

# **DRAWINGS**

- ARCHITECTURAL**
- ARBORIST**
- SEPTIC**
- GRADING**

**PROPOSED HOSPICE HOME IN MARKHAM**

**7672 ELGIN MILLS RD. E. MARKHAM, ON.**

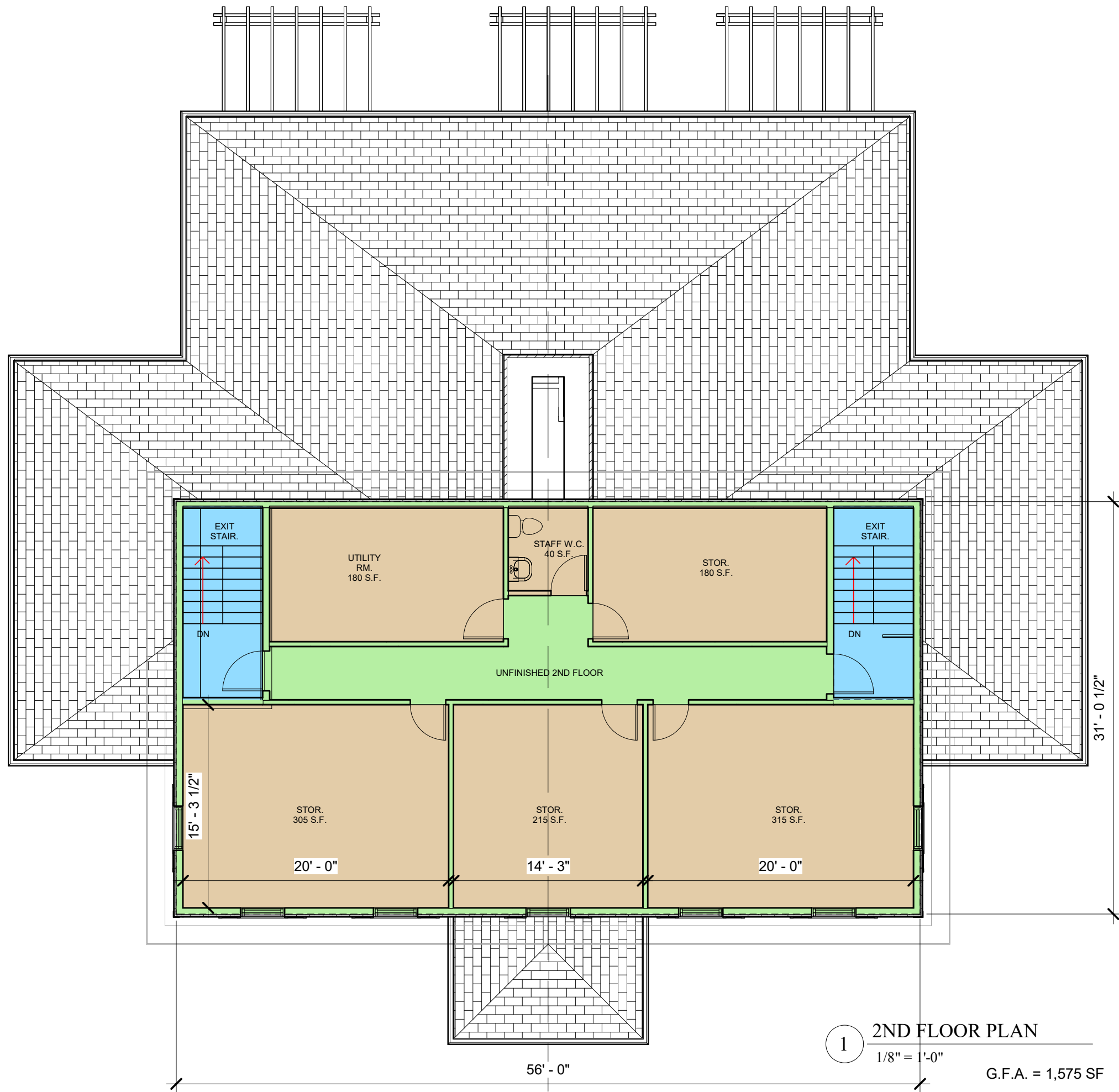
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**TOTAL 3 UNITS**









**PROPOSED HOSPICE HOME IN MARKHAM**

7672 ELGIN MILLS RD. E. MARKHAM, ON.



**EVERGREEN HOSPICE  
MARKHAM -**  
201-5762 Hwy 7,  
Markham, ON. L39 1A8



100 Anna Russell Way, Unit 108  
Unionville, ON. L3 C 6C7  
Phone: 416-919-6020  
E mail: d.johnston@davidjohnston.ca

**PROPOSED ARCHITECTURAL DESIGN**

No	Description	Date	By

Drawn by	<b>Author</b>
Date	<b>APR. , 2026</b>
Scale	<b>1/8" = 1'-0"</b>
Project Number	<b>250513</b>
DRAWING NAME	<b>2ND FLOOR PLAN</b>
SHEET NUMBER	<b>A-1.12</b>

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# Preliminary For Discussion

## Sewage System Design Only

**Note:**  
It is understood from the owner that there will not be any strong medications use for the Hospice patients.

**Note:**  
1. All services including sewer, water, hydro, cable, telephone, and gas should be staked out prior to construction and appropriate pre-cautions taken to protect the existing services.  
2. Soil and groundwater conditions may be variable across the site. If soil and underground water conditions, other than those used to prepare this design, are encountered during the installation, Gunnell Engineering Ltd. should be contacted to determine the effect on the proposed sewage system.  
3. Contractor to verify location of neighbouring wells, if any, prior to septic system installation. Any conflict between wells and septic system, i.e. less than 30 metre clearance, should be discussed with Gunnell Engineering Ltd. prior to septic system installation.

**Notes:**  
1. All landscaped areas to be reinstated with 150mm topsoil and sod or seed, except septic field to be provided with 200/300mm of topsoil & be sodded.  
2. Existing elevations as noted, ie. 221.84  
3. Proposed swale elevations as noted, ie. (221.95)  
4. Proposed elevations as noted, ie. 220.40  
5. Existing slopes shown, ie. (2.2%)  
6. Maintain maximum slopes at 3 horizontal to 1 vertical, except slopes to be maximum 4:1 at septic field.  
7. Provide new swales as detailed.  
8. All site grading to be in accordance with OBC & the City of Markham.  
9. Property to be serviced by new municipal water service.

### Sewage System Details: Class IV Filter Bed Sewage System Ontario Building Code Compliance Analysis

Daily Design Sewage Flow Assessment:

Proposed Hospice : 2,250 L/Day (3 Patient / Hospice rooms + 2 Future Patient / Hospice rooms @ 750 L/Day per bed)[Based on Hospitals (per bed with laundry facilities) : OBC Table 8.2.1.3.B]  
 $Q_1 = 3,750 \text{ L/Day}$   
 \* No medication use (i.e chemotherapy medications)  
 \* 2 Future bedrooms as contingency

Office Use: - 5 employees @ 75 L/Day = 375 L/Day  
 $Q_2 = 375 \text{ L/Day}$

$Q_{TOT} = 4,200 \text{ L/day rounded } (Q_1 + Q_2 = 4,125) - \text{Daily Design Sewage Flow}$

Septic Tank: [3 x Q = 3 x 4,125 L/day] = 12,600 L. Provide 13,500 L (3,000 gal.), two-compartment septic concrete tank, with effluent filter and gravity-flow to Pump Station

Pump Station: Provide pump tank = 7,000 L (1,550 gal.), c/w timed dosing to Filter Bed.

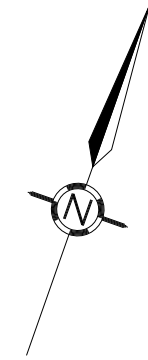
Soil Percolation: T = 50 min/cm. Test pit investigation carried out by Gunnell Engineering Ltd. on March 23, 2026 identified silty clay soils.

Filter Bed (based on  $Q_{TOT} = 4,200 \text{ L/day}$  and  $T = 50 \text{ min/cm}$ ):  
 Filter Area: Maximum loading =  $50 \text{ L/m}^2$  (i.e.:  $3,000 < Q \leq 5,000 \text{ L/day}$ );  $4,200 / 50 = 84.0 \text{m}^2$ . Provide Filter Medium Area:  $90.0 \text{m}^2$  [(5.0m x 9.0m) x 2 Pods]

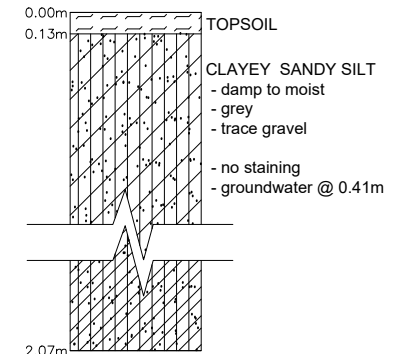
Base of Filter Medium, extending 300mm thickness, over Area =  $Q_{TOT} \times T / 850 = 4,200 \times 50 / 850 = 247.1 \text{m}^2$ . Provide Extended Base Contact area =  $260.0 \text{m}^2$  (10.0m x 26.0m).

Loading Requirements - Reference: Table 8.7.4.1.A  
 Based on a loading rate of  $6 \text{ L/m}^2/\text{day}$  (i.e.  $35 < T \leq 50$ ): Area =  $4,200 / 6 = 700.0 \text{m}^2$ . Provide Loading Area =  $780.0 \text{m}^2$  (26.0m x 30.0m)

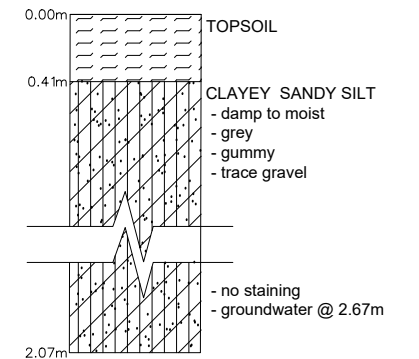
Mantle - 22.5m, extending from stone layer.



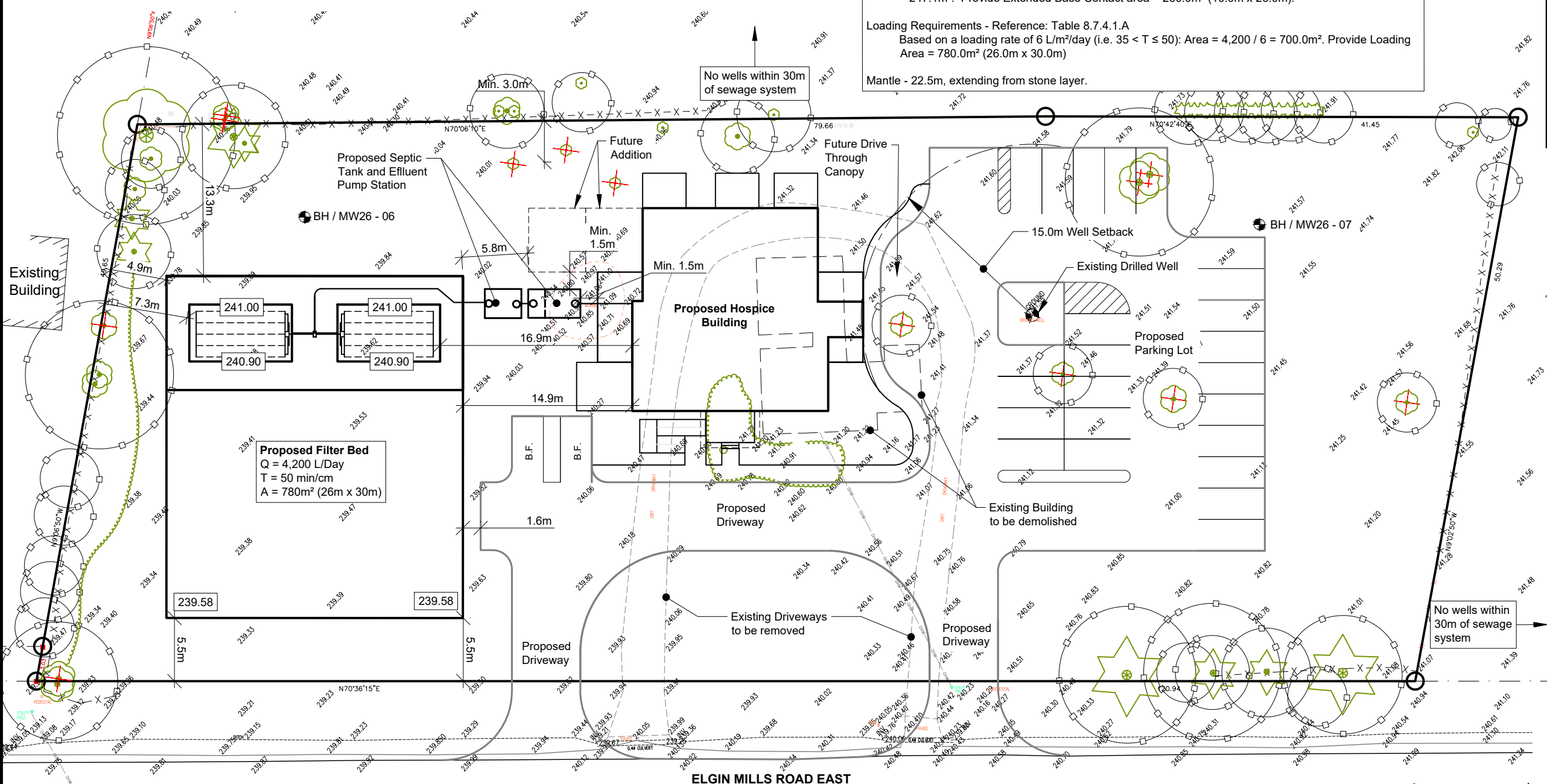
### Borehole Soil Log



**Borehole #BH6**  
Dug on March 23, 2026



**Borehole #BH7**  
Dug on March 23, 2026



**Gunnell Engineering Ltd.**  
 1110 Stellar Drive, Unit 106  
 Newmarket, ON L3Y 7B7  
 bus: 905-868-9400  
 www.septicdesign.ca

### LEGEND

Tree Identified for Removal

**Draft**

**Proposed Hospice**  
 7672 Elgin Mills Rd E  
 City of Markham

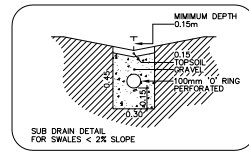
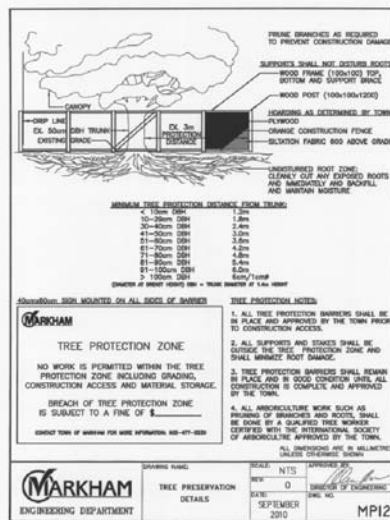
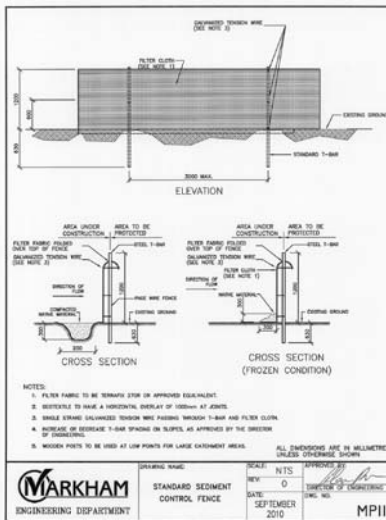
**Site Plan**  
 Preliminary Sewage  
 System Layout

Scale: 1:400	Designed By: DB
Date: 11-MAY-2026	Drawn By: DB
Project No.:	Checked By: EG
	Drawing No.:

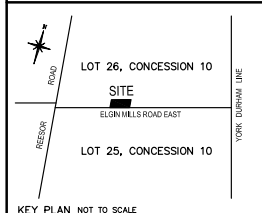
**D3920 SP-1**

File: Z:\Gunnell Engineering AutoCAD\03920 - Evergreen Hospice Markham\CAD\NE-03920AE-SP1.dwg  
 Plotted On: 12 May, 2026

# PRELIMINARY ' FOR COORDINATION '



<b>MARKHAM</b> ENGINEERING DEPARTMENT	STANDARD SEGMENT CONTROL FENCE	DATE: SEPTEMBER 2020	MP11
<b>MARKHAM</b> ENGINEERING DEPARTMENT	TREE PRESERVATION DETAILS	DATE: SEPTEMBER 2020	MP12



**LEGAL DESCRIPTION**  
PART OF LOT 26, CONCESSION 10  
CITY OF MARKHAM GEORGIC TOWNSHIP OF MARKHAM  
REGIONAL MUNICIPALITY OF YORK  
SCALE 1 : 200  
E. W. BOWYER B.Sc., O.L.S.

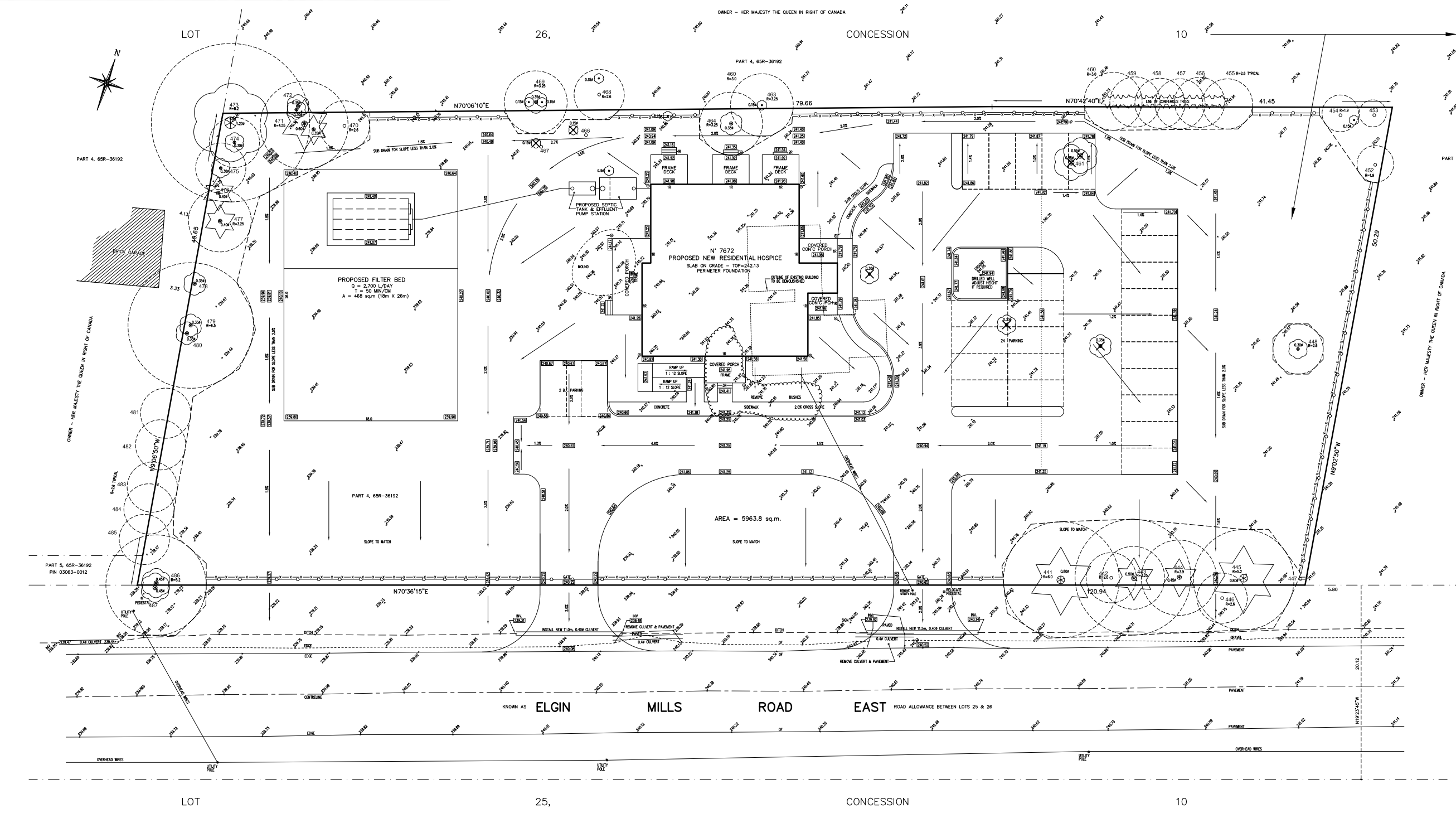
**CAUTION**  
OVERGROUND AND UNDERGROUND SERVICES AND UTILITIES ARE LOCATED ON THIS PLAN HOWEVER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATIONS OF THEM PRIOR TO THE COMMENCEMENT OF ANY WORK AND BE LIABLE FOR ANY DAMAGE TO THEM.  
THIS IS NOT A PLAN OF SURVEY.

**BENCHMARK**  
ELEVATIONS ARE REFERRED TO BM 092901300.  
ELEVATION = 237.69

**LEGEND**

	NOTES PROPOSED ELEVATION
	NOTES EXISTING ELEVATION
	NOTES DECIDUOUS / FEROCIOUS TREE
	NOTES REMOVE TREE
	NOTES RAIN WATER LEADER
	NOTES HIGH POINT
	NOTES TREE PROTECTION ZONE
	NOTES TOP CURB / BOTTOM CURB
	NOTES DIAMETER
	NOTES TREE PROTECTION ZONE AREA
	NOTES OUTLINES OF EXISTING STRUCTURE
	NOTES SEDIMENT CONTROL FENCE (MP11)
	NOTES TREE HOARDING FENCE (MP12)
	NOTES 1.8m HIGH MODULAR FENCING
	NOTES PROPERTY LINE
	NOTES BELL LINE
	NOTES OVERHEAD WIRES
	NOTES LOT FABRIC

**CREDITS**  
BUILDING DESIGN AND POSITION DAVID JOHNSON ARCH. LTD.  
SURVEY DATA BY E. W. BOWYER INC.  
SEPTIC DESIGN - GUNNELL ENGINEERING LTD.  
ABORIST - TRISHA THOMSON



1	1st SUBMISSION	xx/xx/2026
No.	DESCRIPTION	DATE
<b>REVISIONS</b>		
<b>MARKHAM</b>		
THE CORPORATION OF THE CITY OF MARKHAM ENGINEERING DEPARTMENT		
7672 ELGIN MILLS ROAD EAST OWNER - HER MAJESTY THE QUEEN IN RIGHT OF CANADA		
E. W. BOWYER INC. ONTARIO LAND SURVEYORS LAND DEVELOPMENT CONSULTANTS 8275 HIGHWAY # 48, SUITE 203 MARKHAM, ONTARIO L3R 9V3 TELEPHONE (905) 944-8063 EMAIL: ewb@ewbinc.com		
<b>SITE SERVICING/GRADING PLAN</b>		
DESIGN BY: E. W. BOWYER	CHECKED BY: E. W. BOWYER	C:\OLD\2025\26-113-SP2.DWG
DRAWN BY: E. W. BOWYER	CHECKED BY: E. W. BOWYER	SCALE: 1 : 200 0 1 2 3 4 5 metres
DATE: xx/xx/2026		DWG No: M-684-SP2
CITY FILE No.:		

# **DRAWINGS**

- STRUCTURAL**
- ELECTRICAL**
- MECHANICAL**

**PROPOSED HOSPICE HOME IN MARKHAM**

**7672 ELGIN MILLS RD. E. MARKHAM, ON.**

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**TOTAL 3 UNITS**

**GENERAL NOTES:**

- THE DESIGN AND CONSTRUCTION OF ALL WORK ON THIS PROJECT IS TO CONFORM TO THE ONTARIO BUILDING CODE – 2020 INCLUDING ALL AMENDMENTS, AND THE RELEVANT LISTED C.S.A. STANDARDS INCLUDING THE LATEST EDITIONS.
- READ THESE DRAWINGS IN CONJUNCTION WITH ALL RELATED ARCHITECTURAL, MECHANICAL, ELECTRICAL AND CIVIL DRAWINGS AND CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND MEASUREMENTS AT THE SITE AND REPORT TO THE ENGINEER ANY DISCREPANCIES OR UNSATISFACTORY CONDITIONS WHICH MAY ADVERSELY AFFECT THE PROPER COMPLETION OF THE JOB BEFORE PROCEEDING WITH THE WORK.
- DO NOT SCALE THE DRAWINGS.
- DESIGN LIVE LOADS FOR EACH PORTION OF THE STRUCTURE ARE AS INDICATED ON THE DRAWINGS. DO NOT EXCEED THESE LOADS DURING CONSTRUCTION.
- DESIGN LOADS INDICATED ARE UNFACTORED UNLESS NOTED.
- CONSTRUCTION, FABRICATION AND SHOP DRAWING REVIEW MUST BE PROVIDED AS PER CODE.
- REFERENCE ELEVATIONS SHOWN CORRESPOND TO ACTUAL GEODETIC ELEVATION.
- DELIVER, HANDLE AND STORE MATERIALS TO AVOID DAMAGE IN ANY MANNER.
- MAINTAIN A SET OF DRAWINGS ON SITE & UPDATE FREQUENTLY WITH CONSTRUCTION RECORD INFORMATION.

**MATERIALS:**

UNLESS NOTED OTHERWISE ON THE DRAWINGS THE FOLLOWING MATERIALS SHALL BE USED FOR CONSTRUCTION:

- CONCRETE SHALL BE PROPORTIONED AS FOLLOWS (U.N.O.):

CONCRETE DESCRIPTION	FOOTINGS	FOUNDATION WALLS & PIERS (EXTERIOR)	SLAB ON GRADE (INTERIOR)	OTHER (FREEZING & THAWING) PAVEMENTS, SIDEWALKS, CURBS & GUTTERS
28 DAYS (MIN.) STRENGTH (MPA)	25	25	25	32
AIR CONTENT	4% TO 7%	4% TO 7%	4% TO 7%	5% TO 8%
MAX. AGGREGATE SIZE (mm)	20	20	20	20
EXPOSURE CLASS	F2	F2	N	C2

- BEARING GROUT: 35MPa – 28 DAY MIN. COMP. STRENGTH NON SHRINK, NON METALLIC
- REINFORCING STL. BILLET STL. BARS TO G30.18-GRADE 400R, GRADE 400W WHERE WELDING IS REQUIRED
- WELDED STEEL WIRE FABRIC: G30.5
- ANCHOR BOLTS, NUTS AND WASHERS: ASTM A307 & A36
- HIGH STRENGTH BOLTS: ASTM A325
- WIDE FLANGE BEAMS AND WWF SECTIONS: G40.21-350W
- MISC. ROLLED SECTIONS & ROLLED PLATES: G40.21-300W
- HSS: G40.21-350W CLASS H
- GALVANIZING: CSA G164 & ASTM A153 CLASS B2
- WELDING: CSA W59, W55 AND W47 SERIES E480XX ELECTRODES
- BRICK: 55MPa CLAY TO CSA A82 SERIES
- BLOCK: 15MPa CONCRETE ON NET AREA TO CSA A165 SERIES AND AS REQUIRED TO PRODUCE SPECIFIED F'M VALUES
- MORTAR: TYPE S TO CSA A179
- GROUT MASONRY: TO CSA A179 AND TO STRENGTH OF 15MPa MIN. U.N.O.
- WIRE REINF. (MASONRY): CSA G30.3 & ASTM A82 (HOT DIP GALV.)
- STEEL DECK: TO CSSB1 101M, GRADE A MIN. C.N.T. 0.76mm U/N, ZF075 WIPED ZINC COATING.
- WOOD: LUMBER: GRADED TO NIGA RULES, SPF #1/2 –S-DRY U.N.O. MSR GRADE FOR TRUSSES AS REQUIRED.  
GLULAM: CSA 0122 SP GRADE 20FE BENDING STRESS U.N.O. 12cE COMPRESSION STRESS U.N.O.

- I JOISTS: LUMBER CHORDS AND ORIENTED STRAND BOARD WEBS, MANUFACTURER TO IDENTIFY GRADES/PROPERTIES.
- PLYWOOD: CSA 0151 SOFTWOOD EXTERIOR GRADE
- WAFFER BOARD: CSA 0437 GRADE 0-1 OR 0-2.
- COMPOSITE LUMBER: PARALLAM P.S.L. OR MICROLAM L.V. (MIN.) VALUES AS PUBLISHED BY TRUS JOIST MACMILLAN.

**FOUNDATION:**

- STRUCTURE DESIGN IS BASED INDICATED SOIL CAPACITY SLS=150kPa AND ULS=220kPa ON RECOMMENDATIONS CONTAINED IN GEOTECHNICAL INVESTIGATION REPORT PREPARED BY TORONTO INSPECTION LTD., DATED APRIL 9<sup>TH</sup>, 2026 REF. NO. "7152-26-GA". STRICTLY FOLLOW THE RECOMMENDATIONS OF GEOTECHNICAL REPORT.
- FOUND ALL FOOTINGS WHICH WILL BE EXPOSED TO FROST ACTION IN THE COMPLETED BUILDING AT A MINIMUM OF 1200mm BELOW FINISHED GRADE.
- DO NOT EXCEED A RISE OF 1 IN A RUN OF 1.5 IN THE LINE OF SLOPE BETWEEN ADJACENT FOOTING EXCAVATIONS OR ALONG STEPPED FOOTINGS. UNLESS NOTED FOR STEPPED FOOTINGS, USE STEPS NOT EXCEEDING 400mm IN HEIGHT AND NOT LESS THAN 600MM IN LENGTH.
- FOOTING ELEVATIONS CONFORMING WITH NOTES 1, 2, AND 3, ABOVE AND BASED ON INFORMATION AVAILABLE AT THE TIME OF TENDER. IF UPON EXCAVATION TO THE LEVELS SHOWN, THESE CONDITIONS ARE NOT FULFILLED, OR ARE FULFILLED AT HIGHER ELEVATIONS THAN INDICATED, FOOTINGS MAY BE RAISED OR LOWERED BUY ONLY WITH THE REVIEW OF THE STRUCTURAL AND GEOTECHNICAL ENGINEER.
- MAINTAIN UNSUPPORTED SIDES OF EXCAVATION ONLY IF SAFE INCLINATION OF THE SIDES OF THE EXCAVATION IS PROVIDED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS AND/OR MUNICIPAL OR PROVINCIAL REGULATIONS.
- ERECT, MAINTAIN, AND IF REQUIRED, REMOVE A SUPPORTING SHORING SYSTEM ALONG THE SIDES OF THE EXCAVATION. DESIGN SUCH SYSTEM IN ACCORDANCE WITH THE SOIL REPORT RECOMMENDATIONS.
- PROTECT SOIL FROM FREEZING ADJACENT TO AND BELOW ALL FOOTINGS.
- BACKFILL AGAINST FOUNDATION WALL IN SUCH A MANNER THAT THE LEVEL OF BACKFILLING ON ONE SIDE OF THE WALL IS NEVER MORE THAN 450MM DIFFERENT FROM THE LEVEL ON THE OTHER SIDE OF THE WALL EXCEPT WHERE TEMPORARY SUPPORT FOR THE WALL IS PROVIDED OR WALLS ARE DESIGNED AS CANTILEVER WALLS.
- SOIL BARING CAPACITY SPECIFIED MUST BE VERIFIED BY THE GEOTECHNICAL ENGINEERS PRIOR TO THE PLACING OF THE FOUNDATIONS AND ANY NON-COMFORMANCE WITH THE SPECIFIED MINIMUM CAPACITIES MUST BE IMMEDIATELY REPORTED TO THE STRUCTURAL ENGINEER.
- SOFT AREAS UNCOVERED ON EXCAVATION SHALL BE SUB EXCAVATED TO SOUND MATERIAL AND FILLED WITH CLEAN FREE DRAINING GRANULAR MATERIAL COMPACTED TO 100% STANDARD PROCTOR DRY DENSITY.

**CONCRETE AND REINFORCING STEEL:**

- CONCRETE MATERIAL AND METHODS OF CONCRETE CONSTRUCTION CAN/CSA-A23.1 (LATEST EDITION).
- CODE FOR THE DESIGN OF CONCRETE STRUCTURES FOR BUILDINGS CAN/CSA-A23.3 (LATEST EDITION)
- THE CLEAR DISTANCE BETWEEN REINFORCING STEEL AND SURFACE OF CONCRETE SHALL BE AS FOLLOWS:

SLABS (INT.)	25mm	TO TOP AND BOTTOM
SLABS (EXT.)	50mm	TO TOP AND BOTTOM
BEAMS	40mm	TO STIRRUPS
COLUMNS	40mm	TO TIES
WALLS	50mm	TO EXT. FACE; 25MM TO INT. FACE
CONCRETE PIERS	50mm	TO MAIN STEEL
FOOTINGS	75mm	TO MAIN STEEL

- CONCRETE PROTECTION FOR REINFORCING SHALL IN ALL CASES BE AT LEAST EQUAL TO THE BAR DIAMETER.
- ALL REINFORCING BARS SHALL BE SUPPORTED IN THE FORMS AND SPACED WITH STANDARD ACCESSORIES.
- REINFORCING IS TO BE GENERALLY DETAILED IN ACCORDANCE WITH R.S.I.C. MANUAL OF STANDARD PRACTICE (LATEST EDITION).
- CONCRETE PLACING, CURING AND TESTING TO CONFORM TO CAN3-A23.1 AND A23.2 (LATEST EDITION).
- FORMWORK AND TOLERANCES TO CONFORM TO ACI 347-78 (LATEST EDITION).
- NO CUTTING OR DRILLING IN HARDENED CONCRETE IS PERMITTED WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER.
- GROUT UNDERSIDE OF BEARING PLATES OF STEEL COLUMNS AND STEEL BEAMS WITH DRY-PACK NON-SHRINKING GROUT TO MANUFACTURERS INSTRUCTIONS.
- SLAB-ON-GRADE CONTROL JOINTS SHALL BE SPACED NO GREATER THAN 4M SPANS IN EITHER DIRECTION OR AS SHOWN ON PLAN.
- ALL BEAMS AND SPANDRELS TO BE POURED MONOLITHICALLY WITH THE SLAB EXCEPT AS NOTED ON SECTIONS. NO HORIZONTAL CONSTRUCTION JOINTS ARE TO BE MADE IN SLABS OR BEAMS.
- CONTRACTOR SHALL VERIFY DIMENSIONS AND LOCATIONS OF ALL SLOTS, PIPE SLEEVES, ANCHOR BOLTS, ETC. AS REQUIRED FOR MECHANICAL TRADES BEFORE CONCRETE IS POURED.
- AT OPENINGS IN CONCRETE WALLS, ADD 2-15M BARS IN HEADS AND SILLS, 2-15M BARS IN JAMBS, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- FOR THICKNESS OF SLAB ON GRADE SEE FOUNDATION PLAN AND MAINTAIN SLAB THICKNESS AT ALL DEPRESSIONS. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION AND EXTENT OF FINISHES AND DEPRESSIONS. AT ALL DEPRESSIONS REINFORCE SLAB ON GRADE WITH WWM 305X305 MW37.4XMW37.4 U.N.O.
- ALL SPLICES SHALL BE CLASS "B" U.N.O.
- ALL EMBEDDED STEEL EXPOSED TO THE EXTERIOR OR EXTERIOR WALL CAVITIES SHALL BE GALVANIZED.

**TIMBER:**

- ALL WOOD MATERIALS, FABRICATION AND ERECTION TO BE IN ACCORDANCE WITH CAN/CSA-086.1-M89-ENGINEERING DESIGN IN WOOD (LIMIT STATES DESIGN). ALL TIMBER GRADING TO BE IN ACCORDANCE WITH NLGA INCLUDING ALL LATEST EDITIONS.
- ALL TIMBER FOR JOIST RAFTERS, LINTELS, BEAMS, AND POSTS TO BE SPF NO. 1&2 MIXED UNLESS NOTED ON PLAN.
- ALL TIMBER SHALL CONFORM TO RECOGNIZED NOMINAL SIZES SHOWN ON PLAN AND STRESS RATING FOR APPROPRIATE SPECIES. NO TIMBER SHALL BE USED THAT DOES NOT CONFORM TO DIMENSIONS AND SPECIES.

- FLAT JOIST AND PROFILED TRUSS FABRICATOR SHALL SUPPLY ERECTION DRAWINGS SHOWING LOCATION, LOADING, ALLOWABLE STRESSES, WIND UPLIFT FORCES, REQUIRED BEARING AND TEMPORARY AND PERMANENT BRACING, CONNECTIONS AND SHALL BEAR A SEAL OF THE PROFESSIONAL DESIGN ENGINEER REGISTERED WITH THE PEO.
- PROVIDE DOUBLE JOISTS UNDER ALL PARALLEL PARTITIONS.
- MAXIMUM BRIDGING SPACING:
 

STD. WOOD JOISTS	1220mm
STUD WALLS	2000mm TO MATCH SHEATHING JOINTS
- FRAMING INTO FLUSH BEAMS MUST BE FASTENED WITH METAL JOIST OR BEAM HANGERS.
- SPIKE ALL BUILT-UP SAWN LUMBER BEAMS @300 O.C. (12") IN ROWS NOT EXCEEDING 75mm c/c (3").
- SPIKE & GLUE BUILT-UP COLUMNS @ 150mm C/C (6") IN ROWS NOT EXCEEDING 75mm c/c (3").
- SPIKE & GLUE BUILT-UP SAW LUMBER BEAM @ 300mm O.C. (12") IN ROWS NOT EXCEEDING 75mm c/c (3").
- SEPARATE ALL WOOD FROM CONCRETE WITH WATERPROOF BARRIER OR USE PRESSURE-TREATED WOOD.
- PREMANUFACTURED SPECIALTY WOOD PRODUCTS SUCH AS "PARALLAM" PARALLEL STRAND LUMBER, "MICRO-LAM" LAMINATED VENEER LUMBER, OR WOOD JOIST TRUSS JOIST MANUFACTURED JOISTS, MUST BE STORED HANDLED, MODIFIED AND ERECTED AS PER MANUFACTURERS' DETAILED GUIDELINES. AN INDEPENDENT TESTING AGENCY RETAINED BY THE MANUFACTURER WILL PROVIDE PRODUCT CERTIFICATION DOCUMENTS IF REQUIRED.

**MISCELLANEOUS METALS AND STAIR FABRICATORS:**

- PROVIDE SHOP DRAWINGS PRIOR TO FABRICATION STAMPED, SIGNED AND DATED BY PROFESSIONAL ENGINEER TO THE ENGINEER FOR REVIEW.
- ALL GUARDS TO BE DESIGNED TO MEET LATERAL LOAD DESCRIBED IN OBC.
- ALL HANDRAILS TO BE DESIGNED TO MEET DESCRIBED IN OBC.
- ALL STAIRS TO BE DESIGNED TO SUPPORT A LIVE LOAD OF 4.8kPa.

NOTE: DRAWINGS ARE NOT TO BE SCALED, USE ONLY DRAWINGS MARKED 'ISSUED FOR CONSTRUCTION'. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE CONSULTANT BEFORE PROCESSING WITH THE WORK. THIS DRAWING IS THE COPYRIGHT PROPERTY AND MUST BE RETURNED UPON REQUEST.

NOTE: THE UNDERSIGNED HAS REVIEWED AND TAKES RESPONSIBILITY FOR THIS DESIGN, AND HAS QUALIFICATIONS AND NEEDS THE REQUIREMENTS SET OUT IN THE ONTARIO BUILDING CODE TO BE A DESIGNER.

DATE	REV.	DESCRIPTION	ENGR BY	DRN BY
MAY 11 2026	0	ISSUED FOR COORDINATION	GX	WC

REVISION RECORD



**XU STRUCTURAL ENGINEERING ENTERPRISE**  
 42 ERNEST AVENUE  
 NORTH YORK, ON M2J 3T5  
 TEL: 647-428-4022  
 EMAIL: GREG\_XU@LIVE.CA / INFO.XUSTRUCTURAL@GMAIL.COM

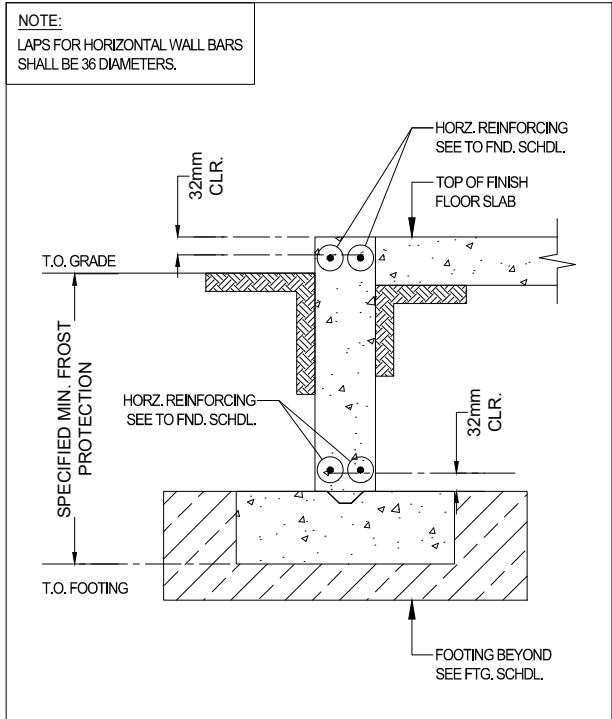
PROJECT  
 7672 ELGIN MILLS RD E.  
 MARKHAM

DRAWING TITLE  
**GENERAL NOTES**

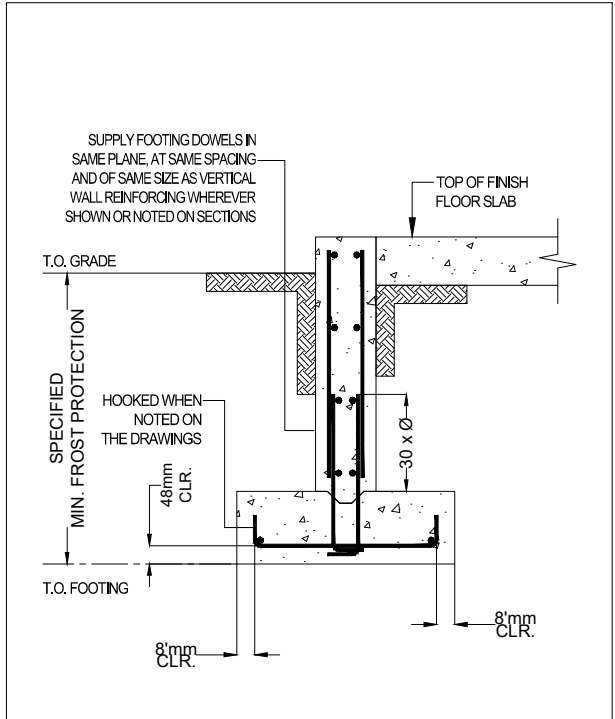
DRAWING No.  
**S101**

SCALE  
 FILE NAME

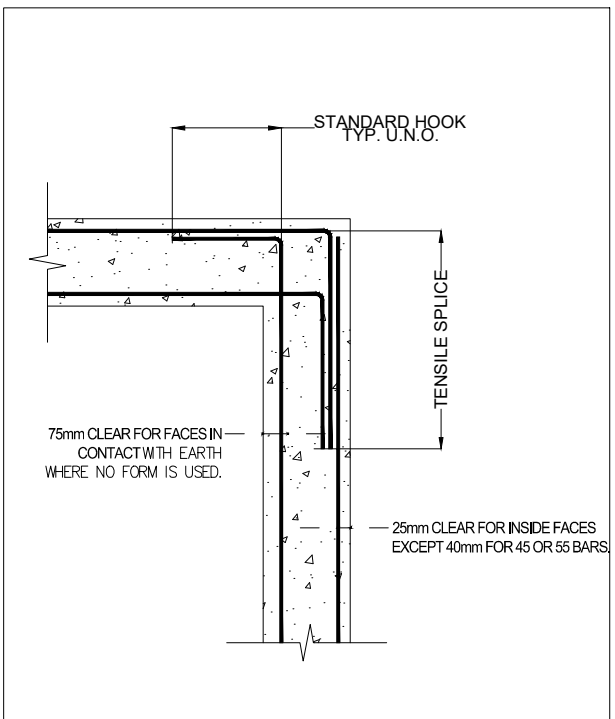
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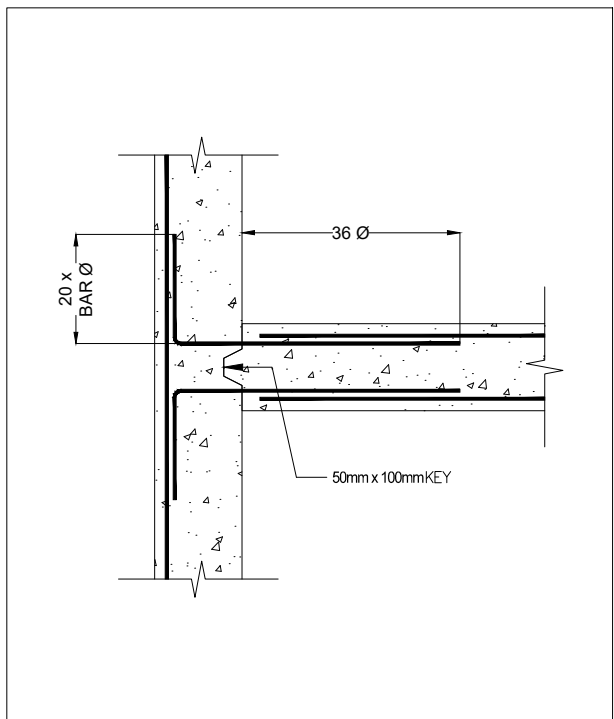
1 TYPICAL WALL FOUNDATION  
(U.N.O. ON DWGS)  
S102



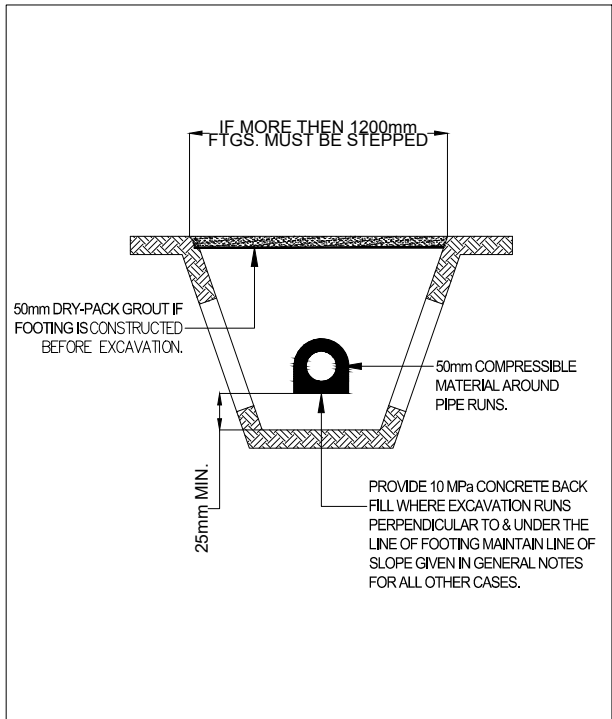
2 CONCRETE WALL FOOTING  
(U.N.O. ON DWGS)  
S102



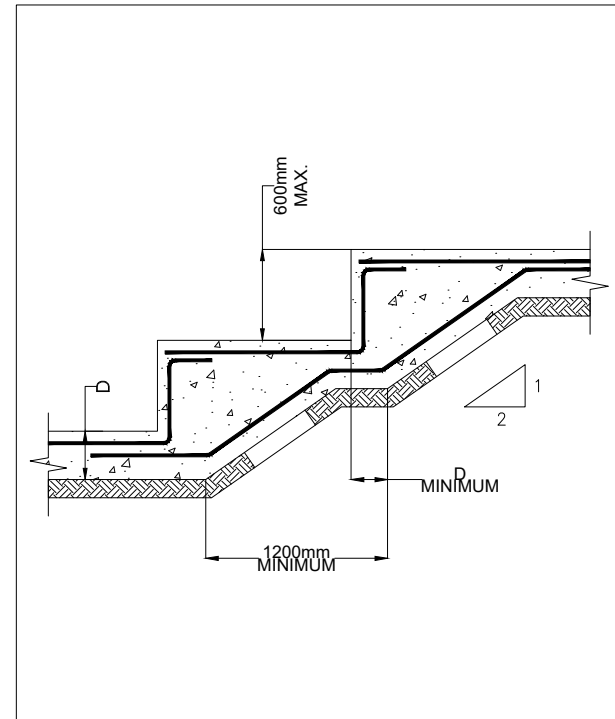
3 DETAIL AT CORNERS  
S102



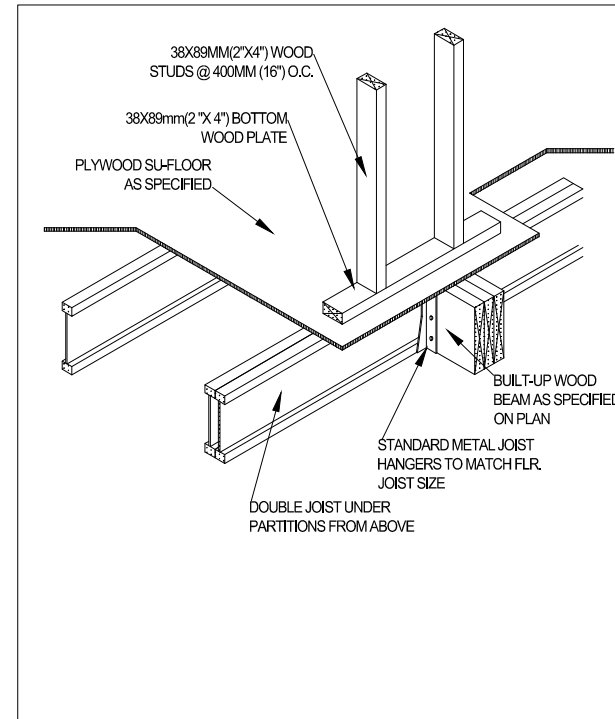
4 DETAIL AT INTERSECTION WALLS  
S102



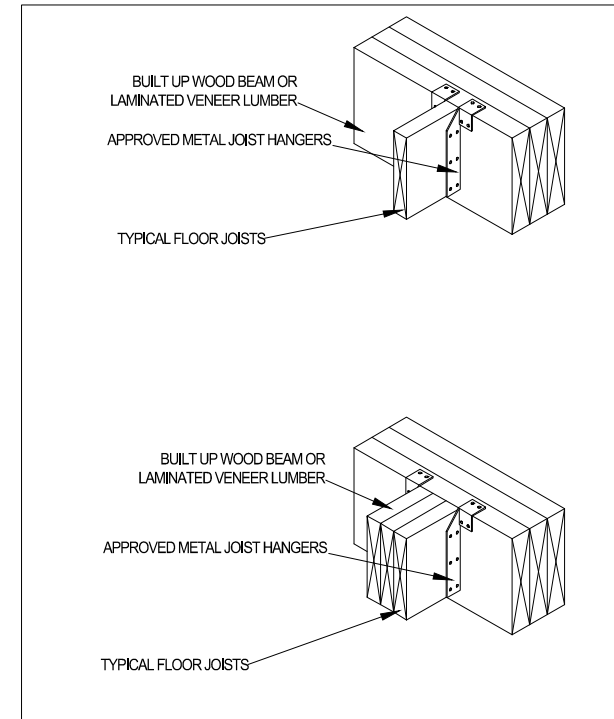
5 TYP. BACK FILLING UNDER CONTINUOUS WALL FOOTING  
S102



6 STEPPED FOOTINGS  
S102



7 DOUBLE JOIST & FLUSH BEAM UNDER PARTITION  
S102



8 JOIST TO BEAM CONNECTION & BEAM TO BEAM CONNECTION  
S102

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DATE	REV.	DESCRIPTION	ENGR BY	DRN BY
MAY 11 2026	0	ISSUED FOR COORDINATION	GX	WC

REVISION RECORD

**XU STRUCTURAL ENGINEERING ENTERPRISE**  
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NORTH YORK, ON M2J 3T5  
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EMAIL: GREG\_XU@LIVE.CA / INFO.XUSTRUCTURAL@GMAIL.COM

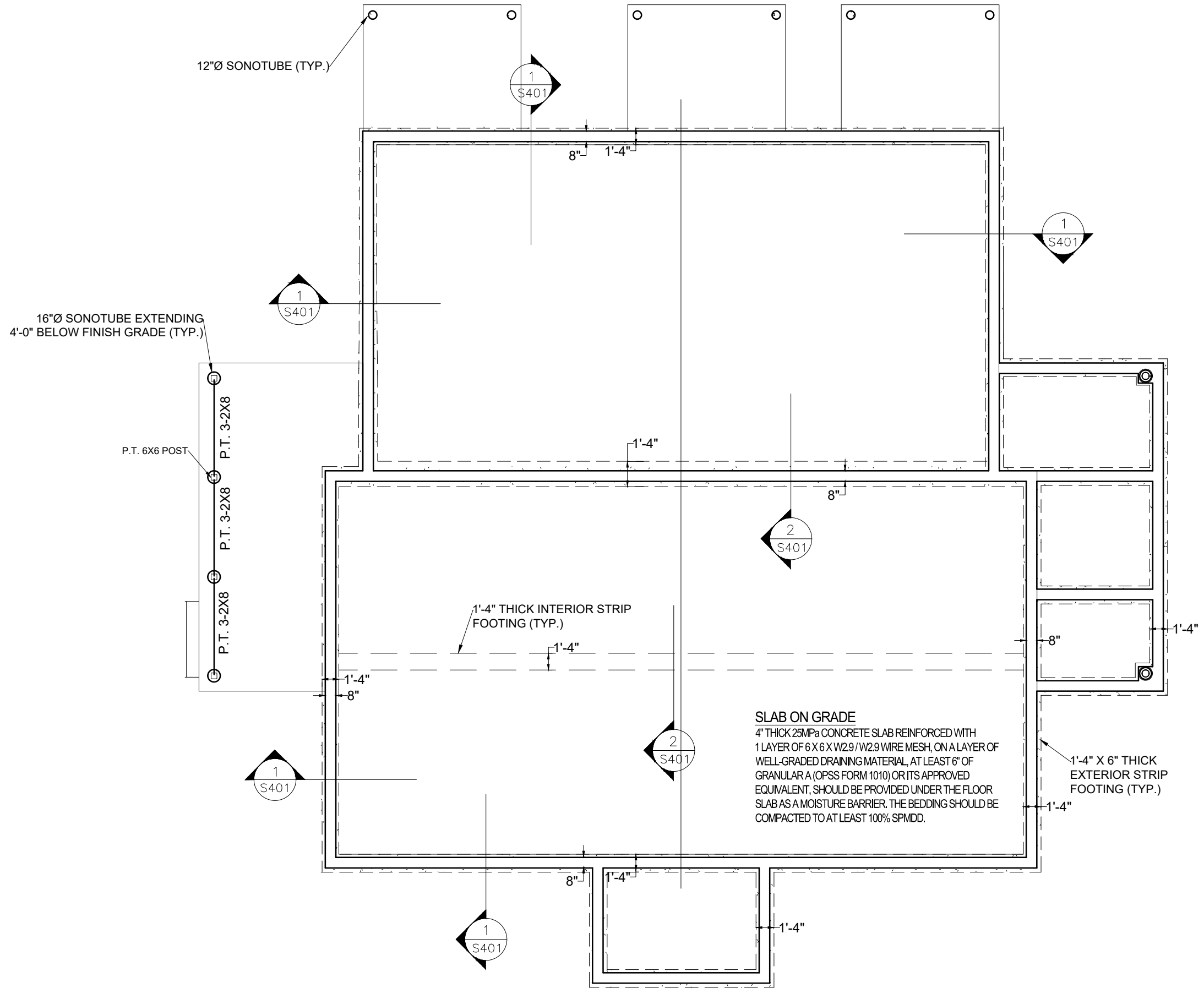
PROJECT  
7672 ELGIN MILLS RD E.  
MARKHAM

DRAWING TITLE  
TYPICAL DETAILS

DRAWING No.  
S102

SCALE  
FILE NAME

JOB No.



**SLAB ON GRADE**  
 4" THICK 25MPa CONCRETE SLAB REINFORCED WITH 1 LAYER OF 6 X 6 X W2.9 / W2.9 WIRE MESH, ON A LAYER OF WELL-GRADED DRAINING MATERIAL, AT LEAST 6" OF GRANULAR A (OPSS FORM 1010) OR ITS APPROVED EQUIVALENT, SHOULD BE PROVIDED UNDER THE FLOOR SLAB AS A MOISTURE BARRIER. THE BEDDING SHOULD BE COMPACTED TO AT LEAST 100% SPMD.

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PROJECT  
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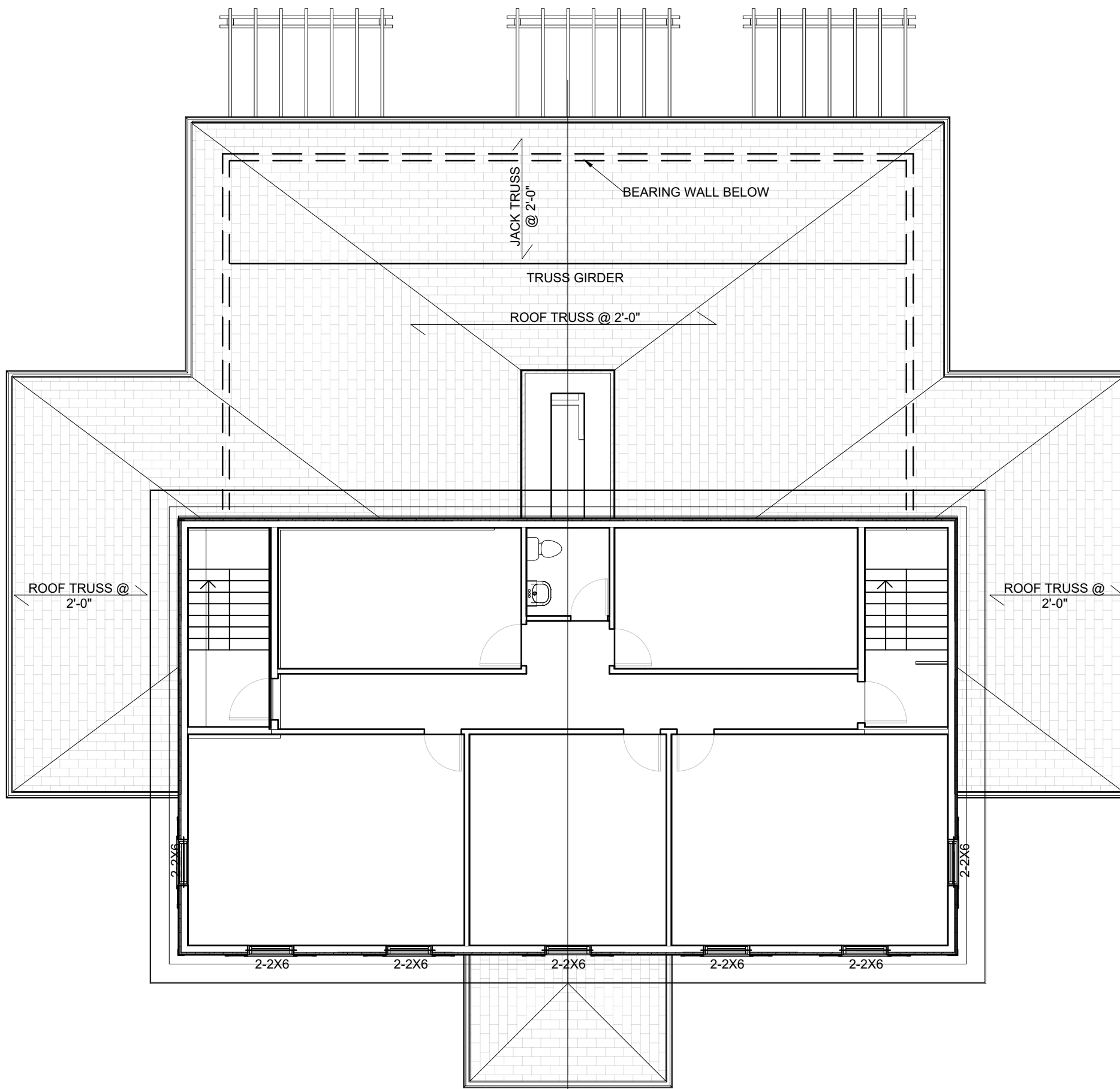
DRAWING TITLE  
**FOUNDATION PLAN**

DRAWING No.  
**S201**

SCALE  
 FILE NAME

JOB No.





### ROOF FRAMING NOTES

- REFER TO DRAWING S101 FOR GENERAL NOTES.
- SPECIFIED ROOF LOADING (DO NOT EXCEED DURING CONSTRUCTION):
  - DESIGN ROOF LOADS:
  - DEAD LOADS:
  - WOOD ROOF SYSTEM
  - SHINGLES: 0.15 kPa
  - SHEATHING: 0.10 kPa
  - JOIST: 0.20 kPa
  - INSULATION: 0.10 kPa
  - MECH/ELEC: 0.20 kPa
  - CEILING: 0.15 kPa
  - TOTAL DEAD LOADS: 0.90 kPa
- SNOW LOADS:
- BASIC FACTORS:  $S_s = 1.30$  kPa  
 $S_r = 0.40$  kPa
- BASIC ROOF LIVE LOAD = 1.11 kPa
- WIND LOADS:
- BASIC PARAMETERS:  $q(\frac{1}{50}) = 0.44$  kPa
- SEISMIC DATA:
- BASIC FACTORS:  $S_a(0.2) = 0.18$   
 $S_a(0.5) = 0.11$   
 $S_a(1.0) = 0.067$   
 $S_a(2.0) = 0.022$
- INSTALL ROOF SHEATHING WITH AT LEAST A 2mm GAP BETWEEN SHEETS.
- ROOF SHEATHING:  
 $\frac{5}{8}$ " PLYWOOD INSTALL PLYWOOD ROOF SHEATHING WITH SURFACE GRAIN AT RIGHT ANGLES TO ROOF FRAMING. END JOINTS PARALLEL TO FRAMING MUST BE STAGGERED.
- TEMPORARY BRACING OF ALL MEMBERS TO BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
- USE 2.0E LVL OR EQUIVALENT.
- USE SPF NO1/NO2 FOR ALL SAWN TIMBER.
- WALL STUD TO BE 2X6 SPF @ 1'-4" O.C. U.N.O.
- WALL SHEATHING TO BE  $\frac{5}{8}$ " O.S.B. OR 0-2.

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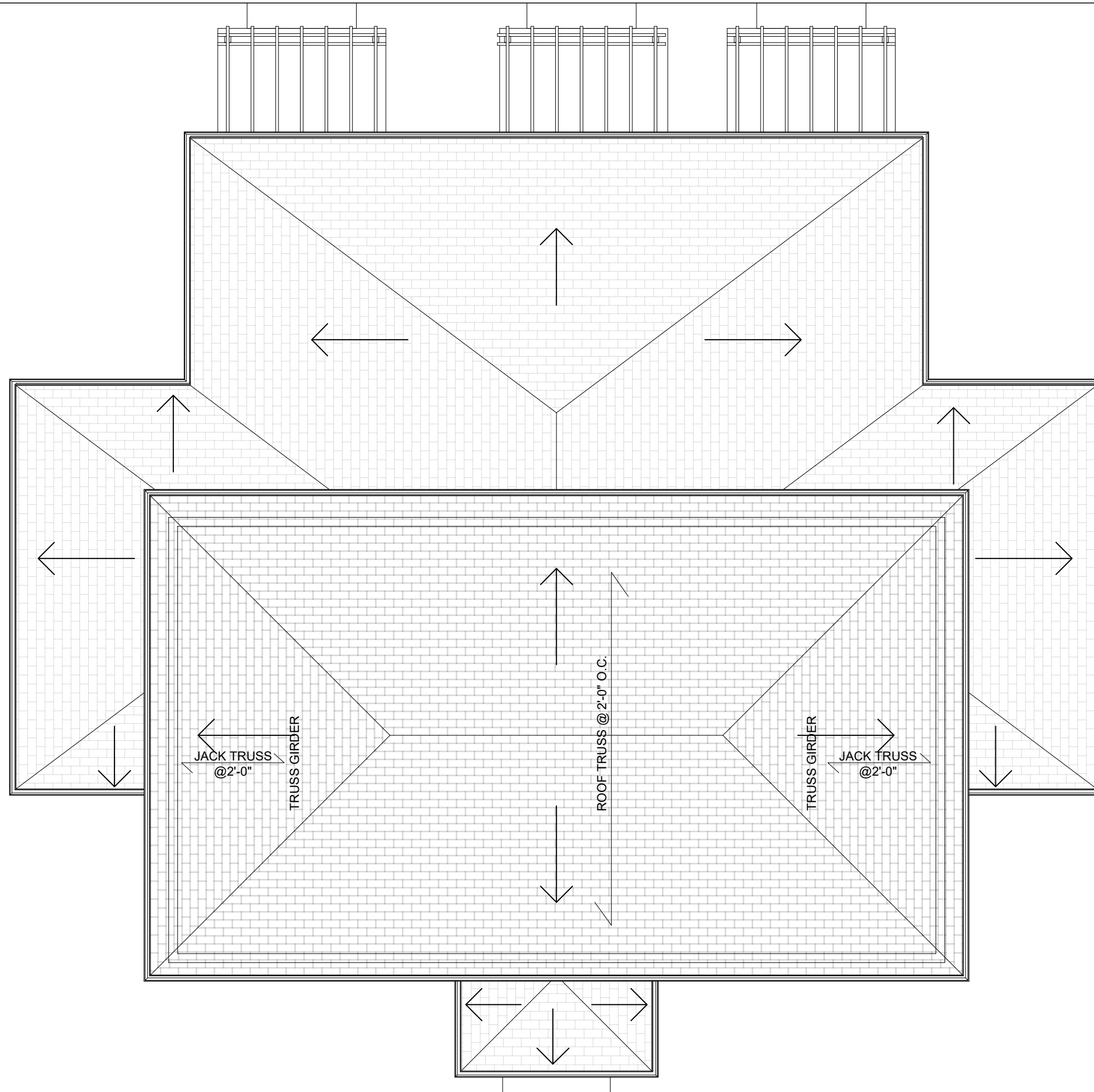
PROJECT  
7672 ELGIN MILLS RD. E.  
MARKHAM

DRAWING TITLE  
**LOW ROOF FRAMING PLAN**

DRAWING No.  
**S203**

SCALE  
FILE NAME

JOB No.



### ROOF FRAMING NOTES

- REFER TO DRAWING S101 FOR GENERAL NOTES.
- SPECIFIED ROOF LOADING (DO NOT EXCEED DURING CONSTRUCTION):
  - DESIGN ROOF LOADS:
    - DEAD LOADS:
      - WOOD ROOF SYSTEM
        - SHINGLES: 0.15 kPa
        - SHEATHING: 0.10 kPa
        - JOIST: 0.20 kPa
        - INSULATION: 0.10 kPa
        - MECH/ELEC: 0.20 kPa
        - CEILING: 0.15 kPa
        - TOTAL DEAD LOADS: 0.90 kPa
      - SNOW LOADS:
        - BASIC FACTORS:  $S_s = 1.30$  kPa
        - $S_r = 0.40$  kPa
      - BASIC ROOF LIVE LOAD = 1.11 kPa
    - WIND LOADS:
      - BASIC PARAMETERS:  $q(\frac{1}{50}) = 0.44$  kPa
    - SEISMIC DATA:
      - BASIC FACTORS:
        - $S_a(0.2) = 0.18$
        - $S_a(0.5) = 0.11$
        - $S_a(1.0) = 0.067$
        - $S_a(2.0) = 0.022$
- INSTALL ROOF SHEATHING WITH AT LEAST A 2mm GAP BETWEEN SHEETS.
- ROOF SHEATHING:
  - $\frac{5}{8}$ " PLYWOOD INSTALL PLYWOOD ROOF SHEATHING WITH SURFACE GRAIN AT RIGHT ANGLES TO ROOF FRAMING. END JOINTS PARALLEL TO FRAMING MUST BE STAGGERED.
- TEMPORARY BRACING OF ALL MEMBERS TO BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
- USE 2.0E LVL OR EQUIVALENT.
- USE SPF NO1/NO2 FOR ALL SAWN TIMBER.
- WALL STUD TO BE 2X6 SPF. @ 1'-4" O.C. U.N.O.
- WALL SHEATHING TO BE  $\frac{3}{8}$ " O.S.B. OR 0-2.

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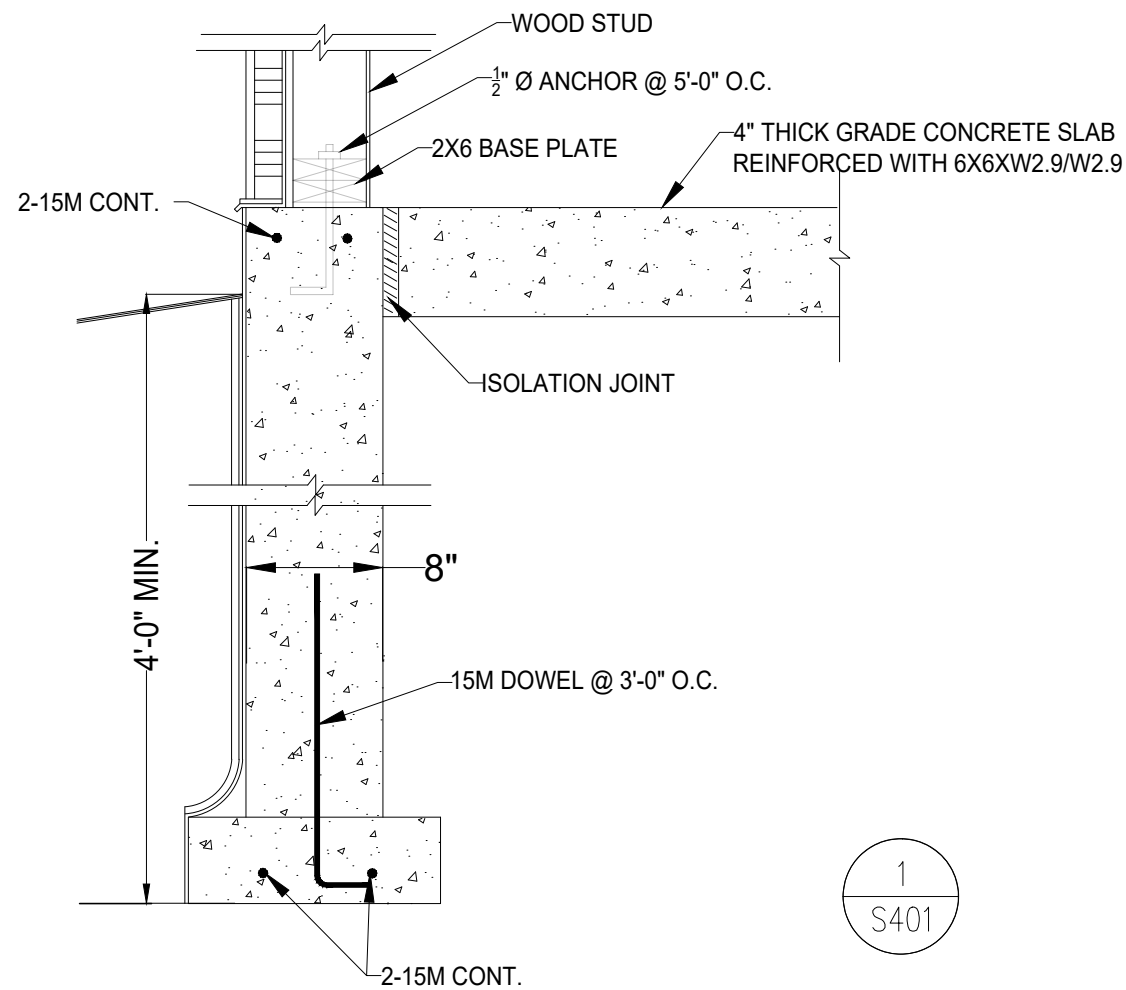
PROJECT  
 7672 ELGIN MILLS RD E.  
 MARKHAM

DRAWING TITLE  
**HIGH ROOF FRAMING PLAN**

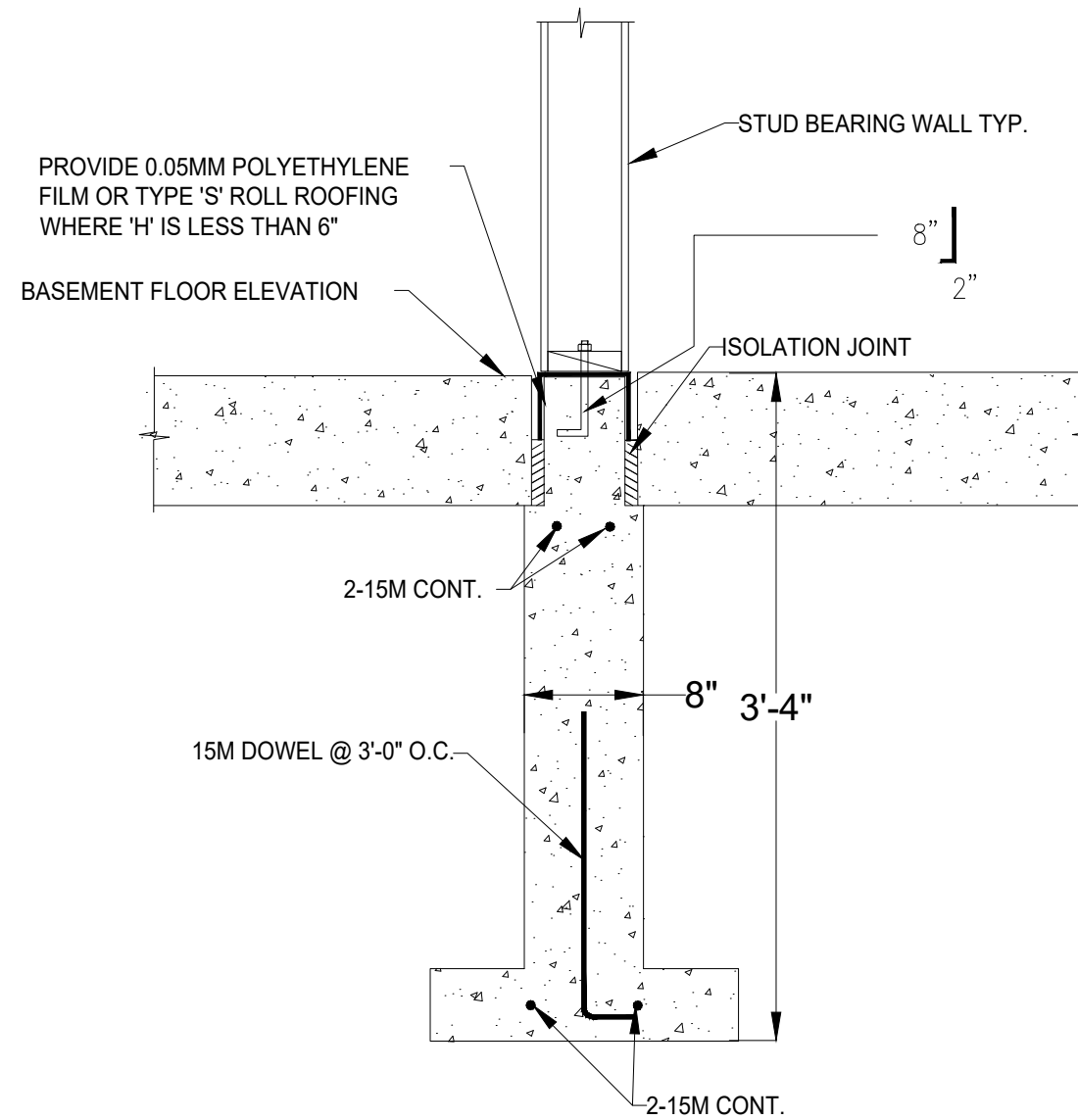
DRAWING No.  
**S204**

SCALE  
 FILE NAME

JOB No.



1  
S401



2  
S401

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PROJECT  
 7672 ELGIN MILLS RD E.  
 MARKHAM

DRAWING TITLE  
 SECTIONS

DRAWING No.  
 S401

SCALE  
 FILE NAME

JOB No.

**SCOPE OF WORK:**  
THIS CONTRACT SHALL INCLUDE THE SUPPLY OF ALL TOOLS, EQUIPMENT, LABOUR AND MATERIALS EXCEPT AS OTHERWISE SPECIFICALLY NOTED, REQUIRED FOR THE COMPLETE INSTALLATION, TESTING AND PUTTING INTO PROPER OPERATION ALL WORK AS SHOWN AND DETAILED ON THE PLAN AND AS SPECIFIED HEREIN.

**GUARANTEE:**  
CONTRACTOR SHALL GUARANTEE THE COMPLETE INSTALLATION AGAINST ANY DEFECTS IN WORKMANSHIP AND MATERIALS NOT DUE, IN THE OPINION OF OWNERS TO MISUSE OR NEGLECT, FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE OF WORK. DEFECTS SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER.

**CODES, PERMITS, FEES, AND INSPECTIONS:**  
THE WHOLE OF THE WORK SPECIFIED HEREIN AND ON THE DRAWINGS SHALL COMPLY STRICTLY TO THE REQUIREMENTS OF THE LATEST EDITION OF THE ONTARIO ELECTRICAL CODE AS AMENDED TO DATE, THIS CODE AND ANY ADDITIONAL REQUIREMENTS EXCEEDING THE MINIMUM REQUIREMENTS OF THE CODE, THE DRAWINGS AND SPECIFICATIONS SHALL BE FOLLOWED.

BEFORE STARTING ANY WORK, SUBMIT THE REQUIRED NUMBER OF COPIES OF THE ELECTRICAL DRAWINGS AND SPECIFICATIONS, TO THE ELECTRICAL SAFETY INSPECTION AUTHORITY (ESA), FOR THEIR APPROVAL AND COMMENTS, AND MAKE ANY REQUIRED CHANGES AND ALTERATION REQUESTED.

PAY ALL FEES FOR EXAMINATION OF DRAWINGS AND SPECIFICATIONS. PREPARE AND SUBMIT ANY ADDITIONAL DRAWINGS WHICH MAY BE REQUIRED BY THE INSPECTION AUTHORITY (ESA).

OBTAIN ALL PERMITS REQUIRED AND PAY ALL PERMITS AND INSPECTION FEES.

ARRANGE FOR INSPECTION OF ALL WORK BY THE INSPECTION AUTHORITY DEPARTMENT ON COMPLETION OF THE WORK, PRESENT TO THE OWNER THE FINAL UNCONDITIONAL CERTIFICATES OF APPROVAL.

**CONDUIT INSTALLATION:**  
PROVIDE GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT) UNLESS OTHERWISE SPECIFIED OR REQUIRED BY CODE.

CONCEAL ALL CONDUITS EXCEPT IN SERVICE SPACES.

INSTALL ALL LOCK NUTS AND BUSHINGS TO ENSURE A SECURE MECHANICAL AND ELECTRICAL BOND. USE ERICKSON COUPLINGS IN LIEU OF RUNNING THREADS.

PROVIDE BUSHINGS ON THE ENDS OF ALL CONDUITS IN ENCLOSURES, BOXES, PANELS AND CABINETS, TO PROTECT THE CONDUCTOR INSULATION.

LAYOUT CONDUIT TO DRAIN FREE OF ALL MOISTURE.

KEEP CONDUIT NOT LESS THAN 150mm [6"] CLEAR OF TEAM PIPES, FLUES AND OTHER SUCH WORK.

SUPPORT MULTIPLE RUNS OF CONDUIT ON CHANNEL OR ANGLE IRON WITH ROD HANGERS.

SECURE ALL CONDUITS IN PLACE WITH CONDUIT CLAMPS, PERFORATED PIPE STRAPS, WIRE LASHINGS, WOOD SCREWS OR NAILS ARE NOT ACCEPTABLE.

MAKE FIELD BENDS AND OFFSETS UNIFORM AND SYMMETRICAL WITHOUT FLATTENING CONDUIT. MINIMUM BENDING RADIUS SHALL BE TEN TIMES THE CONDUIT DIAMETER.

REAM CONDUIT ENDS TO REMOVE BURRS AND SHARP EDGES. FIT CONDUIT STUBS WITH WATERPROOF PLASTIC CAPS DURING INSTALLATION TO PROTECT THREADS AND TO PREVENT ENTRANCE OF MOISTURE INTO CONDUIT.

TEST ALL CONDUITS FOR CLEAR BORE USING BALL MANDREL, BRUSHES AND SNAKE.

INSTALL A CONTINUOUS NYLON CORD 18KG (40LBS) TEST IN EACH ENCLOSED RACEWAY LEFT EMPTY.

SECURE CONDUITS ABOVE CEILING TO STRUCTURAL MEMBERS. CONDUITS SHALL NOT BE SUPPORTED FROM THE CEILING SUSPENSION SYSTEM. COORDINATE INSTALLATION OF CONDUITS WITH MECHANICAL DUCTWORK, PIPING ETC.

PROVIDE CONDUIT SEALS IN CONDUITS WHICH PASS TO REFRIGERATED AREAS OR TO THE OUTSIDE.

PROVIDE NEW LAMACOID PANEL DESIGNATION FOR ALL EXISTING PANELS TO REMAIN ON A NEW TYPEWRITTEN CIRCUIT DIRECTORY INDICATING EXISTING AND NEW LOADS.

**ENGLISH/METRIC CONVERSION:**  
METRIC UNITS OF MEASUREMENTS USED IN THIS SPECIFICATION ARE BASED ON THE INTERNATIONAL SYSTEM OF UNITS (SI) CONTAINED IN THE "CANADIAN METRIC PRACTICE GUIDE" PREPARED BY THE CANADIAN STANDARDS ASSOCIATION, PUBLICATION NUMBER CAN3-Z234.1-76.

WHERE MEASURE VALUES DEPEND ON MANUFACTURED PRODUCTS OR MATERIALS, THE METRIC CONVERSION FROM ENGLISH SYSTEM UNITS SHALL BE A CLOSE APPROXIMATION OF THE ENGLISH VALUE. THESE VALUES, OTHERWISE KNOWN AS "SOFT" CONVERSIONS, SHALL BE SPECIFIED IN APPROPRIATE TRADE SECTION, OR AS INSTRUCTED.

**COORDINATION:**  
WORK OF EACH TRADE SECTION UNDER THIS DIVISION SHALL BE LAID OUT IN SUCH A MANNER THAT UNIT DOES NOT CONFLICT WITH WORK UNDER OTHER TRADE SECTIONS OR DIVISION OF THIS SPECIFICATION.

PREPARE FIELD DRAWINGS SHOWING SIZE AND LOCATION OF INSERTS, SLEEVES, AND OPENINGS REQUIRED FOR PASSAGE OF CABLE, MAJOR CONDUITS, THROUGH WALLS, PARTITIONS, ROOFS, CEILINGS, FLOORS AND STRUCTURAL MEMBERS. CONSULT ARCHITECTURAL AND STRUCTURAL DRAWINGS, IF AVAILABLE, FOR SPECIFIC REQUIREMENTS. OPENINGS SHALL BE LOCATED RELATIVE TO GRID LINES AND ELEVATION DATA.

PREPARE DRAWINGS SHOWING SIZE AND LOCATION OF EQUIPMENT BASES AND ANCHORS PERTAINING TO THE WORK OF THIS DIVISION.

**PROTECTION OF WORK AND MATERIALS:**  
PROTECT MATERIALS AND EQUIPMENT FROM DAMAGE, INCLEMENT WEATHER AND/OR EXTREME TEMPERATURES. PROVIDE ENCLOSURE, TARPULINS, OR SPECIAL PROTECTION AS REQUIRED UNDER THE CIRCUMSTANCES.

**OUTLET BOXES:**  
IN INTERIOR DAMP LOCATIONS, OR LOCATIONS EXPOSED TO WEATHER PROVIDE ALL OUTLET BOXES OF WEATHERPROOF DESIGN WITH GASKET AND WEATHER-PROOF COVER PLATE.  
  
IN DRY LOCATIONS OUTLET BOXES USED WITH SURFACE MOUNTED EMT SHALL BE STANDARD SHEET STEEL SURFACE TYPE BOXES.

WHERE STANDARD MAKE BOXES ARE NOT SUITABLE PROVIDE BOXES OF SPECIAL DESIGN TO FIT SPACE AND OTHER REQUIREMENTS

INSTALL ALL BOXES IN WALLS SO THAT TAPPED HOLES FOR MOUNTING WIRING DEVICES WILL BE ALIGNED VERTICALLY OR HORIZONTALLY, AS REQUIRED. WHERE BOXES ARE GROUPED AT ONE LOCATION WITH COMMON AND VARYING MOUNTING HEIGHTS ALIGN BOXES HORIZONTALLY AND VERTICALLY FROM CENTRE LINE UNLESS OTHERWISE INDICATED.

ENSURE THAT THE OUTLET BOXES WITHIN A CEILING SPACE ARE MINIMUM 200mm [8"] CLEAR FROM THE SUPPORT SYSTEM GRID.

OFFSET OUTLET BOXES IN SOUND ATTENUATING PARTITIONS TO AVOID UNWIRE TRANSMISSION OF SOUND BETWEEN THE PARTITION ELEMENTS. USE FLEXIBLE CONDUIT CONNECTIONS WHERE WIRING IS REQUIRED BETWEEN OUTLET BOXES ON OPPOSITE SIDES OF PARTITIONS.

OFFSET OUTLET BOXES WHERE INSTALLED ON EITHER SIDE OF A FIRE SEPARATION.

**WARRANTY:**  
WARRANT ALL EQUIPMENT AND MATERIAL SUPPLIED AND INSTALLED UNDER THIS DIVISION AGAINST DEFECTS, DEFICIENCIES IN EQUIPMENT DESIGN, MATERIALS AND WORKMANSHIP WHICH ARE NOT DETECTED PRIOR TO DATE OF SUBSTANTIAL PERFORMANCE OF THE SYSTEM, BUT WHICH MAY DEVELOP WITHIN ONE YEAR AFTER SUCH ACCEPTANCE. MAKE GOOD ANY SUCH DEFECTS AND DEFICIENCIES AT NO CHARGE TO THE CONTRACT PRICE. PROVIDE EXTENDED WARRANTIES WHERE CALLED FOR.

**INSERTS AND HANGERS:**  
PROVIDE AND INSTALL ALL INSERTS, HANGERS, ANCHORS, AND SUPPORTS REQUIRED FOR ALL WORK TO BE INSTALLED UNDER THIS DIVISION.

**ACCESSIBILITY:**  
INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIRS BY ACCESS PANELS OR OTHER ACCEPTABLE MEANS.

**GROUNDING:**  
PROVIDE ALL GROUNDING TO CONFORM TO THE CANADIAN ELECTRICAL CODE AND THE LATEST GROUNDING INSTRUCTIONS OF THE INSPECTION AUTHORITY, WITH ANY FURTHER REQUIREMENTS AS NOTED HEREIN.

BOND ALL INTERIOR NON-ELECTRICAL METALLIC PIPING SYSTEMS TO THE ELECTRICAL SYSTEM GROUND INCLUDING, BUT NOT LIMITED TO, WATER SUPPLY, WASTE WATER, AND GAS SYSTEMS.

GROUND ALL CONDUIT, AND ALL NON-CURRENT CARRYING METAL PARTS, EQUIPMENT CASES, FRAMES, BASES, BRACKETS, ETC.

**WIRE AND CABLE UP TO 600 VOLTS:**  
INSTALL ALL WIRING IN EMT UNLESS OTHERWISE REQUIRED BY CODE.

WIRE FOR 120 VOLT BRANCH CIRCUITS SHALL BE #12 AWG FOR RUNS UP TO 100m (30m) AND #10 AWG MINIMUM FOR RUNS OVER 100m (30m). WIRE FOR BRANCH CIRCUITS SHALL BE SIZED FOR PROPER CURRENT-CARRYING CAPACITY AND TO LIMIT THE VOLTAGE DROP AT THE OUTLET TO 2%. WIRE FOR 120 VOLT CONTROL CIRCUITS SHALL BE #12 AWG MINIMUM.

ALL WIRING, EXCEPT AS CLASSIFIED BELOW OR ON DRAWINGS, SHALL BE COPPER WITH RWP90 INSULATION UNLESS OTHERWISE INDICATED OR SPECIFIED. USE MINIMUM #12 AWG UNLESS OTHERWISE NOTED.

DO NOT SPLICE NEW FEEDERS BUT MEASURE AT SITE AND PROVIDE CORRECT LENGTH.

MAKE WIRING CONNECTION WITH PRESSURE TYPE SOLDER LESS CONNECTORS. TWIST WIRE CONNECTION PRIOR TO SPLICING AND INSULATE WITH VINYL CAPS AND LOCKING RINGS. PROVIDE PITGALS FOR CONNECTIONS TO DEVICES TO ENSURE THAT LINES AND NEUTRALS ARE NOT OPENED WHEN A FIXTURE OR A DEVICE IS REMOVED FROM THE CIRCUIT.

**IDENTIFICATION OF EQUIPMENT:**  
CLEARLY IDENTIFY ALL EQUIPMENT AS FOLLOWS:  
  
DISCONNECT SWITCHES, SPLITTERS, CONTACTORS, TIME SWITCHES, LIGHTING PANELS, ETC., SHALL BE IDENTIFIED WITH A BLACK ELASTIC LAMACOID NAMEPLATE WITH WHITE LETTERING SHOWING EQUIPMENT NAME AND/OR EQUIPMENT CONTROLLED, AS DESIGNATED ON THE DRAWINGS.

EACH POWER PANEL (PP) AND SWITCHBOARD (SB) SHALL HAVE TYPEWRITTEN DIRECTORY.

**SPLITTER TROUGHS AND BOXES:**  
SPLITTER TROUGHS AND BOXES SHALL BE OF SHEET STEEL FINISHED IN CEMA 2Y-1 LIGHT GRAY ENAMEL, COMPLETE WITH HINGED COVERS AS REQUIRED.

SPLITTERS SHALL HAVE COPPER BUS OR BLOCKS, MAIN AND BRANCH LUGS FOR THE WIRING INDICATED ON THE DRAWINGS.

**PANEL BOARDS:**  
PANELS SHALL HAVE DOORS WITH CONCEALED HINGES AND COMBINED LOCK AND LATCH. OPERATED BY ONE MASTER KEY, UNLESS OTHERWISE INDICATED. SUPPLY TO SUCH KEYS.

BREAKERS SHALL BE BOLT-ON SINGLE POLE OR MULTIPLE POLE OF THE COMMON TRIP TYPE.

BREAKERS SHALL BE CLEARLY MARKED WITH THEIR RESPECTIVE TRIP RATING.

PANELS SHALL BE ARRANGED FOR THE VOLTAGE INDICATED.

ALL BUS BARS, LUGS AND BREAKER TERMINALS SHALL BE ALUMINUM UNLESS OTHERWISE NOTED IN PANEL SCHEDULE.

**WIRING DEVICES:**  
LIGHT SWITCHES SHALL BE PREMIUM SPECIFICATION GRADE, A.C., TOGGLE TYPE SWITCHES.

RECEPTACLES SHALL BE OF THE TYPE SHOWN ON THE DRAWINGS WITH THE STANDARD C.S.A. CONFIGURATIONS AND SHALL BE PREMIUM SPECIFICATION GRADE, HUBBELL #5262.

LIGHT SWITCHES AND RECEPTACLES ON NORMAL POWER SHALL BE WHITE UNLESS NOTED OTHERWISE.

WALL PLATES FOR FLUSH MOUNTED DEVICES SHALL BE MULTIPLE GANG SUPER STAINLESS STEEL TYPE 302.

WALL PLATES FOR SURFACE MOUNTED DEVICES IN UNFINISHED AREAS SHALL BE METAL COVERS FOR F.S. TYPE BOXES.

THE WEATHERPROOF PLATES SHALL BE CAST ALUMINUM WITH LIFT COVER FOR F.S. TYPE BOXES.

THE T.V. AND COMPUTER OUTLET WALL PLATES SHALL BE COMPLETE WITH BLANK COVER PLATE UNLESS OTHERWISE NOTED.

THE TELEPHONE OUTLET WALL PLATES SHALL BE COMPLETE WITH BLANK COVER PLATE UNLESS OTHERWISE NOTED.

RECEPTACLE MOUNTED ON THE EXTERIOR WALLS OF THE BUILDING AND ROOF SHALL BE WITH GROUND FAULT PROTECTION MOUNTED IN AN F.S. TYPE BOX WITH A HUBBELL #MX3200 IN-USE COVER PLATE.

WIRING DEVICES SHALL UNLESS OTHERWISE NOTED, BE OF HUBBELL, LEVITON OR COOPER MANUFACTURE AND THE DIMMERS SHALL BE LUTRON MANUFACTURER.

SYMBOLS ON DRAWINGS SHOW APPROXIMATE LOCATIONS. CARE SHALL BE TAKEN TO LOCATE EACH DEVICE TO ENSURE THAT IT IS IN THE APPROPRIATE LOCATION TO SUIT THE ARCHITECTURAL FINISHES.

MOUNTING HEIGHTS ARE REFERRED TO FINISHED FLOOR OR FINISHED CEILING UNLESS RELATED TO BENCH MARK ELEVATIONS.

PROVIDE COVER PLATES FOR FLUSH MOUNTED MANUAL STARTERS.

LIGHT SWITCHES, EXCEPT WHERE NOTED, SHALL BE MOUNTED 1000mm TO 1100mm ABOVE FINISHED FLOOR ON THE LOCK SIDE OF THE DOOR.

RECEPTACLE, TELEPHONE, ETC. OUTLETS SHALL, UNLESS OTHERWISE NOTED, BE MOUNTED VERTICALLY 350MM ABOVE FINISHED FLOOR IN THE FINISHED AREAS AND 1370MM IN ALL UNFINISHED AREAS. THERMOSTATS SHALL BE MOUNTED 1200MM UNLESS OTHERWISE NOTED.

TELEPHONE, P.A., ETC. WALL OUTLETS SHALL BE SPACED 100MM FROM POWER OUTLET.

**PANELS:**  
PANELS SHALL BE OF THE SIZE, CAPACITY AND TYPE AS SHOWN ON THE DRAWINGS.

PANELS SHALL BE OF THE SPRINKLER-PROOF, DEAD FRONT TYPE ENCLOSED IN CODE GAUGE STEEL EQUIPPED WITH DOOR, LOCK AND DIRECTORY AND SHALL BE SUITABLE FOR SURFACE OR FLUSH MOUNTING AS REQUIRED.

BUSSING IN EACH PANEL SHALL BE ALUMINUM AND SHALL EXTEND THE FULL LENGTH OF THE PANEL.

BREAKERS SHALL BE AMBIENT COMPENSATED TYPE, CALIBRATED AT 75 DEGREES C. AND BE OF THE BOLT-ON TYPE. MULTI-POLE BREAKERS SHALL HAVE COMMON TRIP.

SURFACE PANELS, INCLUDING TUBS, SHALL HAVE TWO COATS OF PRIMER PAINT AND TWO COATS OF ANS49 GRAY PAINT.

LIGHTING PANELS SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD.

LOCATE LIGHTING PANELS WHERE INDICATED AND MOUNT SECURELY AND PLUMB TRUE AND SQUARE TO ADJOINING SURFACES.

PANELS ARE TO BE MOUNTED SO THAT THE TOP OF THE PANELS ARE 1800MM ABOVE FINISHED FLOOR FOR PANELS UP TO 54 CIRCUITS, AND 1980MM ABOVE FINISHED FOR PANELS LARGER THAN 54 CIRCUITS.

PROVIDE 1-25MM EMPTY CONDUIT FROM EACH FLUSH MOUNTED PANEL TO THE CEILING SPACES ABOVE AND BELOW FOR FUTURE INSTALLATION.

PROVIDE WIREWAYS ABOVE MULTI-SECTION PANELS TO AVOID CROSS-WIRING.

NUMBERING OF BREAKERS IN MULTI-PANEL ASSEMBLIES SHALL BE CONSECUTIVE. IF NECESSARY PROVIDE NARROW DYNAMOMETER STRIPS WITH THE REQUIRED NUMBERINGS.

**LIGHTING CONTROLS (OPTIONAL):**  
PROVIDE LIGHTING CONTROL DEVICES(S) INCLUDING OCCUPANCY SENSORS, ROOM CONTROLLERS, DAYLIGHT SENSORS, DIMMERS, ETC. AS SPECIFIED ON THE DRAWINGS. - PROVIDE ASSOCIATED POWER AND RELAY PACKS. - PROVIDE ALL ASSOCIATED MOUNTING ACCESSORIES.

ELECTRICAL CONTRACTOR SHALL INCLUDE IN TENDER PRICE FOR INSTALLATION, TESTING, TIME ADJUSTMENT, FUNCTIONAL TESTING AND COMMISSIONING OF OCCUPANCY SENSORS, ROOM CONTROLLERS, DAYLIGHT SENSORS

FUNCTIONAL TESTING: LIGHTING CONTROL DEVICES AND CONTROL SYSTEMS SHALL BE TESTED TO ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED, AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS. WHERE OCCUPANCY SENSORS, TIME SWITCHES, PROGRAMMABLE SCHEDULE CONTROLS, OR PHOTO SENSORS ARE INSTALLED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED.

OCCUPANCY SENSORS: - CERTIFY THAT THE SENSOR HAS BEEN LOCATED AND AIMED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. - FOR EACH SENSOR TO BE TESTED, VERIFY THE FOLLOWING: - STATUS INDICATOR (AS APPLICABLE) OPERATES CORRECTLY. - CONTROLLED LIGHTS TURN 'OFF' OR DOWN TO THE PERMITTED LEVEL WITHIN THE REQUIRED TIME. - FOR AUTO-ON OCCUPANCY SENSORS, THE LIGHTS TURN 'ON' TO THE PERMITTED LEVEL WHEN SOMEONE ENTERS THE SPACE - FOR MANUAL-ON SENSORS, THE LIGHTS TURN 'ON' ONLY WHEN MANUALLY ACTIVATED - THE LIGHTS ARE NOT INCORRECTLY TURNED 'ON' BY MOVEMENT IN NEARBY AREAS OR BY HVAC OPERATION. - SIMULATE OCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING: - ALL LIGHTS CAN BE TURNED 'ON' AND 'OFF' BY THEIR RESPECTIVE AREA CONTROL SWITCH - THE SWITCH ONLY OPERATES LIGHTING IN THE ENCLOSED SPACE IN WHICH THE SWITCH IS LOCATED.

**ALTERNATOR**  
1. THE ELECTRIC PLANT (ENGINE AND ALTERNATOR) SHALL BE MOUNTED WITH INTERNAL VIBRATION ISOLATION ONTO A WELDED STEEL BASE. EXTERNAL VIBRATION ISOLATION SHALL NOT BE REQUIRED FOR NORMAL PAD MOUNTED APPLICATIONS.

2. A MAIN LINE CIRCUIT BREAKER CARRYING THE ILL/CSA MARK SHALL BE FACTORY INSTALLED. THE BREAKER SHALL BE RATED AS PER THE MANUFACTURER'S RECOMMENDATIONS. THE LINE SIDE CONNECTIONS ARE TO BE MADE AT THE FACTORY. OUTPUT LUGS SHALL BE PROVIDED FOR LOAD SIDE CONNECTIONS.

**CONTROLS**

- THE GENERATOR CONTROL SYSTEM SHALL BE A FULLY INTEGRATED MICROPROCESSOR BASED CONTROL SYSTEM FOR STANDBY EMERGENCY GENERATORS MEETING ALL REQUIREMENTS OF CSA C282, LATEST EDITION.
- THE CONTROL PANEL WILL DISPLAY ALL USER PERTINENT PARAMETERS INCLUDING:
  - ENGINE AND ALTERNATOR OPERATING CONDITIONS
  - OIL PRESSURE AND OPTIONAL OIL TEMPERATURE
  - COOLANT TEMPERATURE AND LEVEL ALARM
  - ENGINE SPEED
  - DC BATTERY VOLTAGE
  - RUN TIME HOURS
  - GENERATOR VOLTAGES, AMPS, FREQUENCY, KILOWATTS, AND POWER FACTOR
  - ALARM STATUS
- THE FOLLOWING EQUIPMENT IS TO BE INSTALLED AT THE ENGINE-GENERATOR SET MANUFACTURER'S FACILITY:
  - A DPDT RELAY SHALL BE SOCKET MOUNTED IN THE GENERATOR CONTROL PANEL AND OPERATE ON ENGINE START AND RUN FOR CUSTOMER CONNECTION.
- THE FOLLOWING EQUIPMENT IS TO BE PROVIDED BY THE ENGINE-GENERATOR SET MANUFACTURER AND SHIPPED LOOSE WITH THE UNIT:
  - PROVIDE A CSA C282 COMPLIANT ALARM ANNUNCIATOR PANEL FOR REMOTE INDICATION PER LOCAL AND NATIONAL CODE REQUIREMENTS. THE ANNUNCIATOR SHALL BE CONTROLLED USING RS485 COMMUNICATIONS FROM THE GENERATOR CONTROLLER.

**WARRANTY**  
THE STANDBY ELECTRIC GENERATING SYSTEM COMPONENTS, COMPLETE ENGINE-GENERATOR AND INSTRUMENTATION, PANEL SHALL BE WARRANTED BY THE MANUFACTURER AGAINST DEFECTIVE MATERIALS AND FACTORY WORKMANSHIP FOR A PERIOD OF 24 MONTHS. SUCH DEFECTIVE PARTS SHALL BE REPAIRED OR REPLACED AT THE MANUFACTURER'S OPTION, FREE OF CHARGE. TRAVEL AND LABOUR SHALL BE INCLUDED FOR THE FIRST 12 MONTHS. START-UP AND CHECK-OUT  
THE SUPPLIER OF THE ELECTRIC GENERATING PLANT AND ASSOCIATED ITEMS COVERED HEREIN SHALL PROVIDE

**EMERGENCY GENERATOR:**  
ENGINE REQUIREMENTS

- THE PRIME MOVER SHALL BE A LIQUID COOLED, DIESEL FUELED, AND NATURALLY ASPIRATED ENGINE OF 4-CYCLE DESIGN.
- THE ENGINE IS TO BE COOLED WITH A UNIT MOUNTED RADIATOR, FAN, WATER PUMP, AND CLOSED COOLANT RECOVERY SYSTEM PROVIDING VISUAL DIAGNOSTIC MEANS TO DETERMINE IF THE SYSTEM IS OPERATING WITH A NORMAL ENGINE COOLANT LEVEL.
- THE INTAKE AIR FILTER(S) WITH REPLACEABLE ELEMENT MUST BE MOUNTED ON THE UNIT. FULL PRESSURE LUBRICATION SHALL BE SUPPLIED BY A POSITIVE DISPLACEMENT LUBE OIL PUMP. THE ENGINE SHALL HAVE REPLACEABLE OIL FILTER(S) WITH INTERNAL BYPASS AND REPLACEABLE ELEMENT(S). ENGINE COOLANT AND OIL DRAIN EXTENSIONS, EQUIPPED WITH PIPE PLUGS, MUST BE PROVIDED TO OUTSIDE OF THE MOUNTING BASE FOR CLEANER AND MORE CONVENIENT ENGINE SERVICING. A FAN GUARD MUST BE INSTALLED FOR PERSONNEL SAFETY.
- THE ENGINE SHALL HAVE A BATTERY CHARGING DC ALTERNATOR WITH A TRANSFORMERIZED VOLTAGE REGULATOR. REMOTE 2-WIRE STARTING SHALL BE BY A SOLENOID SHIFTER, ELECTRIC STARTER.
- THE ENGINE FUEL SYSTEM SHALL BE DESIGNED FOR PRIMARY OPERATION ON NATURAL GAS.
- THE ENGINE SHALL HAVE (A) UNIT MOUNTED, THERMOSTATICALLY CONTROLLED WATER JACKET HEATER(S) TO AID IN QUICK STARTING. THE WATTAGE SHALL BE AS RECOMMENDED BY THE MANUFACTURER. THE CONTRACTOR SHALL PROVIDE PROPER BRANCH CIRCUIT FROM NORMAL UTILITY POWER SOURCE.
- SENSING ELEMENTS TO BE LOCATED ON THE ENGINE FOR LOW OIL PRESSURE SHUTDOWN, HIGH COOLANT TEMPERATURE SHUTDOWN, LOW COOLANT LEVEL SHUTDOWN, OVERSPEED SHUTDOWN AND OVERCRANK SHUTDOWN. THESE SENSORS ARE TO BE CONNECTED TO THE CONTROL PANEL USING A WIRING HARNESS WITH THE FOLLOWING FEATURES: WIRE NUMBER LABELING ON EACH END OF THE WIRE RUN FOR EASY IDENTIFICATION; EACH SENSOR CONNECTION SHALL BE SEALED TO PREVENT CORROSION AND ALL WIRING TO BE RUN IN FLEXIBLE CONDUIT FROM PROTECTION FROM THE ENVIRONMENT AND ANY MOVING OBJECTS.
- PROVIDE THE FOLLOWING ITEMS INSTALLED AT THE FACTORY:
  - THE MANUFACTURER SHALL SUPPLY ITS RECOMMENDED STAINLESS STEEL, FLEXIBLE CONNECTOR TO COUPLE THE ENGINE EXHAUST MANIFOLD TO THE EXHAUST SYSTEM.
  - THE ENGINE OIL PAN WILL CONTAIN 120VAC, 150WATT, THERMOSTATICALLY CONTROLLED CRANKCASE OIL HEATER. THE OPERATING TEMPERATURE WITH BE SET AT 80 DEG. ON AND 100 DEG. OFF.
- THE FOLLOWING EQUIPMENT IS TO BE PROVIDED BY THE ENGINE GENERATOR SET MANUFACTURER AND SHIPPED LOOSE WITH THE UNIT:
  - THE MANUFACTURER WILL SUPPLY AN APPROVED FLEXIBLE FUEL LINE TO CONNECT THE ENGINE TO THE EXTERNAL NATURAL GAS GUEI SUPPLY LINE. ON STATIONARY APPLICATIONS THE FUEL LINE SHALL BE OF FUEL FITTING ON THE UNIT AND HAVE BRAIDED STAINLESS STEEL COVERING WITH BRASS FITTINGS.
- THE GENERATOR SYSTEM SHALL SUPPORT START-UP AND LOAD TRANSFER WITHIN 10SECONDS.

- THE ELECTRIC PLANT (ENGINE AND ALTERNATOR) SHALL BE MOUNTED WITH INTERNAL VIBRATION ISOLATION ONTO A WELDED STEEL BASE. EXTERNAL VIBRATION ISOLATION SHALL NOT BE REQUIRED FOR NORMAL PAD MOUNTED APPLICATIONS.
- A MAIN LINE CIRCUIT BREAKER CARRYING THE ILL/CSA MARK SHALL BE FACTORY INSTALLED. THE BREAKER SHALL BE RATED AS PER THE MANUFACTURER'S RECOMMENDATIONS. THE LINE SIDE CONNECTIONS ARE TO BE MADE AT THE FACTORY. OUTPUT LUGS SHALL BE PROVIDED FOR LOAD SIDE CONNECTIONS.

- THE GENERATOR CONTROL SYSTEM SHALL BE A FULLY INTEGRATED MICROPROCESSOR BASED CONTROL SYSTEM FOR STANDBY EMERGENCY GENERATORS MEETING ALL REQUIREMENTS OF CSA C282, LATEST EDITION.
- THE CONTROL PANEL WILL DISPLAY ALL USER PERTINENT PARAMETERS INCLUDING:
  - ENGINE AND ALTERNATOR OPERATING CONDITIONS
  - OIL PRESSURE AND OPTIONAL OIL TEMPERATURE
  - COOLANT TEMPERATURE AND LEVEL ALARM
  - ENGINE SPEED
  - DC BATTERY VOLTAGE
  - RUN TIME HOURS
  - GENERATOR VOLTAGES, AMPS, FREQUENCY, KILOWATTS, AND POWER FACTOR
  - ALARM STATUS
- THE FOLLOWING EQUIPMENT IS TO BE INSTALLED AT THE ENGINE-GENERATOR SET MANUFACTURER'S FACILITY:
  - A DPDT RELAY SHALL BE SOCKET MOUNTED IN THE GENERATOR CONTROL PANEL AND OPERATE ON ENGINE START AND RUN FOR CUSTOMER CONNECTION.
- THE FOLLOWING EQUIPMENT IS TO BE PROVIDED BY THE ENGINE-GENERATOR SET MANUFACTURER AND SHIPPED LOOSE WITH THE UNIT:
  - PROVIDE A CSA C282 COMPLIANT ALARM ANNUNCIATOR PANEL FOR REMOTE INDICATION PER LOCAL AND NATIONAL CODE REQUIREMENTS. THE ANNUNCIATOR SHALL BE CONTROLLED USING RS485 COMMUNICATIONS FROM THE GENERATOR CONTROLLER.

**WARRANTY**  
THE STANDBY ELECTRIC GENERATING SYSTEM COMPONENTS, COMPLETE ENGINE-GENERATOR AND INSTRUMENTATION, PANEL SHALL BE WARRANTED BY THE MANUFACTURER AGAINST DEFECTIVE MATERIALS AND FACTORY WORKMANSHIP FOR A PERIOD OF 24 MONTHS. SUCH DEFECTIVE PARTS SHALL BE REPAIRED OR REPLACED AT THE MANUFACTURER'S OPTION, FREE OF CHARGE. TRAVEL AND LABOUR SHALL BE INCLUDED FOR THE FIRST 12 MONTHS. START-UP AND CHECK-OUT  
THE SUPPLIER OF THE ELECTRIC GENERATING PLANT AND ASSOCIATED ITEMS COVERED HEREIN SHALL PROVIDE

FACTORY TRAINED TECHNICIANS TO CHECKOUT THE COMPLETED INSTALLATION AND TO PERFORM AN INITIAL STARTUP INSPECTION TO INCLUDE:  
-ENSURING THE ENGINE STARTS (BOTH HOT & COLD) WITHIN THE SPECIFIED TIME  
-VERIFICATION OF ENGINE PARAMETERS WITHIN SPECIFICATION.  
-VERIFY NO LOAD FREQUENCY AND VOLTAGE, ADJUSTING IF REQUIRED.  
-TEST ALL AUTOMATIC SHUTDOWNS OF THE ENGINE-GENERATOR.  
-PERFORM A LOAD TEST OF THE ELECTRIC PLANT, ENSURING FULL LOAD FREQUENCY AND VOLTAGE ARE WITHIN SPECIFICATION BY USING BUILDING LOAD

- INSTALLATION**
- MOVE THE EQUIPMENT INTO PLACE AND CONNECT. CONTRACTOR SHALL INSTALL THE COMPLETE ELECTRICAL GENERATING SYSTEM INCLUDING ALL FUEL CONNECTIONS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AS REVIEWED BY THE ENGINEER.
  - SUPPLY AND INSTALL ANCHORS FOR THE ENGINE/GENERATOR AND FUEL TANK BASE IN THE PAD AND CONNECT TO ISOLATING DEVICES ON BASE.
  - INSTALL BATTERIES.
  - INSTALL CONTROL PANEL. SUPPLY AND INSTALL INTERCONNECTING WIRING BETWEEN CONTROL PANEL, ENGINE/GENERATOR, TRANSFER SWITCH, REMOTE ANNUNCIATOR, DAMPERS AND OTHER EQUIPMENT.
  - PROVIDE 120V 1PH NORMAL POWER CONNECTION TO ALL ACCESSORIES. USE A SEPARATE SUITABLY SIZED BRANCH CIRCUIT FOR EACH SEPARATE COMPONENT. LABEL LOAD CENTRE ACCORDINGLY.

**APPLICATIONS**  
ELECTRICAL CONTRACTOR SHALL APPLY TO MINISTRY OF ENVIRONMENT FOR APPROVAL OF GENERATOR EXHAUST SYSTEM TO SUIT CODE REQUIREMENTS.

**AUTOMATIC TRANSFER SWITCHES:**

**RATINGS**  
THE VOLTAGE RATING OF THE TRANSFER SWITCH SHALL BE NO LESS THAN THE SYSTEM VOLTAGE  
THE CONTINUOUS CURRENT RATING OF THE TRANSFER SWITCH SHALL BE NO LESS THAN THE MAXIMUM CONTINUOUS CURRENT REQUIREMENTS OF THE SYSTEM.  
TRANSFER SWITCHES SHALL CONSIST OF COMPLETELY ENCLOSED CONTACT ASSEMBLIES AND A SEPARATE CONTROL PANEL. THE CONTACT ASSEMBLIES SHALL BE OPERATED BY A NON-FUSED MOTOR OPERATOR OR STORED ENERGY MECHANISM AND WILL ONLY BE ENERGIZED DURING A TRANSFER OPERATION, PROVIDING INHERENTLY DOUBLE THROW SWITCHING ACTION.  
EACH TRANSFER SWITCH SHALL BE POSITIVELY INTERLOCKED BOTH MECHANICALLY AND ELECTRICALLY TO PREVENT SIMULTANEOUS CLOSING OF BOTH SOURCES DURING AUTOMATIC OR MANUAL OPERATION. EACH TRANSFER SWITCH SHALL BE CAPABLE OF ACHIEVING A NEUTRAL POSITION FOR SYSTEMS MAINTENANCE PURPOSES. A TRANSFER SWITCH POSITION INDICATOR SHALL BE INCLUDED ON THE FACE OF THE TRANSFER MECHANISM TO DISPLAY THE SWITCH POSITION.  
MAIN CONTACTS SHALL BE DESIGNED TO WITHSTAND MULTIPLE FAULT CURRENTS AND SHALL MEET CSA 22.2 NO. 178 AND C22.2 NO. 5.

- INSTALLATION**
- CONTRACTOR SHALL INSTALL ALL EQUIPMENT PER THE MANUFACTURER'S RECOMMENDATIONS AND THE CONTRACT DRAWINGS.
  - ALL NECESSARY HARDWARE TO SECURE THE ASSEMBLY IN PLACE SHALL BE PROVIDED BY THE CONTRACTOR.
  - THE EQUIPMENT SHALL BE INSTALLED AND CHECKED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
  - PROVIDE THE SERVICES OF A QUALIFIED FACTORY-TRAINED MANUFACTURER'S REPRESENTATIVE TO ASSIST THE CONTRACTOR IN INSTALLATION AND START-UP OF THE EQUIPMENT SPECIFIED UNDER THIS SECTION FOR A PERIOD OF 2 WORKING DAYS. THE MANUFACTURER'S REPRESENTATIVE SHALL PROVIDE TECHNICAL DIRECTION AND ASSISTANCE TO THE CONTRACTOR IN GENERAL ASSEMBLY OF THE EQUIPMENT, CONNECTIONS, AND ADJUSTMENTS, AND TESTING OF THE ASSEMBLY AND COMPONENTS CONTAINED THEREIN.
  - A QUALIFIED FACTORY-TRAINED MANUFACTURER'S REPRESENTATIVE SHALL CERTIFY IN WRITING THAT THE EQUIPMENT HAS BEEN INSTALLED, ADJUSTED AND TESTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
  - THE CONTRACTOR SHALL PROVIDE A TRAINING SESSION FOR 1 NORMAL WORKDAY AT A JOBSITE LOCATION DETERMINED BY THE OWNER.
  - THE TRAINING SESSION SHALL BE CONDUCTED BY A MANUFACTURER'S QUALIFIED REPRESENTATIVE. THE TRAINING PROGRAM SHALL CONSIST OF THE INSTRUCTION ON THE OPERATION OF THE ASSEMBLY, CIRCUIT BREAKERS AND MAJOR COMPONENTS WITHIN THE ASSEMBLY.

ELECTRICAL SCHEMATIC LEGEND	
SYMBOL	DESCRIPTION
	15A 125V SPECIFICATION GRADE DUPLEX RECEPTACLE (5-15R) MOUNTED AT 305mm A.F.F.
	15A 125V SPECIFICATION GRADE DUPLEX RECEPTACLE (5-15R) MOUNTED AT 1200mm A.F.F. (OR OTHERWISE NOTED)
	20A 125V SPECIFICATION GRADE DUPLEX RECEPTACLE (5-20R) MOUNTED AT 305mm A.F.F. (OR OTHERWISE NOTED)
	20A 125V SPECIFICATION GRADE DUPLEX RECEPTACLE (5-20R) MOUNTED AT 1000mm A.F.F. (OR OTHERWISE NOTED)
	15A 125V SPECIFICATION GRADE QUAD RECEPTACLE (5-15R) MOUNTED AT 305mm A.F.F. (OR OTHERWISE NOTED)
	20A 125V SPECIFICATION GRADE QUAD RECEPTACLE (5-20R) MOUNTED AT 305mm A.F.F. (OR OTHERWISE NOTED)
	1-PHASE DIRECT CONNECTION TO NOTED EQUIPMENT
	3-PHASE DIRECT CONNECTION TO NOTED EQUIPMENT
	GFCI: GROUND FAULT CIRCUIT INTERRUPTER, WP- WEATHER-PROOF H: HOSPITAL GRADE, IG: ISOLATED GROUND
	FUSED / NON-FUSED DISCONNECT TO NOTED EQUIPMENT
	TELEPHONE OUTLET MOUNTED AT 305mm A.F.F. (OR OTHERWISE NOTED)
	TELEPHONE OUTLET MOUNTED AT 1200mm A.F.F. (OR OTHERWISE NOTED)
	DATA (CAT6E) OUTLET MOUNTED AT 305mm A.F.F. (OR OTHERWISE NOTED)
	DATA (CAT6E) OUTLET MOUNTED AT 1200mm A.F.F. (OR OTHERWISE NOTED)
	TELEPHONE / DATA OUTLET MOUNTED AT 1000mm A.F.F. (OR OTHERWISE NOTED)
	120/277V SPECIFICATION GRADE SINGLE POLE SWITCH MOUNTED AT 900-1100mm A.F.F.
	120/277V SPECIFICATION GRADE 3-WAY SWITCH MOUNTED AT 900-110

**INCOMING POWER NOTES:**

- USE PVC SHOP MANUFACTURED DUCT SPACERS AT 900mm [36"] INTERVALS TO MAINTAIN DUCT ALIGNMENT. SLOPE DUCT MINIMUM 75mm [3"] PER 30m [100'] TOWARDS STREET.
- PROVIDE REINFORCING STEEL AS INDICATED 15mm [5/8"].
- PROVIDE (3/8") ONE CONTINUOUS LENGTH OF POLYPROPYLENE FISH ROPE.
- ALL DUCTS SHALL BE TERMINATED WITH BELL FITTINGS AT EACH END.
- THE TOP ELEVATION OF THE CONCRETE ENCASUREMENT SHALL BE A DEPTH OF 1.0m IN ROCK OR HIGH WATER TABLE AREAS. THE TOP OF THE DUCT BANK MAY BE PLACED AT SUB GRADE ELEVATION OR AS OTHERWISE DIRECTED. THE REINFORCING BARS ALONG SIDES AND BOTTOM OF DUCT SHALL BE CONCEALED WITH A MINIMUM OF 25mm CONCRETE COVER. DUCTS SHALL BE ENCASED WITH 20MPA GRADE CONCRETE WITH A MINIMUM COVER OF 75mm FROM EXTERIOR WALLS OF DUCTS ON ALL SIDES. CONCRETE SHALL BE WORKED BELOW AND BETWEEN PIPES TO PRODUCE A HOMOGENEOUS MASS. CONCRETE SHALL BE IN ACCORDANCE WITH CSA STANDARDS CAN3-A23.2, A23.1, A23.4, AS WELL AS LOCAL UTILITY STANDARDS.
- DRILL 4 DRAINAGE HOLES IN BOTTOM OF EACH DUCT 1.3cm DIA. AT 5cm CENTRES. FILL TO TOP OF DUCTS WITH 1.9cm (3/4") CLEAR STONE. TOP OFF WITH A LAYER OF POLY-FILM, OR STYROFOAM, ETC., AND A FINAL LAYER OF CONCRETE.
- WHERE IT IS REQUIRED, CUSTOMER DUCTS SHALL BE LEFT FOR LOCAL UTILITY WITH THE PROJECTING (MINIMUM 300mm) FROM THEIR CONCRETE ENVELOPE IN A STAGGERED PATTERN. THEY SHALL BE EQUIPPED WITH SUITABLE COUPLINGS AND PLUGGED UNTIL THE JOINTS ARE MADE. THE FACE OF THE CONCRETE ENVELOPE SHALL BE LEFT ROUGH TO KEY WITH THE EXTENSION ENVELOPE AND 15mm (3/8") DIAMETER STEEL REINFORCING BARS 1.8m IN LENGTH SHALL BE ENCASED LONGITUDINALLY IN THE ENVELOPE. 50mm INSIDE THE PERIMETER OF THE BANK AT 100mm CENTRES ALONG THE SIDES AND BOTTOM OF THE BANK. THE RODS SHALL PROJECT 900mm FROM THE CENTRE TO ANCHOR FIRMLY INTO THE CONCRETE OF THE EXTENSION WHEN THE LATTER IS POURED.
- CONTRACTOR SHALL APPLY TO LOCAL UTILITY CONSTRUCTION DEPARTMENT 48 HOURS BEFORE DIGGING THE TRENCH.
- HYDRO DUCT BANK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH LOCAL UTILITY SPECIFICATIONS. HIGH VOLTAGE DUCT BANK TO BE TERMINATED AT PROPERTY LINE AS SHOWN ON SITE PLAN.
- RUN 100mm (4") PVC DBI DUCT FROM ELECTRICAL ROOM TO PROPERTY LINE AND CAP FOR FUTURE USE (PHONE/INTERNET).
- RED CAUTION TAPE TO BE LAID ABOVE DUCT BANK AS PER DETAIL. "CAUTION BURIED ELECTRIC LINE BELOW".
- PROVIDE SECONDARY CABLING PER OESC FROM POLE-MOUNT TRANSFORMER TO MAIN PANEL IN MAIN ELECTRICAL ROOM.
- CONFIRM ALL WORK TO BE DONE BY LOCAL UTILITY OFFER TO CONNECT. ELECTRICAL CONTRACTOR TO COORDINATE WITH LOCAL UTILITY AS REQUIRED.

**SITE LIGHTING NOTES:**

- ALL EXTERIOR LIGHTING CIRCUITS TO BE CONTROLLED BY A COMMON PHOTOCELL AND TIMER. PROVIDE ALL NECESSARY EQUIPMENT AND MAKE ALL CONNECTIONS.
- LOCATION OF PHOTOCELL TO BE VERIFIED ON SITE. EXTERIOR CIRCUITS SHALL HAVE A DEDICATED NEUTRAL. INSTALL LIGHT STANDARDS AS INDICATED IN THE DETAIL.
- THIS DRAWING INDICATES THE PROPOSED OUTDOOR LIGHTING FIXTURES FOR THIS PROJECT. THE PHOTOMETRIC DATA ILLUSTRATED INDICATES LINES OF MAINTAINED HORIZONTAL ILLUMINATION IN FC.
- THE PHOTOMETRIC DATA DOES NOT TAKE INTO ACCOUNT THE CONTRIBUTIONS FROM EXISTING STREET LIGHTING.

MH (MOUNTING HEIGHT) IN FEET. CLIENT TO APPROVE ALL FIXTURE FINISHES.

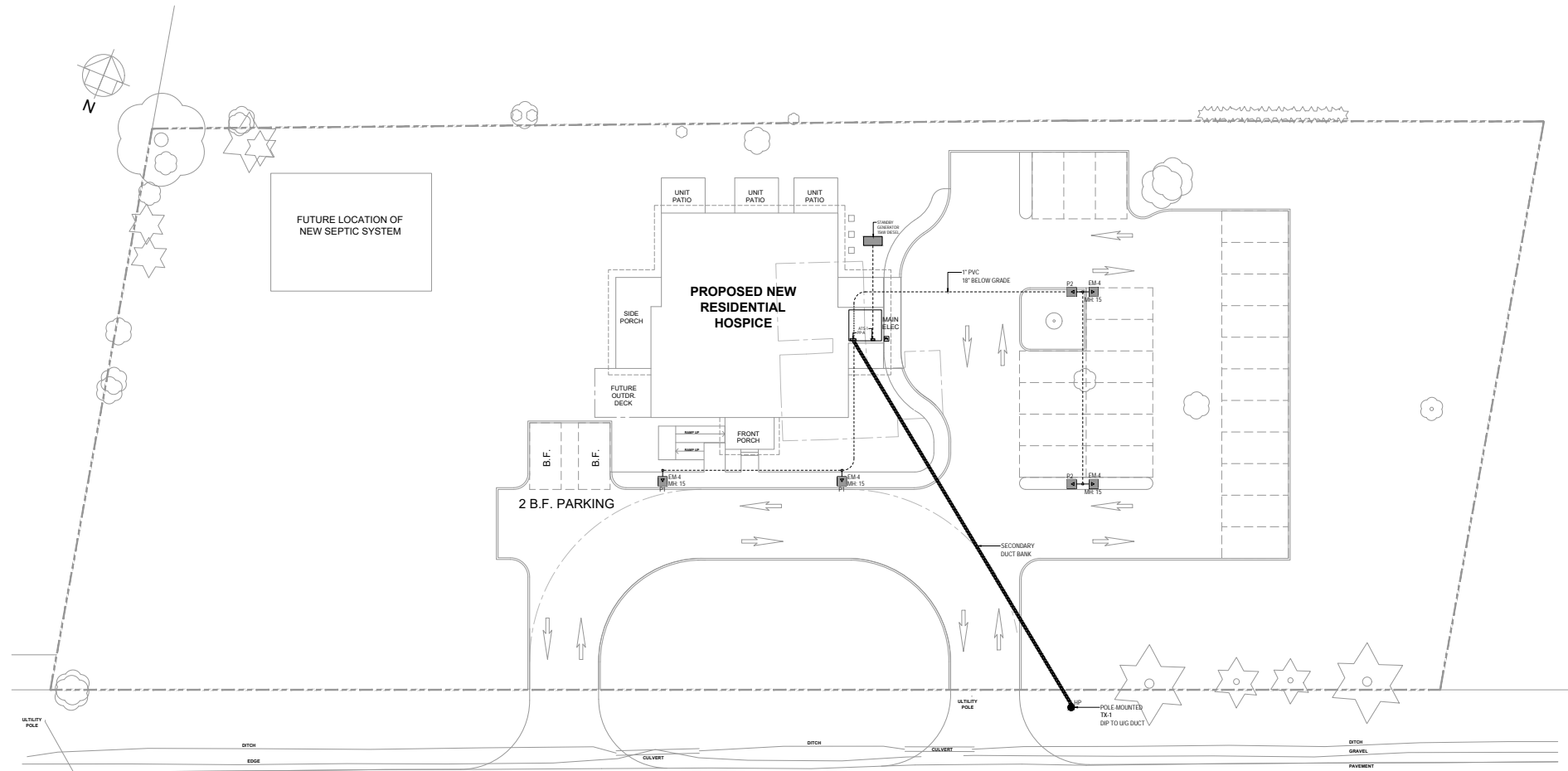
SITE LIGHTING STATISTICS						
DESCRIPTION	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
SITE	Fc	1.46	18.9	0.0	NA	NA

EXTERIOR LIGHTING SCHEDULE		
TYPE	SYMBOL	DESCRIPTION
P1		CS/LED FL05-100W(80W)-30K-T3-VISOR-BLACK (8W 120V LED POLE MOUNT TYPE III) FINISH: BLACK SWITCHING: PHOTOCELL / TIMER
P2		CS/LED 2 X FL05-100W(80W)-30K-T3-VISOR-BLACK (8W 120V LED POLE MOUNT TYPE III) FINISH: BLACK SWITCHING: PHOTOCELL / TIMER

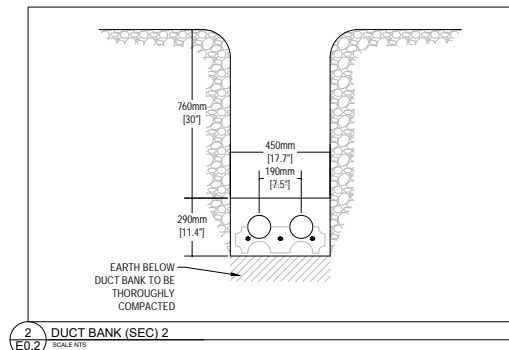
**EXTERIOR LUMINAIRE POLE NOTES:**

- MINIMUM CONDUIT SIZE TO BE 25mm [1"]; CONTRACTOR TO UPSIZE CONDUCTORS TO SATISFY ELECTRICAL SAFETY AUTHORITY AND NOT EXCEED MAXIMUM VOLTAGE DROP.
- MINIMUM BURIAL DEPTH OF 2.15m [7'-0"] MUST BE MAINTAINED TO SAFELY ANCHOR POLES.

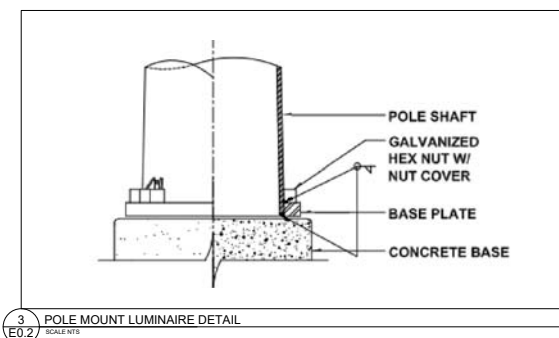
EXTERIOR POLE SCHEDULE		
TYPE	HEIGHT	DESCRIPTION
P1P2	15FT	DYNAPOLE TRS-15 (15FT ROUND TAPERED BLACK POLE) FIXTURE MH ABOVE GRADE: 15FT (4.57m) LV DIVIDER REQUIRED: NO



**1 SITE**  
E0.2 SCALE 1:250

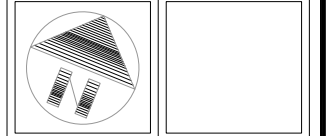


**2 DUCT BANK (SEC) 2**  
E0.2 SCALE NTS



**3 POLE MOUNT LUMINAIRE DETAIL**  
E0.2 SCALE NTS

1	FOR COORDINATION	05/12/26
NO	REVISION / ISSUED	DATE



**Hudson Engineering**

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416-663-5470

PROJECT:

**HOSPICE**

7672 ELGIN MILLS RD. E  
MARKHAM, ON

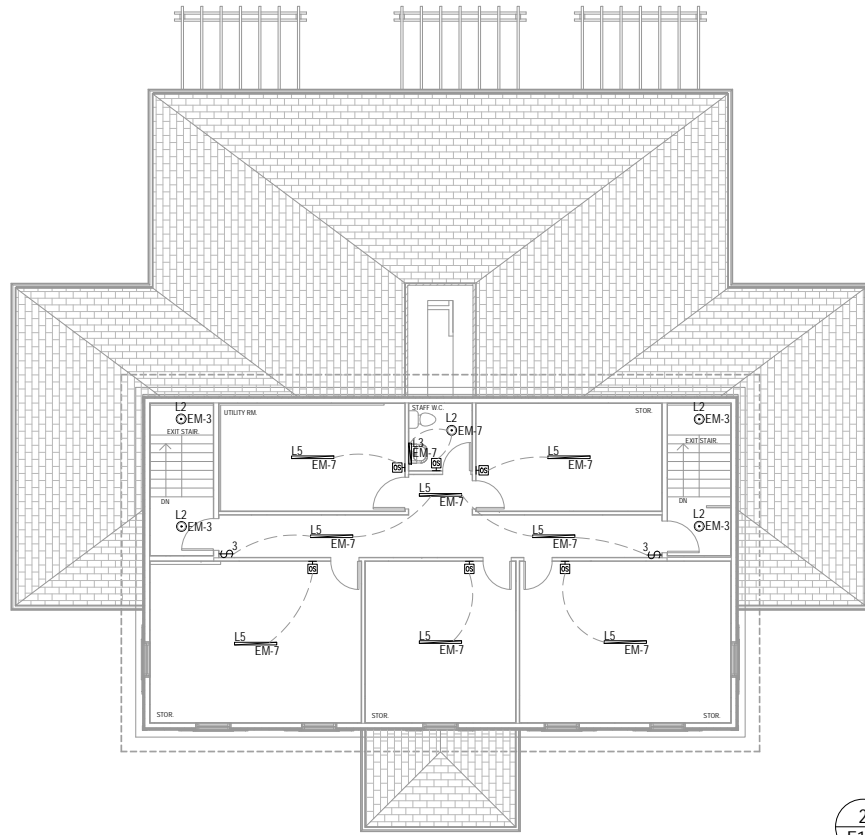
DRAWING TITLE

**SITE PLAN  
LIGHTING  
& INCOMING POWER**

DRAWN BY	CS	DATE	MAY 12 2026
CHECKED BY	RMS	SCALE	1: 250
PROJECT No.	26-XXXX	DRAWING No.	<b>E0.2</b>

**LIGHTING NOTES**

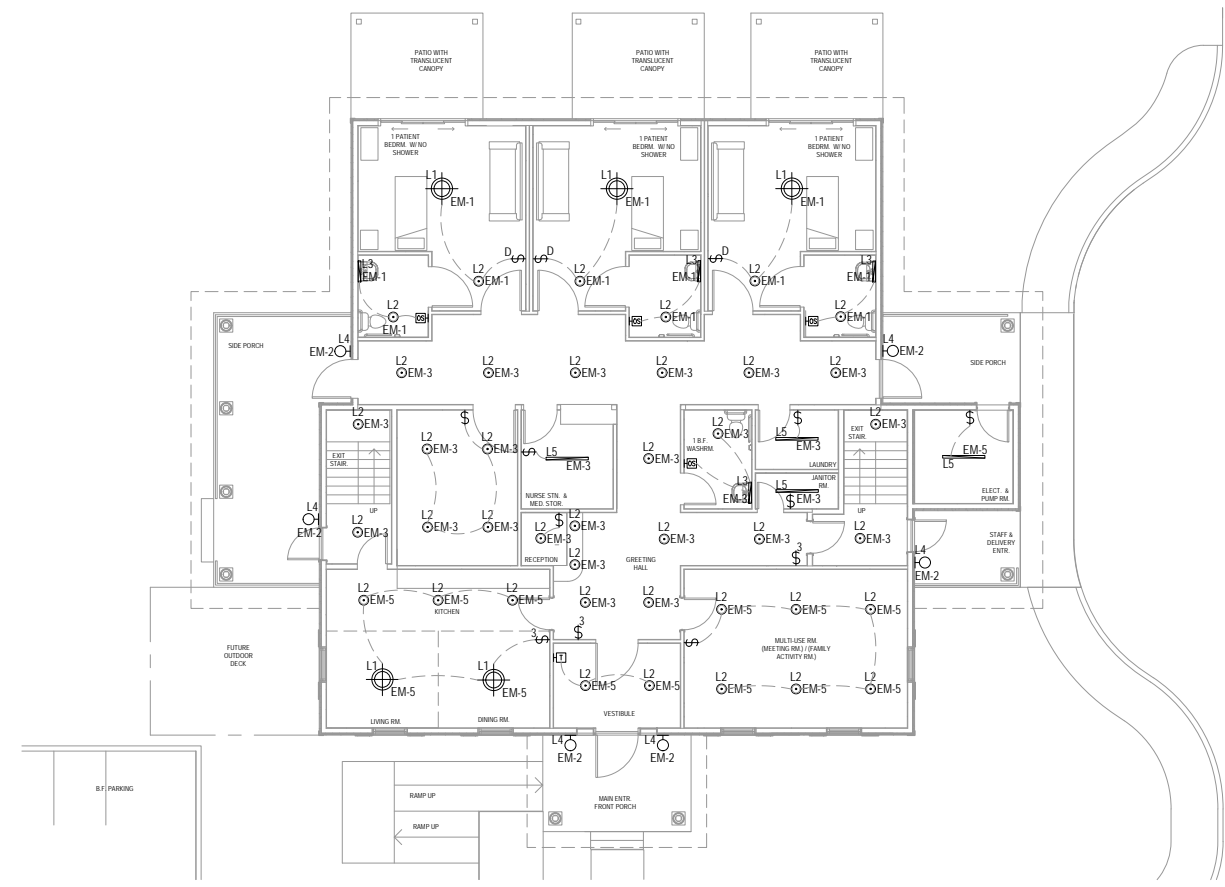
1. ELECTRICAL CONTRACTOR TO PROVIDE ALL NECESSARY SUPPORTS, HANGERS AND MOUNTING HARDWARE FOR A COMPLETE INSTALLATION. ALL SUPPORTS OR HANGERS SHALL BE OF A NON-COMBUSTIBLE NATURE. PROVIDE METAL CHANNELS OR UNI-STRUT AS REQUIRED.
2. ALL LIGHT SWITCHES, AND OTHER CONTROL DEVICES MOUNTING HEIGHTS TO BE 900-1100mm A.F.F. UNLESS OTHERWISE NOTED. ALL EXPOSED ELECTRICAL COVER PLATES TO BE WHITE.
3. LIGHT FIXTURES SHALL NOT BE SUPPORTED DIRECTLY FROM ROOF DECK. LIGHT FIXTURES SHALL BE INSTALLED TO RENDER A COMPLETE OPERATING SYSTEM.
4. ALL RECESSED LIGHTING TO BE 2-HOUR FIRE RATED. REFER TO FIXTURE SCHEDULE.
5. EXACT LOCATION FOR CORRIDOR 3-WAY SWITCHES TO BE CONFIRMED BY CLIENT.



**2 SECOND FLOOR PLAN**  
E1.1 SCALE 1:100

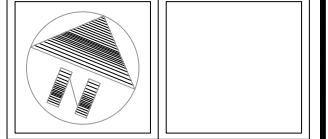
LUMINAIRE SCHEDULE		
TYPE	SYMBOL	DESCRIPTION
L1	⊕	CSCLED SSM-12R-24W-SCCT-WH (24W 120V 2,000L 2700K LED SURFACE MOUNT) MH: SURFACE - CEILING SWITCHING: SWITCH / OCC / DIMMER
L2	⊙	RENO LIGHTING RENO-4-S12W-ACCCT-WH-FR (R36033) (12W 120V 800L 2700K LED RECESSED 4IN FIRE-RATED 120MIN) MH: RECESSED - CEILING SWITCHING: SWITCH / OCC / DIMMER
L3	⊏	CSCLED VNL-2S-19W-3P-SCCT-LV-BN (19W 120V 1,750L 2700K LED VANITY FIXTURE) MH: ABOVE MIRROR SWITCHING: OCCUPANCY SENSOR
L4	⊕	CSCLED WCYL-DR-30W-3P-SCCT-UD (30W 120V 3,360L 3000K LED CYLINDER WALL MOUNT) MH: 8FT (2,44m) A.F.F. SWITCHING: TIMER
L5	⊏	CSCLED WR2-35W-3P-3CCT-UD (35W 120V 4,725L 3500K LED 4FT LINEAR) MH: SURFACE - CEILING SWITCHING: SWITCH / OCC / DIMMER

LIGHTING CONTROL SCHEDULE		
TYPE	SYMBOL	DESCRIPTION
OSW	⊏	LUTRON MS-2101-WH (OR EQUIVALENT) (120-277V 8A MAESTRO 0-10V DIMMER w/ XCT PIR OCC/VACANCY SENSOR) MH: 900-1100mm A.F.F. FINISH: WHITE
TC	⊏	INTERMATIC E1600WC (OR EQUIVALENT) (120-277V ASTRONOMICAL TIMER w/ PROGRAMMABLE SETTINGS) MH: 900-1100mm A.F.F. FINISH: WHITE



**1 GROUND FLOOR PLAN**  
E1.1 SCALE 1:100

1	FOR COORDINATION	05/12/26
NO	REVISION / ISSUED	DATE



**Hudson Engineering**  
2901 Steeles Ave. W Unit 26  
Toronto, Ontario M3J-3A5  
416-663-5470

PROJECT:  
**HOSPICE**  
7672 ELGIN MILLS RD. E  
MARKHAM, ON

DRAWING TITLE  
**LIGHTING  
GROUND FLOOR AND  
SECOND FLOOR PLAN**

DRAWN BY CS	DATE MAY 12 2026
CHECKED BY RMS	SCALE 1:100
PROJECT No. 26-XXXX	DRAWING No. <b>E1.1</b>

**POWER NOTES**

- ELECTRICAL CONTRACTOR NOT RESPONSIBLE FOR SECURITY & INTERCOM EQUIPMENT SUPPLY & INSTALLATION.
- ALL RECEPTACLE MOUNTING HEIGHTS TO BE 450mm A.F.F. UNLESS OTHERWISE NOTED. ALL EXPOSED ELECTRICAL COVER PLATES TO BE WHITE.
- ALL SWITCHES, DOOR OPERATORS AND OTHER CONTROL DEVICES MOUNTING HEIGHTS TO BE 900-1100mm A.F.F. UNLESS OTHERWISE NOTED. ALL EXPOSED ELECTRICAL COVER PLATES TO BE WHITE.
- ELECTRICAL CONTRACTOR TO COORDINATE WITH CLIENT REGARDING NURSE CALL SYSTEM REQUIREMENTS. POWER, CONTROL CABLING, AND INSTALLATION OF DEVICES SHALL BE CONFIRMED WITH SHOP DRAWINGS.
- STANDBY GENERATOR TO BE GENERAC MODEL #RD016 - 15KW 1-PHASE 120/240V 3-WIRE DIESEL GENERATOR (OR APPROVED EQUAL), UL/C S601 LISTED, COMPLETE WITH BATTERY & OIL HEATERS. DIESEL TANK TO BE BASE MOUNTED, 360 LITRE. AUTOMATIC TRANSFER SWITCH TO BE A GENERAC MODEL #RXSW100A3CUL (100A 120/240V 2-POLE 3-WIRE UL LISTED).

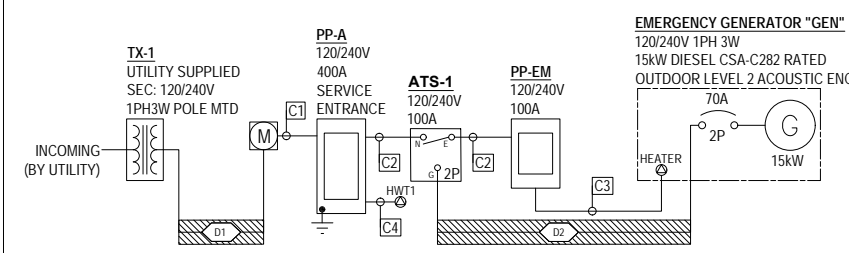
**MECHANICAL NOTES**

- ELECTRICAL CONTRACTOR TO COORDINATE WITH MECHANICAL CONTRACTOR REGARDING CONTROL INTERLOCKING CABLING AND TERMINATIONS. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL POWER FEEDS TO DESIGNATED EQUIPMENT.
- THERMOSTATS & FAN CONTROLLERS TO BE SUPPLIED BY OTHERS. ELECTRICAL CONTRACTOR RESPONSIBLE FOR POWER FEEDS TO EQUIPMENT.
- REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATIONS AND INSTALLATION HEIGHTS AND INSTRUCTIONS.
- ELECTRICAL HEATERS TO BE SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR. REFER TO ELECTRIC HEATER SCHEDULE AND MECHANICAL DRAWINGS FOR DETAILS.  
 EFF-4 OUELLET OAC64000-T + SURFACE MOUNT KIT  
 EFF-6 OUELLET OAC6000-T + SURFACE MOUNT KIT  
 BB-0.5 OUELLET OFM0500BL-T

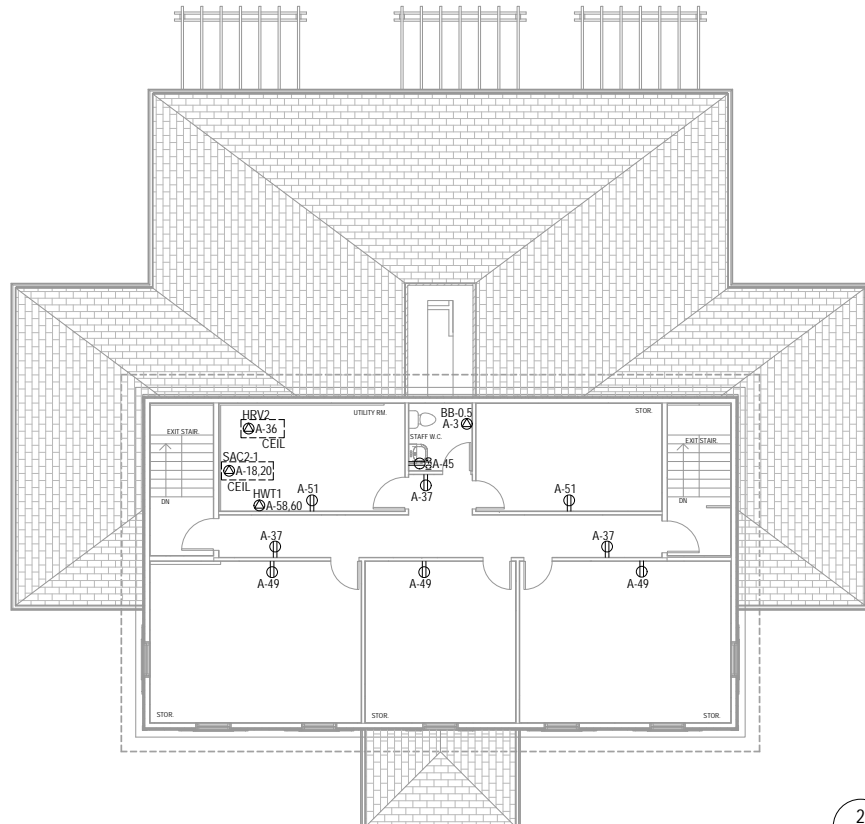
VOLTAGE:	120/240V 1PH 3W	PANEL PP-A	RATING	NEMA 1 w/ DRIP SHIELD				
AMPERAGE:	400A	ELEC PUMP ROOM	MOUNT	SURFACE				
MAINS:	400A MAIN BREAKER S E	BUS	ALUMINUM					
POWER (W)	CCT DESC	MCCB	#	PH	#	MCCB	CCT DESC	POWER (W)
1500	WC BB HEATER (3)	2P20A	1	A	2	2P40A	SAC1 (OUTDOOR)	6000
1000	WC BB HEATER (2)	1P20A	3	B	4			
4000	EFF-4 WEST	2P30A	5	A	6	2P40A	SAC2 (OUTDOOR)	6000
4000	EFF-4 EAST	2P30A	7	B	8			
6000	EFF-4 VESTIBULE	2P40A	9	A	10	2P40A	SAC3 (OUTDOOR)	6000
4000	EFF-4 STAR WEST	2P30A	11	B	12			
4000	EFF-4 STAR EAST	2P30A	13	A	14	2P15A	SAC1-1 (INDOOR)	1250
2000	DRYER	2P40A	15	B	16	2P15A	SAC2-1 (INDOOR)	1500
500	WASHER	1P15A	17	A	18	2P15A	SAC3-1 (INDOOR)	1500
1000	KITCHEN RECEPT	1P15A	19	B	20			
1000	KITCHEN RECEPT	1P15A	21	A	22	2P15A	SAC3-2 (INDOOR)	1500
1000	CORRIDOR RECEPT	1P15A	23	B	24			
1000	CORRIDOR 2FL RECEPT	1P15A	25	A	26	2P15A	SAC3-3 (INDOOR)	1500
500	AMENITY ROOM	1P15A	27	B	28			
500	WASHROOM GFCI 1	1P15A	29	A	30	2P15A	SAC3-3 (INDOOR)	1500
500	WASHROOM GFCI 2	1P15A	31	B	32			
500	WASHROOM GFCI 3	1P15A	33	A	34	1P15A	HRV1	750
500	WASHROOM GFCI 4	1P15A	35	B	36	1P15A	HRV2	750
500	2FL STORAGE REC	1P15A	37	A	38	1P15A	HRV3-1/2/3	500
500	KITCHEN REC	1P15A	39	B	40	1P15A	EF-1,2	500
500	2FL STORAGE REC	1P15A	41	A	42			
500	KITCHEN REC	1P15A	43	B	44			
500	2FL STORAGE REC	1P15A	45	A	46			
500	KITCHEN REC	1P15A	47	B	48			
500	2FL STORAGE REC	1P15A	49	A	50			
500	KITCHEN REC	1P15A	51	B	52			
500	2FL STORAGE REC	1P15A	53	A	54	2P15A	ATS-1 / PP-EM	-
500	KITCHEN REC	1P15A	55	B	56			
500	2FL STORAGE REC	1P15A	57	A	58	2P15A	HWT-1	27000
500	KITCHEN REC	1P15A	59	B	60			
<b>NOTES:</b> [24 SHW HEAT] [27KW COOLING]								<b>TOTAL CONNECTED (W):</b> 83500

VOLTAGE:	120/240V 1PH 3W	PANEL PP-EM	RATING	NEMA 1 w/ DRIP SHIELD				
AMPERAGE:	100A	ELEC PUMP ROOM	MOUNT	SURFACE				
MAINS:	100A MAIN BREAKER	BUS	ALUMINUM					
POWER (W)	CCT DESC	MCCB	#	PH	#	MCCB	CCT DESC	POWER (W)
200	LIGHTING 1	1P20A	1	A	2	1P20A	WALL SCONES	200
500	LIGHTING 2	1P20A	3	B	4	1P20A	SITE LIGHTING	500
250	LIGHTING 3	1P20A	5	A	6	1P20A	EMERGENCY EXITS	100
300	LIGHTING 4	1P20A	7	B	8	1P15A	ELEC RM REC	-
150	ADO	1P15A	9	A	10	1P15A	TELEPHONE REC	-
350	JANITOR REC	1P15A	11	B	12	1P15A	RECEPTION REC	350
350	PATIENT REC	1P15A	13	A	14	1P15A	NURSE CALL	150
350	PATIENT 1 BED REC	1P15A	15	B	16	1P15A	NURSE STATION	350
350	PATIENT 2 BED REC	1P15A	17	A	18			
350	PATIENT 3 BED REC	1P15A	19	B	20			
			21	A	22			
			23	B	24			
			25	A	26			
			27	B	28			
			29	A	30			
			31	B	32			
<b>NOTES:</b> *CONTROLLED BY PHOTOCELL / TIMER								<b>TOTAL CONNECTED (W):</b> 3600

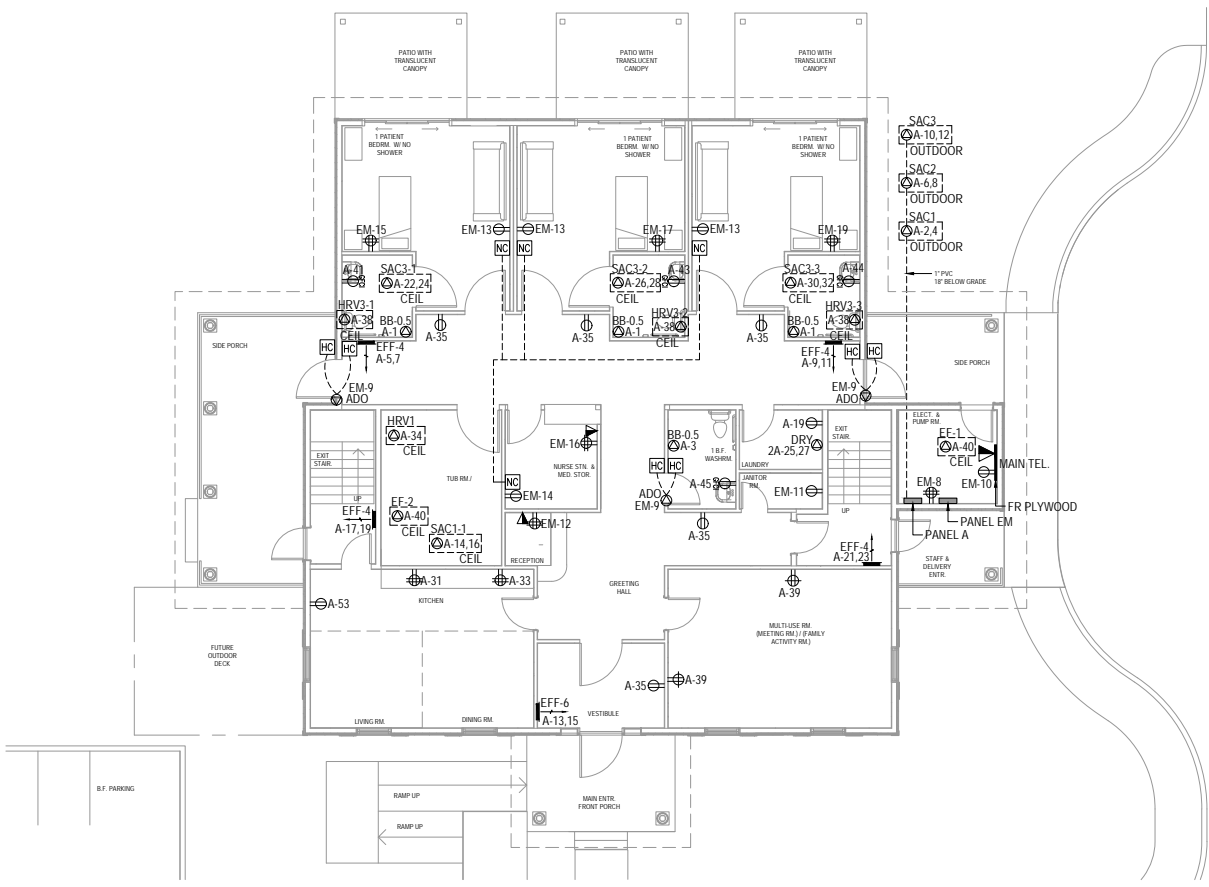
FEEDER SCHEDULE					
TAG	AMPS	RUNS	CONDUCTOR SIZE (BONDING CONDUCTOR)	CONDUIT SIZE (TYPE)	LENGTH
D1	400	2	3 x 1/0 AWG CU, RW90 (N/A)	4" (DBII DUCT)	
D2	70	1	3 x #4 AWG CU, RW90 (#8 AWG CU)	1-1/4" (35mm) (PVC)	
G1	200	1	3 x 3/0 AWG CU, RW90 (#6 AWG CU)	2" (53mm) (NIPPLE)	
G2	70	1	3 x #4 AWG CU, RW90 (#8 AWG CU)	1-1/4" (35mm) (EMT)	
G3	15	1	2 x #14 AWG CU, T90 (#14 AWG CU)	3/4" (21mm) (PVC)	
G4	150	1	2 x 1/0 AWG CU, T90 (#6 AWG CU)	1-1/2" (41mm) (EMT)	



**3 SINGLE LINE DIAGRAM**  
 SCALE NTS

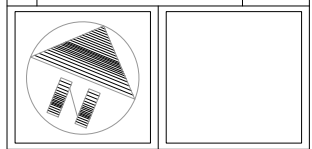


**2 SECOND FLOOR PLAN**  
 SCALE 1:100



**1 GROUND FLOOR PLAN**  
 SCALE 1:100

NO	REVISION / ISSUED	DATE
1	FOR COORDINATION	05/12/26



**Hudson Engineering**  
 2901 Steeles Ave. W Unit 26  
 Toronto, Ontario M3J-3A5  
 416-663-5470

**PROJECT:**  
**HOSPICE**  
 7672 ELGIN MILLS RD. E  
 MARKHAM, ON

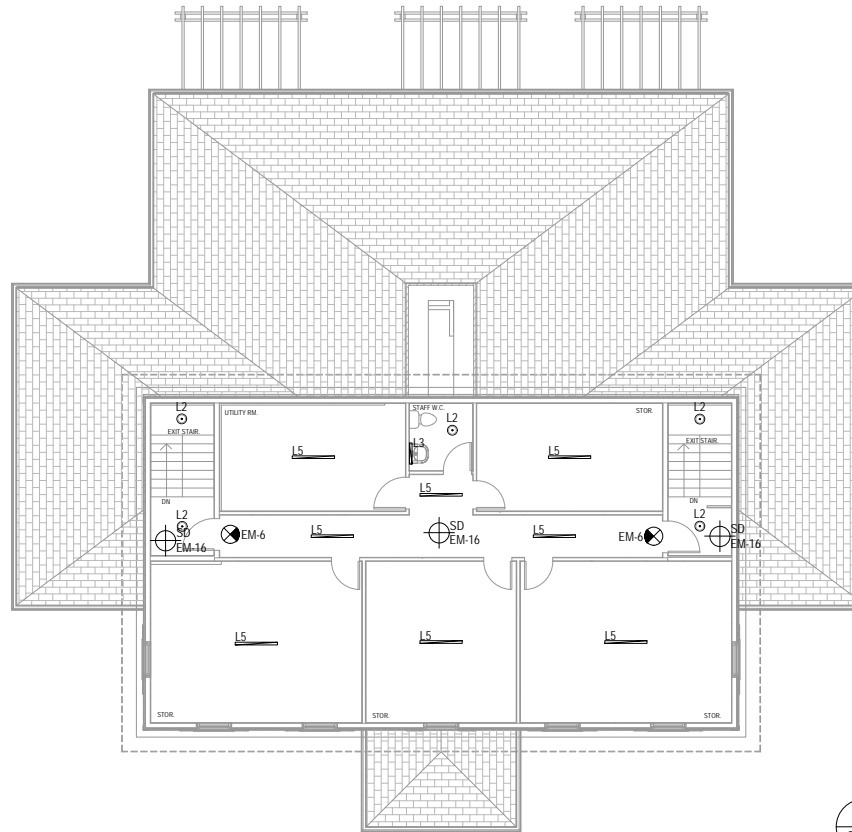
**DRAWING TITLE**  
 POWER & DATA  
 GROUND FLOOR AND  
 SECOND FLOOR PLAN

DATE	MAY 12 2026
SCALE	1:100
DRAWN BY	CS
CHECKED BY	RMS
PROJECT No.	26-XXXX
DRAWING No.	<b>E2.1</b>

**EMERGENCY SYSTEM NOTES**

1. ALL INTERIOR LIGHTING & EXIT SIGNAGE TO BE FED FROM EMERGENCY PANEL (PP-EM).
2. SMOKE DETECTORS (3-IN-1) TO BE FED FROM EMERGENCY PANEL (PP-EM).

EMERGENCY LIGHTING SCHEDULE		
TYPE	SYMBOL	DESCRIPTION
EXIT		CSCLED EML-RMS-P-UD-SP (RUNNING MAN EXIT EMERGENCY 120V) FINISH: WHITE MOUNTING: ABOVE DOOR
SD		KIDDE P4010ACLEDSCOCA (120V 3-IN-1 LED STROBE SMOKE & CO ALARM) FINISH: WHITE MOUNTING: CEILING

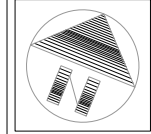


**2** SECOND FLOOR PLAN  
E3.1 SCALE 1:100



**1** GROUND FLOOR PLAN  
E3.1 SCALE 1:100

1	FOR COORDINATION	05/12/26
NO	REVISION / ISSUED	DATE



**Hudson Engineering**

2901 Steeles Ave. W Unit 26  
Toronto, Ontario M3J-3A5  
416-663-5470

PROJECT:

**HOSPICE**

7672 ELGIN MILLS RD. E  
MARKHAM, ON

DRAWING TITLE

EMERGENCY  
GROUND FLOOR AND  
SECOND FLOOR PLAN

DRAWN BY  
CS

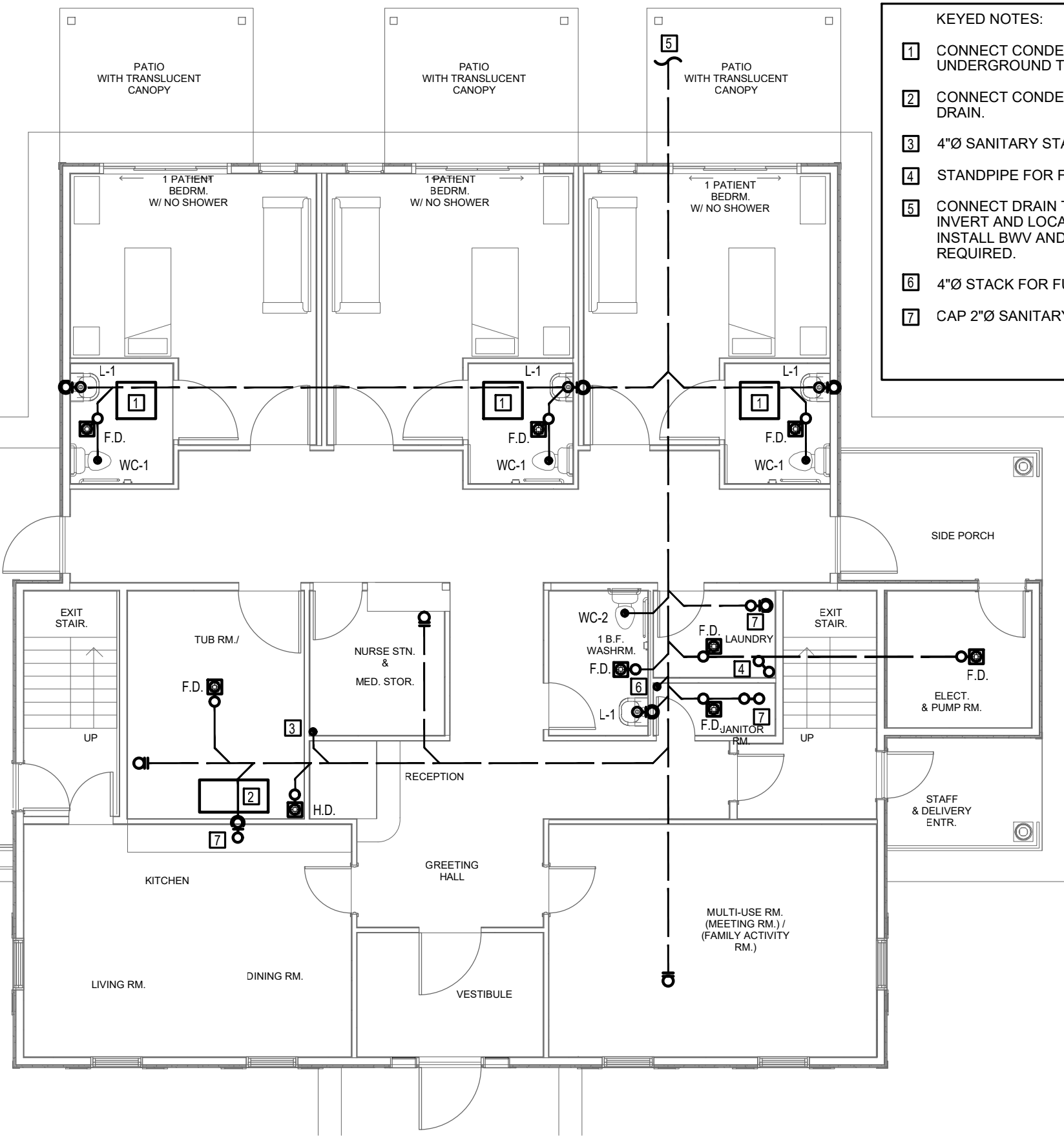
DATE  
MAY 12 2026

CHECKED BY  
RMS

SCALE  
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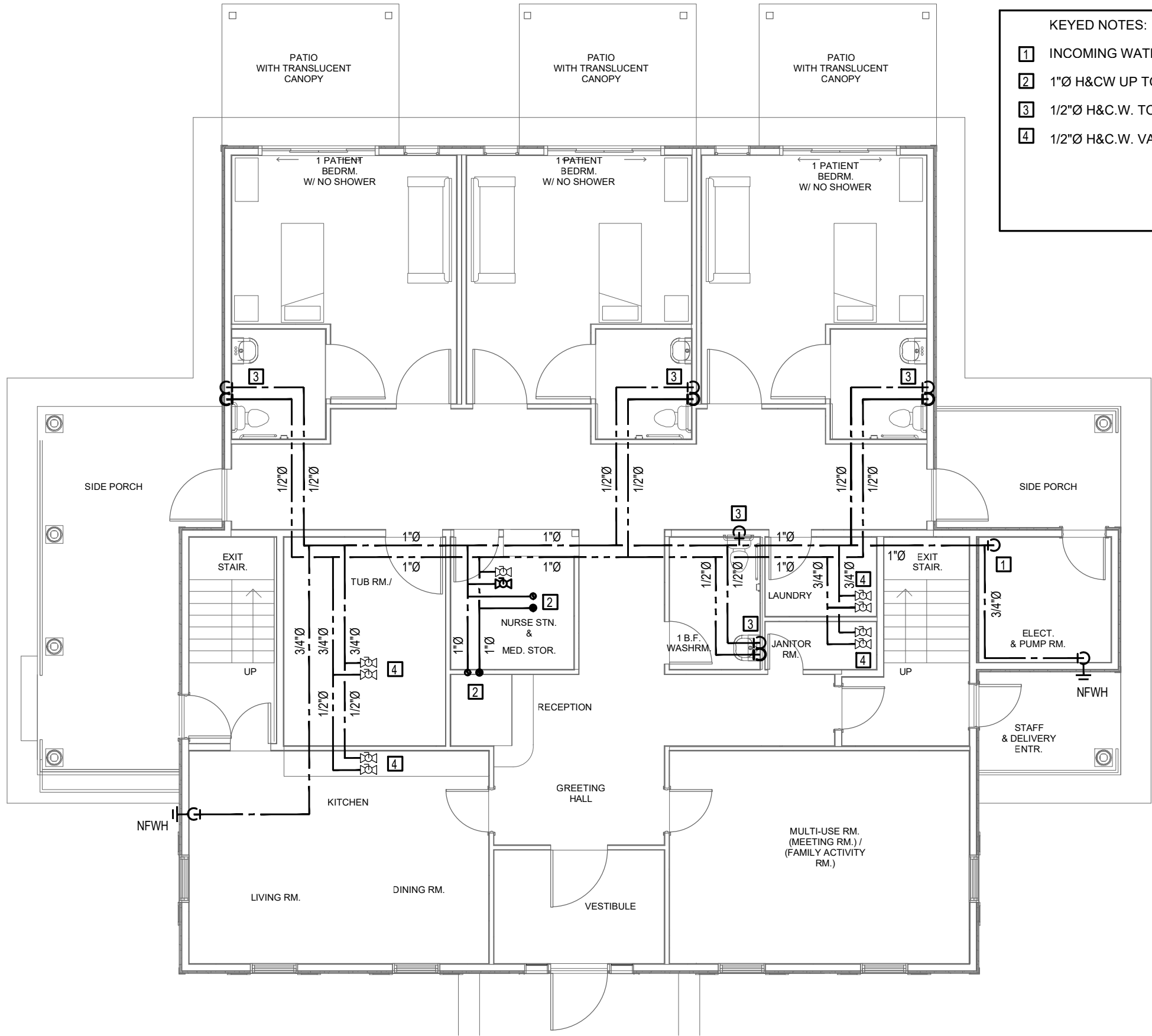
PROJECT No.  
26-XXXX

DRAWING No.  
**E3.1**



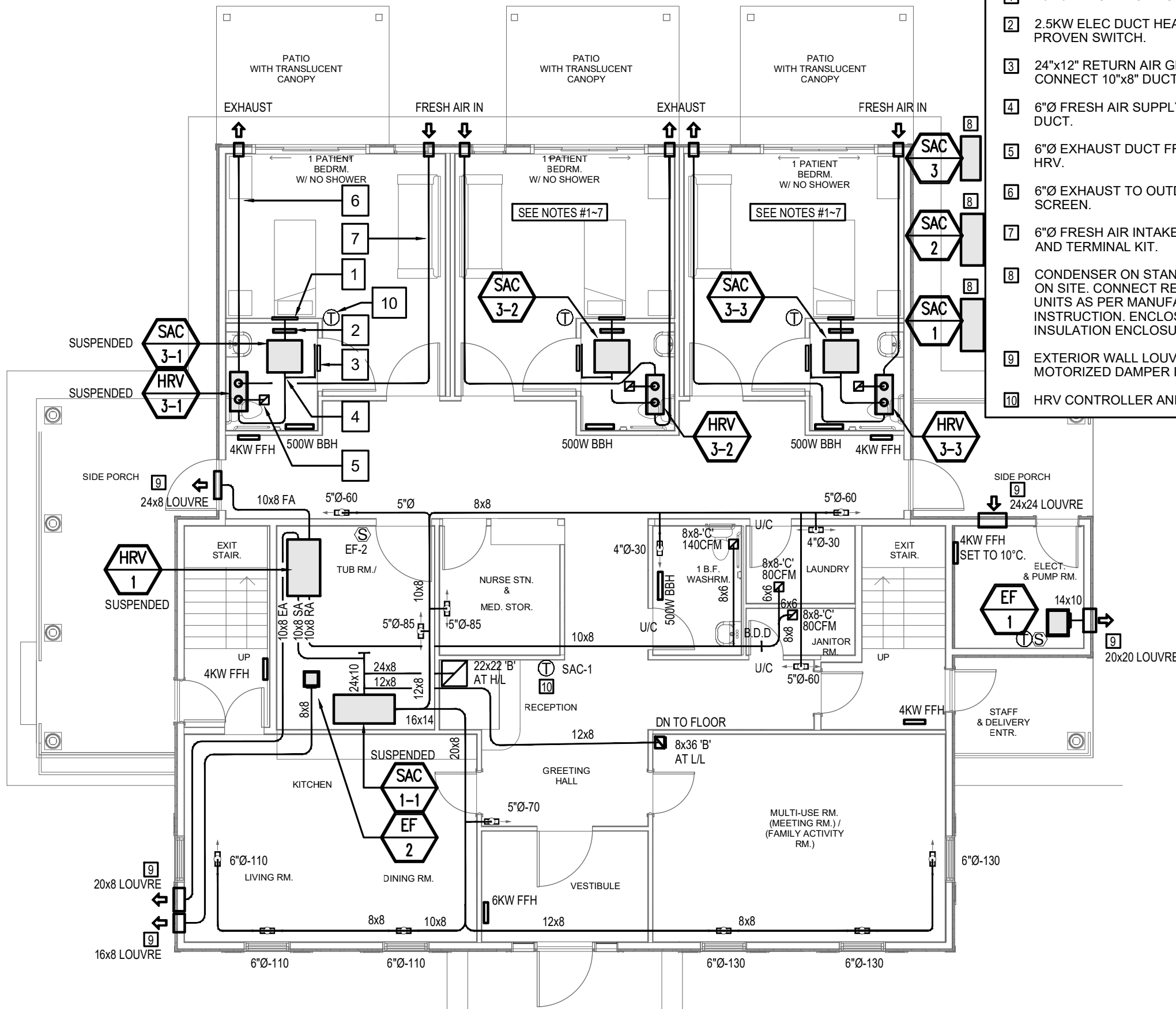
- KEYED NOTES:
- 1 CONNECT CONDENSATE DRAIN FROM SPLIT AC UNIT UNDERGROUND TO FLOOR DRAIN.
  - 2 CONNECT CONDENSATE DRAIN FROM SPLIT AC UNIT TO HUB DRAIN.
  - 3 4"Ø SANITARY STACK DOWN BELOW GRADE c/w C.O.
  - 4 STANDPIPE FOR FUTURE WASHER DISCHARGE.
  - 5 CONNECT DRAIN TO SITE SERVICE PROVISION. COORDINATE INVERT AND LOCATION PRIOR TO ANY WORK. SUPPLY AND INSTALL BWV AND COVERED BY THERMAL INSULATION AS REQUIRED.
  - 6 4"Ø STACK FOR FUTURE.
  - 7 CAP 2"Ø SANITARY FOR FUTURE.

NOTES:  
 ALL UNDERGROUND SANITARY PIPING SHALL BE 4"Ø UNLESS SPECIFIED OTHERWISE.  
 COMPLETE VENTING PER N.P.C.



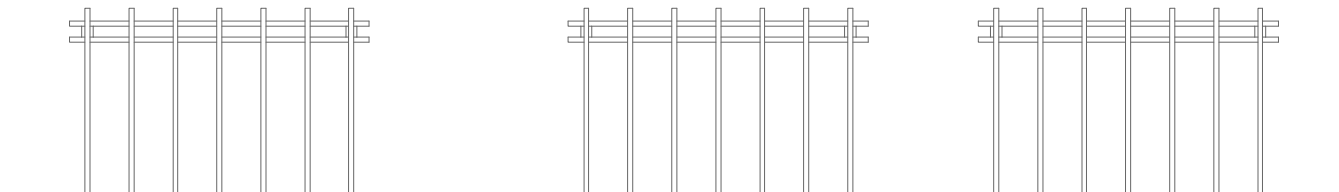
- KEYED NOTES:
- 1 INCOMING WATER BY OTHER.
  - 2 1"Ø H&CW UP TO 2ND FLOOR.
  - 3 1/2"Ø H&C.W. TO SERVE FIXTURES.
  - 4 1/2"Ø H&C.W. VALVED FOR FUTURE.

- NOTES:
- INSTALL PIPE AS HIGH AS POSSIBLE.
  - PIPE TO BE INSULATED TO INSULATION SCHEDULE.
  - OFFSET PIPING AS REQUIRED TO SUIT SITE CONDITION AND AVOID CONFLICT WITH OTHER SYSTEMS.

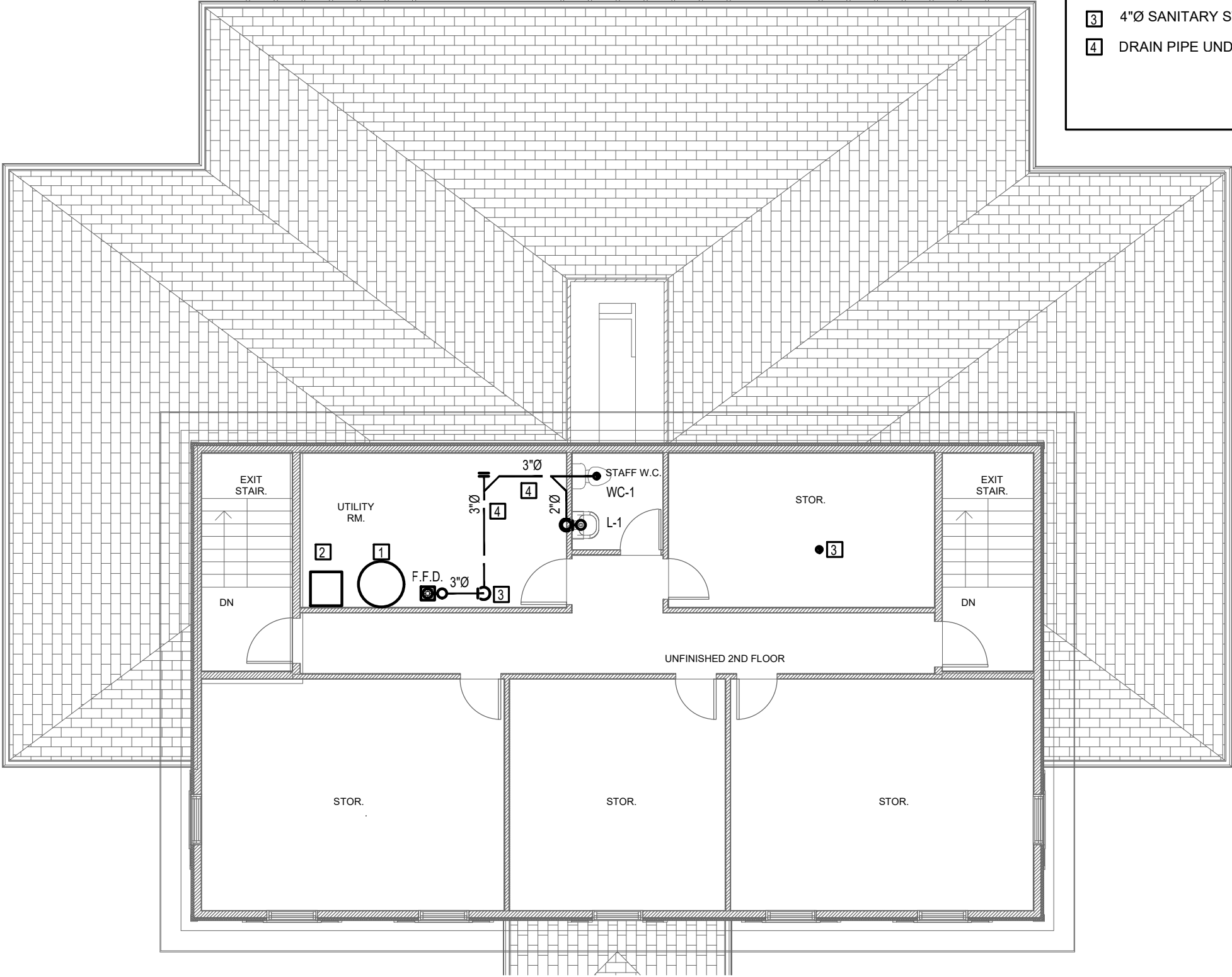


- KEYED NOTES:
- 1 20"x6" DISCHARGE DUCT TO 22"x6" REGISTER 'D' AT H/L.
  - 2 2.5KW ELEC DUCT HEATER w/ THERMOSTAT AND AIR PROVEN SWITCH.
  - 3 24"x12" RETURN AIR GRILLE 'B' w/ FILTER ABOVE DOOR. CONNECT 10"x8" DUCT TO SPLIT UNIT.
  - 4 6"Ø FRESH AIR SUPPLY FROM HRV TO SPLIT UNIT R.A. DUCT.
  - 5 6"Ø EXHAUST DUCT FROM 10"x10" EXHAUST GRILLE 'C' TO HRV.
  - 6 6"Ø EXHAUST TO OUTDOOR c/w TERMINAL KIT AND BIRD SCREEN.
  - 7 6"Ø FRESH AIR INTAKE FROM OUTSIDE c/w BIRD SCREEN AND TERMINAL KIT.
  - 8 CONDENSER ON STAND, COORDINATE EXACT LOCATION ON SITE. CONNECT REFRIGERANT PIPING TO INDOOR UNITS AS PER MANUFACTURER'S INSTALLATION INSTRUCTION. ENCLOSE PIPING AND CONTROL WIRING IN INSULATION ENCLOSURE.
  - 9 EXTERIOR WALL LOUVRE c/w BIRD SCREEN AND MOTORIZED DAMPER INTERLOCK WITH FAN.
  - 10 HRV CONTROLLER AND SAC THERMOSTAT.

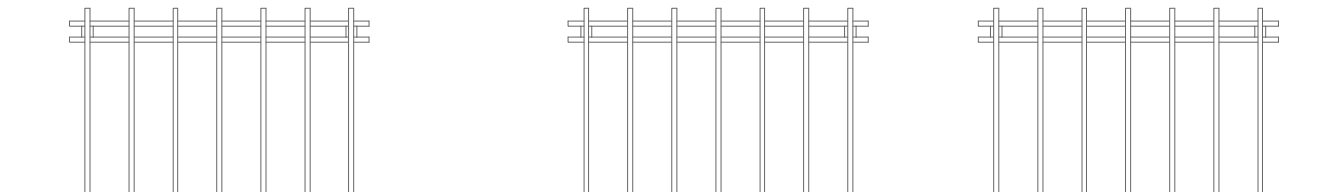
- NOTES:
- INSTALL DUCTWORK TIGHT TO UNDERSIDE OF RATED CEILING. COORDINATE EXACT ROUTE ON SITE.
  - ANY DUCT PENETRATES FIRE RATED CEILING/ WALL, SHALL BE c/w FIRE DAMPER.
  - CEILING-HUNG EQUIPMENT SHALL BE SUSPENDED FROM STRUCTURAL c/w VIBRATION ISOLATORS.



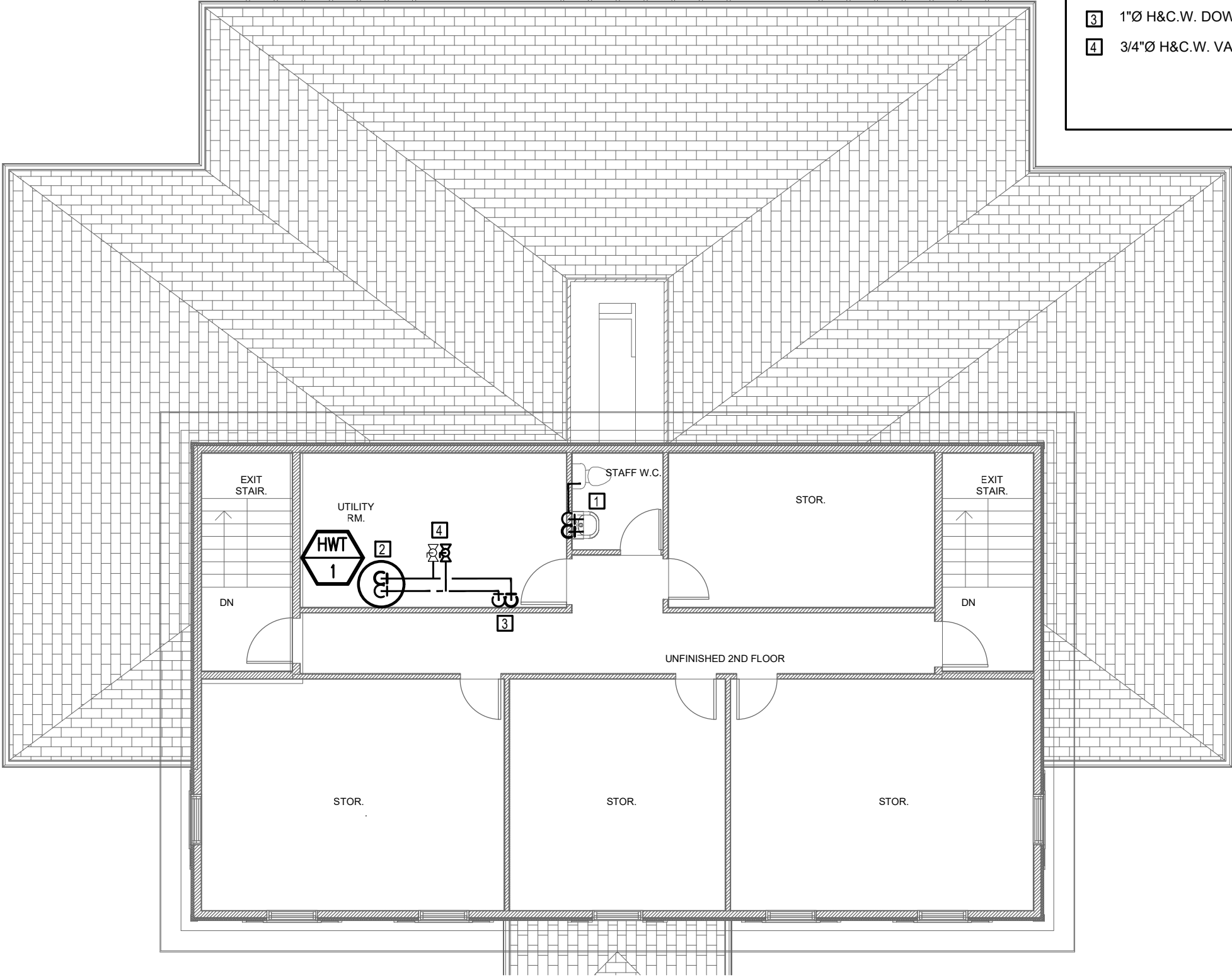
- KEYED NOTES:
- 1 HOT WATER TANK PIPE RELIED TO FUNNEL FLOOR DRAIN.
  - 2 CONNECT CONDENSATE DRAIN FROM SPLIT AC UNIT TO FUNNEL FLOOR DRAIN.
  - 3 4"Ø SANITARY STACK BELOW.
  - 4 DRAIN PIPE UNDER SLAB AS HIGH AS POSSIBLE.



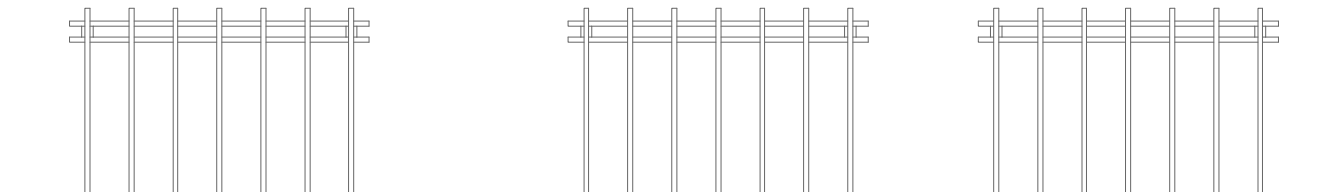
NOTES:  
COMPLETE VENTING PER N.P.C.



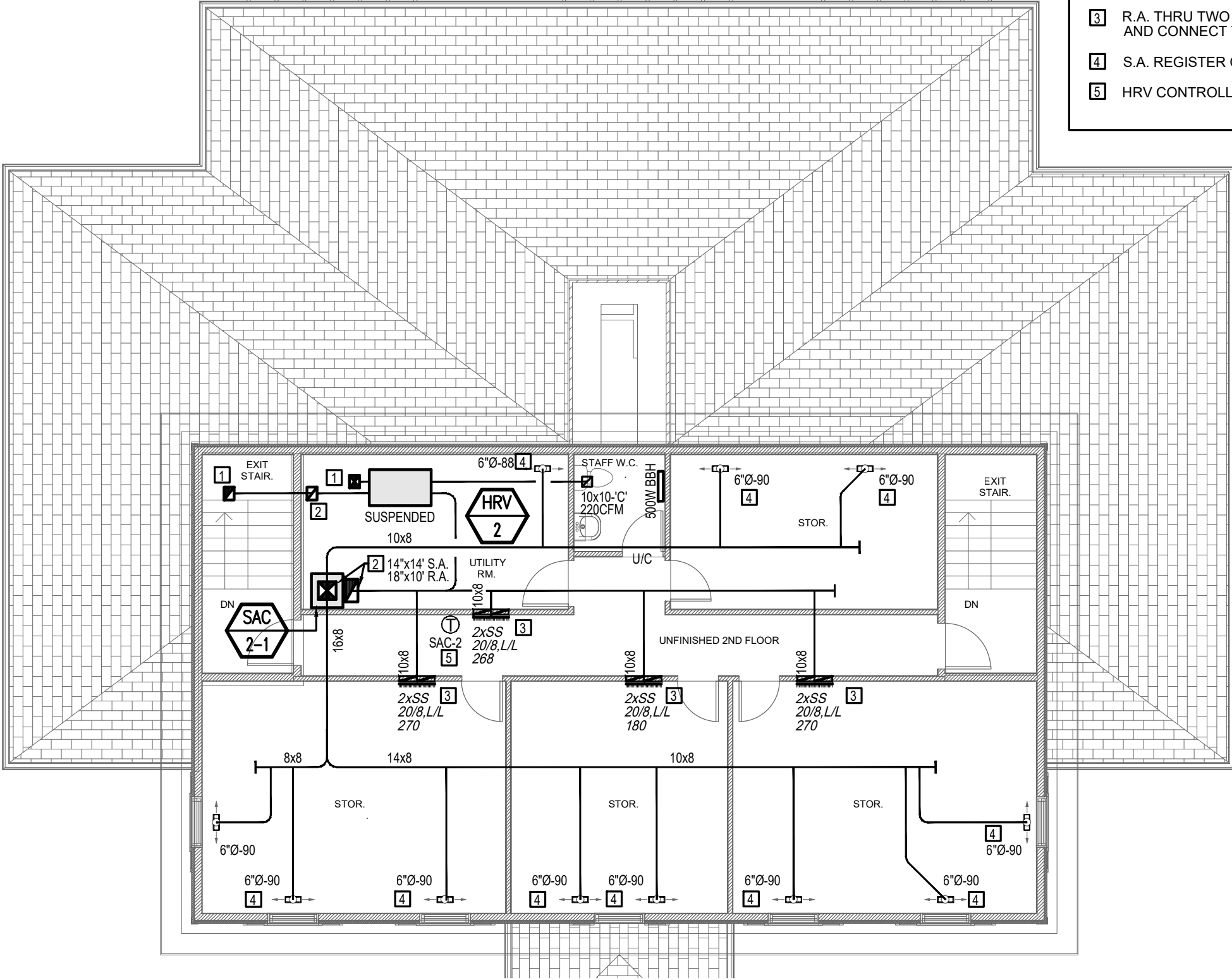
- KEYED NOTES:
- 1 1/2"Ø H&C.W. FROM BELOW TO SERVE FIXTURES.
  - 2 HOT WATER TANK ON FLOOR STAND. CONNECT 1"Ø H&C.W.
  - 3 1"Ø H&C.W. DOWN TO GROUND FLOOR.
  - 4 3/4"Ø H&C.W. VALVED FOR FUTURE.



- NOTES:
- INSTALL PIPE AS HIGH AS POSSIBLE.
  - PIPE TO BE INSULATED TO INSULATION SCHEDULE.
  - OFFSET PIPING AS REQUIRED TO SUIT SITE CONDITION AND AVOID CONFLICT WITH OTHER SYSTEMS.



- KEYED NOTES:
- 1 10"x6" DUCT UP THRU ROOF c/w RAIN CAP AND BIRD SCREEN.
  - 2 DUCT UP TO ATTIC SPACE.
  - 3 R.A. THRU TWO STUD SPACE (2xSS), UP TO ATTIC SPACE AND CONNECT TO R.A. MAIN TRUNK.
  - 4 S.A. REGISTER ON CEILING.
  - 5 HRV CONTROLLER AND SAC THERMOSTAT.



- NOTES:
- DUCTWORK IN ATTIC SPACE SHALL BE c/w 1" THERMAL INSULATION w/ VAPOR BARRIER.
  - ANY DUCT PENETRATES FIRE RATED CEILING/ WALL, SHALL BE c/w FIRE DAMPER.
  - CEILING-HUNG EQUIPMENT SHALL BE SUSPENDED FROM STRUCTURAL c/w VIBRATION ISOLATORS.

## DIFFUSER AND GRILLE SCHEDULE

DESIGNATION	TYPE	DESCRIPTION
A	CEILING MOUNTED REGISTER	RESIDENTIAL TYPE CEILING REGISTER WITH BOOT AND BALANCING DAMPER (ACCESS FROM GRATE).
B	EGGCRATE RETURN AIR GRILLE	E.H.PRICE MODEL 80 RETURN GRILLE, 1/2"x1/2"x1/2" EGGCRATE GRILLE. TYPE NF FRAME FOR T-BAR. 1-1/4" FLAT SURFACE MOUNTED TYPE F w/ COUNTERSUNK SCREWHOLES TYPE A FOR DRYWALL CEILING.
C	EGGCRATE EXHAUST AIR GRILLE	E.H.PRICE MODEL 80D EXHAUST GRILLE, 1/2"x1/2"x1/2" ALUMINUM EGGCRATE GRID CORE c/w O.B. DAMPER.

**NOTES:**

ALL COLOR TO BE B12 WHITE POWDER COAT FINISH, VERIFY WITH ARCHITECTURAL SPECIFICATION.  
ACCEPTABLE ALTERNATES: NAILOR, TITUS.

## PIPING SCHEDULE

SYMBOL	ITEM	DESCRIPTION
—	ABOVE FLOOR SANITARY DRAINS	<=3"Ø, COPPER GRADE DWV. URINAL DRAIN PIPING SHALL BE CAST IRON. >3"Ø, CAST IRON WITH MECHANICAL JOINTS.
- - -	BURIED SANITARY DRAINS	PVC OR ABS. TO MINIMIZE CRUSHING DAMAGE, USE SCH.40 PVC FROM BASE OF RWL TO 10 FEET AWAY.
— - — - - - - -	DOMESTIC COLD WATER DOMESTIC HOT WATER	COPPER L WITH SOLDERED FITTINGS.
— V —	VENT	<=3"Ø, COPPER GRADE DWV. >3"Ø, CAST IRON WITH MECHANICAL JOINTS.
— COND —	CONDENSATE DRAIN	COPPER L WITH SOLDERED FITTINGS.

## INSULATION SCHEDULE

ITEM	DESCRIPTION
DOMESTIC COLD WATER SYSTEM INCLUDING FITTINGS	1" THICK DUAL TEMPERATURE RIGID FIBRE GLASS INSULATION WITH FIRE RESISTANT VAPOUR BARRIER JACKET (WHITE) AND FIREPROOF ADHESIVE AT ALL JOINTS. BUTT JOINTS SHALL BE WRAPPED WITH WHITE 4" WIDE VAPOUR BARRIER STRIPS SAME MATERIAL AS JACKET. SEAL ALL LONGITUDINAL AND CIRCUMFERENTIAL JOINTS WITH ADHESIVE. THE INSULATION SHALL PASS UNBROKEN THROUGH ALL PIPE SLEEVES.
DOMESTIC HOT WATER SYSTEM INCLUDING FITTINGS	2" THICK DUAL TEMPERATURE RIGID FIBRE GLASS INSULATION WITH FIRE RESISTANT VAPOUR BARRIER JACKET (WHITE) AND FIREPROOF ADHESIVE AT ALL JOINTS. BUTT JOINTS SHALL BE WRAPPED WITH WHITE 4" WIDE VAPOUR BARRIER STRIPS SAME MATERIAL AS JACKET. SEAL ALL LONGITUDINAL AND CIRCUMFERENTIAL JOINTS WITH ADHESIVE. THE INSULATION SHALL PASS UNBROKEN THROUGH ALL PIPE SLEEVES.
REFRIGERANT PIPING	2" THICK CLOSED CELL INSULATION TYPE ARMAFLEX OR EQUAL. OUTDOOR APPLICATION: SHALL BE COMPLETE WITH SUITABLE INSULATION MINIMUM RATING R25, ARMAFLEX OR EQUAL.
VENT PIPING AT ROOF	1" THICK DUAL TEMPERATURE RIGID FIBRE GLASS INSULATION WITH FIRE RESISTANT VAPOUR BARRIER JACKET AND FIREPROOF ADHESIVE AT ALL JOINTS START FROM 12" BELOW FINISHED ROOF.
DUCTWORK PASSING THROUGH SPACE WITH NO MECHANICAL COOLING (ATTIC SPACE) AND DUCTWORK TO AND FROM ENERGY/ HEAT RECOVERY UNIT	SEAL JOINTS WITH DUCT SEALER. USE 2" RIGID FIBRE GLASS INSULATION WITH VAPOUR BARRIER. SECURE THE INSULATION USING APPROVED ADHESIVE AND BY IMPALING ON MECHANICAL FASTENERS. SEAL WITH VAPOUR BARRIER TAPE SO THAT THE VAPOUR BARRIER IS CONTINUOUS. FINISH WITH 6 OZ CANVAS JACKET AND PAINT WITH 2 COATS OF WHITE FIRE RETARDANT PAINT.
EXHAUST DUCTWORK	INSULATE FINAL 5 FEET WITH 1" ACOUSTIC LINER. JOINTS SHALL BE SEALED WITH DUCT SEALER.

**General Notes:**

Provide all labour, materials and equipment necessary to execute the work shown and described. Installation shall meet all applicable National, Provincial, Federal and Municipal requirements and to be in accordance with all authorities having jurisdiction.

Before submitting tenders, the contractor shall examine site, existing services and familiar himself with all drawings, notes, and phases.; submit questions to the engineer to clarify any concerns. No extra will be entertained for failure to do so.

The contractor is to obtain permits and pay all fees for works and required inspections.

Maintain Liability Insurance to protect owner and the contractor from any and all claims under the Worker's Compensation Act.

The drawings shall be considered diagrammatic only. All measurements shall be taken from building site and architect's drawings.

All materials shall confirm to NBC, CSA, HEPC and CEC requirements and shall bear CSA label.

All existing services must be maintained at all times during construction. The contractor shall provide all necessary temporary provisions to meet this requirement. After-hour work will be considered to minimize interrupt. All shall be included in the tender price.

All cutting, drilling, X-ray, and patching for mechanical work will be the responsibility of the mechanical contractor. Hire specialized trades to conduct these work.

Do all excavating and backfilling for mechanical work: Backfill from bottom of trench, around pipe and to 24" above pipe shall be clean sand, compacted mechanically in 6" layers to 95% modified proctor density. Remainder of trench shall be backfilled utilizing native material compacted in 6" layers.

Pipe hangers shall be Clevis split type with mild steel rods. For copper pipe use plastic inserts. Use oversized hangers and saddles for cold water piping. Do not support equipment, ducts or piping from ceiling panel. Supply and install necessary steel to transfer load to structural members.

Shop drawings shall be submitted to the engineer for review and approval prior to order.

Supply and install all necessary devices including flexible connections, isolators, spring hangers, sound curbs, silencers, acoustic insulations to reduce the transmission of noise and vibration.

Provide concrete or metal curbs or sleeves around all mechanical penetrations and seal all openings watertight.

All surfaces must be left clean and smooth, and ready for painting by others.

Balance all systems to quantities shown. Supply and install all necessary balancing devices to achieve design requirements. Submit a detailed report upon completion.

Piping passing through fire-rated structural shall be wrapped with two hour rated, fire resistant, ULC approved fire wrap. Provided fire dampers at all rated walls. Refer to architectural drawings for locations.

Identify all piping and duct using stencils or colour codes and directional arrows.

Identify all equipment and starters/ thermostats/control panels using Lamacoid nameplate.

Prepare and submit asbuilts when completion. Buried services must be dimensioned.

After acceptance, instruct the owner in equipment operation and provide him with operation and maintenance manuals. Fully guarantee the entire installation from startup to one year thereafter. The mechanical contractor is to repair any faults including parts and labours at his cost.

Ductwork shall be fabricated and installed in strict accordance with the latest SMACNA standards and shall be manufactured of galvanized steel unless specified otherwise.

Where 1-1/2" radius turns on supply air duct are not possible, use double width turning vanes.

All ductwork dimensions shown on the drawings indicate clear inside dimensions. increase duct size accordingly.

Install balancing dampers at all branch takeoffs and in other locations where necessary for system balancing.

All plumbing and drainage system shall be installed as required by the latest NBC and NPC.

All piping shall be installed as high as possible. Offset down and back-up to high level where required.

All piping shall be installed straight. Supply and install expansion devices to Codes.

Insulation as per insulation schedule.

LEGEND	
	SUSPENDED SANITARY DRAIN
	BURIED SANITARY DRAIN
	SANITARY VENT
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	CONDENSATE DRAIN
	CLEANOUT PLUG
	FLOOR CLEANOUT
	PLUMBING TRAP
	FLOOR DRAIN
	FUNNEL FLOOR DRAIN
	HUB DRAIN
	PIPE UP/ DOWN/ T-OFF AND DOWN
	BALL VALVE
	SHUT-OFF VALVE
	BACKWATER PREVENTOR
	THERMOSTAT
	STARTER/ SPEED CONTROLLER
	FIRE DAMPER
S/A	SUPPLY AIR
R/A	RETURN AIR
E/A	EXHAUST AIR
F/A	FRESH AIR
H/L	HIGH LEVEL
L/L	LOWER LEVEL
	CONNECT TO EXISTING
U/C	UNDERCUT DOOR
	CEILING REGISTER, 6"Ø CONNECTION, 90CFM TYPICAL SIZE 10"x4"
	R/A GRILLE, SIZE 20"x10", AT HIGH LEVEL
	R/A THRU TWO (2) WALL STUD SPACE R/A GRILLE 'B' ON WALL AT H/L, SIZE 20"x12", 145CFM
	DUCT UP
	DUCT DOWN, DUCT SIZE, 16"x8"
1xSS	THRU 1 STUD SPACE
1xJS	THRU 1 JOIST SPACE

SCHEDULE:
<p>SAC-1/ SAC-1-1: MOOVAIR MODEL MSHMB36R2AN1/ MAHMA36R4AS1, 36 MBH HTG/CLG, 27.8MBH HTG @ -30°C. 208/1/60, OUTDOOR MCA 29. INDOOR MCA 6, 1189CFM @ 0.7" ESP. c/w 8KW BUILT-IN ELEC HEATER, R454b, REFRIGERANT DETECTOR, CRANKCASE HEATER, BASE PAN HEATER, THERMOSTAT.</p> <p>SAC-2/ SAC-2-1: MOOVAIR MODEL MSHMA30R2AN1/ MAHMA30R4AS1, 30 MBH HTG/CLG, 20.1MBH HTG @ -30°C. 208/1/60, OUTDOOR MCA 29.5. INDOOR MCA 6, 988CFM @ 0.7" ESP. c/w 8KW BUILT-IN ELEC HEATER, R454b, REFRIGERANT DETECTOR, CRANKCASE HEATER, BASE PAN HEATER, THERMOSTAT.</p> <p>SAC-3/ SAC-3-1/2/3: MOOVAIR MODEL MXHA2742AV1 CONDENSER, 27 MBH HTG/ CLG, 14MBH HTG @ -30°C. 208/1/60, MCA 30. c/w R454b, REFRIGERANT DETECTOR, CRANKCASE HEATER, BASE PAN HEATER. THREE (3) INDOOR DUCTED UNIT MODEL GDHRA09C2AS1. 9MBH HTG/CLG, 344CFM @ 0.7" ESP c/w MINIM DRAIN PUMP, THERMOSTAT. ELEC DUCT HEATER SHOULD BE TIE INTO INDOOR DUCTED UNITS AS AUXILIARY HEAT AND SET AS FOLLOWING: THE LOGIC OF THE UNIT WILL BRING AUX HEAT ON IF ALL 3 CONDITIONS BELOW ARE MET: 1. -2°C OR GREATER DELTA BETWEEN THE T1 (ROOM TEMP) AND SET POINT. 2. T2 (INDOOR COIL TEMP) IS LESS THAN OR EQUAL TO 45°C. 3. THE INDOOR UNIT FAN IS ON.</p> <p>HRV-1: LIFEBREATH MODEL350DCS, 300CFM, 0.5"WCESP. 120V, 6.3A. c/w WALL CONTROLS, FILTERS.</p> <p>HRV-2: LIFEBREATH MODEL350DCS, 220CFM, 0.5"WCESP. 120V, 6.3A. c/w WALL CONTROLS, FILTERS.</p> <p>HRV-3-1/2/3: LIFEBREATH MODEL100ECM, 100CFM, 0.5"WCESP. 120V. c/w WALL CONTROLS, FILTERS.</p> <p>EF-1: ELEC/ PUMP ROOM VENTILATOR. CARNES MODEL VCDD090C, 800CFM, 0.25"ESP, 289W, 120/1/60, c/w REVERSE ACTING THERMOSTAT, STARTER, HANGER RODS, VIBRATION ISOLATORS, GRILLE, B.D.D.</p> <p>EF-2: TUB ROOM EXHAUST. CARNES MODEL VCDD025C, 250CFM, 0.25"ESP, 169W, 120/1/60, c/w STARTER, HANGER RODS, VIBRATION ISOLATORS, GRILLE, B.D.D.</p> <p>HWT-1: ELECTRIC HOT WATER TANK. RHEEM HEAVY DUTY MODEL E120, 120GAL, 9 ELEMENTS, 36KW, 240/1/60, 150A, IMMERSION THERMOSTAT. c/w T &amp; P VALVE PIPED TO CLOSEST DRAIN.</p>

HYDRAULIC LOAD (WATER SUPPLY)			
PLUMBING FIXTURE	F.U.	QTY.	TOTAL
WASHROOM	8	7	56
WASHER AND SINK	4.5	1	4.5
MOP SINK	3	1	3
DISHWASHER	4	1	4
KITCHEN SINK	3	1	3
HOSE BIBB	3	2	6
<b>TOTAL FU</b>			<b>76.5</b>
<b>PEAK FLOW RATE: 38 GPM</b>			

HYDRAULIC LOAD (DRAINAGE)			
PLUMBING FIXTURE	F.U.	QTY.	TOTAL
WASHROOM	8	7	56
WASHER AND SINK	4.5	1	4.5
MOP SINK	3	1	3
DISHWASHER	4	1	4
KITCHEN SINK	3	1	3
FLOOR/HUB DRAIN	3	10	30
<b>TOTAL FU</b>			<b>100.5</b>
<b>MAXIMUM HYDRAULIC LOAD FOR 4"Ø SAN @ 1%: 180 F.U.</b>			

PLUMBING FIXTURES				
PLUMBING FIXTURES	DRAIN SIZE	VENT SIZE	HW	CW
MOP SINK	3"Ø	1-1/2"Ø	1/2"Ø	1/2"Ø
LAVATORY	1-1/2"Ø	1-1/4"Ø	1/2"Ø	1/2"Ø
OTHER SINK	2"Ø	1-1/2"Ø	1/2"Ø	1/2"Ø
WATER CLOSET (FT)	3"Ø	1-1/2"Ø	-	1/2"Ø
FLOOR DRAIN	3"Ø	1-1/2"Ø	-	-
<p>PLUMBING FIXTURES ARE TO BE SPECIFIED BY THE OWNER, SUPPLIED AND INSTALLED BY THE PLUMBER.</p> <p>ALL HOT AND COLD WATER CONNECTIONS FOR PLUMBING FIXTURES SHALL BE c/w SHUT-OFF VALVES.</p>				

# 350 DCS HEAT RECOVERY VENTILATOR



## ENGINEERING DATA:

### CORES

Two modular (two section) aluminum HRV cores arranged for high efficiency cross-flow ventilation.

### MOTORS

Two PSC, 5 speed double shafted, 120 VAC, 3.15 A motors. (6.3 A total on high speed) with 1/10 hp at 1625 RPM. Total of 610 watts on High speed. MCA: 7.9 MOP:10

### BLOWERS

Centrifugal-type rated at 530 CFM (250 L/s) free air delivery. Each air stream has two centrifugal blowers driven by two PSC motors.

### FILTERS

Washable air filters in exhaust and supply air streams.

### DEFROST

Supply bypass damper routes indoor air to defrost cores.

### CONNECTION DUCT SIZES

Four - 14 in. x 8 in. (356 mm x 200 mm).

### MOUNTING

Unit to be set on support brackets hung by threaded rod-type apparatus (brackets and rods not included).

### CASE

Twenty gauge pre-painted galvanized steel (G60) for superior corrosion resistance. Insulated with foil faced insulation duct liner where required to prevent exterior condensation. One drain connection 1/2" (12 mm) OD.

### ELECTRONICS

Integrated microprocessor circuit board. Built-in interlock contacts.

### CONTROL OPTIONS

99-DXPLO2 LIFE BREATH DIGITAL CONTROL (Included)

- 5 speed operation on each mode
- Humidity control through adjustable Dehumidistat
- 5 user selectable operational modes: Continuous Ventilation, Continuous Recirculation, 20 ON/40 OFF, 10 ON/50 OFF, 20 ON/40 Recirculation
- 20/40/60 min. High speed override button
- Compatible with 99-DETO2 Wireless Timers
- 3 wire connection

### TIMERS

99-DETO1 LIFE BREATH 20/40/60 MINUTE TIMER

- Initiates High speed Ventilation for 20, 40 or 60 minutes. 3 wire connection.

99-DETO2 LIFE BREATH WIRELESS 20/40/60 MINUTE TIMER

- Initiates High speed Ventilation for 20, 40 or 60 minutes. Wirelessly connects to main control for ease of installation. 40 ft. approximate range.

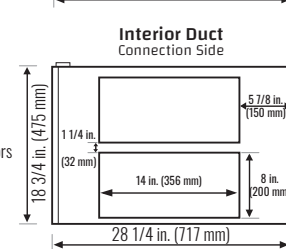
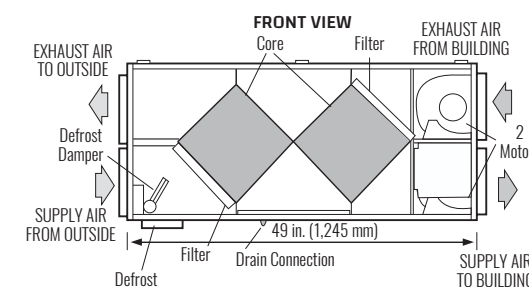
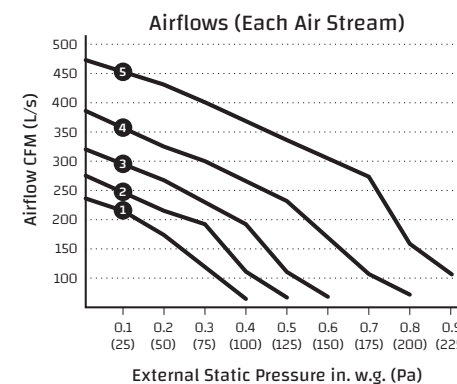
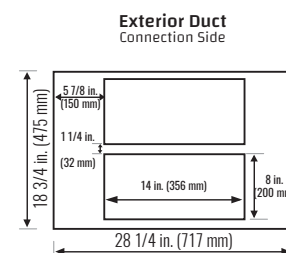
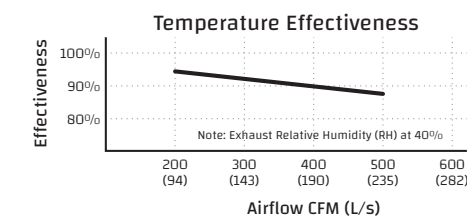
99-RXO2 LIFE BREATH WIRELESS REPEATER

- Used to extend range of 99-DETO2 Wireless Timers
- Plugs into 120V power outlet and wirelessly connects to main control and 99-DETO2. Install at halfway point between timer and main wall control if timer is out of range.

IN. W.G. (PA)	0.2 (50) CFM (L/s)	0.3 (75) CFM (L/s)	0.4 (100) CFM (L/s)	0.5 (125) CFM (L/s)	0.6 (150) CFM (L/s)	0.7 (175) CFM (L/s)	0.8 (200) CFM (L/s)	0.9 (225) CFM (L/s)
Net Supply Airflow	426 (201)	400 (189)	371 (159)	337 (159)	304 (143)	269 (127)	158 (75)	107 (50)

ELECTRICAL SPECIFICATIONS	
VAC @ 60Hz	120
Watts / Low Speed	187
Watts / High Speed	610
Amp Rating	6.3

WEIGHT: **160 LBS (70 KG)** SHIPPING WEIGHT: **240 LBS (110 KG)** : **Note:** Service clearance of 30 in. (765 mm). All specifications are subject to change without notice.



## SUBMITTAL / DESSIN DE SOUMISSION - 36,000 BTU

### MULTI-POSITION AHU / UNITÉ DE TRAITEMENT D'AIR MULTIPosition (-30°C)

Job Name / Nom du projet : \_\_\_\_\_  
 Location / Emplacement : \_\_\_\_\_  
 Engineer / Ingénieur(e) : \_\_\_\_\_  
 Submitted By / Soumis par : \_\_\_\_\_  
 Submitted To / Soumis à : \_\_\_\_\_

Submitted For / Soumis pour : \_\_\_\_\_  
 Approval / Approbation  Construction   
 Reference / Référence  Date: \_\_\_\_\_  
 Unit Tag / Étiquette de l'unité : \_\_\_\_\_  
 Drawing No. / N° de dessin : \_\_\_\_\_

#### WARRANTY / GARANTIE

Standard 10 Years Parts & Compressor /  
 10 ans de pièces et compresseur standard  
 Terms & Conditions Apply. / Conditions s'appliquent.

#### MODELS / MODÈLES

Indoor / Intérieure	MAHMA36R4AS1
Outdoor / Extérieure	MSHMB36R2AN1

#### CAPACITY RANGE / PLAGE DE CAPACITÉ<sup>1</sup>

Output / Sortie (Btu/h)	Min.	Rated / Nominal	Max.
Cooling / Climatisation	9700	36000	42000
Heating / Chauffage	11000	37000	48000

#### HEATING PERFORMANCE / PERFORMANCES DE CHAUFFAGE<sup>2</sup>

Output / Sortie (Btu/h)	Min.	Rated / Nominal	Max.
47°F (8.3°C)	11000	37000	48000
17°F (-8.3°C)	10500	31800	41000
5°F (-15°C)	7400	39000	39000
-22°F (-30°C)	6600	27800	27800

#### OUTDOOR TEMPERATURE OPERATING RANGE / PLAGE DE TEMPÉRATURE D'OPÉRATION EXTÉRIEURE

	°C	°F
Cooling / Climatisation	-30~50	-22~122
Heating / Chauffage <sup>3</sup>	-30~24	-22~75

#### LINE SET & REFRIGERANT / TUYAUTERIE & RÉFRIGÉRANT

Liquid (in.) / Liquide (po)	3/8
Gas (in.) / Gaz (po)	3/4
Conn. Type / Type de connexion	Flared / évasé
Pre-Charge Length (ft) / Long. de précharge (pi)	24.6
Max. Length (ft) / Long. max. (pi)	246
Max. Height Diff. (ft) / Diff. de hauteur max. (pi)	98.4
Refrigerant Type / Type de réfrigérant	R454B
Pre-Charge / Précharge (oz)	126.99
Add. Charge per Ft / Charge sup. par pied (oz)	0.7
Oil Type / Type d'huile	VG75
Oil Volume / Volume d'huile (ml)	1460
Drain Connection (in.) / Raccord drain (po)	3/4



Images for reference only. / Images à titre de référence seulement.

#### CERTIFIED / CERTIFIÉ

AHRI No.	216030968		
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#### EFFICIENCY RATINGS / DONNÉES D'EFFICACITÉ

SEER2	17.3	HSPF2 (4)	10.3	
EER2	11.7	HSPF2 (5)	8.6	
COP <sup>2</sup>	47°F (8.3°C)	17°F (-8.3°C)	5°F (-15°C)	-22°F (-30°C)
	3.6	2.55	1.9	1.59

#### ELECTRICAL / ÉLECTRIQUE

Power / Alimentation	(V/Ph/Hz)	208-230/1/60		
Voltage Range / Plage de tension	(V)	187-253		
MOCP (A)	ODU / EXT.	30	IDU / INT.	15
MCA (A)	ODU / EXT.	29	IDU / INT.	6
<i>Alt. MCA (A) @ 115V to IDU / MCA (A) alt. @ 115V vers INT.</i>				
Power Input / Puissance d'entrée (W)	Min.	Rated / Nominal	Max.	
Cooling / Climatisation	820	3076	4440	
Heating / Chauffage	665	3012	4370	
Current / Courant (A)	Min.	Rated / Nominal	Max.	
Cooling / Climatisation	5.6	13.4	19.7	
Heating / Chauffage	3.6	13.1	19.4	

Specifications subject to change without notice. Refer to page 2 for numbered notes and additional disclaimers. / Les spécifications sont susceptibles de changer sans préavis. Reportez-vous à la page 2 pour les notes numérotées et les avis de non-responsabilité supplémentaires.

DIMENSIONS & WEIGHTS / DIMENSIONS & POIDS			
Indoor / Intérieure	Net (WxDxH; in.) / (LxPxH; po)	21.02x21.02x49.02	
	Gross (WxDxH; in.) / Brut (LxPxH; po)	24.41x26.57x52.56	
		lb	kg
	Net Wt / Poids net	129.41	58.7
	Gross Wt / Poids brut	153.88	69.8
Outdoor / Extérieure	Net (WxDxH; in.) / (LxPxH; po)	38.58x16.34x38.39	
	Gross (WxDxH; in.) / Brut (LxPxH; po)	45.08x19.68x42.52	
		lb	kg
	Net Wt / Poids net	204.15	92.6
	Gross Wt / Poids brut	235.23	106.7
KEY FEATURES / CARACTÉRISTIQUES PRINCIPALES			
Rotary Inverter Compressor / Compresseur rotary inverter		<input type="checkbox"/>	
Twin Rotary Inverter Compressor / Compresseur twin rotary inverter		<input checked="" type="checkbox"/>	
Base Pan Heater / Chauffage de bac de base		<input checked="" type="checkbox"/>	
Crankcase Heater / Chauffage de carter		<input checked="" type="checkbox"/>	
IDU with Refrigerant Detection Sensor / INT. avec capteur de détection de réfrigérant		<input checked="" type="checkbox"/>	

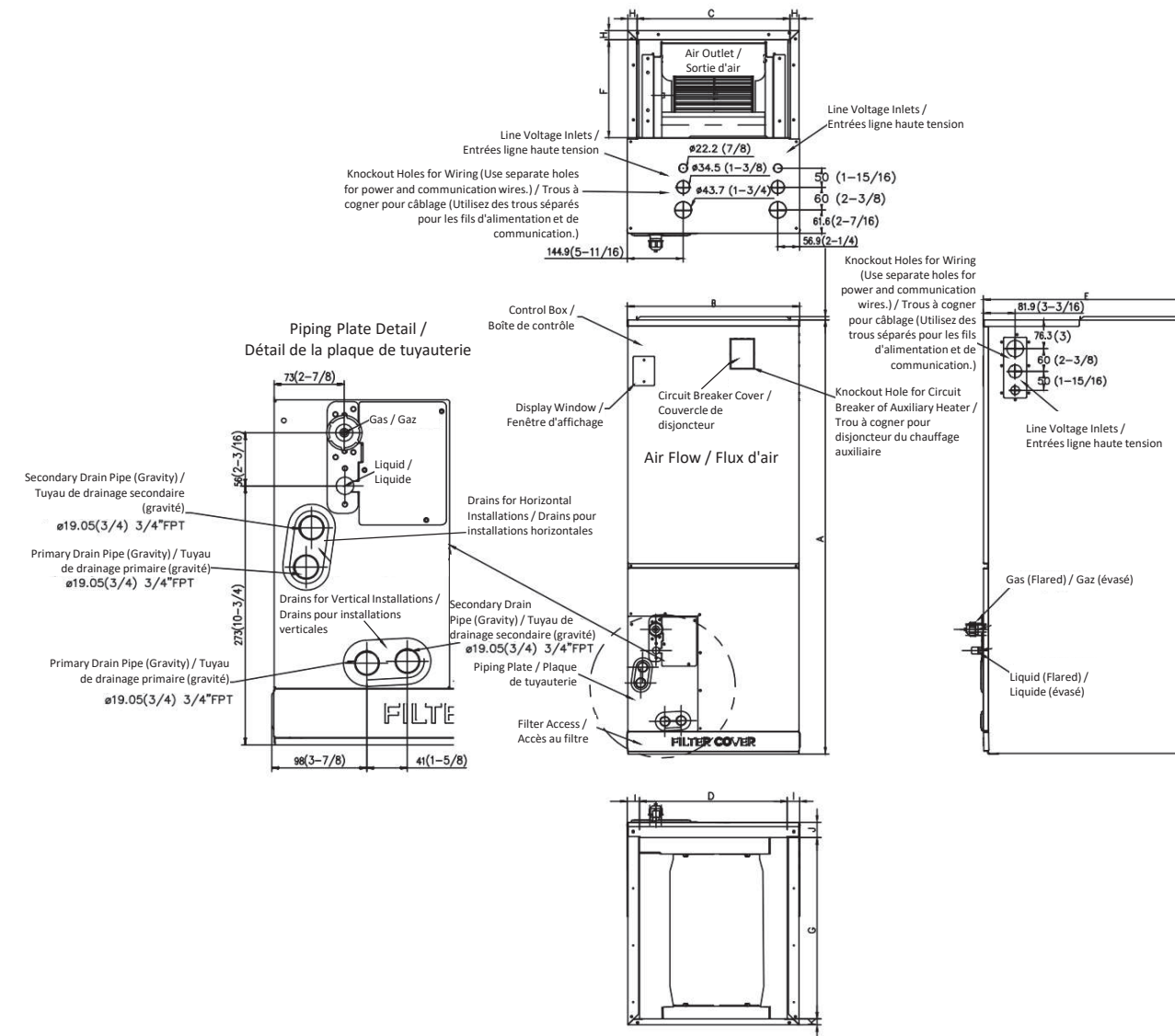
FAN / VENTILATEUR				
Indoor / Intérieure	Turbo	High / Haut	Med. / Moy.	Low / Bas
CFM	1189	1083	971	865
dB(A)	49	48	45.5	25.5
Indoor ESP Range / Plage PSE intérieur (inWG)				0-0.8
Indoor Moisture Removal / Élim. de l'humidité intérieure (l/h)				3.4
Outdoor Max. CFM / Débit max. CFM extérieur				3002
Outdoor Max. dB(A) / Niv. max. dB(A) extérieur				62.5
INCLUDED ACCESSORIES / ACCESSOIRES INCLUS				
RG10F8(M2)/BGFFU1 Remote Controller / Télécommande				
OPTIONAL ACCESSORIES / ACCESSOIRES EN OPTION <sup>4</sup>				
KJR-120N(X6)/BGEF V1.3 Wired Ctrl/Contrôleur câblé				<input type="checkbox"/>
KJR-120N(X6W)/BGEF V1.4 Wired Ctrl/Contrôleur câblé				<input type="checkbox"/>
ST1S42RW1 Smart Thermostat / Thermostat intelligent				<input type="checkbox"/>
EAH5EUL 5kW Heater / Chauffage 5 kW				<input type="checkbox"/>
EAH8EUL 8kW Heater / Chauffage 8 kW				<input type="checkbox"/>
EAH10EUL 10kW Heater / Chauffage 10 kW				<input type="checkbox"/>
EAH15EUL 15kW Heater / Chauffage 15 kW				<input type="checkbox"/>
EAH20EUL 20kW Heater / Chauffage 20 kW				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>

1. Cooling Capacity Conditions: Indoor Temperature @ 80°F (26.7°C) DB; 67°F (19.4°C) WB with Outdoor Temperature @ 95°F (35°C) DB; 75°F (23.9°C) WB. Heating Capacity Conditions: Indoor Temperature @ 70°F (21.1°C) DB; 60°F (15.6°C) WB with Outdoor Temperature @ 47°F (8.3°C) DB; 43°F (6.1°C) WB. Line Set @ 24.6ft (7.5m); Height Difference @ 0ft (0m). 2. COP for all temperatures is @ rated output except when rated output is not given. In that case, COP is @ max. output. 3. System continues to operate below rated outdoor temperature operating range, subject to varying conditions. System has no low temperature cutout. Capacity is not tested outside of the rated temperature range. 4. A wired controller (thermostat) from this list or a compatible alternative is required. Connection of these accessories may require secondary items not listed; refer to full product literature. | Master Group is not responsible for the accuracy and validity of any changes made to this document without the written authorization of Master Group. Specifications subject to change without notice.

/

1. Conditions de capacité de refroidissement : Température intérieure à 80°F (26,7°C) DB ; 67°F (19,4°C) BW avec température extérieure à 95°F (35°C) DB ; 75°F (23,9°C) BW. Conditions de capacité de chauffage : Température intérieure à 70°F (21,1°C) DB ; 60°F (15,6°C) BW avec température extérieure à 47°F (8,3°C) DB ; 43°F (6,1°C) BW. Tuyauterie à 24,6 pi (7,5 m) ; différence de hauteur à 0 pi (0 m). 2. Le COP pour toutes les températures est basé sur la puissance nominale, sauf lorsque la puissance nominale n'est pas indiquée. Dans ce cas, le COP est basé sur la puissance maximale. 3. Le système continue de fonctionner en dehors de la plage de température extérieure nominale, sous réserve de conditions variables. Le système ne dispose pas de système d'arrêt de basse température. La capacité n'est pas testée en dehors de la plage de température nominale. 4. Un contrôleur câblé (thermostat) de cette liste ou un alternatif compatible est requis. Le raccordement de ces accessoires peut nécessiter des éléments supplémentaires non listés ; se référer à la documentation complète du produit. | Le Groupe Master n'est pas responsable de l'exactitude et de la validité de toute modification apportée à ce document sans son autorisation écrite. Les spécifications sont susceptibles de changer sans préavis.

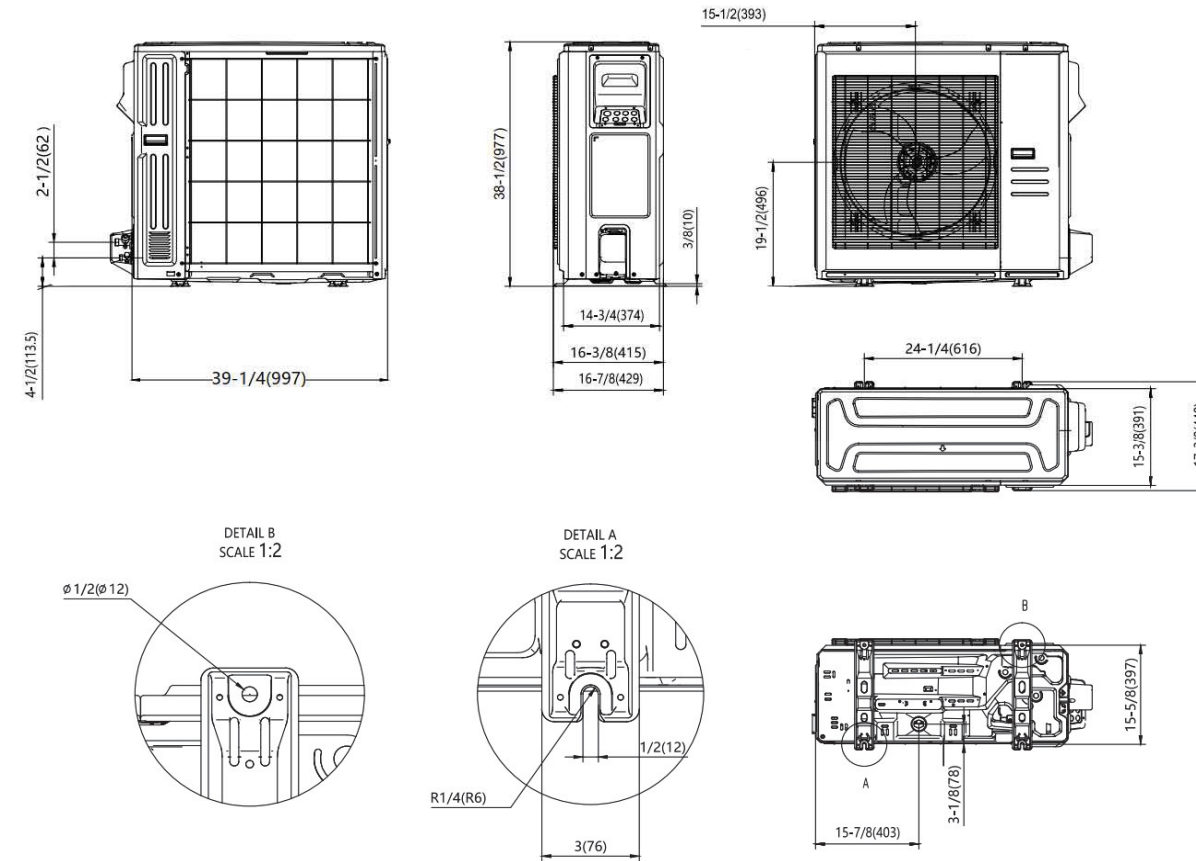
INDOOR UNIT DRAWING / DESSIN DE L'UNITÉ INTÉRIEURE



Tag / Réf.	A	B	C	D	E	F	G	H	I
in. / po	49	21	19-1/8	18-5/8	21	10-1/4	18-3/4	15/16	1-1/4
mm	1245	534	486	473	534	260	476	24	32
Tag / Réf.	J	K							
in. / po	1-5/8	5/8							
mm	41	16							

Drawing dimensions are nominal. Specifications subject to change without notice. / Les dimensions du dessin sont nominales. Les spécifications sont susceptibles de changer sans préavis.

## OUTDOOR UNIT DRAWING / DESSIN DE L'UNITÉ EXTÉRIEURE



Drawing dimensions are nominal. / Les dimensions du dessin sont nominales.

## MINIMUM OUTDOOR UNIT CLEARANCES / DÉGAGEMENTS MINIMAUX DE L'UNITÉ EXTÉRIEURE



Note: Outdoor units must be elevated 30.5-61cm (12-24in.) above the surface below in heating applications to allow for snow clearance and defrost runoff. Follow local codes, best practices, and guidelines. Diagrams for reference only.

Remarque : Les unités extérieures doivent être surélevées de 30,5-61 cm (12-24 po) au-dessus de la surface inférieure dans les applications de chauffage pour permettre l'évacuation de la neige et l'écoulement du dégivrage. Suivez les codes locaux, les meilleures pratiques et les directives. Diagrammes à titre de référence seulement.

## NOTES / REMARQUES

## SUBMITTAL / DESSIN DE SOUMISSION - 9,000 BTU

### SLIM DUCT / GAINABLE (-30°C)

Job Name / Nom du projet : \_\_\_\_\_  
 Location / Emplacement : \_\_\_\_\_  
 Engineer / Ingénieur(e) : \_\_\_\_\_  
 Submitted By / Soumis par : \_\_\_\_\_  
 Submitted To / Soumis à : \_\_\_\_\_

Submitted For / Soumis pour : \_\_\_\_\_  
 Approval / Approbation  Construction   
 Reference / Référence  Date: \_\_\_\_\_  
 Unit Tag / Étiquette de l'unité : \_\_\_\_\_  
 Drawing No. / N° de dessin : \_\_\_\_\_

#### WARRANTY / GARANTIE

Standard 10 Years Parts & Compressor /  
 10 ans de pièces et compresseur standard

Terms & Conditions Apply. / Conditions s'appliquent.

#### MODELS / MODÈLES

Indoor / Intérieure GDHRA09C2AS1  
 Outdoor / Extérieure MSHMA09C2AN1

#### CAPACITY RANGE / PLAGE DE CAPACITÉ <sup>1</sup>

Output / Sortie (Btu/h)	Min.	Rated / Nominal	Max.
Cooling / Climatisation	3000	9000	13100
Heating / Chauffage	3900	9900	16500

#### HEATING PERFORMANCE / PERFORMANCES DE CHAUFFAGE<sup>2</sup>

Output / Sortie (Btu/h)	Min.	Rated / Nominal	Max.
47°F (8.3°C)	3900	9900	16500
17°F (-8.3°C)	3200	10200	12600
5°F (-15°C)	2500	11900	11900
-22°F (-30°C)	2000	5900	5900

#### OUTDOOR TEMPERATURE OPERATING RANGE /

#### PLAGE DE TEMPÉRATURE D'OPÉRATION EXTÉRIEURE

	°C	°F
Cooling / Climatisation	-30~50	-22~122
Heating / Chauffage <sup>3</sup>	-30~24	-22~75

#### LINE SET & REFRIGERANT / TUYAUTERIE & RÉFRIGÉRANT

Liquid (in.) / Liquide (po)	1/4
Gas (in.) / Gaz (po)	3/8
Conn. Type / Type de connexion	Flared / évasé
Pre-Charge Length (ft) / Long. de précharge (pi)	24.6
Max. Length (ft) / Long. max. (pi)	82
Max. Height Diff. (ft) / Diff. de hauteur max. (pi)	49.2
Refrigerant Type / Type de réfrigérant	R454B
Pre-Charge / Précharge (oz)	35.27
Add. Charge per Ft / Charge sup. par pied (oz)	0.16
Oil Type / Type d'huile	VG74
Oil Volume / Volume d'huile (ml)	350
Drain Pipe O.D. / Ø ext. tuyau de drainage (mm)	25



Images for reference only. / Images à titre de référence seulement.

#### CERTIFIED / CERTIFIÉ

AHRI No.	216031050		
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#### EFFICIENCY RATINGS / DONNÉES D'EFFICACITÉ

SEER2	20.5	HSPF2 (4)	13.8	
EER2	14	HSPF2 (5)	10.8	
COP <sup>2</sup>	47°F (8.3°C)	17°F (-8.3°C)	5°F (-15°C)	-22°F (-30°C)
	3.88	2.45	1.85	1.18

#### ELECTRICAL / ÉLECTRIQUE

Power / Alimentation	(V/Ph/Hz)	208-230/1/60	
Voltage Range / Plage de tension	(V)	187-253	
MOCP (A)		15	
MCA (A)		15	
Power Input / Puissance d'entrée (W)	Min. Rated / Nominal	Max.	
Cooling / Climatisation	150	642	1260
Heating / Chauffage	260	750	1420
Current / Courant (A)	Min. Rated / Nominal	Max.	
Cooling / Climatisation	1.2	4.9	5.6
Heating / Chauffage	1.6	5.4	6.7

Specifications subject to change without notice. Refer to page 2 for numbered notes and additional disclaimers. / Les spécifications sont susceptibles de changer sans préavis. Reportez-vous à la page 2 pour les notes numérotées et les avis de non-responsabilité supplémentaires.

DIMENSIONS & WEIGHTS / DIMENSIONS & POIDS			
Indoor / Intérieure	Net (WxDxH; in.) / (LxPxH; po)	27.56x29.53x9.65	
	Gross (WxDxH; in.) / Brut (LxPxH; po)	36.42x33.46x11.73	
		lb	kg
	Net Wt / Poids net	64.15	29.1
	Gross Wt / Poids brut	73.85	33.5
Outdoor / Extérieure	Net (WxDxH; in.) / (LxPxH; po)	31.69x12.99x21.81	
	Gross (WxDxH; in.) / Brut (LxPxH; po)	36.02x14.57x24.21	
		lb	kg
	Net Wt / Poids net	72.75	33
	Gross Wt / Poids brut	78.7	35.7
KEY FEATURES / CARACTÉRISTIQUES PRINCIPALES			
Rotary Inverter Compressor / Compresseur rotary inverter		<input checked="" type="checkbox"/>	
Twin Rotary Inverter Compressor / Compresseur twin rotary inverter		<input type="checkbox"/>	
Base Pan Heater / Chauffage de bac de base		<input checked="" type="checkbox"/>	
Crankcase Heater / Chauffage de carter		<input checked="" type="checkbox"/>	
IDU with Refrigerant Detection Sensor / INT. avec capteur de détection de réfrigérant		<input checked="" type="checkbox"/>	

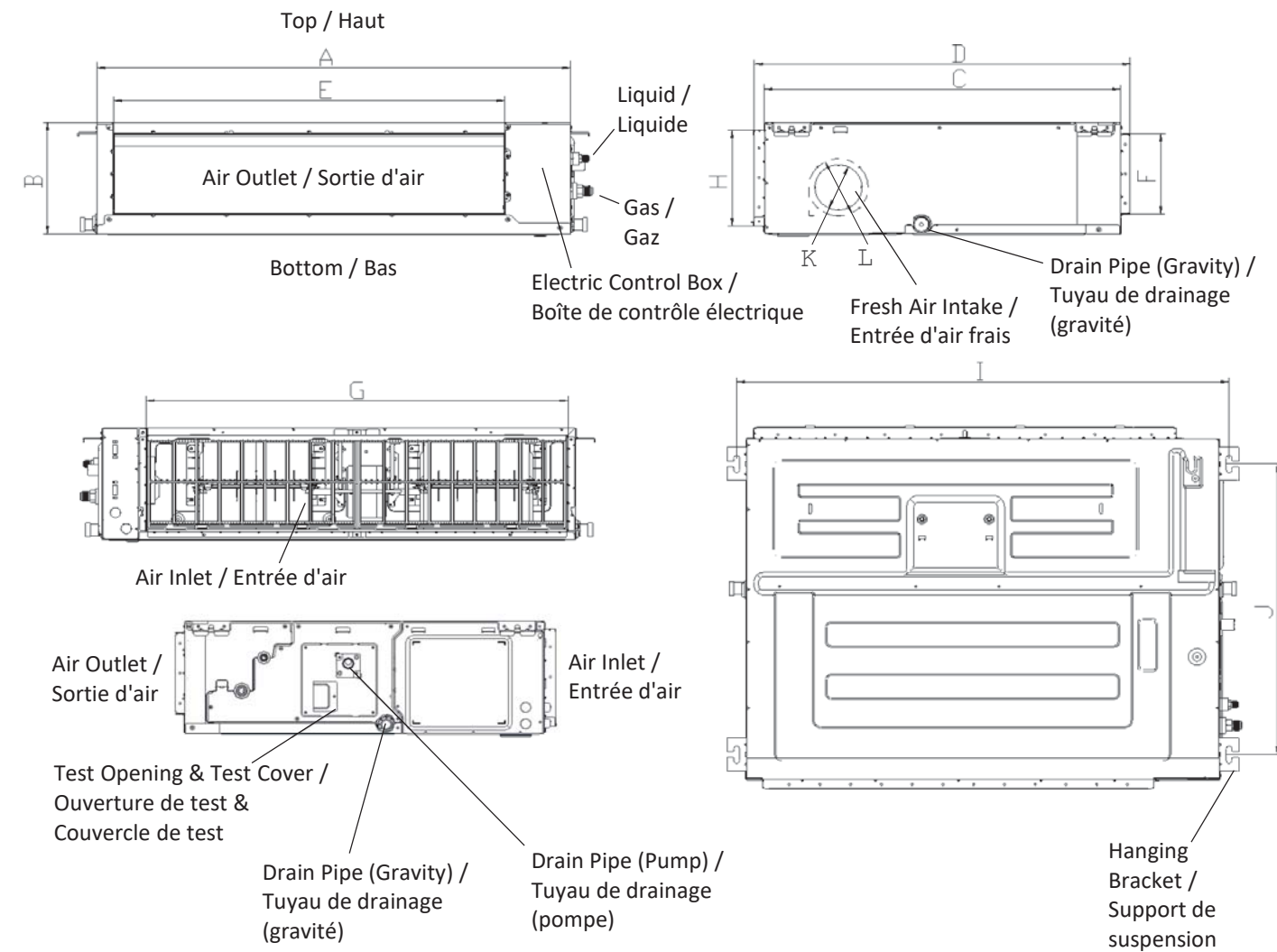
FAN / VENTILATEUR				
Indoor / Intérieure	Turbo	High / Haut	Med. / Moy.	Low / Bas
CFM	344	288	230	200
dB(A)		29.5	28.5	27.5
Indoor ESP Range / Plage PSE intérieur (inWG)				0-0.8
Indoor Moisture Removal / Élim. de l'humidité intérieure (l/h)				0.69
Outdoor Max. CFM / Débit max. CFM extérieur				1472
Outdoor Max. dB(A) / Niv. max. dB(A) extérieur				54
INCLUDED ACCESSORIES / ACCESSOIRES INCLUS				
RG10R(M2S)/BGFFU1 Remote Controller / Télécommande				
KJR-120N(X6W)/BGEF V1.4 Wired Ctrl/Contrôleur câblé				
OPTIONAL ACCESSORIES / ACCESSOIRES EN OPTION <sup>4</sup>				
KJR-120L(R2)/EFU1 V1.0 Wired Ctrl/Contrôleur câblé				<input type="checkbox"/>
KJR-120N(X6)/BGEF V1.3 Wired Ctrl/Contrôleur câblé				<input type="checkbox"/>
24V Mini Interface / Mini interface 24V				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>

1. Cooling Capacity Conditions: Indoor Temperature @ 80°F (26.7°C) DB; 67°F (19.4°C) WB with Outdoor Temperature @ 95°F (35°C) DB; 75°F (23.9°C) WB. Heating Capacity Conditions: Indoor Temperature @ 70°F (21.1°C) DB; 60°F (15.6°C) WB with Outdoor Temperature @ 47°F (8.3°C) DB; 43°F (6.1°C) WB. Line Set @ 24.6ft (7.5m); Height Difference @ 0ft (0m). 2. COP for all temperatures is @ rated output except when rated output is not given. In that case, COP is @ max. output. 3. System continues to operate below rated outdoor temperature operating range, subject to varying conditions. System has no low temperature cutout. Capacity is not tested outside of the rated temperature range. 4. Connection of these accessories may require secondary items not listed; refer to full product literature. | Master Group is not responsible for the accuracy and validity of any changes made to this document without the written authorization of Master Group. Specifications subject to change without notice.

/

1. Conditions de capacité de refroidissement : Température intérieure à 80°F (26,7°C) DB ; 67°F (19,4°C) BW avec température extérieure à 95°F (35°C) DB ; 75°F (23,9°C) BW. Conditions de capacité de chauffage : Température intérieure à 70°F (21,1°C) DB ; 60°F (15,6°C) BW avec température extérieure à 47°F (8,3°C) DB ; 43°F (6,1°C) BW. Tuyauterie à 24,6 pi (7,5 m) ; différence de hauteur à 0 pi (0 m). 2. Le COP pour toutes les températures est basé sur la puissance nominale, sauf lorsque la puissance nominale n'est pas indiquée. Dans ce cas, le COP est basé sur la puissance maximale. 3. Le système continue de fonctionner en dehors de la plage de température extérieure nominale, sous réserve de conditions variables. Le système ne dispose pas de système d'arrêt de basse température. La capacité n'est pas testée en dehors de la plage de température nominale. 4. Le raccordement de ces accessoires peut nécessiter des éléments supplémentaires non listés ; se référer à la documentation complète du produit. | Le Groupe Master n'est pas responsable de l'exactitude et de la validité de toute modification apportée à ce document sans son autorisation écrite. Les spécifications sont susceptibles de changer sans préavis.

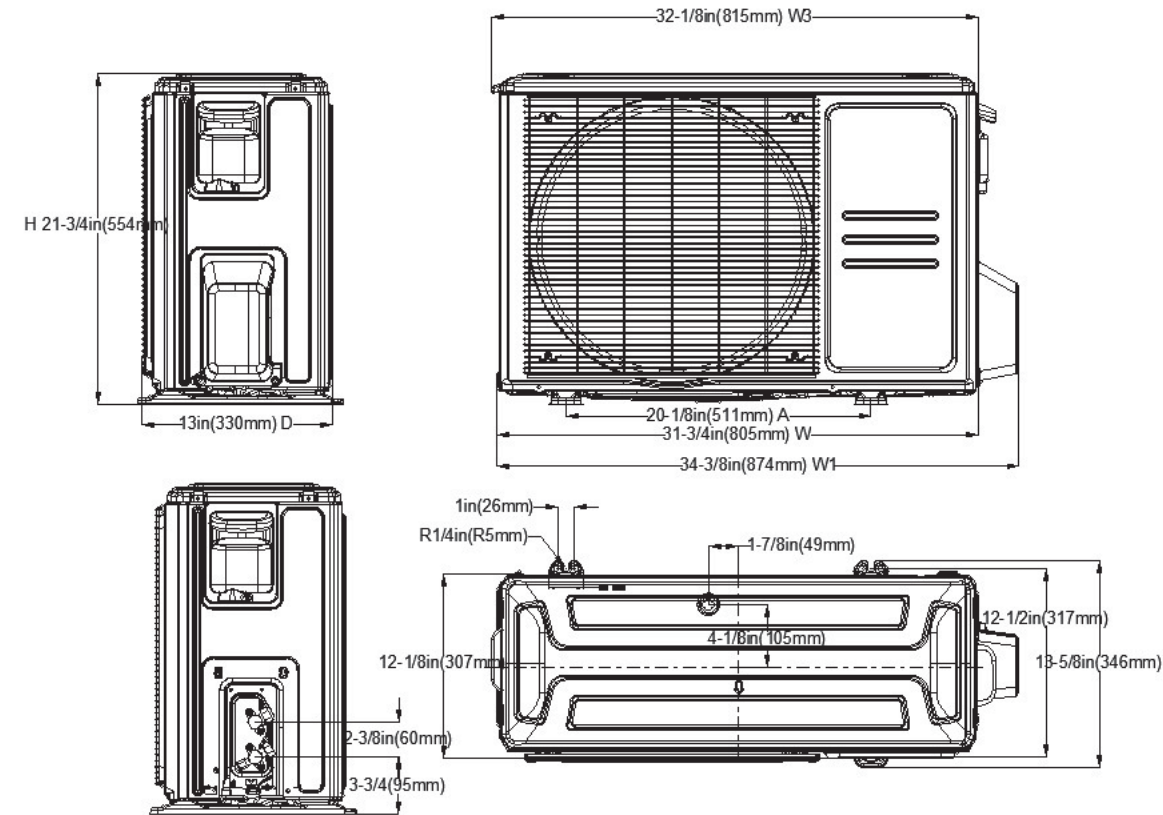
## INDOOR UNIT DRAWING / DESSIN DE L'UNITÉ INTÉRIEURE



Tag / Réf.	A	B	C	D	E	F	G	H	I
in. / po	27.6	9.6	29.5	31.3	20.7	7	23.3	8.3	29.1
mm	700	245	750	795	527	178	592	212	740
Tag / Réf.	J	K	L						
in. / po	25.2	3.9	5						
mm	640	100	126						

Drawing dimensions are nominal. Specifications subject to change without notice. / Les dimensions du dessin sont nominales. Les spécifications sont susceptibles de changer sans préavis.

OUTDOOR UNIT DRAWING / DESSIN DE L'UNITÉ EXTÉRIEURE



Drawing dimensions are nominal. / Les dimensions du dessin sont nominales.

MINIMUM OUTDOOR UNIT CLEARANCES / DÉGAGEMENTS MINIMAUX DE L'UNITÉ EXTÉRIEURE



Note: Outdoor units must be elevated 30.5-61cm (12-24in.) above the surface below in heating applications to allow for snow clearance and defrost runoff. Follow local codes, best practices, and guidelines. Diagrams for reference only.

Remarque : Les unités extérieures doivent être surélevées de 30,5-61 cm (12-24 po) au-dessus de la surface inférieure dans les applications de chauffage pour permettre l'évacuation de la neige et l'écoulement du dégivrage. Suivez les codes locaux, les meilleures pratiques et les directives. Diagrammes à titre de référence seulement.

NOTES / REMARQUES

## SUBMITTAL / DESSIN DE SOUMISSION - 27,000 BTU/H

### Multi-Zone Outdoor Unit / Unité extérieure multizone - MYRIAD +

Job Name / Nom du projet : \_\_\_\_\_  
 Location / Emplacement : \_\_\_\_\_  
 Engineer / Ingénieur(e) : \_\_\_\_\_  
 Submitted By / Soumis par : \_\_\_\_\_  
 Submitted To / Soumis à : \_\_\_\_\_

Submitted For / Soumis pour : \_\_\_\_\_  
 Approval / Approbation  Construction   
 Reference / Référence  Date: \_\_\_\_\_  
 Unit Tag / Étiquette de l'unité : \_\_\_\_\_  
 Drawing No. / N° de dessin : \_\_\_\_\_

#### Warranty / Garantie

Standard 10 Years Parts & Compressor /  
 10 ans de pièces et compresseur standard  
 Terms & Conditions Apply. / Conditions s'appliquent.

#### Model / Modèle

Outdoor / Extérieure MXHZA2742AV1

#### Capacity Range / Plage de capacité <sup>1</sup>

Output / Sortie (Btu/h)	Min.	Rated / Nominal	Max.
Cooling / Climatisation	7200	27000	37000
Heating / Chauffage	8400	27000	36000

#### Heating Performance / Performances de chauffage <sup>2</sup>

Output / Sortie (Btu/h)	Min.	Rated / Nominal	Max.
47°F (8.3°C)	8400	27000	36000
17°F (-8.3°C)	6000	25000	28000
5°F (-15°C)	5400	27000	27000
-22°F (-30°C)	5200	14000	14000

#### Line Set & Refrigerant / Tuyauterie & réfrigérant

Liquid (in.) / Liquide (po)	4x1/4
Gas (in.) / Gaz (po)	3x3/8+1x1/2
Conn. Type / Type de connexion	Flared / évasé
Pre-Charge Length (ft x connections) / Long. de pré-charge (pi x connexions)	24.6x4
Max. Length (Total) (ft) / Long. max. (totale) (pi)	262.4
Max. Length (Each) (ft) / Long. max. (chacune) (pi)	114.8
Max. Height Difference (ODU to IDU) (ft) / Différence de hauteur max. (EXT. à INT.) (pi)	49.2
Max. Height Difference (IDU to IDU) (ft) / Différence de hauteur max. (INT. à INT.) (pi)	32.8
Refrigerant Type / Type de réfrigérant	R454B
Pre-Charge / Précharge (oz)	120.63
Oil Type / Type d'huile	VG74
Oil Volume / Volume d'huile (ml)	1000

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Images for reference only. / Images à titre de référence seulement.

#### Certified / Certifié

System / Système	AHRI No.		ETL Intertek	ENERGY STAR
Non-Duct / Sans conduit	216031071	<input checked="" type="checkbox"/>		
Mixed / Mixte	216031073	<input checked="" type="checkbox"/>		
Ducted / Avec conduit	216031072	<input checked="" type="checkbox"/>		

#### Outdoor Temperature Operating Range /

#### Plage de température d'opération extérieure

	°C	°F
Cooling / Climatisation	-30 ~ 50	-22 ~ 122
Heating / Chauffage <sup>3</sup>	-30 ~ 24	-22 ~ 75

#### Efficiency Ratings / Données d'efficacité

	SEER2	EER2	HSPF2 (4)	HSPF2 (5)
Non-Duct / Sans conduit	23	12.5	10.5	8.5
Mixed / Mixte	21	12.25	10	8.1
Ducted / Avec conduit	19	12	9.5	7.7
COP <sup>2</sup>	47°F (8.3°C)	17°F (-8.3°C)	5°F (-15°C)	-22°F (-30°C)
Non-Duct / Sans conduit	3.8	2.6	2	1.26
Mixed / Mixte	3.7	2.5	2	1.23
Ducted / Avec conduit	3.6	2.4	2	1.2

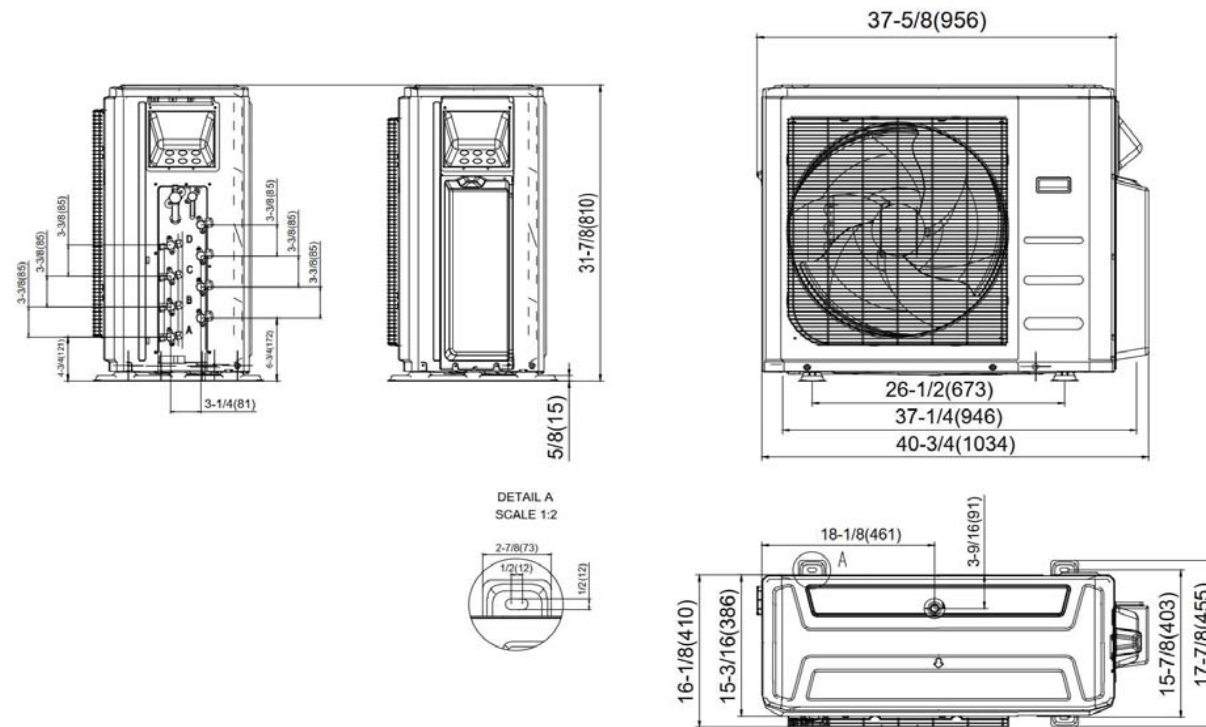
Electrical / Électrique			
Power / Alimentation	(V/Ph/Hz)	208-230/1/60	
Voltage Range / Plage de tension	(V)	187-253	
MOCP (A)	35	MCA (A)	30
Power Input / Puissance d'entrée (W)	Non-Duct / Sans conduit	Mixed / Mixte	Ducted / Avec conduit
Cooling (Rated) / Clim. (Nominal)	2125	2229	2333
Cooling / Clim. (Max)	3620	4060	4500
Heating (Rated) / Chauffage (Nominal)	2082	2180.5	2279
Heating / Chauff. (Max)	3400	3700	4000
Current / Courant (A)	Non-Duct / Sans conduit	Mixed / Mixte	Ducted / Avec conduit
Cooling (Rated) / Clim. (Nominal)	9.5	10	10.5
Heating (Rated) / Chauffage (Nominal)	9.1	9.55	10
Dimensions & Weights / Dimensions & poids			
Outdoor / Extérieure	Net (WxDxH; in.) / (LxPxH; po)	37.24x16.14x31.89	
	Gross (WxDxH; in.) / Brut (LxPxH; po)	42.91x19.68x34.84	
		lb	kg
	Net Wt / Poids net	168.43	76.4
	Gross Wt / Poids brut	179.67	81.5
Optional Accessories / Accessoires en option <sup>5</sup>			
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

1. Cooling Capacity Conditions: Indoor Temperature @ 80°F (26.7°C) DB; 67°F (19.4°C) WB with Outdoor Temperature @ 95°F (35°C) DB; 75°F (23.9°C) WB. Heating Capacity Conditions: Indoor Temperature @ 70°F (21.1°C) DB; 60°F (15.6°C) WB with Outdoor Temperature @ 47°F (8.3°C) DB; 43°F (6.1°C) WB. Line Set @ 25ft (7.5m); Height Difference @ 0ft (0m). 2. COP for all temperatures is @ rated output except when rated output is not given. In that case, COP is @ max. output. Heating performance varies subject to specific indoor unit combination. 3. System continues to operate below rated outdoor temperature operating range, subject to varying conditions. Capacity is not tested outside of the rated temperature range. 4. It is not recommended to exceed a 133% connection ratio of the outdoor unit's nominal capacity. Total capacity of the system is dictated by the outdoor unit; exceeding a 100% connection ratio does not increase total capacity of the system. Refer to full product literature for allowable combinations of units. 5. Connection of these accessories may require secondary items not listed; refer to full product literature. | Master Group is not responsible for the accuracy and validity of any changes made to this document without the written authorization of Master Group. Specifications subject to change without notice.

1. Conditions de capacité de refroidissement : Température intérieure à 80°F (26,7°C) DB ; 67°F (19,4°C) BW avec température extérieure à 95°F (35°C) DB ; 75°F (23,9°C) BW. Conditions de capacité de chauffage : Température intérieure à 70°F (21,1°C) DB ; 60°F (15,6°C) BW avec température extérieure à 47°F (8,3°C) DB ; 43°F (6,1°C) BW. Tuyauterie à 25 pi (7,5 m) ; différence de hauteur à 0 pi (0 m). 2. Le COP pour toutes les températures est basé sur la puissance nominale, sauf lorsque la puissance nominale n'est pas indiquée. Dans ce cas, le COP est basé sur la puissance maximale. 3. Le système continue de fonctionner en dehors de la plage de température extérieure nominale, sous réserve de conditions variables. La capacité n'est pas testée en dehors de la plage de température nominale. 4. Il n'est pas recommandé de dépasser un ratio de connexion de 133 % de la capacité nominale de l'unité extérieure. La capacité totale du système est dictée par l'unité extérieure ; dépasser un ratio de connexion de 100 % ne donnera pas lieu à une augmentation de la capacité totale du système. Veuillez vous référer à la documentation complète du produit pour connaître les combinaisons d'unités autorisées. 5. Le raccordement de ces accessoires peut nécessiter des éléments supplémentaires non listés ; se référer à la documentation complète du produit. | Le Groupe Master n'est pas responsable de l'exactitude et de la validité de toute modification apportée à ce document sans son autorisation écrite. Les spécifications sont susceptibles de changer sans préavis.

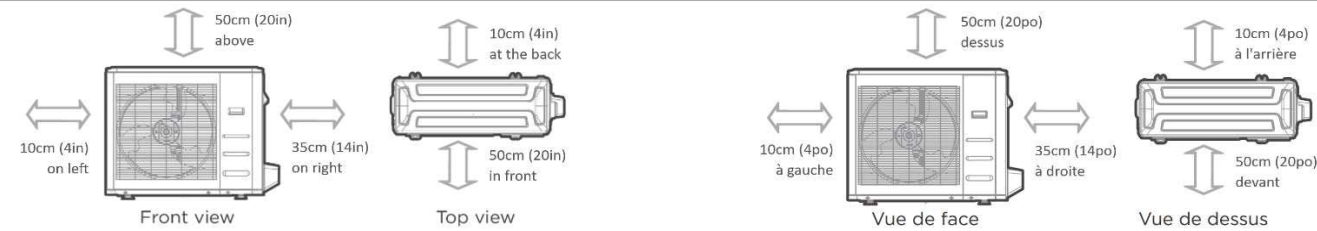
Fan / Ventilateur	
Outdoor Max. CFM / Débit max. CFM extérieur	2148
Outdoor Max. dB(A) / Niv. max. dB(A) extérieur	61
System Pairings / Configurations de systèmes <sup>4</sup>	
Maximum Number of Indoor Units / Nombre maximum d'unités intérieures	4
Nominal Connection Range / Plage de connexion nominale (Mbtu/h)	18-36
Indoor Unit Types Vary / Les types d'unités intérieures peuvent varier	
Key Features / Caractéristiques principales	
Rotary Inverter Compressor / Compresseur rotary inverter	<input type="checkbox"/>
Twin Rotary Inverter Compressor / Compresseur twin rotary inverter	<input checked="" type="checkbox"/>
Base Pan Heater / Chauffage de bac de base	<input checked="" type="checkbox"/>
Crankcase Heater / Chauffage de carter	<input checked="" type="checkbox"/>
Automatic Refrigerant Shut-Off Valve / Valve de fermeture du réfrigérant automatique	<input checked="" type="checkbox"/>
Included Accessories / Accessoires inclus	
1 x Adapter; 3/8 to 1/2 (Gas) / Adaptateur ; 3/8 à 1/2 (gaz)	
1 x Adapter; 1/2 to 5/8 (Gas) / Adaptateur ; 1/2 à 5/8 (gaz)	
1 x Adapter; 1/2 to 3/8 (Gas) / Adaptateur ; 1/2 à 3/8 (gaz)	
1 x Adapter; 1/4 to 3/8 (Liquid) / Adaptateur ; 1/4 à 3/8 (liquide)	

**Outdoor Unit Drawing / Dessin de l'unité extérieure**



Drawing dimensions are nominal. / Les dimensions du dessin sont nominales.

**Minimum Outdoor Unit Clearances / Dégagements minimaux de l'unité extérieure**



Note: Outdoor units must be elevated 30.5-61cm (12-24in.) above the surface below in heating applications to allow for snow clearance and defrost runoff. Follow local codes, best practices, and guidelines. Diagrams for reference only.

Remarque : Les unités extérieures doivent être surélevées de 30,5-61 cm (12-24 po) au-dessus de la surface inférieure dans les applications de chauffage pour permettre l'évacuation de la neige et l'écoulement du dégivrage. Suivez les codes locaux, les meilleures pratiques et les directives. Diagrammes à titre de référence seulement.

**Notes / Remarques**