

| STRUCTURAL ABBREVIATIONS: | |
|---------------------------|--|
| ACI | AMERICAN CONCRETE INSTITUTE |
| AISC | AMERICAN INSTITUTE OF STEEL CONSTRUCTION |
| ALT | ALTERNATE |
| ASTM | AMERICAN SOCIETY FOR TESTING AND MATERIALS |
| AWS | AMERICAN WELDING SOCIETY |
| ARCH | ARCHITECTURAL |
| B | BOTTOM |
| BLDG | BUILDING |
| BOTT | BOTTOM |
| CL | CENTER LINE |
| CFMF | COLD FORM METAL FRAME |
| CFS | COLD FORMED STEEL |
| CIP | CAST IN PLACE |
| CIPL | CAST-IN-PLACE LINTEL |
| CJ | CONTROL JOINT |
| CLR | CLEAR |
| CMU | CONCRETE MASONRY UNIT |
| COEFF | COEFFICIENT |
| COL | COLUMN |
| CONC | CONCRETE |
| CONT | CONTINUOUS |
| COORD | COORDINATE |
| CSJ | CONSTRUCTION JOINT |
| CTJ | CONTROL JOINT |
| DIA | DIAMETER |
| DIAG | DIAGONAL |
| DIM | DIMENSION |
| DWG | DRAWING |
| DWL | DOWEL |
| EA | EACH |
| ELEC | ELECTRICAL |
| ELEV | ELEVATION |
| EMBED | EMBEDMENT |
| EQUIV | EQUIVALENT |
| ETC | ET CETERA |
| EW | EACH WAY |
| EXT | EXTERIOR |
| FTG | FOOTING |
| GA | GAUGE |
| HORIZ | HORIZONTAL |
| HRS | HOURS |
| IBC | INTERNATIONAL BUILDING CODE |
| INT | INTERIOR |
| Kg | KILOGRAM |
| KIP | KIPS (1 KIP = 1,000 POUNDS) |
| kN | KILONEWTON |
| kPa | KILOPASCAL |
| L# | ANGLE (# INDICATES SIZE) |
| LLV | LONG LEG VERTICAL |
| M | METER |
| MAX | MAXIMUM |
| MBM | METAL BUILDING MANUFACTURER |
| MECH | MECHANICAL |
| MFG | MANUFACTURER |
| MID | MIDDLE |
| MIN | MINIMUM |
| MISC | MISCELLANEOUS |
| MM | MILLIMETER |
| MPa | MEGAPASCAL |
| MTL | METAL |
| MWFRS | MAIN WIND FORCE RESISTING SYSTEM |
| N | NEWTON |
| NORTH | NORTH |
| N/A | NOT APPLICABLE |
| # | NUMBER SYMBOL FOR REBAR SIZE |
| NTS | NOT TO SCALE |
| OC | ON CENTER |
| OPNG | OPENING |
| P or PL | PLATE |
| PRE-ENG | PRE-ENGINEERED |
| REINF | REINFORCED |
| REQ'D | REQUIRED |
| SIM | SIMILAR |
| SPECS | SPECIFICATIONS |
| STD | STANDARD |
| STRUCT | STRUCTURAL |
| SW | SHEAR WALL |
| T | TOP |
| T/ | TOP OF |
| T/ELEV | TOP ELEVATION |
| T&B | TOP AND BOTTOM |
| THK | THICK |
| TM | TRADE MARK |
| TYP | TYPICAL |
| UON | UNLESS OTHERWISE NOTED |
| VERT | VERTICAL |
| W | WIDTH |
| W/ | WITH |

GENERAL NOTES

- THIS PROJECT HAS BEEN DESIGNED FOR THE WEIGHTS AND MATERIALS INDICATED ON THE SHEETS AND FOR THE LIVE LOADS INDICATED IN THE DESIGN DATA. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ALLOWABLE CONSTRUCTION LOADS AND TO PROVIDE PROPER DESIGN AND CONSTRUCTION OF FALSEWORK, FORMWORK, STAGING, BRACING, SHEETING AND SHORING, ETC.
- COORDINATE THESE SHEETS WITH THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND CIVIL SHEETS. ALL DIMENSIONS SHOWN ON THE SHEETS ARE MILLIMETERS UNLESS NOTED OTHERWISE.
- THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL FLOOR AND ROOF OPENING SIZES AND LOCATIONS, EQUIPMENT PAD SIZES AND LOCATIONS, ANCHOR BOLT LAYOUTS, ETC WITH EQUIPMENT SELECTED. THE CONTRACTOR SHALL MAKE ANY REQUIRED MODIFICATIONS AT NO ADDITIONAL COST.
- THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING SHEETS FOR SLEEVES, CURBS, INSERTS OR OPENINGS, ETC. NOT HEREIN INDICATED.
- SLAB OPENINGS SMALLER THAN 250mm DIA TO BE CORE DRILLED IN FIELD UON. SEE MECHANICAL, ELECTRICAL AND PLUMBING SHEETS FOR LOCATIONS OF THESE OPENINGS.
- WORK NOT INCLUDED ON THE SHEETS BUT IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PLACES ELSEWHERE ON THE SHEETS SHALL BE REPEATED.
- IN CASE OF CONFLICT BETWEEN THE NOTES, DETAILS AND SPECIFICATIONS THE MOST RIGID REQUIREMENTS SHALL GOVERN.
- SEE ARCHITECTURAL SHEETS FOR LOCATIONS OF MASONRY AND DRYWALL NON-LOAD BEARING PARTITIONS. PROVIDE COMPRESSIBLE FIRESAFING AT TOP OF WALL AS REQUIRED BY ARCHITECTURAL SHEETS.
- COORDINATE FINISHED FLOOR DATUM ELEVATION 0.0m WITH THE CIVIL SHEETS.
- FOUNDATION NOTES**
- THE GEOTECHNICAL ANALYSIS FOR THIS PROJECT IS THE RESPONSIBILITY OF THE CONTRACTOR AWARDED THE WORK. DESIGN VALUES USED IN THE STRUCTURAL ANALYSIS OF THE BUILDINGS HEREIN INDICATED HAVE BEEN ASSUMED AND SHALL BE CONFIRMED AND VERIFIED AS PART OF THE GEOTECHNICAL INVESTIGATION. VALUES WHICH DO NOT MEET THE REQUIREMENTS INDICATED ON SHEET S2 SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER FOR CONSIDERATION AND DETERMINATION ON THE NEXT APPROPRIATE COURSE OF ACTION.
- SEE THE SPECIFICATION FOR ADDITIONAL REQUIREMENTS TO THOSE OUTLINED IN THE GEOTECHNICAL INVESTIGATION FOR EXCAVATION AND PREPARATION OF THE FOUNDATION AND THE SLAB ON GRADE SUBGRADE INCLUDING COMPACTION PROCEDURES.
- EXCAVATIONS FOR FOOTINGS SHALL HAVE THE SIDES AND BOTTOMS TEMPORARILY LINED WITH 0.25mm POLYETHYLENE IF PLACEMENT OF CONCRETE DOES NOT OCCUR WITHIN 24 HRS OF THE EXCAVATION OF THE FOOTING.
- FOUNDATION CONDITIONS NOTED DURING CONSTRUCTION WHICH DIFFER FROM THOSE DESCRIBED IN THE GEOTECHNICAL REPORT SHALL BE REPORTED TO THE GENERAL CONTRACTOR BEFORE FURTHER CONSTRUCTION IS ATTEMPTED. SEE PROJECT SPECIFICATIONS.
- NO FOOTINGS OR SLABS SHALL BE POURED INTO OR AGAINST SUBGRADE CONTAINING FREE WATER, FROST, ICE OR LOOSE MATERIAL. FROST DEPTH ASSUMED TO BE 800MM
- ALL SLAB-ON-GRADE, TRENCH BOTTOMS AND OTHER ON-GRADE INTERIOR HORIZONTAL SURFACES SHALL BE PLACED OVER A 0.25mm VAPOR RETARDER OVER A 100mm #57 STONE WATER BARRIER PLACED ON SUBGRADE PROPERLY PREPARED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. (UON)
- SEE PLUMBING, ELECTRICAL & CIVIL SHEETS FOR REQUIRED UNDERSLAB UTILITIES. SEE ARCHITECTURAL SHEETS FOR ALL WATERPROOFING DETAILS AND MATERIALS.
- IF UNDERMINING OF FOOTINGS OCCURS, FILL VOIDS WITH 15MPa CONCRETE. DO NOT ATTEMPT TO REPLACE AND RECOMPACT SOIL.
- CONCRETE**
- CONCRETE SHALL HAVE THE UNIT WEIGHT AND THE MINIMUM COMPRESSIVE STRENGTHS (f'c) AT 28 DAYS AS SHOWN IN THE CONCRETE MATERIALS SCHEDULE ON THIS SHEET. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION. ENTRAIN AIR TO PRODUCE TOTAL AIR CONTENT ACCORDING TO THE SPECIFICATIONS FOR CONCRETE EXPOSED TO FREEZING TEMPERATURES (EXTERIOR FOOTINGS, SLAB TURNDOWNS, EXTERIOR SLABS AND SLABS-ON-GRADE, EXTERIOR RETAINING WALLS, AND EXTERIOR GRADE BEAMS.)
- GROUT FOR BASE PLATES SHALL BE NON-SHRINKABLE GROUT AND SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH AT 28 DAYS OF 35MPa, UNLESS NOTED OTHERWISE.
- NO CALCIUM CHLORIDE SHALL BE USED IN ANY CONCRETE.
- MIXING, TRANSPORTING AND PLACING OF CONCRETE SHALL CONFORM TO ACI 301M-05.
- ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN CONCRETE INSTITUTE (ACI) 318M MANUAL (metric), "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", AND REQUIREMENTS OUTLINED IN THE CONTRACT SPECIFICATIONS. WHEN THERE IS A CONFLICT BETWEEN ACI AND THE SPECIFICATIONS, THE MORE STRINGENT SHALL GOVERN.
- CHAMFER ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH 20mm x45 DEGREE CHAMFER UON.
- CONCRETE REINFORCEMENT BARS SHALL CONFORM TO ASTM A615M, GRADE 420, REINFORCING BARS SHALL NOT BE TACK WELDED, WELDED, HEATED OR CUT, UNLESS INDICATED ON THE CONTRACT DOCUMENTS. ALL LAP SPLICES SHALL BE CLASS "B" UON.
- HORIZONTAL FOOTING AND HORIZONTAL WALL REINFORCEMENT SHALL BE CONTINUOUS AND SHALL HAVE 90 DEGREE BENDS AND EXTENSIONS, OR CORNER BARS OF EQUIVALENT SIZE LAPPED WITH A CLASS B TENSION SPLICE AT CORNERS AND INTERSECTIONS. TOP BAR CRITERIA SHALL APPLY IF 300mm OR MORE OF FRESH CONCRETE IS PLACED BELOW BAR.
- SLABS-ON-GRADE SHALL HAVE CONSTRUCTION JOINTS OR CRACK CONTROL JOINTS AS SHOWN ON THE SHEETS. CONSTRUCTION JOINTS CAN BE USED AT CONTROL JOINT LOCATIONS AT CONTRACTORS OPTION. SEE SLAB PLANS & JOINT DETAILS FOR ADDITIONAL INFORMATION. FOR AREAS NOT SHOWN ON THE SHEETS, THE MAXIMUM SPACING OF CONSTRUCTION/ CRACK CONTROL JOINTS SHALL BE 4800 mm.

- SEE SPECIFICATIONS FOR ALL WATERPROOFING/DAMP-PROOFING REQUIREMENT.
- ALL CONCRETE REINFORCEMENT SHALL BE DETAILED, FABRICATED, LABELED, SUPPORTED, AND SPACED IN FORMS AND SECURED IN PLACE IN ACCORDANCE WITH THE PROCEDURES AND REQUIREMENTS OUTLINED IN THE LATEST EDITION OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", ACI 318M, AND THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", ACI 315M, LATEST EDITION.
- SHOP DRAWINGS SHOWING REINFORCING DETAILS, INCLUDING STEEL SIZES, SPACING AND PLACEMENT, SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION.
- ALL DOWELS SHALL MATCH SIZE AND NUMBER OF MAIN REINFORCING, UNLESS NOTED OTHERWISE ON THE SHEETS.
- ADDITIONAL BARS SHALL BE PROVIDED AROUND ALL FLOOR AND WALL OPENINGS AS SHOWN ON THE SHEETS.
- SEE ARCHITECTURAL SHEETS FOR TYPE AND LOCATION OF ALL FLOOR FINISHES.
- THE CONTRACTOR SHALL COORDINATE ADDITIONAL WALL/SLAB OPENINGS NOT SHOWN ON STRUCTURAL SHEETS. SEE MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL SHEETS.
- THE SUB-CONTRACTOR SHALL VERIFY ALL OPENINGS, PAD SIZES, AND ANCHOR BOLTS WITH EQUIPMENT SELECTED.
- FOR ALL WALLS & PIERS, PROVIDE DOWELS INTO FOOTING AT EACH VERT REINF BAR, UON DOWEL SIZE SHALL BE SAME AS VERT REINF.
- ALL REINFORCING INDICATED TO BE WELDED SHALL BE IN ACCORDANCE WITH ASTM A706M. "LOW ALLOY STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT". ANY INSTALLATIONS USING MANUFACTURER'S EQUIPMENT SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE CONCRETE POUR STOPS OR FORMED AS REQUIRED FOR INSTALLATION OF ALL CONCRETE WORK.
- PROVIDE ADDITIONAL (2)-#13 x 600mm REINFORCING BARS IN SLAB-ON GRADE AT ALL RE-ENTRANT CORNERS. PLACE BARS AT MID-DEPTH OF SLAB WITH A CLEARANCE OF 50mm FROM CORNER UON.
- CONCRETE MASONRY**
- MASONRY CONSTRUCTION AND MATERIALS SHALL CONFORM TO ALL REQUIREMENTS OF THESE CONTRACT DOCUMENTS AND THE PROJECT SPECIFICATIONS.
- THE SPECIFIED ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE MASONRY (f'm) ON THE NET AREA IS A MINIMUM OF 10.4 MPa.
- PROVIDE TWO #16 BARS CONTINUOUS IN ALL CMU AND CAST-IN-PLACE BOND BEAMS UON ON THE SHEETS. BOND BEAMS SHALL BE CONTINUOUS AND SPACED AT A MAXIMUM OF 1200mm OC VERTICALLY. PROVIDE BOND BEAM STARTER COURSE AT BOTTOM OR FIRST COURSE ON ALL MASONRY WALLS AND PARTITIONS. ALL BOND BEAMS SHALL BE A MINIMUM OF 200mm IN DEPTH WITH REINFORCING BEING CONTINUOUS AND HAVING STANDARD ACI 180° HOOKS AT EACH END. PROVIDE STANDARD BAR SPLICES AS SPECIFIED.
- FOR WALL REINFORCING, SEE DETAIL 7 ON SHEET S5
- CMU CELLS THAT REQUIRE VERTICAL REINFORCING BARS AS INDICATED ON THE CONTRACT DRAWINGS AND/OR SPECS SHALL HAVE REINF BARS PLACED IN CENTERS OF CMU CELLS AND CONTINUOUSLY GROUTED UON.
- PROVIDE LADDER TYPE JOINT REINFORCEMENT AT (200mm EXTERIOR & 400mm INTERIOR) ON CENTER MAXIMUM UON MINIMUM ROD SIZE USED SHALL BE 9 GA. DEFORMED WIRE AND CONFORM TO ASTM A82M, UON.
- PROVIDE CONTROL JOINTS AS INDICATED ON THE ARCHITECTURAL SHEETS.
- GROUT FOR MASONRY SHALL BE NORMAL WEIGHT AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 25 MPa AT 28 DAYS. GROUT SHALL CONFORM TO ASTM C476M. GROUT LIFTS SHALL NOT EXCEED 1400mm.
- USE MORTAR TYPE S CONFORMING TO ASTM C270M, SEE SPECIFICATIONS.
- CONCRETE MASONRY UNITS SHALL BE NORMAL WEIGHT AND CONFORM TO ASTM C90M.
- ALL CMU CELLS, OPEN CAVITIES, AND AIR SPACES SHALL BE GROUTED TO STOP FRAGMENTS FROM MORTAR BLAST
- BOND BEAM REINFORCING SHALL BE DISCONTINUOUS AT CONTROL JOINTS (UON). MAXIMUM CONTROL JOINT SPACING SHALL BE AS INDICATED ON THE ARCHITECTURAL SHEETS.
- CONTRACTOR SHALL COORDINATE LOCATION OF ALL OPENINGS SEE ARCH, MECH, ELEC, AND PLUMBING SHEETS. FOR SIZE AND LOCATION OF OPENINGS.
- MASONRY WALLS SHALL NOT BE BACK FILLED PRIOR TO THE MORTAR AND GROUT ATTAINING THEIR RESPECTIVE MAXIMUM DESIGN STRENGTHS PER SPECIFICATIONS.

- CFMRF - COLD FORM METAL ROOF FRAMING SYSTEM**
- CFMRF SHALL BE DESIGNED BY CFMF MANUFACTURER'S ENGINEER FOR ALL LOADING PER CODE AND AS INDICATED ON THE SHEETS.
- FOR WIND LOADS, SEE THE DESIGN CRITERIA ON SHEET S2.
- SUBMIT VENDOR'S PUBLISHED LITERATURE, TEST DATA AND INSTALLATION INSTRUCTIONS FOR METAL STUD ASSEMBLY AND ACCESSORIES INCLUDING OTHER DATA AS MAY BE REQUIRED TO CERTIFY COMPLIANCE WITH PERFORMANCE REQUIREMENTS SPECIFIED HEREIN.
- SHOP DRAWINGS AND DESIGN ANALYSIS SHALL BE STAMPED AND APPROVED BY A LICENSED PROFESSIONAL ENGINEER. CONNECTIONS AND GAUGE SIZES ARE MINIMUM AND SHALL BE INCREASED AS NECESSARY TO PROVIDE A STRUCTURALLY ADEQUATE SYSTEM. KICKERS MAY BE ADDED TO REDUCE THE STUD HEIGHTS WHERE ACCEPTABLE AND COORDINATED WITH THE ARCHITECTURAL DRAWINGS.
- CFMRF SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

STUD/RAFTER/EAVE STRUT:
 Fy = 344 MPa
 GAUGE = 18
 DEPTH = 152.3 mm
 WIDTH = 34.8 mm
 MOMENT OF INERTIA, Ix = 847x10³ mm⁴
 SECTION MODULUS, Sx = 11.2x10³ mm³

TRACK:
 Fy = 344 MPa
 GAUGE = 16
 DEPTH = 152.3 mm
 WIDTH = 38 mm
 MOMENT OF INERTIA, Ix = 1083x10³ mm⁴
 SECTION MODULUS, Sx = 13.8x10³ mm³

PURLIN:
 Fy = 393 MPa
 GAUGE = 16
 MOMENT OF INERTIA (TOP COMPRESSION), Ixt = 23.7x10³ mm⁴
 MOMENT OF INERTIA (BOTT COMPRESSION), Ixb = 22.7x10³ mm⁴
 SECTION MODULUS (TOP COMPRESSION), Sxt = 1.8x10³ mm³
 SECTION MODULUS (BOTT COMPRESSION), Sxb = 1.7x10³ mm³

| STRUCTURAL ELEMENT | f'c CONCRETE COMPRESSIVE STRENGTH @ 28 DAYS (MPa) |
|---------------------------------|---|
| SLAB-ON-GRADE/TURN-DOWN SLABS | 28 |
| ROOF AND FLOOR SLABS | 28 |
| ALL FOOTINGS (UON) | 28 |
| MISC. CURBS, WALLS AND PADS UON | 28 |
| CAST-IN-PLACE LINTEL | 28 |

| BAR SIZE | BASIC LAP SPLICE Ld FOR CMU REINFORCING(mm) |
|----------|---|
| #10 | 450 |
| #13 | 600 |
| #16 | 750 |

- NOTES:
- ALL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE. (2400 Kg/m³ UON)
 - ALL CONCRETE SHALL HAVE A WATER-CEMENT RATIO OF 0.45.

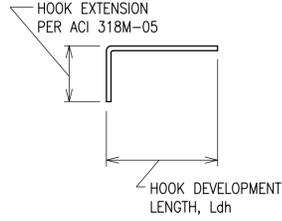
MINIMUM LAP SPLICES OF REINFORCING BARS IN TENSION (PER ACI 318M-05)

| BAR SIZE | f'c = 28 MPa CONCRETE | | | | |
|----------|------------------------------|----------------|-------------|------------------|-------------|
| | CENTER TO CENTER BAR SPACING | (--TOP BARS--) | | (--OTHER BARS--) | |
| | | LESS THAN 4db | 4db OR MORE | LESS THAN 4db | 4db OR MORE |
| #10 | 460 | 460 | 410 | 410 | 40 |
| #13 | 660 | 610 | 510 | 480 | 50 |
| #16 | 1020 | 760 | 790 | 580 | 60 |

- NOTES:
- LAP SPLICES ABOVE ARE IN MILLIMETERS UON.
 - YIELD STRENGTH OF REINFORCEMENT, fy, IS 420MPa (LAP SPLICE LENGTH IS IN MILLIMETERS).
 - CONCRETE IS NORMAL WEIGHT (2400Kg/m³).
 - TOP BAR INDICATES HORIZONTAL REINFORCEMENT WHICH IS PLACED ABOVE 300mm OR MORE OF FRESH CONCRETE.
 - SEE COLUMN SCHEDULE FOR COLUMN AND SHEAR WALL VERTICAL LAP SPLICE.
 - STRAIGHT DEVELOPMENT LENGTH OF AN UNLAPPED BAR IS EQUAL TO VALUE FROM TABLE DIVIDED BY 1.3. CATEGORY FOR BARS SPACED LESS THAN 4d, OR ON CENTER CORRESPONDS TO CATEGORY 1 IN THE CRSI HANDBOOK WHEREAS FOR BARS SPACED 4d, OR MORE ON CENTER CORRESPOND TO CRSI CATEGORY 5.

STANDARD HOOKS IN TENSION PER (ACI 318M-05)

| BAR SIZE | f'c 28 MPa |
|----------|------------|
| #10 | 180 |
| #13 | 250 |
| #16 | 300 |
| #19 | 380 |
| #22 | 430 |
| #25 | 480 |
| #29 | 560 |
| #32 | 610 |
| #36 | 690 |



- NOTES:
- CONCRETE IS NORMAL WEIGHT CONCRETE.
 - BAR YIELD STRENGTH, fy = 420 MPa
 - SIDE COVER REQUIREMENTS OF ACI SECT. 12.5.3 ARE ASSUMED TO NOT BE MET.
 - TIE OR STIRRUP REQUIREMENTS OF ACI SECT. 12.5.3 ARE ASSUMED TO NOT BE MET.
 - REDUCTION FOR EXCESS REINFORCEMENT IS NOT TAKEN.
 - HOOK DEVELOPMENT LENGTH IS VALID FOR 180° HOOKS ALSO.



| APR | DATE | DESCRIPTION | SYMBOL |
|-----|------|-------------|--------|
| | | | |
| | | | |
| | | | |
| | | | |

DESIGNED BY: DATE: 09-30-09
 GDH
 SUBMITTED BY: BAKER
 MDB
 FILE NO.: ANPDS-001XXX
 CWV
 Michael Baker Jr. Inc.
 A Unit of Michael Baker Corporation
 1000 Business Park
 Moon Township, PA 15108
 www.mbakercorp.com

AFGHAN NATIONAL POLICE
 STANDARD DESIGN
 WELL HOUSE
 GENERAL NOTES

SHEET REFERENCE NUMBER:
S1

100% SUBMISSION

STRUCTURAL DESIGN CRITERIA

ALL DESIGNS SHALL CONFORM TO THE PROVISIONS OF THE IBC 2006 AS APPLICABLE

1.0 DESIGN LOADS

1.1 DEAD LOADS

1.1.1 ROOF DEAD LOADS – CONVENTIONAL FRAMING

| | MAXIMUM GRAVITY LOAD | MINIMUM GRAVITY LOAD |
|---------------------|----------------------|----------------------|
| LIGHT GAUGE FRAMING | 0.20 KPa | 0.15 KPa |
| METAL ROOFING | 0.14 KPa | 0.05 KPa |
| INSULATION | 0.10 KPa | 0.05 KPa |
| MISC | 0.05 KPa | 0.00 KPa |
| | 0.49 KPa | 0.25 KPa |

1.1.2 ROOF DEAD LOADS – CONCRETE FRAMING

| | MAXIMUM GRAVITY LOAD |
|--------------------|----------------------|
| CONC FLAT SLAB | 4.80 KPa |
| MECH/ELEC/PLUMBING | 0.15 KPa |
| MISC | 0.05 KPa |
| | 5.00 KPa |

1.2 LIVE LOADS (PER IBC 2006)

1.2.1 ROOF LIVE LOADS: ALL BUILDINGS

GREATER OF 1.0 KPa MINIMUM OR SNOW LOAD

1.2.2 SLAB-ON-GRADE LIVE LOADS

ALL BUILDINGS 4.80 KPa

1.3 SNOW LOADS (PER IBC 2006)

1.3.1 DESIGN PARAMETERS

| | |
|-------------------------------------|---------------------|
| GROUND SNOW LOAD (per UFC 3-310-01) | PER LOCAL CONDITION |
| SNOW IMPORTANCE FACTOR | 1.0 KPa |
| SNOW EXPOSURE FACTOR | 1.0 KPa |

1.4 SEISMIC LOADS (PER IBC 2006 & UFC 3-310-04)

1.4.1 SEISMIC PARAMETERS – LOAD BEARING MASONRY

| | |
|----------------------------------|-----------------------------------|
| SEISMIC OCCUPANCY CATEGORY | II |
| SEISMIC IMPORTANCE FACTOR (I) | 1.0 |
| SEISMIC SITE CLASS | D |
| Ss | 1.280 |
| S1 | 0.510 |
| Sds | 0.853 |
| Sd1 | 0.510 |
| SEISMIC DESIGN CATEGORY | D |
| SEISMIC RESISTING SYSTEM | BEARING WALL SYSTEM |
| | SPECIAL REINF MASONRY SHEAR WALLS |
| RESPONSE MODIFICATION FACTOR (R) | 5.0 |
| RESPONSE COEFFICIENT (Cs) | 0.17 |
| SEISMIC ANALYTICAL PROCEDURE | EQUIV LATERAL FORCE |
| SEISMIC BASE SHEAR | 49 kN |

1.6 WIND LOADS (PER IBC 2006)

1.6.1 DESIGN PARAMETERS

| | |
|---------------------------------|----------|
| BASIC WIND SPEED | 137 Km/h |
| WIND IMPORTANCE FACTOR | 1.0 |
| WIND EXPOSURE CATEGORY | D |
| DIRECTIONALITY COEFFICIENT (Kd) | 0.85 |
| TOPOGRAPHIC FACTOR (Kzt) | 1.0 |

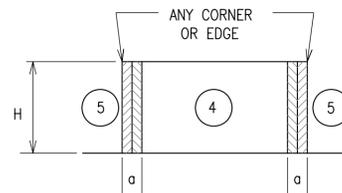
1.6.2 DESIGN WIND PRESSURE – MAIN WINDFORCE RESISTING SYSTEM

| LOCATION | CORNER ZONE WIDTH "a" | MEAN ROOF HEIGHT (h) | WINDWARD WALL (@ MEAN ROOF HEIGHT) | LEEWARD WALL (@ MEAN ROOF HEIGHT) | ROOF |
|-------------|-----------------------|----------------------|------------------------------------|-----------------------------------|------------------------|
| FIELD ZONE | N/A | 3890mm | 582 N/m ² | -463 N/m ² | -803 N/m ² |
| CORNER ZONE | 900mm | 3890mm | 883 N/m ² | -689 N/m ² | -1244 N/m ² |

a = 10% OF LEAST HORIZONTAL DIMENSION OR 0.4h, WHICHEVER IS SMALLER, BUT NOT LESS THAN EITHER 4% OF LEAST HORIZONTAL DIMENSION OR 0.9M.
h = MEAN ROOF HEIGHT, IN METERS, EXCEPT THAT EAVE HEIGHT SHALL BE USED FOR ANGLE GREATER THAN 10°.

1.6.3 DESIGN WIND PRESSURE – WALL COMPONENTS AND CLADDING

EXTERIOR WALL SYSTEMS & THEIR ATTACHMENTS TO THE PRIMARY STRUCTURE SHALL BE DESIGNED FOR THE PRESSURES SHOWN IN THE DIAGRAM BELOW:



| LOCATION | WINDWARD PRESSURE N/m ² (inward) | | LEEWARD PRESSURE N/m ² (outward) | | a |
|--------------------------|---|-----|---|---------|------|
| | ④ | ⑤ | ④ | ⑤ | |
| MAIN BUILDING | | | | | (mm) |
| AREA = 1 m ² | 627 | 627 | -986 | -1216 | 900 |
| AREA = 2 m ² | 589 | 589 | -948 | -1134.8 | 900 |
| AREA = 5 m ² | 565 | 565 | -910 | -1086.9 | 900 |
| AREA = 10 m ² | 565 | 565 | -910 | -1086.9 | 900 |

NOTES:

- DESIGN WIND PRESSURES ABOVE REPRESENT THE NET PRESSURE (SUM OF INTERNAL AND EXTERNAL PRESSURE) APPLIED NORMAL TO ALL SURFACES.
- LINEAR INTERPOLATION BETWEEN VALUES OF TRIBUTARY AREA IS PERMISSIBLE.
- PLUS AND MINUS SIGNS SIGNIFY PRESSURE TOWARD AND AWAY FROM THE EXTERIOR SURFACE, RESPECTIVELY.

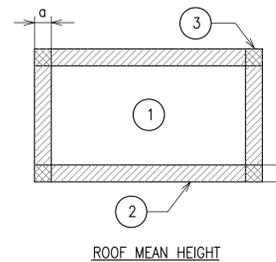
MASONRY CONCRETE LINTEL SCHEDULE

| OPENING TYPE OR SIZE, BEAM LOCATION OR TYPE | MAX SPAN (mm) | BEAM DEPTH (mm) | MAIN REINFORCING | | | SHEAR REINF STIRRUPS |
|---|---------------|-----------------|------------------|---------|-------|----------------------|
| | | | TOP | BOTTOM | OTHER | |
| EXT WINDOW OR DOOR | 900 | 400 | (2)-#13 | (2)-#13 | | ---- |
| INT WALL OPENING, NON-BEARING | 1800 | 400 | (2)-#13 | | | ---- |
| INT WALL OPENING, NON-BEARING | 900 | 200 | (2)-#13 | | | ---- |

- STRUCTURAL DRAWINGS DO NOT INDICATE ALL OPENINGS IN MASONRY WALLS. VERIFY NUMBER, SIZE AND LOCATION OF ALL OPENINGS IN MASONRY WALLS FROM ARCHITECTURAL SHEETS AND APPROVED PLUMBING, MECHANICAL, AND ELECTRICAL SHOP DRAWINGS.
- PROVIDE 200mm BEARING EA END FOR 200mm DEEP CMU LINTEL PROVIDE 400mm BEARING EA END FOR 400mm DEEP CIPL.
- FOR HEAD DETAILS REFER TO ARCHITECTURAL SHEETS.
- REINFORCING SHALL BE ASTM A615M, GRADE 400. CONCRETE FOR CAST-IN-PLACE BEAMS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa AT 28 DAYS.
- CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS AND SCHEDULES SHOWING SIZE, DETAILS, LOCATIONS, ETC FOR ALL CAST-IN-PLACE BEAMS IN CMU WALLS.

1.6.4 DESIGN WIND PRESSURE – ROOF COMPONENTS AND CLADDING

ROOF COMPONENTS & THEIR ATTACHMENTS SHALL BE DESIGNED FOR THE PRESSURES SHOWN IN THE ADJACENT DIAGRAM & TABLE BELOW:



1.6 WIND LOADS (CON'T)

| LOCATION | GROSS UPLIFT PRESSURE N/m ² (upward) | | | a |
|--------------------------|---|-------|-------|------|
| | ① | ② | ③ | |
| MAIN BUILDING | | | | (mm) |
| AREA = 1 m ² | -838 | -1460 | -1460 | 900 |
| AREA = 2 m ² | -838 | -1460 | -1460 | 900 |
| AREA = 5 m ² | -838 | -1460 | -1460 | 900 |
| AREA = 10 m ² | -838 | -1460 | -1460 | 900 |

NOTES:

- DESIGN WIND PRESSURES ABOVE REPRESENT THE NET PRESSURE (SUM OF INTERNAL AND EXTERNAL PRESSURE) APPLIED NORMAL TO ALL SURFACES.
- LINEAR INTERPOLATION BETWEEN VALUES OF TRIBUTARY AREA IS PERMISSIBLE.
- PLUS AND MINUS SIGNS SIGNIFY PRESSURE TOWARD AND AWAY FROM THE EXTERIOR SURFACE, RESPECTIVELY.

2.0 FOUNDATION DESIGN CRITERIA (TO BE CONFIRMED BY THE CONTRACTOR)

THE GEOTECHNICAL ANALYSIS FOR THIS PROJECT IS THE RESPONSIBILITY OF THE CONTRACTOR AWARDED THE WORK. DESIGN VALUES USED IN THE STRUCTURAL ANALYSIS OF THE BUILDINGS HEREIN INDICATED HAVE BEEN ASSUMED AND SHALL BE CONFIRMED AND VERIFIED AS PART OF THE GEOTECHNICAL INVESTIGATION. VALUES WHICH DO NOT MEET THE REQUIREMENTS INDICATED BELOW SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER FOR CONSIDERATION AND DETERMINATION ON THE NEXT APPROPRIATE COURSE OF ACTION.

2.1.1 SOIL DESIGN PARAMETERS

| | |
|--|------------------------|
| NET ALLOWABLE SOIL BEARING CAPACITY | 96.0 KPa |
| UNIT WEIGHT OF SOIL (moist) | 1800 Kg/m ³ |
| COEFF ACTIVE EARTH PRESSURE (Kpa) | 0.30 |
| COEFF PASSIVE EARTH PRESSURE (Kpp) | 3.33 |
| COEFF AT-REST EARTH PRESSURE (Kpr) | .55 |
| COEFF OF SOIL FRICTION | .35 |
| SUBGRADE MODULUS | 4120 g/m ³ |
| MINIMUM BEARING DEPTH BELOW GRADE | 800mm |
| SEISMIC SITE CLASS (based on in-situ soil) | D |

CONCRETE COVER SCHEDULE

MINIMUM CONCRETE COVER PROTECTION FOR REINFORCEMENT BARS SHALL BE AS FOLLOWS: (SEE ACI 318M-05, SECTION 7.7 FOR CONDITIONS NOT NOTED). DIMENSIONS FOR BAR PLACEMENT GIVEN IN SECTIONS AND DETAILS SHALL SUPERSEDE MINIMUM COVER REQUIREMENTS GIVEN HERE. DIMENSIONS ARE IN mm.

| | |
|--|-------------------|
| FOOTINGS (EARTH FORMED) | 70 |
| COLUMNS / PIERS (TO TIES) | 40 |
| GRADE BEAMS OR SLAB TURNED DOWN EDGES: | |
| TOP | 40 |
| BOTTOM (EARTH FORMED) | 70 |
| SIDES (EARTH FORMED) | 70 |
| SIDES (BOARD FORMED) | 40 |
| | #16 BAR & SMALLER |
| | #19 THRU #36 BAR |
| ELEVATED BEAMS & SLABS: | |
| BEAM TIES & STIRRUPS (NOT EXPOSED TO WEATHER) | 40 |
| BEAM TIES & STIRRUPS (EXPOSED TO WEATHER) | 50 |
| FLOOR SLABS (NOT EXPOSED TO WEATHER) | 20 |
| FLOOR SLABS (EXPOSED TO WEATHER) | |
| #19 & LARGER | 50 |
| #13 & SMALLER | 40 |
| ROOF SLAB BARS | 25 |
| SLABS-ON-GRADE (NO EXPOSURE TO WEATHER) FROM TOP | 20 |
| SLABS-ON-GRADE (EXPOSURE TO WEATHER) FROM TOP | 40 |
| UTILITY TUNNEL WALLS, RETAINING WALLS AND SHEAR WALLS, (NO SURFACES SHALL BE EARTH FORMED) | |
| EARTH SIDE AND FRONT SIDE (EXPOSED TO WEATHER): | |
| #16 BAR AND SMALLER | 40 |
| #19 THRU #36 BAR | 50 |
| PROVIDE STANDARD BAR CHAIRS AND SPACERS AS REQUIRED TO MAINTAIN CONCRETE PROTECTION SPECIFIED. | |

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| DWN BY: MDB | SUBMITTED BY: BAKER |
| CHK BY: CWV | FILE NO: ANPSDS-002XXX |

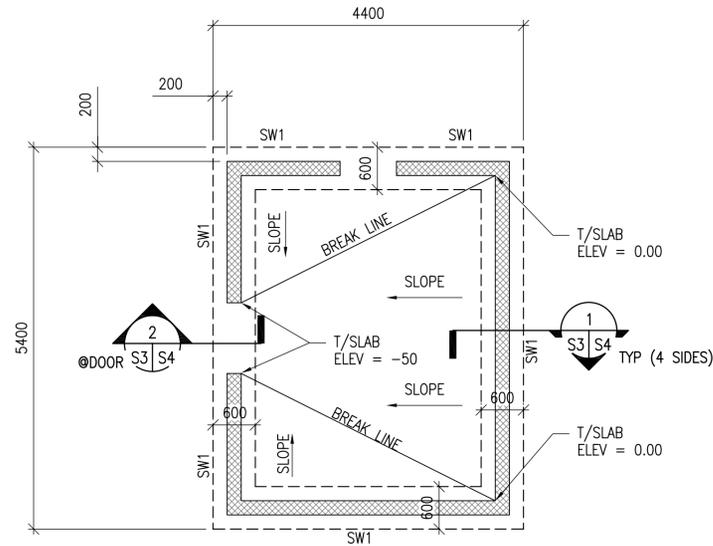
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AFGHAN NATIONAL POLICE
STANDARD DESIGN
WELL HOUSE
DESIGN CRITERIA & SCHEDULES

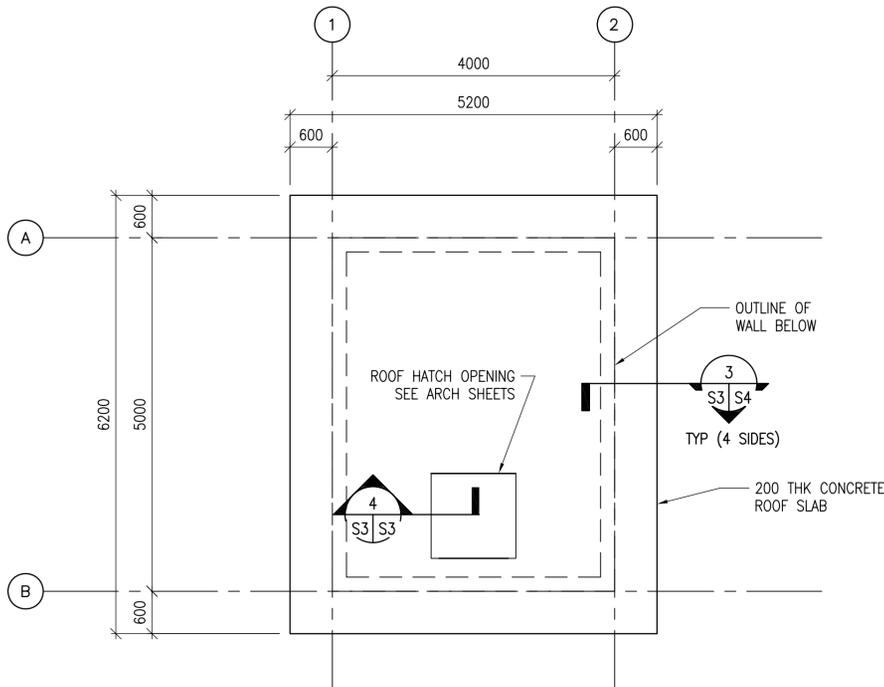
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S2

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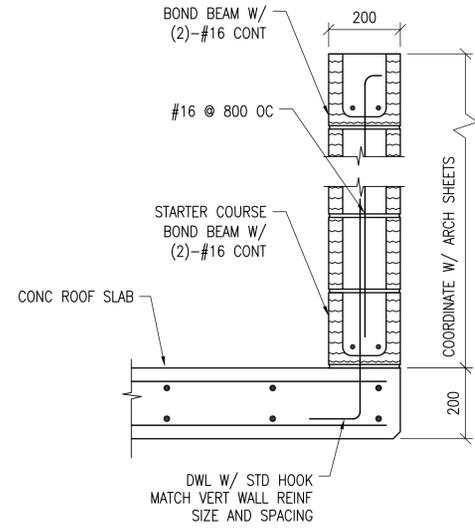
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1 WELL HOUSE FOUNDATION PLAN
SCALE: 1:50



2 WELL HOUSE ROOF FRAMING PLAN
SCALE: 1:50



4 SECTION
SCALE: 1:10

- NOTES:
1. FINISH FIRST FLOOR ELEVATION SHALL BE (DATUM 0.0) ALL PLUS OR MINUS DIMENSIONS INDICATED ON PLAN OR REFERRED TO IN NOTES RELATE TO FINISH FIRST FLOOR ELEVATION.
 2. TOP OF EXTERIOR FOOTINGS SHALL BE -600 UNLESS OTHERWISE INDICATED.
 3. UNLESS OTHERWISE INDICATED, FLOORS SHALL BE 150 THICK CONCRETE SLAB-ON-GRADE W/ 13 DIA REBAR @ 450 OC E.W. (38 CLR. TOP)
 4. REFER TO SHEET S1 AND S2 FOR STRUCTURAL NOTES, ABBREVIATIONS AND SYMBOLS.
 5. REFER TO ARCHITECTURAL SHEETS FOR MASONRY PARTITION TYPES AND SHEET S5 REINFORCEMENT.
 6. SEE MECHANICAL AND ELECTRICAL SHEETS FOR CONCRETE PAD LOCATIONS, SIZES, AND THICKNESS NOT SHOWN. SEE SHEET S5 FOR DETAILS.
 7. ——— INDICATES SLOPE IN SLAB ON GRADE. COORDINATE LOCATION AND ELEVATION WITH ARCHITECTURAL AND PLUMBING SHEETS (TYP).
 8. COORD W/ ARCHITECTURAL SHEETS FOR COLD-FORMED STEEL OVERBUILT FRAMING ABOVE ROOF SLAB.
 9. COLD-FORMED METAL OVERBUILT ROOF FRAMING NOT SHOWN FOR CLARITY. SEE OVERBUILT ROOF FRAMING DETAILS AND SECTIONS ON SHEET S4.

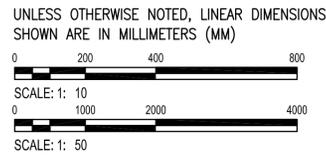
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Afghanistan Engineer District

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| DWN BY: | SUBMITTED BY: | BAKER |
| CHK BY: | FILE NO.: | ANFSDS-103XXX |
| CWW | | |

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AFGHAN NATIONAL POLICE
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FOUNDATION & ROOF FRAMING PLANS



SHEET REFERENCE NUMBER:
S3

100% SUBMISSION

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| CHK BY: | GPH | FILE NO.: | ANPSDP-501XXX |

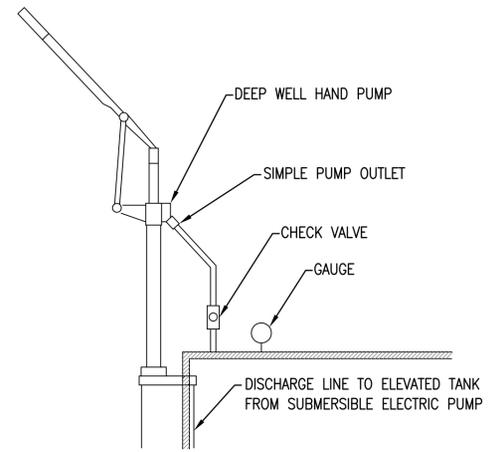
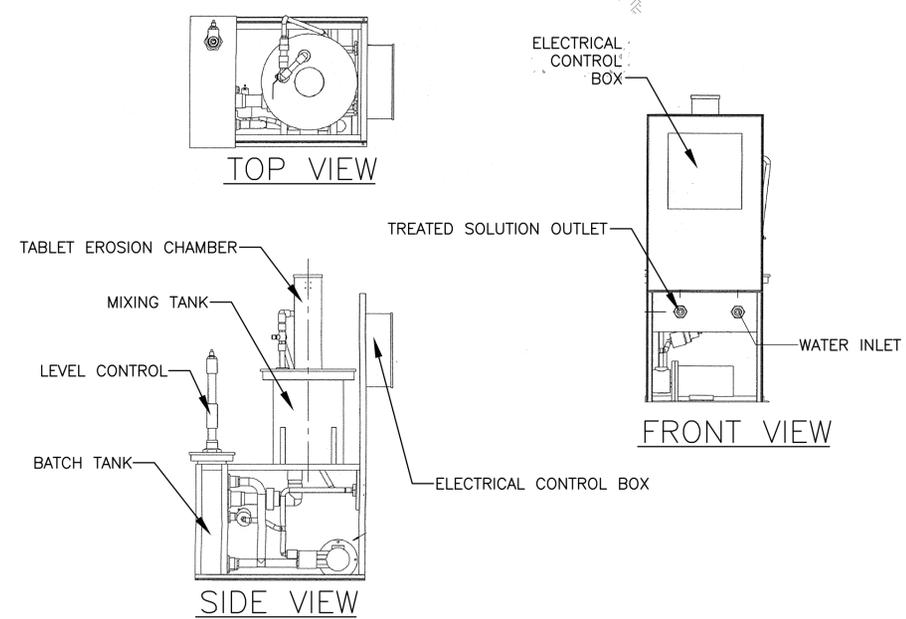
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WELL HOUSE
PLUMBING SCHEMATIC AND DETAILS

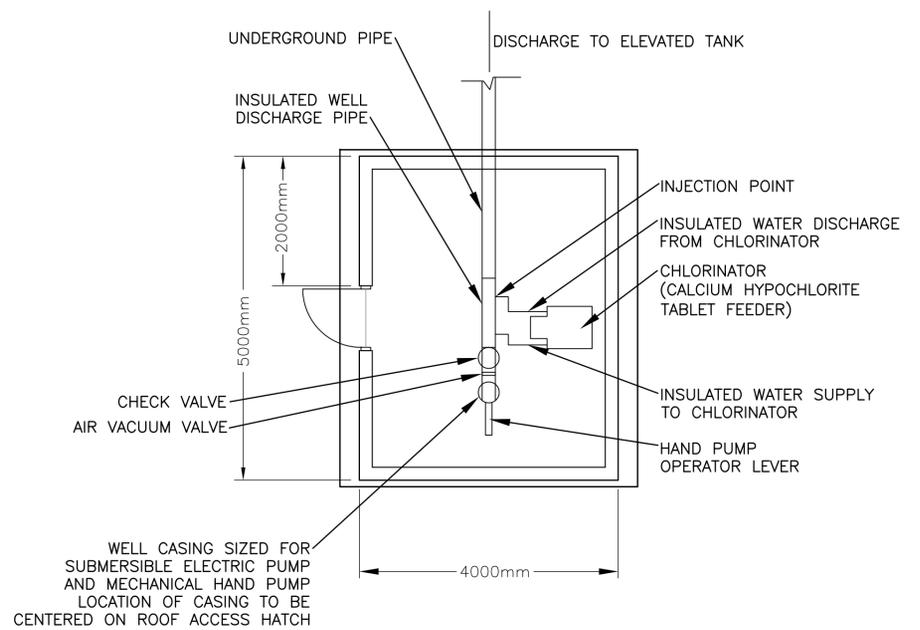
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P1

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HAND PUMP
INSTALLATION DETAIL
N.T.S.

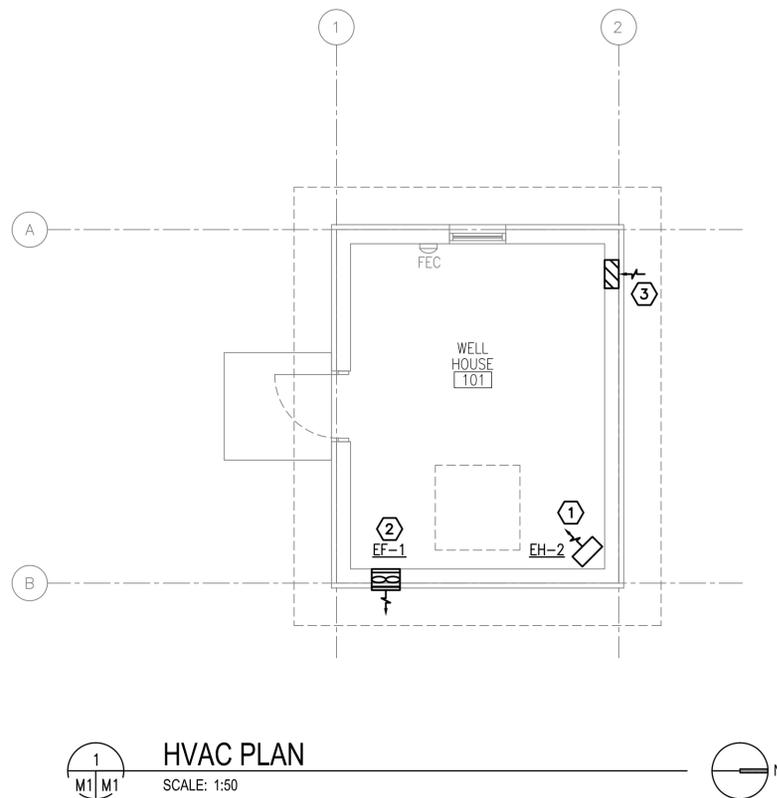


WELL HOUSE
PLUMBING SCHEMATIC
N.T.S.

WELL CASING SIZED FOR
SUBMERSIBLE ELECTRIC PUMP
AND MECHANICAL HAND PUMP
LOCATION OF CASING TO BE
CENTERED ON ROOF ACCESS HATCH

A B C D E F G H

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GENERAL NOTES:

- DO NOT SCALE DRAWINGS – ALL DIMENSIONS AND CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- ALL WORK PERFORMED ON THIS BUILDING SHALL BE IN COMPLIANCE WITH ALL PERTINENT CODES, RULES, ORDINANCES AND REGULATIONS OF THE GOVERNING AUTHORITIES.
- ALL WORK PERFORMED UNDER AND IN CONNECTION WITH THESE DRAWINGS AND SPECIFICATIONS SHALL BE IN STRICT COMPLIANCE WITH THE LATEST SAFETY AND HEALTH STANDARDS.

NUMBERED NOTE:

- CORROSION RESISTANT ELECTRIC UNIT HEATER SUSPENDED FROM STRUCTURE ABOVE.
- CORROSION RESISTANT WALL MOUNTED EXHAUST FAN.
- 200x400 (8x16) LOW LEAKAGE GRAVITY WALL LOUVER FOR INTAKE. PROVIDE WEATHER PROOF LOUVER W/0.05mm (2") WASH DOWN FILTER AND SAND TRAP.

ELECTRIC UNIT HEATER SCHEDULE

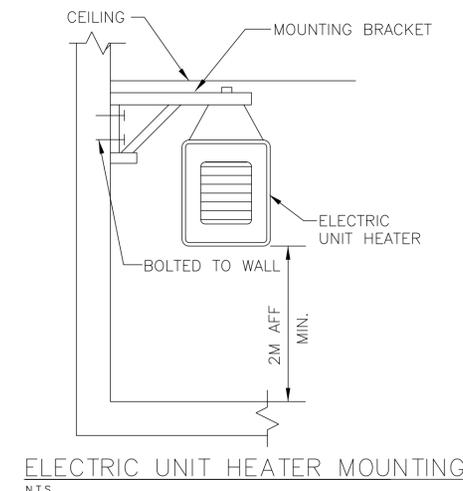
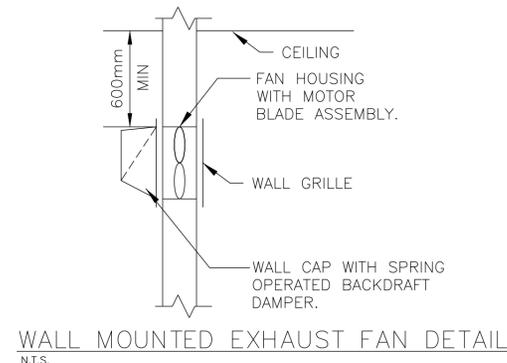
| NO. | CMS | KW | F.A.T. °C | ELECT. CHAR. | MOUNTING |
|------|------|-----|-----------|--------------|----------|
| EH-2 | .200 | 2.6 | 33 | 370/1/50 | CEILING |

- NOTES:
1. HEATERS SHALL BE CORROSION RESISTANT

EXHAUST FAN SCHEDULE

| NO. | TYPE | FAN CMS | DRIVE | HP | SP mmH2O | ELECT. CHAR. | SWITCH |
|------|------|---------|--------|-------|----------|--------------|--------|
| EF-1 | WALL | 0.100 | DIRECT | FRACT | 13 | 220/1/50 | ⊙ WALL |

- NOTES:
1. WALL MOUNTED EXHAUST FAN MOUNT AT 600mm BELOW CEILING.
2. FANS SHALL HAVE LOW LEAKAGE GRAVITY LOUVER AND SECURITY GRILLE.
3. FANS SHALL BE EXPLOSION PROOF.



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DESIGNED BY: DATE: 09-30-09
RML
SUBMITTED BY: BAKER
OWN BY: JUN
CHK BY: CJM
FILE NO.: ANPSDM-101XXX

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HVAC PLAN

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M1

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