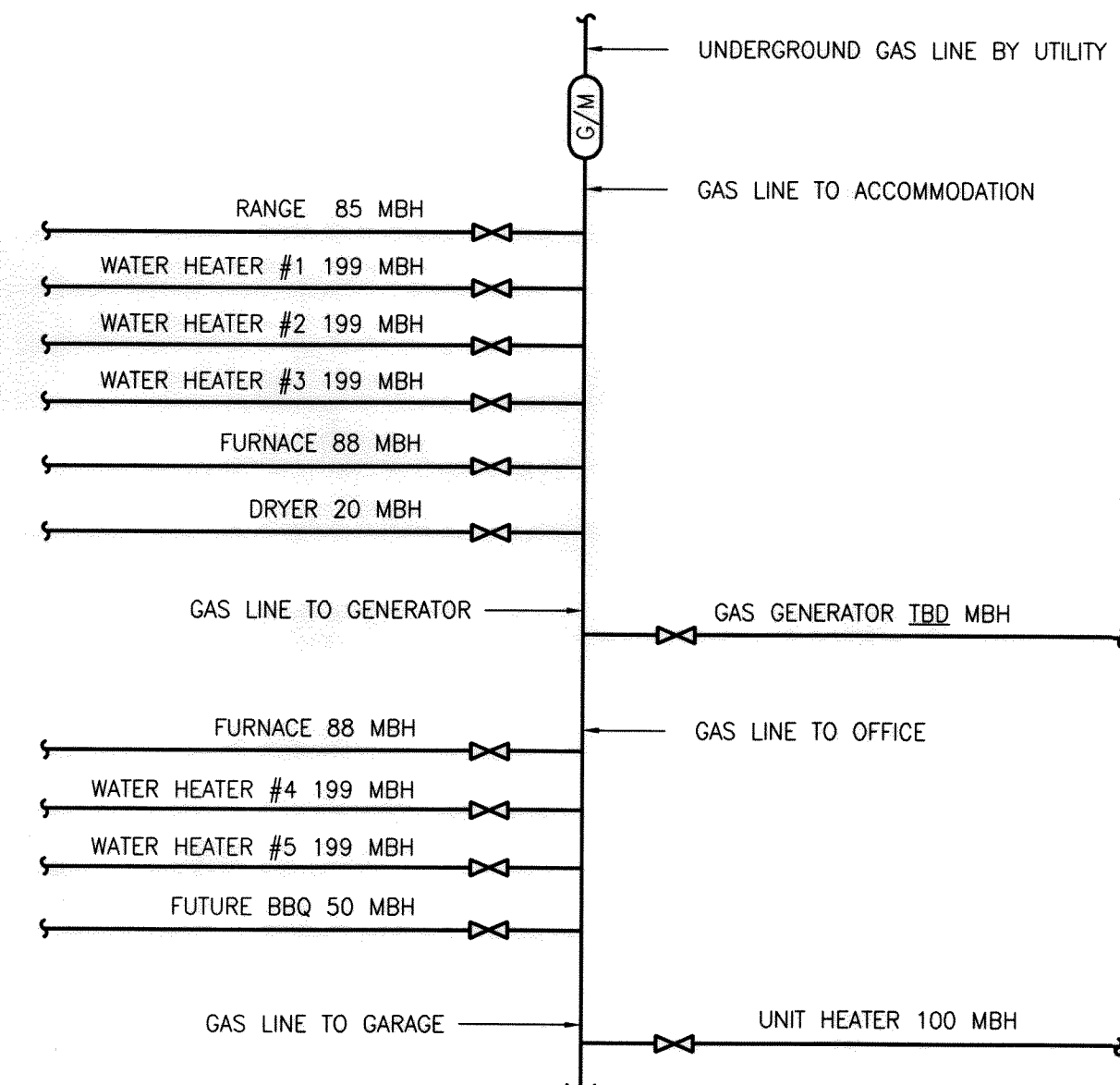
WATER SERVICE DETAIL
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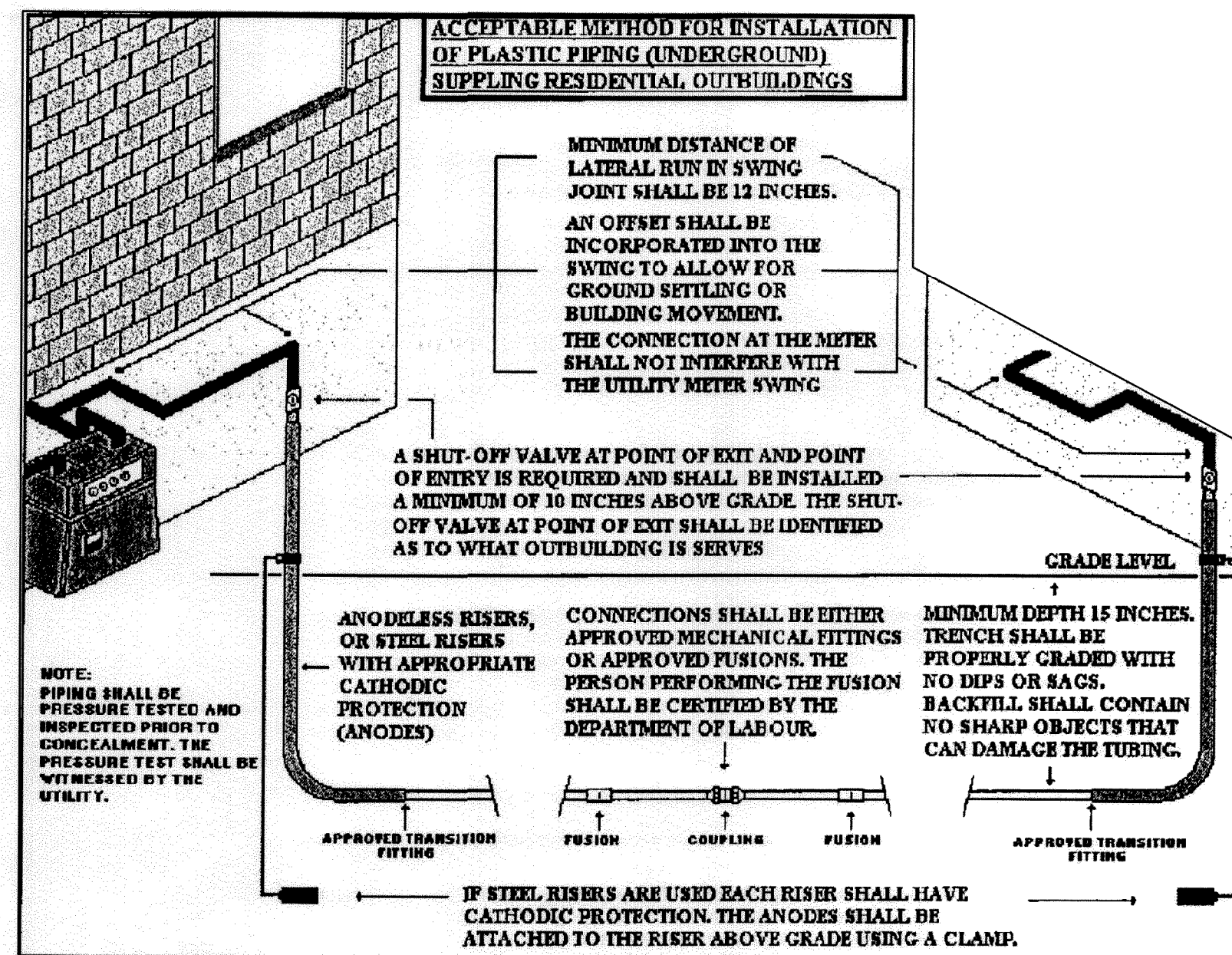
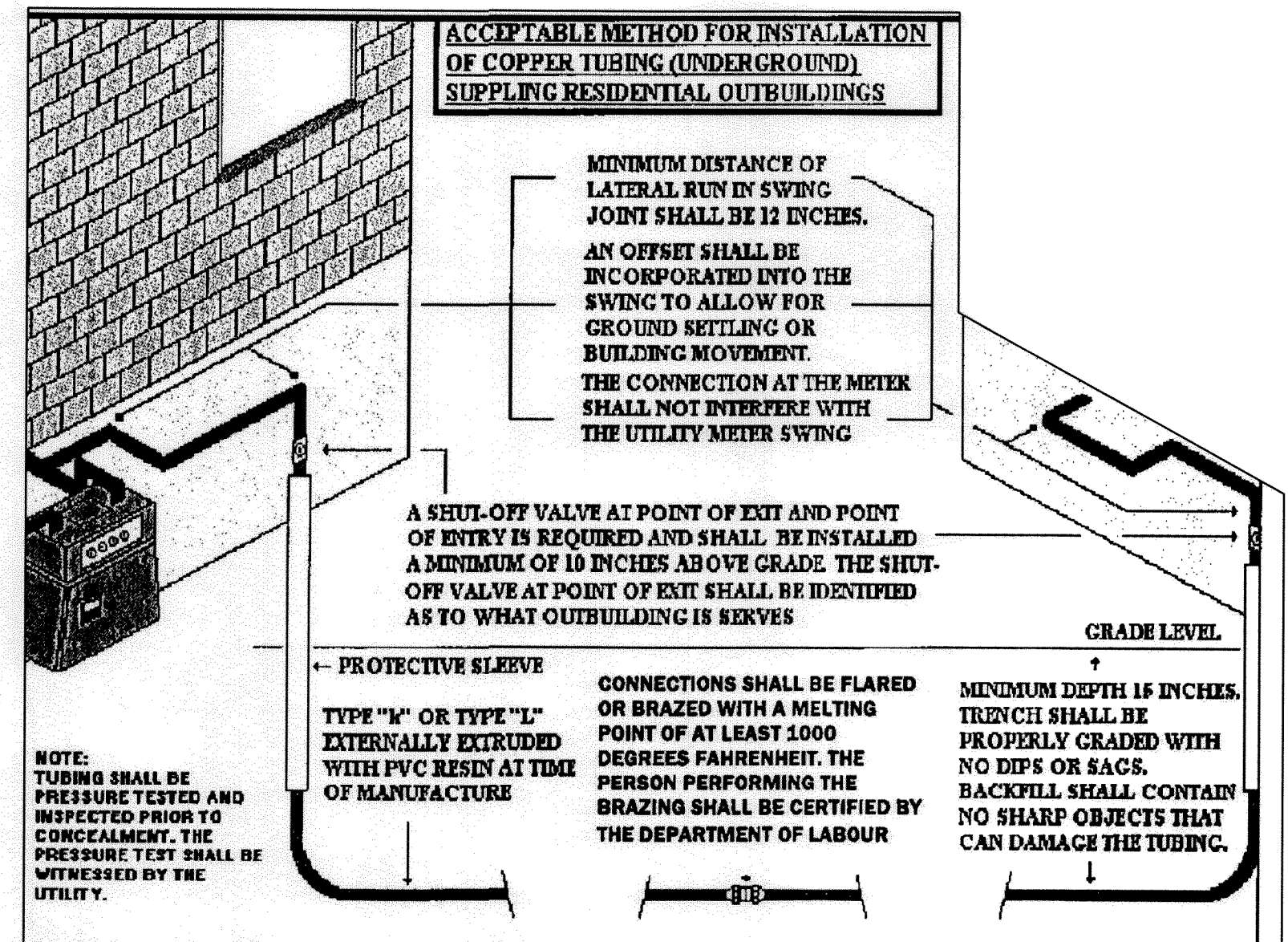
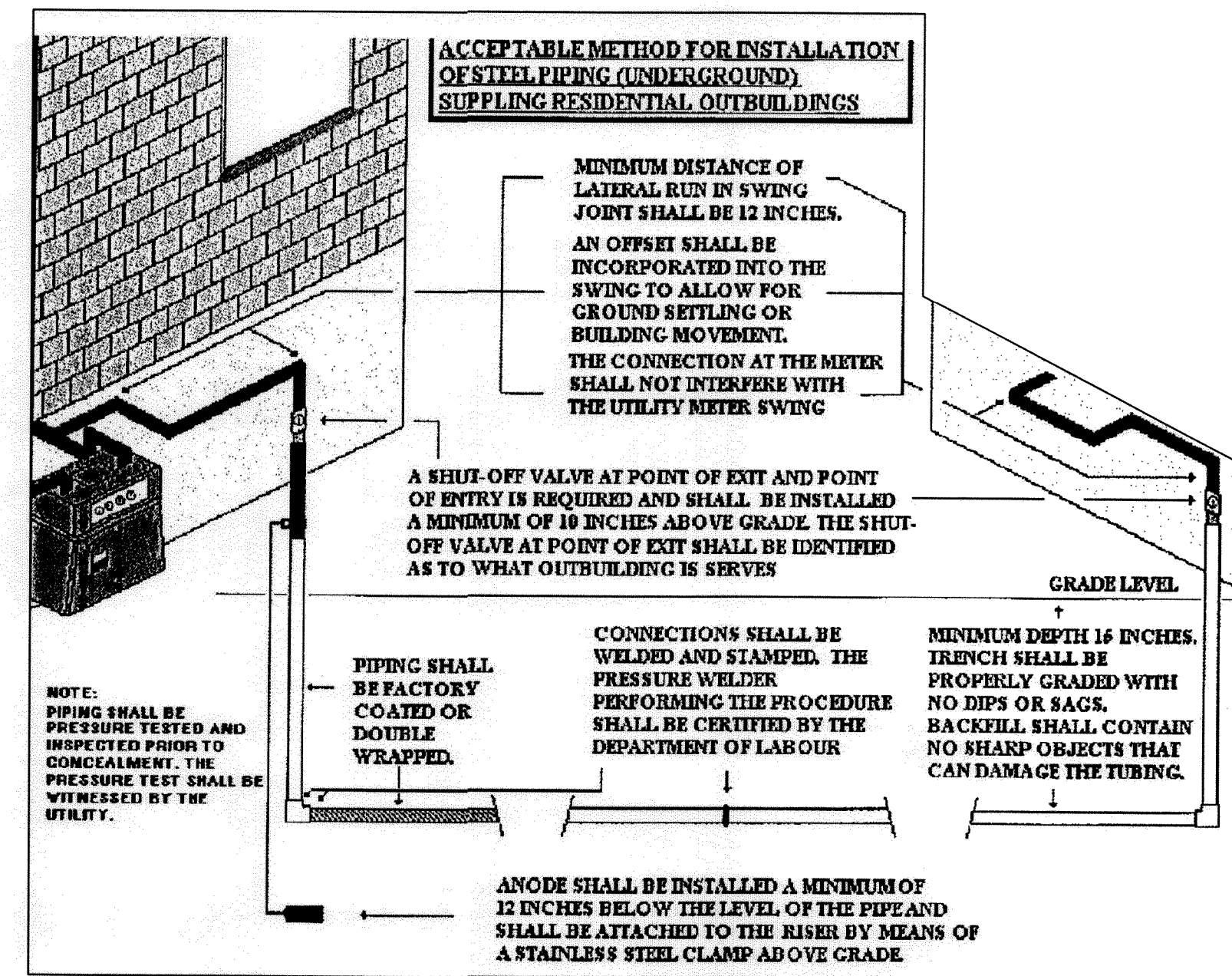
SANITARY DRAIN WALL CLEANOUT DETAIL
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WATER SERVICE FROST BOX DETAIL
SCALE: N.T.S.



NATURAL GAS LOADS
SCALE: N.T.S.



UNDERGROUND GAS LINE DETAILS
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Dec 20/16
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Certificate of Authorization
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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba
DRAWING TITLE
MECHANICAL DETAILS

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SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
M3.0	A	
CAD FILE: 161364 - M3.0 Mechanical Details.dwg	DRAWER NO.	

GENERAL SPECIFICATIONS

- THE BIDDERS SHALL EXAMINE THE SITE AND THE EXISTING CONDITIONS AFFECTING THE PROJECT. EXAMINE THE COMPLETE SET OF CONTRACT DOCUMENTS TO ENSURE THAT THE WORK CAN BE CARRIED OUT WITHOUT SIGNIFICANT CHANGES TO THE INTENT OF THE DOCUMENTS. NO FUTURE ALLOWANCE WILL BE MADE FOR CHANGES UNLESS THE ENGINEER HAS BEEN NOTIFIED IN WRITING OF ANY DISCREPANCIES OR INTERFERENCES, PRIOR TO THE CLOSE OF TENDERS. NO ALLOWANCE WILL BE MADE FOR ITEMS THAT SHOULD HAVE BEEN NOTED DURING A PRE-TENDER SITE INSPECTION.
- THE LOCATION, ROUTING AND ELEVATIONS OF ALL NEW AND EXISTING SERVICES AND UTILITIES AS SHOWN ON THE DRAWINGS ARE TO BE CONSIDERED AS APPROXIMATIONS ONLY. VERIFY THE EXACT LOCATIONS, ROUTINGS AND ELEVATIONS OF ALL SERVICES PRIOR TO COMMENCING WORK, AND ASSUME RESPONSIBILITY FOR LAYING OUT ALL WORK. THE CONTRACTOR SHALL RETAIN RESPONSIBILITY FOR ANY DAMAGE TO EXISTING SERVICES AND UTILITIES.
- ALL ASPECTS OF THE INSTALLATION MUST COMPLY WITH THE MOST STRINGENT OF THE APPLICABLE BUILDING CODES, LOCAL REGULATIONS, AND BY-LAWS. BEFORE PROCEEDING WITH THE WORK, OBTAIN APPROVED DRAWINGS AND SPECIFICATIONS FROM THE AUTHORITIES HAVING JURISDICTION.
- PROVIDE ALL NECESSARY NOTICES, OBTAIN ALL REQUIRED PERMITS, PAY ALL FEES REQUIRED BY LAW, AND ARRANGE FOR ALL INSPECTIONS RELATED TO THE PERFORMANCE OF THE SPECIFIED WORK.
- PROVIDE ALL MATERIALS, LABOUR AND EQUIPMENT REQUIRED TO COMPLETE THE WORK AS SHOWN AND AS SPECIFIED, SO AS TO LEAVE THE OWNER WITH A COMPLETE AND FUNCTIONING SYSTEM.
 - ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND C.S.A. APPROVED, UNLESS SPECIFICALLY NOTED OTHERWISE.
 - ALL SIMILAR EQUIPMENT AND OR MATERIALS SHALL BE BY THE SAME MANUFACTURER.
- REQUEST FOR APPROVAL OF SUBSTITUTE MATERIAL AND/OR EQUIPMENT FOR THAT SPECIFIED, SHALL BE SUBMITTED TO THE ENGINEER AT LEAST FIVE WORKING DAYS PRIOR TO TENDER CLOSING. REQUESTS SHALL INCLUDE ALL PERFORMANCE SPECIFICATIONS, PHYSICAL DATA, & OTHER PERTINENT INFORMATION REQUIRED FOR THE ENGINEER TO MAKE A COMPLETE COMPARISON.
- PROVIDE A MINIMUM OF SEVEN COPIES OF SHOP DRAWINGS FOR REVIEW BY THE ENGINEER. THE SHOP DRAWINGS MUST BE ASSEMBLED INTO COMPLETE BROCHURES, WITH NO LOOSE SHEETS. UNASSEMBLED SUBMISSIONS WILL BE RETURNED AS INCOMPLETE.
 - THE REVIEW OF THE SHOP DRAWINGS IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPT. THE REVIEW SHALL NOT MEAN APPROVAL OF THE DETAILED DESIGN INHERENT IN THE EQUIPMENT. THE RESPONSIBILITY FOR WHICH SHALL REMAIN WITH THE CONTRACTOR. THE REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REMAIN RESPONSIBLE FOR CONFIRMING AND CORRELATING THE DIMENSIONS ON THE JOBSITE, AND FOR INFORMATION THAT PERTAINS TO THE FABRICATION PROCESS, CONSTRUCTION TECHNIQUES, AND INSTALLATION DETAILS, AND FOR COORDINATING ALL WORK OF THE RELATED SUB-TRADES.
- ALL CUTTING AND PATCHING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. EXISTING EXPOSED SURFACES SHALL BE RETURNED TO AN "AS-FOUND" CONDITION ACCEPTABLE TO THE OWNER.
- EACH CONTRACTOR SHALL COORDINATE THE WORK WITH OTHER CONTRACTORS IN ORDER TO AVOID CONFLICTS.
- NEATLY STORE ALL MATERIALS, AND CLEAN UP REFUSE ON A REGULAR BASIS. PROTECT AND MAINTAIN ALL WORK UNTIL THE PROJECT HAS BEEN COMPLETED AND TURNED OVER TO THE OWNER.
- THE INSTALLATION SHALL BE COMPLETELY TESTED, DEMONSTRATING THAT THE EQUIPMENT AND SYSTEMS INSTALLED ARE PERFORMING IN THE MANNER INTENDED.
- AT THE COMPLETION OF THE INSTALLATION, PROVIDE TWO MARKED-UP COPIES OF THE TENDER DRAWINGS FOR RECORD PURPOSES. PROVIDE THREE SETS OF OPERATION AND MAINTENANCE MANUALS. PAY ALL COSTS ASSOCIATED WITH THE PRODUCTION OF THE "RECORD" DRAWINGS AND THE MANUALS. SUBMIT THE DOCUMENTS TO THE ENGINEER FOR REVIEW, AND MAKE ANY REQUESTED CHANGES BEFORE DELIVERING THEM TO THE OWNER.
- REVIEW THE OPERATION AND MAINTENANCE OF THE SYSTEMS WITH THE OWNER'S MAINTENANCE PERSONNEL AND PROVIDE WRITTEN AND/OR VERBAL INSTRUCTIONS AS REQUIRED.
- FURNISH CERTIFICATES CONFIRMING THAT THE WORK HAS BEEN INSTALLED TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
 - NO CERTIFICATE ISSUED, PAYMENT MADE, OR PARTIAL OR ENTIRE USE OF THE SYSTEMS BY THE OWNER, SHALL BE CONSTRUED AS ACCEPTANCE OF DEFECTIVE WORK OR MATERIALS.
- THE CONTRACTOR SHALL PROVIDE A ONE YEAR LABOUR AND MATERIAL WARRANTY ON ALL NEW EQUIPMENT AND COMPONENTS, COMMENCING UPON THE DATE OF ACCEPTANCE BY THE OWNER.
 - REPLACE AT NO CHARGE TO THE OWNER, ALL ITEMS WHICH FAIL OR PROVE DEFECTIVE WITHIN A PERIOD OF ONE YEAR AFTER THE DATE OF FINAL ACCEPTANCE BY THE OWNER, PROVIDED THAT THE FAILURE IS NOT DUE TO IMPROPER USAGE BY THE OWNER. MAKE GOOD ALL DAMAGES INCURRED AS A RESULT OF THE FAILURE AND OF THE REPAIRS.
- PROVIDE TEMPORARY HEATING AS REQUIRED. DO NOT USE NEW EQUIPMENT FOR THIS PURPOSE WITHOUT THE EXPRESS CONSENT OF THE ENGINEER.
- SCHEDULING OF ALL WORK SHALL BE ARRANGED WITH THE OWNER. COORDINATE THE SHUT-DOWN OF EXISTING UTILITIES AND SERVICES AS REQUIRED FOR CONNECTIONS OF NEW WORK. WORK WITHIN THE BUILDING MAY HAVE TO BE PERFORMED DURING NON-REGULAR HOURS, AND MUST CONFORM TO THE WORK RULES OF THE BUILDING, AS DIRECTED BY THE OWNER.
- THE DRAWINGS FOR THE MECHANICAL WORK ARE PERFORMANCE DRAWINGS, DIAGRAMMATIC AND APPROXIMATELY TO SCALE, INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE LOCATIONS OF APPARATUS, FIXTURES AND PIPE/DUCT RUNS. THESE DRAWINGS DO NOT INTEND TO SHOW ARCHITECTURAL AND STRUCTURAL DETAILS.
- EVEN THOUGH SOME PIPING AND/OR DUCTWORK IS NOT COMPLETELY SHOWN SCHEMATICALLY, AND ALL DETAILS ARE NOT SHOWN OR SPECIFIED, IT IS EXPECTED THAT THE CONTRACTORS BE FAMILIAR ENOUGH WITH THEIR FIELDS OF WORK TO COMPLETE THE PROJECT TO THE STANDARDS GENERALLY ADHERED TO BY THE LOCAL INDUSTRY, INCLUDING GOOD WORKMANSHIP AND COMMON SENSE. THE ENGINEER RESERVES THE RIGHT TO FURNISH ANY ADDITIONAL DETAIL DRAWINGS, WHICH IN THE JUDGEMENT OF THE ENGINEER, MAY BE NECESSARY TO CLARIFY THE WORK, AND SUCH DRAWINGS SHALL FORM PART OF THIS CONTRACT. THE WORK FOR SUCH CLARIFICATIONS SHALL BE AT NO COST TO THE OWNER.

MECHANICAL SPECIFICATIONS

SECTION 21.05.01 - GENERAL

- PROVIDE ONE SET OF SPECIAL TOOLS REQUIRED TO SERVICE EQUIPMENT, AS RECOMMENDED BY THE MANUFACTURERS/SUPPLIERS.
- PROVIDE OI-ELECTRIC COUPLINGS WHEREVER PIPES OF DISSIMILAR METALS ARE JOINED.
- HOISTING AND PLACING OF MECHANICAL EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE SUB-CONTRACTOR PROVIDING THE EQUIPMENT.
- PIPE HANGERS SHALL BE GRINNELL FIGURE 65 FOR STEEL PIPE AND FIGURE CP65 FOR COPPER PIPE, WITH FIGURE 140 THREADED ROD. THREADED ROD SHALL BE ATTACHED TO FIGURE 117 EXPANSION CASE SET IN HOLES DRILLED IN CONCRETE, OR ATTACHED TO FIGURE 225 OR FIGURE 227 CLAMP ATTACHED TO ROOF/FLOOR JOISTS. FOR INSULATED PIPING, PROVIDE FIGURE 167 PROTECTION SADDLES. SIZE HANGERS AND SADDLES TO SUIT INDIVIDUAL PIPE SIZES, INCLUDING INSULATION WHERE APPLICABLE.
- USE THE FOLLOWING SCHEDULE FOR MINIMUM HANGING STANDARDS FOR HORIZONTAL PIPING:

SIZE	ROD DIAMETER	MAXIMUM SPACING
1-1/4" (32mm) AND SMALLER	3/8" (10mm)	3'-0" (900mm)
1-1/2" (38mm) AND 2" (50mm)	3/8" (10mm)	10'-0" (3000mm)

2-1/2" (65mm) AND 3" (75mm)	1/2" (12mm)	12'-0" (3600mm)
4" (100 mm) AND 5" (125mm)	5/8" (16mm)	12'-0" (3600mm)
6" (150 mm)	3/8" (10mm)	12'-0" (3600mm)
1" (25mm) AND SMALLER	3/8" (10mm)	6'-0" (1800mm)
1-1/4" (32mm) AND 2" (50mm)	3/8" (10mm)	10'-0" (3000mm)

COPPER PIPE

SIZE	ROD DIAMETER	MAXIMUM SPACING
1" (25mm) AND SMALLER	3/8" (10mm)	6'-0" (1800mm)
1-1/4" (32mm) AND 2" (50mm)	3/8" (10mm)	10'-0" (3000mm)

SECTION 21 07 01 - THERMAL INSULATION

PART 1 GENERAL

- WORK PERFORMED UNDER THIS SECTION**
 - SUPPLY AND INSTALLATION OF EXTERNAL THERMAL INSULATION FOR NEW PIPING, DUCTWORK, AND EQUIPMENT.
 - PROVIDE INSULATION ON THE FOLLOWING SYSTEMS:
 - ALL NEW DOMESTIC COLD WATER LINES.
 - ALL NEW DOMESTIC HOT WATER SUPPLY LINES.
 - ALL NEW & EXISTING OUTSIDE/FRESH AIR DUCTWORK AND PLENUMS.
 - ALL NEW EXHAUST AIR DUCTWORK (10'-0" BACK OF BUILDING THERMAL ENVELOPE WITHIN BUILDING).
 - ALL NEW MISCELLANEOUS DRAIN LINES.
 - ALL NEW MIXED & SUPPLY AIR DUCTWORK PLENUMS & RUN-OUTS.
 - ALL NEW REFRIGERANT LINES.
 - PROVIDE COVERING OF INSULATION MATERIALS, IE. CANVAS, ALUMINUM, OR PVC JACKETING WHERE SPECIFIED.
 - PREPARE INSULATION SURFACES TO RECEIVE PRIMER AND FINISH PAINTING.
 - INSULATION PROTECTION SHIELDS SHALL NOT BE USED.
 - INSULATE BETWEEN PROTECTION SADDLES AND PIPING.
 - ALL FINAL PIPE AND DUCT INSTALLATIONS INCLUDING INSULATION, COVERING AND ADHESIVE SHALL HAVE A FLAME SPREAD RATING OF NOT GREATER THAN 25.
- REFERENCE STANDARDS**
 - CONFORM WITH THE REQUIREMENTS OF THE PLANS AND SPECIFICATION, THE LOCAL AUTHORITIES HAVING JURISDICTION, AND THE LOCAL BUILDING CODES. IN THE CASE OF CONFLICTING REQUIREMENTS, BE GOVERNED BY THE MOST SEVERE REGULATIONS.
 - CONFORM TO THE MANITOBA ENERGY CODE FOR BUILDINGS (MECB), WHERE ANY DISCREPANCIES SHALL ARISE BETWEEN THIS SPECIFICATION & THE MECB, THE MECB SHALL TAKE PRECEDENCE.
 - USE LATEST EDITION OF ALL REFERENCED CODES, STANDARDS, REGULATIONS, ETC.
- ENVIRONMENTAL REQUIREMENTS**
 - THE VOC CONTENT OF THE ADHESIVES, SEALANTS AND SEALANT PRIMERS USED MUST BE LESS THAN THE VOC CONTENT LIMITS OF THE STATE OF CALIFORNIA'S SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE #1168, OCTOBER 2003.
 - ADHESIVES MUST CONTAIN NO UREA-FORMALDEHYDE.
- SAMPLES**
 - IF REQUESTED BY ADMINISTRATIVE AUTHORITY OR ARCHITECT, SUPPLY COMPLETE ASSEMBLY OF EACH TYPE OF INSULATION SYSTEM, ON 25 MM PLYWOOD BOARD. AFFIX TYPEWRITTEN LABEL BENEATH SAMPLE INDICATING SERVICE.
- QUALITY ASSURANCE**
 - QUALIFICATIONS: EXECUTE WORK OF THIS SECTION ONLY BY SKILLED TRADESMEN REGULARLY EMPLOYED IN THE APPLICATION OF INSULATION OF MECHANICAL SYSTEMS.
- DEFINITIONS**
 - THE TERM 'MINERAL FIBRE' INCLUDES GLASS FIBRE, MINERAL WOOL, SLAG WOOL.
 - THE TERM 'TIAC' AND 'TIAC CODES' REFERS TO THE 'THERMAL INSULATION ASSOCIATION OF CANADA' AND THEIR ASSOCIATED 'NATIONAL INSULATION STANDARDS'.
 - THE WORD 'EXPOSED' WHERE USED IN THIS SECTION MEANS ANY WORK WHICH IS NOT CONCEALED IN WALLS, SHAFTS, CAVITIES, CEILING OR CRAWLSPACES.
 - WORK BEHIND DOORS, IN CLOSETS OR CUPBOARDS, OR UNDER COUNTERS IS CONSIDERED EXPOSED.
 - WORK IN MECHANICAL AND BOILER ROOMS IS CONSIDERED EXPOSED.
 - THE WORD 'CONCEALED' WHERE USED IN THIS SECTION MEANS ANY WORK IN SUSPENDED CEILING AND NON-ACCESSIBLE CHASES AND FURRED-IN SPACES.
 - THE TERM 'COLD PIPING' REFERS TO THE FOLLOWING SYSTEMS: CHILLED WATER, WELL/GROUND WATER, DOMESTIC COLD WATER, PLUMBING VENTS, CONDENSATE DRIP DRAINS, AND ANY PIPE WITHIN 2400 MM (8'-0") OF AN EXTERIOR WALL OR ROOF PENETRATION.
 - THE TERM 'HOT PIPING' REFERS TO DOMESTIC HOT WATER SUPPLY AND RECIRC PIPING, TEMPERED WATER SUPPLY AND RECIRC PIPING, HIGH TEMPERATURE DOMESTIC HOT WATER SUPPLY AND RECIRC PIPING, STEAM AND STEAM CONDENSATE PIPING, GLYCOL SUPPLY AND RETURN PIPING, AND HEATING WATER SUPPLY AND RETURN PIPING.
- SHOP DRAWINGS**
 - SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH SECTION 15100.
 - IN ADDITION TO ITEMS NOTED IN SECTION 15100, SUBMIT MANUFACTURER'S CATALOGUE INFORMATION RELATING TO THE FOLLOWING:
 - INSTALLATION TECHNIQUES FOR PIPE, FITTINGS AND VALVES.
 - JOINTING RECOMMENDATIONS.
 - RECOMMENDED ADHESIVES.

PART 2 PRODUCTS AND MATERIALS

- GENERAL**
 - FIRE AND SMOKE RATING:
 - IN ACCORDANCE WITH CAN/ULC-S102
 - MAXIMUM FLAME SPREAD RATING: 25
 - MAXIMUM SMOKE DEVELOPED CLASSIFICATION: 50
 - THERMAL CONDUCTIVITY ('K' FACTOR) SHALL NOT EXCEED SPECIFIED VALUES AT 240C (750F) MEAN TEMPERATURE WHEN TESTED IN ACCORDANCE WITH ASTM C335.
- MATERIALS**
 - MEET NFPA STANDARD 90A-1990, AND 255-1990: UL-723-1971 AND 465-1972 UNLESS NON-CONFORMING MATERIALS HAVE BEEN APPROVED BY THE MUNICIPALITY FOR SPECIAL APPLICATIONS AND MEET WITH THE ACCEPTANCE OF THE ARCHITECT.
 - UNDERWRITERS' LABORATORIES OF CANADA LABEL OR SATISFACTORY CERTIFIED REPORT FROM APPROVED TESTING LABORATORY IS REQUIRED TO INDICATE THAT FIRE HAZARD RATINGS OF MATERIALS PROPOSED FOR USE DO NOT EXCEED THOSE SPECIFIED.
 - FLAME-PROOFING TREATMENTS SUBJECT TO DETERIORATION DUE TO EFFECTS OF HIGH HUMIDITY ARE NOT ACCEPTABLE.

- ARCHITECT RESERVES RIGHT TO DEMAND TEST SAMPLES OF INSULATION SYSTEMS AND INDIVIDUAL SYSTEM COMPONENTS FOR FIRE HAZARD TEST RATING. BE RESPONSIBLE FOR COST OF ALL TESTING.
- COMPATIBILITY OF COMPONENTS**
 - PROVIDE ADHESIVES, SEALERS, VAPOUR COATING, MASTICS, LAGGINGS AND BEDDING COMPOUNDS, WHICH ARE COMPATIBLE WITH MATERIALS TO WHICH THEY ARE APPLIED. USE COMPONENTS WHICH SHALL NOT SOFTEN, CORRODE OR OTHERWISE ATTACK OTHER COMPONENT MATERIAL IN EITHER WET OR DRY STATE. USE MATERIALS RECOMMENDED BY MANUFACTURER OF INSULATION AS SUITABLE FOR APPLICATION PROPOSED. APPLY ALL MATERIALS WITHIN AMBIENT TEMPERATURES RECOMMENDED BY MANUFACTURER.
- STANDARD OF ACCEPTANCE**
 - INSULATION MATERIALS: ONLY MATERIALS CONFORMING TO PARAGRAPH 2.1 & 2.2 ARE ACCEPTABLE FOR USE ON THIS PROJECT.
 - COATINGS, SEALERS AND ADHESIVES: BENJAMIN FOSTER CO.; MINNESOTA MINING AND MFG. OF CANADA LTD.; THE FLINTKOTE CO.; JACOB AND THOMPSON; DURO-DYNE.
 - CAULKING COMPOUND: THE TREMCO MANUFACTURING CO.; THOKOL; CANADIAN HANSON & VAN WINKLE CO. LTD.; BENJAMIN FOSTER CO.
 - TAPE: ARNO DR. SCHOOL'S TAPE DIVISION; 3M; DURO-DYNE.
 - PREFABRICATED FITTING AND EQUIPMENT INSULATION, DEMOUNTABLE: INSULACOUSTICS LTD., OTTAWA.
 - INSULATION: PREFORMED FIBERGLASS - KNAUF, ARMSTRONG, ARMAFLEX OR EQUAL AS MANUFACTURED BY IMCOA.

- PREFORMED PIPE INSULATION FOR COLD PIPING**
 - PROVIDE SECTIONAL RIGID MINERAL FIBRE PIPE INSULATION IN PREFORMED SECTIONS 900 MM (36") LONG; SPLIT AND READY FOR APPLICATION; WITH A MAXIMUM 'K' FACTOR OF 0.035 AT 240C (750F) MEAN TEMPERATURE, AND BE CAPABLE OF USE ON SERVICE FROM -400C (-400F TO 5000F); AND WITH FACTORY APPLIED VAPOUR SEAL JACKET OF FOIL CRAFT LAMINATE WITH REINFORCING OF OPEN MESH GLASS FIBRE, AND WITH LAP SEAL ADHESIVE.
 - TIAC CODE: A3
- PREFORMED PIPE INSULATION FOR HOT PIPING**
 - PROVIDE SECTIONAL RIGID MINERAL FIBRE PIPE INSULATION IN PREFORMED SECTIONS 900 MM (36") LONG; SPLIT AND READY FOR APPLICATION; WITH A MAXIMUM 'K' FACTOR OF 0.035 AT 240C (750F) MEAN TEMPERATURE, AND BE CAPABLE OF USE ON SERVICE FROM -400C TO 2600C (-400F TO 5000F); AND WITH FACTORY APPLIED ALL SERVICE JACKET OF PAPER WITH REINFORCING OF OPEN MESH GLASS FIBRE, AND WITH LAP SEAL ADHESIVE.
 - TIAC CODE: A3

- INSULATION FOR SERVICE HOT WATER PIPING**
 - ALL HOT SERVICE WATER PIPING IN CIRCULATING SYSTEMS, NON-CIRCULATING SYSTEMS W/O HEAT TRAPS, & NON-CIRCULATING SYSTEMS W/ ELECTRIC HEATING ELEMENTS ALONG THE PIPES TO MAINTAIN TEMPERATURE SHALL BE THERMALLY INSULATED IN ACCORDANCE WITH TABLE 6.2.3.1 FROM THE MECB, SHOWN BELOW.

TABLE 6.2.3.1. (MECB)
MINIMUM PIPE INSULATION THICKNESS FOR SERVICE HOT WATER SYSTEMS

PIPING LOCATION	INSULATION CONDUCTIVITY RANGE (W/m ² °C)	MEAN RATING TEMPERATURE (°C)	NOMINAL PIPE DIAMETER, INCH (MM)	MINIMUM PIPE INSULATION THICKNESS (MM) ⁽¹⁾
CONDITIONED SPACE	0.035-0.040	38	RUNOUTS ⁽¹⁾ ≤ 2 (51)	25.4
			≤ 1 (25.4)	
			1-1/4 TO 2 (32 TO 51)	
			2-1/2 TO 4 (64 TO 102)	
			≤ 5 (127)	
NON-CONDITIONED SPACE OR OUTSIDE	0.046-0.049	121	RUNOUTS ⁽¹⁾ ≤ 2 (51)	38.1
			≤ 1 (25.4)	
			1-1/4 TO 2 (32 TO 51)	
			2-1/2 TO 4 (64 TO 102)	
			≤ 5 (127)	

- (1) APPLIES TO RE-CIRCULATING SECTIONS OF SERVICE HOT WATER SYSTEMS AND THE FIRST 2.4M FROM STORAGE TANKS FOR NON-RE-CIRCULATING SYSTEMS.
- WHERE PIPE INSULATION HAS A THERMAL CONDUCTIVITY OF MORE THAN THE RANGE GIVEN IN TABLE 6.2.3.1 ABOVE, THE THICKNESS GIVEN IN THE TABLE SHALL BE INCREASED BY THE RATIO U1/U2, WHERE U1 IS THE HIGHER END OF THE CONDUCTIVITY RANGE FOR THE OPERATING TEMPERATURE AND U2 IS THE MEASURED THERMAL CONDUCTIVITY OF THE INSULATION AT THE MEAN RATING TEMPERATURE.
 - WHERE PIPE INSULATION HAS A THERMAL CONDUCTIVITY OF LESS THAN THE RANGE GIVEN IN TABLE 6.2.3.1 ABOVE, THE THICKNESS GIVEN IN THE TABLE SHALL BE DECREASED BY THE RATIO U1/U2, WHERE U1 IS THE LOWER END OF THE CONDUCTIVITY RANGE FOR THE OPERATING TEMPERATURE AND U2 IS THE MEASURED THERMAL CONDUCTIVITY OF THE INSULATION AT THE MEAN RATING TEMPERATURE.
 - THE THERMAL CONDUCTIVITY OF PIPE INSULATION AT THE MEAN RATING TEMPERATURE SHALL BE DETERMINED IN CONFORMANCE WITH ASTM C 335, 'STANDARD TEST METHOD FOR STEADY-STATE HEAT TRANSFER PROPERTIES OF HORIZONTAL PIPE INSULATION'.
 - ON NON-CIRCULATING SYSTEMS WITH HEAT TRAPS, THE INLET & OUTLET PIPING BETWEEN THE STORAGE OR HEATING VESSEL AND THE HEAT TRAPS, AND THE FIRST 2.4M OF OUTLET PIPING DOWNSTREAM OF THE HEAT TRAP, SHALL BE INSULATED IN ACCORDANCE WITH TABLE 6.2.3.1. ABOVE AND SENTENCES 4 TO 6 OF SECTION 2.3 ABOVE.
 - INSULATION FOR DUCTWORK**
 - ALL AIR-HANDLING DUCTS, PLENUMS, & RUN-OUTS FORMING PART OF AN HVAC SYSTEM SHALL BE THERMALLY INSULATED IN ACCORDANCE WITH TABLE 5.2.2.5 FROM THE MECB SHOW BELOW. EXHAUST DUCTS & RETURN DUCTS/PLENUMS LOCATED WITHIN CONDITIONED SPACE NEED NOT COMPLY.

TABLE 5.2.2.5. (MECB)
INSULATION OF DUCTS

TEMPERATURE DIFFERENCE ⁽¹⁾ (°C)	MIN. THERMAL RESISTANCE FOR DUCTS & PLENUMS (m ² C/W)	MIN. THERMAL RESISTANCE FOR RUNOUTS ⁽²⁾ (m ² C/W)
<5	0	0
5 TO 22	0.58	0.58
>22	0.88	0.58

- Notes to Table 5.2.2.5:
(1) THE TEMPERATURE DIFFERENCE AT DESIGN CONDITIONS BETWEEN THE SPACE WITHIN THE DUCT IS LOCATED & THE DESIGN AIR TEMPERATURE OF THE AIR CARRIED BY THE DUCT. WHERE A DUCT IS USED FOR BOTH HEATING & COOLING PURPOSES, THE LARGER TEMPERATURE DIFFERENCE SHALL BE USED.
(2) DUCTS NOT EXCEEDING 3M IN LENGTH CONNECTING TO TERMINAL GRILLES OR DIFFUSERS.
- EXHAUST DUCTS, RETURN DUCTS, & PLENUMS LOCATED WITHIN CONDITIONED SPACE NEED NOT COMPLY WITH SENTENCE 1.
 - DUCTS & PLENUMS LOCATED WITHIN CONDITIONED SPACE IN A DWELLING UNIT & SERVING ONLY THAT DWELLING UNIT NEED NOT COMPLY WITH SENTENCE 1.
 - EXCEPT FOR RELIEF & OUTSIDE AIR DUCTS ALL AIR-HANDLING DUCTS & PLENUMS FORMING PART OF A HVAC SYSTEM THAT ARE LOCATED OUTSIDE THE BUILDING ENVELOPE SHALL BE INSULATED TO THE SAME LEVEL AS REQUIRED FOR WALLS IN SUBSECTION 3.2.2 OF THE MECB.
 - INSULATION MATERIAL REQUIRED AS NOTED ABOVE SHALL BE INSTALLED IN ACCORDANCE WITH GOOD PRACTICE, SUCH AS DESCRIBED IN 'TIAC NATIONAL INSULATION STANDARDS', PUBLISHED BY THE THERMAL INSULATION ASSOCIATION OF CANADA.
 - EXPOSED RECTANGULAR:
 - 48 KG/M³ (3.0 LBS/FT³) DENSITY PER 25 MM (1") THICKNESS, FOIL FACED FIBREGLASS BOARD. (TIAC CODE: C1).
 - OR-
 - 12 KG/M³ (0.75 LBS/FT³) DENSITY PER 25 MM (1") THICKNESS, FLEXIBLE MINERAL FIBRE BLANKET WITH OPEN MESH, GLASS FIBRE REINFORCED, FOIL FACING (TIAC CODE C2).
 - CONCEALED RECTANGULAR:
 - 48 KG/M³ (3.0 LBS/FT³) DENSITY PER 25 MM (1") THICKNESS, FOIL FACED RIGID MINERAL FIBRE BOARD (TIAC CODE: C1).
 - OR-
 - 12 KG/M³ (0.75 LBS/FT³) DENSITY PER 25 MM (1") THICKNESS, FLEXIBLE MINERAL FIBRE BLANKET WITH OPEN MESH, GLASS FIBRE REINFORCED, FOIL FACING (TIAC CODE C2).
 - ROUND DUCTWORK:
 - 12 KG/M³ (0.75 LBS/FT³) DENSITY PER 25 MM (1") THICKNESS, FLEXIBLE MINERAL FIBRE BLANKET WITH OPEN MESH, GLASS FIBRE REINFORCED, FOIL FACING (TIAC CODE C2).
 - DUCTWORK EXPOSED TO OUTDOORS OR HANDLING OUTDOOR AIR:
 - 48 KG/M³ (3.0 LBS/FT³) DENSITY PER 25 MM (1") THICKNESS, FOIL FACED RIGID MINERAL FIBRE BOARD (TIAC CODE C1).

- INSULATION FOR EQUIPMENT**
 - WATER METERS, ROOF DRAIN BODIES, DOMESTIC COLD WATER BOOSTER PUMPS, AND CHILLED WATER PUMPS: 12 KG/M³ (0.75 LBS/FT³) DENSITY PER 25 MM (1" MESH, GLASS FIBRE REINFORCED, FOIL FACING. 3" THICKNESS, FLEXIBLE FIBREGLASS BLANKET WITH OPEN -OR- CLOSED CELL RUBBER (UNICELLULAR ELASTOMER) FLEXIBLE BLANKET
- MISCELLANEOUS APPLICATIONS**
 - PROVIDE 'TRAP-WRAP' OR EQUAL INSULATION ON ALL P-TRAPS ON ALL LAVATORIES, WHETHER NOTED AS HANDICAP ACCESSIBLE OR NOT.
 - NOT REQUIRED WHERE LAV IS FED BY TEMPERED WATER.
 - REFRIGERANT SYSTEMS:
 - PREFORMED, CLOSED CELL RUBBER (UNICELLULAR TUBULAR ELASTOMER) PIPE INSULATION, WITH LAP SEAL ADHESIVE.
 - TIAC CODE: A6
 - EQUAL TO ARMAFLEX OR IMCOLOCK
- JACKETES**
 - POLYVINYL CHLORIDE (PVC):
 - ONE-PIECE MOULDED TYPE AND SHEET TO CAN/CO58-51.53
 - WITH PREFORMED SHAPES FOR PIPING AS REQUIRED.
 - COLOURS: WHITE.
 - MINIMUM SERVICE TEMPERATURES: -20°C.
 - MAXIMUM SERVICE TEMPERATURE: 65°C.
 - MOISTURE VAPOUR TRANSMISSION: 0.02 PERM.
 - FASTENINGS:
 - USE SOLVENT WELD ADHESIVE COMPATIBLE WITH INSULATION TO SEAL LAPS AND JOINTS.
 - TACKS.
 - PRESSURE SENSITIVE VINYL TAPE OF MATCHING COLOUR.
 - SPECIAL REQUIREMENTS:
 - OUTDOOR: UV RATED MATERIAL AT LEAST 0.5 MM THICK.

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PROJECT TITLE
Gimli Search & Rescue Station

DRAWING TITLE
MECHANICAL SPECIFICATIONS

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2.12 INSULATION SECUREMENT

- 1 TAPE: SELF-ADHESIVE, ALUMINUM, REINFORCED, 50 MM WIDE MINIMUM.
2 CONTACT ADHESIVE: QUICK SETTING.
3 CANVAS ADHESIVE: WASHABLE.
4 TIE WIRE: 1.5 MM DIAMETER STAINLESS STEEL.
5 BANDS: STAINLESS STEEL, 19 MM WIDE, 0.5 MM THICK.
6 FASTENERS FOR DUCTWORK: 2 MM DIAMETER PINS WITH 35 MM SQUARE CLIPS, LENGTH TO SUIT THICKNESS OF INSULATION.

2.13 CEMENT

- 1 THERMAL INSULATING AND FINISHING CEMENT:
.1 HYDRAULIC SETTING OR AIR DRYING ON MINERAL WOOL, TO ASTM C449/C449M.

2.14 VAPOUR RETARDER LAP ADHESIVE

- 1 WATER BASED, FIRE RETARDANT TYPE, COMPATIBLE WITH INSULATION.
2 INDOOR VAPOUR RETARDER MASTIC

2.15 VINYL EMULSION TYPE ACRYLIC, COMPATIBLE WITH INSULATION.

2.16 OUTDOOR VAPOUR RETARDER MASTIC

- 1 VINYL EMULSION TYPE ACRYLIC, COMPATIBLE WITH INSULATION.
2 REINFORCING FABRIC: FIBROUS GLASS, UNTREATED 305 G/M2.

PART 3 INSTALLATION AND EXECUTION

3.1 INSTALLATION - GENERAL

- 1 INSTALL USING MANUFACTURERS RECOMMENDED INSTRUCTIONS.
2 INSTALL IN ACCORDANCE WITH TIAC NATIONAL STANDARDS.
3 PRE-INSTALLATION REQUIREMENTS
.1 PRESSURE TESTING OF PIPE AND DUCTWORK SYSTEMS AND ADJACENT EQUIPMENT IS COMPLETE, WITNESSED AND CERTIFIED.
.2 DO NOT INSULATE DUCTWORK PRIOR TO DUCT SEALANT BEING APPLIED.
.3 SURFACES TO BE CLEAN, DRY, AND FREE FROM FOREIGN MATERIAL.
4 WHEN TWO OR MORE LAYERS ARE USED, INSTALL WITH STAGGERED JOINTS.
5 USE TWO LAYERS WITH STAGGERED JOINTS WHEN REQUIRED NOMINAL THICKNESS EXCEEDS 50 MM.
6 MAINTAIN UNINTERRUPTED CONTINUITY AND INTEGRITY OF VAPOUR RETARDER JACKET AND FINISHES.
.1 HANGERS, SUPPORTS TO BE OUTSIDE VAPOUR RETARDER JACKET.

3.2 INSTALLATION - PIPING

- 1 APPLY INSULATION AT A TEMPERATURE OF APPROXIMATELY 180C (650F) OVER CLEAN, DRY SURFACES. BUTT ADJOINING SECTIONS OF INSULATION FIRMLY TOGETHER WITH THE LONGITUDINAL SEAM OF THE JACKET LOCATED ON THE BOTTOM HALF OF THE PIPE.
2 ON COLD PIPING, INSULATE AND FINISH ALL VALVES, FITTINGS AND FLANGES IN THE SAME MANNER AND SAME THICKNESS AS THE PIPING. USE MIXED SECTIONS OF THE SPECIFIED PIPE COVERING.
3 ON HOT PIPING, DO NOT INSULATE VALVES, UNIONS AND FLANGES, AND WHERE CONCEALED, DO NOT INSULATE ANY FITTINGS - STRAIGHT RUNS OF PIPE ONLY.
4 FOR COLD PIPING, SEAL LONGITUDINAL LAP JOINTS WITH SUITABLE VAPOUR BARRIER ADHESIVE. COVER ALL JOINTS WITH FOIL FACED SELF-ADHESIVE TAPE.
5 FOR HOT PIPING, SEAL LONGITUDINAL LAP JOINTS WITH A SUITABLE ADHESIVE/CEMENT CAPABLE OF WITHSTANDING THE SERVICE TEMPERATURE. COVER BUTT JOINTS WITH A STRIP OF THE SAME MATERIAL AS THE JACKET, AND CEMENT AS REQUIRED.
6 CONCEALED INSULATED ITEMS REQUIRE NO FURTHER FINISH THAN PROVIDED IN FACTORY APPLIED JACKET.
7 ALL ADHESIVES AND FINISHES: FIRE RETARDENT OR FIRE RESISTENT WHEN DRY, AND ACCEPTABLE TO THE AUTHORITIES HAVING JURISDICTION.
8 FOR COLD PIPING, SEAL END JOINTS AND PERFORATIONS WITH FACTORY FURNISHED 100 MM (4") WIDE VAPOUR BARRIER STRIPS APPLIED WITH THE SAME ADHESIVES AND CEMENTS AS PREVIOUSLY SPECIFIED.
9 SEAL VALVES, FITTINGS AND FLANGES ON COLD PIPING IN A MANNER AS SPECIFIED FOR END JOINTS.
10 SUPPORTS, HANGERS:
.1 ON ALL COLD PIPING WHERE OVERSIZED HANGERS ARE USED: PROTECT INSULATION WITH A SHEET METAL SADDLE INSTALLED OVER THE VAPOUR BARRIER.
2 FOR PIPING N.P.S. 1.5" AND LARGER, PROVIDE A SECTION OF RIGID INSULATION OR NON-COMPRESSIBLE MATERIAL UNDER THE VAPOUR BARRIER, THE SAME LENGTH AS THE SADDLE.

3.3 INSTALLATION - DUCTWORK

- 1 DO NOT INSULATE DUCTWORK PRIOR TO DUCT SEALANT BEING APPLIED.
2 EXPOSED RECTANGULAR DUCTWORK: IMPALE FIBREGLASS BOARD ON WELD PINS AND SPEED WASHERS 300 MM (12") O.C. WITH A MINIMUM OF TWO ROWS PER SIDE ON ANY SIDE GREATER THAN 300 MM (12"). CUT PINS FLUSH WITH SURFACE OF INSULATION AND COVER WITH FOIL FACED TAPE. COVER ALL JOINTS WITH FOIL FACED ADHESIVE TAPE.
3 CONCEALED DUCTWORK AND EXPOSED ROUND: APPLY FLEXIBLE BLANKET INSULATION WITH AN APPROVED ADHESIVE BRUSHED ON IN 100 MM (4") WIDE STRIPS 300 MM (12") O.C. AND AT ALL JOINTS. SEAL ALL JOINTS AND PERFORATIONS WITH FOIL FACED ADHESIVE TAPE.
4 WHERE INTERIOR LINED DUCTWORK IS REQUIRED TO BE INSULATED, THE THICKNESS OF THE LINER MAY BE DEDUCTED FROM THE TOTAL THICKNESS OF THE EXTERIOR INSULATION. THIS IS WITH THE EXCEPTION OF SPECIFIC ITEMS SUCH AS EXHAUST FLENUMS DETAILED ON THE DRAWINGS.
5 SUPPORTS, HANGERS:
.1 APPLY HIGH COMPRESSIVE STRENGTH INSULATION WHERE INSULATION MAY BE COMPRESSED BY WEIGHT OF DUCTWORK.
2 MAINTAIN UNINTERRUPTED CONTINUITY AND INTEGRITY OF VAPOUR RETARDER JACKET AND FINISHES.
3 HANGERS, SUPPORTS TO BE OUTSIDE VAPOUR RETARDER JACKET.

3.4 EQUIPMENT AND MISCELLANEOUS APPLICATIONS

- 1 WATER METERS, ROOF DRAIN BODIES, AND PUMP CASINGS:
APPLY FLEXIBLE BLANKET WITH SUITABLE ADHESIVE. SEAL JOINTS AND EDGES WITH FOIL FACED TAPE.
2 P-TRAPS:
REFER TO 'MISCELLANEOUS APPLICATIONS' IN PART TWO OF THIS SPECIFICATION SECTION.
3 REFRIGERANT PIPING:
INSTALL USING SELF-LOCKING PLASTIC TIES. SEAL JOINTS WITH SUITABLE MASTIC.

3.5 REMOVABLE, PRE FABRICATED INSULATION AND ENCLOSURES

- 1 APPLICATION: AT EXPANSION COMPENSATORS, VALVES, PRIMARY FLOW MEASURING ELEMENTS, AND FLANGES AND UNIONS AT EQUIPMENT.
2 DESIGN: TO PERMIT MOVEMENT OF EXPANSION COMPENSATOR AND TO PERMIT PERIODIC REMOVAL AND REPLACEMENT WITHOUT DAMAGE TO ADJACENT INSULATION.
3 INSULATION:
.1 INSULATION, JACKETS, FASTENINGS AND FINISHES: SAME AS SYSTEM.

3.6 INSTALLATION OF ELASTOMERIC INSULATION

- 1 INSULATION TO REMAIN DRY AT ALL TIMES. OVERLAPS TO MANUFACTURER'S INSTRUCTIONS. ENSURE TIGHT JOINTS.
2 PROVIDE VAPOUR RETARDER AS RECOMMENDED BY MANUFACTURER.

3.7 RECOMMENDED INSULATION THICKNESS SCHEDULE

(REFER TO PART 2 FOR MINIMUM ACCEPTABLE REQUIREMENTS AS PER MECB. ALL FINAL THICKNESS & INSULATION VALUES SHALL BE AS PER THE MECB, THE VALUES LISTED BELOW ARE TO BE USED AS A GUIDE ONLY.)

1 PIPING:

- 1 ANY PIPE WITHIN 2400MM (10'-0") OF A PENETRATION THROUGH AN EXTERIOR WALL OR ROOF, OR A PENETRATION TO ANOTHER SPACE OF DIFFERING TEMPERATURE.
25 MM (1")
2 DOMESTIC COLD WATER PIPING:
25 MM (1")
3 DOMESTIC HOT OR TEMPERED WATER SUPPLY AND RECIRC PIPING:
25 MM (1") FOR UP TO AND INCLUDING 50 MM (2") SIZE
40 MM (1.5") FOR PIPE SIZES OVER 50 MM (2")
4 HEATING WATER OR GLYCOL SUPPLY AND RETURN PIPING:
FOR TEMPERATURES OF 13-40°C (55-104°F):
NOT REQUIRED
FOR TEMPERATURES OF 41-60°C (105-140°F):
25 MM (1") FOR UP TO AND INCLUDING 100 MM (4") SIZE
40 MM (1.5") FOR PIPE SIZES OVER 100 MM (4")
FOR TEMPERATURES OF 61-93°C (141-200°F):
25 MM (1") FOR UP TO AND INCLUDING 50 MM (2") SIZE
40 MM (1.5") FOR PIPE SIZES OVER 50 MM (2")

- 5 STEAM AND STEAM CONDENSATE PIPING:
FOR TEMPERATURES OF 94-121°C (201-250°F):
25 MM (1") FOR RUNOUTS UP TO & INCLUDING 50 MM (2") SIZE AND 3.7M (12') LONG
40 MM (1.5") FOR PIPE SIZES UP TO AND INCLUDING 50 MM (2")
50 MM (2") FOR PIPE SIZES OVER 50 MM (2")

- 6 CHILLED WATER SUPPLY AND RETURN PIPING:
FOR TEMPERATURES OF 5-13°C (41-55°F)
25 MM (1")
FOR TEMPERATURES BELOW 5°C (41°F)
25 MM (1") FOR RUNOUTS UP TO 50 MM (2") SIZE AND 3.7M (12') LONG
25 MM (1") FOR PIPE SIZES UP TO AND INCLUDING 25 MM (1")
40 MM (1.5") FOR PIPE SIZES OVER 25 MM (1")

- 7 WELL/GROUND WATER SUPPLY AND RETURN PIPING (INSIDE BUILDING):
25 MM (1")
8 PLUMBING VENTS IN ATTIC SPACE
25 MM (1")
9 CONDENSATE DRIP DRAINS:
12 MM (1/2")

2 DUCTWORK:

- 1 GENERAL NOTE:
25 MM (1") MAY BE DEDUCTED FROM THE SPECIFIED REQUIREMENT FOR EXTERNAL THERMAL INSULATION WHERE DUCT SECTIONS ARE LINED WITH 25 MM (1") THICK ACOUSTIC DUCT LINER.
2 SUPPLY DUCTWORK (WHERE INDICATED ON THE DRAWINGS):
(ON ALL NEW DUCTWORK WHETHER SPECIFICALLY NOTED ON THE DRAWINGS OR NOT):
25 MM (1")
3 FRESH AIR INTAKE DUCTS TO AIR UNITS:
50 MM (2")
4 COMBUSTION AND VENTILATION AIR DUCTS FOR GAS-FIRED EQUIPMENT ROOMS:
25 MM (1")
5 MIXED AIR DUCTS FROM FRESH AIR DUCT TO HEATING COIL:
50 MM (2")
6 EXHAUST/RELIEF AIR DUCTS (FROM HRV'S TO OUTDOORS):
50 MM (2")
7 EXHAUST AIR DUCTS (FROM EXHAUST FAN BACK DRAFT OR MOTORIZED DAMPER TO OUTDOORS):
25 MM (1")
8 DUCTS PENETRATING AN EXTERIOR BUILDING SURFACE [FOR THE LAST 3000 MM (10'-0")]:
25 MM (1")
9 DUCTS IN ATTIC SPACE AND OUTDOORS:
50 MM (2")
10 RELIEF AIR DUCTS:
50 MM (2")
11 DRIP PANS:
25 MM (1")

3 EQUIPMENT AND MISCELLANEOUS APPLICATIONS:

- 1 WATER METERS, ROOF DRAIN BODIES, AND PUMP CASINGS:
25 MM (1")
2 P-TRAPS:
REFER TO 'MISCELLANEOUS APPLICATIONS' IN PART 2 OF THIS SPECIFICATION SECTION.
3 REFRIGERANT PIPING:
25 MM (1") FOR COLD PIPING
25 MM (1") FOR HOT PIPING, EXCEPT OUTDOORS
4 BREECHINGS:
50 MM (2")

3.8 FINISHES

- 1 PIPING (CONCEALED):
FACTORY APPLIED JACKET.
2 PIPING (EXPOSED):
170 G/M2 (6 OZ/YD2) U.L. LABELED CANVAS WITH PVC FITTING COVERS.
-OR-
PVC, STAINLESS STEEL OR ALUMINUM PIPE AND FITTING COVERS
3 DUCTWORK (CONCEALED):
FACTORY APPLIED JACKET.
4 DUCTWORK (EXPOSED):
170 G/M2 (6 OZ/YD2) U.L. LABELED CANVAS.
5 DUCTWORK (EXPOSED OUTDOORS):
.1 TWO LAYERS OF FELT PAPER, TARRED AND SEALED TO MAKE WEATHERPROOF
- OR -
'BLUESKIN' POLY-TYPE BITUMEN MEMBRANE.
2 DIMPLE FINISH 016 ALUMINUM JACKET.
6 WATER METERS AND PUMP CASINGS:
FACTORY APPLIED JACKET.
7 ROOF DRAIN BODIES (EXPOSED):
170 G/M2 (6 OZ/YD2) U.L. LABELED CANVAS.
8 ROOF DRAIN BODIES (CONCEALED):
FACTORY APPLIED JACKET.
9 REFRIGERANT PIPING:
NONE.
10 BREECHINGS:
CEMENT LAYER

SECTION 22 05 05 - PLUMBING

- 1. DOMESTIC WATER PIPING ABOVE GROUND SHALL BE TYPE 'L' HARD COPPER, WITH SOLDERED COPPER JOINTS AND FITTINGS. USE LEAD-FREE SOLDER.
2. DOMESTIC WATER PIPING BELOW GROUND SHALL BE TYPE 'L' SOFT COPPER, WITH NO JOINTS.
3. DRAIN AND VENT PIPING ABOVE GROUND SHALL BE AS ALLOWED BY CODE, INCLUDING DWV COPPER, CAST IRON, AND PVC/ABS PLASTIC. JOINTS SHALL BE SOLDERED FOR COPPER, SOLVENT WELDED FOR PLASTIC, AND MECHANICAL JOINT FOR CAST IRON.
4. DRAIN AND VENT PIPING BELOW GROUND SHALL BE AS ALLOWED BY CODE, INCLUDING CAST IRON, AND PVC/ABS PLASTIC. JOINTS SHALL BE SOLVENT WELDED FOR PLASTIC, AND MECHANICAL JOINT FOR CAST IRON.
5. NATURAL GAS PIPING SHALL BE SCHEDULE 40 STEEL, WITH SCREWED OR WELDED JOINTS AND FITTINGS AS PER CODE.
6. DOMESTIC WATER VALVES SHALL BE BALL OR BUTTERFLY TYPE.
7. NATURAL GAS VALVES SHALL BE APPROVED PLUG TYPE.
8. PROVIDE CHROME PLATED ESCUTCHEONS WHERE VISIBLE PIPING PASSES THROUGH WALLS AND PARTITIONS.
9. PROVIDE UNIONS WHERE PIPING CONNECTS TO EQUIPMENT. UNIONS SHALL BE LOCATED SO THAT THE PIPING DOES NOT HAVE TO BE ADJUSTED IN ORDER TO REMOVE THE EQUIPMENT.
10. DURING CONSTRUCTION, OPEN ENDED PIPING SHALL BE TEMPORARILY CAPPED TO PREVENT THE ENTRY OF DIRT AND DEBRIS. ON COMPLETION, PIPING SYSTEMS SHALL BE FLUSHED TO REMOVE ANY FOREIGN MATERIAL.
11. ALL DRAIN LINES 4"(100mm) & GREATER SHALL SLOPE AT A MINIMUM OF 1/8" PER FOOT (1%). DRAIN LINES LESS THAN 4"(100mm) SHALL SLOPE AT A MINIMUM OF 1/4" PER FOOT (2%). ALL DRAIN LINES SHALL BE INSTALLED W/ SLOPE AS PER THE PLUMBING CODE.

SECTION 21 13 13 - FIRE PROTECTION

- 1. HAND HELD FIRE EXTINGUISHERS SHALL BE 5 LB. ABC DRY CHEMICAL TYPE. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS.

SECTION 23 21 05 - REFRIGERATION

- 1. USE REFRIGERATION GRADE HARD COPPER WITH SOLDERED CONNECTIONS.
2. INSTALLATION AND SIZING OF REFRIGERANT PIPING SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS AND TABLES.
3. PROVIDE FULL CHARGE OF REFRIGERANT.

SECTION 23 30 00 - VENTILATION

- 1. ALL DUCTWORK AND RELATED ACCESSORIES SHALL BE INSTALLED AS PER THE LATEST SMACNA STANDARDS.
2. DUCTWORK SHALL BE GALVANIZED SHEET METAL UNLESS NOTED OTHERWISE, AND SHALL BE OF THE FOLLOWING GAUGES:

RECTANGULAR
DUCTS UP TO 12" (300 MM) ON LONGEST DIMENSION = 26 GA.
DUCTS 13" TO 28" (325 TO 700 MM) ON LONGEST DIMENSION = 24 GA.
DUCTS 29" TO 48" (725 TO 1200 MM) ON LONGEST DIMENSION = 22 GA.
DUCTS 49" TO 96" (1225 TO 2400 MM) ON LONGEST DIMENSION = 20 GA.

ROUND (EXPOSED SHALL BE SPIRAL, CONCEALED SHALL BE SNAP-LOCK OR SPIRAL)
DUCTS 6" (200 MM) AND SMALLER = 26 GA.
DUCTS 8" TO 22" (225 TO 550 MM) = 24 GA.
DUCTS 24" TO 36" (600 TO 900 MM) = 22 GA.

- 3. BALANCING DAMPERS SHALL BE PROVIDED FOR EACH SUPPLY AIR OUTLET AND RETURN/EXHAUST AIR INLET. DAMPERS MOUNTED AT GRILLS SHALL BE MULTI-BLADE TYPE. BUTTERFLY DAMPERS IN DUCTWORK SHALL BE CONSTRUCTED OF SHEET METAL, TWO GAUGES HEAVIER THAN THE DUCTWORK. DUCT DAMPERS SHALL HAVE LOCKING QUADRANTS AND POSITION INDICATORS.
4. ALL DUCTWORK SHALL BE SEALED WITH DUCT SEALANT AS PER THE MECB & AS PER SMACNA GUIDELINES & REQUIREMENTS.
5. PROVIDE 4" (100mm) WIDE FLEXIBLE FABRIC DUCT CONNECTIONS AT INLETS AND OUTLETS OF FANS.
6. WHERE SHC IN OR NOTED ON THE DRAWINGS, PROVIDE 1" THICK, FLEXIBLE RESIN IMPREGNATED FIBREGLASS INTERNAL ACOUSTIC INSULATION WITH BLACK PLASTIC-COATED MATTE FINISH.
6.1. ACOUSTIC INSULATION SHALL BE INSTALLED USING PINS WELDED TO THE DUCTWORK, AND ADHESIVE. PROVIDE BLACK MASTIC TO SEAL ALL JOINTS.
7. FIRE DAMPERS SHALL BE INSTALLED AT ALL LOCATIONS WHERE DUCTWORK PASSES THROUGH A RATED SEPARATION, WHETHER SHOWN ON THE DRAWINGS OR NOT. CONFIRM ALL SEPARATION LOCATIONS WITH THE ARCHITECTURAL DRAWINGS.
8. PROVIDE DUCT ACCESS DOORS AT ALL LOCATIONS REQUIRED FOR INSTALLATION, MAINTENANCE OR ADJUSTMENT OF EQUIPMENT OR CONTROLS. ACCESS DOORS SHALL HAVE GASKETS, HINGES AND THUMB LATCHES. DOORS SHALL BE INSTALLED TO ALLOW FOR INSTALLATION OF INTERNAL OR EXTERNAL INSTALLATION AS REQUIRED.
9. SUPPORT HORIZONTAL DUCTWORK AT MAXIMUM 8'-0" (2400mm) ON CENTRE.

- 9.1. FOR ROUND DUCTWORK UP TO 36" (900mm) DIAMETER, SUPPORT DUCT USING PERFORATED GALVANIZED STEEL STRAP, SUSPENDED USING THREADED RODS ATTACHED TO THE STRUCTURE. USE 3/8" (10mm) RODS FOR DUCTS 12" (300mm) DIAMETER AND LESS. USE 1/2" (12mm) RODS FOR DUCTS 14" TO 22" (350mm TO 550mm) DIAMETER. USE 5/8" (16mm) RODS FOR DUCTS OVER 24" (600mm) DIAMETER.
9.2. FOR ROUND DUCTWORK OVER 36" (900mm) DIAMETER, SUPPORT DUCT USING 1" x 1" x 1/8" (25mm x 25mm x 3mm) GALVANIZED ANGLE IRON TRAPEZE, SUSPENDED BY 5/8" (16mm) DIAMETER THREADED RODS ATTACHED TO THE STRUCTURE.
9.3. FOR RECTANGULAR DUCTWORK 18" (450mm) WIDE OR LESS, SUPPORT DUCT WITH PERFORATED GALVANIZED STEEL STRAP, SUSPENDED USING 1/2" (12mm) THREADED RODS ATTACHED TO THE STRUCTURE.
9.4. FOR RECTANGULAR DUCTWORK OVER 18" (450mm) WIDE, SUPPORT DUCT WITH 1" x 1" x 1/8" (25mm x 25mm x 3mm) GALVANIZED ANGLE IRON TRAPEZE, SUSPENDED BY 5/8" (16mm) DIAMETER THREADED RODS ATTACHED TO THE STRUCTURE.
9.5. IN CONCEALED SPACES FOR ROUND AND RECTANGULAR DUCTWORK 12" (300mm) WIDE OR LESS, PERFORATED GALVANIZED STEEL STRAP MAY BE USED IN LIEU OF THREADED ROD SUSPENSION.

10. ACOUSTIC INSULATION

- 1. S/A AND R/A DUCTWORK SHALL BE INTERNALLY LINED WITH ACOUSTIC INSULATION FOR A MINIMUM OF 10'-0" (3.048M) BACK FROM AIR HANDLING EQUIPMENT & HEAT RECOVERY VENTILATORS UNLESS A LARGER AMOUNT IS SHOWN ON THE DRAWINGS.
2. PROVIDE ACOUSTIC LINING/INSULATION IN ALL DUCTWORK 10'-0" (3.048M) FROM INLET & OUTLET ON ALL FANS (EXHAUST, TRANSFER, SUPPLY, RETURN, ETC.), UNLESS A LARGER AMOUNT IS SHOWN ON THE DRAWINGS.
3. PROVIDE ACOUSTIC LINING/INSULATION IN ALL DUCTWORK WHERE INDICATED ON THE DRAWINGS AT A THICKNESS OF 25 MM (1").
4. THE USE OF FIBERGLASS LINER IS NOT ALLOWED. ALL ACOUSTIC DUCT LINER MUST BE CONSTRUCTED OF CLOSED-CELL, POLYMER SHEET INSULATION MATERIALS.

- 5. PRODUCT MUST BE CLEANABLE AND HAVE A ZERO PERM RATING AND ZERO WATER ABSORPTION.
6. INSTALLATION SHALL NOT INCLUDE ANY TAPES, FABRICS, CEMENTS OR OTHER MATERIALS WHICH ARE NOT CLEANABLE OR WHICH OFFER OPPORTUNITY FOR MOLD GROWTH.
7. INSTALLATION SHALL BE TO MANUFACTURER'S STANDARDS AND SHALL WITHSTAND AIR VELOCITIES OF 12.7 M/S (2500 FEET PER MINUTE).
8. DUCT SIZES SHOWN ON THE DRAWINGS ARE CLEAR INSIDE DIMENSIONS. SHEET METAL SIZES SHALL INCREASE AS REQUIRED TO ACCOMMODATE THE THICKNESS OF THE INTERNAL INSULATION, TO MAINTAIN THE EQUIVALENT FREE AREA NOTED ON THE DRAWINGS.
9. SUBMIT SHOP DRAWINGS FOR APPROVAL.

SECTION 23 05 93 - TESTING AND BALANCING

- 1. BALANCE EACH FAN AND EACH AIR OUTLET AND INLET TO THE AIR QUANTITY NOTED.
2. TEST EACH FIRE DAMPER TO ENSURE PROPER ACCESS AND PERFORMANCE. TAG EACH FIRE DAMPER WITH THE DATE OF TESTING.
3. PROVIDE A WRITTEN REPORT TO THE ENGINEER REGARDING THE TESTING AND BALANCING. MAKE ANY REQUESTED CHANGES TO THE REPORT BEFORE DELIVERING THREE FINAL COPIES TO THE OWNER.
4. TESTING AND BALANCING COMPANY SHALL BE A MEMBER IN GOOD STANDING WITH A.A.B.C., OR SHALL PROVE EQUIVALENCY TO THE ENGINEER.

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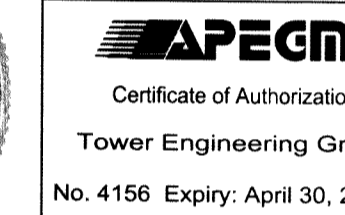
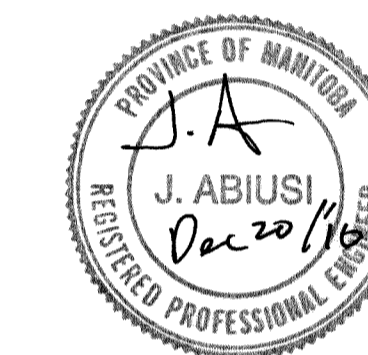


Table with 3 columns: Description, Initials, Date. Includes rows for ISSUED FOR CONSTRUCTION, ISSUED FOR IFR, and REVISIONS.

Table with 3 columns: NO., REVISIONS, BY, DATE. Includes a row for REVISIONS.

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PROJECT TITLE

Gimli Search & Rescue Station

Gimli, Manitoba

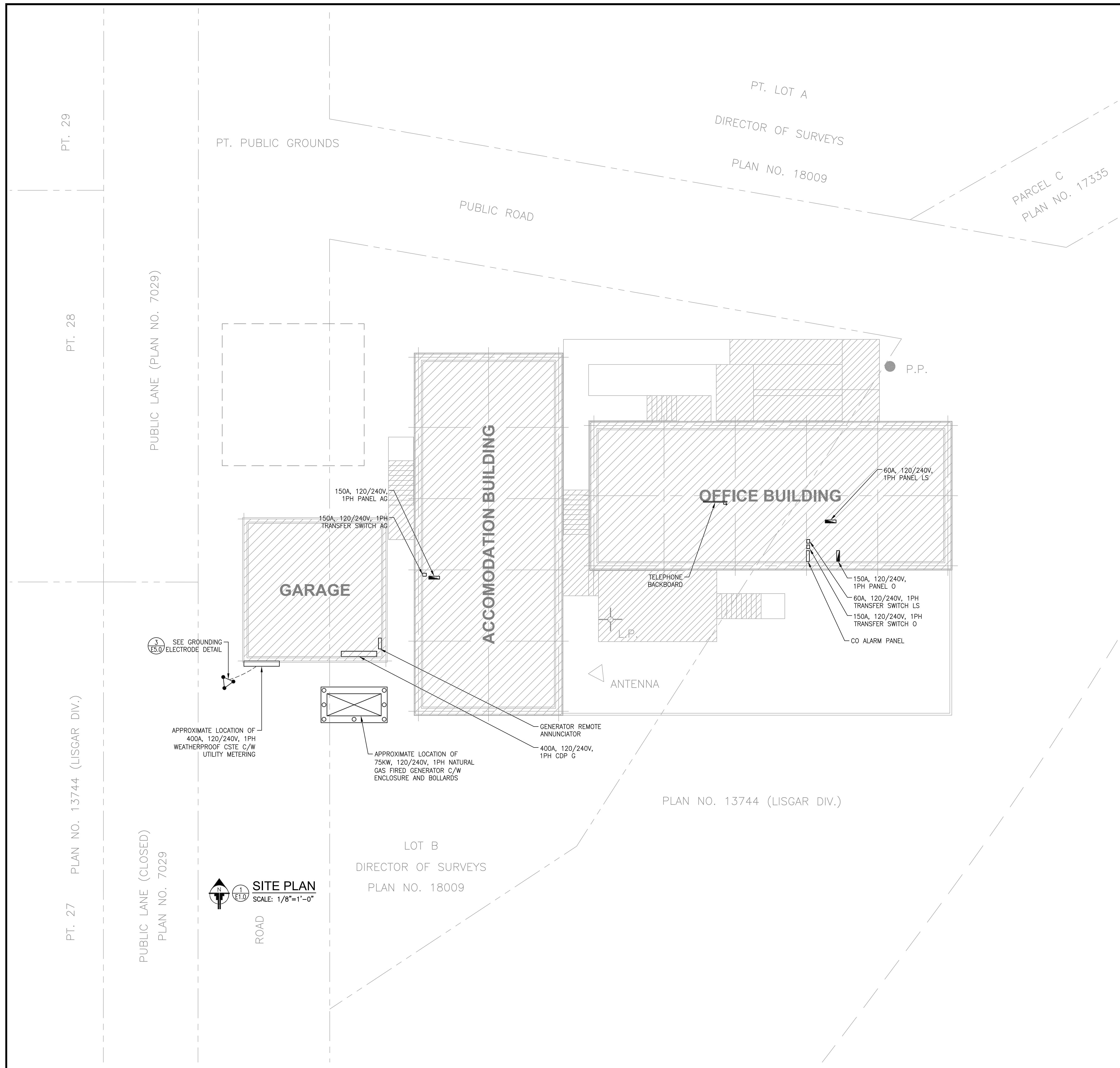
DRAWING TITLE

MECHANICAL SPECIFICATIONS



300 - 214 McDermot Avenue, Winnipeg Manitoba R3B 0S3
Tel (204) 956-0530 Fax (204) 943-5704 www.mmparchitects.com

Table with 3 columns: APPROVED, CHECKED, DRAWN BY, SCALE, DATE, FILE NO., AS NOTED, DRAWING NUMBER, REVISION NUMBER, DRAWER NO. Includes drawing number M4.1 and revision number A.



LEGEND	
A	STRIP LIGHT FIXTURE (A DENOTES TYPE)
B	1'x4' TROFFER (B DENOTES TYPE)
C	2'x4' TROFFER (C DENOTES TYPE)
F	SURFACE OR PENDANT LIGHT FIXTURE (F DENOTES TYPE)
H	WALL MOUNTED LIGHT FIXTURE (H DENOTES TYPE)
H/NL	LIGHT FIXTURE ON NIGHT LIGHT CIRCUIT
EL	EMERGENCY LIGHT (REMOTE - 2 HEADS)
EL-2	EXIT LIGHT C/W DIRECTIONAL ARROWS AS SHOWN
ELB	EMERGENCY BATTERY BANK UNIT C/W HEAD LIGHTS
3	SINGLE POLE SWITCH (3 DENOTE 3 WAY SWITCH)
MS	MOTION SENSOR SWITCH (WALL MOUNTED)
MS-C	MOTION SENSOR SWITCH (CEILING MOUNTED)
D	DIMMER SWITCH
HD	HAND DRYER
WP	DUPLEX RECEPTACLE - WEATHER PROOF
D	DUPLEX RECEPTACLE
GFCI	DUPLEX RECEPTACLE - ABOVE COUNTER (GFCI)
GFCI	DUPLEX RECEPTACLE- GROUND FAULT CIRCUIT INTERRUPTER
208	120/208 VOLT RECEPTACLE
JB	JUNCTION BOX (CEILING OR WALL MOUNTED)
PP	POWER POLE (PACPOLE)
DC	DIRECT CONNECT
SP	POWER PANELBOARD - SURFACE MOUNT/FLUSH MOUNT
SSP	SYSTEM PANELBOARD - SURFACE MOUNT/FLUSH MOUNT
T	TRANSFORMER
TB	TELEPHONE BACKBOARD
VDO	VOICE/DATA OUTLET
MD	MOTOR AND DISCONNECT
BH	BASEBOARD HEATER (1000 DENOTES 1000 WATTS)
FFH	FORCE FLOW HEATER
UH	UNIT HEATER
T	THERMOSTAT
ES	ELECTRIC STRIKE
CR	CARD ACCESS READER (PROXIMITY)
SACMD	STAND ALONE CARBON MONOXIDE DETECTOR
HCS	HANDI-CAP SECURITY PUSH BUTTON
SCA	120V SMOKE/CO COMBO ALARM (WALL MOUNTED)
DC	DOOR CONTACT (FLUSH IN FRAME)
ER	EXISTING TO BE REMOVED
EX	EXISTING TO REMAIN
R	RELOCATED EXISTING (SHOWN IN NEW LOCATION)

DRAWING LIST	
E1.0	ELECTRICAL SITE PLAN
E2.0	ELECTRICAL LIGHTING LAYOUT - ACCOMMODATION
E2.1	ELECTRICAL LIGHTING LAYOUT - OFFICE
E2.2	ELECTRICAL LIGHTING AND POWER & SYSTEM LAYOUT - GARAGE
E3.0	ELECTRICAL POWER & SYSTEM LAYOUT - ACCOMMODATION
E3.1	ELECTRICAL POWER & SYSTEM LAYOUT - OFFICE
E4.0	ELECTRICAL SCHEDULES
E4.1	ELECTRICAL SCHEDULES
E5.0	ELECTRICAL SINGLE LINE DIAGRAM
E6.0	ELECTRICAL SPECIFICATIONS
E6.1	ELECTRICAL SPECIFICATIONS

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A	ISSUED FOR 66% IFR	DKG	2016.12.05

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PROJECT TITLE
Gimli Search & Rescue Station

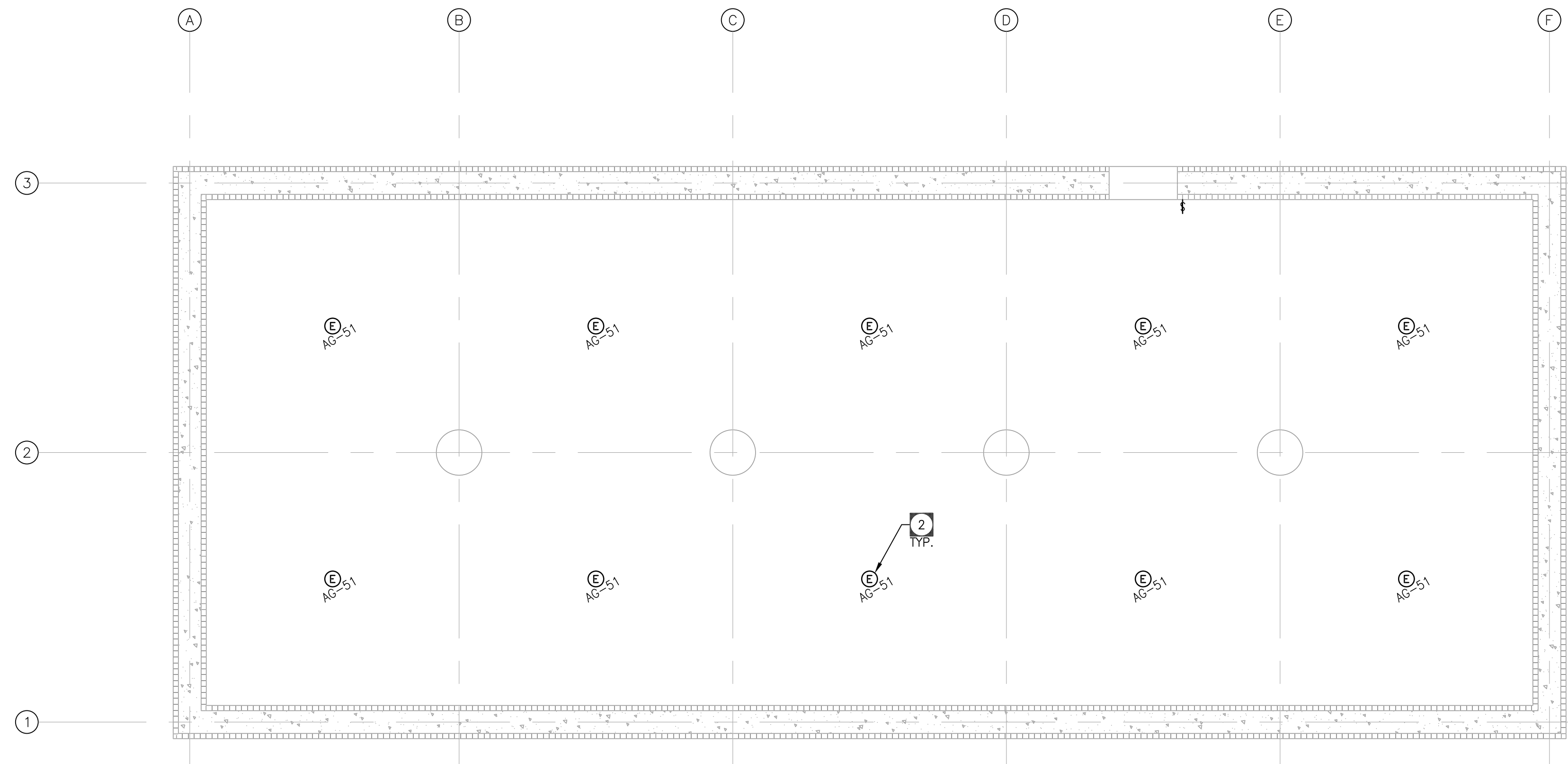
Gimli, Manitoba
 DRAWING TITLE

**ELECTRICAL
 SITE PLAN**

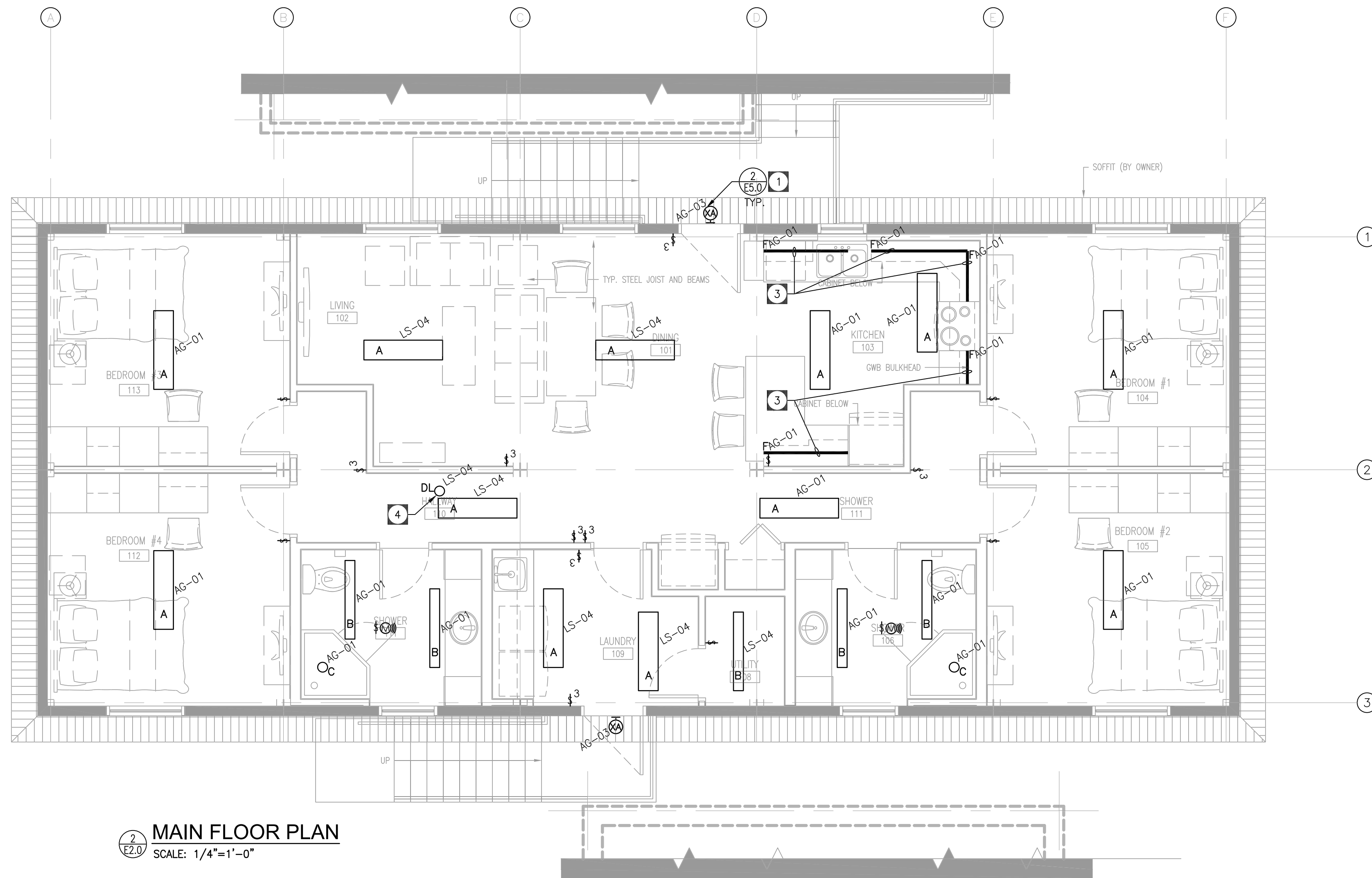


APPROVED	CHECKED	DRAWN BY
	PC	VRR
SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39

DRAWING NUMBER	REVISION NUMBER
E1.0	1
CAD FILE: 161364 - E1.0 Electrical Site Plan.dwg	DRAWER NO:



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



2 MAIN FLOOR PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTE

- A. ALL ELECTRICAL WORK SHALL BE DONE IN COMPLETE COMPLIANCE WITH 2011 MANITOBA BUILDING CODE AND 2015 CANADIAN ELECTRICAL CODE.
- B. PROVIDE DEDICATED AND SEPARATED NEUTRAL CONDUCTOR FOR EACH LIGHTING CIRCUIT. SHARING OF NEUTRAL CONDUCTORS AMONG LIGHTING CIRCUITS ARE NOT ACCEPTABLE. TYPICAL.

DRAWING NOTES:

- 1 EXTERIOR LIGHT FIXTURE TO BE CONTROLLED AS PER DETAIL 2 ON DRAWING E5.0.
- 2 COORDINATE EXACT LOCATION OF LIGHT FIXTURES IN CRAWL SPACE WITH MECHANICAL CONTRACTOR AND ARCHITECT AND ENSURE THEY DO NOT INTERSECT WITH DUCT/PIPE ROUTING AND OTHER MECHANICAL EQUIPMENT.
- 3 PROVIDE UNDER CABINET LED STRIP LIGHTING AS SHOWN IN THE KITCHEN. COORDINATE WITH ARCHITECT FOR EXACT LENGTH, LOCATION AND MOUNTING PRIOR TO INSTALLATION.
- 4 CONFIRM EXACT LOCATION OF DOWN LIGHT WITH ARCHITECT AND OWNER.

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Tower Engineering Group
No. 4156 Expiry: April 30, 2017

1	ISSUED FOR CONSTRUCTION	DKG	2016.12.21
B	ISSUED FOR 99% IFR	DKG	2016.12.15
A	ISSUED FOR 66% IFR	DKG	2016.12.05

NO.	REVISIONS	BY	YR/MNDY

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PROJECT TITLE

Gimli Search & Rescue Station

Gimli, Manitoba

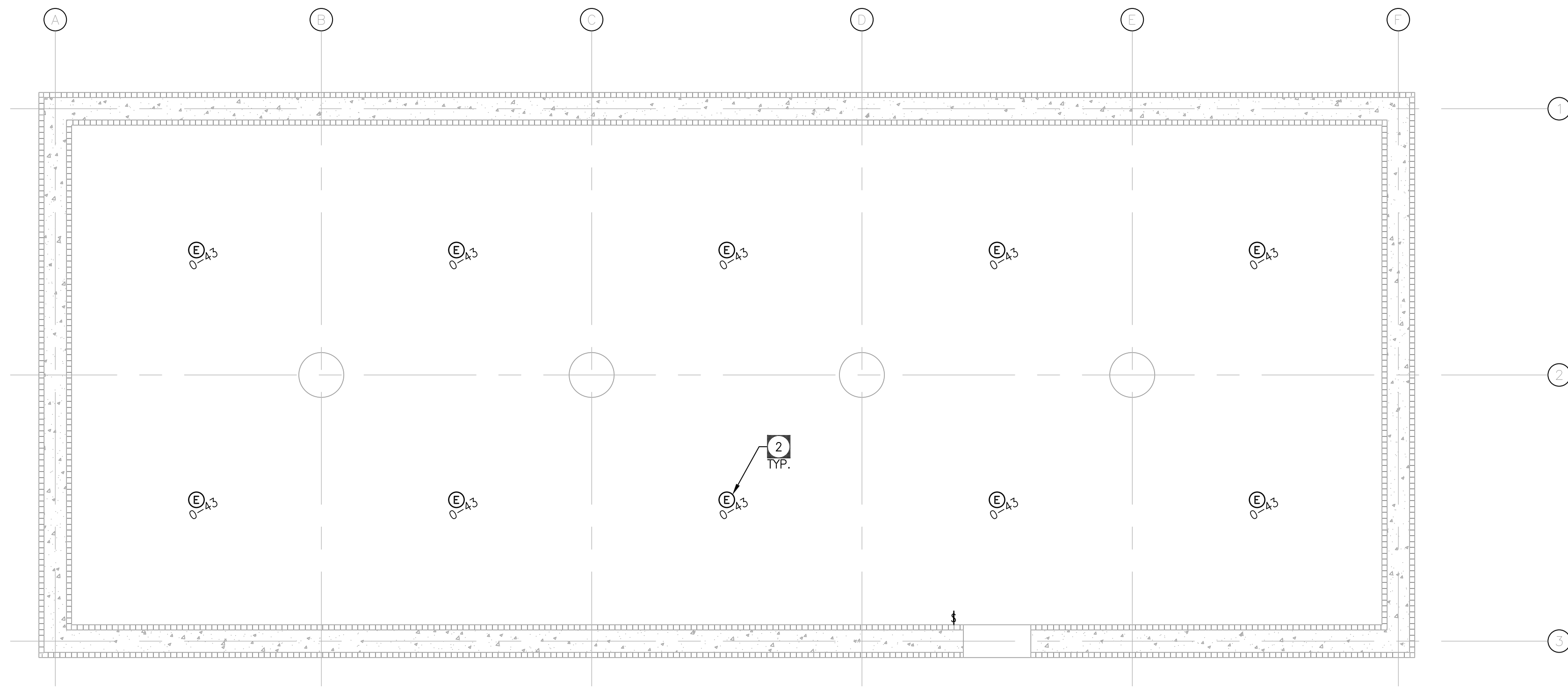
DRAWING TITLE

ELECTRICAL LIGHTING LAYOUT - ACCOMMODATION



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SCALE	PC	VRR
AS NOTED	DATE	FILE NO.
	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
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CAD FILE: 161364 - E2.0 Electrical Lighting - Accommodation.dwg		DRAWER NO:



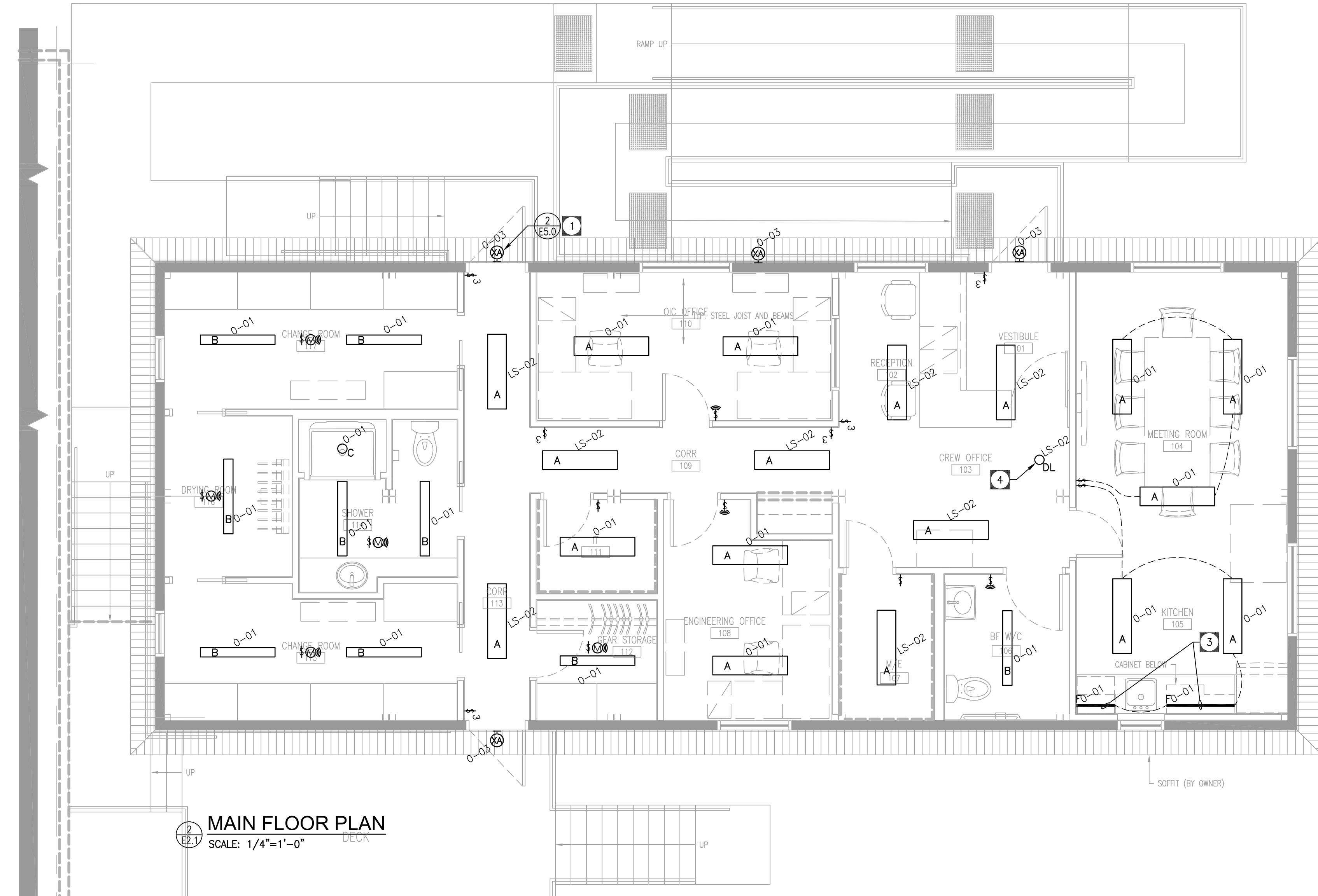
1 CRAWLSPACE PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTE

A. ALL ELECTRICAL WORK SHALL BE DONE IN COMPLETE COMPLIANCE WITH 2011 MANITOBA BUILDING CODE AND 2015 CANADIAN ELECTRICAL CODE.

B. PROVIDE DEDICATED AND SEPARATED NEUTRAL CONDUCTOR FOR EACH LIGHTING CIRCUIT. SHARING OF NEUTRAL CONDUCTORS AMONG LIGHTING CIRCUITS ARE NOT ACCEPTABLE. TYPICAL.

- DRAWING NOTES:**
- EXTERIOR LIGHT FIXTURE TO BE CONTROLLED AS PER DETAIL 2 ON DRAWING E5.0.
 - COORDINATE EXACT LOCATION OF LIGHT FIXTURES IN CRAWL SPACE WITH MECHANICAL CONTRACTOR AND ARCHITECT AND ENSURE THEY DO NOT INTERSECT WITH DUCT/PIPE ROUTING AND OTHER MECHANICAL EQUIPMENT.
 - PROVIDE UNDER CABINET LED STRIP LIGHTING AS SHOWN IN THE KITCHEN. COORDINATE WITH ARCHITECT FOR EXACT LENGTH, LOCATION AND MOUNTING PRIOR TO INSTALLATION.
 - CONFIRM EXACT LOCATION OF DOWN LIGHT WITH ARCHITECT AND OWNER.



2 MAIN FLOOR PLAN
SCALE: 1/4"=1'-0"

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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba
DRAWING TITLE
ELECTRICAL LIGHTING LAYOUT - OFFICE



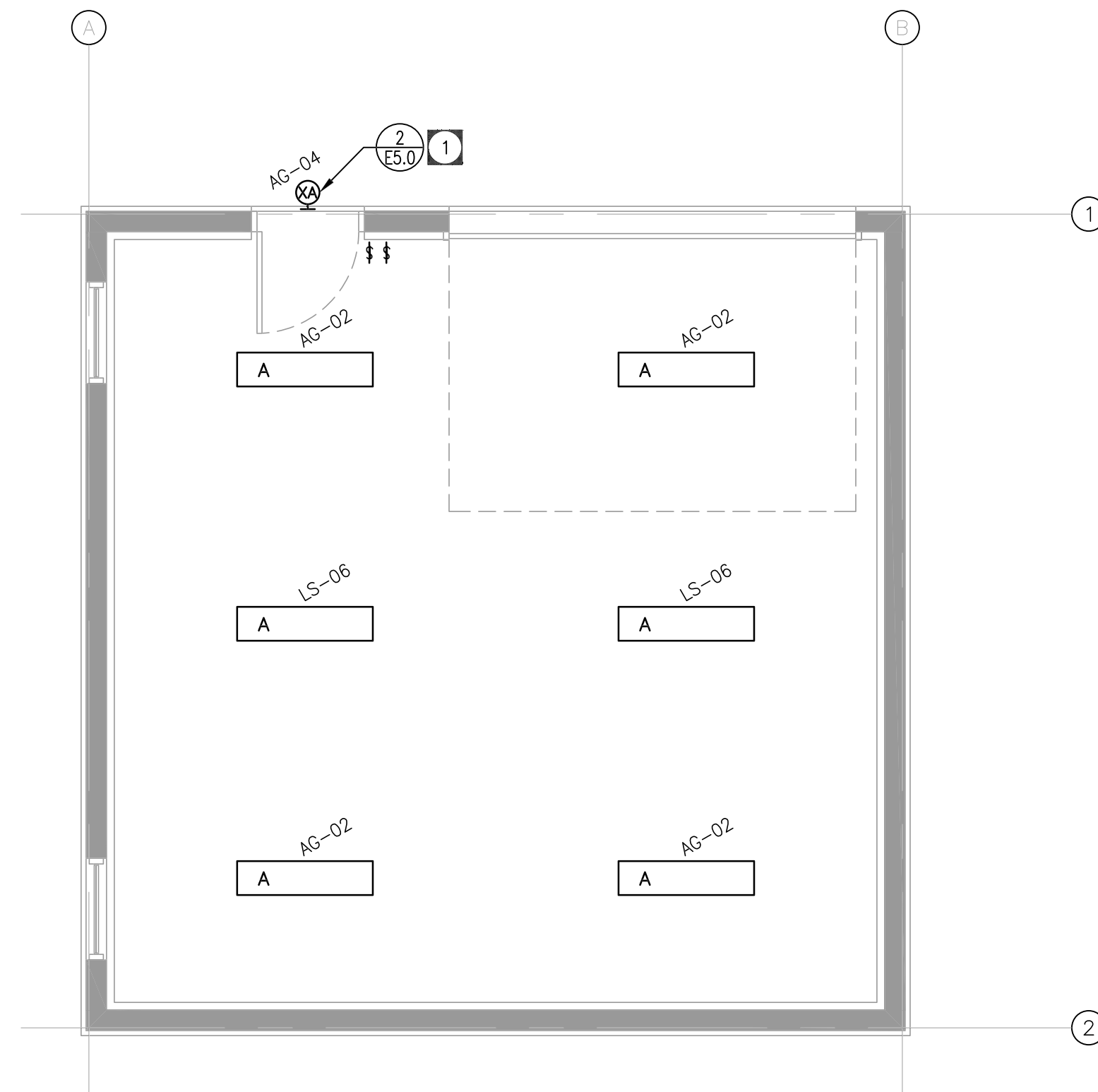
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	PC	VRR
SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
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CAD FILE: 161364 - E2.1 Electrical Lighting - Office.dwg	DRAWER NO:	

GENERAL NOTE

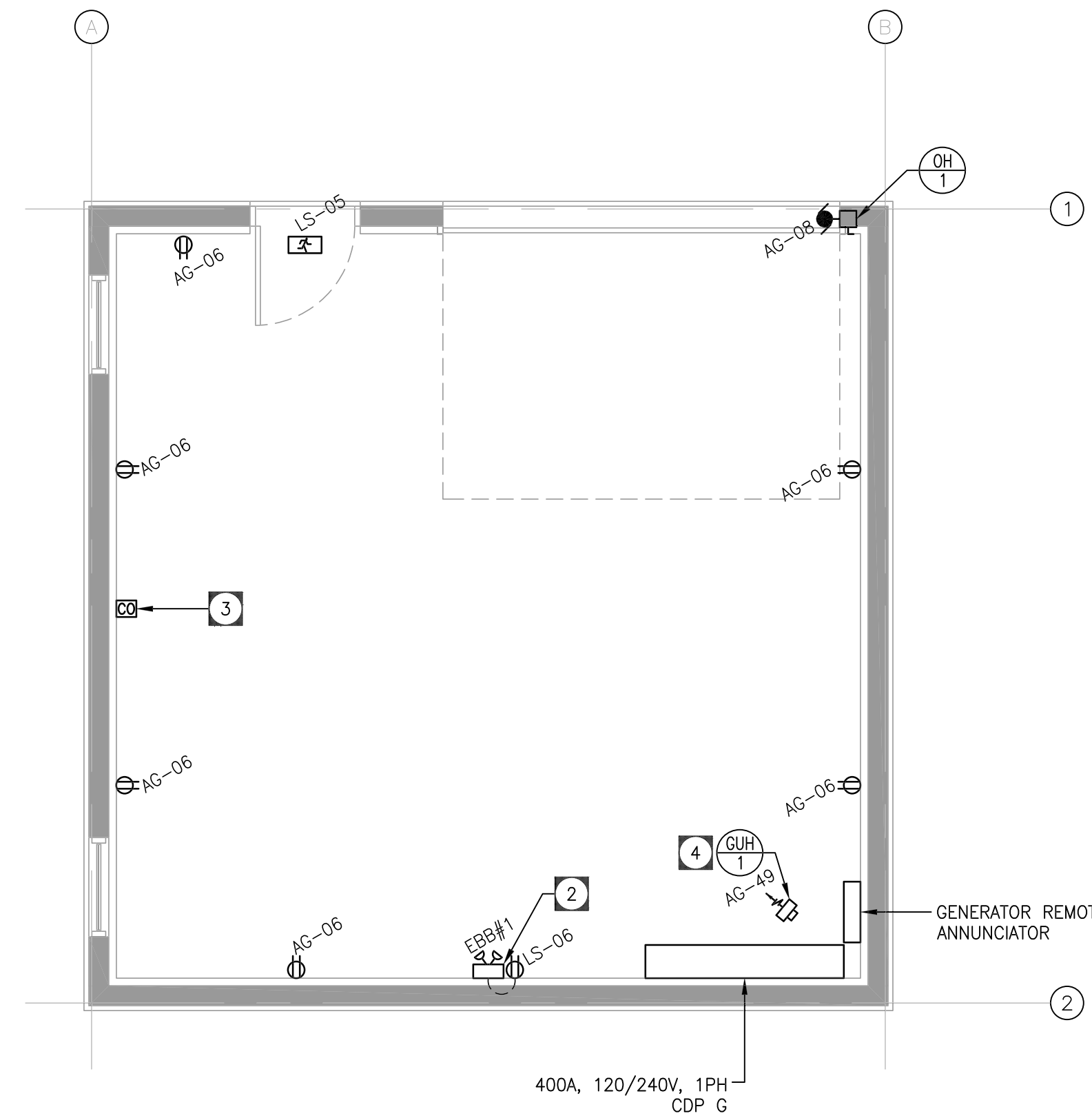
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- B. PROVIDE DEDICATED AND SEPARATED NEUTRAL CONDUCTOR FOR EACH LIGHTING CIRCUIT. SHARING OF NEUTRAL CONDUCTORS AMONG LIGHTING CIRCUITS ARE NOT ACCEPTABLE. TYPICAL.

DRAWING NOTES:

- 1 LIGHT FIXTURE TO BE CONTROLLED AS PER DETAIL 2 ON DRAWING E5.0.
- 2 CONNECT ALL EMERGENCY LIGHTING TO UNSWITCHED NIGHT LIGHTING/UNSWITCHED LIGHTING CIRCUIT IN THE AREA.
- 3 ALL STAND ALONE CO ALARM DEVICES SHALL BE NFPA 720 (AND BY EXTENSION, UL2075 & UL2034) COMPLIANT, NON-RESIDENTIAL, COMMERCIAL LIFE SAFETY GRADE, LOW VOLTAGE, FULLY SUPERVISABLE DEVICES.
- 4 CONFIRM ALL BREAKER SIZES FOR MECHANICAL EQUIPMENT WITH EQUIPMENT NAMEPLATE AND COORDINATE THEIR EXACT LOCATIONS WITH MECHANICAL CONTRACTOR.



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



2 POWER & SYSTEM PLAN
SCALE: 1/4"=1'-0"

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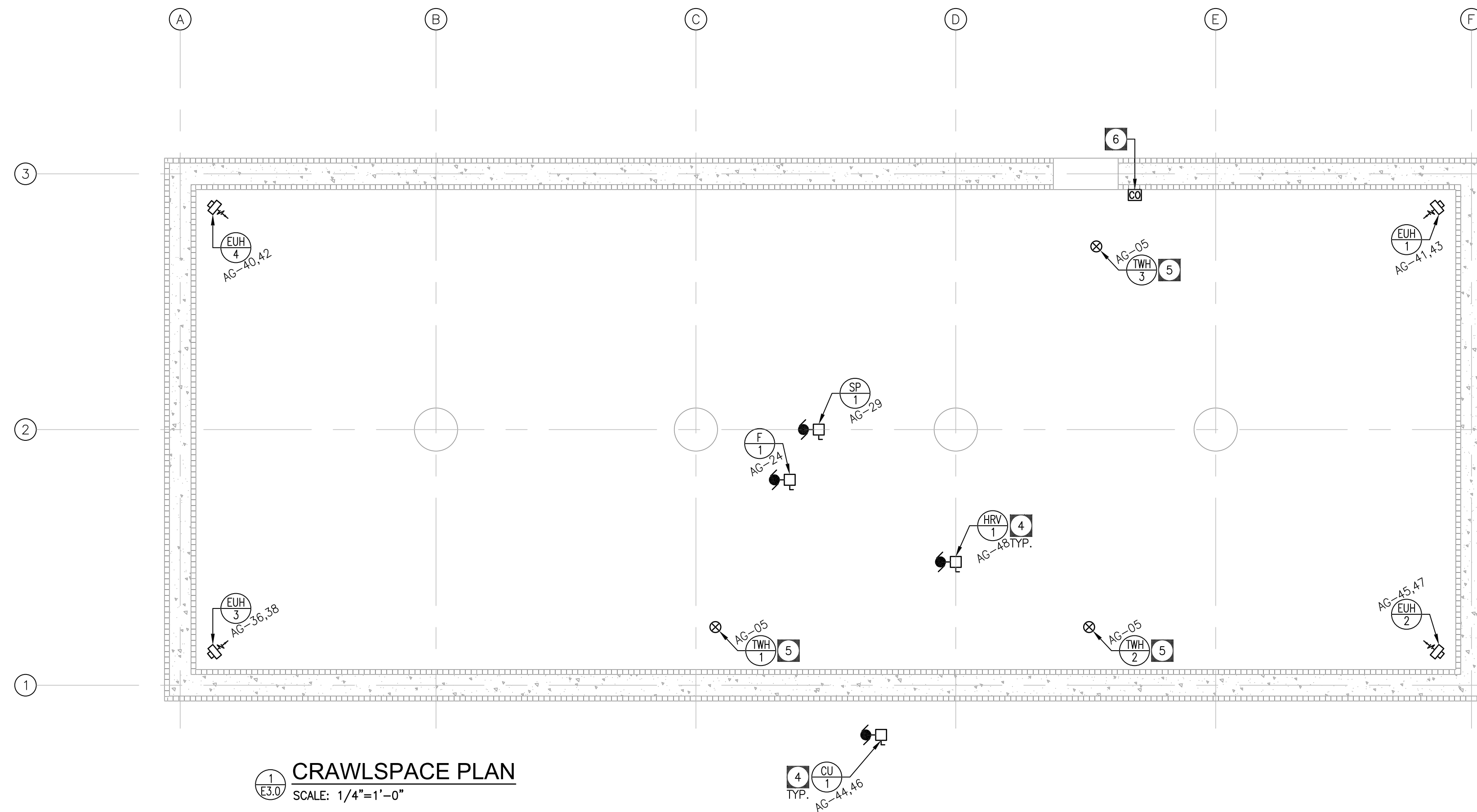
PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba
DRAWING TITLE
ELECTRICAL LIGHTING AND POWER & SYSTEM - GARAGE

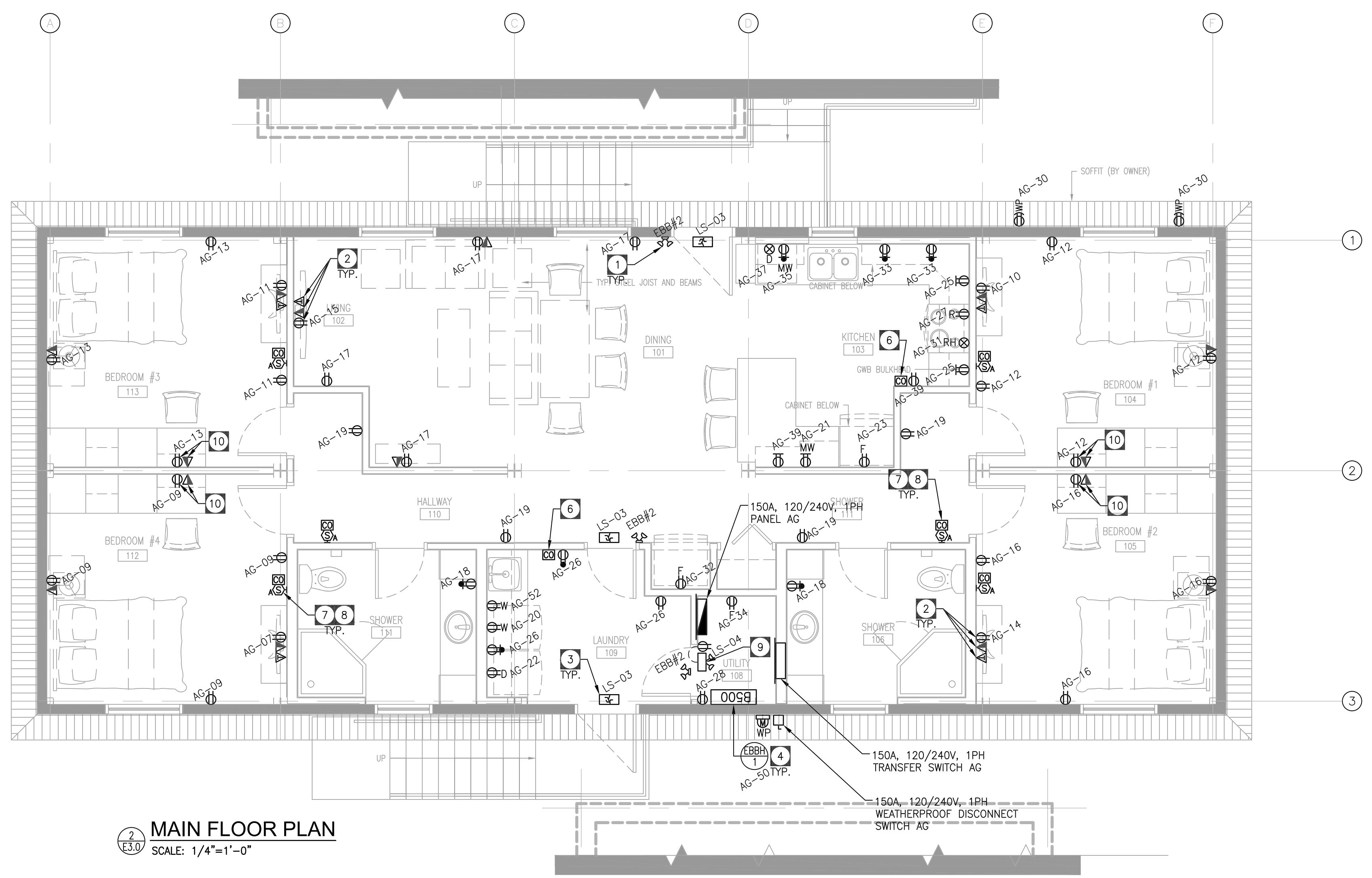


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SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
E2.2	1	
CAD FILE: 161364 - E2.2 Electrical Layout - Garage.dwg	DRAWER NO:	



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



2 MAIN FLOOR PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTE
A. ALL ELECTRICAL WORK SHALL BE DONE IN COMPLETE COMPLIANCE WITH 2011 MANITOBA BUILDING CODE AND 2015 CANADIAN ELECTRICAL CODE.

- DRAWING NOTES:**
- CONNECT ALL EMERGENCY LIGHTING TO UNSWITCHED NIGHT LIGHTING/UNSWITCHED LIGHTING CIRCUIT IN THE AREA.
 - TELEVISION OUTLETS. COORDINATE MOUNTING HEIGHT WITH ARCHITECT PRIOR TO INSTALLATION.
 - PROVIDE DEDICATED 15A, 120V CIRCUIT FOR STANDALONE EXIT SIGNS.
 - CONFIRM ALL BREAKER SIZES FOR MECHANICAL EQUIPMENT WITH EQUIPMENT NAMEPLATE AND COORDINATE THEIR EXACT LOCATIONS WITH MECHANICAL CONTRACTOR.
 - CONFIRM EXACT LOCATION OF GAS FIRED TANKLESS WATER HEATER WITH MECHANICAL CONTRACTOR.
 - ALL STAND ALONE CO ALARM DEVICES SHALL BE NFPA 720 (AND BY EXTENSION, UL2075 & UL2034) COMPLIANT, NON-RESIDENTIAL, COMMERCIAL LIFE SAFETY GRADE, LOW VOLTAGE, FULLY SUPERVISABLE DEVICES.
 - ALL SMOKE/CO ALARM COMBO DEVICES TO HAVE UNIQUE TEMPORAL PATTERNS FOR SMOKE (TEMPORAL 3) AND CO (TEMPORAL 4).
 - INTERCONNECT ALL SMOKE/CO ALARM COMBO DEVICES AND CONNECT TO A LIGHTING CIRCUIT.
 - EMERGENCY LIGHTING BATTERY BANK SHALL BE SIZED TO PROVIDE A MINIMUM SOLX FOR 2HR AND SHALL INCLUDE AUTO SELF-DIAGNOSTIC CIRCUITRY AND TRANSIENT VOLTAGE SURGE SUPPRESSOR ON SUPPLY SIDE AS PER CSA C282-09.
 - CONFIRM EXACT LOCATION OF BEDROOM DESK OUTLETS WITH ARCHITECT.

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A	ISSUED FOR 66% IFR	DKG	2016.12.05

NO.	REVISIONS	BY	YR/MNDY

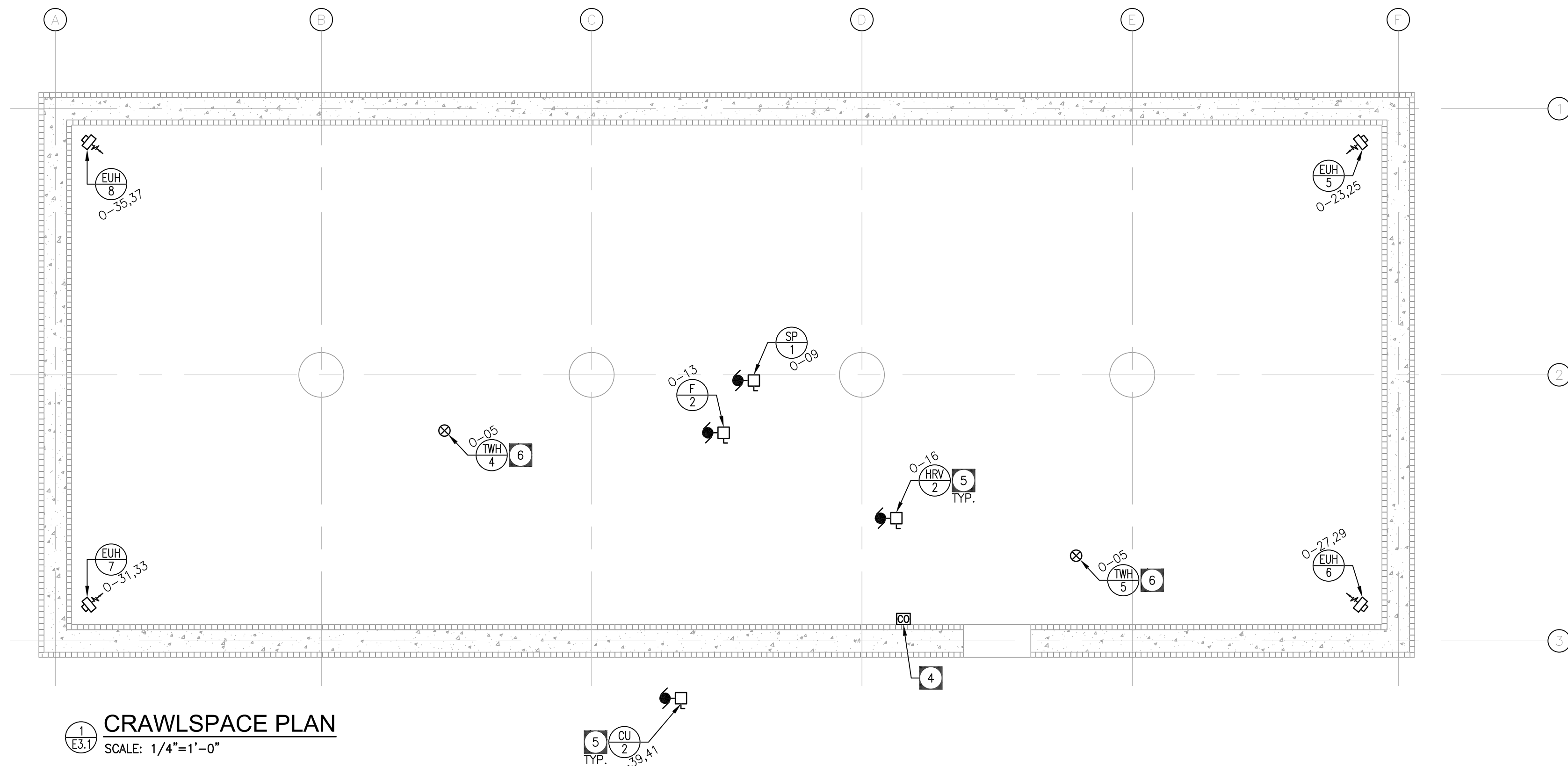
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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba
DRAWING TITLE
ELECTRICAL POWER & SYSTEM LAYOUT - ACCOMMODATION



APPROVED	CHECKED	DRAWN BY
	PC	VRR
SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
E3.0	1	
CAD FILE: 161364 - E3.0 Electrical P&S - Accommodation.dwg	DRAWER NO:	



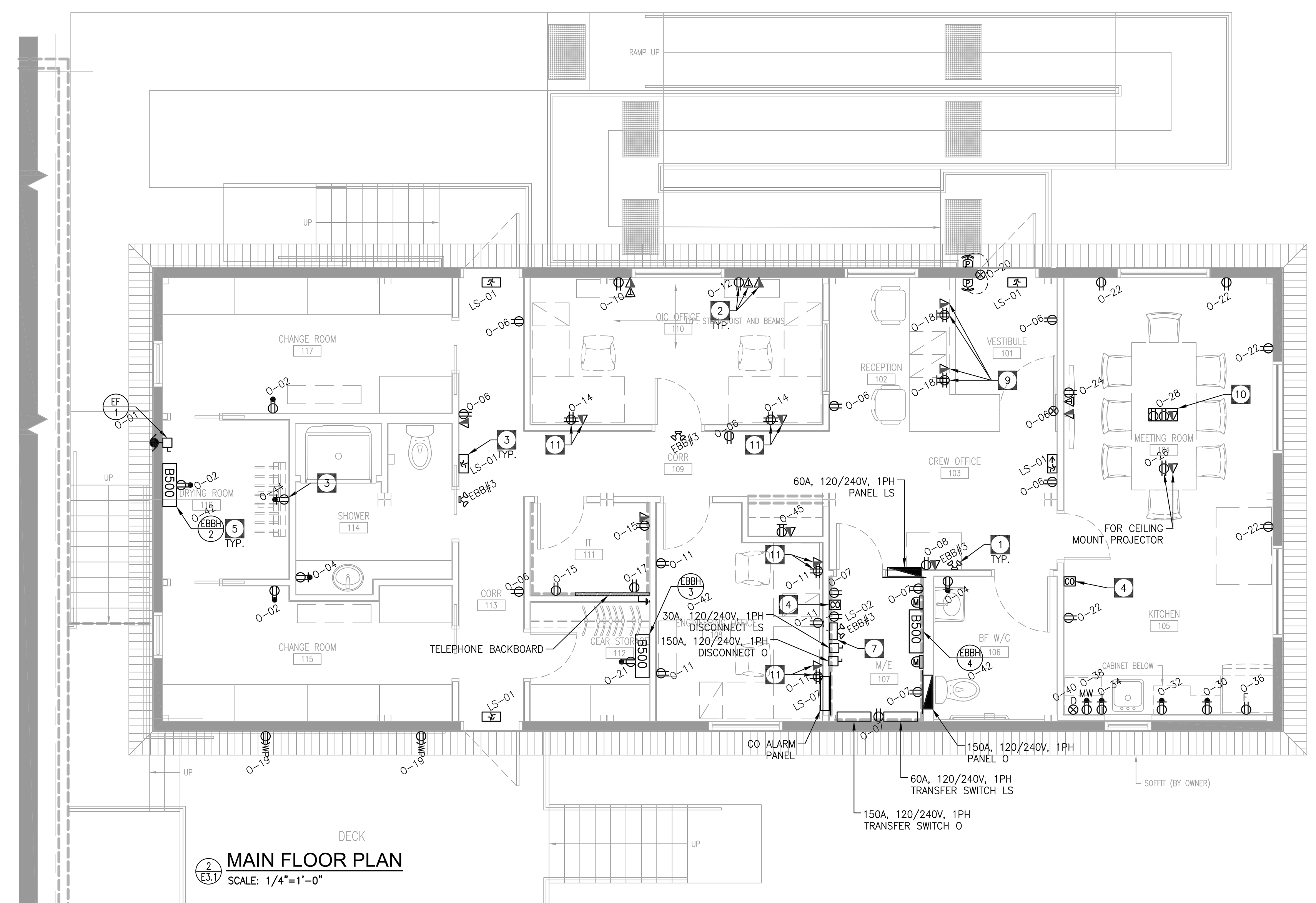
1 CRAWLSPACE PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTE

A. ALL ELECTRICAL WORK SHALL BE DONE IN COMPLETE COMPLIANCE WITH 2011 MANITOBA BUILDING CODE AND 2015 CANADIAN ELECTRICAL CODE.

DRAWING NOTES:

- 1 CONNECT ALL EMERGENCY LIGHTING TO UNSWITCHED NIGHT LIGHTING/UNSWITCHED LIGHTING CIRCUIT IN THE AREA.
- 2 TELEVISION OUTLETS. COORDINATE MOUNTING HEIGHT WITH ARCHITECT PRIOR TO INSTALLATION.
- 3 PROVIDE DEDICATED 15A, 120V CIRCUIT FOR STANDALONE EXIT SIGNS.
- 4 ALL STAND ALONE CO ALARM DEVICES SHALL BE NFPA 720 (AND BY EXTENSION, UL2075 & UL2034) COMPLIANT, NON-RESIDENTIAL, COMMERCIAL LIFE SAFETY GRADE, LOW VOLTAGE, FULLY SUPERVISABLE DEVICES.
- 5 CONFIRM ALL BREAKER SIZES FOR MECHANICAL EQUIPMENT WITH EQUIPMENT NAMEPLATE AND COORDINATE THEIR EXACT LOCATIONS WITH MECHANICAL CONTRACTOR.
- 6 CONFIRM EXACT LOCATION OF GAS FIRED TANKLESS WATER HEATER WITH MECHANICAL CONTRACTOR.
- 7 EMERGENCY LIGHTING BATTERY BANK SHALL BE SIZED TO PROVIDE A MINIMUM SOLX FOR 2HR AND SHALL INCLUDE AUTO SELF-DIAGNOSTIC CIRCUITRY AND TRANSIENT VOLTAGE SURGE SUPPRESSOR ON SUPPLY SIDE AS PER CSA C282-09.
- 8 CONFIRM EXACT LOCATION OF BOOT DRYER RACK WITH ARCHITECT.
- 9 COUNTERTOP RECEPTION MILLWORK RECEPTACLES. EC TO COORDINATE WITH GC AND SCAN AND CORE AS REQUIRED. CONFIRM MOUNTING HEIGHT AND EXACT LOCATION WITH ARCHITECT.
- 10 BOARDROOM FLOOR OUTLETS. EC TO COORDINATE WITH GC AND SCAN AND CORE AS REQUIRED. CONFIRM EXACT LOCATION WITH ARCHITECT.
- 11 ALL DESKTOP OUTLETS TO BE MOUNTED 36" ON CENTRE AFF. CONFIRM EXACT MOUNTING HEIGHT WITH ARCHITECT PRIOR TO INSTALLATION.



2 MAIN FLOOR PLAN
SCALE: 1/4"=1'-0"

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Tower Engineering Group
No. 4156 Expiry: April 30, 2017

1	ISSUED FOR CONSTRUCTION	DKG	2016.12.21
B	ISSUED FOR 99% IFR	DKG	2016.12.15
A	ISSUED FOR 66% IFR	DKG	2016.12.05

NO.	REVISIONS	BY	YR/MNDY

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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba
DRAWING TITLE
ELECTRICAL POWER & SYSTEM LAYOUT - OFFICE



300 - 214 McDermott Avenue, Winnipeg Manitoba R3B 0S3
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APPROVED	CHECKED	DRAWN BY
	PC	VRR
SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39
DRAWING NUMBER	REVISION NUMBER	
E3.1	1	
CAD FILE: 161364-E3.1 Electrical P&S - Office.dwg	DRAWER NO.:	

MOTOR/EQUIPMENT SCHEDULE

EQUIPMENT					FEED FROM	PKG UNIT	STARTER					CONTROLS				FIRE ALARM SHUT DOWN	REMARKS	SEE NOTES BELOW
ITEM	DESCRIPTION	LOCATION	W/HP/AMPS	VOLTS/Ø			TYPE	FUNC	PL	PB	HOA	SUPPLY BY	TYPE	SUPPLY BY	INSTALL BY			
TWH-1 - TWH-3	TANKLESS GAS HEATER	AS SHOWN ON DRAWINGS	100W	120/1	PANEL AG	Y					IT	MECH	MECH	ELEC				
TWH-4 - TWH-5	TANKLESS GAS HEATER	AS SHOWN ON DRAWINGS	100W	120/1	PANEL O	Y					IT	MECH	MECH	ELEC				
SP-1	SUMP PUMP	AS SHOWN ON DRAWINGS	1/3HP	120/1	PANEL AG	Y					FS	MECH	MECH	ELEC				
SP-2	SUMP PUMP	AS SHOWN ON DRAWINGS	1/3HP	120/1	PANEL O	Y					FS	MECH	MECH	ELEC				
F-1	FURNACE	AS SHOWN ON DRAWINGS	15A MOC	120/1	PANEL AG	Y					T	MECH	MECH	ELEC				
CU-1	CONDENSING UNIT	AS SHOWN ON DRAWINGS	25A MOC	230/1	PANEL AG	Y					T	MECH	MECH	ELEC		INTERCONNECTED TO F-1		
HRV-1	HEAT RECOVERY VENTILATOR	AS SHOWN ON DRAWINGS	100W	120/1	PANEL AG	Y					DH	MECH	MECH	ELEC		INTERCONNECTED TO F-1		
F-2	FURNACE	AS SHOWN ON DRAWINGS	15A MOC	120/1	PANEL O	Y					T	MECH	MECH	ELEC				
CU-2	CONDENSING UNIT	AS SHOWN ON DRAWINGS	30A MOC	230/1	PANEL O	Y					T	MECH	MECH	ELEC		INTERCONNECTED TO F-2		
HRV-2	HEAT RECOVERY VENTILATOR	AS SHOWN ON DRAWINGS	100W	120/1	PANEL O	Y					DH	MECH	MECH	ELEC		INTERCONNECTED TO F-2		
EF-1	EXHAUST FAN	AS SHOWN ON DRAWINGS	180W	120/1	PANEL O	Y					DH	MECH	MECH	ELEC		INTERCONNECTED TO LIGHTING CIRCUIT IN THE AREA		
GUH-1	GAS UNIT HEATER	AS SHOWN ON DRAWINGS	4.7A	120/1	PANEL AG	Y					T	MECH	MECH	ELEC				

GENERAL NOTES:

A. MANUAL MOTOR STARTER TO BE C/W PILOT LIGHT AND OVERCURRENT PROTECTION.

B. ALL STARTERS TO BE SUPPLIED & INSTALLED BY THE ELECTRICAL CONTRACTOR (EC) UNLESS OTHERWISE NOTED.

C. DISCONNECT SWITCHES TO BE SUPPLIED & INSTALLED BY THE ELECTRICAL CONTRACTOR (EC)

D. ELECTRICAL CONTRACTOR TO PROVIDE CIRCUIT BREAKERS AND WIRING ACCORDING TO THE FINAL NAMEPLATES OF THE MECHANICAL EQUIPMENT AT NO COST.

E. REFER TO PANELBOARD SCHEDULES AND SINGLE LINE DIAGRAM FOR MOTOR AND EQUIPMENT OVERLOAD PROTECTION.

F = FLOAT SWITCH
 FVNR = FULL VOLTAGE NON-REVERSING
 HOA = HAND/OFF/AUTO
 INT = INTEGRAL
 MAG = MAGNETIC STARTER
 MAN = MANUAL STARTER
 PL = PILOT LIGHT
 PS = PRESSURE SWITCH
 RVNR = REVERSE VOLTAGE NON-REVERSING
 SS = SOFT STARTER
 T = THERMOSTAT
 Y = YES

AD = AMMONIA DETECTION SYSTEM
 CHL = CHLORINE SENSOR
 CO = CARBON MONOXIDE SENSOR
 CO2 = CARBON DIOXIDE SENSOR
 ES = END SWITCH
 ESC = ELECTRONIC SPEED CONTROLLER
 FS = FLOW SWITCH
 H = HUMIDISTAT
 LS = LEVEL SWITCH
 MS = MANUAL SWITCH
 MT = MANUAL TIMER(WALL MOUNTED)
 TDS = TIME DELAY SWITCH(WALL MTD)

DDC = DIGITAL DATA CONTROL SYSTEM
 I = INTERLOCK
 PB = PUSH BUTTON
 RP = REMOTE PANEL
 TC = TIME CLOCK
 VFD = VARIABLE FREQUENCY DRIVE
 IT = INTERNAL THERMOSTAT
 DH = DEHUMIDISTAT

ELECTRIC HEATER SCHEDULE

TYPE	MANUFACTURER	CATALOGUE NO.	KW	VOLTS/Ø	MOUNTING	REMARKS	NOTES
EUH-1 - EUH-8	OUELLET	OAE2000AM-TB6	2KW	240/1Ø	S	C/W BUILT-IN THERMOSTAT	1
EBBH-1 - EBBH-4	OUELLET	OFM0502	0.5KW	120/1Ø	W	C/W BUILT-IN THERMOSTAT	1

NOTES: 1. FINISH/COLOR AS SELECTED BY OWNER.

W = WALL P = PENDANT CH = CHAIN
 S = SUSPENDED DW = DRYWALL

LUMINAIRE SCHEDULE

TYPE	MANUFACTURER	CATALOGUE NO.	LAMPS		VOLTS	MOUNTING	REMARKS	NOTES	WATTS
			NO.	TYPE					
A	METALUX	4WNLED-LD4-50SL-F-UNV-835-CD1-U		LED	120	S		2	47
B	METALUX	4SNLED-LD1-44-UNV-L835-CD1-U		LED	120	S		2	45
C	HALO	SLD606-8-35		LED	120	R		2	12.5
DL	COOPER	ML5612835 C/W 694WB DIRECTIONAL TRIM		LED	120	R	6" DIRECTIONAL DOWNLIGHT	2	18
E	LUMARK	PLASTIC KEYLESS C/W METAL CAGE		A19 LED	120	S	PLASTIC KEYLESS LAMP C/W METAL CAGE	2,3	19
F	MAGIC LITE	LV-HS-WW-24T2-2F C/W MLDRE-XX-24-DM DRIVER		LED	120	W	UNDERCABINET LED STIP LIGHTING	2	12W/M
XA	LUMARK	XTOR2B-W		LED	120	W		2	18

NOTES: 1. ALL FLUORESCENT LAMPS ARE TO BE 3500°K AND A MINIMUM 82 CRI UNLESS NOTED OTHERWISE.
 2. FINISH AS SELECTED BY INTERIOR DESIGNER.
 3. ALL SCREW-IN BASE FIXTURES TO BE LAMPED WITH LED TYPE.

S = SURFACE W = WALL TB = T-BAR
 R = RECESSED V = VALANCE DW = DRYWALL
 C = CEILING P = PENDANT CH = CHAIN

BATTERY BANK SCHEDULE

NO.	MANUFACTURER	CATALOGUE NO.	INPUT VOLTS	OUTPUT VOLTS	SOURCE PANEL	MINIMUM WATTAGE x 1.25
EBB#1	LUMACELL	RG12S-36-2-LD7	120	12		8WX1.25=10W
EBB#2	LUMACELL	RG12S-144-2-LD7	120	12		32WX1.25=40W AFTER 2HR
EBB#3	LUMACELL	RG12S-144-2-LD7	120	12		32WX1.25=40W AFTER 2HR
	LUMACELL	LUMACELL LS SERIES, SELF POWERED	120			SEE DWG

NOTES: LUMACELL MQM-2-LD7
 LUMACELL MQM-2-LD7

PANEL 'LS'

DESCRIPTION		LOAD WATTS	BKR SIZE	CIRCUIT	BKR SIZE	LOAD WATTS	DESCRIPTION
EXIT SIGNS - OFFICE		250	15	1-2	15	396	NTG LTG/EMER LTG - OFFICE
EXIT SIGNS - ACCOMMODATION		150	15	3-4	15	340	NTG LTG/EMER LTG - ACCOMM.
EXIT SIGNS - GARAGE		50	15	5-6	15	104	NTG LTG/EMER LTG - GARAGE
CO PANEL		500	15	7-8			
				9-10			
				11-12			

VOLTAGE : 120/240V
 BUS : 30A
 PHASE : 1
 WIRE : 3

HTG. : 0KW LTG. : 1.3KW MTR. : 0KW MISC. : 0.5KW TOTAL : 1.8KW

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NO.	REVISIONS	BY	VRM/DY

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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba
 DRAWING TITLE

ELECTRICAL SCHEDULES

APPROVED	CHECKED	DRAWN BY
SCALE	DATE	FILE NO.
AS NOTED	12/21/2016	2016-39

DRAWING NUMBER: **E4.0** REVISION NUMBER: **1**
 CAD FILE: 161364 - E4.0 Electrical Schedules.dwg DRAWER NO.:



PANEL 'O'						VOLTAGE : 120/240V BUS : 150A	PHASE : 1 WIRE : 3		
DESCRIPTION	LOAD WATTS	BKR SIZE	CIRCUIT	BKR SIZE	LOAD WATTS	DESCRIPTION			
LTG - INTERIOR OFFICE/EF-1	1068	15	1	2	15	600	RECEPT - CHANGE/DRYING RM		
LTG - INTERIOR OFFICE	72	15	3	4	15	400	RECEPT - WASHROOM		
THE-4 - TWH-5	200	15	5	6	15	1400	RECEPT - CORRIDOR		
RECEPT - MECH & ELEC RM	800	15	7	8	15	200	RECEPT - PRINTER/COPIER		
SP-2	1000	15	9	10	15	500	RECEPT - TV OIC OFFICE		
RECEPT - ENG. OFFICE	1000	15	11	12	15	500	RECEPT - TV OIC OFFICE		
F-2	1200	15	13	14	15	400	RECEPT - OIC OFFICE		
RECEPT - IT RM	400	15	15	16	15	100	HRV-2		
TELEPHONE BACKBOARD	1000	15	17	18	15	400	RECEPT - RECEPTION		
RECEPT - EXTERIOR OFFICE	400	15	19	20	15	500	DOOR OPERATOR		
RECEPT - GEAR STORAGE	200	15	21	22	15	1200	RECEPT - MEETING ROOM		
EUH-5	2000	15	23	24	15	500	RECEPT - TV MEETING ROOM		
		2P	25	26	15	500	PROJECTOR		
EUH-6	2000	15	27	28	15	500	FLOOR RECEPT - MEETING RM		
		2P	29	30	15	200	RECEPT - KITCH. COUNTERTOP		
EUH-7	2000	15	31	32	15	200	RECEPT - KITCH. COUNTERTOP		
		2P	33	34	15	600	RECEPT - KITCH. COUNTERTOP		
EUH-8	2000	15	35	36	15	500	FRIDGE		
		2P	37	38	15	1000	MICROWAVE		
CU-2	5500	30	39	40	15	750	DISHWASHER		
		2P	41	42	20	1500	EBBH-2/EBBH-3/EBBH-4		
LTG - CRAW SPACE	190	15.0	43	44	20	1550	BOOT DRYER		
RECEPT - COUNTERTOP	500	15.0	45	46					
			47	48					
			49	50					
			51	52					
			53	54					
			55	56					
			57	58					
			59	60					
HTG. :	17.5KW	LTG. :	1.1KW	MTR. :	0KW	MISC. :	16.9KW	TOTAL :	35.5KW

LOAD SUMMARY (PANELAG)	Demand Factor	Connected Load	Demand Load
Heating	0.75	15.90 kW	11.93 kW
Lighting	1.00	.97 kW	.97 kW
Refrigeration/Motor	0.75	.00 kW	.00 kW
Miscellaneous	0.50	31.65 kW	15.83 kW
TOTAL LOAD		48.52 kW	28.72 kW
Current (I _c) at 240 V		202.15 Amps	119.65 Amps
I _c = I _c x Spare Capacity 25%		252.69 Amps	149.56 Amps

LOAD SUMMARY (PANEL O)	Demand Factor	Connected Load	Demand Load
Heating	0.75	17.50 kW	13.13 kW
Lighting	1.00	.96 kW	.96 kW
Refrigeration/Motor	0.75	.00 kW	.00 kW
Miscellaneous	0.50	14.83 kW	7.42 kW
TOTAL LOAD		33.29 kW	21.50 kW
Current (I _c) at 240 V		138.71 Amps	89.58 Amps
I _c = I _c x Spare Capacity 25%		173.39 Amps	111.98 Amps

LOAD SUMMARY (PANEL S)	Demand Factor	Connected Load	Demand Load
Heating	0.75	.00 kW	.00 kW
Lighting	1.00	1.29 kW	1.29 kW
Refrigeration/Mc	0.75	.00 kW	.00 kW
Miscellaneous	0.50	.50 kW	.25 kW
TOTAL LOAD		1.79 kW	1.54 kW
Current (I _c) at 240 V		7.46 Amps	6.42 Amps
x Spare Capacity 25%		9.33 Amps	8.03 Amps

PANEL 'AG'						VOLTAGE : 120/240V BUS : 150A	PHASE : 1 WIRE : 3		
DESCRIPTION	LOAD WATTS	BKR SIZE	CIRCUIT	BKR SIZE	LOAD WATTS	DESCRIPTION			
LTG - INTERIOR ACCOMM.	534	15	1	2	15	188	LTG - INTERIOR GARAGE		
LTG - EXTERIOR ACCOMM.	36	15	3	4	15	18	LTG - EXTERIOR GARAGE		
THE-1 - TWH-3	300	15	5	6	15	1200	RECEPT - GARAGE		
RECEPT - TV BEDROOM #4	500	15	7	8	15	1000	O/H DOOR GARAGE		
RECEPT - BEDROOM #4	1000	15	9	10	15	500	RECEPT - TV BEDROOM #1		
RECEPT - TV BEDROOM #3	500	15	11	12	15	1000	RECEPT - BEDROOM #1		
RECEPT - BEDROOM #3	1000	15	13	14	15	500	RECEPT - TV BEDROOM #2		
RECEPT - TV LIVING ROOM	500	15	15	16	15	1000	RECEPT - BEDROOM #2		
RECEPT - LIVING ROOM	600	15	17	18	15	400	RECEPT - SHOWER		
RECEPT - HALLWAY	800	15	19	20	15	1000	WASHER		
MICROWAVE	1000	15	21	22	15	1000	GAS DRYER		
FRIDGE - KITCHEN	500	15	23	24	15	1200	F-1		
RECEPT - KITCH. COUNTER TOP	400	15	25	26	15	600	RECEPT - LAUNDRY		
GAS RANGE	1000	15	27	28	15	200	RECEPT - UTILITY		
SP-1	750	15	29	30	15	400	RECEPT - EXTERIOR ACCOMM.		
RANGEHOOD	500	15	31	32	15	500	FRIDGE - UTILITY RM		
RECEPT - COUNTER TOP GFCI	400	15	33	34	15	500	FRIDGE - UTILITY RM		
MICROWAVE	1000	15	35	36	15				
DISHWASHER	750	15	37	38	2P	2000	EUH-3		
RECEPT - KITCHEN	400	15	39	40	15				
EUH-1	2000	15	41	42	2P				
		2P	43	44	2P	4500	CU-1		
EUH-2	2000	15	45	46	2P				
		2P	47	48	15	100	HRV-1		
GUH-1	550	15	49	50	15	500	EBBH-1		
LTG - CRAW SPACE	190	15	51	52	15	1000	WASHER		
GENERATOR ENCLOSURE	10k	60	53	54					
		2P	55	56					
			57	58					
			59	60					
HTG. :	15.9KW	LTG. :	1KW	MTR. :	0KW	MISC. :	31.7KW	TOTAL :	48.5KW

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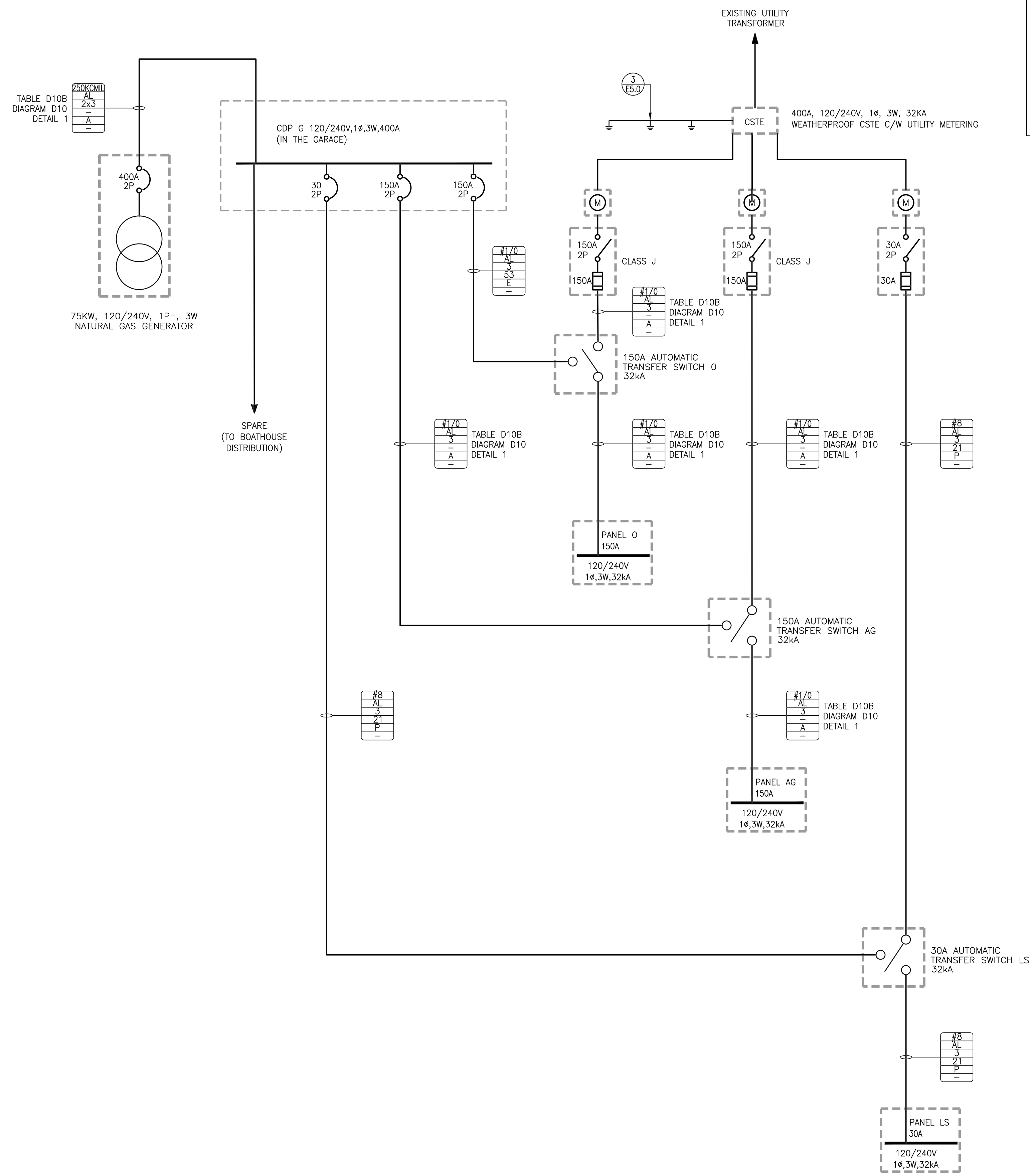
PROJECT TITLE
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Gimli, Manitoba

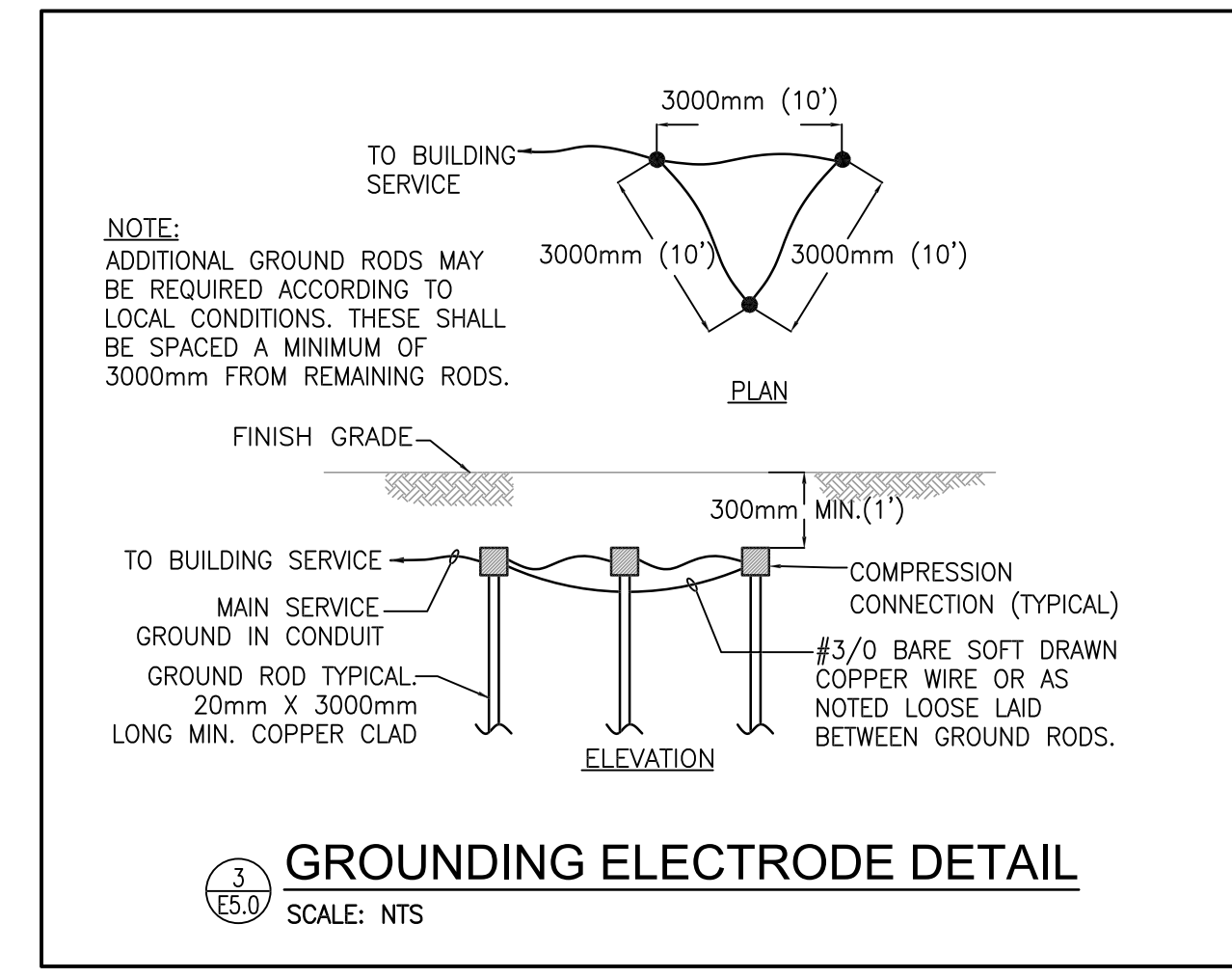
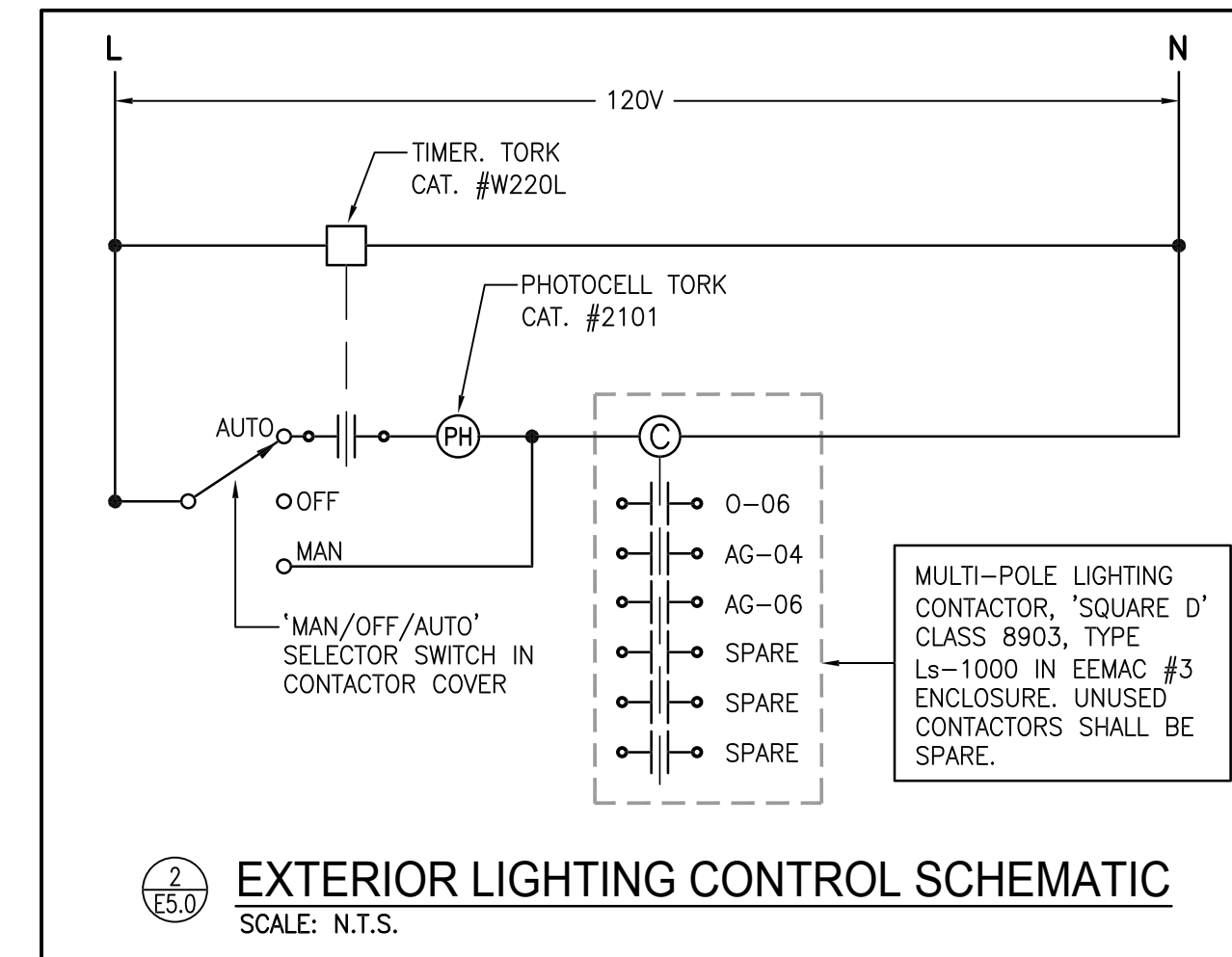
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ELECTRICAL SCHEDULES

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CAD FILE: 161364 - E4.0 Electrical Schedules.dwg	DRAWER NO:	

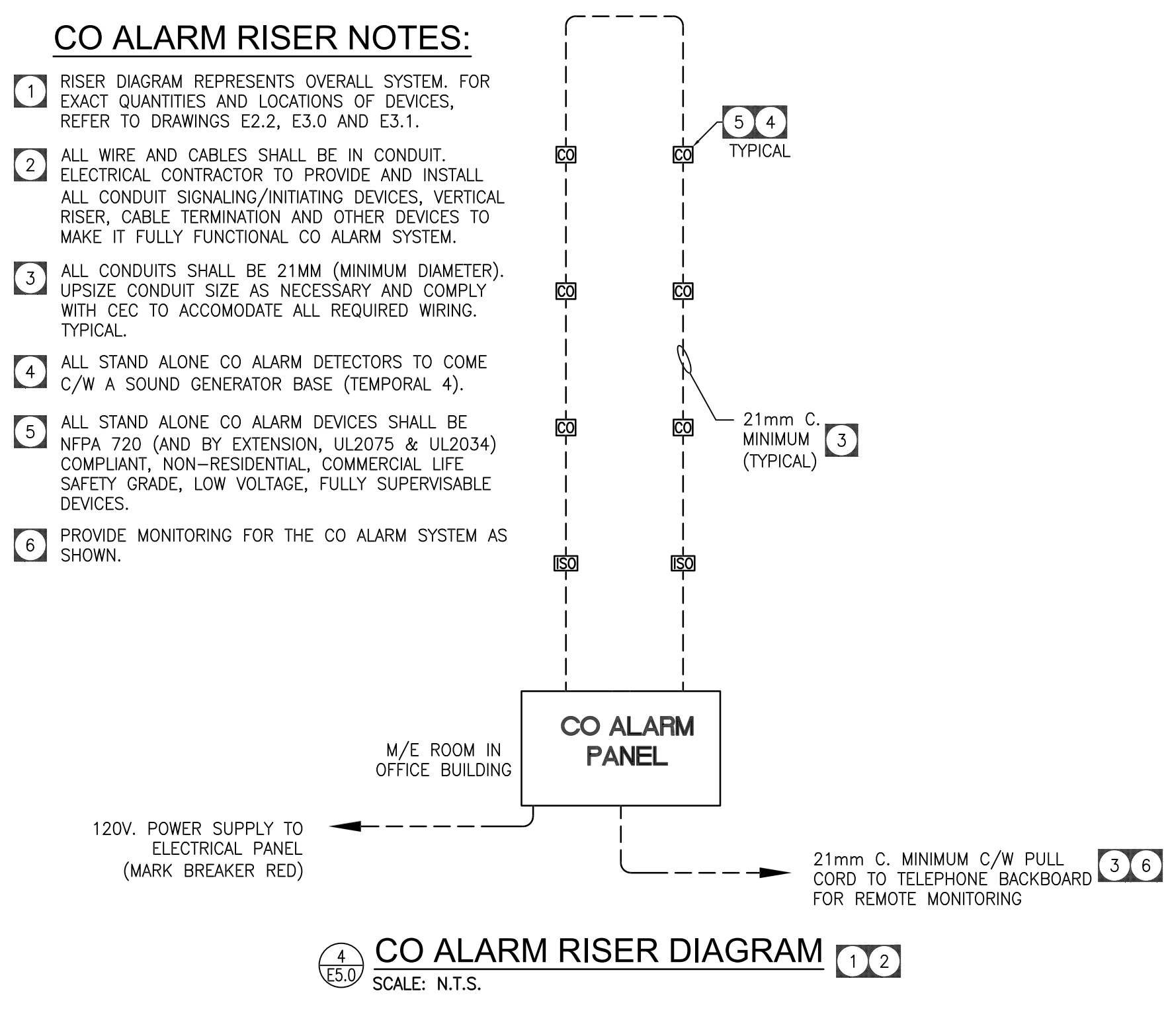


#10	MINIMUM CONDUCTOR SIZE: RW90
CU	CU = COPPER & AL = ALUMINUM
4	NO. OF CONDUCTORS
16	CONDUIT SIZE (MM)
E	EMT CONDUIT
P	PVC CONDUIT
R	RIGID STEEL CONDUIT
T	TECK CABLE
A	ACWJ
RA	RA90
D	DRIVE TYPE TECK CABLE
	BONDING CONDUCTOR



CO ALARM RISER NOTES:

- RISER DIAGRAM REPRESENTS OVERALL SYSTEM. FOR EXACT QUANTITIES AND LOCATIONS OF DEVICES, REFER TO DRAWINGS E2.2, E3.0 AND E3.1.
- ALL WIRE AND CABLES SHALL BE IN CONDUIT. ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL ALL CONDUIT SIGNALING/INITIATING DEVICES, VERTICAL RISER, CABLE TERMINATION AND OTHER DEVICES TO MAKE IT FULLY FUNCTIONAL CO ALARM SYSTEM.
- ALL CONDUITS SHALL BE 21MM (MINIMUM DIAMETER). UPSIZE CONDUIT SIZE AS NECESSARY AND COMPLY WITH CEC TO ACCOMMODATE ALL REQUIRED WIRING. TYPICAL.
- ALL STAND ALONE CO ALARM DETECTORS TO COME C/W A SOUND GENERATOR BASE (TEMPORAL 4).
- ALL STAND ALONE CO ALARM DEVICES SHALL BE NFPA 720 (AND BY EXTENSION, UL2075 & UL2034) COMPLIANT, NON-RESIDENTIAL, COMMERCIAL LIFE SAFETY GRADE, LOW VOLTAGE, FULLY SUPERVISABLE DEVICES.
- PROVIDE MONITORING FOR THE CO ALARM SYSTEM AS SHOWN.



SINGLE LINE DIAGRAM
NTS

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ELECTRICAL SLD & DETAILS

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DRAWER NO:		

PART 1 GENERAL

1. GENERAL SPECIFICATION

- 1.1. IT IS RECOMMENDED THAT THE BIDDERS EXAMINE THE SITE AND THE EXISTING CONDITIONS AFFECTING THE PROJECT. EXAMINE THE COMPLETE SET OF CONTRACT DOCUMENTS TO ENSURE THAT THE WORK CAN BE CARRIED OUT WITHOUT SIGNIFICANT CHANGES TO THE INTENT OF THE DOCUMENTS. NO FUTURE ALLOWANCE WILL BE MADE FOR CHANGES UNLESS THE ENGINEER HAS BEEN NOTIFIED IN WRITING OF ANY DISCREPANCIES OR INTERFERENCES, PRIOR TO THE CLOSE OF TENDERS. NO ALLOWANCE WILL BE MADE FOR ITEMS WHICH SHOULD HAVE BEEN NOTED DURING A PRE-TENDER SITE INSPECTION.
1.2. THE LOCATION, ROUTING AND ELEVATIONS OF ALL NEW AND EXISTING SERVICES AND UTILITIES AS SHOWN ON THE DRAWINGS ARE TO BE CONSIDERED AS APPROXIMATIONS ONLY. VERIFY THE EXACT LOCATIONS, ROUTINGS AND ELEVATIONS OF ALL SERVICES PRIOR TO COMMENCING WORK, AND ASSUME RESPONSIBILITY FOR LAYING OUT ALL WORK. THE CONTRACTOR SHALL RETAIN RESPONSIBILITY FOR ANY DAMAGE TO EXISTING SERVICES AND UTILITIES.
1.3. ALL ASPECTS OF THE INSTALLATION MUST COMPLY WITH THE MOST STRINGENT OF THE APPLICABLE BUILDING CODES, LOCAL REGULATIONS, AND BY-LAWS. BEFORE PROCEEDING WITH THE WORK, OBTAIN APPROVED DRAWINGS AND SPECIFICATIONS FROM THE AUTHORITIES HAVING JURISDICTION.
1.4. PROVIDE ALL NECESSARY NOTICES, OBTAIN ALL REQUIRED PERMITS, PAY ALL FEES REQUIRED BY LAW, AND ARRANGE FOR ALL INSPECTIONS RELATED TO THE PERFORMANCE OF THE SPECIFIED WORK.
1.5. PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLETE THE WORK AS SHOWN AND AS SPECIFIED, SO AS TO LEAVE THE OWNER WITH A COMPLETE AND FUNCTIONING SYSTEM. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND C.S.A. APPROVED, UNLESS SPECIFICALLY NOTED OTHERWISE. ALL SIMILAR EQUIPMENT AND OR MATERIALS SHALL BE BY THE SAME MANUFACTURER.
1.6. REQUEST FOR APPROVAL OF SUBSTITUTE MATERIAL AND/OR EQUIPMENT FOR THAT SPECIFIED, SHALL BE SUBMITTED TO THE ENGINEER WITH A STAMPED SELF-ADDRESSED ENVELOPE OR RETURN FAX NUMBER AT LEAST FIVE WORKING DAYS PRIOR TO TENDER CLOSING. REQUESTS SHALL INCLUDE ALL PERFORMANCE SPECIFICATIONS, PHYSICAL DATA AND OTHER PERTINENT INFORMATION REQUIRED FOR THE ENGINEER TO MAKE A COMPLETE COMPARISON.
1.7. ALL CUTTING AND PATCHING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. EXISTING EXPOSED SURFACES SHALL BE RETURNED TO AN "AS-FOUND" CONDITION ACCEPTABLE TO THE OWNER.
1.8. PROVIDE ALL REQUIRED ACCESS PANELS WITH SUITABLE FIRE RATINGS FOR THE WALL OR CEILING THAT THEY ARE BEING INSTALLED IN.
1.9. EACH CONTRACTOR SHALL COORDINATE THE WORK WITH OTHER CONTRACTORS IN ORDER TO AVOID CONFLICTS.
1.10. NEATLY STORE ALL MATERIALS, AND CLEAN UP REFUSE ON A REGULAR BASIS. PROTECT AND MAINTAIN ALL WORK UNTIL THE PROJECT HAS BEEN COMPLETED AND TURNED OVER TO THE OWNER.
1.11. THE INSTALLATION SHALL BE COMPLETELY TESTED, DEMONSTRATING THAT THE EQUIPMENT AND SYSTEMS INSTALLED ARE PERFORMING IN THE MANNER INTENDED.
1.12. AT COMPLETION OF THE INSTALLATION, PROVIDE TWO MARKED-UP COPY OF THE "AS BUILT" DRAWINGS FOR RECORD PURPOSES. PROVIDE THREE SETS OF OPERATION AND MAINTENANCE MANUALS, IN HARD COPY AND ELECTRONIC FORMAT. PROVIDE ELECTRONIC COPY TO CONSULTANT VIA EMAIL FOR REVIEW WITH HARD COPY AS BUILTS. PAY ALL COSTS ASSOCIATED WITH THE PRODUCTION OF THE "AS BUILT" DRAWINGS AND THE MANUALS. SUBMIT THE DOCUMENTS TO THE ENGINEER FOR REVIEW, AND MAKE ANY REQUESTED CHANGES BEFORE DELIVERING THEM TO THE OWNER.
1.13. REVIEW THE OPERATION AND MAINTENANCE OF THE SYSTEMS WITH THE OWNER'S MAINTENANCE PERSONNEL AND PROVIDE WRITTEN AND/OR VERBAL INSTRUCTIONS AS REQUIRED.
1.14. FURNISH CERTIFICATES CONFIRMING THAT THE WORK HAS BEEN INSTALLED TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
1.15. FURNISH CERTIFICATES CONFIRMING THAT THE WORK HAS BEEN INSTALLED TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
1.16. THE CONTRACTOR SHALL PROVIDE A ONE YEAR LABOR AND MATERIAL WARRANTY ON ALL NEW EQUIPMENT AND COMPONENTS, COMMENCING UPON THE DATE OF ACCEPTANCE BY THE OWNER.
1.17. REPLACE AT NO CHARGE TO THE OWNER, ALL ITEMS WHICH FAIL OR PROVE DEFECTIVE WITHIN A PERIOD OF ONE YEAR AFTER THE DATE OF FINAL ACCEPTANCE BY THE OWNER, PROVIDED THAT THE FAILURE IS NOT DUE TO IMPROPER USAGE BY THE OWNER, MAKE GOOD ALL DAMAGES INCURRED AS A RESULT OF THE FAILURE AND OF THE REPAIRS.
1.18. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL UNIT, FORCEFLOW AND BASEBOARD HEATERS.
1.19. BE RESPONSIBLE TO COORDINATE, SUBMIT AND FACILITATE ALL ITEMS RELATED TO POWER SMART PROGRAM INCENTIVES. ALL REBATES TO BE FORWARDED TO THE OWNER.

2. ELECTRICAL SPECIFICATIONS

- 2.1. REFER TO DIVISION 1 AND ARCHITECTURAL SPECIFICATIONS AND OTHER GENERAL CONDITIONS.
2.2. PROVIDE FOR A COMPLETE AND WORKING INSTALLATION AS HEREIN SPECIFIED AND AS SHOWN ON THE DRAWINGS.
2.3. THE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE, PROVINCIAL AND MUNICIPAL CODES AND REGULATIONS.
2.4. OBTAIN ALL PERMITS, APPROVALS AND PAY ALL RELATED FEES REQUIRED FOR THIS INSTALLATION.
2.5. ALL EQUIPMENT SUPPLIED UNDER THIS CONTRACT SHALL BE NEW AND BE C.S.A. APPROVED.
2.6. COORDINATE ALL TELEPHONE CONDUIT RUNS WITH TELEPHONE UTILITY BEFORE INSTALLATION BEGINS.
2.7. ARRANGE FOR, AND COORDINATE, ROUGH-IN AND FINAL INSPECTIONS WITH INSPECTION AUTHORITIES, CONSULTANT AND THE BUILDING OWNER'S REPRESENTATIVE.
2.8. CONFIRM ALL RECEPTACLE CONFIGURATIONS, OUTLETS AND WIRING FOR OWNER SUPPLIED EQUIPMENT BEFORE INSTALLATION OF SAME. VISIT EXISTING SITE WHERE SUCH EQUIPMENT IS PRESENTLY INSTALLED, AND/OR OBTAIN OUTLETS, WIRING AND RECEPTACLE CONFIGURATIONS FROM EQUIPMENT MANUFACTURERS. EXACT CONFIGURATIONS MAY DIFFER FROM THOSE SHOWN ON THE DRAWINGS. INCLUDE ALL COSTS TO PROVIDE NECESSARY OUTLETS WIRING AND RECEPTABLES.

3. EXAMINATION

- 3.1. EXAMINE THE ARCHITECTURAL, INTERIOR DESIGN, STRUCTURAL AND MECHANICAL DRAWINGS TO ENSURE THAT THE WORK UNDER THIS CONTRACT CAN BE SATISFACTORILY CARRIED OUT. REPORT ANY DISCREPANCIES TO THE CONSULTANT PRIOR TO SUBMISSION OF TENDER.
3.2. THE ELECTRICAL SUBCONTRACTOR SHALL EXAMINE THE SITE, LOCAL CONDITIONS AND CONSIDER HOW THEY MAY AFFECT THE PROJECT.

4. SUPERVISION

- 4.1. SUPERVISE THE WORK AT ALL TIMES THROUGH A RESPONSIBLE AND COMPETENT JOURNEYMEN ELECTRICIAN / SUPERVISOR.
4.2. FULL COOPERATION SHALL BE SHOWN WITH OTHER TRADES TO FACILITATE INSTALLATIONS AND TO AVOID DELAYS IN CARRYING OUT THE WORK.

5. ACCURACY OF DATA

- 5.1. DRAWINGS ARE SCHEMATIC; EXACT LOCATIONS, DISTANCES, LEVELS AND OTHER DIMENSIONS SHALL BE GOVERNED BY THE BUILDING AS CONSTRUCTED.
5.2. OUTLETS OR EQUIPMENT SHALL BE MOVED TO ANY POINT WITHIN A 10' RADIUS WHEN RELOCATION IS REQUESTED BY THE CONSULTANT OR OWNER BEFORE THE WORK HAS BEEN SUBSTANTIALLY COMPLETED, WITHOUT ADDITIONAL COST.
5.3. BRANCH CIRCUIT WIRING SHALL BE INSTALLED WITH CIRCUITS ARRANGED EXACTLY AS SHOWN ON THE DRAWINGS. CONDUIT AND CABLE RUNS MAY BE MODIFIED TO SUIT THE INSTALLATION.

6. APPROVAL OF MATERIAL

- 6.1. REQUEST FOR APPROVAL OF MATERIAL AS EQUALS OR ALTERNATES TO THAT SPECIFIED SHALL BE SUBMITTED TO THE CONSULTANT WITH A STAMPED SELF-ADDRESSED ENVELOPE OR RETURN FAX NUMBER AND PERFORMANCE SPECIFICATIONS FIVE (5) WORKING DAYS PRIOR TO THE TENDER SUBMITTAL. SAMPLES SHALL BE PROVIDED ON REQUEST.

7. SHOP DRAWINGS

- 7.1. PROVIDE ELECTRONIC COPIES OF SHOP DRAWINGS FOR REVIEW BY THE ENGINEER. THE SHOP DRAWINGS MUST BE ASSEMBLED INTO COMPLETE BROCHURES, WITH NO LOOSE SHEETS.
7.2. THE REVIEW OF THE SHOP DRAWINGS IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPT. THE REVIEW SHALL NOT MEAN APPROVAL OF THE DETAILED DESIGN INHERENT IN THE EQUIPMENT. THE RESPONSIBILITY FOR WHICH SHALL REMAIN WITH THE CONTRACTOR. THE REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REMAIN RESPONSIBLE FOR CONFIRMING AND CORRELATING THE DIMENSIONS ON THE JOBSITE, AND FOR INFORMATION THAT PERTAINS TO THE FABRICATION PROCESS, CONSTRUCTION TECHNIQUES, AND INSTALLATION DETAILS, AND FOR COORDINATING ALL WORK OF THE RELATED SUB-TRADES.
7.3. FABRICATION OF EQUIPMENT SHALL NOT COMMENCE UNTIL SHOP DRAWINGS OF SUCH EQUIPMENT HAVE BEEN REVIEWED BY THE CONSULTANT. TWO SETS SHALL BE SUBMITTED WITH LOCAL INSPECTION DEPARTMENT APPROVAL WHERE REQUIRED.
7.4. THE ELECTRICAL CONTRACTOR SHALL REVIEW ALL MECHANICAL SHOP DRAWINGS - REQUIRING ELECTRICAL CONNECTION - AND COORDINATE VOLTAGE AND SIZES WITH DIVISION 15 AND GENERAL CONTRACTOR.
7.5. REQUIRED SHOP DRAWINGS:
- LIGHT FIXTURES, LAMPS, BALLASTS AND CONTROL SYSTEMS
- ELECTRICAL DISTRIBUTION (COPS, PANELBOARDS, BREAKERS, ETC)
- MAIN SERVICE ENTRANCE DISTRIBUTIONS
- PANELBOARDS
- ELECTRIC HEATING EQUIPMENT AND CONTROLS
- EMERGENCY LIGHTING EQUIPMENT
- WIRING DEVICES (RECEPTABLES, SWITCHES, ETC)
- MOTOR STARTERS
- CONTACTORS
- DISCONNECT SWITCHES

8. AS-BUILT DRAWINGS

- 8.1. KEEP A RECORD SET OF DRAWINGS ON THE SITE AT ALL TIMES RECORDING ANY CHANGES THAT MAY OCCUR. SUBMIT THESE DRAWINGS TO THE CONSULTANT UPON COMPLETION OF THE WORK. AS-BUILTS SHALL INCLUDE CIRCUITING OF NEW AND EXISTING EQUIPMENT TO REMAIN.
8.2. AT THE COMPLETION OF THE INSTALLATION, PROVIDE TWO MARKED-UP COPY OF THE AS-BUILT DRAWINGS FOR RECORD PURPOSES. PROVIDE THREE SETS OF OPERATION AND MAINTENANCE MANUALS. PAY ALL COSTS ASSOCIATED WITH THE PRODUCTION OF THE AS-BUILT DRAWINGS AND THE MANUALS. SUBMIT THE DOCUMENTS TO THE ENGINEER FOR REVIEW, AND MAKE ANY REQUESTED CHANGES BEFORE DELIVERING THEM TO THE OWNER.
8.3. SUBMIT A CERTIFICATE OF INSPECTION FROM THE LOCAL INSPECTION AUTHORITY UPON COMPLETION OF WORK AND INCLUDE WITH "AS-BUILT" DRAWINGS.
8.4. THE CONSULTANT RESERVES THE RIGHT TO RECOMMEND THAT A PORTION OF THE CONTRACT FUNDS BE WITHHELD PENDING SUBMISSION OF ACCEPTABLE AS-BUILT DRAWINGS.

9. TESTING

- 9.1. THE ELECTRICAL INSTALLATION SHALL BE COMPLETELY TESTED DEMONSTRATING THAT THE EQUIPMENT AND SYSTEMS INSTALLED PERFORM IN THE MANNER INTENDED.

10. GUARANTEE

- 10.1. THE SATISFACTORY OPERATION OF ALL WORK SHALL BE GUARANTEED FOR A PERIOD OF 12 CALENDAR MONTHS AFTER FINAL ACCEPTANCE OF THE BUILDING.

11. REQUEST FOR CHANGE

- 11.1. ALL QUOTATIONS IN RESPONSE TO REQUEST FOR CHANGE SHALL BE SUBMITTED COMPLETE WITH AN ITEMIZED COST BREAKDOWN OF ALL MATERIALS AND LABOUR REQUIRED IN THE CHANGE.

12. GROUNDING

- 12.1. THE ENTIRE INSTALLATION SHALL BE GROUNDED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE AND AS SHOWN ON DRAWINGS.

13. WORKMANSHIP

- 13.1. INSTALL EQUIPMENT, CONDUIT AND CABLES IN A WORKMANLIKE MANNER TO PRESENT A NEAT APPEARANCE TO THE SATISFACTION OF THE CONSULTANT. INSTALL CONDUIT AND CABLE RUNS PARALLEL AND PERPENDICULAR IN CHASES, BEHIND FURRING OR ABOVE CEILINGS, IN AREAS WHERE SYSTEMS ARE TO BE EXPOSED, INSTALL NEATLY AND GROUP TO PRESENT A TIDY APPEARANCE.
13.2. INSTALL EQUIPMENT AND APPARATUS REQUIRING MAINTENANCE, ADJUSTMENT OR EVENTUAL REPLACEMENT WITH ADEQUATE CLEARANCES AND ACCESSIBILITY FOR SAME.
13.3. INCLUDE, IN THE WORK, ALL REQUIREMENTS SHOWN ON THE SHOP DRAWINGS OR MANUFACTURERS' INSTALLATION INSTRUCTIONS.
13.4. REPLACE WORK UNSATISFACTORY TO THE CONSULTANT WITHOUT EXTRA COST.
13.5. USE OF CLIPS FOR SECURING AC90 TO CEILING SYSTEM IS PROHIBITED.
13.6. ALL CONDUITS MUST BE CLIPPED TO STRUCTURAL CONCRETE BY MEANS OF ANCHORS OR SUPPORTED BY UNISTRUT HANGERS AS CLOSE TO UNDERSIDE AS POSSIBLE. TYE WRAPS FOR WIRE HANGING AND FASTENING IS NOT ACCEPTABLE. PERFORATED STRAPPING IS ALSO UNACCEPTABLE. ALL ELECTRICAL COMPONENTS MUST BE SUPPORTED INDEPENDENTLY.
13.7. ALL ELECTRICAL SUPPORTS AND HANGER ARE TO CO-ORDINATED AND ACCEPTABLE TO THE PRE-ENGINEERED MANUFACTURE PRIOR TO INSTALLATION.

PART 2 MATERIALS AND INSTALLATION

1. OUTLET BOXES

- 1.1. OUTLET, JUNCTION AND SWITCH BOXES SHALL BE GALVANIZED PRESSED STEEL SIZE AND TYPE TO SUIT EACH INDIVIDUAL APPLICATION.
1.2. OUTLETS SHALL NOT BE LOCATED ANYWHERE ON THE OUTSIDE CURTAIN WALL. OUTLETS SHOWN THUS SHALL BE MOUNTED ON THE NEAREST DIVIDING WALL 2' FROM OUTSIDE WALL, OR NEAREST FURRED OUT COLUMN.
1.3. PROVIDE ALL REQUIRED ACCESS PANELS WITH SUITABLE FIRE RATINGS FOR THE WALL OR CEILING THAT THEY ARE BEING INSTALLED IN.

2. WIRING METHODS

- 2.1. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, ALL WIRE SHALL BE COPPER, MINIMUM #12 AWG WITH 90 DEGREES CELSIUS X-LINK INSULATION. WIRING TO BE INSTALLED IN CONDUIT (INCLUDING WIRING ON ROOF DECK FLUTES WHERE APPROVED).
2.2. WIRING IN CONCRETE OR MASONRY CONSTRUCTION SHALL BE INSTALLED IN STEEL ELECTRICAL METALLIC TUBING (EMT). PROVIDE A SEPARATE GROUNDING CONDUCTOR IN EMT CONDUIT RUNS EMBEDDED IN CONCRETE SLABS. CONDUITS INSTALLED IN AREAS EXPOSED TO MOISTURE SHALL HAVE WATER TIGHT FITTINGS.
2.3. ALL WIRING IN FINISHED AREAS SHALL BE CONCEALED. ALL CONDUCTORS AND CONDUITS SHALL BE RUN PERPENDICULAR OR PARALLEL TO THE BUILDING CORE WALLS.
2.4. CONDUIT AND WIRING SHALL BE GROUPED WHERE POSSIBLE AND CLIPPED IN A NEAT AND WORKMANLIKE MANNER.
2.5. AC-90 CABLE TO BE USED FOR DROPS FROM CONDUIT SYSTEMS TO RECESSED LIGHTING FIXTURES IN ACCESSIBLE CEILINGS OR OUTLET BOXES IN STEEL STUD WALLS ONLY. HOME RUNS SHALL BE IN CONDUIT. MAXIMUM RUN OF AC-90 IN ACCESSIBLE CEILING SPACE SHALL BE 5'-0".
2.6. EACH CIRCUIT FOR COMPUTER EQUIPMENT, PRINTERS AND COPIERS SHALL HAVE A SEPARATE NEUTRAL CONDUCTOR.
2.7. PROVIDE ONE ISOLATED GROUND CONDUCTOR PER THREE 2 WIRE ISOLATED GROUND CIRCUITS.
2.8. CONDUIT RUNS SHALL BE INSTALLED AND INSPECTED BEFORE AC-90 RUNS ARE INSTALLED TO ENSURE CONFORMANCE WITH ITEM .9 HEREIN.
2.9. THREE WIRE AC-90 SHALL NOT BE USED FOR ISOLATED GROUND WIRING, UNLESS IT INCLUDES A GREEN INSULATED CONDUCTOR FOR THIS PURPOSE.
2.10. ALL AC-90 USED FOR DROPS SHALL BE RUN TIGHT TO DECK AND FOLLOW LINES OF BREAMS AND BUILDING.
2.11. ALL WIRING IN SERVICE AREAS TO BE IN SURFACE MOUNTED EMT. EMT NOT RUN CONDUIT HORIZONTALLY ON WALLS, VERTICAL DROPS ONLY.
2.12. ALL CABLE SHALL BE MINIMUM FT4 RATED, UNLESS RUN IN PLENUM. ALL CABLE RUN THROUGH PLENUM SPACE TO BE FT6 RATED. OTHERWISE CABLE SHALL BE RUN IN EMT OR NON COMBUSTIBLE RACEWAY.

3. IDENTIFICATION OF EQUIPMENT

- 3.1. ALL EQUIPMENT SHALL BE IDENTIFIED WITH 3/8" x 1 1/2" (1/8" LETTERS) ENGRAVED LAMACOID NAMEPLATES INDICATING PANEL AND CIRCUIT NUMBER OR FIRE ALARM HORN DESIGNATION. LAMACOIDS SHALL BE EITHER SCREWED OR RIVETED IN PLACE, WITH EXCEPTION TO RECEPTABLES AND LIGHTING SWITCHES, SELF ADHESIVE TYPE IS NOT ACCEPTABLE. LAMACOIDS SHALL BE WHITE LETTERING ON RED FACE FOR EMERGENCY AND FIRE ALARM DEVICES AND WHITE LETTERING ON BLACK FACE TO NORMAL POWER DEVICES AND COMMUNICATION PANELS.
3.2. PROVIDE 1" x 3" LAMACOIDS FOR EACH NEW COP BREAKER, INDICATING PANEL OR FEED BEING FED.
3.3. IDENTIFICATION OF EQUIPMENT

4. MECHANICAL EQUIPMENT WIRING

- 4.1. PROVIDE STARTERS (MINIMUM SIZE NEMA 1) AND WIRING FOR ALL HEATING, VENTILATING AND PLUMBING EQUIPMENT UNLESS SPECIFIED OTHERWISE.
4.2. POWER WIRING FOR THE MECHANICAL EQUIPMENT SHALL BE PERFORMED BY THE ELECTRICAL CONTRACTOR. OBTAIN A WIRING DIAGRAM FROM THE MECHANICAL SUBCONTRACTOR.
4.3. PROVIDE CONTROL WIRING FOR ALL MECHANICAL EQUIPMENT AS INDICATED. REFER TO MOTOR SCHEDULE FOR CONTROL WIRING REQUIREMENTS.
4.4. REFER TO THE MECHANICAL DRAWINGS FOR THE EXACT LOCATION OF MECHANICAL EQUIPMENT REQUIRING AN ELECTRICAL CONNECTION.
4.5. WHERE CONDUIT IS TO BE INSTALLED IN DESIGNATED EXPOSED AREAS (OPEN BEAM CEILING, ETC), E.C. COORDINATE EXACT INSTALLATION LOCATION WITH G.C. AND ARCHITECT. WHERE CONDUIT IS INSTALLED WITHOUT COORDINATE AND IS NOT BE THE SATISFACTION OF THE CONSULTANT.

5. LUMINAIRES

- 5.1. SUPPLY AND INSTALL LED FIXTURES COMPLETE WITH DRIVERS AS INDICATED.
5.2. INSTALL ANY LUMINAIRES SUPPLIED BY THE OWNER, AS INDICATED.
5.3. ALL FLUORESCENT LAMPS SHALL BE 3500 K AND 82 CR MINIMUM, UNLESS NOTED OTHERWISE.
5.4. ALL SWITCHING SHALL BE RUN IN CONDUIT.
5.5. ALL FIXTURES RATED 150V OR LARGER TO BE COMPLETE WITH AN ACCESSIBLE INTEGRAL DISCONNECTING SWITCH.

6. PANELBOARDS

- 6.1. LOAD CENTRES ARE NOT ACCEPTABLE. PANELS SHALL BE COMPLETE WITH PANEL TRIM HAVING CONCEALED HINGES AND TRIM MOUNTING SCREWS, LOCKING DOOR WITH FLUSH CATCH, PROVIDE TWO KEYS FOR EACH PANEL. PROVIDE SPRINKLER HOOD ON ALL PANELBOARDS.
6.2. BRANCH CIRCUIT BREAKERS SHALL BE BOLT-ON MOULDED CASE WITH THERMAL BREAKERS RATED AT 10,000A SYMMETRICAL OR AS INDICATED ON SINGLE LINE DRAWING.
6.3. AFFIX TYPEWRITTEN DIRECTORY TO THE INSIDE OF THE PANELBOARD INDICATING LOADS CONTROLLED BY EACH CIRCUIT INCLUDE COPY IN OPERATION AND MAINTENANCE MANUALS.

- 6.4. PANELBOARDS TO BE SURFACE OR RECESSED MOUNTED AS INDICATED.
6.5. PROVIDE BREAKER LOCK ON DEVICE FOR NIGHT LIGHTS AND FIRE ALARM CIRCUITS, AND PAINT BREAKER COLOR RED.

7. CUTTING AND PATCHING

- 7.1. ARRANGE AND PAY FOR ALL CUTTING AND PATCHING AS REQUIRED FOR THE ELECTRICAL INSTALLATION.
7.2. PROVIDE APPROPRIATE FIRE STOP AT ALL FIRE WALL PENETRATIONS. ACCEPTABLE MANUFACTURERS: DOW CORNING, FIRE-STOP SYSTEMS (ELASTA-SEAL) OR G.E. SILICONE.
7.3. REFER TO ARCHITECTURAL SPECIFICATIONS FOR PRODUCT AND INSTALLATION DETAILS.

8. DISTRIBUTION

- 8.1. GENERAL ARRANGEMENT AND SIZE OF COMPONENTS SHALL BE AS SHOWN ON THE DRAWINGS.
8.2. ALL DISTRIBUTION EQUIPMENT IS TO BE COMPLETE WITH LOCKING DOOR AND SPRINKLER HOODS.
8.3. ACCEPTABLE MANUFACTURERS; EATON, SCHNEIDER, SIEMENS.

9. DEVICES

- 9.1. COLORS OF RECEPTABLES, SWITCHES, OUTLETS AND COVERPLATES SHALL BE WHITE UNLESS NOTED OTHERWISE. RECEPTABLES SHALL BE DECORA STYLE.
9.2. SWITCHES SHALL BE HUBBELL, ARROW HART, BRYANT, LEVITON, WOODHEAD, PASS & SEYMOUR, 15 AMPS, 125 / 347 VAC. MOUNT SWITCHES 1200MM A.F.F. TO CENTRE UNLESS OTHERWISE NOTED. SWITCHES SHALL BE DECORA STYLE.
9.3. ACCEPTABLE MANUFACTURERS FOR RECEPTABLES SHALL BE HUBBELL, ARROW HART, BRYANT, LEVITON, WOODHEAD, PASS & SEYMOUR. MOUNT RECEPTABLES 400MM A.F.F. TO BOTTOM UNLESS OTHERWISE NOTED.
9.4. INCANDESCENT LIGHTING DIMMER CONTROLS SHALL BE LUTRON NOVA *1 RATED AT 1500, 1000 OR 600 WATTS AS INDICATED ON DRAWING. COLOUR OF DIMMER SNAP-ON COVER TO BE AS SELECTED BY ARCHITECT, INTERIOR DESIGNER, OR AS INDICATED ON THE DRAWING. MOUNT DIMMERS 1200MM A.F.F. TO CENTRE UNLESS OTHERWISE NOTED.
9.5. WHERE HANDICAP WHEELCHAIR ACCESS IS CONSIDERED, INSTALL ELECTRICAL DEVICES AT THE FOLLOWING HEIGHTS:
9.5.1. SWITCHES, DIMMERS, PUSHBUTTONS: 1200mm TO CENTER
9.5.2. RECEPTABLES, TELEVISION, TELEPHONE: 400mm TO BOTTOM
9.5.3. THERMOSTATS: 1200mm TO CENTER
9.5.4. FIRE ALARM PULLSTATIONS, INTERCOMS: 1200mm TO CENTER

10. EMERGENCY AND EXIT LIGHTING

- 10.1. DESIGN INTENT IS TO PROVIDE NEW 12 VOLT BATTERY BANKS TO SERVE NEW EMERGENCY LIGHTING AND NEW EXIT LIGHTING FIXTURES. PROVIDE BATTERY BANKS AND REMOTE FIXTURES AS INDICATED ON THE DRAWINGS. SEE SCHEDULES FOR MODEL NUMBERS.
10.2. NEW EXIT LIGHT FIXTURES SHALL BE LOW WATTAGE, LED TYPE, WHITE, STEEL OR CAST METAL EQUAL TO LUMACELL LS SERIES. UNITS TO BE ONE OR TWO SIDED AS INDICATED UNITS TO BE PROVIDED WITH FULL PANEL (HIGH BRIGHTNESS) LED'S, WITH MINIMUM 100,000 HOUR LIFE. RATING AND BE COMPLETE WITH DIRECTIONAL ARROWS, AS SHOWN ON THE DRAWING. PROVIDE AC AND DC POWER.
10.3. WIRING SHALL BE MINIMUM #12 AWG. PROVIDE #10 AWG WHERE REQUIRED TO ATTAIN 2% (OR LESS) VOLTAGE DROP, UNLESS OTHERWISE NOTED. ALL WIRING IN EMT.
10.4. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING BATTERY BANK SIZE AND CAPACITY TO PROVIDE A MINIMUM OF 30 MINUTE BACK-UP.
10.5. ACCEPTABLE MANUFACTURERS ARE EMERGI-LITE, BEGHELLI, LUMACELL, BEGHELLI, READI-LITE AND DUAL-LITE.
10.6. PROVIDE A WRITTEN GUARANTEE, STATING THAT THE BATTERY FOR EMERGENCY LIGHTING IS GUARANTEED AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP FOR PERIOD OF TEN YEARS, WITH A NO-CHARGE REPLACEMENT DURING THE FIRST FIVE YEARS AND A PRO-RATE CHARGE ON THE SECOND FIVE YEARS FROM THE DATE OF THE FINAL ACCEPTANCE FROM THE OWNER.
10.7. ALL EXIT SIGNS TO BE CSA C860 APPROVED.

11. OWNER SUPPLIED EQUIPMENT

- 11.1. WIRE AND CONNECT ALL OWNER SUPPLIED EQUIPMENT AS SHOWN ON THE DRAWINGS. VERIFY NAMEPLATE RATINGS WITH POWER PROVISIONS. ANY DISCREPANCIES SHALL BE REPORTED TO THE CONSULTANT.
11.2. ALL OWNER SUPPLIED EQUIPMENT, WITH THE EXCEPTION OF PLUG-IN TYPES, SHALL BE HARD-WIRED AT LOCATIONS SHOWN ON THE DRAWINGS.

12. COMMUNICATIONS CONDUITS

- 12.1. CONDUIT SHALL BE COMPLETELY INDEPENDENT FROM OTHER CONDUIT. INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH THE LOCAL TELEPHONE AND TELEVISION SYSTEM REGULATIONS WITH REGARD TO PULLBOXES, BENDS, ETC. MINIMUM RISER CONDUIT SIZE TO BE 3/4". REFER TO RISER DIAGRAM FOR DETAILS.

13. VOICE/DATA COMMUNICATIONS SYSTEMS

- 13.1. CONNECT COMMUNICATION DEVICES AS REQUIRED OF CUSTOMER EQUIPMENT. (PLUG IN ONLY) TELEPHONE SETS AND DATA.
13.2. THE INSTALLATION IS TO BE A CERTIFIED LEVEL 6 INSTALLATION.
13.3. CABLES TO BE IDENTIFIED AT BOTH ENDS OF CABLE WITH 5 CM FROM TERMINATION.
13.4. ALL CABLES SHALL BE TERMINATED ON THE CROSS CONNECT PANEL WITH NO MORE THAN 1.27 CM OF UNTWISTED CABLE BEFORE TERMINATION.
13.5. DATA COMMUNICATIONS WORK AS SPECIFIED SHALL BE THE RESPONSIBILITY OF CERTIFIED SYSTEM VENDOR (CSV). THE CSV IS REQUIRED TO:
13.5.1. PROVIDE PROOF OF CERTIFICATION WITH TENDER SUBMISSION; DESIGN A CATEGORY 6 WIRING SYSTEM BASED ON CONTRACT DOCUMENTS;
13.5.2. COMPLY WITH LEVITON, NORDX IDB, AMP, SYSTEMAX DESIGN GUIDE AND INSTALLATION PRINCIPLES;
13.5.3. PERFORM AND SUPERVISE THE CABLE PULL;
13.5.4. ONLY QUALIFIED TECHNICIANS DIRECTLY EMPLOYED BY THE CSV SHALL TERMINATE;

- 13.5.6. CABLES (AT EITHER ENDS), TEST AND PERFORM CROSS-CONNECTS;
13.5.7. UPON COMPLETION, PROVIDE STANDARD AND ENHANCED TESTING ON ALL CABLE RUNS, AND DOCUMENTATION OF TEST RESULTS.
13.5.8. PROVIDE AND INSTALL EQUIPMENT AS SPECIFIED HEREIN;
13.5.9. PROVIDE DOCUMENTATION OF THE INSTALLATION;
13.5.10. PROVIDE CSV LETTER OF CERTIFICATION WITHIN TWO WEEKS OF COMPLETION OF JOB WHICH WILL INCLUDE PERFORMANCE LEVEL, THE IDENTIFICATION OF THE INSTALLATION BY THE LOCATION AND INSTALLATION DATE.
13.6. EACH WORK STATION SHALL BE PROVIDED WITH ONE CAT 6 DATA OUTLET C/W RJ 45 JACK FOR DATA AND ONE CAT 6 FOR VOICE.
13.7. PROVIDE CONSOLIDATION POINT IN SERVER ROOM CABINET TO ALLOW GROUPING CONDUIT RISERS AND TERMINATION THEREIN ON BIX PUNCH DOWN - TO RJ 45 CROSS CONNECTS.
13.8. EACH CONSOLIDATION POINT WILL CONTAIN A SWITCH WITH SUITABLE NUMBER OF PORTS (PLUS 10% SPARE).
13.9. PROVIDE J HOOK PATHWAYS FROM V/D OUTLETS TO CONSOLIDATION POINT.
13.10. STATION OUTLETS - FOR EACH OUTLET PROVIDE:
13.10.1. 1 CATEGORY 6, DATA OUTLET, COMPLETE WITH ICON TYPE NUMBERED LABELS: DXX-YYYA, WHERE XX=FLOOR LEVEL (08, 09, 10) OF WORK STATION, YYY IS WORK STATION NUMBER (001, TO 100 ETC.) AND A IS WIRE TO OUTLET. OUTLETS AS MANUFACTURED BY THOMAS & BETTS OR APPROVED EQUAL. TERMINATION OF CABLES ON BIX BLOCK AT APPLICABLE CABINET.
13.10.2. CABLE AND TERMINATION OF SAME ON BIX BLOCK TO BACK OF CROSS CONNECT OUTLET ON RACK
13.10.4. ONE CROSS CONNECT JUMPER.
13.11. PROVIDE PATCH PANELS AS REQUIRED.

14. CO DETECTION

- 14.1. THE CO DETECTION SYSTEM SHALL CONFORM TO NFPA-720 2009.
14.2. THE CO DETECTION SYSTEM SHALL CONFORM TO MANITOBA BUILDING CODE (MBC) LATEST EDITION.
14.3. THE CO DETECTION SYSTEM SHALL CONFORM TO UL STANDARD 2075 STANDARD FOR GAS AND VAPOR DETECTORS AND SENSORS.
14.4. SHALL BE UL/C/CSA LISTED AND SUBJECT TO APPROVAL BY LOCAL AUTHORITY HAVING JURISDICTION.
14.5. MICROPROCESSOR CONTROL PANEL TO CARRY OUT CO DETECTION AND ALARM AND PROTECTION FUNCTIONS INCLUDING RECEIVING ALARM SIGNALS, ACTUATING ZONE ANNUNCIATORS, INITIATING ALARM, SUPERVISING SYSTEM CONTINUOUSLY, PERFORMING VENTILATION CONTROL FUNCTIONS, AND INITIATING TROUBLE SIGNALS.
14.6. ACCEPTABLE MANUFACTURERS: SYSTEM SENSOR OR APPROVED EQUAL.
14.7. 120 VAC, 60 HZ INPUT, 24 VDC OUTPUT STANDBY POWER FROM GEL CELL BATTERIES SIZED AS PER NBC/MBC-2010 REQUIREMENTS.
14.8. ALL INTELLIGENT CO DETECTORS, REMOTE ZONE MODULE AND PROGRAMMABLE REMOTE RELAYS MUST BE CAPABLE OF BEING INTERMIXED ON THE SAME ADDRESSABLE LOOP.
14.9. THE INTELLIGENT CO DETECTOR MUST CONTAIN EITHER METAL OXIDE SEMICONDUCTOR OR ELECTROCHEMICAL (PLATINUM/ACID COMBINATION) SENSING TECHNOLOGIES. EACH MUST CONTAIN ITS OWN MICROCOMPUTER CAPABLE OF STORING ALL OF THE DEVICES PROGRAMMED INFORMATION PROVIDE DISCREET SENSITIVITY AND TRANSMITTING SAME IN DIGITAL FORMAT TO THE CONTROL PANEL.
14.10. HORN/STROBE: POLARIZED 24 VDC, FLUSH OR SURFACE MOUNTED, 250 MM, WITH INTEGRATED STROBE LIGHTS, MINIMUM 85DB. THE HORN SOUND SHALL BE DISTINCTIVE FROM FIRE ALARM SIGNAL ALARM SOUND, AND TEMPORAL CODED AS SPECIFIED IN NFPA-720.
14.10.1. IF CO DETECTION SYSTEM IS CENTRALLY MONITORED AS PER CAN/ULC-5561, HORN/STROBES ARE NOT REQUIRED. ALL DETECTORS SHALL HAVE SOUNDER BASE INSTEAD.
14.11. INSTALL SYSTEMS IN ACCORDANCE WITH NFPA-720, AND ACCORDING TO THE MANUFACTURER'S REQUIREMENTS.
14.12. COORDINATE WITH MECHANICAL DIVISION FOR EXACT LOCATION OF THE CO DETECTOR LOCATIONS AND CONNECT TO ALARM CIRCUIT WIRING.
14.13. INSTALL MAIN CONTROL PANEL(S) AND CONNECT TO AC EMERGENCY POWER SUPPLY.
14.14. DO NOT MOUNT DETECTORS WITHIN 1M RADIUS OF AIR OUTLETS. MAINTAIN AT LEAST 600MM RADIUS CLEAR SPACE ON CEILING, BELOW AND AROUND DETECTORS.
14.15. CONNECT ALARM AND SIGNALING CIRCUITS TO MAIN CONTROL PANEL.
14.16. LOCATE AND INSTALL SIGNAL AND/OR VISUAL SIGNAL DEVICES OR DETECTORS COMPLETE WITH SOUNDER BASES AND CONNECT TO RESPECTIVE CIRCUITS. ALTERNATE CIRCUITS FOR ADJACENT AUDIBLE DEVICES.
14.17. ARRANGE FOR AND MAKE CONNECTION FOR CENTRAL REPORTING TIE-IN THROUGH LOCAL TEL LINES. THE INTERCONNECTION WIRING FROM THE CO DETECTION CONTROL UNIT/TRANSPONDER TO THE FIRE SIGNAL RECEIVING CENTRE SHALL COMPLY WITH NFPA-720.
14.18. ARRANGE FOR AND MAKE CONNECTION BETWEEN CO DETECTION SYSTEM AND THE BUILDING FIRE ALARM PANEL (IF FIRE ALARM PANEL IS REQUIRED).
14.19. THE MANUFACTURER OR HIS AUTHORIZED REPRESENTATIVE MUST PERFORM TESTS IN ACCORDANCE WITH NFPA-720.
14.20. THE VERIFYING TECHNICIAN MUST BEAR APPROVAL AS SPECIFIED IN NFPA-720.

CONSULTANT

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PROJECT TITLE
Gimli Search & Rescue Station

Gimli, Manitoba

DRAWING TITLE

ELECTRICAL SPECIFICATIONS

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