

AGRICULTURE & AGRI-FOOD CANADA INDIAN HEAD RESEARCH FARM DUST COLLECTOR

INDIAN HEAD, SASKATCHEWAN

ISSUED FOR TENDER
(2020.09.22)




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DRAWING INDEX

STRUCTURAL

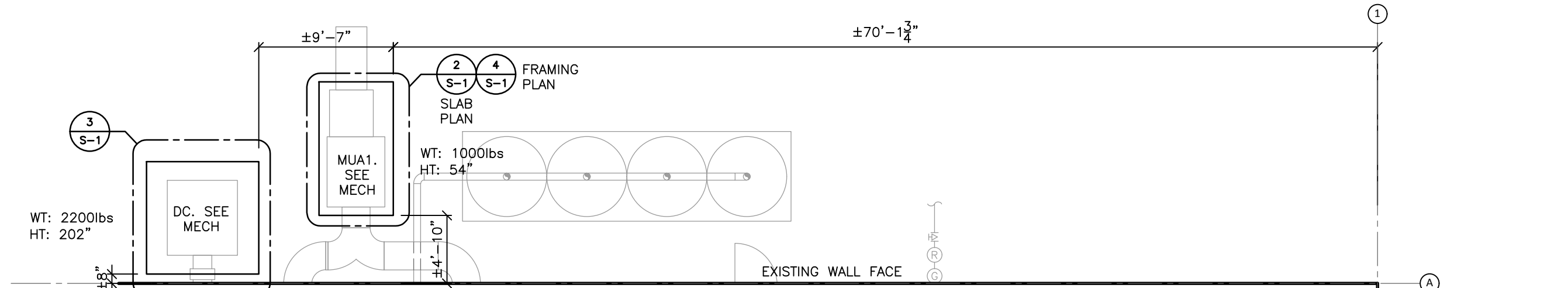
- | | |
|-----|---|
| S-1 | MECHANICAL EQUIPMENT SUPPORT PAD PLANS, SECTIONS & DETAILS |
| S-2 | GENERAL NOTES |

MECHANICAL

- | | |
|-----|---|
| M.1 | BUILDING 21 MAIN FLOOR PLANS MECH DEMOLITION & RENOVATED |
| M.2 | BUILDING 13 MAIN FLOOR PLANS MECH DEMOLITION & RENOVATED |

ELECTRICAL

- | | |
|----|------------------------------|
| E1 | MAIN FLOOR PLAN - ELECTRICAL |
| E2 | MAIN FLOOR PLAN - ELECTRICAL |
| E3 | ELECTRICAL SPECIFICATIONS |



NOTE: PAD LOCATIONS TO BE CONFIRMED WITH MECHANICAL TRADE PRIOR TO CONSTRUCTION

FLOOR ASSEMBLIES

F1 MUA UNIT PAD
 FRR : N/A
 • 5" REIN CONCRETE SLAB ON-GRADE c/w 10M @ 12"o/c. EA. WAY
 • 6 mil POLY VAPOUR BARRIER
 • MIN. 12" COMPACTED GRANULAR FILL OVER COMPACTED SUB BASE

F2 DUST COLLECTOR PAD
 FRR : N/A
 • 10" DBL MATT REIN CONCRETE SLAB ON-GRADE c/w 10M @ 12"o/c. EA. WAY (TOP & BTM)
 • 6 mil POLY VAPOUR BARRIER
 • MIN. 12" COMPACTED GRANULAR FILL OVER COMPACTED SUB BASE

PLAN LEGEND

C(X) TYPE COLUMN / BASEPLATE REFER TO COLUMN SCHEDULE & BASEPLATE DETAILS

FACTORED LOAD, KIPS (k)

COLUMN SCHEDULE

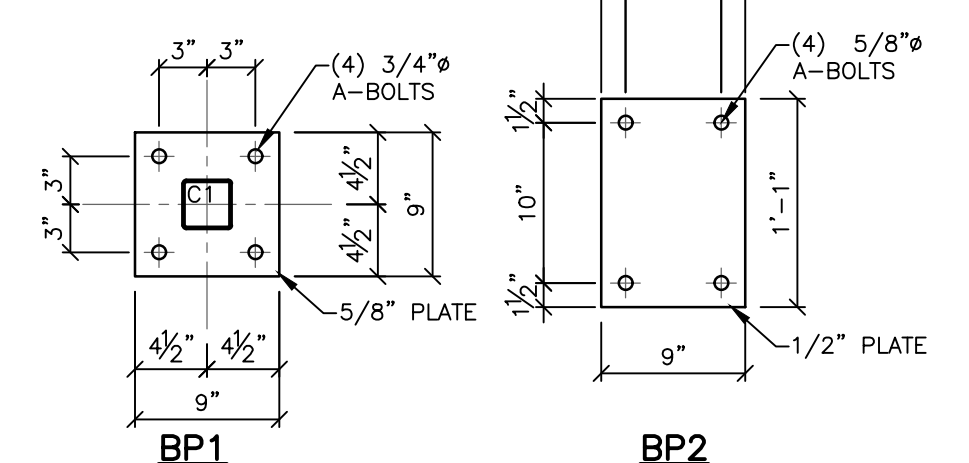
| TYPE | DESCRIPTION |
|------|--------------|
| C1 | HSS 3x3x.188 |

SEISMIC REQUIREMENTS ARE BASED ON NATIONAL BUILDING CODE FOR SITE CLASS E.
 $SA(0.2) = 0.090$, $SA(0.5) = 0.054$, $SA(1.0) = 0.028$
 $SA(2.0) = 0.012$, $SA(5.0) = 0.0025$
 $PGA = 0.054$

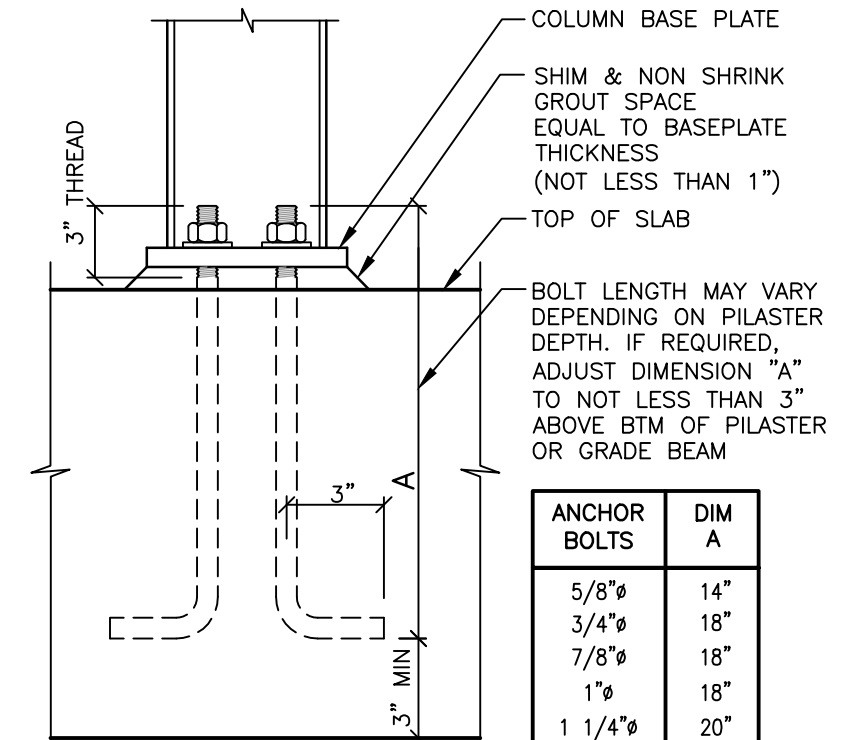
PAD LOADING

| LOAD TYPE | MUA | DUST COLL. |
|------------|-----------|------------|
| DEAD LOAD | 118.0 PSF | 125 PSF |
| SNOW LOAD | 30.5 PSF | 30.5 PSF |
| TOTAL LOAD | +1485 PSF | +1555 PSF |
| | +1000# | +2200# |

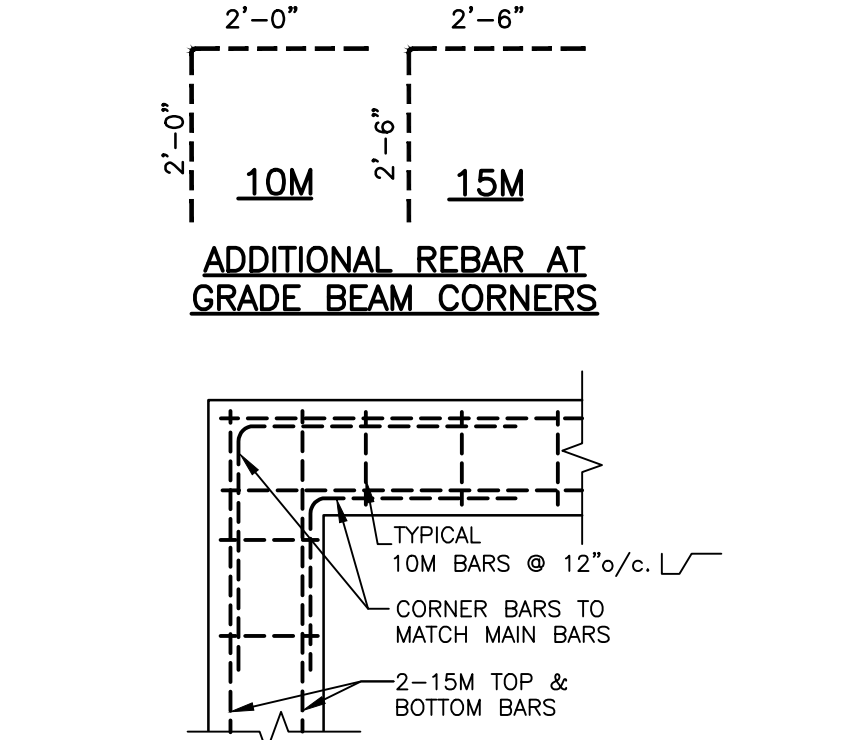
WIND, $q_s = 0.42$
 $S_s = 1.7$ $S_r = 0.1$
 ALLOWABLE BEARING CAPACITY USED = 1500PSF(ASSUMED)



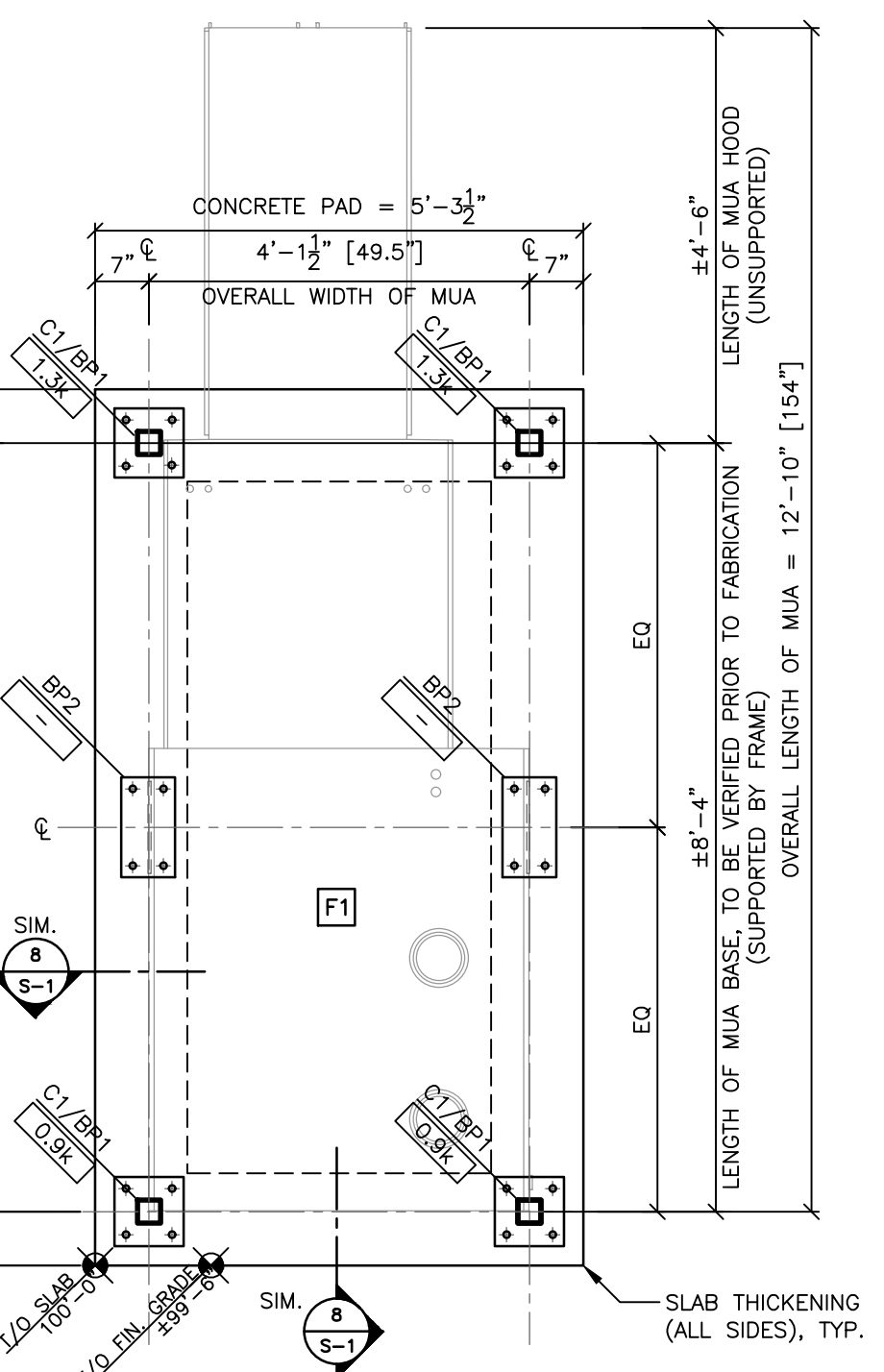
1A BASEPLATES
 S-1 SCALE 1" = 1' 0"



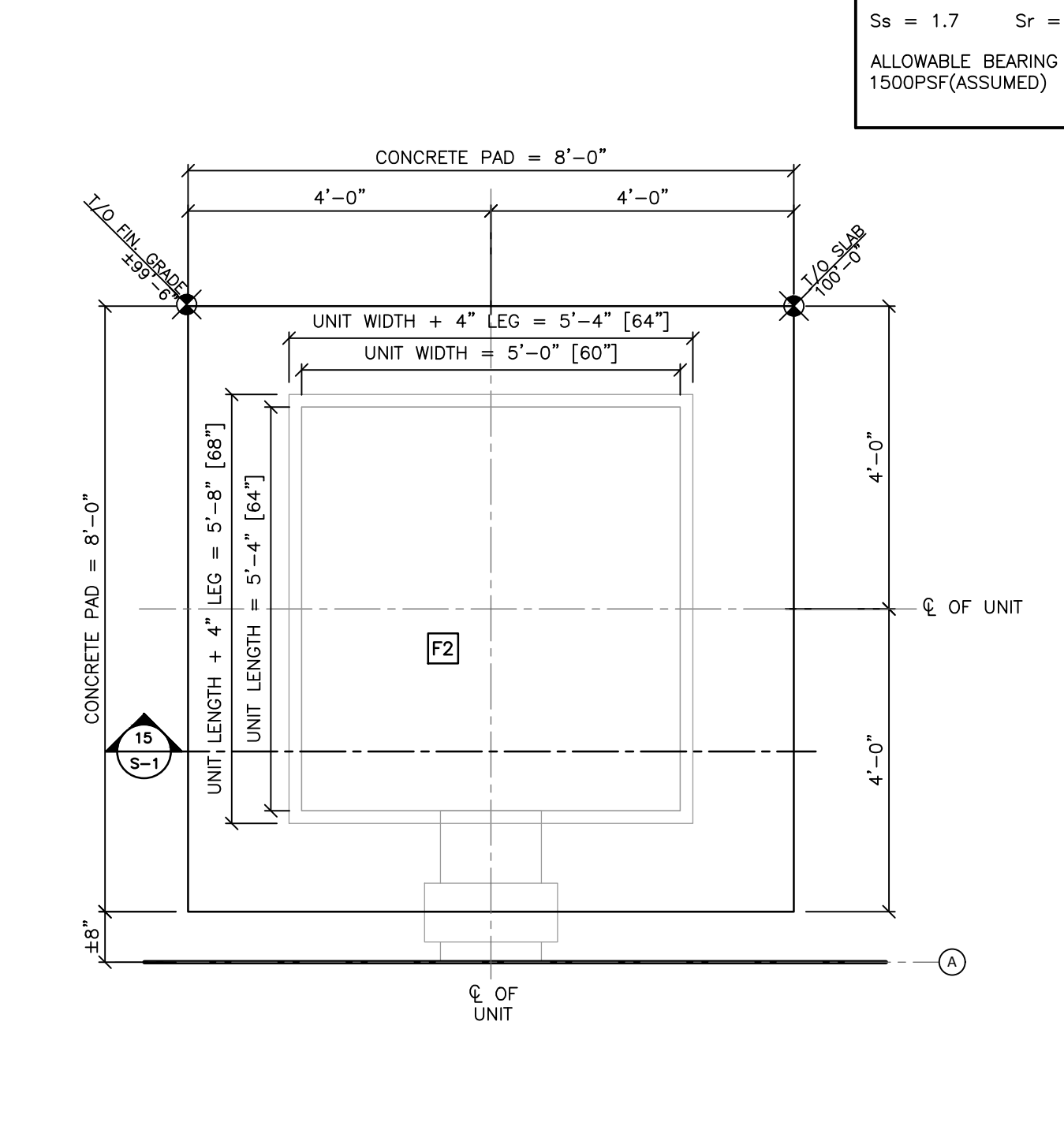
1B TYPICAL ANCHOR BOLT
 S-1 NOT TO SCALE



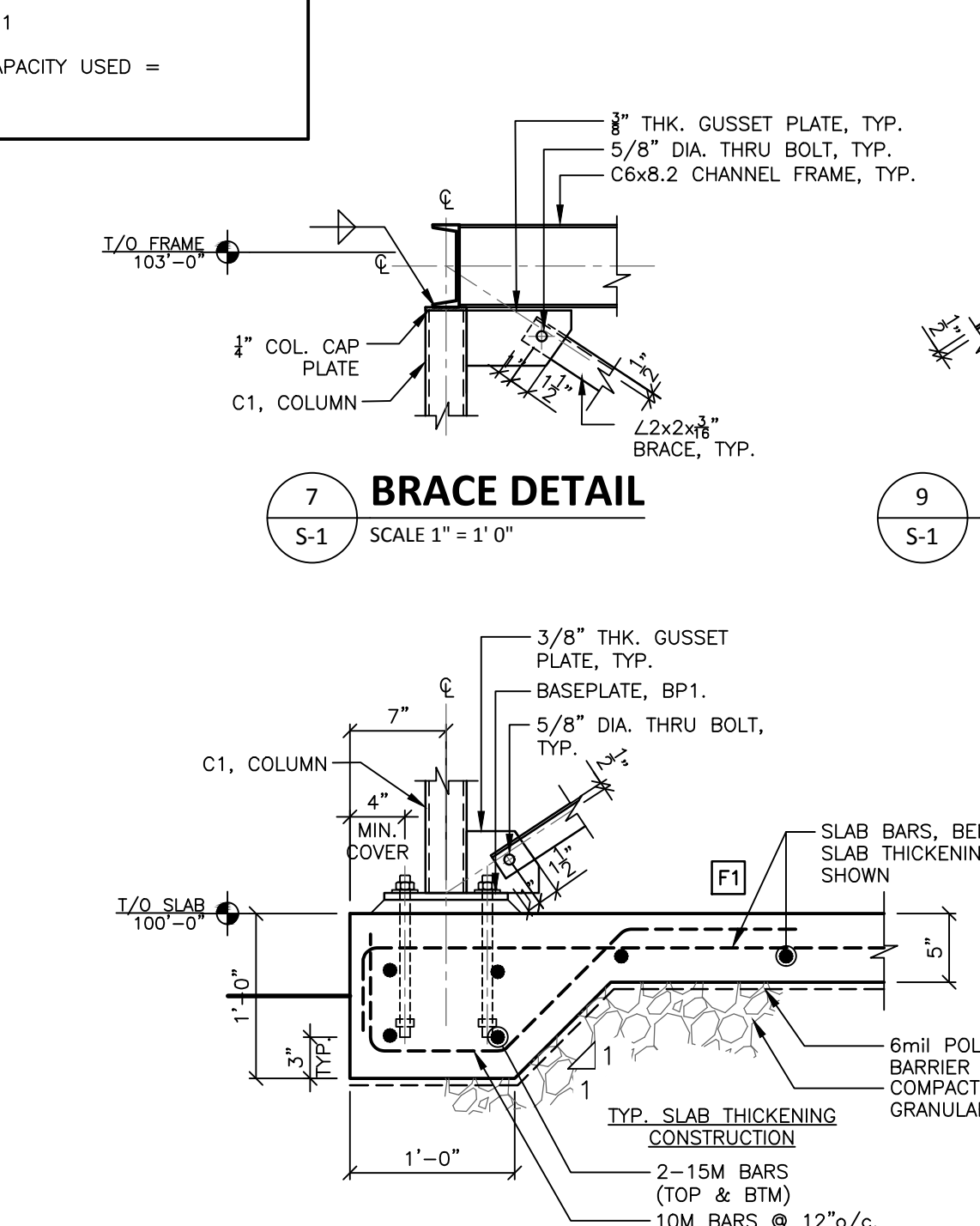
1C TYPICAL CORNER REINFORCING
 S-1 NOT TO SCALE



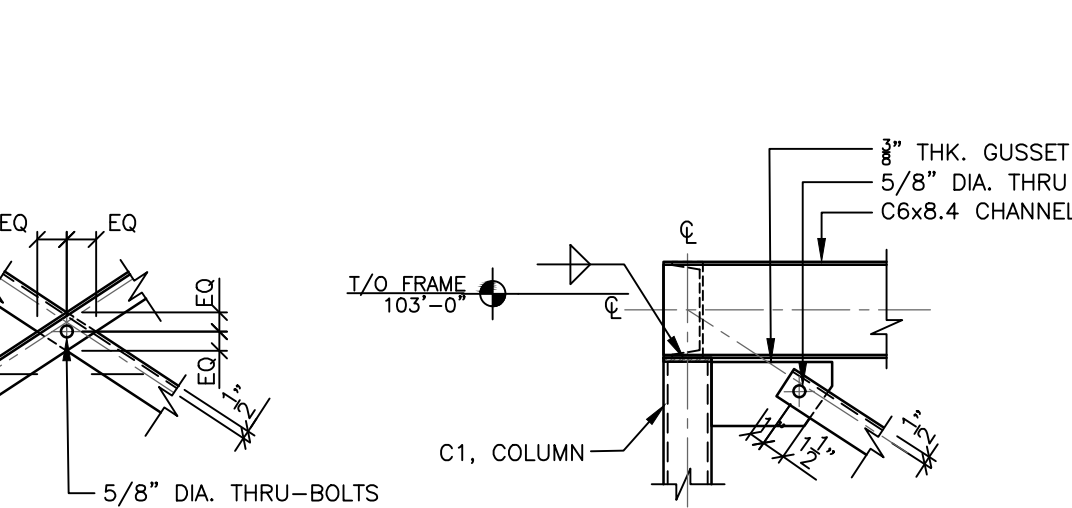
2 SLAB PLAN (M.U.A.)
 S-1 SCALE 1/2" = 1' 0"



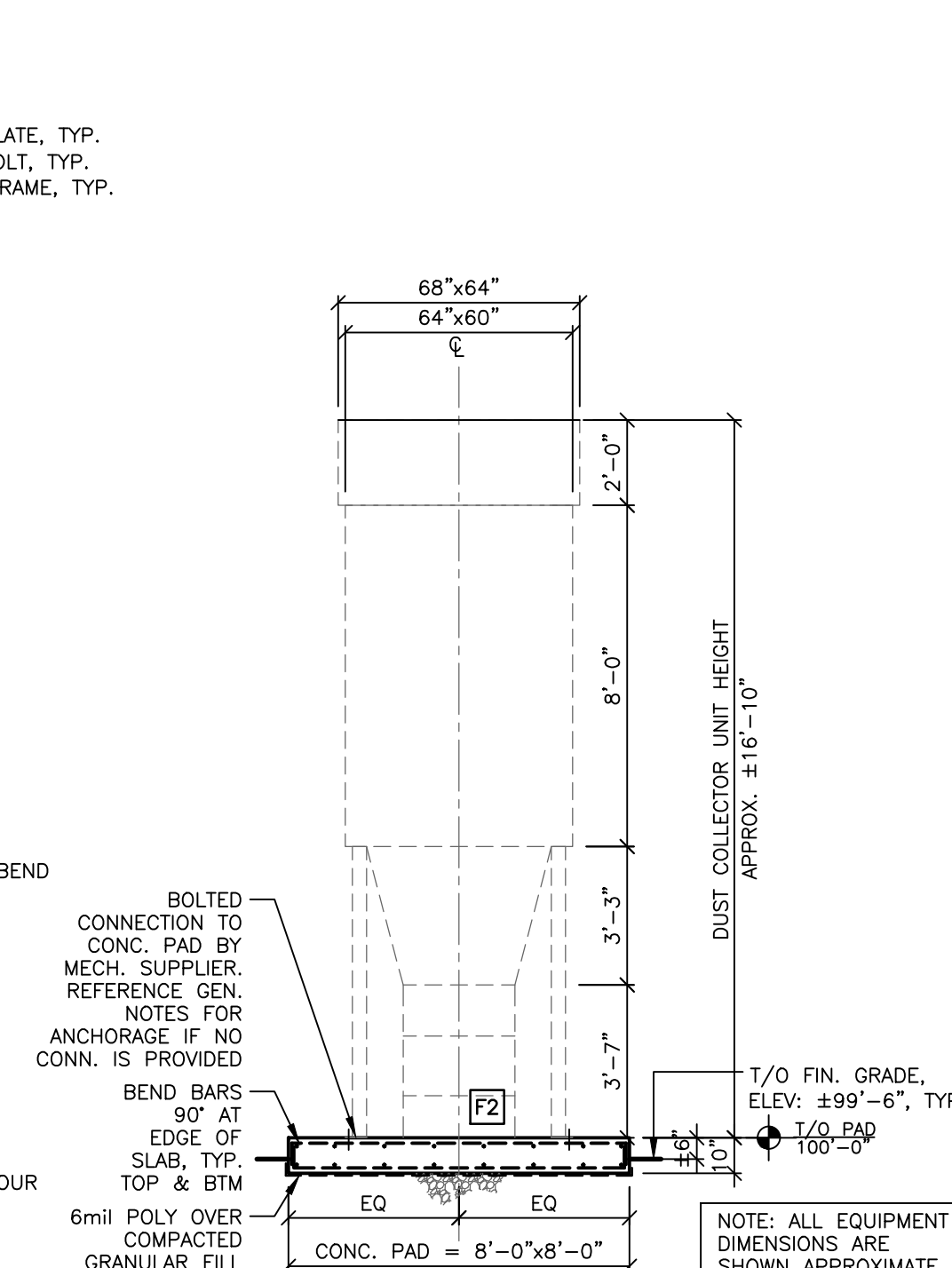
3 SLAB PLAN (DUST COLLECTOR (DC))
 S-1 SCALE 1/2" = 1' 0"



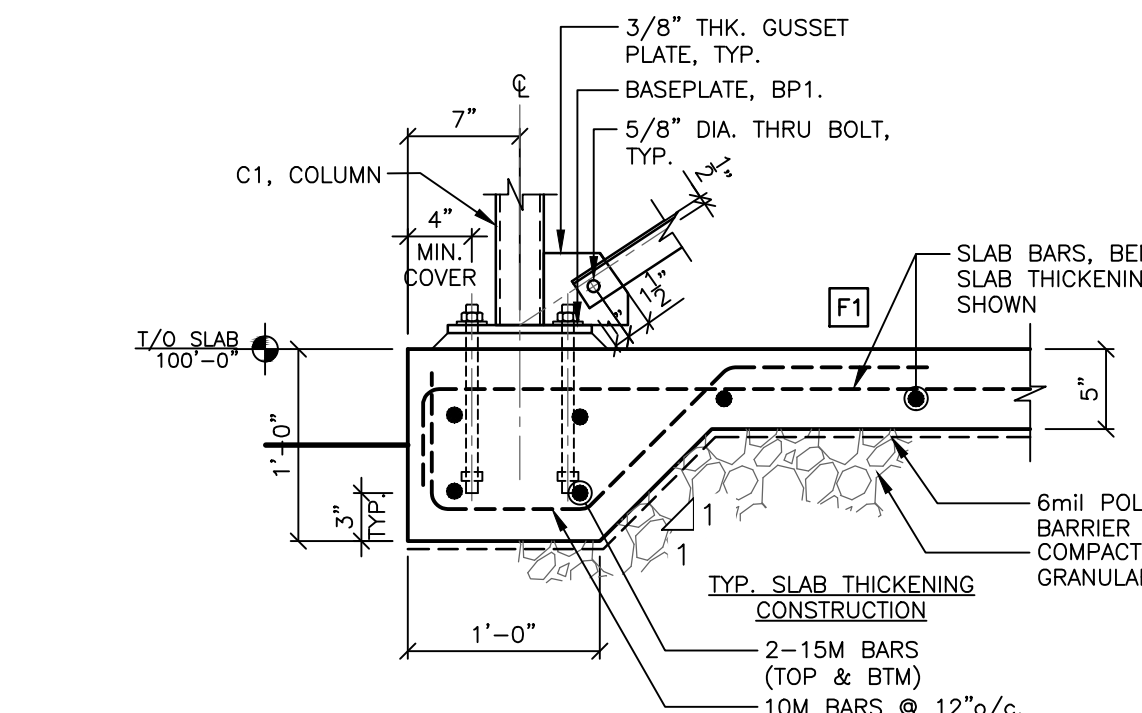
7 BRACE DETAIL
 S-1 SCALE 1" = 1' 0"



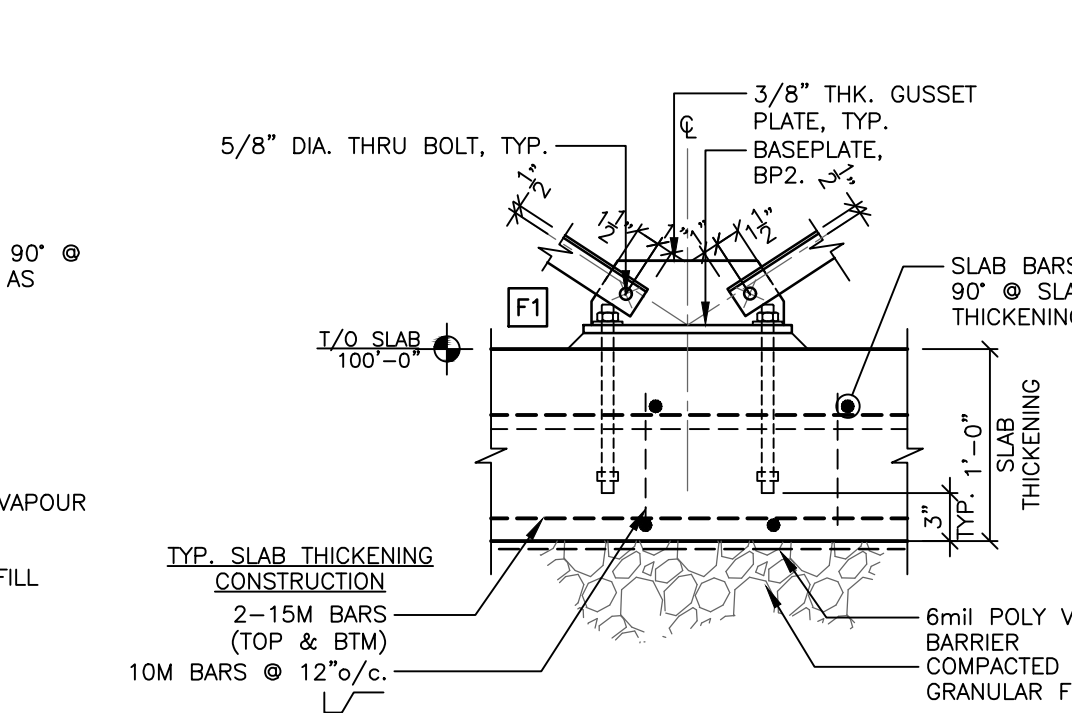
9 TYP. BRACE DETAIL
 S-1 SCALE 1" = 1' 0"



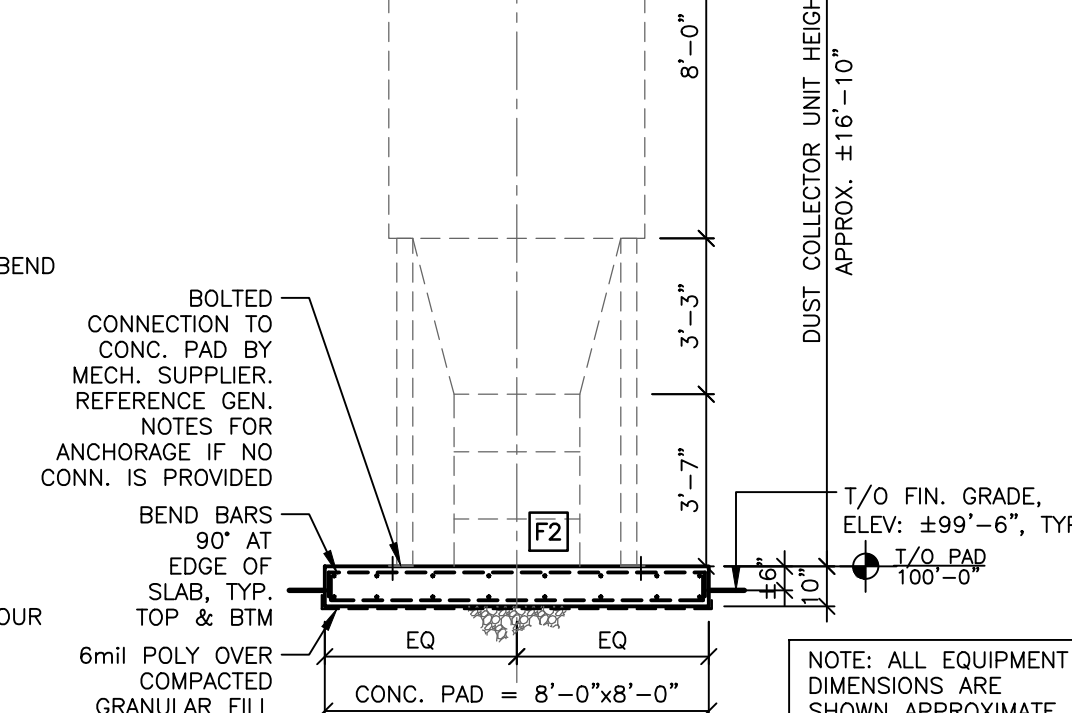
10 TYP. BRACE DETAIL
 S-1 SCALE 1" = 1' 0"



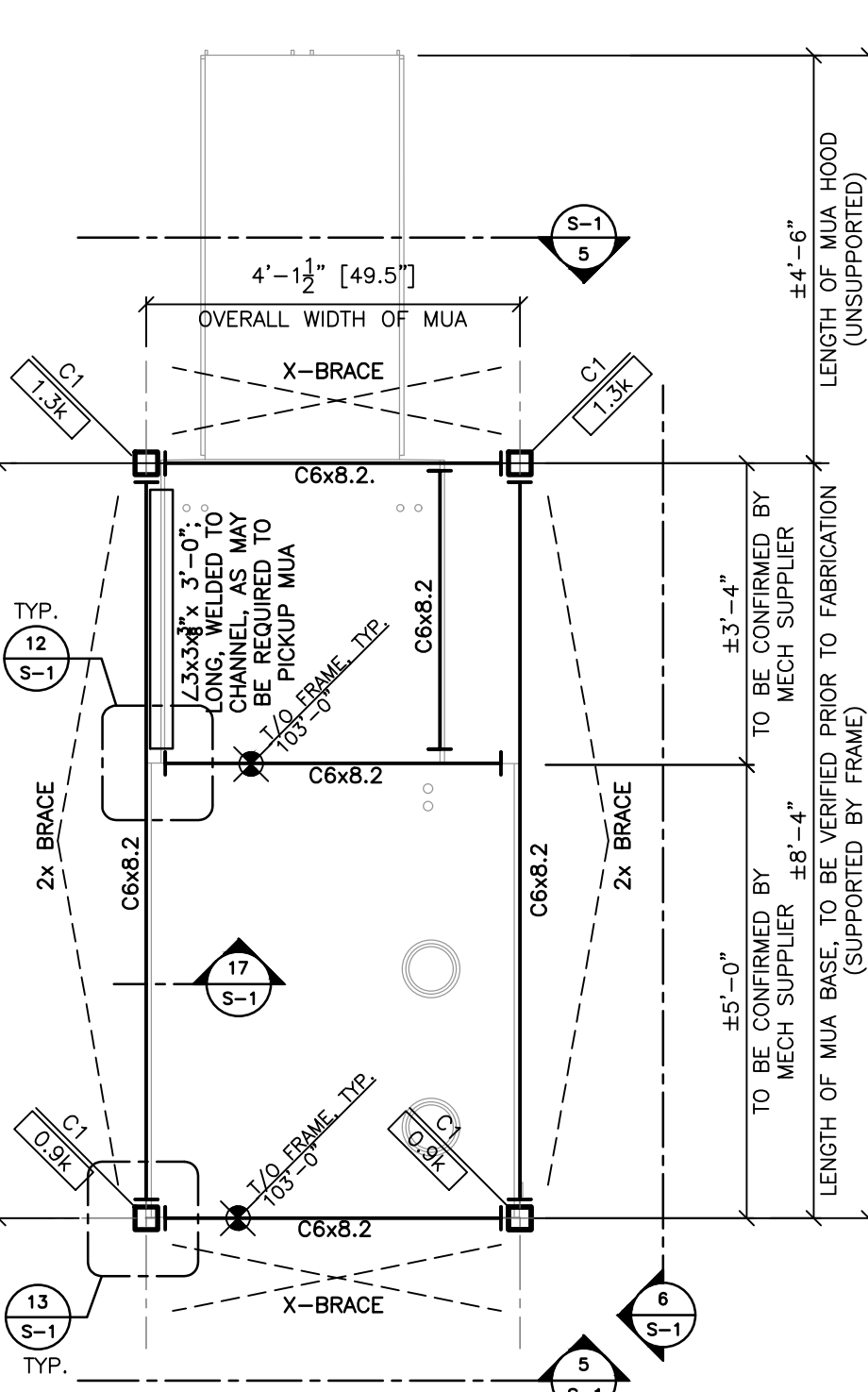
8 TYP. BRACE DETAIL
 S-1 SCALE 1" = 1' 0"



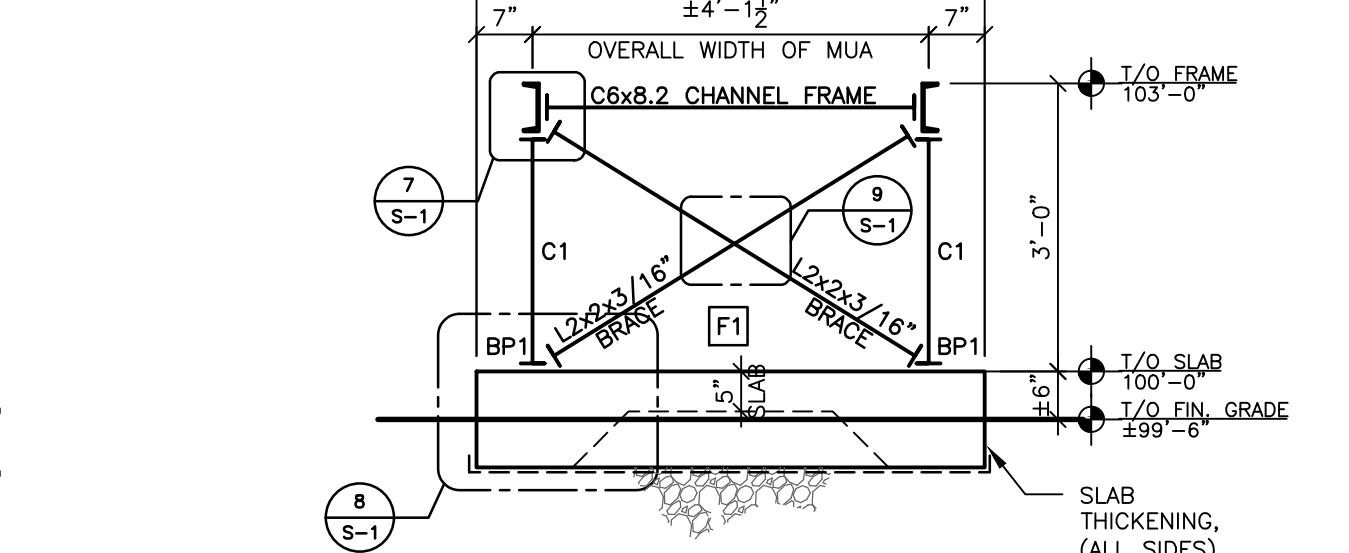
11 TYP. BRACE DETAIL
 S-1 SCALE 1" = 1' 0"



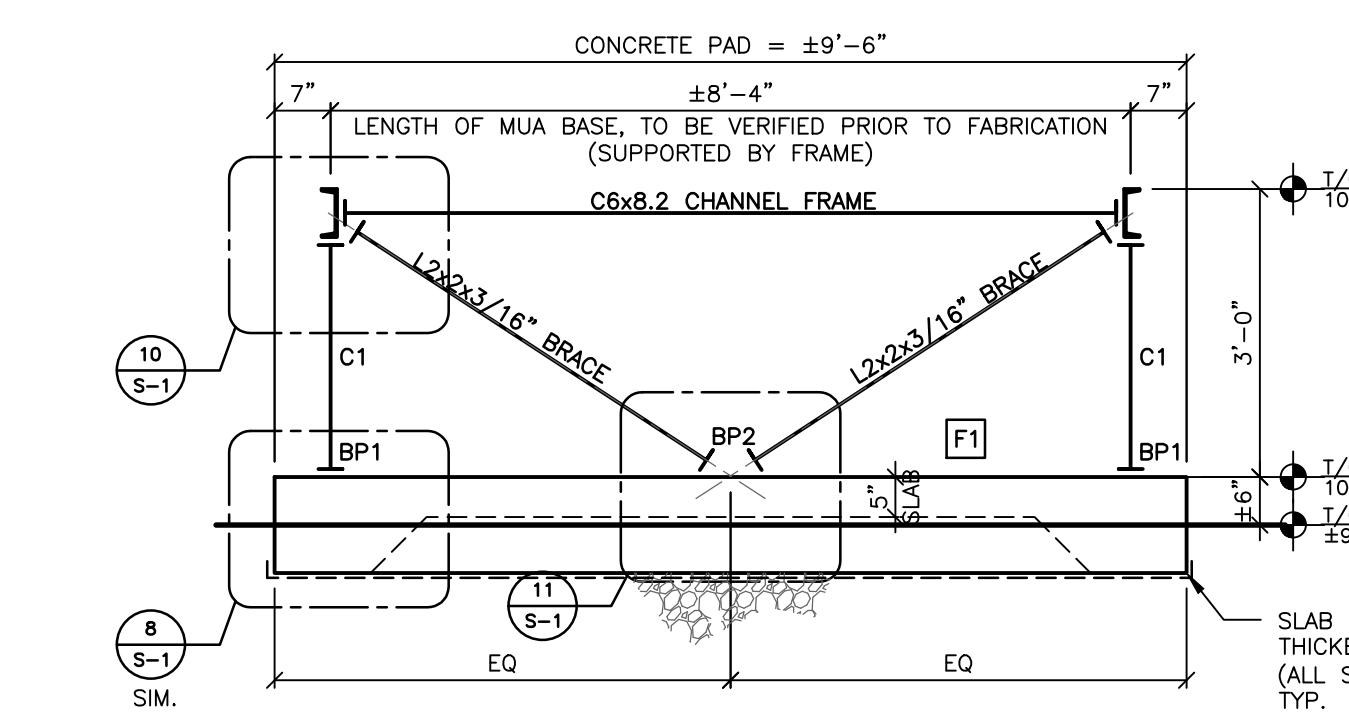
15 TYP. SLAB SECTION
 S-1 SCALE 1/4" = 1' 0"



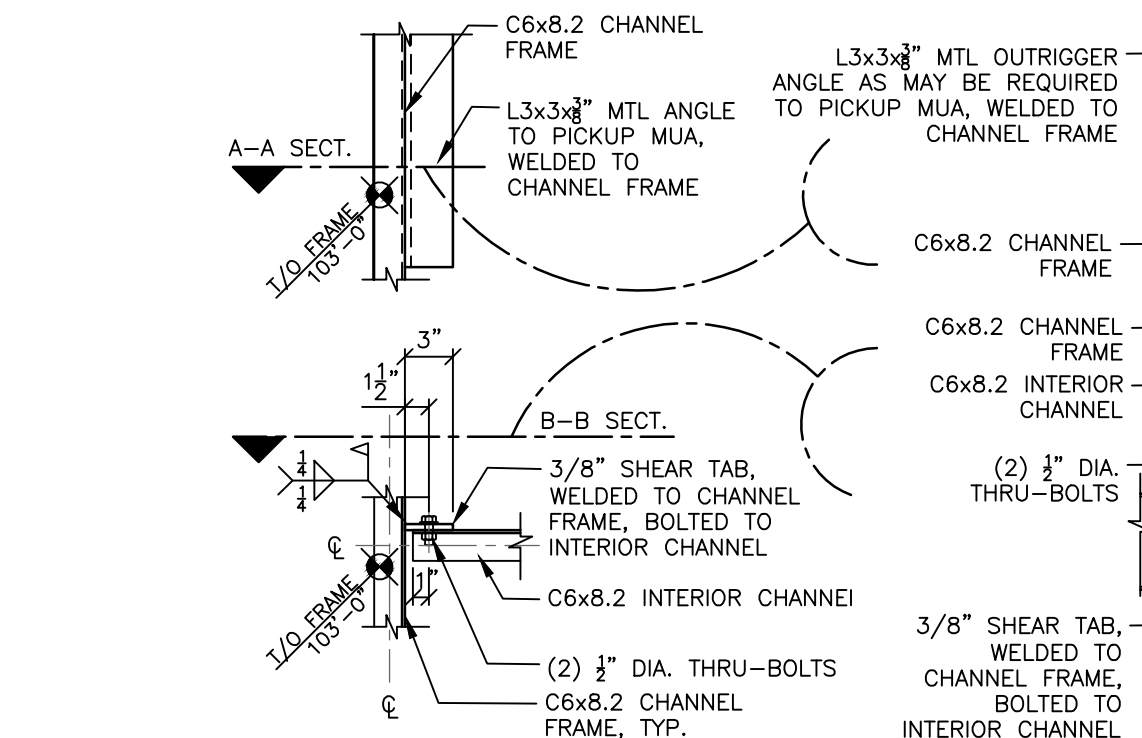
4 FRAMING PLAN (M.U.A.)
 S-1 SCALE 1/2" = 1' 0"



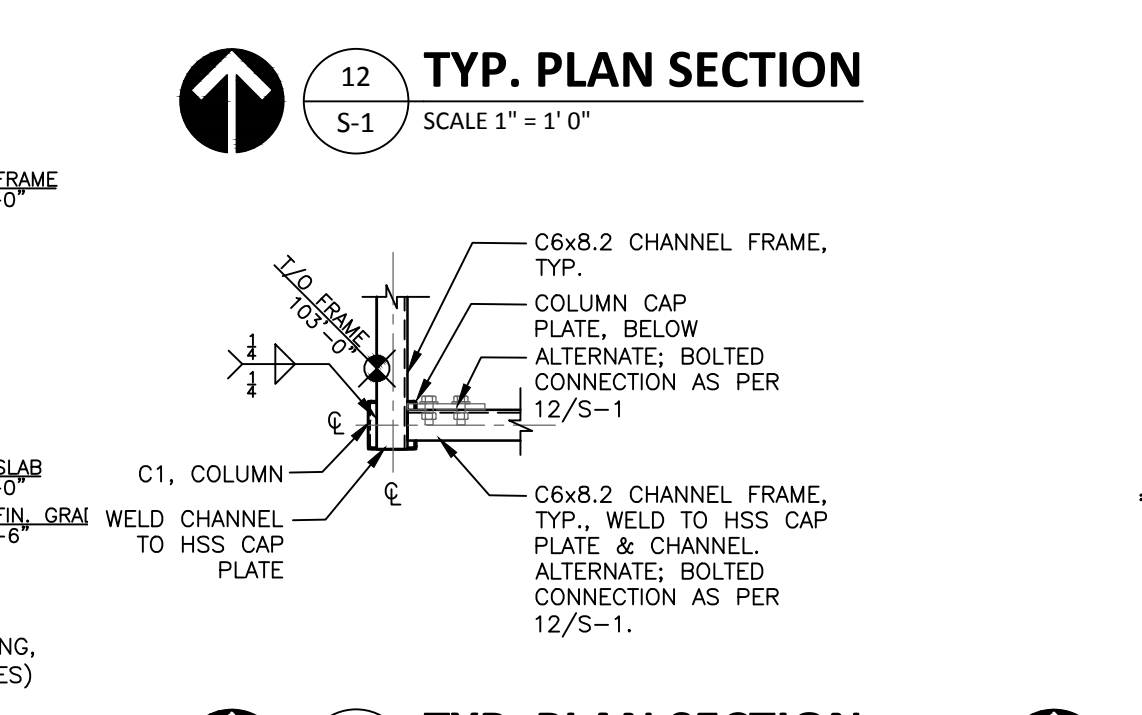
5 STRUCTURAL STEEL PROFILE
 S-1 SCALE 1/2" = 1' 0"



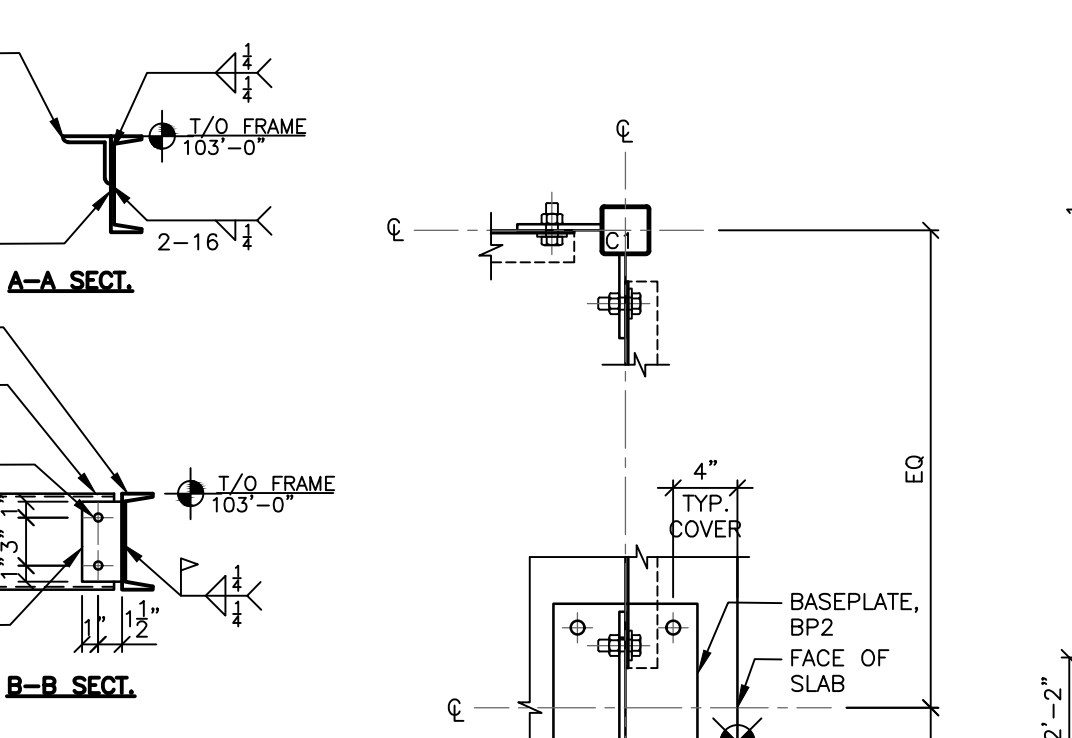
6 STRUCTURAL STEEL PROFILE
 S-1 SCALE 1/2" = 1' 0"



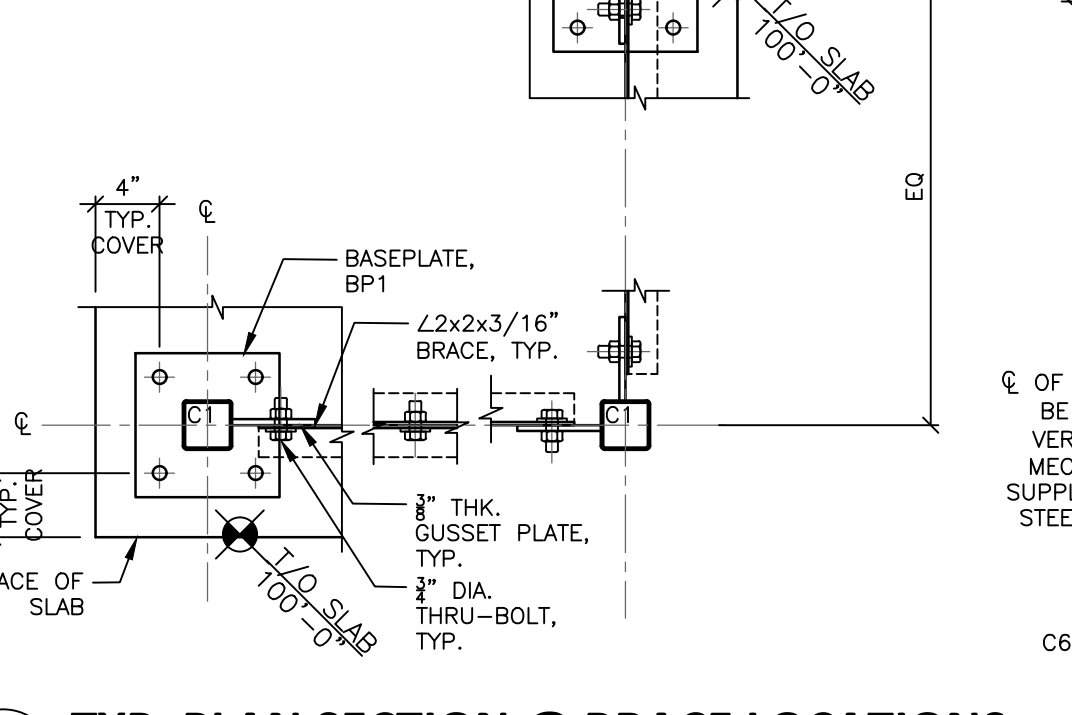
8 TYP. BRACE DETAIL
 S-1 SCALE 1" = 1' 0"



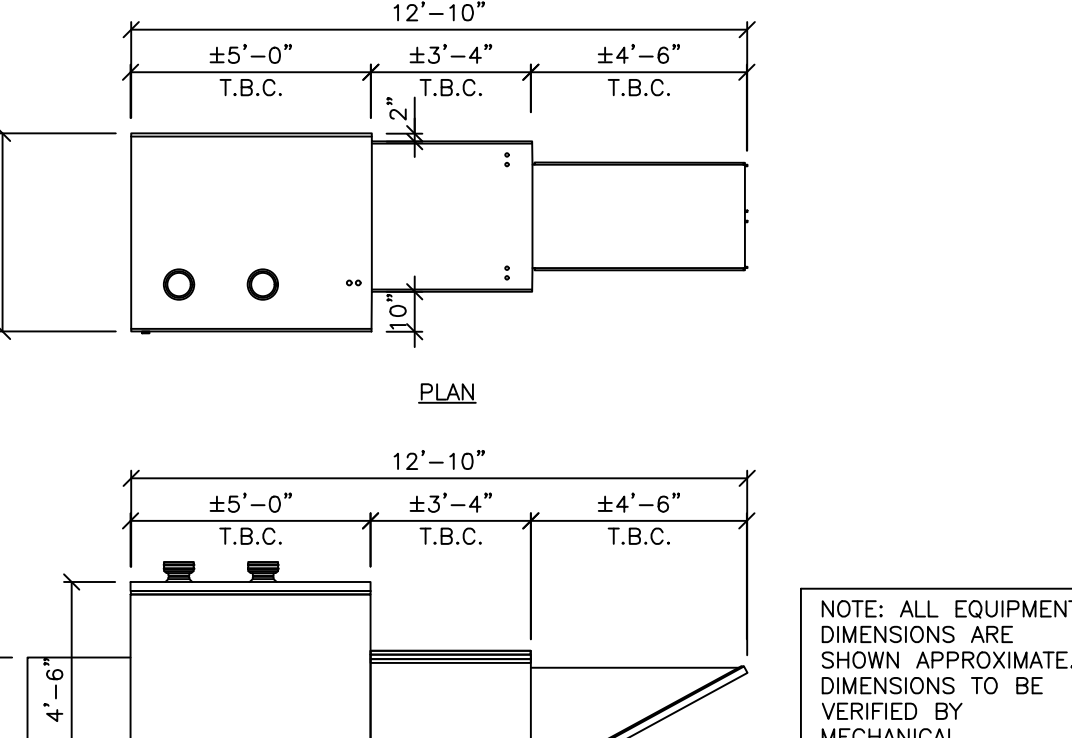
12 TYP. PLAN SECTION
 S-1 SCALE 1" = 1' 0"



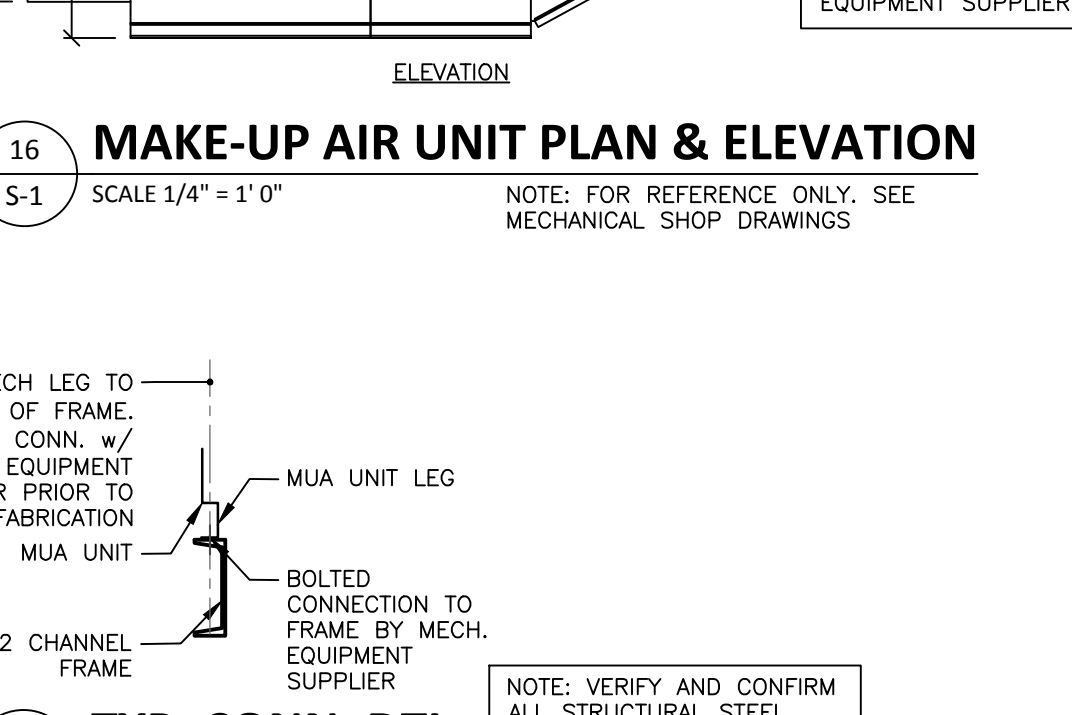
9 TYP. BRACE DETAIL
 S-1 SCALE 1" = 1' 0"



14 TYP. PLAN SECTION @ BRACE LOCATIONS
 S-1 SCALE 1" = 1' 0"



16 MAKE-UP AIR UNIT PLAN & ELEVATION
 S-1 SCALE 1/4" = 1' 0"



17 TYP. CONN. DTL.
 S-1 SCALE 1" = 1' 0"

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 CERTIFICATE OF AUTHORIZATION
 No. 124
 Permission to Consult held by:
 DISCIPLINE: SASK. REG. NO.: SIGNATURE: [Signature]
 P. T. MCGINN
 REGINA

Any representations in the tender documents are for the general information of bidders and are not in any way warranted or guaranteed by or on behalf of the owner or the owner's consultants and its subcontractors' employees, and neither the owner nor its consultants or its employees, shall be liable for any representations negligent or otherwise contained in the documents. These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design professional has not entered into a contract. The contractor shall check all dimensions, elevations and other data as represented on all drawings in the set for consistency and correctness and report to the consultant any discrepancies prior to proceeding with construction. Any costs to the contractor arising from failure to execute this requirement is a cost to the contractor and not to the owner nor the consultant. This term supercedes the specifications. All construction work to be completed in accordance with all applicable code and requirements of all utilities as set out by governing authorities.

Project Title: **AAFC CROP SERVICES BUILDING #21 DUST COLLECTION SYSTEM**
 INDIAN HEAD, SASKATCHEWAN

NOTE: ALL EQUIPMENT DIMENSIONS ARE SHOWN APPROXIMATE. DIMENSIONS TO BE VERIFIED BY MECHANICAL EQUIPMENT SUPPLIER.

Issue Record:
 Revisions:

MECHANICAL EQUIPMENT SUPPORT PAD PLANS SECTIONS & DETAILS

Designed By: MEL Scale: AS INDICATED
 Drawn By: JS Date: 2020.09.16
 Checked By: PTM Date: 2020.09.21
 Project No.: **5061**

S-1

Revision No.: - Date: -
 Issued For: **TENDER**
 Date Issued: 2020.09.22
 Date Plotted: 22/09/2020



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No. 124
Permitted to Consult held by:

DISCIPLINE SASK. REG. No. SIGNATURE
[Signature]
Professional Seal:



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Project Title:

**AAFC
CROP SERVICES
BUILDING #21
DUST COLLECTION
SYSTEM**

INDIAN HEAD, SASKATCHEWAN

NOTES:

Issue Record:

Revisions:

GENERAL NOTES

Designed By: MEL Scale: AS INDICATED
Drawn By: JS Date: 2020.09.16
Checked By: PTM Date: 2020.09.21
Project No: **5061**

S-2

Revision No.: - Date: -

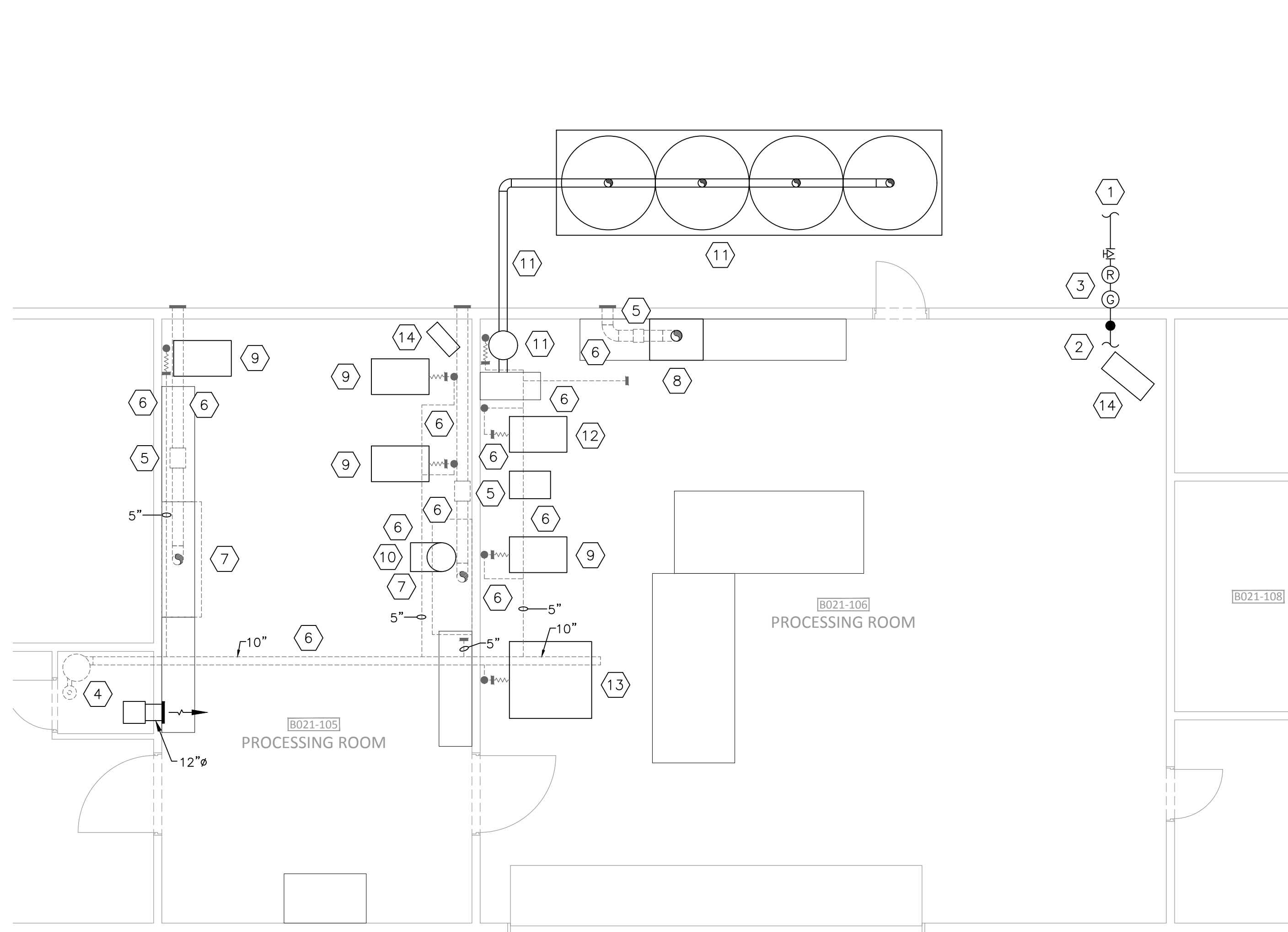
Issued For: **TENDER**

Date Issued: 2020.09.22

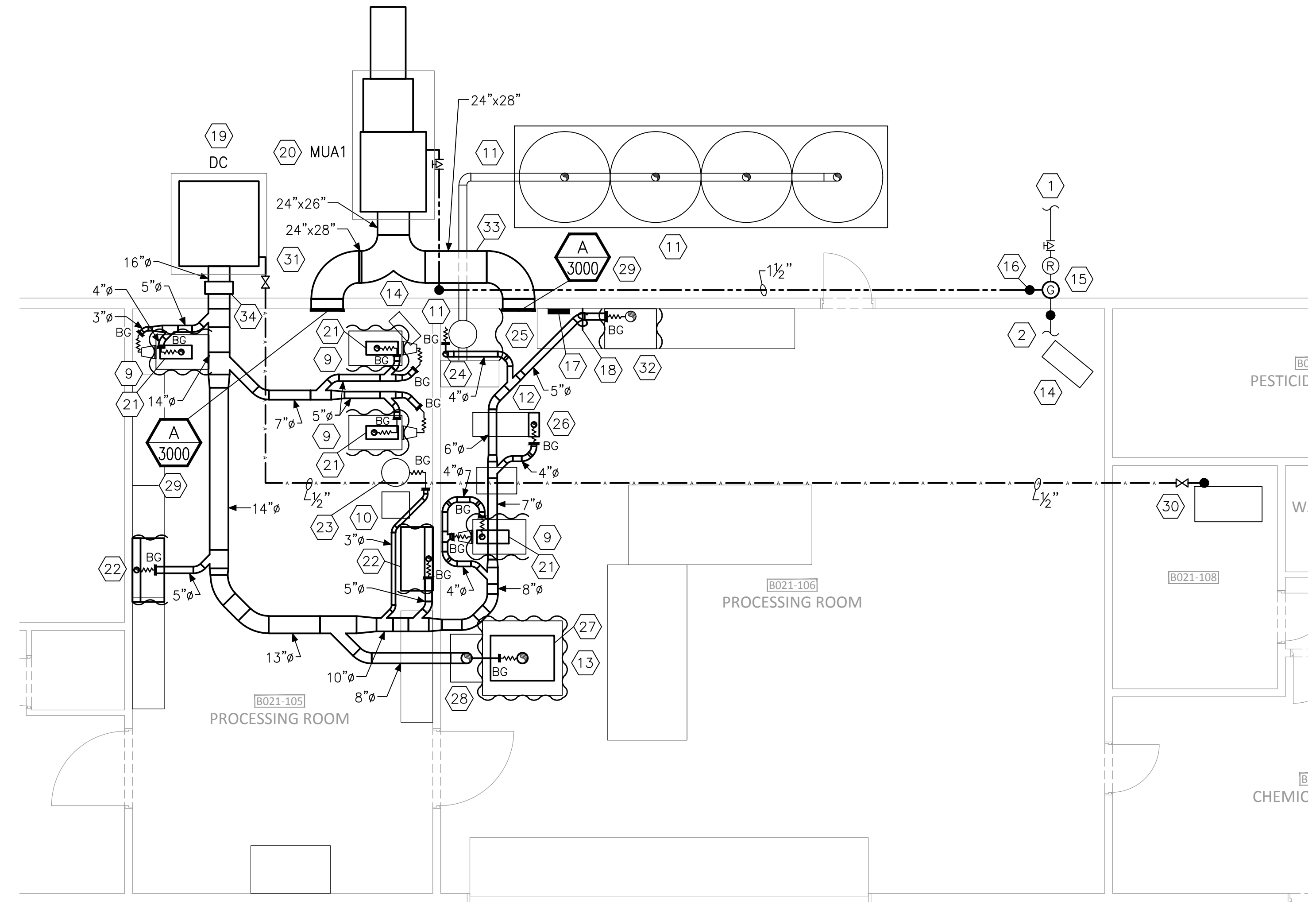
Date Plotted: 22/09/2020

| GENERAL NOTES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------|----------|---------|--------|-------|-------|--|-----------|--------|---------|----|-------|----------------------------------|----|----|----|-------|-----|----------|-----|-----|-----|-----|-----|------------|-----|-----|-----|-----|-----|---|-------------------------------|-----|---------------------|-----|----------------------|-----|----------------------------|-----|---------------------|------------|--------------|---------------|--------------------------|-----------|--------------|-----------|-------------|------|
| <p>GENERAL</p> <p>1. CONTRACTOR IS TO CHECK AND VERIFY ALL SITE CONDITIONS AND DIMENSIONS. REPORT ANY VARIANCES ON OR AGAINST THE DRAWINGS TO THE ENGINEER.</p> <p>2. CONTRACTOR IS TO CONFIRM ALL BUILDING GRADE ELEVATIONS ON SITE AGAINST THE DRAWINGS.</p> <p>3. CONTRACTOR IS TO OBTAIN APPROVAL FROM THE GOVERNING JURISDICTION AND OBTAIN A BUILDING PERMIT.</p> <p>4. CONSTRUCTION IS TO BE IN FULL COMPLIANCE WITH THE NATIONAL BUILDING CODE (2015).</p> <p>5. ENGINEER IS ENGAGED BY THE OWNER, TO PROVIDE PERIODIC INSPECTIONS AND IS THUS TAKING RESPONSIBILITY FOR DESIGN AND CONSTRUCTION IN PLACE.</p> <p>6. ANY CHANGES TO THE FRAMING OR FOUNDATION DESIGN OR LAYOUT REQUIRES THE ENGINEER'S REVIEW.</p> <p>7. CONTRACTOR IS TO GUARD AGAINST: EXCESSIVE DRYING OR WETNESS OF THE EXCAVATION PRIOR TO POURING CONCRETE SLABS & FOUNDATIONS; FREEZING OF EXCAVATED BASE AND FREEZING OF CONCRETE ONCE IN PLACE.</p> <p>1. FOUNDATIONS</p> <p>.1 ALL NEW STRUCTURAL WORK, INCLUDING REQUIREMENTS FOR WIND, HAS BEEN DESIGNED IN ACCORDANCE WITH THE NATIONAL BUILDING CODE 2015.</p> <p>.2 ALL CONCRETE STRENGTHS SPECIFIED ON PLAN ARE FOR STRUCTURAL REQUIREMENTS ONLY. CONCRETE MIX TO BE DESIGNED WITH A MAXIMUM PERMISSIBLE CEMENT-WATER RATIO IN ACCORDANCE TO WITH TABLE 7 OF CSA CAN3-A23.1-M90</p> <p>.3 ALL FOUNDATIONS SHALL BE SYMMETRICAL UNDER COLUMNS AND WALLS UNLESS NOTED OTHERWISE.</p> <p>.4 REINFORCING STEEL IN FOUNDATIONS TO BE CSA G30.18 DEFORMED BARS, GRADE 400.</p> <p>.5 BACKFILL BELOW SLAB-ON-GRADE TO BE GRANULAR MATERIALS COMPACTED TO 98% STANDARD PROCTOR DRY DENSITY. RESULTS OF COMPACTION TO BE REPORTED TO THIS OFFICE. ALSO SEE SOIL REPORT FOR RECOMMENDATIONS.</p> <p>.6 DO NOT USE ADMIXTURES, STANDARD WATER REDUCERS OR SUPER PLASTICIZERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.</p> <p>.7 DO NOT ADD WATER TO THE CONCRETE ON SITE UNLESS AUTHORIZED BY THE ENGINEER.</p> <p>.8 CONCRETE TESTING (AS SPECIFIED IN SECTION 03300) TEST CONCRETE IN ACCORDANCE WITH CSA A23.2.</p> <table border="1"> <thead> <tr> <th>TYPE/LOCATION</th> <th>STRENGTH</th> <th>CEMENT</th> <th>AGGREG</th> <th>SLUMP</th> <th>TOTAL</th> </tr> <tr> <th></th> <th>F'c (MPa)</th> <th>SYMBOL</th> <th>MAX 9mm</th> <th>mm</th> <th>AIR %</th> </tr> </thead> <tbody> <tr> <td>Grade Supported Slabs (Exterior)</td> <td>32</td> <td>50</td> <td>20</td> <td>50-75</td> <td>4-7</td> </tr> </tbody> </table> <p>NO AIR ENTRAINMENT ALLOWED IN INTERIOR SLABS WHERE POWER TROWELLING IS REQUIRED. AIR ENTRAINMENT IS REQUIRED FOR EXTERIOR CONCRETE PADS. (POWER TROWELLING IS NOT ACCEPTABLE) CONCRETE STRENGTH FOR ALL CONCRETE INTERFACED WITH SOIL SHALL HAVE 32MPa STRENGTH TO SATISFY CSA REQUIREMENTS WHEN SOILS GEOTECHNICAL REPORT SPECIFIES SULPHATE RESISTANT CONCRETE.</p> <p>.9 CONSOLIDATE ALL CONCRETE USING MECHANICAL VIBRATORS.</p> <p>.10 PROTECT CONCRETE FROM ADVERSE WEATHER CONDITIONS IN ACCORDANCE WITH CSA A23.1 OR AS DETERMINED BY THE ENGINEER.</p> <p>.11 CONSTRUCT FORMWORK IN ACCORDANCE WITH WCB REGULATIONS AND CSA S269.1. FORMWORK DESIGN IS THE RESPONSIBILITY OF THE CONTRACTOR</p> <p>.12 PROVIDE CONCRETE AND CO-OPERATE IN THE PREPARATION OF TEST CYLINDERS. TAKE THREE CYLINDERS FOR EVERY 75 CU METERS OR LESS OF CONCRETE PLACED. MINIMUM ONE TEST OF THREE CYLINDERS FOR EACH POUR.</p> <p>.13 THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES IN SOIL CONDITIONS DURING PILING AND EXCAVATION.</p> <p>.14 TIE ALL DOWELS AND ANCHOR BOLTS IN PLACE BEFORE POURING CONCRETE. USE TEMPLATES TO ENSURE CORRECT PLACEMENT.</p> <p>.15 SEE BUILDING DESIGN DRAWINGS FOR GRADE ELEVATIONS AND DRAINAGE SLOPES.</p> <p>.16 SEE SITE PLAN FOR EXTERIOR CONCRETE ELEVATIONS.</p> <p>.17 ALL CONCRETE SHALL COMPLY WITH ALL LOCAL CODES AND CAN3-A23.1</p> <p>.18 NO CONCRETE POURING SHALL BE UNDERTAKEN WITHOUT THE APPROVAL OF THE ENGINEER OR ENGINEER'S REPRESENTATIVE.</p> <p>.19 CO-ORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS FOR ALL OPENINGS, DIMENSIONS AND OTHER DATA FOR CATCH BASINS, TANKS, DRAINS, AND SLAB RECESS UNDER EQUIPMENT.</p> <p>.20 INCORPORATE HIGH SULPHATE HYDRAULIC CEMENT, TYPE 50 HS OR HSB FOR ALL CONCRETE IN DIRECT CONTACT WITH SOIL. CLASS EXPOSURE S-2.</p> <p>2. REINFORCEMENT</p> <p>.1 NEW DEFORMED BARS TO CSA G30.18 GRADE 400. WELDED WIRE FABRIC TO CSA G30.5.</p> <p>.2 PLACE REINFORCEMENT TO CSA A23.1. TIE ALL BARS SECURELY IN PLACE TO PREVENT DISPLACEMENT. SUPPORT SLAB REINFORCEMENT ON SUITABLE CHAIRS OR SUPPORTS AT MAXIMUM 4 FT CENTRES. PROVIDE CORNER BARS TO MATCH HORIZ. WALL OR BEAM REINFORCEMENT.</p> <p>.3 PROVIDE CLEAR CONCRETE COVER FOR REINFORCEMENT AS FOLLOWS: SURFACES POURED AGAINST GROUND - 3" FORMED SURFACES EXPOSED TO WEATHER OR GROUND - 1" SPLICE REINFORCEMENT AS FOLLOWS (UNLESS NOTED OTHERWISE):</p> <table border="1"> <thead> <tr> <th>BAR SIZE</th> <th>10M</th> <th>15M</th> <th>20M</th> <th>25M</th> <th>30M</th> </tr> </thead> <tbody> <tr> <td>LAP SPLICE</td> <td>18"</td> <td>24"</td> <td>30"</td> <td>48"</td> <td>56"</td> </tr> </tbody> </table> <p>INCREASE LAP 20% FOR BAR SPACING LESS THAN 6".</p> | TYPE/LOCATION | STRENGTH | CEMENT | AGGREG | SLUMP | TOTAL | | F'c (MPa) | SYMBOL | MAX 9mm | mm | AIR % | Grade Supported Slabs (Exterior) | 32 | 50 | 20 | 50-75 | 4-7 | BAR SIZE | 10M | 15M | 20M | 25M | 30M | LAP SPLICE | 18" | 24" | 30" | 48" | 56" | <p>3. STRUCTURAL STEEL</p> <p>.1 FABRICATE AND ERECT STRUCTURAL STEEL TO CSA S16.1.</p> <p>.2 PROVIDE STRUCTURAL STEEL TO CSA G40.21 WITH THE FOLLOWING GRADES:</p> <table border="1"> <thead> <tr> <th>WIDE FLANGE BEAMS AND COLUMNS</th> <th>50W</th> </tr> </thead> <tbody> <tr> <td>CHANNELS AND ANGLES</td> <td>44W</td> </tr> <tr> <td>HSS SECTIONS CLASS C</td> <td>50W</td> </tr> <tr> <td>STRUCTURAL BARS AND PLATES</td> <td>44W</td> </tr> <tr> <td>MISCELLANEOUS STEEL</td> <td>36W OR 44W</td> </tr> <tr> <td>PIPE COLUMNS</td> <td>ASTM A53 GR.B</td> </tr> <tr> <td>ERECTOR BOLTS - MIN 3/4"</td> <td>ASTM A325</td> </tr> <tr> <td>ANCHOR BOLTS</td> <td>ASTM A307</td> </tr> <tr> <td>GALVANIZING</td> <td>G164</td> </tr> </tbody> </table> <p>.3 SUBMIT SHOP DRAWINGS TO THE ENGINEER AND RECEIVE APPROVAL PRIOR TO FABRICATION. SHOW ALL DETAILS INCLUDING FIELD WELDS, AND MATERIAL SPECIFICATIONS. SHOP DRAWINGS TO BE SEALED BY A PROFESSIONAL ENGINEER IN PROVINCE OF CONSTRUCTION SITE FOR DESIGN OF CONNECTIONS AND WELDING.</p> <p>.4 DESIGN OF CONNECTIONS TO BE BY STEEL FABRICATOR UNLESS DETAILED ON THE DRAWINGS. USE MIN. 2 BOLTS PER CONNECTION AND DESIGN FOR BEARING CONNECTIONS WITH THREADS INCLUDED IN SHEAR PLANE.</p> <p>.5 TOUCH UP ALL FIELD WELDS WITH PRIMER AFTER SLAG IS REMOVED.</p> <p>.6 MINIMUM SIZE OF FIELD WELDS: 1/16" LESS THAN THE THICKNESS OF MATERIAL BUT NOT LESS THAN 1/4".</p> <p>.7 WELD REINFORCEMENT STEEL TO CSA W186. USE WELDABLE REINFORCEMENT TO CSA G30.18 GRADE 400.</p> <p>.8 WELD TO CSA W59 BY FABRICATORS QUALIFIED TO CSA W47.1.</p> <p>.9 TIGHTEN ALL BOLTS WITH IMPACT WRENCH.</p> <p>.10 USE ONE COAT OF OSO/OPMA STANDARDS 1-73 OR 2-75 PRIMER FOR ALL STEEL SURFACES EXPOSED DIRECTLY TO WEATHER AND FOR STEEL IN UNHEATED BUT COVERED AREAS SUCH AS CANOPIES. PRIMERS MAY BE EXCLUDED ONLY WHEN SPECIFICALLY APPROVED BY THE OWNER AND THE ENGINEER.</p> <p>.11 STRUCTURAL STEEL SHALL CONFORM TO CSA STANDARD G40.21-M87 GRADE 350W - HSS 350W, CLASS C.</p> <p>.12 STEEL FABRICATOR TO BE CERTIFIED IN DIVISION 1 OR 2 BY THE CANADIAN WELDING BUREAU IN ACCORDANCE WITH CSA W47.1.</p> <p>.13 FIELD WELDING BY COMPANIES CERTIFIED BY THE CWB AS PER W47.1 DIVISIONS 1,2 &3.</p> <p>.14 STRUCTURAL STEEL BOLTS CONFORMING TO ASTM STANDARD A325 WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED SUBJECT TO REVIEW AND APPROVAL BY THE STRUCTURAL ENGINEER.</p> <p>.15 ANCHOR BOLTS UP TO 3/4" DIA TO CONFORM TO ASTM STANDARD A307</p> <p>.16 GROUT UNDER BASE PLATES TO BE A NON-SHRINKING, NON-METALLIC, PRE-BLENDED GROUTING COMPOUND CAPABLE OF A MIN. COMPRESSIVE STRENGTH OF 20MPa AT 3 DAYS AND 50 MPa AT 28 DAYS.</p> <p>.17 WELDING ELECTRODES SHALL BE LOW HYDROGEN.</p> <p>.18 REMOVE ALL WELDING SLAG BEFORE PAINTING.</p> <p>.19 ALL AREAS TO RECEIVE WELDING TO BE CLEANED OF GREASE OR PAINT.</p> | WIDE FLANGE BEAMS AND COLUMNS | 50W | CHANNELS AND ANGLES | 44W | HSS SECTIONS CLASS C | 50W | STRUCTURAL BARS AND PLATES | 44W | MISCELLANEOUS STEEL | 36W OR 44W | PIPE COLUMNS | ASTM A53 GR.B | ERECTOR BOLTS - MIN 3/4" | ASTM A325 | ANCHOR BOLTS | ASTM A307 | GALVANIZING | G164 |
| TYPE/LOCATION | STRENGTH | CEMENT | AGGREG | SLUMP | TOTAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | F'c (MPa) | SYMBOL | MAX 9mm | mm | AIR % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Grade Supported Slabs (Exterior) | 32 | 50 | 20 | 50-75 | 4-7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BAR SIZE | 10M | 15M | 20M | 25M | 30M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LAP SPLICE | 18" | 24" | 30" | 48" | 56" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WIDE FLANGE BEAMS AND COLUMNS | 50W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CHANNELS AND ANGLES | 44W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HSS SECTIONS CLASS C | 50W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STRUCTURAL BARS AND PLATES | 44W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MISCELLANEOUS STEEL | 36W OR 44W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PIPE COLUMNS | ASTM A53 GR.B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ERECTOR BOLTS - MIN 3/4" | ASTM A325 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ANCHOR BOLTS | ASTM A307 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GALVANIZING | G164 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| GENERAL STRUCTURAL NOTES | | | | | | | | | | | | | |
|---|--|--------------------------------|--------------------------|--------------------------------|--------------------------|-------------------------|-----|---------------------|--------------|------------------|-----|-----|--------------|
| (THE FOLLOWING APPLY UNLESS NOTED OTHERWISE ON DRAWINGS) | | | | | | | | | | | | | |
| CRITERIA ALL MATERIALS, WORKMANSHIP, DESIGN AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS AND THE NATIONAL BUILDING CODE OF CANADA (NBC), 2015 EDITION. | | | | | | | | | | | | | |
| GENERAL CONDITIONS STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ALL DESIGN DRAWINGS FOR BIDDING AND CONSTRUCTION. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS WITH BUILDING DESIGN DRAWINGS FOR COMPATIBILITY, AND SHALL NOTIFY ENGINEER OF ALL DISCREPANCIES PRIOR TO CONSTRUCTION. | | | | | | | | | | | | | |
| IN THE EVENT OF CONFLICTS BETWEEN THE STRUCTURAL DRAWINGS AND THE PROJECT SPECIFICATIONS, THE STRUCTURAL DRAWINGS SHALL CONTROL. | | | | | | | | | | | | | |
| SEE BUILDING DESIGN DRAWINGS FOR EXACT LOCATIONS AND DIMENSIONS OF DOOR AND WINDOW OPENINGS IN ALL WALLS. SEE MECHANICAL DRAWINGS FOR SIZE AND LOCATION OF MISCELLANEOUS MECHANICAL OPENINGS THROUGH WALLS AND FLOORS. SEE BUILDING DESIGN DRAWINGS FOR ALL GROOVES, NOTCHES, CHAMFERS, FEATURE STRIPS, COLOR, TEXTURE AND OTHER FINISH DETAILS. | | | | | | | | | | | | | |
| CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR THE STRUCTURE AND STRUCTURAL COMPONENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THESE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK. | | | | | | | | | | | | | |
| DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED SUBJECT TO REVIEW AND APPROVAL BY THE STRUCTURAL ENGINEER. | | | | | | | | | | | | | |
| MATERIAL SUBSTITUTIONS FOR PRODUCTS SPECIFIED IN THE PLANS AND NOTES MAY BE SUBMITTED BY THE CONTRACTOR FOR REVIEW BY THE STRUCTURAL ENGINEER. SUBSTITUTION SUBMITTALS SHALL IDENTIFY EXACTLY WHAT PRODUCTS ARE TO BE SUBSTITUTED, AND INCLUDE AN ICC EVALUATION SERVICE REPORT (OR EQUIVALENT) DEMONSTRATING EQUIVALENT OR GREATER LOAD CAPACITIES THAN THE SUBSTITUTED PRODUCT. | | | | | | | | | | | | | |
| CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ON SHOP DRAWINGS ONLY WILL NOT SATISFY THIS REQUIREMENT. | | | | | | | | | | | | | |
| THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY REGULATIONS. SHORING AND RESHORING SHALL BE DESIGNED BY A QUALIFIED DESIGNER AND THE ERECTED SHORING SHALL BE INSPECTED BY A REGISTERED STRUCTURAL ENGINEER EXPERIENCED IN THE DESIGN OF SHORING SYSTEMS, WHO SHALL SUBMIT AN INSPECTION REPORT TO THE ENGINEER. FORM WORK SHALL NOT BE REMOVED UNTIL THE CONCRETE HAS REACHED ITS DESIGN STRENGTH AS INDICATED IN THE CONCRETE NOTES. | | | | | | | | | | | | | |
| QUALITY CONTROL SHOP DRAWINGS FOR THE FOLLOWING ITEMS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW TWO WEEKS PRIOR TO FABRICATION. | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>SUBMITTAL</th> <th>SUBMITTAL REQUIRED</th> <th>STAMPED BY REGISTERED ENGINEER</th> <th>ENGINEERING CALCULATIONS</th> </tr> </thead> <tbody> <tr> <td>CONCRETE REINFORCING</td> <td>YES</td> <td>NOT REQUIRED</td> <td>NOT REQUIRED</td> </tr> <tr> <td>STRUCTURAL STEEL</td> <td>YES</td> <td>YES</td> <td>NOT REQUIRED</td> </tr> </tbody> </table> | SUBMITTAL | SUBMITTAL REQUIRED | STAMPED BY REGISTERED ENGINEER | ENGINEERING CALCULATIONS | CONCRETE REINFORCING | YES | NOT REQUIRED | NOT REQUIRED | STRUCTURAL STEEL | YES | YES | NOT REQUIRED |
| SUBMITTAL | SUBMITTAL REQUIRED | STAMPED BY REGISTERED ENGINEER | ENGINEERING CALCULATIONS | | | | | | | | | | |
| CONCRETE REINFORCING | YES | NOT REQUIRED | NOT REQUIRED | | | | | | | | | | |
| STRUCTURAL STEEL | YES | YES | NOT REQUIRED | | | | | | | | | | |
| SHOP DRAWINGS OF BIDDER-DESIGN AND PRE-ENGINEERED COMPONENTS SHALL INCLUDE THE DESIGNING PROFESSIONAL ENGINEER'S STAMP, AS INDICATED ABOVE. THE ENGINEER SHALL BE REGISTERED IN THE PROVINCE IN WHICH THE PROJECT IS LOCATED. THE SUBMITTAL WILL BE SUBJECT TO A CURSORY REVIEW BY THE ENGINEER OF RECORD FOR LOADS IMPOSED ON THE BASIC STRUCTURE. THE COMPONENT DESIGNER IS RESPONSIBLE FOR CODE CONFORMANCE AND ALL NECESSARY CONNECTIONS NOT SPECIFICALLY CALLED OUT ON THE BUILDING DESIGN OR STRUCTURAL DRAWINGS. THE FOLLOWING CERTIFICATION SHALL BE INCLUDED ADJACENT TO THE ENGINEER'S STAMP ON ALL SUBMITTALS. | | | | | | | | | | | | | |
| I, _____ A LICENSED ENGINEER IN THE PROVINCE IN WHICH THE PROJECT IS LOCATED, DO HEREBY CERTIFY THAT I HAVE REVIEWED THE CONTRACT DOCUMENTS AND HAVE, TO THE BEST OF MY KNOWLEDGE, INCORPORATED ALL OF THE DESIGN CRITERIA CONTAINED HEREIN. | | | | | | | | | | | | | |
| SHOP DRAWING REVIEW: DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER OF RECORD AND THEREFORE MUST BE VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL REVIEW AND STAMP DRAWINGS PRIOR TO REVIEW BY ENGINEER OF RECORD. SUBMITTALS SHALL INCLUDE A REPRODUCIBLE AND ONE COPY. THE REPRODUCIBLE WILL BE MARKED AND RETURNED. | | | | | | | | | | | | | |
| IN THE EVENT OF DEVIATIONS, DISCREPANCIES OR CONFLICTS BETWEEN APPROVED SHOP DRAWING SUBMITTALS AND THE CONTRACT DOCUMENTS, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL. | | | | | | | | | | | | | |
| ALL STRUCTURAL SYSTEMS COMPOSED OF COMPONENTS TO BE FIELD ERECTED SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE AND ERECTION, IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER. | | | | | | | | | | | | | |
| TRANSPORTATION AND SETTING, AND STRUCTURAL LOADING ASSOCIATED THEREWITH FOR MODULAR BUILDINGS SHALL BE DETERMINED AND ACCOUNTED FOR BY THE MANUFACTURER. | | | | | | | | | | | | | |
| ANCHORAGE TO CONCRETE CAST-IN-PLACE (CIP) ANCHORS SHALL HAVE A 90° HOOK WITH AN INSIDE RADIUS OF 3db PLUS AN EXTENSION OF 15 db AT THE FREE END. CIP ANCHORS IN MASONRY SHALL BE SECURED IN PLACE PRIOR TO GROUTING. PROVIDE 1" GROUT MINIMUM AROUND ALL BOLTS IN MASONRY. | | | | | | | | | | | | | |
| CIP ANCHORS IN CONCRETE MAY BE PLACED WHILE THE CONCRETE IS IN A PLASTIC STATE WHEN: 1) THE ANCHORS ARE NOT DETAILED OR SPECIFIED AS HOOKED AROUND OR TIED TO REINFORCEMENT WITHIN THE CONCRETE; 2) THE ANCHORS ARE MAINTAINED IN THE CORRECT POSITION WHILE THE CONCRETE REMAINS PLASTIC, AND THE CONCRETE IS PROPERLY CONSOLIDATED AROUND THE ANCHOR. | | | | | | | | | | | | | |
| EXPANSION BOLTS INTO CONCRETE SHALL BE 'KWIK BOLT TZ' AND THREADED EXPANSION INSERTS INTO CONCRETE SHALL BE SLEEVE ANCHORS, AS MANUFACTURED BY HILTI CORPORATION. INSTALL IN STRICT ACCORDANCE WITH ICC-ES REPORT ESR-1917, INCLUDING MINIMUM EMBEDMENT REQUIREMENTS. | | | | | | | | | | | | | |
| EPOXY-GROUTED ANCHORS (THREADED ROD OR REINFORCING BAR) SHALL BE GROUTED WITH 'SET-XP EPOXY ADHESIVE' BY SIMPSON STRONG-TIE. INSTALL IN STRICT ACCORDANCE WITH ICC-ES REPORT ESR-2508. HOLES FOR EPOXY ANCHORS SHALL BE THOROUGHLY CLEANED WITH A NYLON BRUSH AND PRESSURIZED AIR OR WATER, IN STRICT ACCORDANCE WITH ESR-2508. | | | | | | | | | | | | | |
| ALL THREADED ROD ANCHORS SHALL CONFORM TO ASTM SPECIFICATION A36, Fy=248 MPA (36 KSI). | | | | | | | | | | | | | |
| ANCHOR BOLT TYPES MAY BE SELECTED BY THE CONTRACTOR AS PER THE FOLLOWING CRITERIA AND THE REQUIREMENTS OF DIVISION 6.1 - CHEMICALLY TREATED WOOD AND CORROSION OF CONNECTORS AND FASTENERS. | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>TYPE OF ANCHORAGE</th> <th>TYPE OF ANCHOR</th> </tr> </thead> <tbody> <tr> <td>POST & COLUMN BASES</td> <td>CIP, EXPANSION* OR EPOXY</td> </tr> <tr> <td>HIGH-STRENGTH ANCHORAGE</td> <td>CIP</td> </tr> <tr> <td>EQUIPMENT ANCHORAGE</td> <td>CIP OR EPOXY</td> </tr> </tbody> </table> | TYPE OF ANCHORAGE | TYPE OF ANCHOR | POST & COLUMN BASES | CIP, EXPANSION* OR EPOXY | HIGH-STRENGTH ANCHORAGE | CIP | EQUIPMENT ANCHORAGE | CIP OR EPOXY | | | | |
| TYPE OF ANCHORAGE | TYPE OF ANCHOR | | | | | | | | | | | | |
| POST & COLUMN BASES | CIP, EXPANSION* OR EPOXY | | | | | | | | | | | | |
| HIGH-STRENGTH ANCHORAGE | CIP | | | | | | | | | | | | |
| EQUIPMENT ANCHORAGE | CIP OR EPOXY | | | | | | | | | | | | |
| * EXPANSION ANCHORS MAY NOT BE USED WHERE THE ANCHOR IS EXPOSED TO EARTH OR WEATHER | | | | | | | | | | | | | |



1 MAIN FLOOR PLAN - DEMOLITION
SCALE: 3/16" = 1'-0"

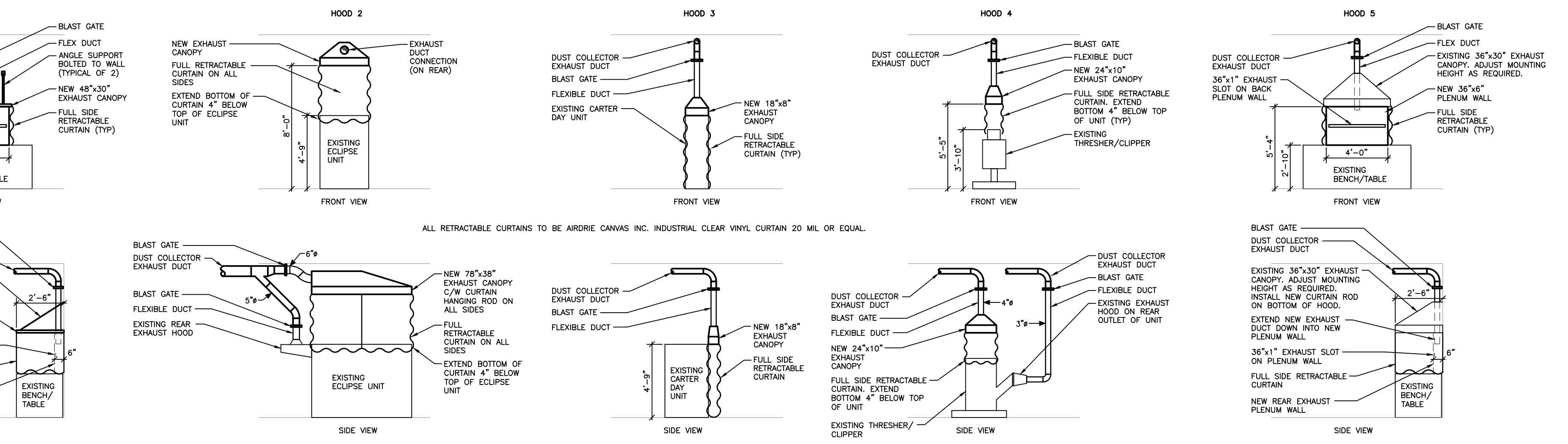


2 MAIN FLOOR PLAN - RENOVATED
SCALE: 3/16" = 1'-0"

MECHANICAL KEYNOTES (A) DENOTES KEYNOTE ON DWG.

- 1 EXISTING NATURAL GAS SERVICE CONTINUES BELOW GRADE.
- 2 EXISTING GAS LINE CONTINUES WITHIN BUILDING.
- 3 EXISTING GAS METER/REGULATOR TO BE UPGRADED TO SUIT NEW BUILDING GAS LOAD. REFER TO REVISED PLAN 2/M.1.
- 4 EXISTING DUST COLLECTOR TO BE REMOVED C/W WIRING, CONTROLS, ETC. AND BE SALVAGED TO OWNER.
- 5 EXISTING EXHAUST FAN TO BE REMOVED C/W WIRING AND CONTROLS.
- 6 EXISTING DUCTWORK TO BE REMOVED.
- 7 EXISTING EXHAUST CANOPY HOOD TO BE REMOVED.
- 8 EXISTING EXHAUST CANOPY HOOD TO REMAIN.
- 9 EXISTING CLIPPER/THRESHER UNIT TO REMAIN.
- 10 EXISTING HULLER UNIT TO REMAIN.
- 11 EXISTING HOPPER TO REMAIN C/W FEED PIPE TO EXTERIOR SILOS.
- 12 EXISTING CARTER DAY UNIT TO REMAIN.
- 13 EXISTING ECLIPSE THRESHER UNIT TO REMAIN.
- 14 EXISTING HOT WATER UNIT HEATER TO REMAIN.
- 15 EXISTING GAS METER/REGULATOR SET TO BE UPGRADED FOR A NEW TOTAL LOAD OF 1,020 FT³/HR AT OUNCE GAS PRESSURE. CONTRACTOR TO COORDINATE APPLICATION AND INSTALLATION OF UPGRADED GAS SERVICE WITH OWNER AND GAS UTILITY.
- 16 NEW GAS LINE TO RISE UP FROM GAS METER TO RUN TIGHT ALONG U/S OF EAVES ON WALL. SUPPORT GAS LINE ALONG WALL WITH UNISTRUT CHANNELS AND CLAMPS ON 6FT CENTERS.
- 17 MAKE-UP AIR UNIT REMOTE CONTROL PANEL TO BE MOUNTED ON WALL.
- 18 DUST COLLECTOR ON/OFF SWITCH TO BE MOUNTED ON WALL.
- 19 NEW DUST COLLECTOR TO BE INSTALLED ON CONCRETE PAD ON GRADE. REFER TO DETAIL 5/M.2.
- 20 NEW MAKE-UP AIR UNIT TO BE INSTALLED ON STEEL STAND ON GRADE. REFER TO DETAIL 4/M.2.
- 21 NEW EXHAUST CANOPY C/W DUST COLLECTOR CONNECTION FOR EXISTING CLIPPER/THRESHER UNIT. REFER TO HOOD 4 DETAIL 3/M.1.
- 22 NEW WORK STATION EXHAUST HOOD/ENCLOSURE C/W REAR PLENUM WALL AND SLOT INLET. REFER TO HOOD 1 DETAIL 3/M.1.
- 23 NEW 3" Ø DUST COLLECTOR DUCT TO BE INSTALLED INTO EXISTING DUST COLLECTION BARREL SERVING EXISTING HULLER UNIT. SEAL BARREL DUST TIGHT AROUND DUCT PENETRATION.
- 24 NEW 3" Ø DUST COLLECTOR DUCT DROP TO SERVE HOPPER ENCLOSURE. TERMINATE DUCT 2 FEET ABOVE TOP OF HOPPER.

- 25 INSTALL RETRACTABLE CURTAIN TO ENCLOSE HOPPER UNIT/AREA. CURTAIN TO BE FULL HEIGHT C/W CURTAIN RAIL AND ACCESSORIES.
- 26 NEW EXHAUST CANOPY C/W DUST COLLECTOR CONNECTION FOR EXISTING CARTER DAY UNIT. REFER TO HOOD 3 DETAIL 3/M.1.
- 27 NEW EXHAUST CANOPY C/W DUST COLLECTOR CONNECTION FOR EXISTING ECLIPSE THRESHER UNIT. REFER TO HOOD 2 DETAIL 3/M.1.
- 28 CONNECT NEW 5" Ø DUST COLLECTOR DUCT TO EXISTING REAR HOOD SERVING ECLIPSE THRESHER UNIT. REFER TO HOOD 2 DETAIL 3/M.1.
- 29 NEW MAKE-UP AIR SUPPLY GRILLE TO BE INSTALLED FLUSH WITH WALL UP AS HIGH AS POSSIBLE.
- 30 EXISTING AIR COMPRESSOR TO REMAIN. NEW 1/2" SCHEDULE 40 BLACK STEEL COMPRESSED AIR LINE TO CONNECT TO EXISTING COMPRESSED AIR SUPPLY LINE TO SERVE NEW DUST COLLECTOR.
- 31 NEW 1/2" SCHEDULE 40 BLACK STEEL COMPRESSED AIR LINE TO CONNECT TO NEW DUST COLLECTOR AS PER MANUFACTURER'S REQUIREMENTS.
- 32 REFER TO HOOD 5 DETAIL 3/M.1 FOR MODIFICATIONS/ADDITIONS TO EXISTING EXHAUST CANOPY.
- 33 INSULATE MAKE-UP AIR SUPPLY DUCT WITH 3" RIGID FIBREGLASS DUCT INSULATION WITH STUCCO EMBOSSED ALUMINUM JACKET.
- 34 EMERGENCY BLOWBACK DAMPER TO BE INSTALLED ON DUST COLLECTOR EXHAUST DUCT.



3 HOOD DETAILS
SCALE: N.T.S.

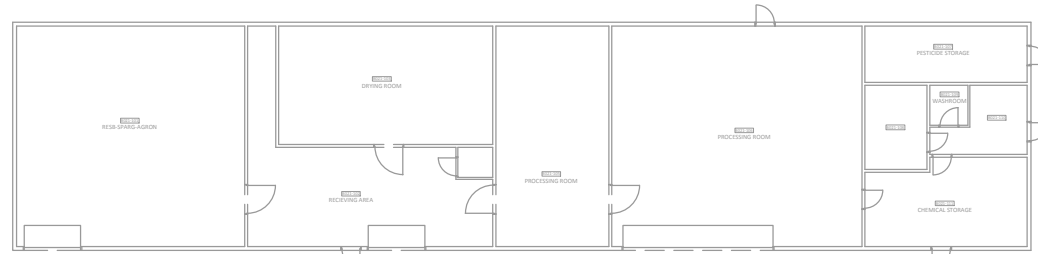
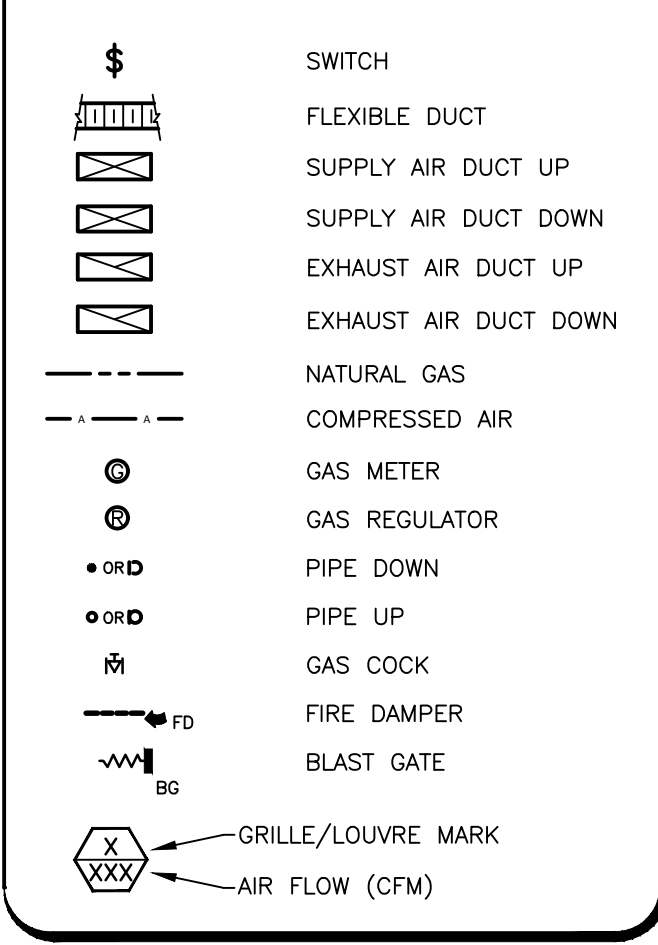
MECHANICAL GENERAL NOTES

1. ALL DUCTING SHOWN SCHEMATICALLY.
2. ALL DUCT SIZES ARE NET SIZES.
3. ALL DUCT TAKE-OFFS TO BE 45° CONICAL WITH BALANCING DAMPERS.
4. MAKE-UP AIR DUCT ELBOW RADII TO BE MINIMUM 1.5 TIMES THE TURNING DIMENSION.
5. DUST COLLECTION DUCT ELBOW RADII TO BE MINIMUM 2 TIMES THE TURNING DIMENSION.
6. ALL DUCTING TO BE INSTALLED IN A GOOD WORKMANSHIP LIKE MANNER AS PER SMACNA STANDARDS. ALL EXPOSED DUCTWORK TO BE SPIRAL ROUND.
7. COORDINATE ROUTING OF DUCTWORK WITH ELECTRICAL TO ENSURE ADEQUATE ACCESS TO ELECTRICAL SYSTEMS IS MAINTAINED AT THE HIGHEST POSSIBLE LEVEL.
8. INSULATE ALL EXHAUST DUCTWORK FOR A DISTANCE OF 10ft. FROM THE BUILDING OUTLET COMPLETE WITH 1/2" FOILBACK FIBREGLASS INSULATION TO BE CANVAS WRAPPED IN FINISHED AREAS ONLY.
9. ENSURE ALL VENT/EXHAUST OUTLETS ARE AT LEAST 10ft. AWAY FROM THE NEAREST FRESH AIR INTAKE.

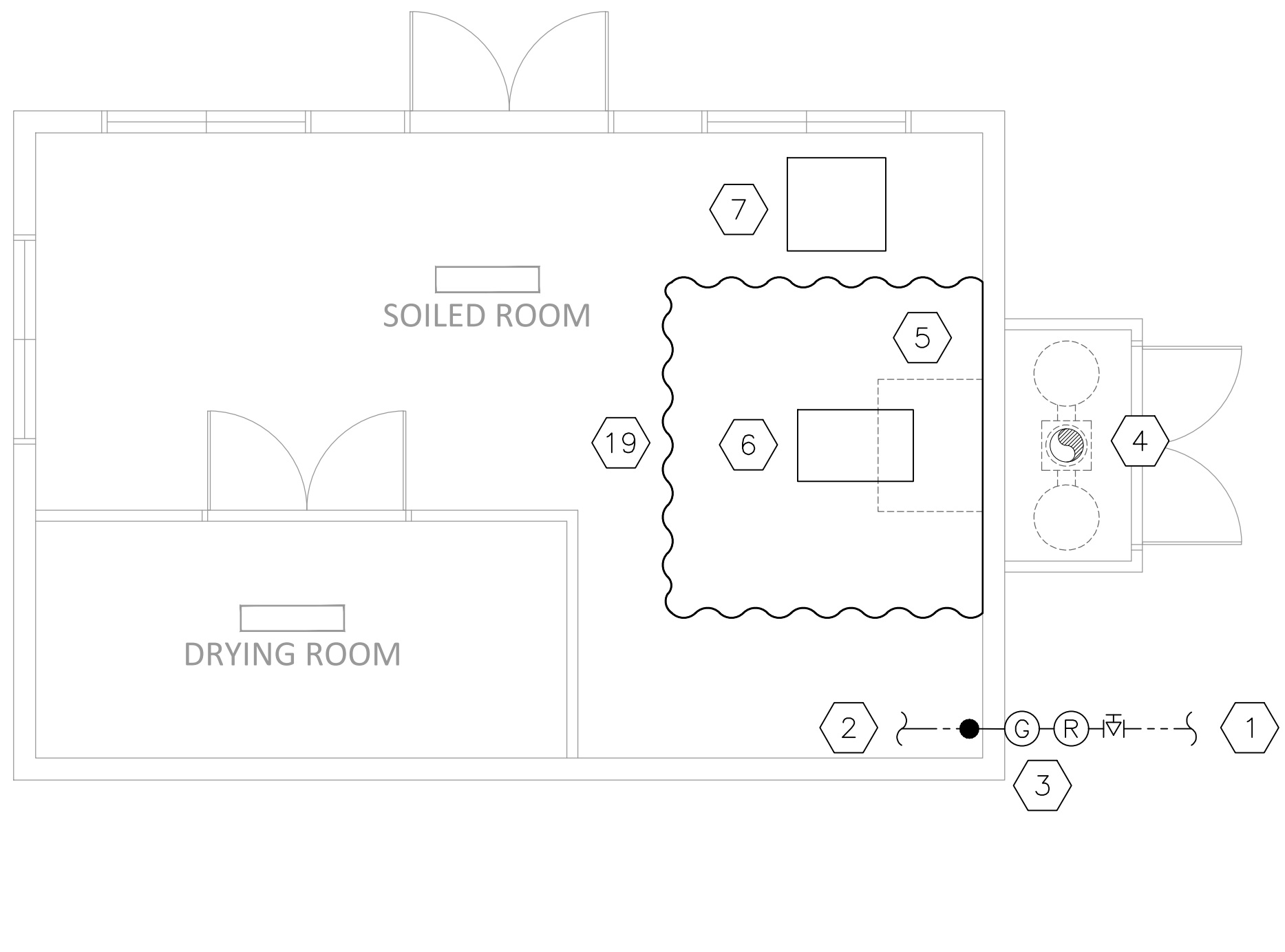
GRILLE / LOUVER SCHEDULE

| MARK | MAKE | MODEL | SIZE | FLOW RATE | DESCRIPTION | REMARKS |
|------|-----------|-----------------------|---------|-----------|---------------------|--|
| (A) | E.H.PRICE | 24"x28"/520/F/L/A/B12 | 24"x28" | AS NOTED | SUPPLY AIR GRILLE | OR EQUAL. MOUNT FLUSH WITH WALL. |
| (B) | E.H.PRICE | 888BL | 4" Ø | - | INTAKE AIR WALL CAP | OR EQUAL. C/W INSECT SCREEN LESS BACKDRAFT DAMPER. PAINT TO MATCH BUILDING EXTERIOR. |

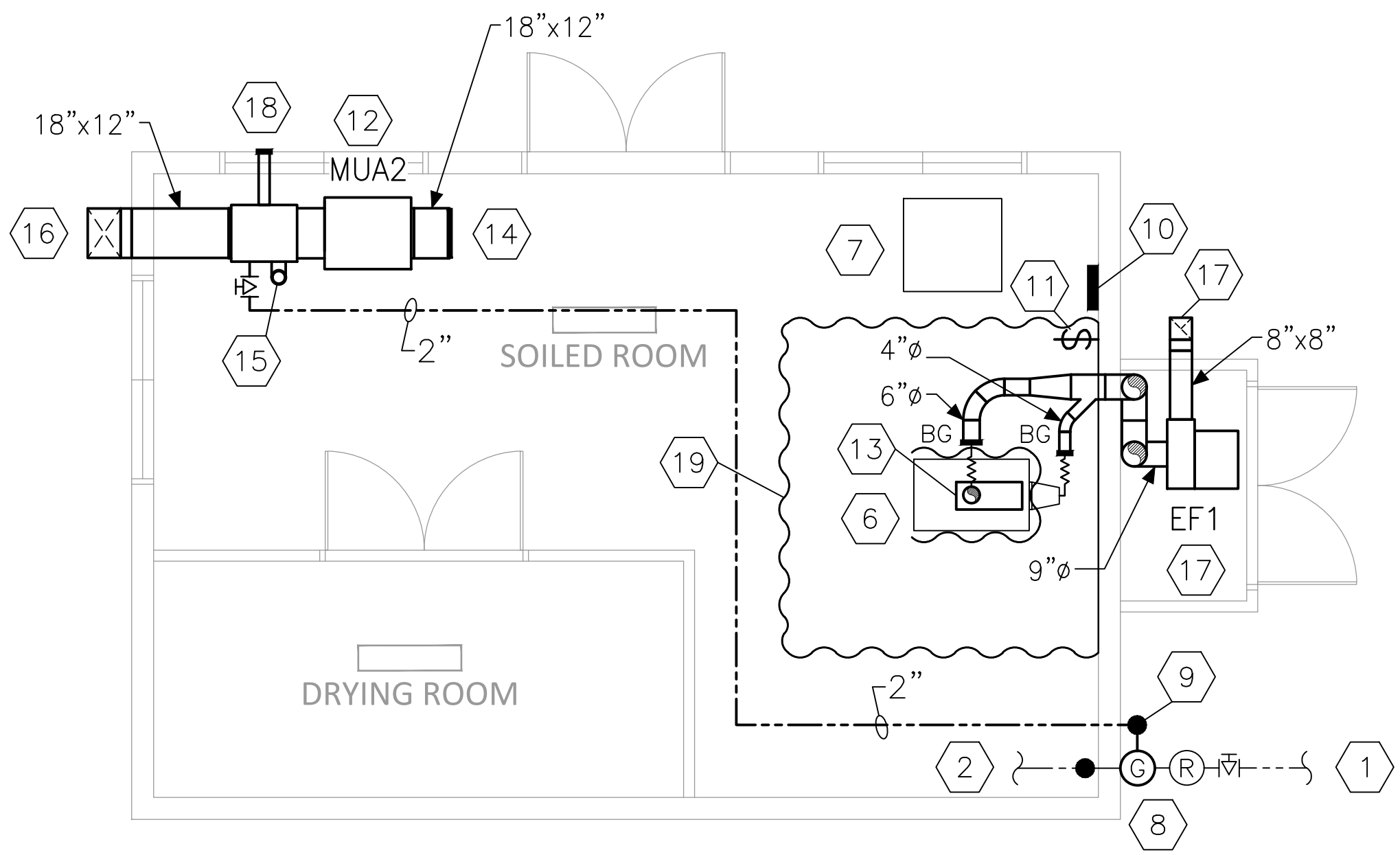
MECHANICAL LEGEND



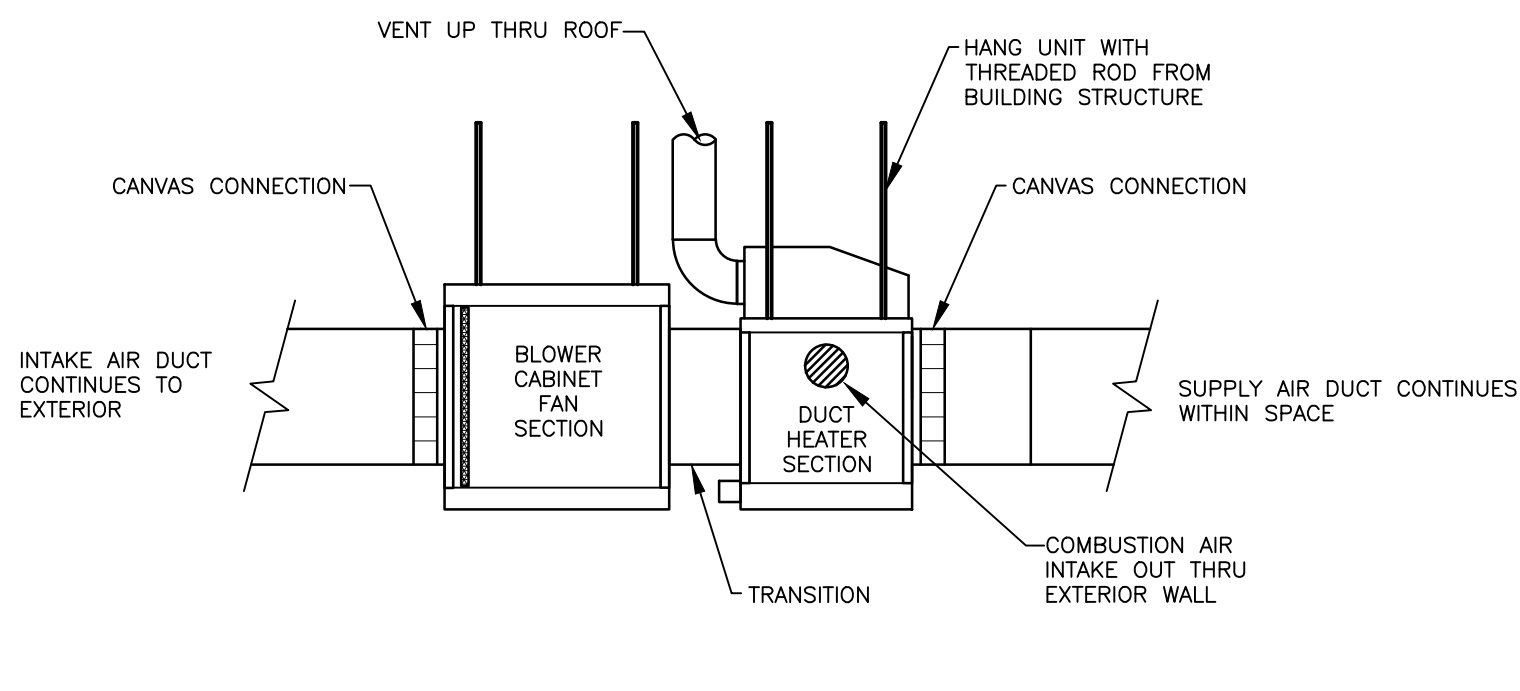
KEY PLAN
SCALE: N.T.S.



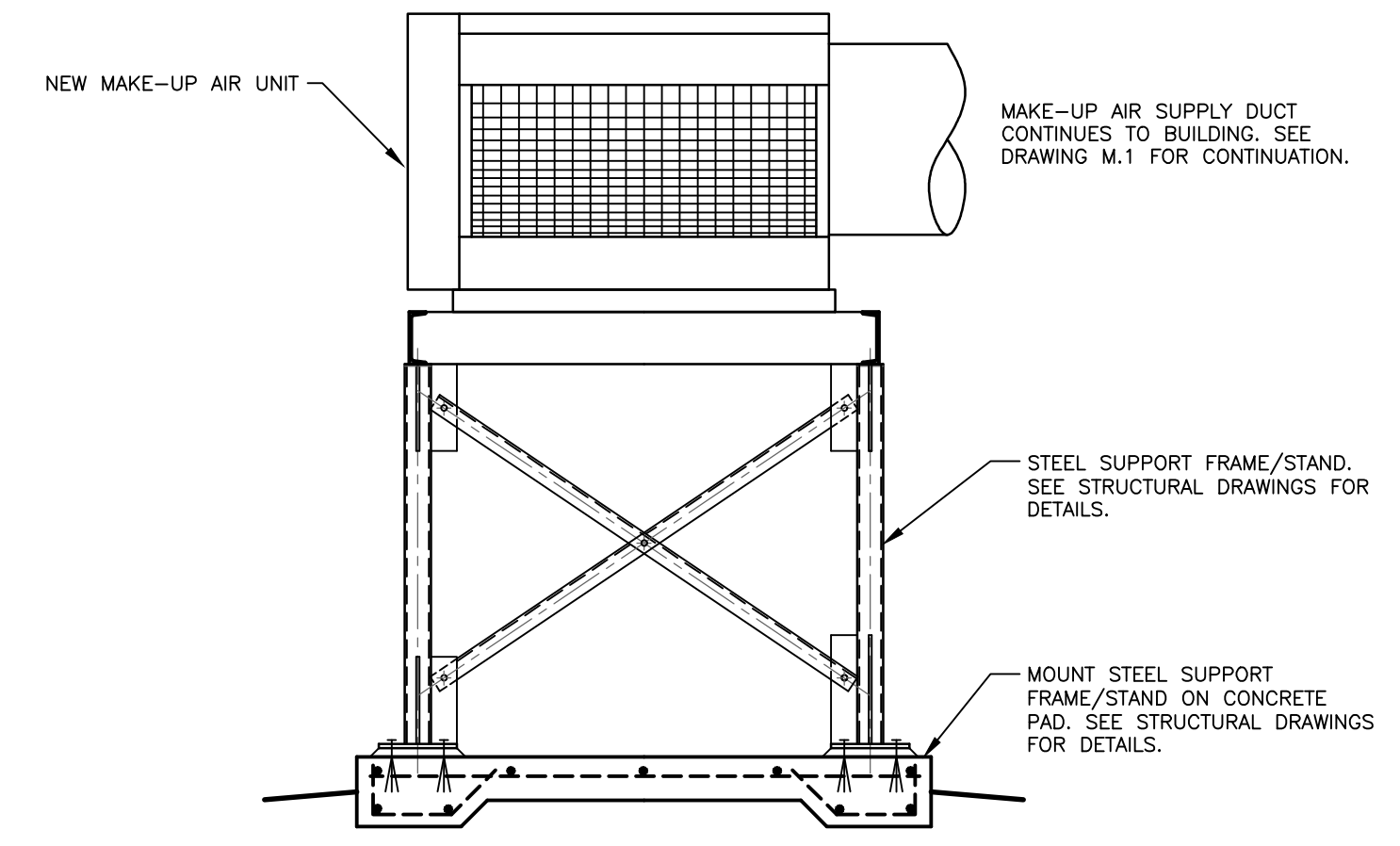
1 MAIN FLOOR PLAN - DEMOLITION
SCALE: 1/4" = 1'-0"



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



3 HORIZONTAL MAKE-UP AIR UNIT DETAIL
SCALE: NTS



4 HVAC STAND DETAIL
SCALE: NTS

MECHANICAL GENERAL NOTES

- 1. REFER TO DRAWING M.1 FOR MECHANICAL GENERAL NOTES, MECHANICAL LEGEND, GRILLE/LOUVER SCHEDULE, AND HOOD DETAILS.
2. ALL EXHAUST SYSTEMS SHOULD BE CONSTRUCTED WITH MATERIALS RECOMMENDED IN THE SPECIFICATIONS. INTERIOR OF ALL DUCTS SHALL BE SMOOTH AND FREE FROM OBSTRUCTIONS WITH JOINTS EITHER WELDED OR SOLDERED AIR TIGHT.
3. ALL LONGITUDINAL SEAMS IN DUCTWORK SHALL BE AIR TIGHT.
4. GIRTH JOINTS OF DUCT SHALL BE MADE WITH AN INNER LAP IN THE DIRECTION OF THE AIR FLOW, AND SHALL BE KEPT AIR TIGHT.
5. ELBOWS AND ANGLES SHALL HAVE A CENTER LINE AND RADIUS OF TWO PIPE DIAMETERS WHENEVER POSSIBLE. LARGE RADII ARE RECOMMENDED FOR HEAVY CONCENTRATIONS OF ABRASIVE DUST. CONSTRUCT ELBOWS, 6" OR LESS IN DIAMETER, IN AT LEAST FIVE SECTIONS. OVER 6" IN DIAMETER, SEVEN SECTIONS. PREFABRICATED ELBOWS OF SMOOTH CONSTRUCTION MAY BE USED. ANGLES PIECED PROPORTIONATELY.
6. HOODS MUST BE FREE OF SHARP EDGES OR BURRS AND REINFORCED TO PROVIDE THE NECESSARY STIFFNESS AND MUST BE OF GOOD DESIGN.
7. TRANSITIONS AND MAINS AND SUB-MAINS TO BE TAPERED. TAPER 5" LONG FOR EACH ONE INCH CHANGE IN DIAMETER WHENEVER POSSIBLE AND TRANSITIONS SHOULD BE STRAIGHT ON THE BOTTOM TO PREVENT BUILD UP OF DUST.
8. ALL BRANCHES SHALL ENTER THE MAIN AT THE LARGE END OF THE TRANSITION AT AN ANGLE NOT TO EXCEED 45 - 30 IS PREFERRED. CONNECT BRANCHES ONLY TO THE TOP OR SIDES OF MAIN WITH NO TWO BRANCHES ENTERING DIAMETRICALLY OPPOSITE.
9. WHERE BLAST GATES ARE USED, USE EITHER FULL COLLAR OR HALF COLLAR GATES. BUTTERFLY TYPE DAMPERS SHALL NOT BE PERMITTED.
10. RECTANGULAR DUCTS CAN BE USED ONLY WHEN CLEARANCE EXCHANGER, MODULATING GAS VALVE, AIR FLOW PROVING SWITCH, SPARK IGNITION, BOTTOM BURNER ACCESS, HIGH EFFICIENCY, FACTORY INSTALLED POWER VENTER AND SEALED FLUE COLLECTOR, REMOVABLE SIDE INSPECTION PANELS, DUCT FURNACE TRANSITION PIECE FOR CABINET BLOWER, FILTER RACK, 1" WASHABLE FILTERS AND ADJUSTABLE DUCT STAT. UNIT TO BE INTERLOCKED VIA SAIL SWITCH IN EXHAUST DUCT TO OPERATE WITH EXHAUST FAN 'EF1' ON MANUAL OR AUTOMATIC THROUGH HUMIDISTAT WHEN ROOM HUMIDITY EXCEEDS 50%. UNIT ELECTRICAL TO BE 208 VOLT, SINGLE PHASE. UNIT WEIGHT IS APPROXIMATELY 320lbs. SEE DETAIL 3/M.2.
11. ELBOWS AND ANGLES FOR THE DUST COLLECTOR EXHAUST SYSTEM SHALL BE A MINIMUM OF TWO GAUGES HEAVIER THAN THE MAIN DUST COLLECTOR DUCTWORK.
12. HOODS SHALL BE A MINIMUM OF TWO GAUGES HEAVIER THAN STRAIGHT SECTIONAL CONNECTION BRANCH DUCTS.
13. ALL FLEXIBLE DUCTING SHALL BE NON-COLLAPSIBLE FLEXIBLE DUCT.
14. CURTAINS TO BE AIRDIRE CANVAS INC. INDUSTRIAL CLEAR VINYL 20 MIL OR EQUAL.

MECHANICAL EQUIPMENT SCHEDULE

DC - DUST COLLECTOR
SUPPLY AND INSTALL A N.R. MURPHY LTD. MODEL HEC-35-6 PULSE JET DUST COLLECTOR OR EQUAL. UNIT TO PROVIDE 45 GALLON DRUM STORAGE CAPACITY AND 6,000 CFM EXHAUST CAPACITY WITH A 20 HP TFC HIGH EFFICIENT FAN MOTOR AT 208 VOLT, 3 PHASE. UNIT TO BE COMPLETE WITH TOTALLY WELDED, ANGLE IRON REINFORCED WIPED GALVANIZED ENCLOSURE, CLEAN AIR PLENUM WITH FLANGED AIR OUTLET WITH PUNCHED MATCHING FLANGE, HEADER PIPE ASSEMBLIES, PLATED POLYESTER ECOSUP FILTERS AND SS FILTER CLAMPS, COMPRESSED AIR MAINFOLD WITH PRESSURE GAUGE AND BRASS DRAIN VALVE, MAGNAHELIC GAUGE, 60' SLOPED HOPPER SECTION TO SOLID DRUM CONNECTOR AND DRUM LID; 16" FLANGED INLET C/W PUNCHED MASKING FLANGE AND INTERNAL BAFFLE DIFFUSER; DIRTY SIDE FILTER REMOVAL ACCESS DOOR; 304L STAINLESS STEEL RECTANGULAR COMPOSITE EXPLOSION VENTS; EMERGENCY BLOWBACK DAMPER; 18-20 TYPE BINOL AIR HANDLING INDUSTRIAL EXHAUSTER, ARRANGEMENT 4, BACKWARD INCLINED WHEEL, SPARK RESISTANT CONSTRUCTION; FULL FLOW INLINE DISIPATIVE DUCT SILENCER WITH FIBROGLASS MEDIA AND PERFORATED METAL INTERIOR WALL; ZONE CONTROL PANEL C/W STATUS LIGHTS RED/GREEN, RELAYS, FUSING, INTRINSIC SAFE BARRIER FOR EXPLOSIVE ENVIRONMENTS, CIRCUIT FOR CAPACITIVE DUST LEVEL SENSOR, SYSTEM SHUTDOWN OUTPUT, NEMA4 ENCLOSURE AND UL LABEL, AND PREWIRED EEMAG-9 CSA APPROVED CONTROL PANEL C/W EXHAUSTER STARTER, SHAKER STARTER, SOLID STATE AUTOMATIC SHAKER CONTROLLER, 120V CONTROL TRANSFORMER, PUSH BUTTON AND 2 PILOT LIGHTS, AND AUXILIARY CONTACTS AND FUSED DOOR DISCONNECT.
BG - BLAST GATE
SUPPLY AND INSTALL A N.R. MURPHY LTD. FABRICATED BLAST GATE OR EQUAL.
MUA1 - MAKE-UP AIR UNIT #1
SUPPLY AND INSTALL A SOUTHAMPTON INDUSTRIAL SERIES SI-EC DIRECT, GAS-FIRED, MAKE-UP AIR UNIT OR EQUAL. UNIT TO PROVIDE 6,000 CFM AT 0.5" E.S.P. WITH A 7.5 H.P. ODP MOTOR AT 208 VOLT, 3 PHASE AND A 110F TEMPERATURE RISE WITH A HEATING OUTPUT OF 600 MBH. UNIT TO BE MOUNTED ON PILES COMPLETE WITH HORIZONTAL DISCHARGE, 20 GAUGE GALVANIZED CONSTRUCTION WITH 1" INSULATION, INLET HOOD WITH BIRDSCREEN, ACCESS DOORS, SLOPED 2" FILTER SECTION, MOTORIZED BACKDRAFT DAMPER, UNIT MOUNTED VFD, NON-FUSED DISCONNECT, GFI ON SEPARATE POWER CIRCUIT, AND REMOTE CONTROL PANEL WITH DISCHARGE TEMPERATURE CONTROL AND COMMON ALARMS. UNIT TO BE REVERSE INTERLOCKED TO OPERATE WITH DUST COLLECTOR 'DC'. UNIT ELECTRICAL TO BE 208 VOLT, 3 PHASE. UNIT WEIGHT IS APPROXIMATELY 1,000 lbs. SEE DETAIL 3/M6.1 FOR MOUNTING DETAIL.
MUA2 - MAKE-UP AIR UNIT #2
SUPPLY AND INSTALL A STERLING HVAC MODEL QVSD-125-A-3-N-2-A-J-1-B SEPARATED COMBUSTION DUCT FURNACE WITH CXXX-CAB1-125-11 CABINET BLOWER OR EQUAL. UNIT TO PROVIDE 125 MBH HEATING INPUT, 100 MBH HEATING OUTPUT, AND 1250 CFM @ 0.5" S.P. WITH A 1/3 H.P. BLOWER MOTOR. UNIT TO BE INSTALLED IN THE HORIZONTAL CONFIGURATION COMPLETE WITH STAINLESS STEEL HEAT EXCHANGER, MODULATING GAS VALVE, AIR FLOW PROVING SWITCH, SPARK IGNITION, BOTTOM BURNER ACCESS, HIGH EFFICIENCY, FACTORY INSTALLED POWER VENTER AND SEALED FLUE COLLECTOR, REMOVABLE SIDE INSPECTION PANELS, DUCT FURNACE TRANSITION PIECE FOR CABINET BLOWER, FILTER RACK, 1" WASHABLE FILTERS AND ADJUSTABLE DUCT STAT. UNIT TO BE INTERLOCKED VIA SAIL SWITCH IN EXHAUST DUCT TO OPERATE WITH EXHAUST FAN 'EF1' ON MANUAL OR AUTOMATIC THROUGH HUMIDISTAT WHEN ROOM HUMIDITY EXCEEDS 50%. UNIT ELECTRICAL TO BE 120 VOLT, SINGLE PHASE. UNIT WEIGHT IS APPROXIMATELY 320lbs. SEE DETAIL 3/M.2.
EF1 - EXHAUST FAN #1
SUPPLY AND INSTALL A GREENHECK MODEL IP-9-A1 CENTRIFUGAL, BELT DRIVEN, INDUSTRIAL DUTY EXHAUST FAN OR EQUAL. UNIT TO EXHAUST 1250 CFM @ 5.0" E.S.P. WITH A 2 H.P. MOTOR @ 208 VOLT, SINGLE PHASE. UNIT TO BE COMPLETE WITH STEEL CONSTRUCTION, OPEN RADIAL MATERIAL HANDLING WHEEL, PREMIUM BEARINGS, SPARK RESISTANT CONSTRUCTION, ARRANGEMENT 1, ON TH DISCHARGE POSITION, BELT GUARD, DISCONNECT SWITCH, AND VIBRATION ISOLATORS. UNIT TO OPERATE VIA A HAND OFF/OFF SWITCH AND BE INTERLOCKED TO OPERATE WITH MAKE-UP AIR UNIT 'MUA2'. UNIT WEIGHT IS APPROXIMATELY 110 lbs.

MECHANICAL KEYNOTES

- 1. EXISTING NATURAL GAS SERVICE CONTINUES BELOW GRADE.
2. EXISTING GAS LINE CONTINUES WITHIN BUILDING.
3. EXISTING GAS METER/REGULATOR TO BE UPGRADED TO SUIT NEW BUILDING GAS LOAD. REFER TO REVISED PLAN 2/M.2.
4. EXISTING EXHAUST FAN TO BE REMOVED C/W DUST COLLECTION BAGS, DUCTWORK, WIRING, CONTROLS, ETC. AND BE SALVAGED TO OWNER.
5. EXISTING EXHAUST CANOPY HOOD TO BE REMOVED.
6. EXISTING SOILS GRINDER UNIT TO REMAIN.
7. EXISTING GAS-FIRED UNIT HEATER TO REMAIN.
8. EXISTING GAS METER/REGULATOR SET TO BE UPGRADED FOR A NEW TOTAL LOAD OF 500 FT3/HR AT OUNCE GAS PRESSURE. CONTRACTOR TO COORDINATE APPLICATION AND INSTALLATION OF UPGRADED GAS SERVICE WITH OWNER AND GAS UTILITY.
9. NEW GAS LINE TO RISE UP FROM GAS METER AND ENTER BUILDING UP HIGH IN WALL. SEAL AT PIPE PENETRATION WEATHER TIGHT. SUPPORT GAS LINE ALONG WALL WITH UNISTRUT CHANNELS AND CLAMPS ON 6FT CENTERS.
10. MAKE-UP AIR UNIT REMOTE CONTROL PANEL TO BE MOUNTED ON WALL.
11. EXHAUST FAN ON/OFF SWITCH TO BE MOUNTED ON WALL.
12. NEW MAKE-UP AIR UNIT TO BE HUNG FROM ROOF STRUCTURE UP AS HIGH AS POSSIBLE. REFER TO DETAIL 3/M.2.
13. NEW EXHAUST CANOPY C/W DUST COLLECTOR CONNECTION FOR EXISTING CLIPPER/THRESHER UNIT. REFER TO HOOD 4 DETAIL 3/M.1.
14. NEW 18"x12" MAKE-UP AIR SUPPLY DUCT TO BE STUBBED INTO SPACE C/W METAL MESH STEEL GRILLE ON DUCT OUTLET.
15. NEW 4" MAKE-UP AIR VENT TO RISE UP THRU ROOF C/W VERTICAL TERMINATION, FLASH AND SEAL AT ROOF PENETRATION WEATHER TIGHT.
16. NEW 18"x12" INTAKE AIR DUCT TO RUN OUT THROUGH EXTERIOR WALL TO EXTERIOR WEATHER HOOD C/W BIRDSCREEN. SEAL AT DUCT PENETRATION WEATHER TIGHT.
17. NEW EXHAUST FAN TO BE MOUNTED ON FLOOR WITHIN SERVICE CLOSET. FAN DISCHARGE TO BE DUCTED OUT THROUGH WALL C/W 90' ELBOW DOWN.
18. NEW 4" COMBUSTION AIR DUCT TO RUN OUT THROUGH EXTERIOR WALL TO WALL CAP 'B'. SEAL AT WALL PENETRATION WEATHER TIGHT.
19. EXISTING RETRACTABLE PLASTIC CURTAIN TO REMAIN.

MECHANICAL SPECIFICATIONS

1.0 GENERAL

1.1 GENERAL PROVISIONS

- 1.1.1 THE CONTRACTOR SHALL PROVIDE A COMPLETE AND FULLY OPERATIONAL MECHANICAL SYSTEM.
1.1.2 THE CONTRACTOR SHALL EXAMINE THE SITE PRIOR TO SUBMITTING THEIR QUOTE TO FAMILIARIZE THEMSELVES WITH THE WORK INVOLVED.
1.1.3 ANY DISCREPANCIES AND OMISSIONS DISCOVERED SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY AND PRIOR TO TENDER CLOSING FOR RECERTIFICATION BY ADDENDUM.
1.1.4 EACH CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR LAYING OUT THEIR WORK AND FOR ANY DAMAGE CAUSED BY IMPROPER EXECUTION OF THEIR WORK. CONTRACTOR TO CARRY ALL NECESSARY INSURANCE COVERAGE.
1.2.0 WARRANTY
1.2.1 THE MECHANICAL CONTRACTOR AS A CONDITION PRECEDENT TO FINAL PAYMENT AFTER COMPLETION OF THIS WORK SHALL PROVIDE THE OWNER WITH A WRITTEN GUARANTEE WARRANTING ALL MATERIALS, LABOUR, AND EQUIPMENT FOR ONE (1) FULL YEAR FROM DATE OF ACCEPTANCE.
1.3.0 WORK, PRODUCTS, AND QUALITY
1.3.1 EQUIPMENT AND MATERIALS TO BE NEW AND FREE FROM DEFECTS AND HAVE DESIGN CHARACTERISTICS AS SPECIFIED.
1.3.2 ALL WORK AND MATERIALS SHALL BE INSTALLED AS SHOWN AND IN ACCORDANCE WITH THE NATIONAL BUILDING CODE AND ALL LOCAL CODES AND BUILDING REGULATIONS.
1.3.3 ALL EQUIPMENT SHALL BE C.S.A. APPROVED.
1.4.0 FEES AND PERMITS
1.4.1 THE MECHANICAL CONTRACTOR WILL OBTAIN AND PAY FEES FOR ALL PERMITS NECESSARY FOR COMPLETION OF THIS CONTRACT.
1.4.2 CONTRACTOR TO FURNISH ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK CONFORMS WITH STANDARDS AND REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.
1.5.0 TESTING
1.5.1 TEST ALL EQUIPMENT AND MATERIALS WHERE REQUIRED BY THE SPECIFICATIONS OR AUTHORITIES HAVING JURISDICTION TO DEMONSTRATE ITS PROPER OPERATION TO THE OWNER.
1.5.2 CARRY OUT ALL HYDRAULIC TESTS PRIOR TO COVERING PIPE IN ANY WAY.
- TEST GAS PIPING AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
1.5.3 TEST LOW VELOCITY DUCTWORK FOR TIGHTNESS AND LEAKAGE. ALL LEAKS SHALL BE REPAIRED BEFORE THE SYSTEM IS BALANCED.
1.6.0 CUTTING AND PATCHING
1.6.1 THE MECHANICAL CONTRACTOR SHALL CONFER WITH THE GENERAL CONTRACTOR IN REGARDS TO THIS WORK AND SHALL GIVE LOCATIONS FOR ALL HOLES FOR PIPE AND DUCTS ETC.
1.7.0 FLASHING AND COUNTERFLASHING
1.7.1 ALL MECHANICAL WORK PASSING THROUGH THE ROOF SHALL BE FLASHED BY THE MECHANICAL CONTRACTOR. COUNTERFLASHING TO BE DONE BY THE ROOFING CONTRACTOR.
1.8.0 APPROVALS
1.8.1 REQUEST FOR APPROVAL OF EQUIVALENT EQUIPMENT FROM MANUFACTURER'S NOT SPECIFIED ON DRAWINGS SHALL BE MADE IN WRITING SEVEN DAYS PRIOR TO TENDER CLOSING.
1.9.0 SHOP DRAWINGS
1.9.1 PRIOR TO THE FABRICATION OF ANY MATERIALS AND EQUIPMENT, SUBMIT A MINIMUM OF SEVEN (7) COMPLETE SETS OF SHOP DRAWINGS AND DATA SHEETS COVERING ALL ITEMS OF MECHANICAL EQUIPMENT UNDER THIS CONTRACT FOR REVIEW BY THE ENGINEER. ELECTRONIC PDF SUBMISSIONS ARE ACCEPTABLE.
1.10.0 ELECTRIC MOTORS AND WIRING
1.10.1 SUPPLY ALL MECHANICAL EQUIPMENT WITH ELECTRIC MOTORS AS REQUIRED.
1.10.2 THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO SUPPLY ALL MOTOR STARTERS AND DISCONNECT SWITCHES FOR ALL MOTORS FOR THIS PROJECT AND INSTALL LINE VOLTAGE WIRING TO STARTERS AND FROM STARTERS TO MOTORS, EXCEPT WHERE PRE-WIRED IN PACKAGED EQUIPMENT.
1.10.3 ELECTRICAL CONTROLS CONNECTED TO MECHANICAL EQUIPMENT SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR AND SHALL BE INSTALLED, WIRED, AND CONNECTED BY THE MECHANICAL CONTROLS SUBCONTRACTOR.
1.10.4 MECHANICAL SHALL CONFIRM ALL EQUIPMENT ELECTRICAL RATINGS WITH ELECTRICAL DRAWINGS AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO ORDERING EQUIPMENT.
1.11.0 MAINTENANCE MANUALS
1.11.1 FURNISH THREE (3) SETS OF MAINTENANCE MANUALS WITH INFORMATION OUTLINED BELOW TO THE ENGINEER PRIOR TO FINAL INSPECTION FOR APPROVAL. AN ELECTRONIC COPY OF THE COMPLETE MAINTENANCE MANUAL SHALL BE PROVIDED AS WELL.
1.11.2 MAINTENANCE MANUALS SHALL CONTAIN THE FOLLOWING:
- WARRANTY CERTIFICATE, BALANCING REPORT
- DESCRIPTION OF ALL SYSTEMS
- DESCRIPTION OF COMPONENTS OF EACH PIECE OF EQUIPMENT
- DESCRIPTION OF CONTROL SYSTEM
- COMPLETE SET OF DRAWINGS
- DETAILED MAINTENANCE AND LUBRICATION SCHEDULE
- OPERATING AND MAINTENANCE INSTRUCTIONS FOR MAJOR EQUIPMENT
- LIST OF EQUIPMENT SUPPLIERS AND MANUFACTURERS
- DATA TO BE ASSEMBLED IN HARD COVER BINDERS
- IDENTIFY FRONT COVER WITH PROJECT NAME & PROJECT LOCATION
- LIST OF CONTRACTORS AND CONSULTANTS
- PROVIDE INDEX AND INDEX LABELS
1.12.0 OPERATING INSTRUCTIONS
1.12.1 ARRANGE AND PAY FOR THE SERVICE OF FULLY QUALIFIED PERSONNEL INCLUDING MANUFACTURER'S REPRESENTATIVES TO INSTRUCT THE OWNER IN OPERATION AND PREVENTIVE MAINTENANCE OF EACH PIECE OF EQUIPMENT AND SYSTEM SUPPLIED AND INSTALLED.
1.13.0 SUPPORTS, ANCHORS, AND SLEEVES
1.13.1 INSTALL SUPPORTS OF STRENGTH AND RIGIDITY TO SUIT LOADING WITHOUT UNDULY STRESSING OF BUILDING. LOCATE ADJACENT TO EQUIPMENT TO PREVENT UNDUE STRESS IN PIPING AND EQUIPMENT.
1.13.2 PROVIDE CHROME PLATED FLOOR, CEILING, AND WALL ESCUTCHEONS AS REQUIRED FOR PIPING IN FINISHED AREAS.
1.13.3 SEISMIC RESTRAINTS SHALL BE PROVIDED AS REQUIRED BY LOCAL CODE. WHEN LOCAL CODE HAS NO STANDARDS, SEISMIC RESTRAINTS SHALL BE PROVIDED AND INSTALLED PER SMACNA STANDARDS.

1.14.0 IDENTIFICATION

1.14.1 THE MECHANICAL CONTRACTOR SHALL SUPPLY AND PERMANENTLY INSTALL LAMACOIDS TO PROVIDE IDENTIFICATION OF ALL INSTALLED EQUIPMENT LIKE DUST COLLECTOR, MAKE-UP AIR UNITS, FANS, AND THEIR SWITCHES.
1.15.0 RECORD DRAWINGS
1.15.1 THE MECHANICAL CONTRACTOR SHALL KEEP ON SITE EXTRA SETS OF PRINTS AND SPECIFICATIONS ON WHICH ALL CHANGES AND DEVIATIONS FROM THE ORIGINAL DESIGN SHALL BE RECORDED DAILY. THESE CHANGES MUST BE NEATLY ADDED TO A CLEAN SET OF DRAWINGS AND GIVEN TO THE OWNERS MARKED "AS-BUILT".
1.16.0 EQUIPMENT AND MATERIALS CLEAN-UP
1.16.1 PIPING, FIXTURES, DUCTS, AND EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT, GREASE, ADHESIVE LABELS, AND FOREIGN MATERIALS.
1.17.0 BALANCING
1.17.1 BALANCING OF ALL VENTILATION SYSTEMS AS INDICATED SHALL BE DONE BY THE MECHANICAL CONTRACTOR WHEN ALL EQUIPMENT IS OPERATING UNDER FULL LOAD. THE CONTRACTOR SHALL ALLOW SUFFICIENT FUNDS TO CHANGE THE PULLEYS ON MOTORS OR FANS TO PROPERLY BALANCE THE SYSTEM AT THE LOWEST FAN RPM.
1.17.2 BALANCING CONTRACTOR SHALL BALANCE ALL AIR OUTLETS AND EQUIPMENT VOLUMES TO WITHIN 5% OF DESIGNED VOLUMES.
1.17.3 BALANCING CONTRACTOR SHALL SUBMIT FOR REVIEW THREE (3) COPIES OF THE REPORT CONTAINING THE FOLLOWING:
- SUPPLY AND RETURN AIR VOLUMES, SUCTION, DISCHARGE AIR PRESSURE, RPM, AND AMPS OF ALL SUPPLY AND EXHAUST FANS.
- SUPPLY AND RETURN AIR VOLUMES OF ALL GRILLES AND DIFFUSERS.
- SKETCH LAYOUT OF DUCT SYSTEMS SHOWING DETAIL OF BALANCE.
1.18.0 GAS
1.18.1 MECHANICAL CONTRACTOR SHALL INSTALL GAS SERVICE FROM UPGRADED BUILDING GAS SERVICE TO ALL NEW GAS FIRED EQUIPMENT COMPLETE WITH ALUMINIZED PAINT COATING ON PIPE WHERE EXPOSED TO OUTDOORS. LINES SHALL BE GRADED SEAMLESS K OR L (UP TO 32mm OR 1 1/2") OR BLACK STEEL SCHEDULE 40 THREADED (UP TO 63mm OR 2 1/2").
1.18.2 ALL GAS PIPING FITTINGS AND WORKSMANSHIP SHALL BE IN ACCORDANCE WITH CSA STANDARD B-149 INSTALLATION CODE.
1.18.3 CONTRACTOR TO COORDINATE APPLICATION AND UPGRADE OF EXISTING GAS SERVICE WITH GAS UTILITY AND OWNER.
1.2.0 PLUMBING

2.1.0 GENERAL
2.1.1 PROVIDE ALL VALVES AS SHOWN ON THE DRAWINGS OR AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. INSTALL ISOLATION VALVES AT ALL CONNECTIONS TO EQUIPMENT, AND IN ALL BRANCHES, FIXTURES, OR GROUPS OF FIXTURES.
2.1.2 USE QUICK OPENING "HENDERSON NEWMAN SUPERBALL" VALVES FOR COMPRESSED AIR AND GAS.
2.2.0 PIPE AND FITTINGS
2.2.1 ALL PIPING SHALL MEET THE REQUIREMENTS OF THE PROVINCIAL PLUMBING CODE AND NATIONAL BUILDING CODE. PVC OR ABS PIPING IS NOT PERMITTED THROUGH A FIRE SEPARATION.
3.0 HEATING/VENTILATION
3.1.0 GENERAL
3.1.1 DUCTWORK SHALL BE GALVANIZED STEEL AND LOCK FORMING QUALITY. ALL DUCTWORK SHALL BE CONSTRUCTED BRACED, CONNECTED, JOINTED, AND INSTALLED IN ACCORDANCE WITH THE LATEST ISSUE OF ASHRAE GUIDE AND DUCT CONSTRUCTION STANDARDS ISSUED BY SMACNA, NFPA 90 AND 90A, PROVINCIAL CODE, AND LOCAL REGULATIONS. INSTALL ALL SUPPLY, RETURN, AND EXHAUST DUCTS COMPLETE WITH GRILLES AND DIFFUSERS AS SHOWN ON THE DRAWINGS.
3.1.2 BLAST GATES SHALL BE INSTALLED AT EACH EXHAUST DUCT CONNECTION TO DUST PRODUCING EQUIPMENT AS IDENTIFIED ON PLANS.
3.1.3 ALL EQUIPMENT SHALL BE AS SPECIFIED ON DRAWING M.2 OR APPROVED EQUAL.
3.1.4 ALL EXPOSED DUCTWORK TO BE SPIRAL ROUND.
3.1.5 ALL DUCTWORK, EXCEPT AS NOTED IN SECTION 3.1.6 BELOW, SHALL BE GALVANIZED STEEL: 28 GAUGE FOR UP TO 305mm (12") WIDE OR 205mm (8") DIAMETER, 24 GAUGE FOR 330mm (13") TO 760mm (30") WIDE OR 230mm (9") TO 760mm (30") DIAMETER. ALL FITTINGS TO MEET SMACNA DESIGN STANDARDS.
3.1.6 ALL DUST COLLECTOR EXHAUST DUCTWORK SHALL BE GALVANIZED STEEL: 28 GAUGE FOR 4" TO 6" DUCTS, 24 GAUGE FOR 7" TO 14" DUCTS, 22 GAUGE FOR 15" TO 19" DUCTS. ALL FITTINGS TO MEET SMACNA DESIGN STANDARDS.
3.1.7 PROVIDE FLEX CONNECTIONS, 6mm (1/4") DURODYNE CONPLEX PCV COATED POLYESTER AT INLET AND OUTLETS OF ALL FAN UNITS.
3.1.8 CLEAN ALL EQUIPMENT PRIOR TO OCCUPANCY.
4.0 INSULATION
4.1.0 GENERAL
4.1.1 ALL INSULATION AND MATERIALS ASSOCIATED WITH INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED CLASSIFICATION OF NOT MORE THAN 50.
4.1.2 RECOVERING JACKET ON DUCTWORK SHALL BE ULC LISTED "THERMO CANVAS" TREATED COTTON FABRIC, SUITABLE FOR PAINTING. PROVIDE RECOVERING JACKET ON ALL EXPOSED INSULATION THROUGHOUT, INCLUDING EQUIPMENT ROOM. INSULATION LOCATED IN PIPE SHAFTS AND SUSPENDED CEILING SPACES IS NOT CONSIDERED EXPOSED. PROVIDE STUCCO EMBOSSED ALUMINUM JACKET ON ALL INSULATED EXTERIOR DUCTWORK.
4.1.3 ENSURE INSULATION IS CONTINUOUS THROUGH INSIDE WALLS. PACK AROUND PIPES WITH FIRE-PROOF, SELF SUPPORTING INSULATION MATERIALS.
4.1.4 INSULATE DUCTWORK WITH MANSON ALUWIP WRAP INSULATION OR EQUIVALENT FACED WITH FSK FOR AN EFFECTIVE VAPOUR BARRIER.
4.1.5 INSULATION SCHEDULE:
EXHAUST DUCTS WITHIN 3.0m (10'-0") OF ATTIC OR COLD ROOF OR COLD WALL COMPLETE WITH FOIL FACED VAPOUR BARRIER - 38mm (1 1/2"); OUTDOOR SUPPLY AIR DUCTWORK - EXTERIOR - 75mm (3").
5.0 CONTROLS
5.1.0 GENERAL
5.1.1 ALL THERMOSTATS, THERMOMETERS, AND CONTROLLERS SHALL BE RATED IN CELSIUS DEGREES. ALL THERMOSTATS AND CONTROLS SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE MECHANICAL CONTROLS SUB-CONTRACTOR.
5.1.2 REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR POWER TO MECHANICAL EQUIPMENT BY THE ELECTRICAL CONTRACTOR.

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CERTIFICATE OF ALIENIZATION
McGinn Engineering Ltd.
No. 124
Permission to Consult held by:

DISCIPLINE: SASK. REG. NO.: SIGNATURE

Professional Seal:



Any representations in the tender documents are for the general information of bidders and are not in any way warranted or guaranteed by or on behalf of the owner or the owner's consultants and its subconsultants' employees, and neither the owner nor its consultants or its employees, shall be liable for any representations negligent or otherwise contained in the documents. These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design professional has not entered into a contract. The contractor shall check all dimensions, elevations and other data as represented on all drawings in the set for consistency and correctness and report to the consultant any discrepancies prior to proceeding with construction. Any costs to the contractor arising from failure to execute this requirement is a cost to the contractor and not to the owner nor the consultant. This term supercedes the specifications. All construction work to be completed in accordance with all applicable code and requirements of all utilities as set out by governing authorities.

Project Title:
AAFC CROP SERVICES BUILDING #21 DUST COLLECTION SYSTEM

INDIAN HEAD, SASKATCHEWAN

NOTES:
Revision No.:
Date:
Issue Record:
Date:
Revisions:
Date:
Date Issued: 2020.09.22
Date Plotted: 2020.09.22

BUILDING 13 MAIN FLOOR PLANS DEMOLITION & RENOVATED
Designed By: DJT/GAS Scale: AS INDICATED
Drawn By: DJT Date: JULY 2020
Checked By: GAS Date: 2020.09.09
Project No.: 5061

M.2
Revision No.: - Date: -
Issued For: TENDER
Date Issued: 2020.09.22
Date Plotted: 2020.09.22

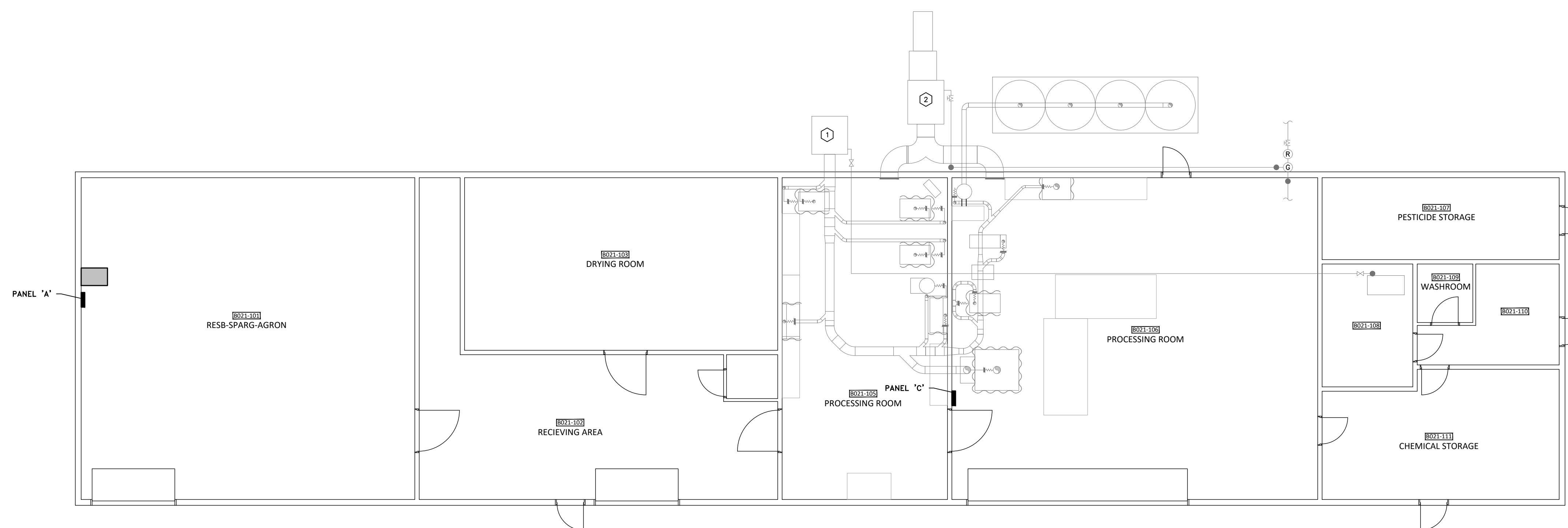
Professional Seal:

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Project Title:
**AAFC
 CROP SERVICES
 BUILDING #21
 DUST COLLECTION
 SYSTEM**

INDIAN HEAD, SASKATCHEWAN

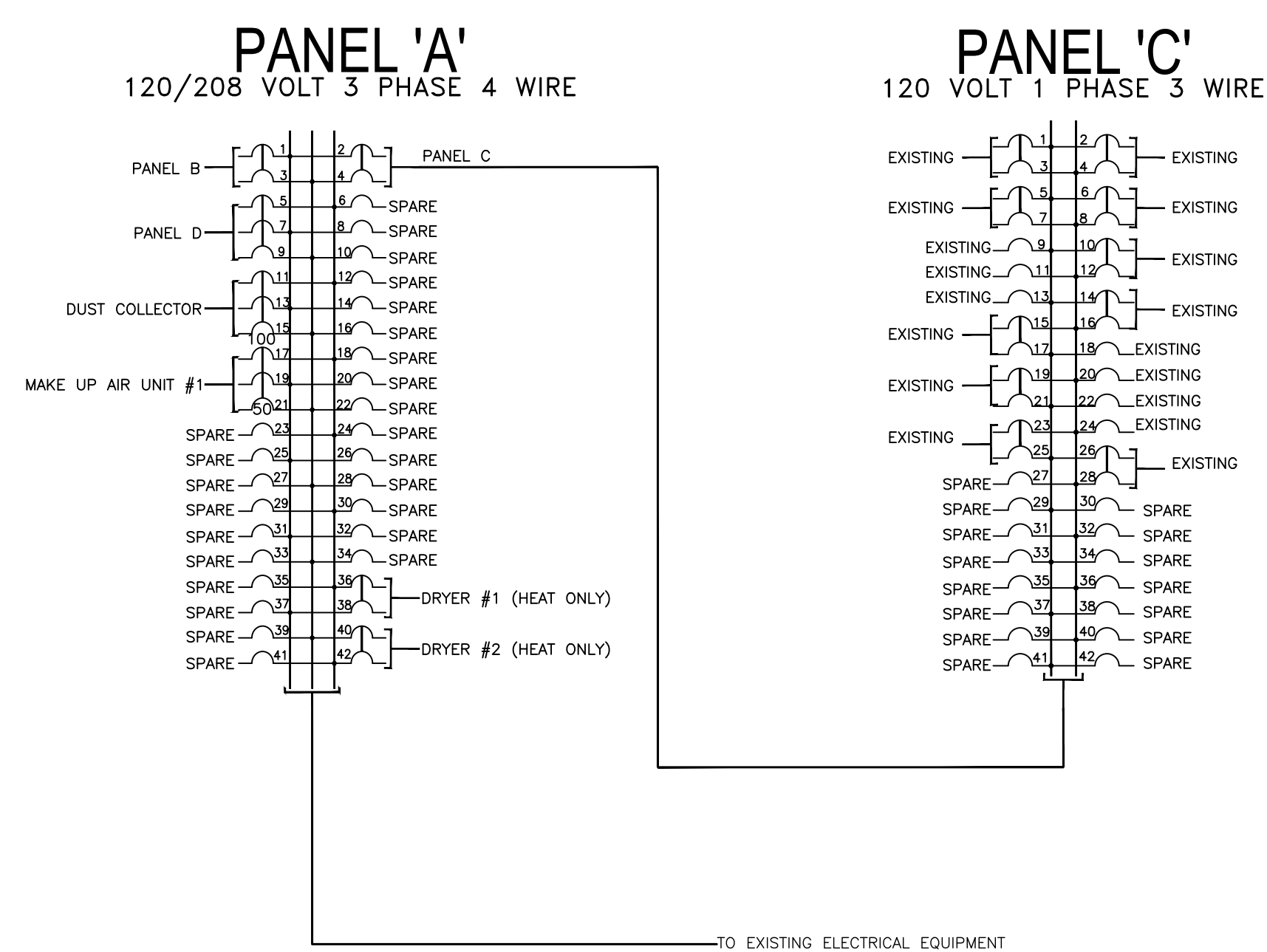
Issue Record:



1 MAIN FLOOR PLAN - ELECTRICAL
 SCALE: 1/8" = 1'-0"

| MOTOR AND EQUIPMENT SCHEDULE | | | | | | | | | | |
|------------------------------|---------------------|----|------|------|------|---|---------|--------|-------|-------|
| Item | Description | KW | H.P. | AMPS | Volt | # | Brkr | Feeder | Panel | NOTES |
| ① | DUST COLLECTOR | - | 20 | - | 208V | 3 | 100A-3P | - | A | - |
| ② | MAKE UP AIR UNIT #1 | - | 7.5 | - | 208V | 3 | 50A-3P | - | A | - |

2 MOTOR AND EQUIPMENT SCHEDULE
 N.T.S.



3 ELECTRICAL PANELBOARD
 N.T.S.



ASSOCIATION OF PROFESSIONAL ENGINEERS
 OF SASKATCHEWAN
 CERTIFICATE OF AUTHORIZATION
 RITENBURG & ASSOCIATES LTD.
 NUMBER 52

PERMISSION TO CONSULT HELD BY:
 DISCIPLINE: ELECTRICAL
 SASK. REG. No.: 11167
 SIGNATURE: [Signature]
 RAL FILE NO: 13296

**MAIN FLOOR PLAN -
 ELECTRICAL**

Designed By: TS Scale: 1/8" = 1'-0"
 Date: AS INDICATED
 Checked By: MKL Date: SPET 2020
 Project No.: 5061 2020.09.17

E1

Revision No.: Date: 2020.09.17
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 Date Issued: 2020.09.17
 Date Plotted: 2020.09.17

Professional Seal:

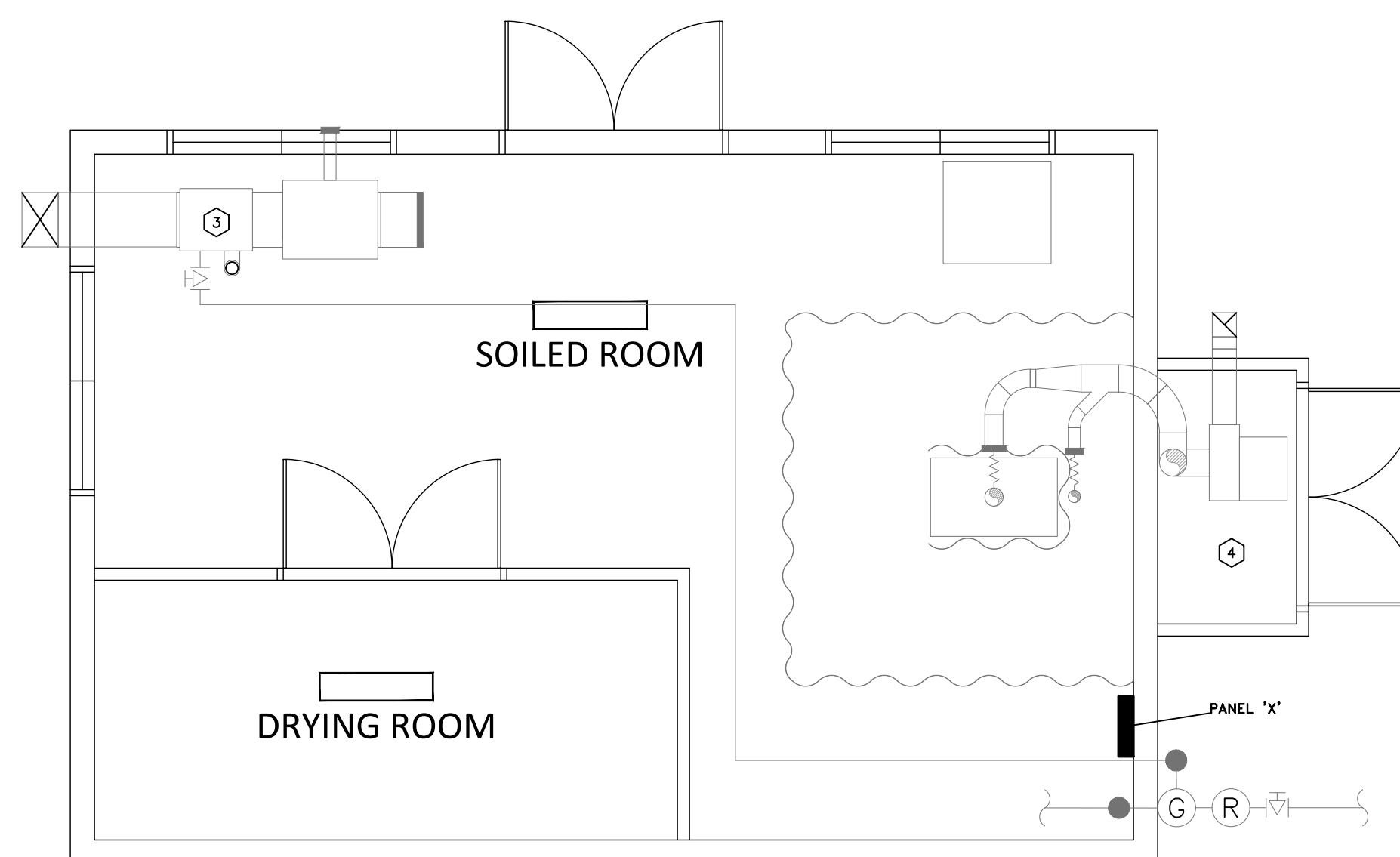
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Project Title:

**AAFC
 CROP SERVICES
 BUILDING #21
 DUST COLLECTION
 SYSTEM**

INDIAN HEAD, SASKATCHEWAN

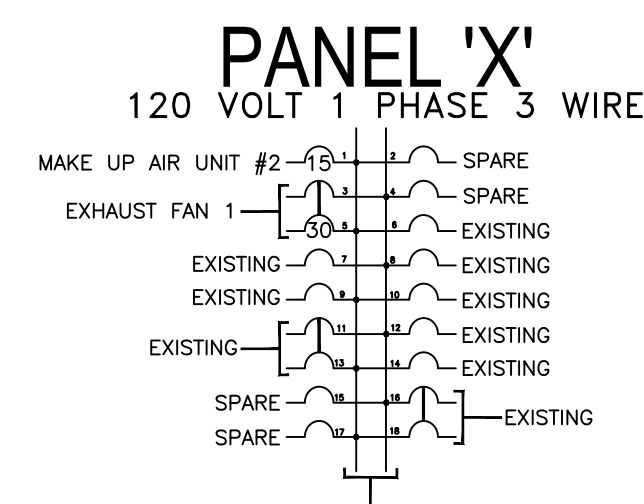
Issue Record:



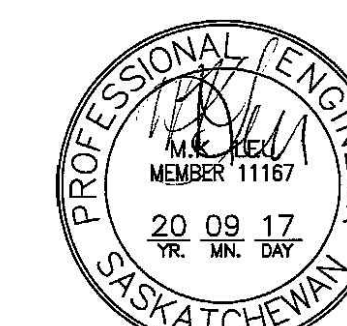
1 MAIN FLOOR PLAN - ELECTRICAL
 SCALE: 1/4" = 1'-0"

| MOTOR AND EQUIPMENT SCHEDULE | | | | | | | | | | |
|------------------------------|---------------------|----|------|------|------|---|--------|--------|-------|-------|
| ITEM | DESCRIPTION | KW | H.P. | AMPS | VOLT | Ø | BRKR | FEEDER | PANEL | NOTES |
| 3 | MAKE UP AIR UNIT #2 | - | 1/3 | - | 120V | 1 | 15A-1P | - | X | - |
| 4 | EXHAUST FAN | - | 2 | - | 208V | 1 | 30A-2P | - | X | - |

2 MOTOR AND EQUIPMENT SCHEDULE
 N.T.S.



3 ELECTRICAL PANELBOARD
 N.T.S.



ASSOCIATION OF PROFESSIONAL ENGINEERS
 OF SASKATCHEWAN
 CERTIFICATE OF AUTHORIZATION
 RITENBURG & ASSOCIATES LTD.
 NUMBER 52

PERMISSION TO CONSULT HELD BY:
 DISCIPLINE SASK. REG. No. SIGNATURE
 ELECTRICAL 11167
 RAL/FILE NO: 13296

**MAIN FLOOR PLAN -
 ELECTRICAL**

Designed By: TS Scale: 1/4" = 1'-0"
 Date: AS INDICATED
 Checked By: MKL Date: SEPT 2020
 Project No.: 5061 2020.09.17

E2

Revision No.: Date: 2020.09.17
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 Date Plotted: 2020.09.17

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Project Title:

AAFC CROP SERVICES BUILDING #21 DUST COLLECTION SYSTEM INDIAN HEAD, SASKATCHEWAN

Issue Record:

ELECTRICAL SPECIFICATIONS

Designed By: **TS** Scale: N.T.S
 Date: AS INDICATED
 Checked By: **MKL** Date: **SEPT 2020**
 Project No.: **5061** 2020.09.17

Revision No.: _____ Date: **2020.09.17**
 Issued For: **TENDER**
 Date Issued: **2020.09.17**
 Date Plotted: **2020.09.17**

ASSOCIATION OF PROFESSIONAL ENGINEERS
 OF SASKATCHEWAN
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NUMBER 52

PERMISSION TO CONSULT HELD BY:
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 ELECTRICAL 11167 *[Signature]*
 RAL FILE NO. 13296



GENERAL CONDITIONS AND INTENT

1. PROVIDE LABOUR AND MATERIALS REQUIRED TO INSTALL TEST AND PLACE INTO OPERATION A COMPLETE ELECTRICAL SYSTEM WITH FACILITIES AND SERVICES TO MEET THE DESIGN. THE DESIGN SHALL BE HERIN, AS SHOWN ON THE DRAWINGS, AND IN COMPLETE ACCORD WITH APPLICABLE CODES AND ORDINANCES.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE 2018 CANADIAN ELECTRICAL CODE, SASKATCHEWAN HUMAN RIGHTS ACCESSIBILITY STANDARD, LOCAL BY-LAWS, AND UTILITY REQUIREMENTS. WORK INVOLVING FIRE PROTECTION SHALL ALSO BE IN ACCORDANCE WITH UNDERWRITERS' LABORATORY OF CANADA, NATIONAL BUILDING CODE NATIONAL FIRE CODE, NATIONAL FIRE CODE, NATIONAL OF CANADIAN UNDERWRITERS' LABORATORIES OF CANADA STANDARDS CANULC-S530A4, CANULC-S530A4, AND CANULC-S530A4.
3. ALL WORK SHALL COMPLY WITH SASKPOWER'S REQUIREMENTS AND REGULATIONS. SUBMIT TO SASKPOWER THE NECESSARY NUMBER OF DRAWINGS AND SPECIFICATIONS FOR EXAMINATION AND APPROVAL PRIOR TO COMMENCEMENT OF WORK. PAY ASSOCIATED FEES IN THE EVENT OF ANY INSPECTION AUTHORITY REQUESTING DEVIATION FROM THE DESIGN, NOTIFY THE CONSULTANT, AND OBTAIN APPROVAL BEFORE PROCEEDING WITH ANY CHANGE.
4. ALL WORK SHALL BE EXECUTED IN A WORKMANLIKE AND SUBSTANTIAL MANNER, NEAT IN ITS MECHANICAL APPEARANCE AND ARRANGEMENT. A COMPETENT REPRESENTATIVE SHALL CONSTANTLY SUPERVISE THE WORK OF THIS DIVISION FROM BEGINNING TO COMPLETION AND FINAL ACCEPTANCE. SO FAR AS POSSIBLE, THE SAME SUPERVISOR AND WORKMEN SHALL BE EMPLOYED THROUGHOUT THE PROJECT'S DURATION. MATERIAL AND WORKMANSHIP NOT MEETING THE STANDARD INTENDED AND REQUIRED BY THIS SPECIFICATION SHALL, UPON INSTRUCTION FROM THE CONSULTANT, BE PROPERLY REPEARED WITHOUT FURTHER CHARGE OR CONSIDERATION.
5. ALL REFERENCES TO KNOWN STANDARD SPECIFICATIONS SHALL MEAN AND INTEND THE LATEST EDITION OF SUCH SPECIFICATION.
6. EXAMINE ALL DRAWINGS TO ENSURE THAT WORK UNDER THIS DIVISION CAN BE PROPERLY INSTALLED WITHOUT INTERFERENCE, WHERE DISCREPANCIES, AMBIGUITIES OR CONTRADICTIONS ARE NOTICED, HAVE BEEN MADE IN DRAWINGS AND SPECIFICATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CLARIFY SAME PRIOR TO TENDER CLOSING. NO ALLOWANCE WILL BE MADE AFTER CONTRACT AWARD FOR ANY EXPENSE INCURRED BY THE CONTRACTOR FOR HAVING TO ADJUST THE WORK TO PROPERLY COMPLY.
7. ELECTRICAL DRAWINGS FOR THE WORK UNDER THIS DIVISION ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE, UNLESS DETAILED OTHERWISE. THEY ESTABLISH SCOPE, MATERIAL, AND INSTALLATION QUALITY, AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS. FOLLOW MANUFACTURER'S RECOMMENDED PRACTICES AND INSTALLATION PROCEDURES FOR EQUIPMENT SUPPLEMENTED BY DETAILS GIVEN HEREIN AND ON PLANS SUBJECT TO APPROVAL OF THE CONSULTANT.
8. ASSUME FULL RESPONSIBILITY FOR LAYOUT OF THIS WORK, AND FOR ANY DAMAGE CAUSED TO THE OWNER OR OTHER DIVISIONS BY IMPROPER LOCATION OR CARRYING OUT OF THIS WORK. WHERE OUTLETS OR EQUIPMENT MAY AFFECT ARCHITECTURAL, OR OTHER TREATMENT DESIRED, CONTACT THE CONSULTANT AND FOR INSTRUCTIONS OR DETAILED DRAWINGS.
9. THE ELECTRICAL CONTRACTOR SHALL CONTACT TO EQUIPMENT FURNISHED IN OTHER DIVISIONS AND BY OWNER. COOPERATE FULLY WITH THE CONSULTANT AND OTHER DIVISIONS TO PROTECT AND OPERATED EQUIPMENT TO ENSURE PROPER ARRANGEMENT OF, AND PROVISIONS FOR ALL ELECTRICAL EQUIPMENT.
10. BEFORE COMMENCING THE WORK, THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE WORK OF OTHER SUB-TRADES, AND REPORT AT ONCE ANY DEFECTS OR INTERFERENCE AFFECTING THE WORK UNDER THIS CONTRACT, OR THE QUANTITIES OR SAME.
11. INSTALL EQUIPMENT GENERALLY IN LOCATIONS AND ROUTES SHOWING CLOSE TO BUILDING STRUCTURE WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE. REMOVE AND REINSTALL IMPROPERLY INSTALLED EQUIPMENT TO THE SATISFACTION OF THE CONSULTANT AT NO EXTRA COST.
12. CEILING AND FLOOR OUTLET SYMBOLS ARE SCALED TO CENTRE LINE OF SYMBOL. SYMBOL DOES NOT INDICATE THE SIZE OR MOUNTING HEIGHT. SHALL BE MEASURED TO THE LOWEST POINT OF CEILING MOUNTED EQUIPMENT.
13. WALL OUTLETS ARE SCALED TO THE PERPENDICULAR CENTRE LINE OF THE SYMBOL. MOUNTING HEIGHTS FOR ALL WALL MOUNTED OUTLETS SHALL BE MEASURED TO THE TOP CORNER OF PANELBOARD IDENTIFICATION.
14. LOCATION OF LIGHTING OUTLETS AND RECEPTACLES IN MECHANICAL OR EQUIPMENT ROOMS AND SIMILAR AREAS SHALL BE FINALIZED DURING CONSTRUCTION TO GIVE OPTIMUM ARRANGEMENT. THE CONSULTANT SHALL APPROVE FINAL LOCATION BEFORE INSTALLATION.
15. CHANGE LOCATION OF OUTLETS AT NO EXTRA COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED 3000 MM, AND INFORMATION IS GIVEN BEFORE INSTALLATION.
16. AS THIS PROJECT INVOLVES A RENOVATION TO AN OCCUPIED EXISTING BUILDING, THE CONTRACTOR SHALL VISIT THE SITE DURING THE TENDERING PROCESS, AND THEREAFTER, NOTIFY THE CONSULTANT THAT THE WORK CONTAINED IN THESE DRAWINGS AND SPECIFICATIONS CAN BE CARRIED OUT. NO ALLOWANCE WILL BE MADE AFTER CONTRACT AWARD FOR ANY EXPENSE INCURRED BY THE CONTRACTOR FOR HAVING TO ADJUST THIS WORK TO PROVIDE A COMPLETE, FULLY OPERATIONAL INSTALLATION.
17. SHOULD ANY CUTTING OR REPAIRING OF EITHER UNFINISHED OR FINISHED WORK BE REQUIRED, THE CONTRACTOR SHALL EMPLOY THE PARTICULAR TRADE WHOSE WORK IS INVOLVED TO CORRECT CUTTING AND PATCHING, AND SHALL PAY FOR ANY RESULTING COSTS.
18. HOLES REQUIRED IN EXISTING CONSTRUCTION TO ACCOMMODATE CONDUITS OR WIREWAYS SHALL BE CUT NEATLY OR DRILLED BY THIS DIVISION.

MATERIALS

1. PROVIDE MATERIALS AND EQUIPMENT IN ACCORDANCE WITH SPECIFICATION REQUIREMENTS. ALL GOODS AND MATERIALS SHALL BE NEW UNLESS OTHERWISE NOTED. ALL MATERIALS SHALL CARRY CSA APPROVED SEAL. EQUIPMENT AND MATERIAL TO BE CSA CERTIFIED, WHERE THERE IS NO ALTERNATIVE TO SUPPLYING EQUIPMENT WHICH IS NOT CSA CERTIFIED, OBTAIN SPECIAL APPROVAL FROM THE CONSULTANT AND THE ELECTRICAL INSPECTOR DEPARTMENT.
2. ALL FIRE ALARM EQUIPMENT SHALL CARRY UL/C APPROVAL SEAL.
3. IN NO INSTANCE SHALL THE STANDARD ESTABLISHED BY THE DRAWINGS AND SPECIFICATIONS BE REDUCED BY ANY CODE OR ORDINANCE. ALL REFERENCES TO CODES SHALL BE TO THE LATEST EDITION.
4. ALL TENDERS SHALL BE BASED ON MATERIALS SPECIFIED, EXCEPT WHERE APPROVAL OF EQUIVALENT PRODUCTS HAS BEEN OBTAINED IN WRITING FROM THE CONSULTANT.
5. NO DEVIATION FROM SPECIFIED MATERIALS SHALL BE ALLOWED, EXCEPT WHERE ALTERNATIVE MATERIALS HAVE BEEN SPECIFICALLY ACCEPTED IN WRITING.
6. WHERE MATERIALS ARE NOT DIRECTLY SPECIFIED BY CATALOGUE NUMBER AND MANUFACTURER'S NAME, A HIGH INDUSTRY SPECIFICATION GRADE PRODUCT SHALL BE PROVIDED. THE CONSULTANT SHALL BE THE SOLE JUDGE OF WHETHER THIS STANDARD IS BEING MET.

SHOP DRAWINGS

1. SUBMIT SHOP DRAWINGS FOR NEW EQUIPMENT REQUIRED. THESE SHOP DRAWINGS SHALL BE SUFFICIENTLY DETAILED TO PERMIT THE OWNERS' TECHNICIANS TO TROUBLESHOOT AND REPAIR THE EQUIPMENT. EQUIPMENT SHALL NOT BE ORDERED AND/OR FABRICATED UNTIL THE CONSULTANT HAS REVIEWED SHOP DRAWINGS.
2. ALL SHOP DRAWINGS MUST BEAR AN APPROVAL STAMP AND BE SIGNED BY THE CONTRACTOR. THIS REVIEW DOES NOT RELIEVE THIS DIVISION FROM THE RESPONSIBILITY FOR THE FINAL INSTALLATION BEING CORRECT IN ALL DETAIL AND FULLY ACCEPTABLE TO THE CONSULTANT.
3. SHOP DRAWINGS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING: SYSTEMS, 2000V AND 120/240V VOLT PANELBOARDS, TRANSFORMERS, SWITCHES, FUSES AND NON-FUSED DISCONNECTS, MOTOR STARTERS, FUSES, WIRING DEVICES, LIGHT FIXTURES, BALLASTS, UNIT EQUIPMENT FOR EMERGENCY LIGHTING, EXIT SIGNS, DOOR ACCESS CONTROL SYSTEMS, FIRE ALARM SYSTEMS, COMMUNICATIONS PANELS, COMMUNICATION CABLES AND PATCH PANELS.

PROGRESS CLAIMS

1. ELECTRICAL PROGRESS CLAIMS SHALL BE BROKEN DOWN INTO TWELVE (12) PARTS TO FACILITATE ASSESSMENT OF WORK DONE AND MATERIAL SUPPLIED. THE BREAKDOWN SHALL INDICATE LABOUR AND MATERIAL TO THE NEAREST DOLLAR. OVERHEAD, PROFIT AND JOB EXPENSE SHALL BE APPORTIONED TO ALL PARTS. THE BREAKDOWN SHALL BE AS FOLLOWS:
 1. MAIN SERVICES
 2. DISTRIBUTION PANELS
 3. CONDUIT AND BOXES
 4. WIRE AND CABLE
 5. MOTOR CONTROL
 6. WIRING DEVICES
 7. LIGHTING FIXTURES AND LAMPS
 8. ALARM SYSTEMS
 9. COMMUNICATIONS SYSTEMS
 10. SPECIALS
 11. MISCELLANEOUS - 8% MAXIMUM
 12. EXTRAS AND CREDITS

AS-BUILT DRAWINGS

1. MAINTAIN, ON A DAILY BASIS, A COMPLETE SET OF MARKED-UP PRINTS AS AS-BUILT DRAWINGS THAT SHOW IN COMPLETE DETAIL, THE FINAL ARRANGEMENT AND LOCATION OF ALL ELECTRICAL COMPONENTS AND THE INTERCONNECTING WIRING. ALL RISER CONDUITS, PANEL FEEDS, CONDUIT RINGS OVER 200 AMP AND MAIN CONDUIT SYSTEMS SHALL BE MARKED ON PLANS. THESE ARE TO BE MAINTAINED IN A NEAT AND SUBSTANTIAL MANNER, AND AS TO PREPARE AND FULLY ILLUSTRATE THE WAY IN WHICH THE INSTALLATION HAS BEEN COMPLETED.

WARRANTY

1. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION, PROPERLY REPAIR AND REPLACE ALL DEFECTIVE WORK AND OTHER WORK WHICH BECOMES DEFECTIVE DURING THE TERM OF WARRANTY. SERVICE ON EQUIPMENT OR SYSTEMS ATTRIBUTED TO THE OWNERS' OPERATION SHALL BE PROVIDED ON EMERGENCY BASIS WHICH MAY BE NECESSARILY OVERTIME AND SERVICE OUTSIDE THE NORMAL WORKING HOURS. THE CONTRACTOR SHALL ENSURE THAT ALL SUPPLIERS COMPLY WITH THIS REQUIREMENT.

MAINTENANCE MANUALS

1. UPON COMPLETION OF THE INSTALLATION, PROVIDE THREE (3) COMPLETE AND COMPREHENSIVE IDENTICAL SETS OF OPERATING AND MAINTENANCE MANUALS TO BE REVIEWED BY THE CONSULTANT PRIOR TO THE MANUALS BEING SENT TO THE OWNER.
 1. THE OPERATING AND MAINTENANCE MANUALS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING INFORMATION:
 - a. CERTIFICATION REPORTS
 - b. DOCUMENTATION INDICATING OWNERS RECEIPT OF OPERATING INSTRUCTIONS
 - c. COMPLETE LIST OF ALL MATERIALS TURNED OVER TO THE OWNER AS PER RECEIPTS FOR SAME
 - d. SHOP DRAWINGS PROPERLY INDEXED AND CONTAINED IN SATURDAY SIZE ENVELOPES
 - e. MANUFACTURERS' INSTALLATION MANUALS AS SUPPLIED WITH THE EQUIPMENT
 - f. SCHEMATIC DRAWINGS FOR ALL SYSTEMS INDEXED AND CONTAINED IN SATURDAY SIZE ENVELOPES
 - g. CATALOGUE BROCHURES FOR LIGHT FIXTURES, PANELBOARDS, SWITCHES RECEPTACLES, FUSES, ETC.
 - h. OVERCURRENT COORDINATION AND ARC FAULT STUDY AND DOCUMENTATION OF ASSOCIATED TESTS
 - i. PHASE ROTATION CONFIRMATION BY THE CONTRACTOR
 - j. CERTIFICATE OF OWNERS ELECTRICAL EQUIPMENT TRAINING
 - k. ACCEPTANCE TESTING REPORTS

2. THE ABOVE INFORMATION SHALL BE BOUND IN BLACK HARD-BACKED, THREE-RING, LETTERHEAD SIZE BINDERS. INCOMPLETE OR POORLY REPRODUCED MANUALS WILL BE REJECTED.

3. OPERATING AND MAINTENANCE MANUALS AS WELL AS ALL OWNER INSTRUCTIONS, SHALL BE COMPLETE BEFORE SUBSTANTIAL COMPLETION AS OUTLINED BY THE BUILDERS' LIEN ACT) WILL BE CONSIDERED. ALSO, PRELIMINARY MAINTENANCE MANUALS MUST BE SUBMITTED PRIOR TO 70% COMPLETION. NO FURTHER PROGRESS PAYMENTS WILL BE PERMITTED UNTIL THESE MAINTENANCE MANUALS HAVE BEEN SUBMITTED AND APPROVED.

IDENTIFICATION

1. THIS CONTRACTOR SHALL INCLUDE IDENTIFICATION OF ALL NEW EQUIPMENT, JUNCTION BOXES, CIRCUITS, ETC. TO ASSIST THE OWNERS IN FOLLOW UP MAINTENANCE OF THE SYSTEM.
2. NAME/OID NAMEPLATES SHALL BE PROVIDED FOR ALL NEW ELECTRICAL EQUIPMENT INCLUDING: POWER PANELS, DISTRIBUTION PANELS, LIGHTING PANELS, TRANSFORMERS, DISCONNECTS, SWITCHES, CONTACTORS, TELEPHONE PANELS, MISCELLANEOUS SYSTEMS AND PANELS. NAME/OID LABELS TO IDENTIFY SUCH EQUIPMENT SHALL AS FOLLOWS:
 - a. NORMAL POWER EQUIPMENT: BLACK SHEET WITH WHITE ENGRAVED LETTERS
 - b. EMERGENCY POWER EQUIPMENT (CLASS 1): RED SHEET WITH WHITE ENGRAVED LETTERS
 - c. EMERGENCY POWER EQUIPMENT (CLASS 2): BLUE SHEET WITH WHITE ENGRAVED LETTERS
 - d. UNINTERRUPTIBLE POWER SUPPLY EQUIPMENT: GREY SHEET WITH WHITE ENGRAVED LETTERS
3. NAME/OID NAMEPLATES, APPROXIMATELY 75 MM X 25 MM, SHALL BE PROVIDED ON FRONT DOORS OF EACH JUNCTION BOX, PANELBOARD SHOWING THE NAME AND RATING. ALSO, A 150 MM X 50 MM NAMEPLATE SHALL BE PROVIDED ON TOP PORTION OF PANELBOARD FOR IDENTIFICATION.
4. NAMEPLATES FOR EACH ELECTRICAL PANEL SHALL INDICATE PANEL DESIGNATION, MAINS VOLTAGE AND PANEL CIRCUIT NUMBER FROM WHICH THE PANEL IS FED.
5. NAMEPLATES FOR DISCONNECTS SHALL INDICATE EQUIPMENT BEING CONTROLLED AND VOLTAGE.
6. NAME/OID NAMEPLATES SHALL BE FASTENED TO EQUIPMENT IN A CONSPICUOUS LOCATION WITH SELF TAPPING METAL SCREWS.
7. FEEDER PULL BOXES AND JUNCTION BOXES SHALL BE IDENTIFIED WITH WATERPROOF INK, SHOWING FEEDER OR SYSTEM CONCERNED. CONDUIT ENTERING JUNCTION BOXES FOR COMMUNICATIONS SYSTEMS SHALL BE IDENTIFIED WITH THE ROOM NUMBER THAT EACH CONDUIT SERVES.
8. BRANCH CIRCUIT IDENTIFICATION SHALL BE PROVIDED ON ALL PLUG-IN RECEPTACLES AND LOCAL SWITCHES, AND ON PANELS IDENTIFIED BY A CLEAR 12MM LAMINATED MARKER TAPE WITH CONTRASTING BLACK LETTERING.

GROUNDING

1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEMOLITION OF ALL EXISTING LIGHTING, ELECTRICAL SYSTEMS, COMMUNICATION SYSTEMS, MEDICAL EMERGENCY AND FIRE ALARM SYSTEMS WITHIN THE RENOVATION AREA AS OUTLINED IN THE ELECTRICAL, MECHANICAL, AND ARCHITECTURAL DRAWINGS.
2. ALL SALVAGED MATERIALS SHALL REMAIN THE PROPERTY OF THE OWNER, UNLESS OTHERWISE NOTED, AND SHALL BE STOCKPILED AS PER THE OWNER'S INSTRUCTIONS. THE SALVAGEABLE MATERIALS SHALL BE REMOVED FOR THE PURPOSES OF REUSE, AND SALVAGED MATERIALS SHALL BE RETURNED AS PER THE OWNER'S INSTRUCTIONS. THE FOLLOWING MATERIALS SHALL BE SALVAGED AND RETURNED TO OWNER: LIGHTING FIXTURES, WIRING DEVICES, NURSE CALL STATIONS AND COMPONENTS, MEDICAL EMERGENCY ALARM PUSHBUTTON STATIONS AND ASSOCIATED MONITOR MODULES AND CONTROLLERS, FIRE ALARM FIELD DEVICES.
3. ALL ABANDONED CONDUIT DUCTS, BOXES, WIRE AND CABLE EXISTING CONDITIONS AND AS A RESULT OF THE RENOVATIONS) SHALL BE COMPLETELY REMOVED BACK TO THE SOURCE OR ORIGIN.
4. ALL EXISTING CEILING POWER DISTRIBUTION (CONDUIT, CABLE, OUTLET BOXES) THAT IS ABANDONED BY THE RENOVATION SHALL BE COMPLETELY REMOVED BACK TO THE EXISTING ELECTRICAL PANELS. EXISTING DISTRIBUTION SHALL REMAIN WHERE NOTE.
5. EXISTING ELECTRICAL DEVICES ON WALLS NOT AFFECTED BY THE RENOVATION THAT ARE NOT SHOWN ON THE DRAWINGS SHALL REMAIN.
6. WHERE WALLS ARE TO BE REMOVED, THE CONTRACTOR SHALL REMOVE ALL EXISTING ELECTRICAL DEVICES SUCH AS RECEPTACLES, SWITCHES, COMMUNICATIONS AND DATA OUTLETS AND FIRE ALARM DEVICES.
7. ALL FIRE ALARM SYSTEM DEVICES REMOVED DURING THIS RENOVATION SHALL BE COMPLETELY REMOVED BACK TO THE NEAREST JUNCTION BOX. DEVICES SHALL BE SALVAGED FOR REUSE IN THE FINAL PLANT.

SITE WORK

1. THIS DIVISION SHALL BE RESPONSIBLE FOR ALL NECESSARY TRENCHING AND BACKFILLING FOR ALL EXTERIOR WORK, INCLUDING CAR PARKING PEDESTALS. ALL TRENCHES SHALL BE 900 MM DEEP. CARDS MUST BE EXERCISED TO ENSURE A PROPER GRADE IS USED, AND THAT SUITABLE DRAINAGE HAS BEEN PROVIDED.
2. THIS DIVISION SHALL BE RESPONSIBLE FOR ALL CONCRETE AND REINFORCING IN CONNECTION WITH SITE LIGHTING AND CAR PARKING PEDESTALS. ALL CONCRETE AND REINFORCING ON THE PROJECT SHALL BE IN ACCORDANCE WITH THE QUALITY REQUIRED FOR REINFORCED CONCRETE AND REINFORCING UNDER THE OTHER DIVISIONS, AND AS DETAILED ON THE DRAWINGS.
3. SUPPLY AND INSTALL ALL CABLE AND CONDUIT IN TRENCHES, AS DETAILED ON THE DRAWINGS.

FIRE BARRIERS

1. ALL CONDUIT AND CABLE PENETRATIONS IN HORIZONTAL AND VERTICAL FIRE BARRIERS SHALL BE SEALED WITH AN APPROVED FIRE SEAL SYSTEM CONSISTING OF A FIREPROOF CEMENT AND/OR SEALANT. ALL FIRE SEALS SHALL COMPLY WITH THE REQUIREMENTS SET OUT IN THE PROVINCIAL FIRE COMMISSIONER AND THE LOCAL AUTHORITY HAVING JURISDICTION, COORDINATE WITH GENERAL CONTRACTOR AND CONFIRM FIRE BARRIER LOCATIONS.
2. WHERE POWER OR COMMUNICATION CABLES PASS THROUGH A FIRE BARRIER WITHOUT THE PROTECTION OF CONDUIT, A METAL-CABLE TRANSIT SHALL BE USED WITHIN THE SLEEVED OPENING, AS MANUFACTURED BY ULTI STI - SPECIFIED TECHNOLOGIES INC. OR LEGRAND WIREMOLD.
3. ALL ELECTRICAL OUTLET BOXES INSTALLED IN PARTITIONS IDENTIFIED ON THE ARCHITECTURAL DRAWINGS AS A FIRE BARRIER OR SEPARATION SHALL BE PROTECTED WITH A NON-WELDING, INTENSIFERED MOLDBLE FIRESTOP PUTTY COMPOUND, FIRESTOP

PUTTY PADS SHALL BE MANUFACTURED BY ULTI, STI - SPECIFIED TECHNOLOGIES INC. OR APPROVED EQUAL.

4. FIRE PROOFING AND FIRE STOPPING OF ELECTRICAL RACEWAYS, CABLES, AND OUTLET BOXES FOR THIS DIVISION SHALL BE A COMPLETE UL/LULC CERTIFIED SYSTEM, AND SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURERS' RECOMMENDED INSTALLATION DETAILS AND PROCEDURES.

CONDUIT RACEWAYS/CONNECTIONS

1. CONDUIT FOR ALL POWER, COMMUNICATIONS AND SIGNAL SYSTEMS SHALL BE SUPPLIED AND INSTALLED AS HERIN SPECIFIED.
2. CONDUIT AND CABLES IN FINISHED AREAS SHALL BE RUN CONCEALED, ABOVE FINISHED CEILINGS, AND IN WALLS AND PARTITIONS. CONDUIT AND CABLES IN UNFINISHED AREAS SUCH AS ELECTRICAL COMMUNICATION ROOMS SHALL BE RUN EXPOSED. ALL CONDUIT/CABLEING SHALL BE RUN AT RIGHT ANGLES OR PARALLEL TO BUILDING LINES AND MECHANICAL DUCTWORK, ACCURATE IN LINE AND LEVEL.
3. RUNS OF CONDUIT AND CABLES, WHERE SHOWN, ARE INDICATED ONLY BY GENERAL LOCATION AND ROUTING. CONDUITS AND CABLES SHALL BE INSTALLED TO PROVIDE MAXIMUM HEADROOM AND SPACE WITHIN ACCESSIBLE CEILINGS, AND TO INTERFERE AS LITTLE AS POSSIBLE WITH FREE USE OF SPACES THROUGH WHICH THEY PASS. WHERE SPACE IS INDICATED FOR FUTURE EQUIPMENT, LEAVE SPACE CLEAR.
4. CONDUITS SHALL NOT BE INSTALLED WITHIN OR BELOW THE CONCRETE FOUR OF FLOORS OR WITHIN COLUMNS EXCEPT WHERE SPECIFICALLY NOTED.
5. CONDUIT SHALL NOT BE BENT OVER SHARP OBJECTS. IMPROPERLY FORMED BENDS AND RUNNING THREADS WILL NOT BE ACCEPTED. BENDS AND FITTINGS SHALL NOT BE REUSED TOGETHER.
6. PROPER SUPPORTS OF MANUFACTURED CHANNELS SHALL BE INSTALLED, AND SHALL BE SPACED IN ACCORDANCE WITH THE MANUFACTURER'S ELECTRICAL CODE.
7. CONDUIT AND CABLES SHALL BE INSTALLED TO AVOID PROXIMITY TO WATER AND HEATING PIPES. THEY SHALL NOT RUN WITHIN 50MM OF SUCH PIPES, EXCEPT WHERE CROSSINGS ARE UNAVOIDABLE, IN WHICH CASE THEY SHALL BE KEPT AT LEAST 25MM FROM COVERING OF PIPE.
8. CONDUIT SHALL BE OF SUFFICIENT SIZE TO PERMIT EASY REMOVAL OF CONDUITS AT ANY TIME. CONDUIT SIZES, WHERE SHOWN ON DRAWINGS ARE MINIMUMS. SIZE OF SUITABLE CONFIGURATION FOR THE DEVICE FOR WHICH IT IS TO COVER WITH COLOR MATCHED MOUNTING SCREWS. USE GANGED PLATE WHERE MORE THAN ONE DEVICE OCCURS AT ONE LOCATION. METAL WALL PLATES SHALL BE STAINLESS STEEL.
9. ALL EMPTY CONDUIT PROVIDED SHALL BE COMPLETE WITH PULL TWINE.
10. NOT MORE THAN FOUR (4) 90 DEGREE BENDS OR EQUIVALENT OFFSETS WILL BE PERMITTED BETWEEN PULL BOXES. WHEN MAXIMUM NUMBER OF BENDS IS USED, THE TOTAL RUN BETWEEN PULL BOXES SHALL NOT EXCEED 3000MM.
11. JUNCTION BOXES OR CABLE ANCHOR BOXES SHALL BE INSTALLED WHEREVER NECESSARY FOR PROPER PULLING OR ANCHORING OF CABLES. WHEN SUCH BOXES SHALL BE ACCESSIBLE AFTER THE BUILDING IS COMPLETED, AND SHALL BE SET TO COME WITH FINISHED LINES OF THE BUILDING.
12. CONDUIT TO OUTLETS BOXES SHALL NOT BE RUN HORIZONTALLY THROUGH INTERIOR WALLS. ALL CONNECTIONS SHALL BE MADE VERTICALLY THROUGH THE WALL STRUCTURE.
13. EMT COUPLINGS AND CONNECTORS SHALL BE SET-SERVE TYPE EXCEPT IN ELECTRICAL, MECHANICAL, COMMUNICATION, AND SPRINKLER ROOMS, WHICH SHALL BE WATER TIGHT.
14. FLEXIBLE CONDUIT AND EMT CONNECTORS SHALL BE OF THE INSULATED THROAT TYPE.
15. ALL CONDUITS SHALL BE TERMINATED WITH A SUITABLE BUSHING TO PROTECT CONDUITS OR CABLE FROM ABRASION.
16. EMT ENTERING BOXES OR ENCLOSURES SHALL BE TERMINATED WITH NYLON INSULATED CONCRETE TIGHT CONNECTORS.
17. PVC CONDUIT AND NON-METALLIC TUBING SHALL NOT PASS THROUGH A FIRE PARTITION OR FLOOR SEPARATION. WHERE IT IS NECESSARY FOR PVC CONDUITS OR NON-METALLIC TUBING TO PASS THROUGH A FIRE BARRIER, A HOT FIRE STOP COLLAR SHALL BE PROVIDED FOR EITHER SIDE OF THE FIRE BARRIER. ALSO, PVC CONDUIT AND NON-METALLIC TUBING SHALL NOT BE USED IN RETURN AIR PLENUMS.

CONDUITORS

1. ALL CONDUITORS SHALL BE COPPER AND MINIMUM #12 AWG (COPPER). ALL CONDUITORS SHALL BE RATED FOR MINIMUM 900 RW90 XLPE. SIZE, GRADE OF INSULATION, VOLTAGE AND MANUFACTURER'S NAME SHALL BE MARKED AT REGULAR INTERVALS.
2. CONDUITORS SHALL BE COLOR CODED. CONDUCTORS #2 AWG AND SMALLER SHALL HAVE COLOR IMPROVED INTO INSULATION AT THE MANUFACTURER. CONDUITORS SIZE NO. 1 AWG AND LARGER SHALL BE COLOR CODED WITH ADHESIVE COLOR CODING TAPE, BUT ONLY BLACK INSULATED CONDUITORS SHALL BE EMPLOYED IN THIS CASE, EXCEPT FOR NEUTRALS, WHICH SHALL BE WHITE WHEREVER POSSIBLE. COLOR CODING SHALL ALSO APPLY TO BUNDLING IN PANELS. COLOR CODING SHALL BE AS FOLLOWS:

| | |
|-------------------|------------------------|
| PHASE 'A' - RED | GROUND - GREEN OR BLUE |
| PHASE 'B' - BLACK | NEUTRAL - WHITE |
| PHASE 'C' - BLUE | CONTROL - ORANGE |
3. HOME RUNS TO 2000V VOLT LIGHTING AND RECEPTACLE PANELS WHICH EXCEED 3000 MM IN LENGTH SHALL BE MINIMUM NO. 10 GAUGE.
4. ALL GROUND CONDUCTORS SHALL BE BARE OR INSULATED, STRANDED, MEDIUM HARM DRAWN COPPER AND SHALL BE SIZED TO PERFORM AT A MAXIMUM VOLTAGE DROP OF 3% BASED ON THE CIRCUIT LOAD 80% OF THE CIRCUIT PROTECTIVE DEVICE.
5. ALL CONDUITOR SIZES SHOWN ARE BASED ON THE 75°C AMPACITY RATING OF THE CANADIAN ELECTRICAL CODE DUE TO THE VARYING ELECTRICAL EQUIPMENT TERMINATION RATINGS. ELECTRICAL CONTRACTOR MAY REVISE CONDUITOR SIZES BASED ON 90°C RATINGS BUT IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE TERMINATION RATINGS FOR ALL EQUIPMENT IS COORDINATED WITH THE APPROPRIATE CONDUCTOR AND BONDING AMPACITY RATING AS REQUIRED BY THE C.I.C. CONTRACTOR SHALL CONFIRM WITH THE CONSULTANT THAT THEY ARE USING 90 DEGREE LUGS AND CABLE PRIOR TO INSTALLATION.
6. WHERE CONDUITOR SIZES ARE SHOWN ON DRAWINGS THEY HAVE BEEN BASED ON A MAXIMUM OF 3 HOT CONDUCTORS INSTALLED IN A CONDUIT. THESE CONDUITOR SIZES ARE BASED ON TABLES IN C.I.C. WHERE ADDITIONAL CONDUCTORS ARE INSTALLED WITHIN A CONDUIT, CONDUITOR SIZES MAY NEED TO BE INCREASED TO REFLECT THE NEW CORRECTION FACTOR. FOR ALL CIRCUITS EXCEEDING 15A CONTRACTOR SHALL CONFIRM WITH THE CONSULTANT THAT ALL NECESSARY INCREASES IN CONDUITOR SIZES REQUIRED PRIOR TO INSTALLING MORE THAN 3 CONDUCTORS IN A CONDUIT. IN NO CASE UNLESS APPROVED BY THE CONSULTANT SHALL MORE THAN 6 HOT CONDUCTORS BE INSTALLED IN ONE CONDUIT.
7. ALL CONDUITORS SHALL BE INSTALLED WITHIN EMT UNLESS NOTED OTHERWISE. TECH CABLE AND FLEXIBLE ARMoured CABLE MAY BE INSTALLED, PROVIDE A NEW UPDATED TYPED PANEL DIRECTORY WITHIN A CLEAR PLASTIC COVER AS REQUIRED. STICKERS OR WRITING ON THE PANEL DOOR IS NOT ACCEPTABLE.
8. TECH CABLE SHALL BE IN ACCORDANCE WITH CANCSA C22.2 NO. 131. ALL CABLES SHALL INCLUDE A GROUND CONDUITOR SIZED IN ACCORDANCE WITH THE 2018 C.E.C. ALL CONDUITORS SHALL BE COVERED WITH RW90 XLPE INSULATION. CONDUITORS SIZED #12 TO #10 GAUGE SHALL BE RATED FOR MINIMUM 900V. CONDUITORS SIZED #8 AND LARGER SHALL BE RATED FOR MINIMUM 1000V.
9. TECH CABLES SHALL BE FASTENED WITH ONE HOLE STEEL STRAPS TO SOLID SURFACE CABLES 50 MM AND SMALLER, AND WITH TWO HOLE STEEL STRAPS ON CABLES LARGER THAN 50 MM. PROVIDE CHANNEL TYPE SUPPORTS FOR TWO OR MORE CABLES. THREADED RODS SHALL BE 6 MM DIA. TO SUPPORT SUSPENDED CHANNELS.
10. TECH CABLE CONNECTORS SHALL BE WATER TIGHT APPROVED FOR TECH CABLE.
11. FLEXIBLE ARMoured CABLE SHALL BE TYPE AC90 WITH INTERLOCKING ARMOUR FABRICATED FROM ALUMINUM STRIP. CONDUITORS SHALL BE COPPER WITH RW90 INSULATION. ARMoured CABLE SHALL BE USED ONLY WHERE INDICATED.
12. FLEXIBLE ARMoured CABLE MAY BE INSTALLED FOR MOTOR CONNECTIONS AND FROM CEILING JUNCTION BOXES TO LIGHT FIXTURES.
13. FLEXIBLE ARMoured CABLE MAY BE INSTALLED IN FINISHED WALLS OR CEILINGS WHERE WIRING IS TO BE FISHED AND IS IMPRACTICABLE TO INSTALL CONDUIT AND WITHIN MILLWORK CONSTRUCTION.
14. FLEXIBLE ARMoured CABLE SHALL NOT BE EXPOSED OR INSTALLED HORIZONTALLY WITHIN WALLS.

15. ALL CONNECTIONS TO SWITCHES, OUTLETS, ETC SHALL BE MADE VERTICALLY THROUGH THE WALL STRUCTURE.
16. CONDUITORS UTILIZED IN CONDUIT RUN UNDER SLAB ON GRADE OR IN CONDUIT UNDERGROUND SHALL BE TYPE RW90-47.
17. TERMINATION FOR #8 AWG AND LARGER SHALL BE BY MEANS OF APPROVED 'BOLDED' CONNECTOR LUG FOR PARALLEL CONDUCTORS. A COMMON LUG WITH SEPARATE TERMINATION FOR EACH CONDUITOR SHALL BE EMPLOYED.
18. WIRE SHALL BE AS MANUFACTURED BY NEXANS OR BICC GENERAL WIRE.

OUTLET BOXES

1. PROVIDE OUTLET BOXES SUITABLE FOR THE APPLICATION AND LOCATION OF THE DEVICES. ALL BOXES SHALL BE SIZED IN ACCORDANCE WITH CSA C22.1.
2. ALL OUTLET BOXES FOR COMMUNICATIONS SYSTEMS SHALL BE 102MM SQUARE OUTLET BOXES WITH EXTENSION AND PLASTER RINGS FOR FLUSH MOUNTING. DEVICES IN FINISHED WALLS SHALL BE MOUNTED ON CADDY #8HA, SERIES S08 OR T508 SCREW GUN BRACKETS. WOOD STRAPPING WITH STEEL STUDS SHALL NOT BE UTILIZED FOR SUPPORTING OUTLET BOXES.
4. EACH OUTLET BOX INSTALLED IN ACOUSTIC TILE CEILINGS SHALL BE MOUNTED ON DOUBLE CADDY 'TEE BAR HANGER' #512 IN SUCH A MANNER THAT THE OUTLET BOX WILL NOT TWIST IN ANY DIRECTION.
5. WHERE BOXES ARE SURFACE MOUNTED IN UNFINISHED AREAS, SUCH AS FURNACE OR BOILER ROOMS, STAMPED GALVANIZED STEEL 10 X MM SQUARE BOX TO ACCEPT #830 SERIES RAISED COVERS SHALL BE USED.
6. PROVIDE BLANK COVER PLATES FOR BOXES WITHOUT WIRING DEVICES.
7. WHERE SURFACE WIRING METHODS ARE ALLOWED AND APPROVED IN FINISHED AREAS, USE HUBBELL OR WIREMOLD BOXES AS PER DRAWINGS. USE SUITABLE ADAPTER FOR WIREWELD ENTRANCE.

COVERPLATES

1. METAL WALL PLATES SHALL BE PROVIDED FOR ALL SWITCHES, RECEPTACLES, BLENDS, TELEPHONE AND SPECIAL PURPOSE OUTLETS. THE WALL PLATES SHALL BE OF SUITABLE CONFIGURATION FOR THE DEVICE FOR WHICH IT IS TO COVER WITH COLOR MATCHED MOUNTING SCREWS. USE GANGED PLATE WHERE MORE THAN ONE DEVICE OCCURS AT ONE LOCATION. METAL WALL PLATES SHALL BE STAINLESS STEEL.
2. EXTERIOR OUTLETS SHALL BE FITTED WITH WEATHERPROOF DIE CAST ALUMINUM COVER PLATES. ALSO, COVER PLATES TO FUSES WHEN SWITCH IS GASKET TO PROVIDE POSITIVE SEAL. DUPLEX COVER PLATES SUITABLE FOR WET AND DAMP LOCATIONS SHALL BE PROVIDED. PROVIDE POWDER-COATED CAST ALUMINUM WALL IN USE COVER IN GREY FINISH. NON-METALLIC WATER-PROTECTIVE COVERS WILL NOT BE ACCEPTED. COVERS SHALL BE MANUFACTURED BY ONE OF THE FOLLOWING: COOPER WRM10M-1 (HORIZONTAL), WRM10M-1 (VERTICAL) OR LEVITON M980 (HORIZONTAL), M980V (VERTICAL).
3. BLANK COVER PLATES IN FINISHED CEILING AREAS SHALL BE ALUMINA ELECTRICAL #902 BAKED WHITE ENAMEL COVER WITH WHITE CEILINGS, OR PAINTED TO MATCH COLORED FINISHES.
4. WHERE SURFACE WIRING METHODS NEED TO BE EMPLOYED IN A HIGH FINISH AREA, STAINLESS STEEL WALL PLATES SHALL BE USED IN CONJUNCTION WITH WIREMOLD SURFACE BOX TO FIT THE DEVICE.

CONVENIENCE OUTLETS & SWITCHES

1. CONVENIENCE OUTLETS SHALL BE WHITE, SPECIFICATION GRADE-STRAIGHT BLADE, 15A, 125 VOLT, 3 WIRE, SELF-GROUNDING, BACK AND SEE WIRED ON HIGH IMPACT CHEMICAL RESISTANT MOLDED NYLON OR POLYCARBONATE FACE. DEVICE TO ACCEPT UP TO #10 COPPER CONDUITORS ON BACK WIRING. ALL RECEPTACLES TO BE OF ONE OF THE FOLLOWING MANUFACTURERS: ARROW, HART, BRYANT, EAGLE, HUBBELL, LEVITON OR PASS & SEYMOUR.

FUSIBLE SWITCHES

1. FUSIBLE SWITCHES SHALL BE QUICK-BREAK, QUICK-BREAK, VISIBLE BLADES, INTEGRAL HANDLE MECHANISM, DE-IONIZING ARC QUENCHERS, DOOR INTERLOCK TO PREVENT ACCESS TO FUSES WHEN SWITCH IS 'ON', FRONT OPERATION, HIGH PRESSURE FUSE CLIPS AND RECESSED LUGS FOR OPERATING HANDLES TO HAVE PROVISION FOR PALCOCKING IN EITHER 'ON' OR 'OFF' POSITIONS. HANDLE TO BE MARKED TO CLEARLY INDICATE SWITCH CONTACT POSITIONS. FUSIBLE SWITCHES SHALL BE MANUFACTURED BY SCHNEIDER ELECTRIC, EATON, OR SEMENS.

FUSES

1. NEW FUSES SHALL BE CSA CERTIFIED HRC-1 TIME DELAY AND SHALL BE IN ACCORDANCE WITH CSA SPECIFICATION C22.2 NO. 108-862, HRC-1 FUSE DIMENSIONS AND CURRENT LIMITING PERFORMANCE SHALL BE IN ACCORDANCE WITH THE UL STANDARD 198C. FUSE INTERRUPTING RATING SHALL BE 2000 AMPERES RMS SYMMETRICAL, UNLESS NOTED OTHERWISE. ALL FUSES SHALL BE MANUFACTURED BY LITLUFUSE, BUIS, MERSEN, OR EDISON.

GROUNDING

1. THE ENTIRE INSTALLATION SHALL BE GROUNDED IN ACCORDANCE WITH THE 2018 CANADIAN ELECTRICAL CODE AND DETAILS AS SHOWN ON THE DRAWINGS.
2. ALL GROUND CONDUCTORS SHALL BE BARE OR INSULATED, STRANDED, MEDIUM HARM DRAWN COPPER AND SHALL BE SIZED TO PERFORM AT A MAXIMUM VOLTAGE DROP OF 3% BASED ON THE CIRCUIT LOAD 80% OF THE CIRCUIT PROTECTIVE DEVICE.
3. ALL NON-CURRENT CARRYING METALLIC PARTS OF EQUIPMENT IN ELECTRICAL ROOMS AND MECHANICAL EQUIPMENT ROOMS SHALL HAVE A DIRECT COPPER CONNECTION RUN TO THE GROUND BUS IN EACH.
4. ALL BRANCH CIRCUITS SHALL INCLUDE A GROUND WIRE. CONDUIT SHALL NOT BE USED AS A GROUND.

PANELBOARDS

1. ALL BREAKER PANELS SHALL BE LOAD BALANCED SUCH THAT THE MAXIMUM VARIATION BETWEEN THE TWO WORST PHASES DOES NOT EXCEED 5%.
2. BRANCH CIRCUIT BREAKER SHALL HAVE QUICK-BREAK, QUICK-BREAK TOGGLE MECHANISM WITH SINGLE, TWO OR THREE POLE COMMON TRIP TRIP TRIP. MAGNETIC TRIPS IN AMPERE RATINGS AS DESIGNATED ON THE DRAWINGS. BREAKER HANDLES SHALL HAVE THREE POSITIONS 'ON', 'OFF' AND 'TRIP'. ALL CIRCUIT BREAKERS AND PANEL BUS SHALL HAVE AN INTERRUPTING CAPACITY OF 10,000 AMPS SYMMETRICAL.
3. EACH PANEL SHALL BE COMPLETE WITH A TYPED DIRECTORY, WHICH SHALL BE MOUNTED INSIDE THE DOOR IN A METAL FRAME WITH CLEAR PLASTIC COVER.
4. ALL PANEL DIRECTORIES AFFECTED BY THIS PROJECT SHALL BE UPDATED. PROVIDE A NEW UPDATED TYPED PANEL DIRECTORY WITHIN A CLEAR PLASTIC COVER AS REQUIRED. STICKERS OR WRITING ON THE PANEL DOOR IS NOT ACCEPTABLE.