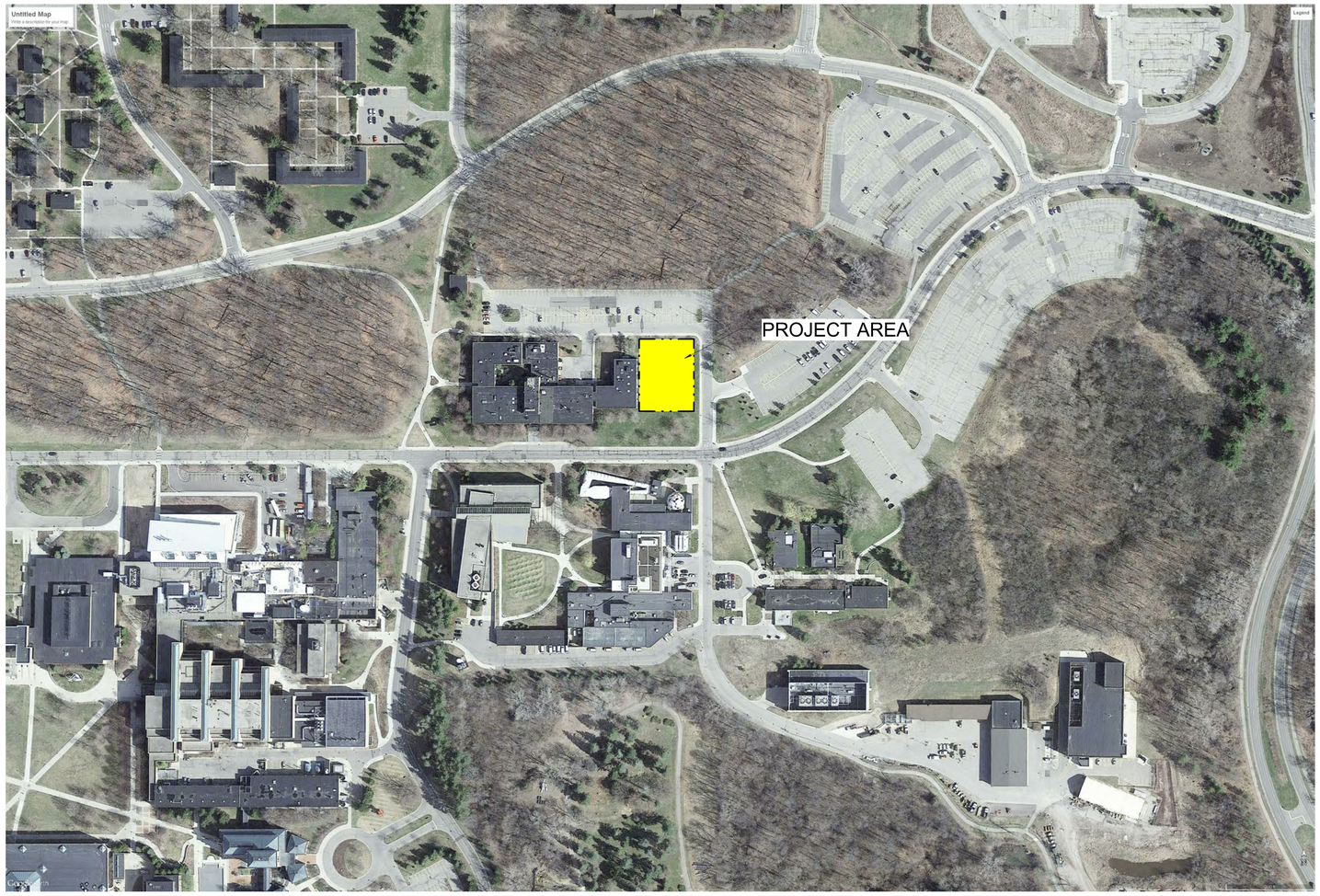


UNIVERSITY OF MICHIGAN

College of Engineering &
Office of Research

M-AIR Test Facility

UNIVERSITY OF MICHIGAN PROJECT NO. - P00011963

Ann Arbor Michigan 48109-1340

Construction Set

08/25/2017

HED

2016-01099-000

PLAN REVIEW DATA

BUILDING CODE

2012 MICHIGAN BUILDING CODE INCORPORATING THE 2012 EDITION OF THE INTERNATIONAL BUILDING CODE

PLUMBING CODE

2012 MICHIGAN PLUMBING CODE INCORPORATING THE 2012 EDITION OF THE INTERNATIONAL PLUMBING CODE

ELECTRICAL CODE

2010 NATIONAL ELECTRICAL CODE AS AMENDED BY MICHIGAN BUREAU OF CONSTRUCTION CODE RULES, 2010 EDITION WITH UNIVERSITY OF MICHGIAN MODIFICATIONS.

FIRE CODE

2012 INTERNATIONAL FIRE CODE, AS REFERNCED IN THE 2012 MICHIGAN BUILDING CODE.

ACCESSIBILITY

2012 MICHIGAN BUILDING CODE INCLUDING MICHIGAN BARRIER FREE AND ICC/ANSI A117.1-2003

USE GROUP

U (SHEDS) FOR PAVILION NOTE: DRONE NETTING AREA IS NOT CONSIDERED A STRUCTURE.

CONSTRUCTION TYPE

TYPE VB (COMBUSTIBLE/NOT PROTECTED)

OCCUPANCY

NOT REGULARLY OCCUPIED

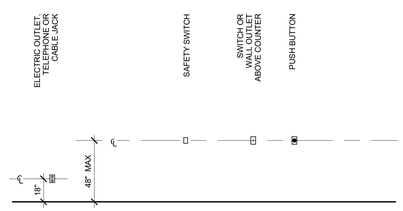
AREA AND HEIGHT

ACTUAL 660 S.F. TABULAR ALLOWABLE 5,500 S.F.
ACTUAL HEIGHT 11'-0" TABULAR ALLOWABLE 40'-0"

MOUNTING DIMENSIONS

NOTES:

1. MOUNTING DIMENSIONS SHOW ACCESSIBLE AND NON-ACCESSIBLE CONDITIONS. WHEN ONLY ONE OPTION IS SHOWN - ALL ITEMS IN PROJECT SHALL BE ACCESSIBLE. WHEN ITEMS CAN BE ACCESSIBLE OR NON ACCESSIBLE DRAWINGS SHALL INDICATE LOCATION OF ACCESSIBLE ITEMS BY THIS SYMBOL
2. COORDINATE ITEMS SHOWN ON THIS DRAWING WITH PLANS AND SPECIFICATIONS FOR ACTUAL ITEMS USED ON THIS PROJECT.
3. NOT EVERY ITEM SHOWN ON THIS DRAWING IS USED ON THIS PROJECT.



PROJECT GENERAL NOTES

A. FIRST FLOOR LEVEL ELEVATION OF 100'-0" NOTED ON ARCHITECTURAL AND STRUCTURAL DRAWINGS EQUALS ELEVATION OF 893.00' NOTED ON CIVIL DRAWINGS.

B. IT SHALL BE EACH TRADE CONTRACTORS RESPONSIBILITY TO VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH ALL EXISTING CONDITIONS. EACH CONTRACTOR SHALL TAKE ALL NECESSARY FIELD MEASUREMENTS AND OTHERWISE VERIFY ALL DIMENSIONS AND EXISTING CONSTRUCTION CONDITIONS INDICATED AND/OR SHOWN ON THE DRAWINGS. SHOULD ANY ERROR OR INCONSISTENCY EXIST, THE CONTRACTOR SHALL NOT PROCEED WITH THE WORK AFFECTED THEREBY UNTIL REPORTING THE SAME TO THE ARCHITECT AND THE OWNER'S REPRESENTATIVE AND GETTING CLARIFICATION AND/OR CORRECTION.

C. DIMENSIONS FOLLOWED BY +/- SHALL BE REVIEWED AND ALL NECESSARY ADJUSTMENTS MADE PRIOR TO FABRICATION AND/OR INSTALLATION OF WORK. CONTRACTOR SHALL NOTIFY ARCHITECT /ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

D. COORDINATE SIZE AND LOCATION OF ALL ACCESS PANELS WITH APPROPRIATE TRADES.

E. COORDINATE SIZE AND LOCATION OF ALL HOUSE- KEEPING PADS AND/OR EQUIPMENT SUPPORTS WITH APPROPRIATE EQUIPMENT MANUFACTURER.

F. PROVIDE FIRE WATCH DURING FIELD CUTTING AND WELDING OPERATIONS, MEETING OWNERS REQUIREMENTS.

G. THE EXTENT OF HATCHING ON DRAWINGS IS ONLY SUFFICIENT TO INDICATE THE NATURE OF THE CONSTRUCTION OR MATERIALS. TERMINATION OF THE HATCHING SHALL NOT BE CONSTRUED TO REPRESENT A CHANGE OR TERMINATION OF MATERIAL.

H. THE CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION & ELEVATION OF ALL UNDERGROUND UTILITIES IN WORK AREAS PRIOR TO PROCEEDING WITH CONSTRUCTION. ALL DISCREPANCIES SHALL BE DOCUMENTED AND FORWARDED TO ARCHITECT AND OWNERS REPRESENTATIVE FOR ACTION.

I. IT IS THE CONTRACTORS RESPONSIBILITY TO INVESTIGATE FIELD CONDITIONS AND PROVIDE AS NEEDED TEMPORARY SUPPORTS, SHORING AND / OR PROTECTION OF EXISTING STRUCTURES AND UNDERGROUND UTILITIES DURING EXECUTION OF WORK.

J. ALL WORK TO CONFORM TO THE REQUIREMENTS OF THE LOCAL AND STATE CODES. COORDINATE W/ SPECIFICATIONS, DIVISION 1.

K. RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS SHALL BE VERIFIED AGAINST MANUFACTURERS CERTIFIED EQUIPMENT DRAWINGS.

L. DO NOT SCALE DRAWINGS TO DETERMINE SIZES AND DIMENSIONS. USE FIGURED DIMENSIONS ONLY. DIMENSIONS ARE TO FINISHED FACE OF WALLS UNLESS OTHERWISE NOTED. ALL PERIMETER DIMENSIONS ARE FROM FACE OF PERIMETER WALLS.

DRAWING LIST

3/27/2017 12:52:52 PM

SOIL EROSION AND SEDIMENTATION CONTROL MAINTENANCE NOTES

IN ACCORDANCE WITH RULE 1709 PROMULGATED UNDER THE AUTHORITY OF PART 91, SOIL EROSION AND SEDIMENTATION CONTROL, OF THE NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED, AND IN ADDITION TO THE INFORMATION IN THE PROJECT PLANS AND SPECIFICATIONS, THE FOLLOWING GENERAL CONDITIONS APPLY TO THE EARTH CHANGE AUTHORIZED BY THIS DOCUMENT:

A. DESIGN, CONSTRUCT, AND COMPLETE THE EARTH CHANGE IN A MANNER THAT LIMITS THE EXPOSED AREA OF DISTURBED LAND FOR THE SHORTEST PERIOD OF TIME.

B. REMOVE SEDIMENT CAUSED BY ACCELERATED SOIL EROSION FROM RUNOFF WATER BEFORE IT LEAVES THE SITE OF THE EARTH CHANGE.

C. TEMPORARY OR PERMANENT CONTROL MEASURES SHALL BE DESIGNED AND INSTALLED TO CONVEY WATER AROUND, THROUGH OR FROM THE EARTH CHANGE AT A NON-EROSIVE VELOCITY.

D. INSTALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES BEFORE OR UPON COMMENCEMENT OF THE EARTH CHANGE ACTIVITY AND MAINTAIN THE MEASURES ON A DAILY BASIS. REMOVE TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AFTER PERMANENT SOIL EROSION MEASURES ARE IN PLACE AND THE AREA IS STABILIZED. ("STABILIZED" MEANS THE ESTABLISHMENT OF VEGETATION OR THE PROPER PLACEMENT, GRADING OR COVERING OF SOIL TO ENSURE ITS RESISTANCE TO SOIL EROSION, SLIDING, OR OTHER EARTH MOVEMENT.)

E. COMPLETE PERMANENT SOIL EROSION CONTROL MEASURE FOR THE EARTH CHANGE WITHIN FIVE (5) CALENDAR DAYS AFTER FINAL GRADING OR UPON COMPLETION OF THE FINAL EARTH CHANGE. IF IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE THE EARTH CHANGE, THEN MAINTAIN TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IN PLACE AND THE AREA IS STABILIZED.

F. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING LANDSCAPING DURING THE WARRANTY PERIOD. AFTER THE WARRANTY HAS EXPIRED, THE PERMANENT SESC MEASURES WILL BE MAINTAINED BY THE UNIVERSITY OF MICHIGAN PLANT OPERATIONS GROUNDS & WASTE MANAGEMENT DEPARTMENT AND THE PLUMBING SHOP AS APPROPRIATE. THE GROUNDS & WASTE MANAGER WILL BE RESPONSIBLE FOR MAINTENANCE OF ANY PERMANENT LANDSCAPING SESC MEASURES. THE PLUMBING SHOP FOREMAN WILL BE RESPONSIBLE FOR THE MAINTENANCE OF ANY SESC MEASURES THAT ARE PART OF THE STORM WATER DRAINAGE SYSTEM PIPING.

SOIL EROSION AND SEDIMENTATION CONTROL NOTES

1. INSTALL TEMPORARY INLET FILTERS AT ALL ADJACENT AND DOWN-GRADIENT STORM WATER INLETS, CATCH BASINS AND MANHOLES THAT MAY BE IMPACTED. CATCH BASIN INLET FILTERS SHALL BE MAINTAINED CLEAN AT ALL TIMES THROUGHOUT THE CONSTRUCTION PERIOD. IF A FILTER HAS HOLES OR IS INUNDATED WITH SEDIMENT, THE FILTER WILL REQUIRE REPLACEMENT.

2. INSTALL AN ANTI-TRACKING PAD AT THE SITE ENTRY AND EXIT(S). THE ANTI-TRACKING PAD SHOULD BE CONSTRUCTED OF GEOTEXTILE FABRIC WITH LIMESTONE OVER IT.

3. SILT FENCE SHALL BE MAINTAINED AT ALL TIMES THROUGHOUT THE CONSTRUCTION PERIOD. IF REPAIR OR REPLACEMENT IS NECESSARY, IT SHALL BE PERFORMED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS. MAINTENANCE INCLUDES THE REMOVING OF BUILT-UP SEDIMENT ACCUMULATES TO ½ THE HEIGHT OF THE FENCE. CONTRACTOR SHALL REMOVE, REPLACE, RETRENCH, OR RE-BACKFILL THE FENCE IF IT FAILS. ADDITIONALLY, THE CONTRACTOR SHALL REINSTALL ANY PORTION OF THE FENCING DAMAGED BY CONSTRUCTION MACHINERY.

4. PLACE STOCKPILES AND OTHER SPOIL PILES AWAY FROM THE DRAINAGE SYSTEM TO MINIMIZE SEDIMENT TRANSPORT. IF THE STOCKPILE AND/OR SPOIL PILE MUST REMAIN ON-SITE OVERNIGHT, OR IF THE WEATHER CONDITIONS INDICATE THE CHANCE FOR PRECIPITATION, A) COVER THE PILE WITH WATER REPELLENT MATERIAL TO PREVENT EROSION AND/OR B) INSTALL SILT FENCING AROUND THE BASE OF THE PILE TO PREVENT TRANSPORT OF SEDIMENT TO THE STORM WATER SYSTEM, OR APPLY OTHER CONTROL METHODS APPROPRIATE TO THE SIDE. CONTROL MEASURES TO GUARD AGAINST WIND EROSION MUST ALSO BE EMPLOYED, SUCH AS WETTING OR COVERING THE STOCKPILES. KEEP AS FEW STOCKPILES AS POSSIBLE DURING THE COURSE OF THE PROJECT.

5. THROUGHOUT THE CONSTRUCTION PERIOD, ALL MUD/SILT TRACKED ONTO EXISTING ROADS FROM THE SITE DUE TO CONSTRUCTION SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR.

6. SEEDING OR OTHER STABILIZATION SHALL BE REQUIRED IMMEDIATELY TO AREAS WHICH HAVE BEEN DAMAGED BY RUNOFF.

7. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL ON THE SITE THROUGHOUT THE DURATION OF THE CONSTRUCTION PROCESS.

8. WEEKLY INSPECTIONS BY A UNIVERSITY SESC TRAINED CERTIFIED STORM WATER MANAGEMENT OPERATOR AS WELL AS PERIODIC INSPECTIONS WITHIN 24 HOURS OF ANY RAINFALL WILL BE REQUIRED. THESE INSPECTIONS MAY RESULT IN RECOMMENDATIONS FOR ROUTINE MAINTENANCE OF THE SOIL EROSION CONTROL DEVICES, AS WELL AS ADDITIONAL CONTROLS.

EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL DURING ALL PHASES OF CONSTRUCTION.

2. CONCRETE WASH SHALL NOT BE ALLOWED TO ENTER THE STORM SEWER SYSTEM. A CONCRETE WASH AREA SHALL BE DESIGNATED BY THE OWNER'S REPRESENTATIVE.

3. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS REQUIRED AND WHERE DESIGNATED ON THE PLANS.

4. ALL DIMENSIONS AND LOCATIONS OF TEMPORARY EROSION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS REQUIRED TO SUIT SPECIFIC SITE NEEDS OR AS MAY BE REQUIRED BY THE LOCAL GOVERNING AUTHORITIES.

5. ALL REQUIRED TEMPORARY EROSION CONTROL MEASURES MUST BE CONSTRUCTED AND IN OPERATION PRIOR TO LAND CLEARING AND/OR OTHER CONSTRUCTION OPERATIONS TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE NATURAL DRAINAGE SYSTEM.

6. THE CONTRACTOR SHALL INSPECT THE TEMPORARY EROSION CONTROL MEASURES DAILY AND AFTER EACH SIGNIFICANT RAIN EVENT. IN THE EVENT OF A FAILURE OF ANY OF THE MEASURES, WORK SHALL BE SUSPENDED UNTIL THEY ARE REPLACED OR REPAIRED TO FULL FUNCTIONALITY.

7. THE EROSION AND SEDIMENTATION CONTROL SYSTEMS DEPICTED ON THIS DRAWING ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. AS CONSTRUCTION PROGRESSES AND UNEXPECTED OR SEASONAL CONDITIONS DICTATE, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE PERMITTEE TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED AND TO PROVIDE ADDITIONAL FACILITIES OVER AND ABOVE MINIMUM REQUIREMENTS, AS MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES AND WATER QUALITY OF THE RECEIVING DRAINAGE SYSTEM.

8. ANY DISTURBED AREA WHICH WAS BEEN STRIPPED OF VEGETATION AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 15 DAYS OR MORE MUST BE IMMEDIATELY STABILIZED WITH MULCHED GRASS PLANTING OR OTHER APPROVED EROSION CONTROL TREATMENT. DURING THE MONTHS OF APRIL THROUGH OCTOBER, INCLUSIVE, SEEDING MAY PROCEED, BUT MUST BE AUGMENTED WITH MULCHING, NETTING OR OTHER TREATMENT APPROVED BY LOCAL AUTHORITY.

9. THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED UPON PERMANENT STABILIZATION OF SURFACES OR IF IN THE OPINION OF LOCAL AUTHORITIES, THE MEASURES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE.

EROSION CONTROL SEQUENCE OF OPERATIONS

1. INSTALL TEMPORARY EROSION CONTROL MEASURES.
2. COMMENCE SITE CLEARING OPERATIONS.
3. STRIP TOPSOIL AND EXCAVATE SITE. EXPORT ALL STRIPPED AND EXCAVATED MATERIAL.
4. INSTALL SITE DEWATERING MEASURES INCLUDING A DEWATERING FILTER BAG.
4. AFTER BUILDING CONSTRUCTION IS COMPLETE, BACKFILL AND ROUGH GRADE SITE.
5. FINE GRADE SITE.
6. COMMENCE SITE RESTORATION (PLANTING, SEEDING, SODDING, ETC.) OPERATIONS.
7. SCHEDULE FINAL INSPECTION WITH EROSION CONTROL AUTHORITY, AS REQUIRED.
8. UPON INSPECTOR'S APPROVAL, REMOVE TEMPORARY EROSION CONTROL MEASURES.

DEMOLITION NOTES

1. ALL TREES AND VEGETATION SHALL BE PROTECTED IN PLACE BY A TREE PROTECTION FENCE PLACED AT A LOCATION EVEN WITH THE DRIP LINE OR EDGE OF PAVEMENT.

2. REMOVE ONLY THE STRUCTURES AND PAVEMENT DESIGNATED FOR REPLACEMENT WITH NEW RAMP WITHIN THE LIMITS OF CONSTRUCTION. ALL OTHER STRUCTURES AND PAVEMENT SHALL BE PROTECTED IN PLACE AS REQUIRED.

3. ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMITS OF CONSTRUCTION SHALL REMAIN AND BE PROTECTED IN PLACE DURING CONSTRUCTION OPERATIONS, UNLESS OTHERWISE DESIGNATED TO BE REMOVED. CONTRACTOR SHALL VERIFY EXACT LOCATION AND DEPTHS OF ALL EXISTING UTILITIES PRIOR TO COMMENCEMENT OF DEMOLITION OPERATIONS.

4. SAWCUT PAVEMENTS, CURBS, ETC., FULL DEPTH TO PROVIDE A CLEAN, VERTICAL EDGE AT THE LIMITS OF CONSTRUCTION OR REMOVE TO THE NEAREST JOINT BEYOND.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE PHASING OF THE DEMOLITION OF ITEMS SHOWN ON THIS DRAWING IN CONJUNCTION WITH THE CONSTRUCTION MANAGER.

6. REPAIR ANY LANDSCAPE IRRIGATION SYSTEMS DAMAGED BY THE NEW WORK. IRRIGATION RESTORATION SHALL BE PERFORMED UTILIZING NEW PARTS AND MATERIALS OF THE SAME TYPE AND MANUFACTURER. COORDINATE WITH UM GROUNDS DEPT TO DETERMINE APPROPRIATE PARTS FOR ANY IRRIGATION REPAIRS. IRRIGATION SYSTEM SHOULD BE TAKEN APART AND CAPPED FOR FUTURE EXTENSION WHERE IT IS IN CONFLICT WITH CONSTRUCTION ACTIVITIES. THE SYSTEM MUST BE KEPT OPERATIONAL THROUGHOUT THE CONSTRUCTION PERIOD.

GRADING NOTES

1. ALL ELEVATIONS ON THESE PLANS ARE ON NAVD 88 DATUM.

2. AT THE OWNER'S OPTION, AN OFF SITE STOCKPILE AREA MAY BE MADE AVAILABLE TO THE CONTRACTOR. ANY OFF SITE STOCKPILE AREAS SHALL BE SUBJECT TO ALL SOIL EROSION AND SEDIMENTATION CONTROL NOTES CONTAINED HEREIN.

3. FINISH GRADES SHOWN ON DRAWING L-101 INDICATE FINISH TOPSOIL AND PAVEMENT GRADES.

4. SLOPE SMOOTHLY BETWEEN INDICATED ELEVATIONS TO ENSURE THAT ALL GRADED AREAS DRAIN TO OUTLETS AND NO STORM WATER PONDING OCCURS ON SITE.

8. ALL GRADED AREAS INCLUDING SLOPES ARE SODDED AND LANDSCAPED AS SOON AS POSSIBLE AFTER FINAL GRADING IS COMPLETED.

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GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY THE SIZES, LOCATIONS, ELEVATIONS AND DETAILS OF EXISTING CONDITIONS THAT AFFECT THE WORK AND SHALL INFORM THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IN DIMENSIONS, SIZES, LOCATIONS AND CONDITIONS, BEFORE PROCEEDING WITH THE WORK.

2. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS AT THE SITE, INCLUDING UTILITIES, SERVICES, ETC. AND SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES HE CAUSES TO THE WORK OR PROPERTY OF THE OWNER, ANY SEPARATE CONTRACTOR OR SUBCONTRACTOR ON THE PROJECT.

3. ALL EXISTING INFORMATION FOR THE SITE AND IMMEDIATELY ADJACENT AREAS WAS OBTAINED FROM A SURVEY PERFORMED BY ARBOR LAND CONSULTANTS, INC. ((734) 669-2960). REFER TO DRAWING R-1.

4. ALL WORK SHALL CONFORM TO APPLICABLE STATE AND LOCAL CODES AND STANDARDS.

5. THE CONTRACTOR SHALL PROVIDE ANY DEWATERING REQUIRED ON-SITE TO FACILITATE CONSTRUCTION. SEE DESCRIPTION OF EXISTING AND PROPOSED ON-SITE DRAINAGE AND DEWATERING FACILITIES NOTES BELOW.

6. REFER TO THE GEOTECHNICAL INVESTIGATION IN THE SPECIFICATIONS FOR INFORMATION CONCERNING EXISTING SOIL CONDITIONS.

7. THE SIDEWALK ADJACENT TO THE CONSTRUCTION SITE ON THE NORTH SIDE OF HAYWARD STREET AND THE WEST SIDE OF DRAPER ROAD EXTENDED (SPACE RESEARCH PARKING LOT ENTRANCE)SHALL REMAIN OPEN TO PEDESTRIAN TRAFFIC AT ALL TIMES EXCEPT WHEN CONSTRUCTION EQUIPMENT REQUIRES ACCESS TO THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING APPROPRIATE TEMPORARY PEDESTRIAN AND VEHICULAR TRAFFIC CONTROLS AS NEEDED TO INSURE PUBLIC SAFETY AT ALL TIMES.

8. PHASING, TEMPOBARY FENCING, BARRICADING, VEHICULAR DETOURS AND PEDESTRIAN ROUTING SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO THE START OF CONSTRUCTION.

9. SHORT TERM AND/OR LONG TERM LANE CLOSURES IN HAYWARD STREET TO ACCOMMODATE CONSTRUCTION ACTIVITIES WILL BE ALLOWED ONLY IF APPROVED BY THE U-M PROJECT MANAGER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL PLANS AND OTHER NECESSARY DOCUMENTATION NEEDED COORDINATE LANE CLOSURES.

10. GREAT CARE SHALL BE TAKEN BY ALL CONTRACTORS TO AVOID DAMAGE TO VEGETATION AND IMPROVEMENTS OUTSIDE THE LIMITS OF CONSTRUCTION AND TO KEEP THE CONSTRUCTION AREA TO A MINIMUM. DRIVING AND PARKING OF VEHICLES AND STORAGE OF MATERIALS AND SUPPLIES SHALL NOT BE PERMITTED OUTSIDE THE LIMITS OF CONSTRUCTION.

11. NO ACTIVITY, INCLUDING PARKING, DRIVING OF VEHICLES, PEDESTRIAN ROUTING, STAGING, LAYDOWN OR STORAGE OF MATERIAL WILL BE ALLOWED WITHIN THE TREE PROTECTIVE ZONES (TO EDGE OF TREE DRIP LINE).

12. AN AREA WILL BE ESTABLISHED ON SITE AT A LOCATION TO BE DETERMINED BY THE OWNER'S REPRESENTATIVE FOR LAYDOWN, STAGING, STORAGE AND STOCKPILING OF MATERIALS.

13. EXCESS AND/OR UNACCEPTABLE EXCAVATED MATERIAL, EXCESS AND/OR UNACCEPTABLE TOPSOIL, TRASH, DEBRIS AND OTHER WASTE MATERIALS SHALL BE REMOVED AND DISPOSED OF OFF THE OWNER'S PROPERTY IN A LEGAL MANNER.

14. CONSTRUCTION STAKEOUT SHALL BE PERFORMED BY A REGISTERED LAND SURVEYOR AND WILL BE PROVIDED AND PAID FOR BY CONTRACTOR.

GENERAL UTILITY NOTES

1. ALL TRENCHES UNDER OR WITHIN THREE FEET OF EXISTING AND/OR PROPOSED PAVEMENT SHALL BE FILLED WITH SAND THAT IS COMPACTED TO AT LEAST 95% OF ITS' MAXIMUM UNIT WEIGHT PER ASTM D 1557. THE BACKFILL SHALL BE IN LAYERS NOT TO EXCEED 12 INCHES LOOSE MEASURE.

2. THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

3. FOR PROTECTION OF UNDERGROUND UTILITIES THE CONTRACTOR SHALL CALL 811 A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO EXCAVATING IN THE VICINITY OF UTILITY LINES. ALL "MISS-DIG" PARTICIPATING MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS-DIG: ALERT SYSTEM".

4. THE CONTRACTOR SHALL HAND DIG, IF NECESSARY, ONLY AFTER SUCH SUCCESSFUL NOTIFICATIONS, AS DIRECTED BY THE CITY AND/OR THE UTILITY OWNER TO DETERMINE THE EXACT LOCATION OF THE UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES TO EXISTING UTILITIES.

5. POSITIVE PROVISIONS SHALL BE MADE TO INSURE THAT ALL UTILITY TRENCHES ARE FREE DRAINING DURING ALL PHASES OF CONSTRUCTION.

6. CONTRACTOR SHALL INSTALL TEMPORARY CONSTRUCTION FENCE ON SIDES OF ANY UTILITY TRENCHES DURING CONSTRUCTION. NO OPEN TRENCHES SHALL BE ALLOWED AT NIGHT OR DURING NON-WORK DAYS.

7. TEMPORARY CONSTRUCTION FENCE SHALL BE HIGH DENSITY POLYETHYLENE PLASTIC IN 2" DIAMOND MESH 48" WIDE ROLLS, IN ORANGE COLOR, AND WEIGH NOT LESS THAN 24 POUNDS FOR A 48" WIDE X 50' LONG ROLL. POSTS SHALL BE 7' LONG STUDDED TEE-POSTS WITH SOIL SET TIPS AND SMOOTH GROOVES TO ACCEPT WIRE TIES. FENCE SHALL BE ATTACHED TO TEE-POSTS WITH A MINIMUM OF 4 WIRE TIES. TEE-POST SHALL BE LOCATED AT 8 FEET ON CENTER AND AT EACH TURN.

8. COORDINATE THE CONSTRUCTION SCHEDULE WITH THE OWNER, INCLUDING DELIVERIES, ALL NECESSARY SHUTDOWNS AND DAILY WORK HOURS IN A TIMELY MANNER.

9. THE OWNER OR OWNER'S REPRESENTATIVE WILL INSPECT ALL WORK. WORK NOT INSPECTED WILL NOT BE PAID FOR.

10. THE CONTRACTOR SHALL VERIFY EXISTING GRADES AT ALL PROPOSED MANHOLE LOCATIONS AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES WITH THE PROPOSED MANHOLE RIM ELEVATIONS SHOWN ON THE PLANS. ALL PROPOSED MANHOLE RIM ELEVATIONS SHALL MATCH PROPOSED GRADES.

11. ALL EXISTING UTILITY STRUCTURES INCLUDING, BUT NOT LIMITED TO, MANHOLES, CATCH BASINS, GATE WELLS, VALVE BOXES, HYDRANTS, ELECTRICAL VAULTS AND HAND HOLES WITHIN THE LIMITS OF CONSTRUCTION SHALL BE ADJUSTED TO THE PROPOSED FINISH GRADE, EVEN IF NOT SO INDICATED ON THE PLANS.

LANDSCAPE NOTES

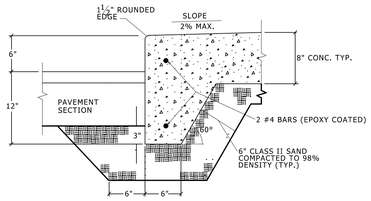
1. TOPSOIL FOR LAWN RESTORATION: SHALL BE SANDY LOAM, pH 6.0-7.0, ORGANIC CONTENT 4-10%. SUBMIT SOIL TEST. TESTING AGENCY SHALL BE A&L GREAT LAKES LABS. PERFORM TESTS S1, S2 & MECHANICAL ANALYSIS. REQUEST, AND PAY FOR, LAB AGRONOMIST TO PROVIDE A MIX DESIGN TO BRING TOPSOIL INTO CONFORMANCE WITH REQUIREMENTS.
2. MULCH: 3" DEPTH OF SINGLE SHREDDED NATIVE HARDWOOD BARK MULCH; NOT LARGER THAN 3" IN LENGTH AND ½" IN WIDTH, FREE OF WOOD CHIPS AND SAWDUST.
3. METAL EDGING: PAINTED STEEL 3/16" THICK X 4" DEPTH WITH INTERLOCKING JOINT, CORNER JOINT AND STEEL STAKES. ASSEMBLE TO THE LINES AND ELEVATIONS INDICATED. ASSEMBLE, ALIGN, BEND AND ADJUST THE SECTIONS BEFORE STAKES ARE SET.
4. FILTER FABRIC:TYPAR PROFESSIONAL LANDSCAPE FABRIC, 3 OZ. WEIGHT.
5. LANDSCAPE STONE: 2"-3" DIA. WASHED ROUNDED RIVER STONE, BLACK AND GRAY IN COLOR

6. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL LAYOUT LANDSCAPE BED FOR APPROVAL BY THE LANDSCAPE ARCHITECT. NOTIFY THE LANDSCAPE ARCHITECT AT LEAST SEVEN WORKING DAYS PRIOR TO INSTALLATION OF PLANT MATERIALS. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO HAVE THE CONTRACTOR REMOVE, RELOCATE OR REPOSITION ANY PLANT MATERIALS.
7. THE CONTRACTOR IS TO REMOVE EXISTING VEGETATION ONLY AS DIRECTED BY THE OWNER OR THE LANDSCAPE ARCHITECT.
8. EXISTING TREES WITHIN PROJECT AREA ARE TO BE PROTECTED FROM DAMAGE DURING CONSTRUCTION. PROTECT TREES WITH A TEMPORARY PLASTIC CONSTRUCTION FENCE ENCLOSURE OR APPROVED EQUIVALENT. PROVIDE A MINIMUM RADIUS FROM CENTER OF TREE TRUNK EQUAL TO THE TREE'S DRIPLINE AND NO LESS THAN 2 FEET HORIZONTAL FOR EVERY CALIPER INCH OF TREE TRUNK. ERECT FENCE BEFORE COMMENCING SITE PREPARATION WORK. MAINTAIN FENCING THROUGH THE END OF THE CONSTRUCTION AND PLANTING PERIOD. REMOVE FENCE WHEN JOB IS COMPLETED.

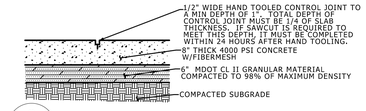
9. ADJUST EXISTING IRRIGATION SYSTEM (IF ANY) TO CONFORM TO NEW PLANTING AND LAWN LAYOUT. WHERE REQUIRED, INSTALL 4" DIAMETER SCHED. 40 PVC PIPE AS SLEEVES BENEATH PAVEMENTS. NEW IRRIGATION HEADS, VALVES, WIRES, SLEEVES, AND ETC. AS NECESSARY ARE TO BE INCLUDED IN THE CONTRACTOR'S BID PRICE.
10. SEEDED LAWN : SHALL BE BY RHINO SEED AND LANDSCAPE SUPPLY (PHONE # : 1.800.482.3130) OR EQUAL.

SUNNY MIX

20% KY. BLUEGRASS 98/80
20% CR. RED FESCUE
20% TURF TYPE PER. RYE.
20% TURF TYPE PER. RYE.
10% BARON KY. BLUE
10% KENBLUE KY. BLUE

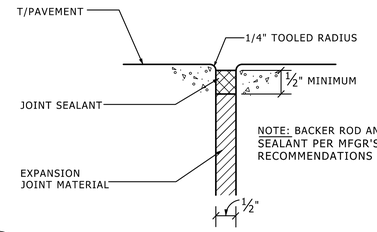


5 THICKENED EDGE WALK
NO SCALE



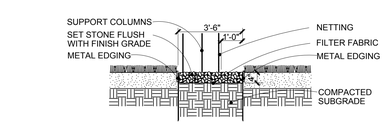
6 SIDEWALK - 8" THICKNESS
NO SCALE

NOTES:
- EXPANSION JOINTS SHALL BE INSTALLED SUCH THAT NO SINGLE DIMENSION EXCEEDS 10 FT. AREA BETWEEN EXPANSION JOINTS NOT TO EXCEED 320 SQ.FT.
- 1/2" EXPANSION PAPER SHALL BE PLACED AT ALL LOCATIONS WHERE NEW SIDEWALK ABUTS CONCRETE CURB, EXISTING SIDEWALK, LIGHT POLE BASES AND RETAINING WALLS.
- SNAP-CAP EXPANSION JOINT STRIPS CAN BE USED ON ALL EXPANSION JOINTS.
- ALL EXPANSION JOINTS SHALL BE SEALED.
- BROOM FINISH PARALLEL TO JOINTS AND PERPENDICULAR TO TRAFFIC (IF BROOMING PATTERN NOT SHOWN).



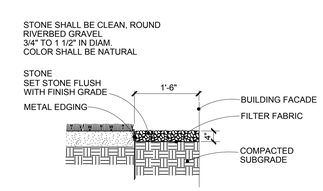
4 PAVEMENT EXPANSION JOINT (E.J.)
NO SCALE

1. VERTICAL SURFACES: PROVIDE MANUFACTURER'S STANDARD, NON-MODIFIED, TWO-OR-MORE-PART, POLY-SULFIDE-BASED, ELASTOMERIC SEALANT; COMPLYING WITH EITHER ASTM C 920 TYPE M CLASS 25, OR FS TT-S-00227E CLASS A; NON-SAG GRADE/TYPE.
2. HORIZONTAL SURFACES: PROVIDE MANUFACTURER'S STANDARD, NON-MODIFIED, TWO-OR-MORE-PART, POLYURETHANE-BASED, ELASTOMERIC SEALANT; COMPLYING WITH EITHER ASTM C 920 TYPE M CLASS 25, OR FS TT-S-00227E CLASS A; SELF-LEVELING GRADE/TYPE.
3. SET UP TIME FOR SEALANT ON WALKING SURFACES SHALL BE NO LONGER THAN 8 HOURS.
4. PROVIDE PRODUCT OF ONE OF THE FOLLOWING MANUFACTURERS:
   a. CONTECH/SONNEBORN
   b. MAMECO INTERNATIONAL
   c. W.R. MEADOWS, INC.
   d. PECORA CORP.
   e. PRODUCTS RESEARCH & CHEMICAL CORP.
   f. SIKA CHEMICAL CORP.
   g. TREMCO, INC.
   h. TOCH/CARBOLINE
5. DO NOT ALLOW SEALANTS TO OVERFLOW OR SPILL ONTO ADJOINING SURFACES. REMOVE EXCESS AND SPILLAGE OF SEALANTS PROMPTLY.
6. SEALED ZIP STRIPS ARE ACCEPTABLE.

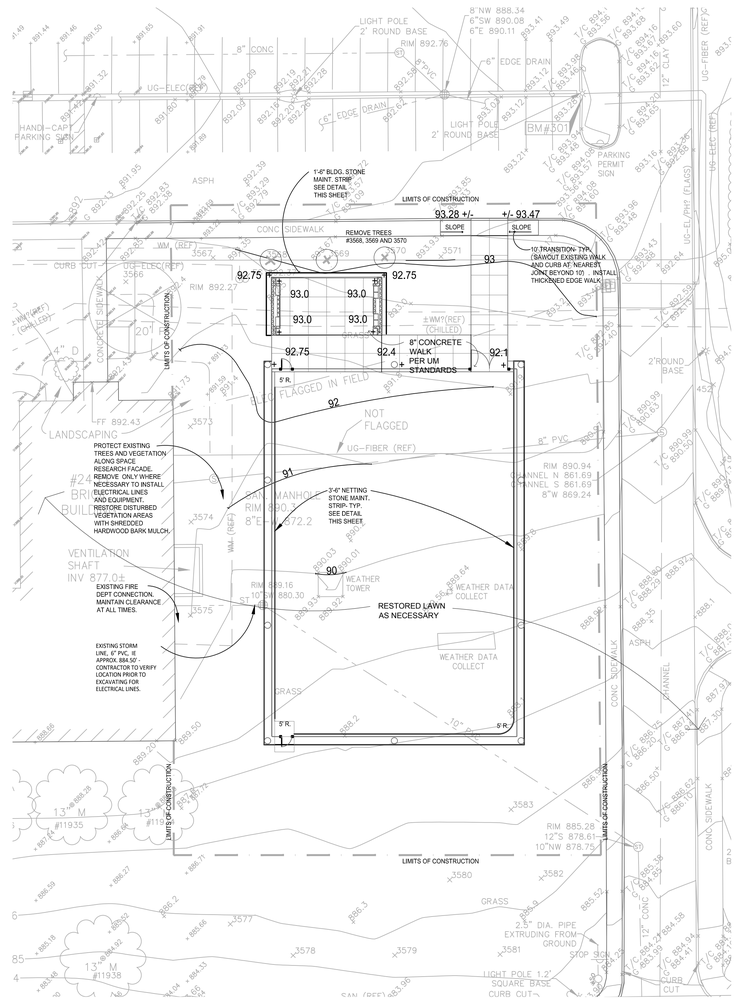


NOTE: STONE SHALL BE CLEAN, ROUND RIVERBED GRAVEL 3/4" TO 1 1/2" IN DIAM. COLOR SHALL BE NATURAL

3 STONE MAINTENANCE STRIP @ NETTED ENCLOSURE
NO SCALE



2 STONE MAINTENANCE STRIP @ BUILDING
NO SCALE



1 SCALE: 1" = 10'-0"

0 10 20 40 100 FT.

University of Michigan
College of Engineering & Office of Research
503 Thompson Street
Ann Arbor,
Michigan 48109-1340

M-AIR Test Facility

Ann Arbor
Michigan 48109-1340
North Campus

Date	Issued For
6/19/2017	BIDS
8/25/2017	CONSTRUCTION SET

HED
26913 Northwestern Hwy
Suite 200
Southfield, Michigan
48033 USA
(248) 262-1500
WWW.HED.DESIGN

2016-01099-000
U OF M PROJECT NO. - P00011963

Site Plan

L-101

6/26/2017 12:13:50 PM

EARTHWORK

1. SUSPECT CONTAMINATED SOIL, GROUNDWATER, OR OTHER UNKNOWN MATERIAL
   a. DURING WORK ACTIVITIES IF SUSPECT CONTAMINATED SOIL, GROUNDWATER, OR OTHER UNKNOWN MATERIAL IS ENCOUNTERED CONTACT YOUR UNIVERSITY OF MICHIGAN CONSTRUCTION MANAGEMENT REPRESENTATIVE AND THE UM ENVIRONMENT, HEALTH & SAFETY DEPARTMENT (763-6973) IMMEDIATELY. SUSPECT CONTAMINATED SOIL MAY EXHIBIT CHEMICAL OR UNUSUAL ODORS, STAINING, UNUSUAL COLORING, AND/OR CONTAIN MAN-MADE DEBRIS. SUSPECT CONTAMINATED GROUNDWATER MAY EXHIBIT CHEMICAL OR UNUSUAL ODORS, UNUSUAL COLORING, AND/OR SHEEN.

   b. IMMEDIATELY CEASE ALL EXCAVATION, DEWATERING, TRANSPORT, OR DISTURBANCE OF THE SUSPECT MATERIAL UNTIL GIVEN DIRECTION BY THE UM CONSTRUCTION MANAGEMENT REPRESENTATIVE.

2. DEWATERING
   a. GROUNDWATER AND SURFACE WATER WHICH IS FREE OF CONTAMINATION AND SEDIMENT MAY BE DISCHARGED TO A STORM DRAIN. DRAINS MUST BE PROTECTED FROM SEDIMENT BY USING FILTER FABRIC OR SILT SACKS. HOWEVER, IF FIELD INDICATORS INDICATE POSSIBLE CONTAMINATION THE WATER CANNOT BE DISCHARGED. IMMEDIATELY CEASE ALL DISCHARGE AND CONTACT YOUR UNIVERSITY OF MICHIGAN CONSTRUCTION MANAGEMENT REPRESENTATIVE AND UM ENVIRONMENT, HEALTH & SAFETY DEPARTMENT (763-6973) FOR INSPECTION OF THE WATER AND DISPOSAL DETERMINATION. NOTE: SUSPECT CONTAMINATED GROUNDWATER MAY EXHIBIT CHEMICAL OR UNUSUAL ODORS, UNUSUAL COLORING, SHEEN, AND/OR CONTAIN MAN-MADE DEBRIS.

REINFORCED HOLLOW CONCRETE MASONRY

1. MASONRY SHALL BE IN ACCORDANCE WITH BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (ACI 530-11/ASCE 5-11) AND SPECIFICATIONS FOR MASONRY STRUCTURES (ACI 530.1-11/ASCE 6-11).
2. MORTAR SHALL BE PORTLAND CEMENT LIME MORTAR IN ACCORDANCE WITH ASTM C 270, TYPE S.
3. GROUT SHALL BE "FINE GROUT" IN ACCORDANCE WITH ASTM C 476. GROUT STRENGTH SHALL BE fc = 2500 PSI MIN.
4. MINIMUM MASONRY STRENGTH SHALL BE f'm = 2000 PSI . UNITS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH ON THE NET AREA OF 2800 PSI.
   EXCEPTION: IF PRISM TESTS ARE PERFORMED IN ACCORDANCE WITH ASTM E 447 METHOD B UNITS OF LESSER STRENGTH MAY BE USED TO ACHIEVE THE REQUIRED f'm.
5. REINFORCEMENT: ASTM A 615 GRADE 60.
6. HORIZONTAL BOND BEAM AND VERTICAL REINFORCEMENT SHALL BE CONTINUOUS U.O.N.
7. LAP SPLICE HORIZONTAL REINFORCEMENT PER TYPICAL DETAILS OR PROVIDE MECHANICAL BAR COUPLERS. STAGGER SPLICE LOCATIONS.
8. GROUT SOLID ALL CORES AND BOND BEAMS WITH REINFORCEMENT.
9. GROUT SOLID ALL MASONRY BELOW FINISH FLOOR AND/OR FINISH GRADE.
10. PROVIDE BRACES TO THE WALLS TO RESIST WIND AND SEISMIC LOADS UNTIL FLOORS AND ROOFS ARE IN PLACE, AND THE MASONRY HAS REACHED 75% OF THE REQUIRED STRENGTH, f'm .
11. PROVIDE TEMPORARY SHORING TO SUPPORT WALLS ABOVE LINTELS UNTIL:
    a. THE FLOOR/ROOF ABOVE IS INSTALLED
    b. THE MASONRY UNITS HAVE REACHED THE REQUIRED STRENGTH, f'm.

POST-INSTALLED ANCHORS

1. WHERE SPECIFIC ANCHOR MANUFACTURER, TYPE, SIZE, AND EMBED REQUIREMENTS ARE SHOWN ON DETAILS, DRAWINGS, OR SPECIFICATIONS, SUBSTITUTIONS ARE NOT ACCEPTABLE.
2. FOR SUBSTITUTION PURPOSES, AT THE CONTRACTORS OPTIONS, SIGNED AND SEALED CALCULATIONS SHALL BE PROVIDED, INDICATING THE SUBSTITUTED ANCHOR MEETS THE CAPACITY REQUIREMENTS OF THE DETAILED ANCHOR. INCLUDE APPROPRIATE LOAD ADJUSTMENT FACTORS APPLICABLE TO ALL LOADING CONDITIONS INCLUDING BUT NOT LIMITED TO, ANCHOR GEOMETRY, EMBEDMENT DEPTH, ANCHOR SPACING, EDGE DISTANCE, CRACKED CONCRETE, SATURATED CONCRETE, AND OTHER SPECIFIED CONCRETE PROPERTIES. ASSUME DETAILED ANCHOR REQUIRES 100% OF ITS CAPACITY.
3. HOLES FOR THROUGH BOLTS SHALL BE FILLED WITH EPOXY TO ENSURE UNIFORM BEARING OF THE BOLT ON THE SUBSTRATE. THE VOLUME OF EPOXY SHALL BE SUFFICIENT TO FILL THE ANNULAR SPACE BETWEEN THE BOLT AND THE HOLE THROUGH THE ENTIRE WIDTH OF THE SUPPORTING ELEMENT.
4. HOLES FOR POST INSTALLED ANCHORS (MECHANICAL OR EPOXY) SHALL BE DRILLED WITH HAMMER OR ROTARY DRILLS ONLY. CONTRACTOR SHALL NOT SUBSTITUTE WITH CORE-DRILLED HOLES UNLESS SPECIFICALLY INDICATED ON THE CONTRACT DOCUMENTS.
5. WHERE NOT SPECIFICALLY INDICATED OTHERWISE, CONTRACTOR SHALL USE HILTI HIT-HY 200 SAFE SET ADHESIVE SYSTEM WHERE INDICATED TO DRILL AND EPOXY DOWELS, ANCHORS, OR REINFORCING INTO HARDENED CONCRETE.

WOOD

1. WOOD FRAMING FABRICATION INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" PUBLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION.
2. FRAMING LUMBER 2" THICK OR LESS SHALL BE STRESS RATED OR GRADED FOR THE SPECIES AS SCHEDULED WITH A MOISTURE CONTENT OF 19% OR LESS. MINIMUM PROPERTIES SHALL BE AS SHOWN ON PLAN.
3. ROOF SHEATHING SHALL BE A.P.A. RATED SHEATHING, TREATED EXPOSURE 1, 5/8 INCH THICK, 32/16 RATING, CONTINUOUS OVER TWO OR MORE SPANS WITH LONG DIMENSION ACROSS SUPPORTS. FASTEN WITH 8d NAILS 6" O.C. @ EDGES AND 12" O.C. @ INTERMEDIATE SUPPORTS. STAGGER PANELS.
4. WOOD FRAMING CONNECTIONS SHALL BE SEATED CONNECTIONS, U.O.N. DO NOT COPE ANY MEMBER. DO NOT USE TOE-NAILING TO SUPPORT VERTICAL LOADS. PROVIDE STANDARD PREFABRICATED, GALVANIZED, MANUFACTURED FRAMING DEVICES PER ASTM D1761, DESIGNED TO SUPPORT THE MEMBER SIZE.
5. DO NOT CUT OR NOTCH STRUCTURAL LUMBER UNLESS SPECIFICALLY DETAILED OR INDICATED.
6. PROVIDE HOLES FOR BOLTS 1/32" TO 1/16" LARGER THAN NOMINAL BOLT DIAMETER. PROVIDE A307 BOLTS, UNLESS NOTED OTHERWISE, WITH STANDARD CUT WASHER UNDER BOLT HEAD AND NUT. PROVIDE STANDARD WASHERS UNDER HEADS OF LAG SCREWS.
7. PRESSURE TREAT WOOD MEMBERS IN CONTACT WITH GROUND OR CONCRETE WITH WATERBORNE PRESERVATIVES IN COMPLIANCE WITH CBC 2303.18. PROVIDE FIRE TREATED LUMBER COMPLYING WITH CBC 2303.2 WHERE INDICATED ON THE ARCHITECTURAL PLANS. PROVIDE HOT-DIPPED GALVANIZED PER ASTM A153 STAINLESS STEEL FASTENERS, AND HARDWARE CONNECTORS PER ASTM A123 AT PRESERVATIVE TREATED AND FIRE TREATED STRUCTURAL LUMBER.
8. PROVIDE LUMBER TREATED WITH WOOD-PRESERVATIVE-TREATING MATERIAL BY ONE THE FOLLOWING ACCEPTABLE MANUFACTURERS:
   a. J. H. BAXTER CO.
   b. CHEMICAL SPECIALITIES, INC.
   c. CONTINENTAL WOOD PRESERVATIVES, INC.
   d. HICKSON CORP.
   e. HOOVER TREATER WOOD PRODUCTS, INC.
   f. OSMOSE WOOD PRESERVING, INC.
9. ALL NAILS, UNLESS INDICATED OTHERWISE, ARE COMMON NAILS WITH DIMENSIONAL PROPERTIES COMPLYING WITH AF & PA NDS TABLE L4 AND ASTM F1667. INSTALL NAILS IN COMPLIANCE WITH CBC CHAPTER 23, INCLUDING TABLE 2304.9.1.
10. PROVIDE WOOD HARDWARE CONNECTORS AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INC. COMPLYING WITH ICBO EVALUATION REPORT NOS. 1211 AND NER209.

STRUCTURAL STABILITY

1. STRUCTURAL STABILITY IS DEPENDENT ON A FULLY COMPLETED STRUCTURE.
2. THE FULLY COMPLETED STRUCTURE IS DESIGNED TO BE STABLE AND TO RESIST THE CODE PRESCRIBED LATERAL AND GRAVITY FORCES.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE IN ITS INCOMPLETE STAGE, INCLUDING BUT NOT LIMITED TO:
   a. DETERMINING ERECTION AND PLACING PROCEDURES.
   b. DESIGNING AND PROVIDING TEMPORARY SUPPORTS, SUCH AS TEMPORARY SHORING, BRACING, GUYS AND TIE-DOWNS.
   c. TEMPORARY BRACING SHALL REMAIN IN PLACE AND SHALL CONSIDER THE FULL WIND LOAD EFFECTS AS STATED ON THE DRAWINGS UNTIL THE ABOVE REQUIREMENTS ARE MET.
   d. DESIGNING AND PROVIDING SEI/ASCE 37-02, "DESIGN LOADS ON STRUCTURES DURING CONSTRUCTION" AS A REFERENCE TO DETERMINE LOADS FOR TEMPORARY SUPPORTS.

TYPICAL DETAILS

1. TYPICAL DETAILS ARE GENERAL IN NATURE AND THEIR USE MAY BE WARRANTED IN A VARIETY OF SITUATIONS.
2. CONDITIONS SHOWN IN THE TYPICAL DETAILS MAY NOT EXACTLY REPRESENT EVERY GIVEN SITE CONDITION, IN WHICH CASE THE CONTRACTOR IS RESPONSIBLE TO COMPLETE THE WORK IN A MANNER CONSISTENT WITH THE SPIRIT OF, AND INTENT SHOWN IN THE TYPICAL DETAIL.
3. SLIGHT VARIATIONS FROM THE DETAIL ENCOUNTERED IN SITE CONDITIONS SHALL IN NO WAY RELIEVE THE CONTRACTOR FROM THE COMPLETION OF THEIR WORK.
4. MANUFACTURERS WRITTEN INSTALLATION PROCEDURES MAY DIFFER FROM THOSE SHOWN IN THE TYPICAL DETAILS. IN SUCH CASE, CONSTRUCTION SHALL BE BASED ON THE MORE CONSERVATIVE INSTALLATION PROCEDURE.

FOUNDATIONS

1. THE FOUNDATION DESIGN IS BASED ON RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT:
   PREPARED BY: SME
   DATED: 11/23/2016
   PROJECT NUMBER: 075270.00
2. FOOTINGS SHALL BE CARRIED DOWN TO UNDISTURBED SOIL HAVING A MINIMUM NET ALLOWABLE BEARING CAPACITY OF 3000 POUNDS PER SQUARE FOOT.
3. DURING WINTER CONSTRUCTION, PROVIDE FROST PROTECTION FOR FOOTING AND AREA WITHIN 3 FEET OF THE FOOTING PERIMETER. PROTECT FOOTINGS IN ORDER TO PREVENT FREEZING AND HEAVING OF THE BEARING STRATUM.
4. FINISHED EXCAVATIONS AND BEARING GRADES SHALL BE INSPECTED AND APPROVED BY THE GEOTECHNICAL INSPECTION AGENCY BEFORE ANY CONCRETE IS PLACED.
5. THE EXPOSED SUBGRADE SOILS ARE SENSITIVE TO DISTURBANCE AND STRENGTH DEGRADATION WHEN HIGH MOISTURE CONTENTS ARE PRESENT. CONSTRUCTION TRAFFIC OVER EXPOSED SUBGRADES SHALL BE AVOIDED. PROVIDE PROPER DRAINAGE AND GRADING TO AVOID PONDING ON THE SUBGRADES.
6. BACKFILL AGAINST FOUNDATION WALLS AND GRADE BEAMS:
   a. DO NOT PLACE BACKFILL UNTIL CONCRETE STRENGTH HAS ATTAINED 75% OF ITS 28 DAY STRENGTH.
   b. DO NOT BACKFILL BASEMENT WALLS UNTIL SLAB-ON-GRADE AND SUPPORTED SLAB ARE IN PLACE AND HAVE ATTAINED 75% OF THE 28 DAY STRENGTH.
   c. PROVIDE BRACING FOR GRADE BEAMS SUSTAINING MORE THAN 2 FEET OF UNBALANCED EARTH PRESSURE. THIS BRACING IS TO REMAIN UNTIL THE PERMANENT RESTRAINTS BECOME EFFECTIVE.
7. CONCRETE FOR FOOTINGS AND GRADE BEAMS MAY ONLY BE PLACED AT CONTRACTOR'S OPTION INTO UNFORMED TRENCHES IF THE BUILDING OFFICIAL CONCURS THAT SOIL CONDITIONS DO NOT REQUIRE FORMWORK.
   a. CUT TRENCH FOOTING SIDES IN VERTICAL MANNER TO NOT ALLOW TRENCH FOOTING TO "MUSHROOM OUT" NEAR THE TOP.
   b. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MINIMIZE SLOUGHING OF SIDEWALLS.
   c. WHERE SLOUGHING OCCURS, REMOVE SLOUGHED SOIL AND/OR OVER EXCAVATE, EITHER ONE OR BOTH AS REQUIRED.

CONCRETE

1. CONCRETE IS NORMAL WEIGHT AND SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
2. CONCRETE BAR REINFORCEMENT SHALL BE NEW BILLET STEEL CONFORMING TO ASTM A615 (60,000 PSI YIELD).
3. UNLESS OTHERWISE NOTED, CONCRETE WORK SHALL CONFORM TO THE ACI STANDARD "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-11) AND THE ACI "DETAILING MANUAL" (SP-66 2004 EDITION).
4. WALLS SHALL BE DOWELED TO FOOTINGS. WALL FOOTING DOWELS SHALL BE SAME SIZE AS WALL VERTICALS.
5. MINIMUM ELAPSED TIME BETWEEN ADJACENT CONCRETE PLACEMENTS SHALL BE 48 HOURS.
6. BEAMS AND SLABS SHALL BE PLACED MONOLITHICALLY EXCEPT WHERE OTHERWISE SHOWN. NO HORIZONTAL CONSTRUCTION JOINTS ARE TO BE MADE IN SLABS OR BEAMS, UNLESS SHOWN OR OTHERWISE NOTED.
7. DRILLED AND EPOXIED / GROUTED DOWELS ARE NOT AN EQUAL SUBSTITUTE FOR DOWELS SHOWN IN DETAILS UNLESS OTHERWISE INDICATED.
8. PROVIDE A SHEAR KEY 1/3 OF DEPTH OF STRUCTURAL MEMBER AT CONSTRUCTION JOINTS. SEE TYPICAL DETAILS FOR ADDITIONAL REINFORCING AT CONSTRUCTION JOINTS.
9. VERTICAL CONSTRUCTION JOINTS USING APPROVED BULKHEADS MAY BE MADE AT 1/3 (THIRD POINT) OF BEAM AND SLAB SPANS WHERE STOP IN CONCRETE WORK IS NECESSARY.
   SUBMIT SHOP DRAWINGS SHOWING ALL PROPOSED CONSTRUCTION JOINT AND CONTROL JOINT LOCATIONS FOR APPROVAL PRIOR TO PREPARATION OF AFFECTED REINFORCEMENT SHOP DRAWINGS.
10. MINIMUM CONCRETE COVER SHALL BE (UNLESS OTHERWISE NOTED):

a. UNFORMED SURFACES IN CONTACT WITH GROUND (FOOTING BOTTOMS).	3"
b. SLABS ON GRADE (TOP COVER)	1"
c. FORMED SURFACES IN CONTACT WITH GROUND OR EXPOSED TO THE WEATHER (GRADE BEAMS, WALLS, ETC.)	2"
d. IN ALL CASES, CLEARANCE NOT LESS THAN THE DIAMETER OF THE BARS.	

NOTE: MAXIMUM DEVIATION FROM THESE REQUIREMENTS SHALL BE +1/4" FOR SECTIONS TEN (10) INCHES OR LESS AND +1/2" FOR SECTIONS OVER TEN (10) INCHES THICK.

11. WHERE CONTINUOUS BARS ARE CALLED FOR, THEY SHALL BE RUN CONTINUOUSLY AROUND CORNERS AND LAPPED AT NECESSARY SPLICES, AND HOOKED AT DISCONTINUOUS ENDS.

DESIGN LOADS

1. DESIGN CODE: MICHIGAN BUILDING CODE 2015
   DESIGN LOAD COMBINATIONS: PER ASCE 7-10 SECTION 2.3 & 2.4 & MBC SECTION 1605
2. FLOOR LIVE LOADS, UNFACTORED(PAVILION ONLY):
   a. TYP, INCLUDING PARTITION 55 PSF
3. ROOF LIVE LOADS, UNFACTORED (PAVILION ONLY):

a. MINIMUM ROOF LIVE LOAD	30 PSF
b. FLAT ROOF DESIGN SNOW LOAD	25 PSF
c. GROUND SNOW LOAD, "Pg"	20 PSF
d. SNOW EXPOSURE FACTOR, "Ce"	1.2
e. SNOW THERMAL FACTOR, "Ct"	1.0
f. SNOW LOAD IMPORTANCE FACTOR, "Is"	1.0
g. SLOPED ROOF SNOW LOAD, "Ps"	25 PSF
h. ROOF SLOPE FACTOR, "Cs"	1.0

4. LIVE LOAD DEFLECTION (PAVILION ONLY):
   a. ROOF AND FLOOR MEMBERS HAVE BEEN DESIGNED TO ACCOMMODATE A LIVE LOAD DEFLECTION OF L/360 (FACADE ATTACHMENTS INCLUDING, BUT NOT LIMITED TO, ALUMINUM STOREFRONT AND ALUMINUM CURTAIN WALL SYSTEMS SHALL BE DESIGNED TO ACCOMMODATE DEFLECTION OF THE PRIMARY STRUCTURE AS OUTLINED ABOVE)
5. SUPERIMPOSED DEAD LOADS, UNFACTORED (PAVILION ONLY):

a. PARTITION ALLOWANCE	20 PSF
b. CEILING	5 PSF
c. MECHANICAL/ELECTRICAL ITEMS	5 PSF
e. ROOFING ASSEMBLY	5 PSF

6. ULTIMATE DESIGN WIND LOAD FOR STRUCTURAL FRAME:

a. RISK CATEGORY	II
b. EXPOSURE	B
c. ULTIMATE WIND SPEED	115 MPH
d. ULTIMATE MAIN WIND-FORCE RESISTING SYSTEM PRESSURE (WINDWARD PLUS LEEWARD) BASE PRESSURE "qh"	25 PSF
H = HEIGHT: 0' < H < 15'	27 PSF

7. ULTIMATE DESIGN WIND LOAD FOR EXTERIOR COMPONENTS AND CLADDING COMPONENT TRIBUTARY OF AREA OF 20 SQUARE FEET (PAVILION ONLY):

a. ROOF ZONE 1 (FIELD)	+/- 32.0 PSF
b. ROOF ZONE 2 (EDGE)	+/- 53.2 PSF
c. ROOF ZONE 3 (CORNER)	+/- 74.3 PSF
d. WALL ZONE 4 (TYPICAL WALL)	+/- 22.0 PSF
e. WALL ZONE 5 (CORNER) (WITHIN 3 FT EACH SIDE OF CORNER)	+/- 44.0 PSF
f. PARAPET CASE A (PRESSURE TOWARDS BLDG)	+/- 96.3 PSF
g. PARAPET CASE B (PRESSURE AWAY FROM BLDG)	+/- 66.0 PSF

   h. COMPONENT TRIBUTARY AREA GREATER THAN 20 SQ.FT. REFER TO "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES" ASCE 7-10.

8. SEISMIC LOADS:

a. RISK CATEGORY	II
b. IMPORTANCE FACTOR "IE"	1.0
c. SEISMIC DESIGN CATEGORY "SDC"	B
d. SHORT PERIOD PEAK SPECTRAL ACCELERATION "SS"	9.4% g
e. 1 - SECOND PERIOD PEAK SPECTRAL ACCELERATION "S1"	4.8% g
f. SEISMIC SITE CLASS	D
g. SPECTRAL RESPONSE COEFFICIENT "SDS"	0.100
h. SPECTRAL RESPONSE COEFFICIENT "SD1"	0.077
i. LONG TERM TRANSITION PERIOD "TL"	12 SEC

   j. BASIC SEISMIC FORCE RESISTANCE SYSTEM (ASCE 7-10 TABLE 12.2-1): ORDINARY REINFORCED MASONRY SHEAR WALLS (PAVILION ONLY)

a) RESPONSE MODIFICATION FACTOR, "R"	2
b) SYSTEM OVERSTRENGTH FACTOR "Ω0"	2.5
c) DEFLECTION AMPLIFICATION FACTOR, "Cd"	1.75
d) SEISMIC RESPONSE COEFFICIENT "Cs"	0.05
e) ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE PROCEDURE

   k. SEISMIC BASE SHEAR, "V" (PAVILION ONLY) 5 KIPS
9. BUILDING IS NOT DESIGNED FOR FUTURE VERTICAL OR HORIZONTAL EXPANSION.

GENERAL

1. THE STRUCTURAL DRAWINGS SHOW A PORTION OF THE WORK TO BE PERFORMED BY THE CONTRACTOR. SUPPLEMENTARY REQUIREMENTS FOR STRUCTURAL STEEL, CONCRETE, ETC., ARE FOUND WITHIN THE DRAWINGS OF OTHER DISCIPLINES AND REMAIN THE RESPONSIBILITY OF THE CONTRACTOR.
2. THESE NOTES ARE COMPLEMENTARY TO THE SPECIFICATIONS AND SHALL BE USED IN CONJUNCTION WITH THE SPECIFICATIONS.
3. SPECIFICATIONS AND DRAWINGS SHALL BE EQUAL IN AUTHORITY AND PRIORITY. SHOULD THE SPECIFICATIONS AND DRAWINGS DISAGREE IN THEMSELVES, OR WITH EACH OTHER, CONSTRUCTION SHALL BE BASED ON THE MOST STRINGENT. THE WORK REQUIRED TO BE CONSTRUCTED BY THE DOCUMENTS SHALL BE DECIDED BY THE ARCHITECT/ENGINEER IN THE EVENT OF THE ABOVE MENTIONED DISAGREEMENTS.
4. VERIFY THE SIZES, LOCATIONS, ELEVATIONS AND DETAILS OF EXISTING CONDITIONS THAT AFFECT THE WORK. INFORM THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES IN DIMENSIONS, SIZES, LOCATIONS, AND CONDITIONS, PROCEEDING WITH WORK ONLY AFTER DISCREPANCIES ARE RESOLVED.
5. PROVIDE SHORING, BRACING, UNDERPINNING, AND ANY OTHER MEANS REQUIRED TO PROTECT AND MAINTAIN THE SAFETY, INTEGRITY AND STABILITY OF ALL EXISTING AND NEW CONSTRUCTION.
6. NORMAL OPERATIONS WILL BE CONTINUED BY THE OWNER THROUGHOUT THE DURATION OF CONSTRUCTION. ANY INTERFERENCE WITH THE OWNER'S OPERATION OR INTERRUPTION TO UTILITIES SHALL BE COORDINATED WITH THE OWNER.
7. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS AT THE SITE, INCLUDING UTILITIES, SERVICES, ETC., AND SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE HE CAUSES TO THE PROPERTY, EXISTING AND NEW CONSTRUCTION, AND FOR ANY UNAUTHORIZED DISRUPTIONS TO THE OWNER'S NORMAL USE OF UTILITIES, SERVICES AND THE SURROUNDING FACILITIES.
8. CONTRACTOR SHALL OBTAIN APPROVAL OF THE ARCHITECT/ENGINEER PRIOR TO PLACING OPENINGS OR SLEEVES NOT SHOWN ON DRAWINGS THROUGH ANY STRUCTURAL MEMBERS.
9. TYPICAL DETAILS APPLY TO ALL DRAWINGS AND SHALL BE USED EXCEPT WHERE OTHERWISE SHOWN OR NOTED.
10. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL DRAWINGS, AND SHOP DRAWINGS FOR SIZE AND LOCATION OF WALL AND FLOOR OPENINGS, WALL OFFSETS, STAIR DETAILS, PIPES, VENTS, DUCTS, CONDUIT, AND OTHER OPENINGS AND DETAILS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

STATEMENT OF SPECIAL INSPECTION

1. GENERAL:
   a. THIS STATEMENT OF INSPECTIONS IS SUBMITTED AS A CONDITION FOR PERMIT ISSUANCE IN ACCORDANCE WITH THE SPECIAL INSPECTION REQUIREMENTS OF THE 2012 MICHIGAN BUILDING CODE.
   b. REFERENCE SPECIFICATION SECTION 014010 "TESTING AND INSPECTION SERVICES - BUILDING" AND DRAWING SHEET S-002

SPECIAL INSPECTIONS & TESTING

1. THE FOLLOWING ITEMS REQUIRE TESTING AND/OR INSPECTION IN ACCORDANCE WITH THE STATEMENT OF SPECIAL INSPECTION, SPECIAL INSPECTION MATRIX LOCATED ON DRAWING SHEET S-002, AND SPECIFICATION SECTION 014010, TESTING AND INSPECTION SERVICES - BUILDING.
   a. 033000 - CAST-IN-PLACE CONCRETE
   b. 042000 - MASONRY CONSTRUCTION
   c. 051200 - STRUCTURAL STEEL MATERIALS, WELDS, AND CONNECTIONS
   d. 058010 - MECHANICAL EXPANSION AND ADHESIVE ANCHORS
   e. 312020 - SOILS AND EARTHWORK

UNIVERSITY OF MICHIGAN
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M-AIR Test Facility

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26913 Northwestern Hwy
Suite 200
Southfield, Michigan
48033 USA
(248) 262-1500
WWW.HED.DESIGN

2016-01099-000
U OF M PROJECT NO. - P00011963

General Notes

S-001

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1705.4 - REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION - LEVEL B

	INSPECTION TASK	FREQUENCY OF INSPECTION		Reference for Criteria		RESPONSIBLE AGENT
		CONTINUOUS	PERIODIC	ACI 530/ASCE 5/TMS 402	ACI 530.1/ASCE 6/TMS 602	
1.	Verification of slump flow and Visual Stability Index (VSI) as delivered to the project site in accordance with Specification Article 1.5 B.1.b.3 for self consolidating grout.	X				SI,PE
2.	Verification of f'm and f'AAC in accordance with Specification Article 1.4 B prior to construction except where specifically exempted by this code.	X				SI,PE
3.	Verify compliance with the approved submittals.		X		Art. 1.5	SI,PE
4.	As masonry construction begins, the following shall be verified to ensure compliance:					
	a. Proportions of site-prepared mortar.		X		Art. 2.1, 2.6A	SI,PE
	b. Construction of mortar joints.		X		Art. 3.3B	
	c. Grade and size of anchorages.		X		Art. 2.4B, 2.4H	
	d. Location of reinforcement, connectors and anchorages.		X		Art. 3.4, 3.6A	
	f. Properties of thin-bed mortar for ACC masonry.	X			Art. 2.1C	
5.	Prior to grouting, verify that the following are in compliance:					
	a. Grout space is clean.		X		Art. 3.2D, 3.2F	SI,PE
	b. Grade, type, and size of reinforcing and anchor bolts, and prestressing tendons and anchorages.		X	Sec 1.16	Art. 2.4, 3.4	
	c. Placement of reinforcement and connectors and anchorages.		X	Sec 1.16	Art. 3.2E, 3.4, 3.6A	
	d. Proportions of site-prepared grout.		X		Art. 2.6B, 2.4G.1.b	
	e. Construction of mortar joints.		X		Art. 3.3B	
6.	Verify during construction:					
	a. Size and location of structural elements.		X		Art. 3.3F	SI,PE
	b. Type, size and locations of anchors, including other details of anchorage of masonry to structural members, frames or other construction.		X	Sec 1.16.4.3, 1.17.1		
	c. Welding of reinforcement.	X		Sec 21.7.7.2, 3.3.3.4(c), 8.3.3.4(b)		
	d. Preparation, construction and protection of masonry during cold weather (temperature below 40 degrees F) or hot weather (temperatures above 90 degrees F).		X		Art. 1.8C, 1.8D	
	f. Placement of grout is in compliance.	X			Art. 3.5, 3.6C	
	g. Placement of ACC masonry units and construction of thin-bed mortar joints.	X			Art. 3.3B.8	
7.	Observe preparation of grout specimens, mortar specimens and/or prisms.		X		Art. 1.4B.2a.3, 1.4B.2.b.3, 1.4B.2.c.3, 1.4B.3, 1.4B.4	SI,PE

1705.5 - REQUIRED VERIFICATION AND INSPECTION OF WOOD CONSTRUCTION

	INSPECTION TASK	FREQUENCY OF INSPECTION			RESPONSIBLE AGENT
		CONTINUOUS	PERIODIC	REFERENCED STANDARD	
1.	Verify nominal size of framing members at adjoining panel edges, the nail or staple diameter and length, the number of fastener lines and that the spacing between fasteners in each line and at edge margins agrees with the approved building plans and/or shop drawings.		X		SI,PE
2.	Verify height, length, width, and location of diaphragms. Size, location, quantity, and fastening of drag struts. Verify appropriate wood or gypsum sheathing panels.		X		SI,PE
3.	Verify bolts and washers, connectors and fastening of connectors, anchor bolt size and spacing, and nailing schedule.		X		SI,PE
4.	Verify connections to roof and sill plates, including hold down connections.		X		SI,PE

1705.6 - REQUIRED VERIFICATION AND INSPECTION OF SOILS

	INSPECTION TASK	FREQUENCY OF INSPECTION			RESPONSIBLE AGENT
		CONTINUOUS	PERIODIC	REFERENCED STANDARD	
1.	Verify materials below footings are adequate to achieve the design bearing capacity.		X	Geotechnical Report	GEOR,SI,PE
2.	Verify excavations are extended to proper depth and have reached proper material.		X		
3.	Perform classification and testing of compacted fill materials.		X		
4.	Verify use of proper materials, analysis of fill materials, densities and lift thicknesses during placement and compaction of compacted fill.	X			
5.	Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly (proof rolling).		X		
6.	Verify earth retaining structures (permanent or temporary) are backfilled in accordance with performance specifications and delegated design submittals.	X			
7.	Verify subgrade preparation for concrete slabs on grade in accordance with specification requirements and geotechnical recommendations contained within the geotechnical report, immediately prior to placement of the concrete slab on grade.	X			
8.	Verify site prepared in accordance with the approved geotechnical report.		X		

SPECIAL INSPECTION LEGEND & NOTES

1. Special inspections shall be performed in accordance with 2015 Michigan Building Code Chapter 17 and as modified herein.
2. SI: Special Inspector meeting the minimum qualification requirements to perform the indicated special inspection services. Shall demonstrate competence documented by certifications from recognized agencies and approved by the Building Official Having Jurisdiction.
3. PE: Registered Professional Engineer licensed in the State of Michigan meeting the minimum qualification requirements to perform the indicated special inspection service and approved by the Building Official Having Jurisdiction.
4. GEOR: The geotechnical engineer of record who provided the original project geotechnical soils investigation report and meets the minimum qualification requirements to perform the indicated special inspection service and approved by the Building Official Having Jurisdiction.
5. GEOR shall submit records of the inspection results to the SI. The SI shall compile and submit inspection records to the Architect/Engineer of Record and Building Official. Records shall include statements of tests, whether installed/fabricated item complies with contract documents, remedial work performed, retests.
6. Special Inspectors performing inspection services and authoring inspection reports shall be the certified individuals indicated in the Special Inspection Program submitted by the Special Inspection Agency.
7. Special Inspectors performing inspection services shall refer to and familiarize themselves with the Contract Documents, approved submittals, RFI responses, and field directives related to the work being inspected.
8. SI shall develop and maintain a list of each reported discrepancy and suggested remedial action. It shall list method of how discrepancy was resolved and when the remedial action is performed.
9. The Special Inspection Agency and/or Special Inspector shall be paid by the Owner or the registered design professional in responsible charge acting as the Owner's agent, in compliance with the Michigan Building Code.
10. Refer to the Michigan Building Code Chapter 35 for current reference standard editions.
11. Refer to the International Code Council Special Inspection Manual 2015 Edition for additional information.

1705.1 - REQUIRED VERIFICATION AND INSPECTION OF SPECIAL CASES

	INSPECTION TASK	FREQUENCY OF INSPECTION			RESPONSIBLE AGENT
		CONTINUOUS	PERIODIC	REFERENCED STANDARD	
1.	Concrete slab moisture testing.		X		SI,PE
2.	Geotextile fabric placement and laps.		X	Manuf. Requirements	SI,PE
3.	Inspection of exterior wall construction, insulation / air vapor barrier:				
	a. Inspect substrate, materials, material stops & transitions, and application equipment prior to installation to verify conformance with drawings and specification requirements.		X		SI,PE
	b. Inspect material continuity to material tops & transitions.		X		
	c. Test applies material thickness every 2,000 square feet of area		X		
	d. Take photographs of substrate immediately prior to materials installation and of the materials during installation.		X		
	e. Monitor actual application methods, including compliance with construction documents and approved submittals.	X			
4.	Inspection of roof construction, EPDM membrane roofing, sheet metal flashings and trim, & roof specialties:				
	a. Inspect substrate, and roofing materials prior to installation to verify conformance with drawings and specification requirements.		X		SI,PE
	b. Take photographs of substrate immediately prior to roofing materials installation and of the roofing during installation.		X		
	c. Monitor actual application methods, including compliance with construction documents and approved submittals.	X			

1705.1 - REQUIRED VERIFICATION AND INSPECTION OF POST-INSTALLED ANCHORS

	INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCED STANDARD	RESPONSIBLE AGENT
		CONTINUOUS	PERIODIC		
1.	Expansion, wedge, screw, and powder-actuated fasteners/anchors:				
	a. Prior to installation, verify anchor type, anchor dimensions, concrete type, concrete compressive strength, and drill bit type.		X	ACI 355.2, ICC ES AC193, Manuf. Requirements	SI,PE
	b. During installation, verify hole dimensions, hole cleaning procedures, anchor spacing, edge distance, concrete thickness, anchor embedment, and installation torque.		X		
2.	Adhesive anchors installed in horizontal or overhead application:				
	a. Prior to installation:				
	1) Review certifications from each installer indicating completion of the ACI/CRSI Adhesive Anchor Installation Certification Program.	X			
	a. During installation verify the following:				
	1) Verify anchor type, adhesive identity and expiration date, anchor dimensions, concrete type, concrete compressive strength, hole drilling method, hole dimensions, hole-cleaning procedures, anchor spacing, edge distances, concrete thickness, anchor embedment, and installation torque.	X		ACI 355.4, ICC ES AC308, Manuf. Requirements	SI,PE
	2) Verify compliance with proof-loading program (when required)	X			
3.	Adhesive anchors not installed in horizontal or overhead application:				
	a. Prior to installation verify the following:				
	1) Review certifications from each installer indicating completion of the adhesive manufacturers training and quality assurance program, or ACI/CRSI Adhesive Anchor Installation Certification Program.	X			
	2) Anchor type, anchor dimensions, concrete type, concrete compressive strength, adhesive identification and expiration date.	X			
	b. During installation verify the following:				
	1) Verify anchor type, adhesive identity and expiration date, anchor dimensions, concrete type, concrete compressive strength, hole drilling method, hole dimensions, hole-cleaning procedures, anchor spacing, edge distances, concrete thickness, anchor embedment, and installati...	X		ACI 355.4, ICC ES AC308, Manuf. Requirements	SI,PE
	2) Verify initial installations of each type and size of adhesive anchor. Subsequent installations of the same anchor type and size by the same construction personnel may be performed in the absence of the special inspector and inspected on a periodic basis.		X		
	3) For ongoing installations, perform periodic inspections in accordance with item 3.b.1		X		

1705.3 - REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

	INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCED STANDARD	RESPONSIBLE AGENT
		CONTINUOUS	PERIODIC		
1.	Inspection of reinforcing steel, placement, profile.		X	ACI 318: 3.5, 7.1-7.7	SI,PE
2.	Inspection of reinforcing steel welding in accordance with Table 1705.2	—	—	AWS D1.4, ACI 318: 3.5.2	SI,PE
3.	Inspect bolts to be installed in concrete prior to and during placement of concrete.	X		ACI 318: 8.1.3, 21.1.8	SI,PE
4.	Verifying use of approved concrete mix designs.		X	ACI 318: Ch. 4, 5.2-5.4	SI,PE
5.	At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X		ASTM C 172 ASTM C 31 ACI 318: Sec. 5.6, 5.8	SI,PE
6.	Inspection of concrete placement for proper application techniques.	X		ACI 318: 5.9, 5.10	SI,PE
7.	Inspection for maintenance of specified curing temperature and techniques.		X	ACI 318: 5.11-5.13	SI,PE
8.	Verification of in-situ concrete strength prior to removal of shores and forms from structural slabs.		X	ACI 318: 6.2	SI,PE
9.	Inspect formwork for shape, location and dimensions of the concrete member being formed.		X	ACI 318: 6.1.1	SI,PE

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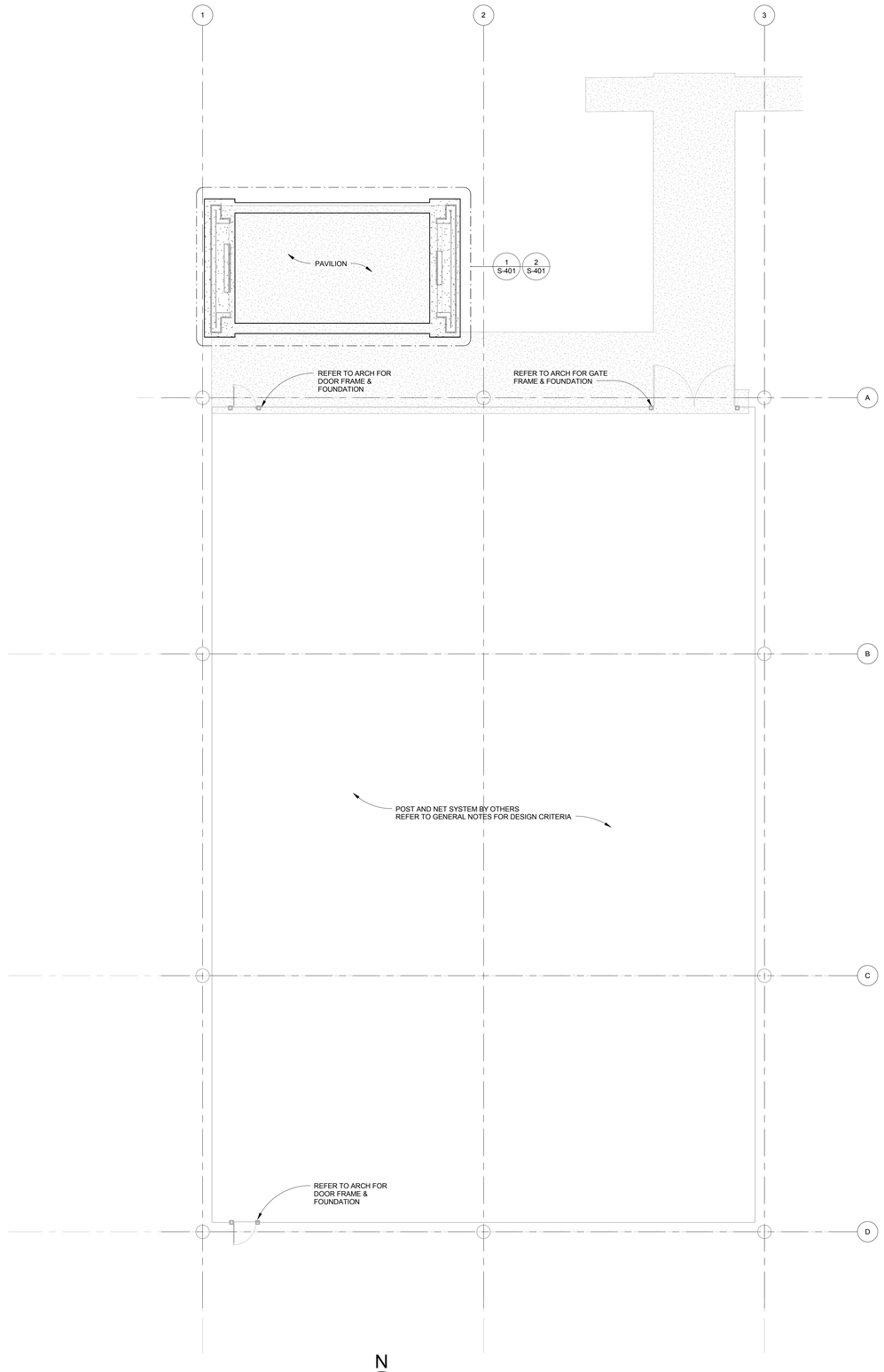
Special Inspection & Testing

S-002



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STRUCTURAL PLAN

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

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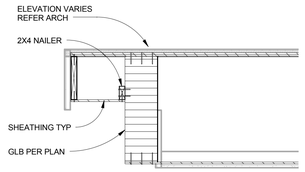
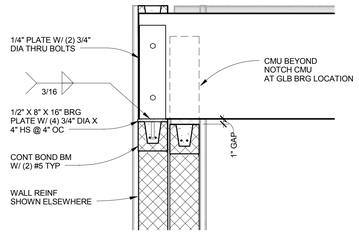
Structural Plan

S-101



9 S-401 SECTION
SCALE: 3/4" = 1'-0"



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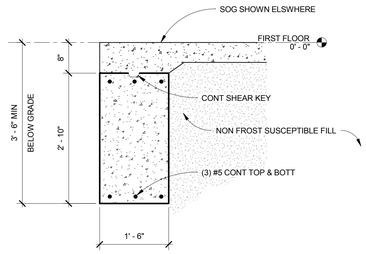

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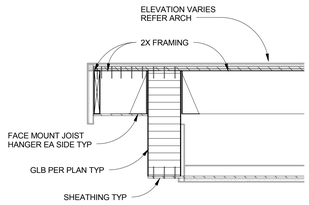

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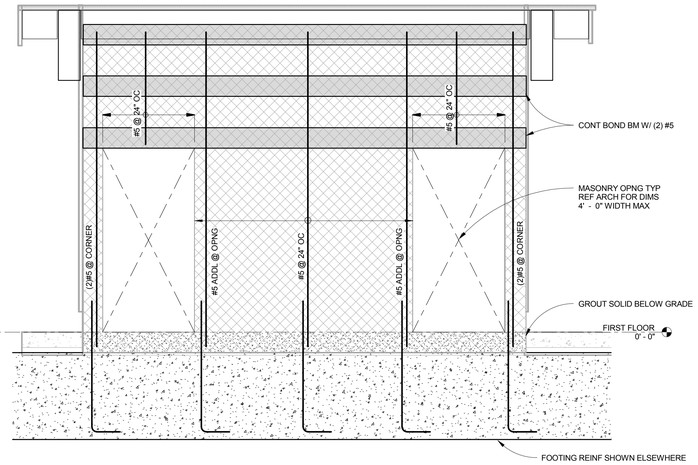
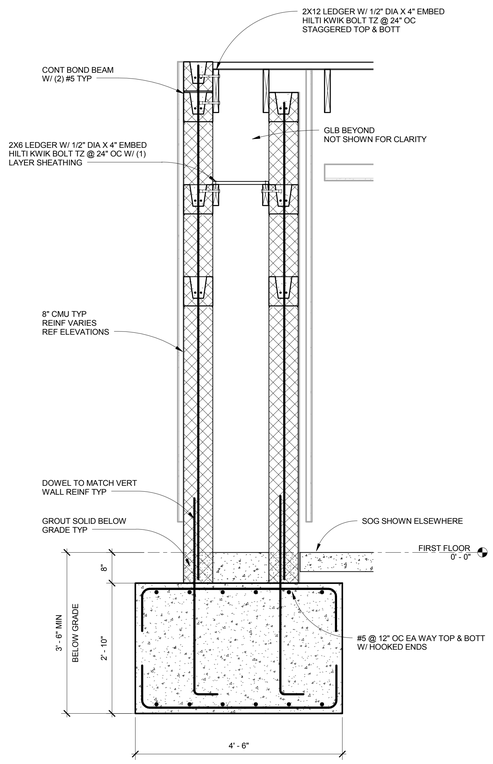


4 S-401 SECTION
SCALE: 1/2" = 1'-0"



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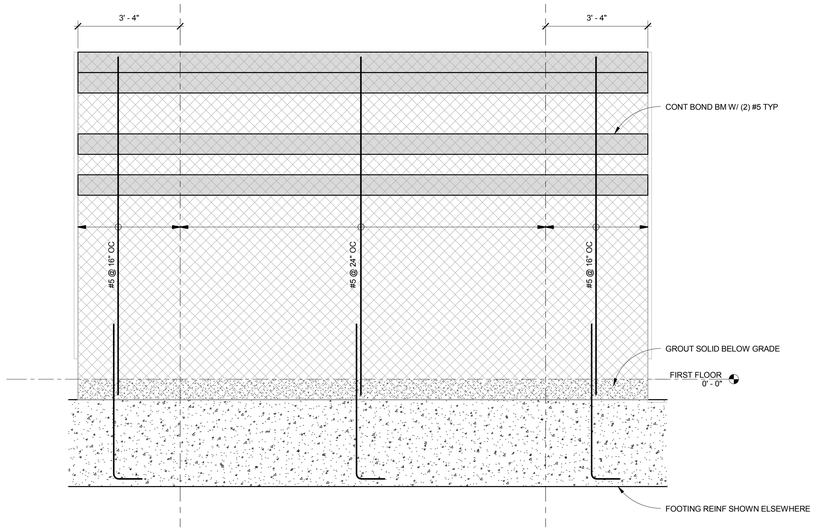
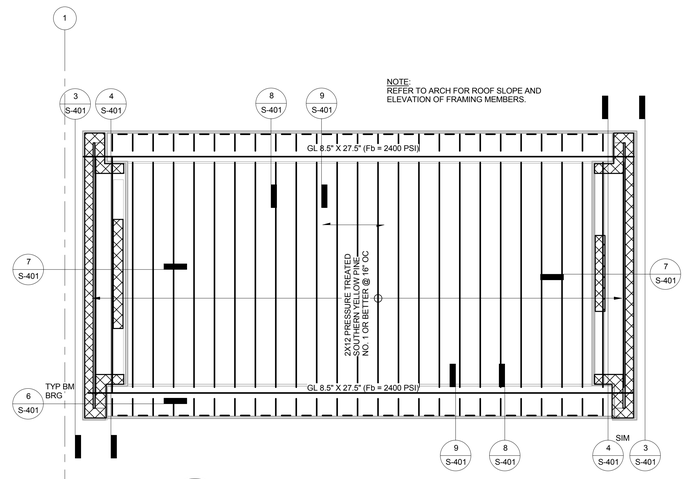
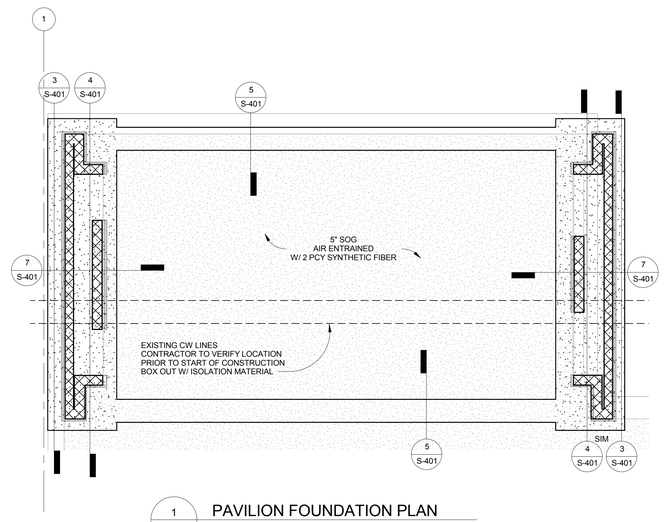


3 S-401 SECTION
SCALE: 1/2" = 1'-0"



2 S-101 PAVILION ROOF FRAMING PLAN
SCALE: 1/4" = 1'-0"



1 S-101 PAVILION FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

FOUNDATION PLAN NOTES

NOTES:

1. REFER TO DRAWING S-001 FOR GENERAL NOTES.
   REFER TO DRAWING S-002 FOR SPECIAL INSPECTION & TESTING.
2. TYPICAL DETAILS APPLY TO ALL DRAWINGS. USE THROUGHOUT EXCEPT WHERE OTHERWISE SHOWN OR NOTED.
3. TYPICAL SLAB ON GRADE: 5" THICK NORMAL WEIGHT CONCRETE REINFORCING: 2 PCY - SHRINKAGE CONTROL SYNTHETIC FIBERS.
4. SLAB ON GRADE CONTROL JOINTS TO OCCUR AT 15' - 0" OC MAX.
5. TOP OF SLAB REFERENCE ELEVATION = 0' - 0" U.O.N.
6. REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL FOR FLOOR PENETRATIONS OF CONDUIT AND PIPING. COORDINATE LOCATIONS W/ TRADES.
7. REFER TO ARCHITECTURAL FOR SLAB EDGE LOCATIONS.

ROOF FRAMING PLAN NOTES

NOTES:

1. REFER TO DRAWING S-001 FOR GENERAL NOTES.
   REFER TO DRAWING S-002 FOR SPECIAL INSPECTION & TESTING.
2. TYPICAL DETAILS APPLY TO ALL DRAWINGS. USE THROUGHOUT EXCEPT WHERE OTHERWISE SHOWN OR NOTED.
3. TYPICAL ROOF DECK: (2) LAYERS 3/4" TONGUE & GROOVE EXTERIOR GRADE PLYWOOD.
4. MEMBERS ARE EQUALLY SPACED U.O.N.
5. CMU WALLS ARE SHEAR WALLS. DO NOT CREATE OPENINGS IN WALLS OTHER THAN THOSE SHOWN.
6. REFER TO ARCHITECTURAL FOR ROOF EDGE LOCATIONS.
7. TYPICAL SYMBOLS:

   INDICATES DIRECTION OF DECK SPAN

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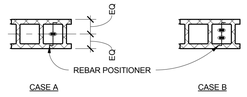
Enlarged Plans & Details

S-401

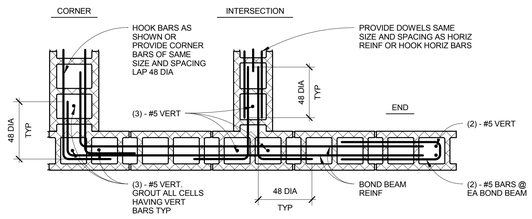
TYPICAL SPLICE LENGTHS FOR MASONRY BLOCK - STRENGTH DESIGN														
BLOCK WIDTH	BARS CENTERED - CASE A							BARS EACH FACE - CASE B						
	VERTICAL BAR SIZE							VERTICAL BAR SIZE						
	#3	#4	#5	#6	#7	#8	#9	#3	#4	#5	#6	#7	#8	#9
8" BLOCK	14"	18"	22"	38"	52"	72"	*	15"	25"	39"	54"	63"	--	--

SYMBOLS:
-- REINFORCING CONFIGURATION NOT PERMISSIBLE
* MECHANICAL TENSION SPLICE REQD

NOTES:
1) MECH TENSION SPLICE CAN BE FOR ANY BAR SIZE IF NOT NOTED.
2) FOR USE WITH: f'm = 2,000 psi & fy = 60,000 psi



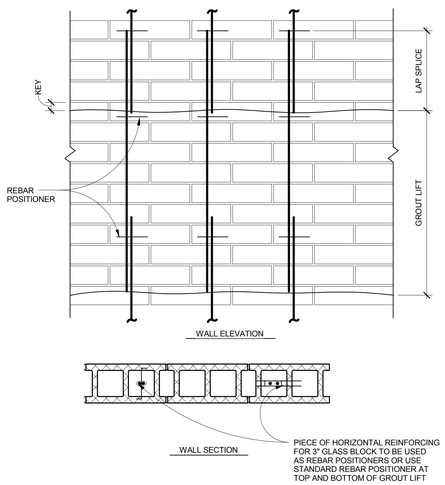
14 TYP MASONRY SPLICE LENGTHS
SCALE: N.T.S.



NOTES:

1. CORNERS AND INTERSECITONS UNLESS OTHERWISE NOTED OR SPECIFIED, AT POINTS WHERE CONCRETE MASONRY WALLS MEET OR INTERSECT, LAY 50% OF UNITS IN MASONRY BOND WITH ALTERNATE UNITS HAVING A BEARING ON NOT LESS THAN 4" ON THE UNIT BELOW.
2. DOWELS UNLESS OTHERWISE NOTED OR SPECIFIED, PROVIDE DOWELS FROM CONCRETE FOOTING OR WALL BELOW WITH SAME SIZE AND SPACING AS VERTICAL BARS AT LEVEL BELOW. LAP REINFORCING PER SPLICE LENGTH SCHEDULE.

13 TYP MASONRY WALL REINFORCEMENT DETAIL (8" BLOCK)
SCALE: N.T.S.



12 TYP REINFORCEMENT MASONRY VERTICAL LAP SPLICING DETAIL
SCALE: N.T.S.

BAR SIZE	BEAM & MAT TOP BARS	BEAM & MAT BARS OTHER THAN TOP BARS	COLUMN & WALL BARS TENSION	COMPRESSION BARS (SEE NOTE #4)
f'c=	3000 PSI	3000 PSI	3000 PSI	3000 PSI
3	13"	12"	17"	9"
4	18"	14"	22"	11"
5	22"	17"	28"	14"
6	26"	20"	33"	17"
7	38"	29"	48"	20"
8	43"	33"	55"	22"
9	49"	38"	62"	25"
10	55"	42"	70"	28"
11	61"	47"	78"	31"

NOTES:

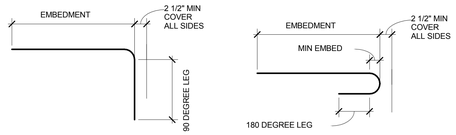
1. BEAM BARS SPACED @ NOT LESS THAN 5 db C/C
2. COLUMN BARS SPACED @ NOT LESS THAN 5 db C/C
3. REINFORCING BARS ARE CLASSED AS TOP BARS WHEN MORE THAN 12" OF CONCRETE IS CAST BENEATH RESPECTIVE REINFORCING BAR
4. COMPRESSION DEVELOPMENT IS PERMISSIBLE ONLY WHEN SPECIFICALLY NOTED ON THE DRAWINGS, DETAILS, OR SCHEDULES.

11 TYP CONCRETE REINFORCING BAR DEVELOPMENT LENGTH (3000 PSI)
SCALE: N.T.S.

BAR SIZE	EMBEDMENT	90 DEGREE LEG	180 DEGREE LEG	MIN EMBED
f'c=	3000 PSI	3000 PSI	3000 PSI	3000 PSI
3	8"	5"	2 1/2"	1 1/2"
4	11"	6"	2 1/2"	2"
5	14"	8"	2 1/2"	2 1/2"
6	16"	9"	3"	3"
7	19"	11"	3 1/2"	3 1/2"
8	22"	12"	4"	4"
9	25"	14"	4 1/2"	6"
10	28"	15"	5"	6"
11	31"	17"	6"	7"

NOTES:

1. HOOKS SHALL NOT BE USED TO DEVELOP COMPRESSION EMBEDMENT.
2. BEND HOOKS ACCORDING TO ACI 318 "STANDARD HOOKS"



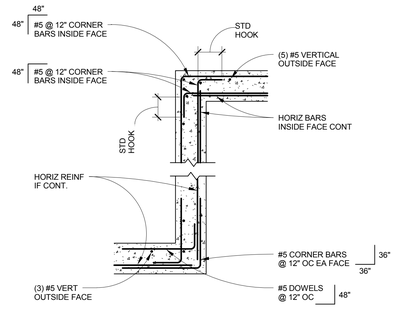
10 TYP CONCRETE REINFORCING BAR STANDARD TENSION HOOK (3000 PSI)
SCALE: N.T.S.

BAR SIZE	BEAM & MAT TOP BARS (CLASS B)	BEAM & MAT BARS OTHER THAN TOP BARS (CLASS B)	COLUMN & WALL BARS TENSION (CLASS B)	COMPRESSION BARS (SEE NOTE #4)
f'c=	3000 PSI	3000 PSI	3000 PSI	3000 PSI
3	28"	22"	22"	11"
4	37"	29"	29"	15"
5	47"	36"	36"	18"
6	56"	43"	43"	22"
7	81"	63"	63"	25"
8	93"	72"	72"	29"
9	105"	81"	81"	33"
10	118"	91"	91"	37"
11				41"

NOTES: USE MECH. TENSION SPLICE FOR 125% TENSILE CAPACITY OF REINFORCEMENT

1. BEAM BARS SPACED @ NOT LESS THAN 3 db C/C
2. COLUMN BARS SPACED @ NOT LESS THAN 4 db C/C
3. REINFORCING BARS ARE CLASSED AS TOP BARS WHEN MORE THAN 12" OF CONCRETE IS CAST BENEATH RESPECTIVE REINFORCING BAR.
4. COMPRESSION SPLICES ARE PERMISSIBLE ONLY WHEN SPECIFICALLY NOTED ON THE DRAWINGS, DETAILS OR SCHEDULES.
5. TENSION SPLICES SHALL BE USED IN ALL BEAMS, SLABS, AND WALLS UNLESS OTHERWISE NOTED.
6. WHEN LAPPING LARGER BAR WITH SMALLER BAR, LAP LENGTH OF THE SMALLER BAR SHALL GOVERN RESPECTIVE SPLICE.

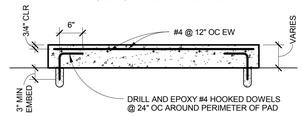
9 TYP CONCRETE REINFORCING BAR LAP SPLICE SCHEDULE (3000 PSI)
SCALE: N.T.S.



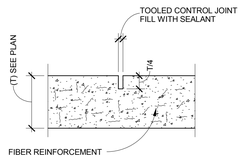
8 TYP DOUBLE LAYER REINFORCING AT CORNERS
SCALE: N.T.S.

NOTES:

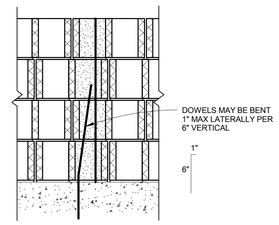
1. SCARIFY CONCRETE 1/4"
2. SOAK SCARIFIED SLAB FOR 24 HOURS MIN W/ LATEX BONDING AGENT PRIOR TO PLACING EQUIPMENT PAD
3. ALL HEIGHTS, WIDTHS, AND LENGTHS TO BE COORDINATED WITH ARCH, MECH, AND ELEC AS REQUIRED



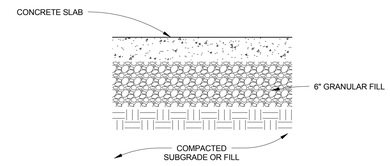
7 TYP CONCRETE EQUIPMENT PAD
SCALE: N.T.S.



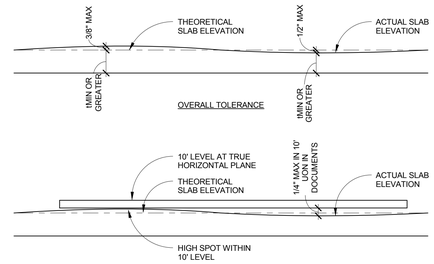
6 TYP CONTROL JOINT SLAB ON GRADE
SCALE: N.T.S.



5 TYP MASONRY DOWEL POSITION TOLERANCE
SCALE: N.T.S.



4 TYP SLAB ON GRADE WITH VAPOR RETARDER
SCALE: N.T.S.

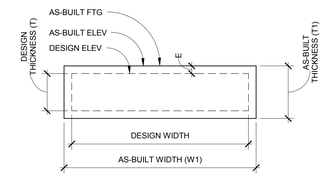


10 FOOT TOLERANCE

NOTE:

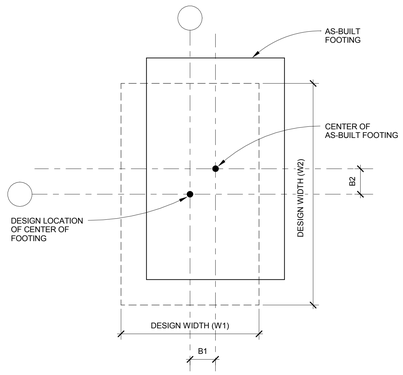
1. CONSULT SPECIFICATION FOR ADDITIONAL FINISHING REQUIREMENTS
2. tMIN = MINIMUM THICKNESS SHOWN ON PLANS
3. AS CONCRETE IS PLACED, ADJUST SCREEDS, BY LASER OR TRANSIT, TO PRODUCE A FLAT FINISHED CONCRETE SURFACE

3 TYP SLAB ON GRADE ELEVATION TOLERANCES
SCALE: N.T.S.



E= ELEVATION TOLERANCE (TOP OF FTG):
SUPPORTING MASONRY (+/- 1/2")
OTHERWISE (+1/2", -2")
T1= AS-BUILT THICKNESS
NO LIMIT ON LARGER THAN THICKNESS (T) U.O.N.
NOT THINNER THAN (0.95xT)
W1= AS-BUILT WIDTH
NOT LESS THAN (W-1/2")

2 TYP FOOTING SECTION TOLERANCES
SCALE: N.T.S.



B1 & B2 = LATERAL ALIGNMENT TOLERANCE
+/- 0.02x(W1 OR W2 RESPECTIVELY);
BUT NOT GREATER THAN 2"

1 TYP SPREAD FOOTING PLAN TOLERANCE
SCALE: N.T.S.

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Construction Tolerances & Typical Details

S-501

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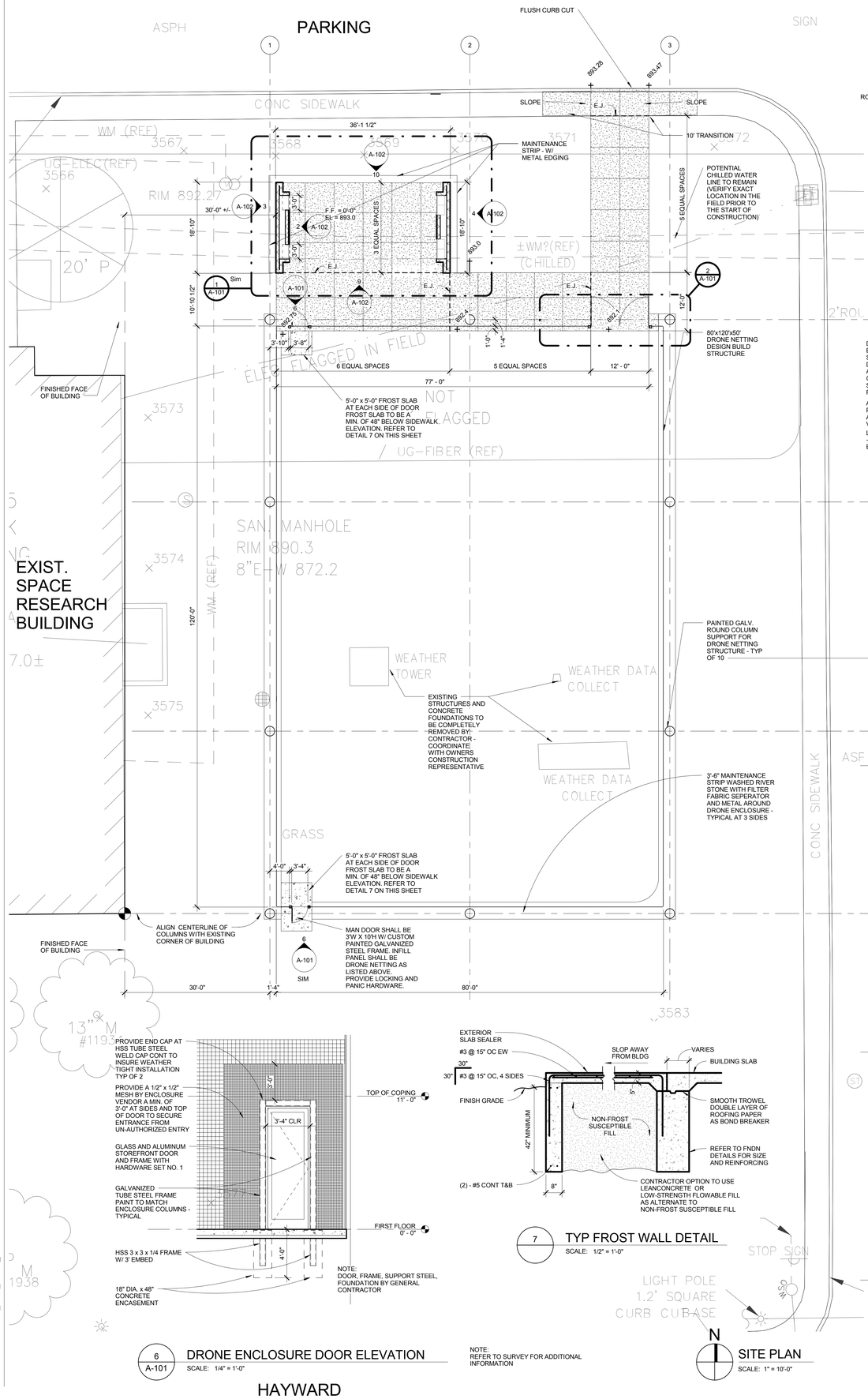
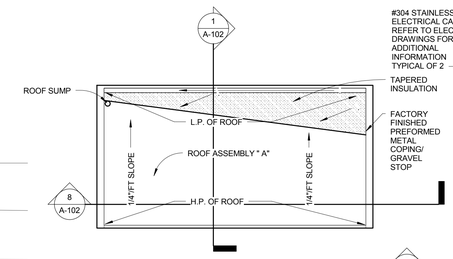
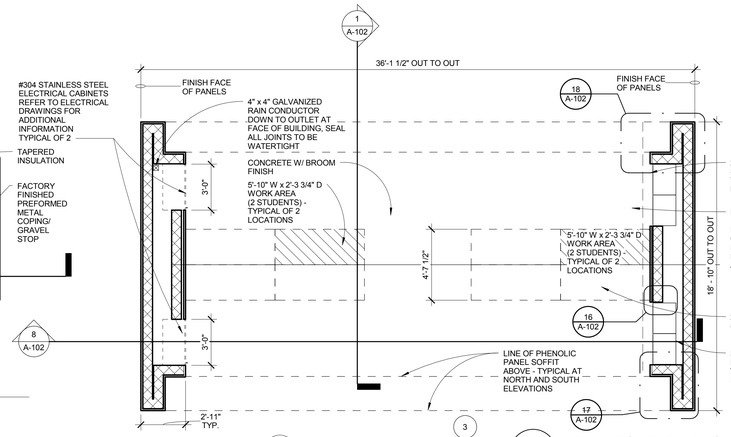
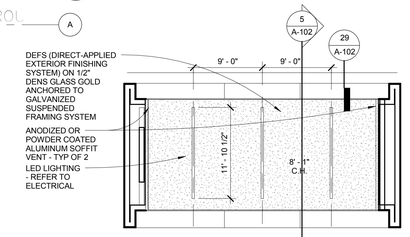
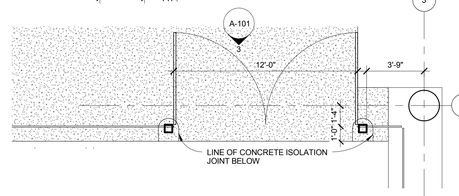




4 A-101 PAVILION ROOF PLAN
SCALE: 1/8" = 1'-0"

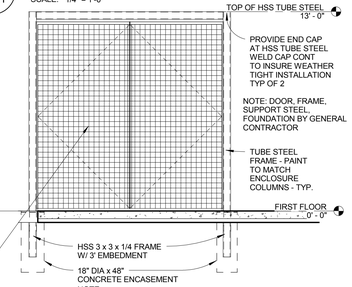






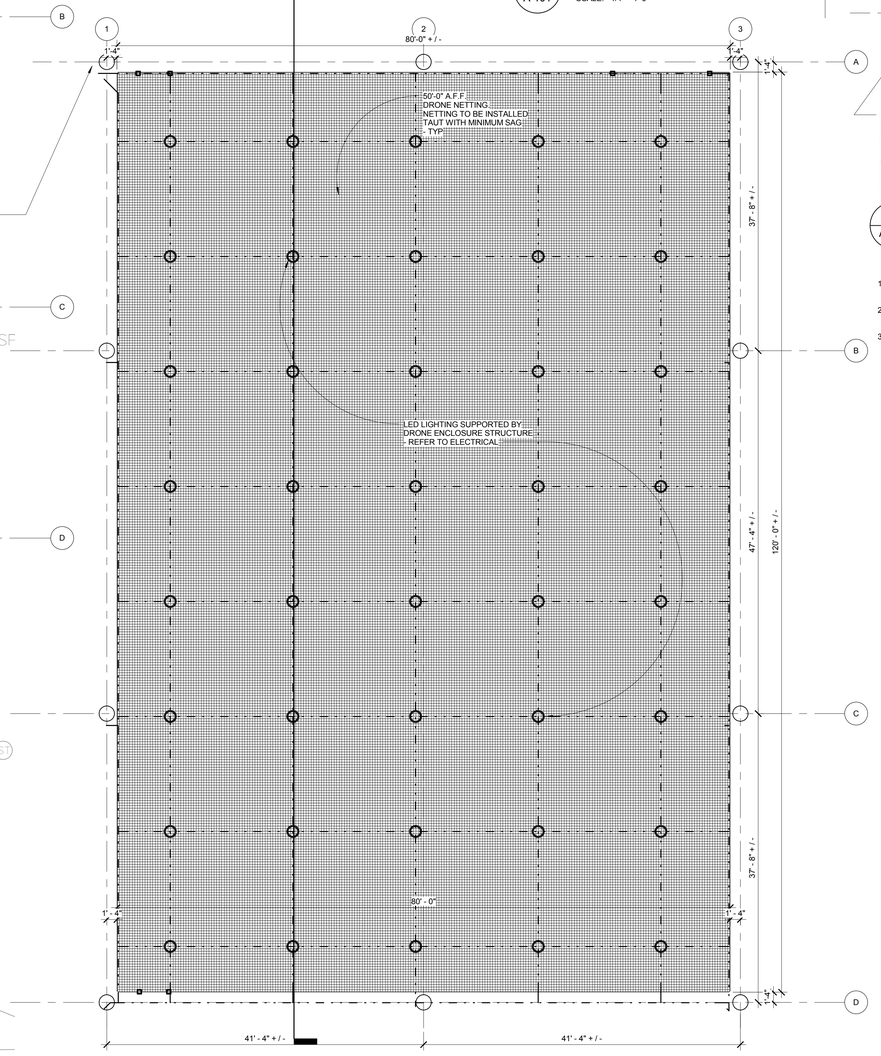
2 A-101 ENLARGED PLAN
SCALE: 1/4" = 1'-0"

1 A-101 ENLARGED PAVILION PLAN
SCALE: 1/4" = 1'-0"



DECORATIVE METAL SWING GATE WITH ALL ASSOCIATED HARDWARE (2) 6'-0"W x 12'-6" +/- H WITH 4" UNDERCUT (FIELD VERIFY WITH TOP OF CONC SIDEWALK) GATE IN-FILL PANEL WITHIN STEEL TUBE FRAME. EXTRA DUTY STEEL HINGES WITH STAINLESS PIN AND BALL BEARINGS. PADLOCKABLE CANE BOLT WITH (2) DROP-IN STAINLESS STEEL PAVEMENT SOCKETS (AT OPEN AND CLOSED POSITIONS). ALL COMPONENTS TO BE HOT-DIP GALVANIZED AND POLYESTER POWDER-COATED (COLOR TO MATCH ENCLOSURE COLUMNS). PROVIDE HASP TO SECURE (LOCK) GATES; LOCK PROVIDED BY OWNER. PROVIDE ENGINEERED SHOP DRAWINGS AND SAMPLE FOR APPROVAL. GATES TO BE PROVIDED BY ENCLOSURE CONTRACTOR. INFILL GATE FRAME WITH VINYL COATED CHAIN LINK FENCING - COLOR: BLACK.

3 A-101 ENLARGED ELEVATION
SCALE: 1/4" = 1'-0"



BUILDING SYSTEM GENERAL NOTES

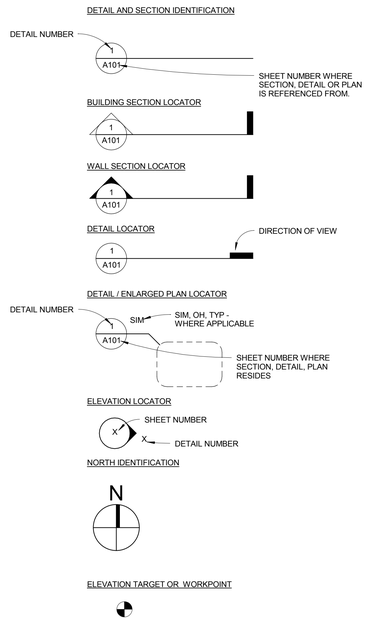
1. INTERIOR AND EXTERIOR CLADDING AT PAVILION SHALL BE SMOOTH PHENOLIC WALL PANEL W/ CONCEALED FASTENERS.
2. EXTERIOR AND INTERIOR EXPOSED CMU BASE SHALL BE BOARDMAN BURNISHED MASONRY (GRAND BLANC CEMENT PRODUCTS).
3. ROOF ASSEMBLY "A" - ROOFING SYSTEM SHALL BE BLACK EPDM FULLY ADHERED ROOF SYSTEM ON 5/8" SUBSTRATE BOARD ON 3/4" EXTERIOR GRADE PLYWOOD.

FLOOR PLAN LEGEND

COL — NEW COLUMN LINE

ROOM NAME / XXXX — ROOM NAME & NUMBER

REFERENCE SYMBOLS



6 A-101 DRONE ENCLOSURE DOOR ELEVATION
SCALE: 1/4" = 1'-0"

7 TYP FROST WALL DETAIL
SCALE: 1/2" = 1'-0"

NOTE:
REFER TO SURVEY FOR ADDITIONAL INFORMATION

N
SITE PLAN
SCALE: 1" = 10'-0"

N
5 A-101 DRONE NETTING ENCLOSURE REFLECTED CEILING PLAN
SCALE: 1/8" = 1'-0"

HAYWARD

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03/28/2017	CD Review
06/19/2017	Bids
07/17/2017	Addendum No. 2
08/25/2017	Construction Set

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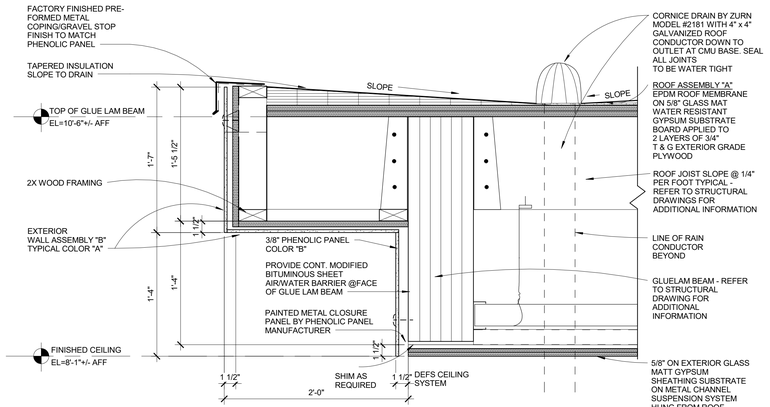
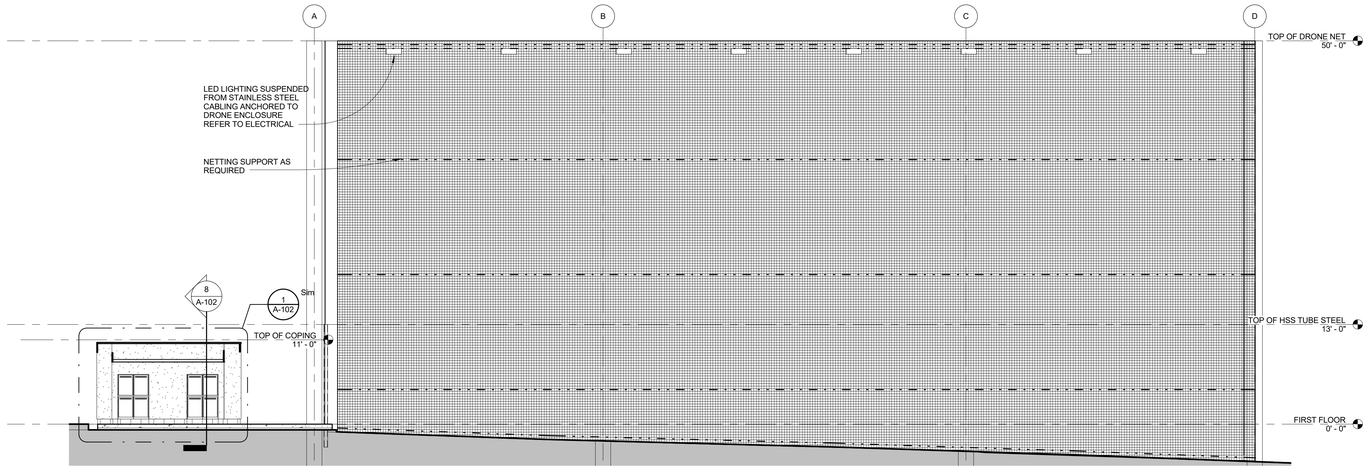
Composite Floor Plan

A-101



29 / A-101 **SECTION AT NORTH ELEVATION**
SCALE: 1 1/2" = 1'-0"



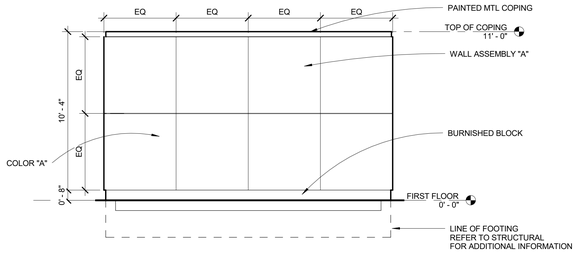
5 / A-101 **DRONE NETTING ENCLOSURE SECTION - LOOKING EAST**
SCALE: 1/8" = 1'-0"

28 / TYP. **NOT USED**
SCALE: N.T.S.

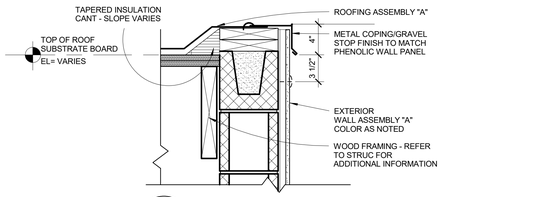
EXTERIOR WALL ASSEMBLIES

EXTERIOR WALL ASSEMBLY "A" –3/8" PHENOLIC PANELS AS DIMENSIONED ON DRAWINGS on MANUFACTURERS CONTINUOUS VERTICAL "ZEE" SUB-GIRT EXTRUSION SPACED AS REQUIRED BY PANEL MANUFACTURER. ENTIRE SUB-GIRT AND FACE OF MASONRY (INTERIOR AND EXTERIOR) TO BE PRIMED AND PAINTED FLAT BLACK. ALL PANEL JOINTS TO BE EQUAL WITH A MAXIMUM WIDTH OF 3/8". PROVIDE ALL REQUIRED EXTRUDED ALUMINUM TRIM TO MATCH PHENOLIC PANEL SYSTEM. INSTALL THE MANUFACTURERS ALUMINUM SUB-FRAMING SYSTEM DESIGNED TO WITHSTAND STRUCTURAL LOADING DUE TO WIND LOAD AS OUTLINED IN THE STRUCTURAL DRAWINGS. EXTRUDED ALUMINUM CONCEALED SUB – FRAMING SYSTEM TO BE PAINTED FLAT BLACK.

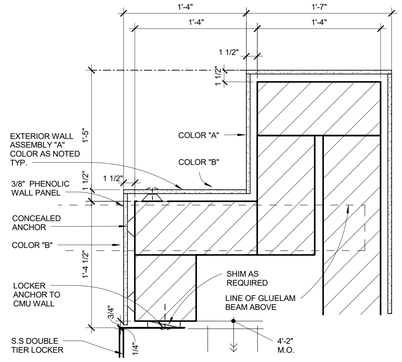
EXTERIOR WALL ASSEMBLY "B" –3/8" PHENOLIC PANELS AS DIMENSIONED ON DRAWINGS on MANUFACTURERS HORIZONTAL SUB-GIRT EXTRUSION SPACED AS REQUIRED BY PANEL MANUFACTURER. ENTIRE SUB-GIRT AND SUBSTRATE TO BE PRIMED AND PAINTED FLAT BLACK. PROVIDE CONCEALED FASTENERS AS RECOMMENDED BY THE PANEL MANUFACTURER. ALL PANEL JOINTS TO BE EQUAL WITH A MAXIMUM WIDTH OF 3/8". INSTALL THE MANUFACTURERS ALUMINUM SUB-FRAMING SYSTEM DESIGNED TO WITHSTAND STRUCTURAL LOADING DUE TO WIND LOAD AS OUTLINED IN THE STRUCTURAL DRAWINGS. EXTRUDED ALUMINUM CONCEALED SUB – FRAMING SYSTEM TO BE PAINTED FLAT BLACK. PROVIDE EXTERIOR GRADE PLYWOOD WITH CONT. BITUMINOUS SHEET AIR/ WATER BARRIER ON 2X WOOD FRAMING AS SHOWN.

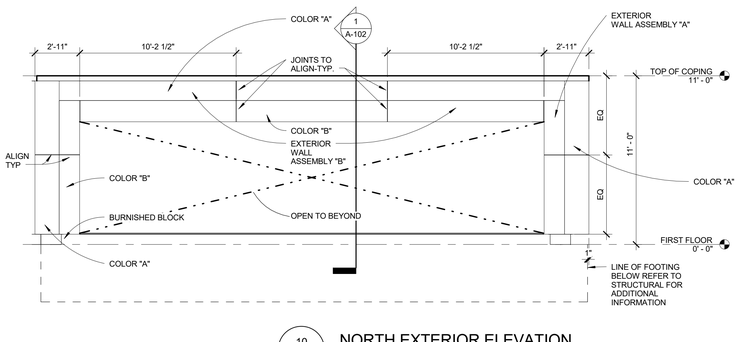


4 / A-101 **EXTERIOR EAST ELEVATION**
SCALE: 1/4" = 1'-0"

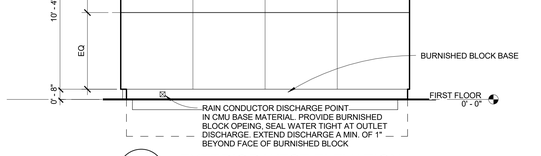


26 / A-102 **SECTION AT EAST/WEST SIDE**
SCALE: 1 1/2" = 1'-0"

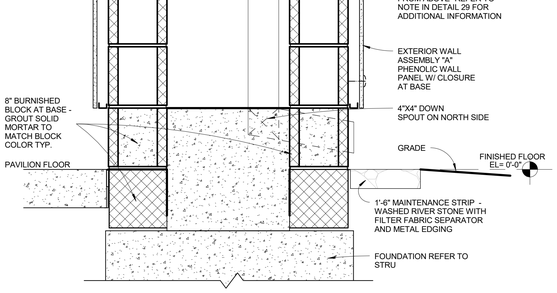




10 / A-101 **NORTH EXTERIOR ELEVATION**
SCALE: 1/4" = 1'-0"

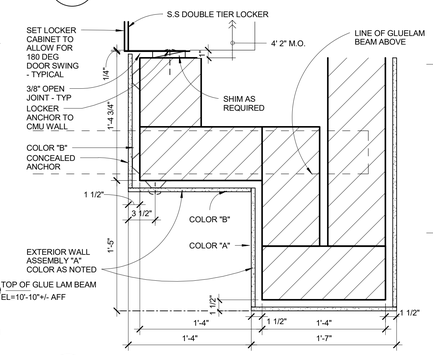


3 / A-101 **EXTERIOR WEST ELEVATION**
SCALE: 1/4" = 1'-0"

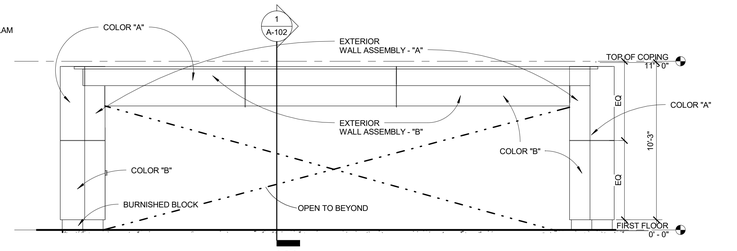


25 / A-102 **MASONRY CAVITY WALL ASSEMBLY**
SCALE: 1 1/2" = 1'-0"

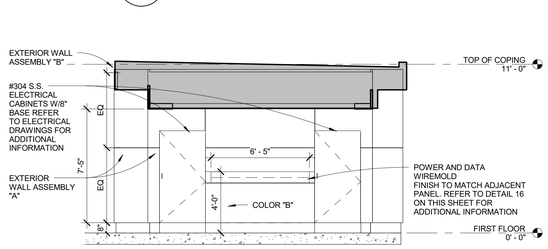
18 / A-101 **CORNER PLAN DETAIL**
SCALE: 1 1/2" = 1'-0"



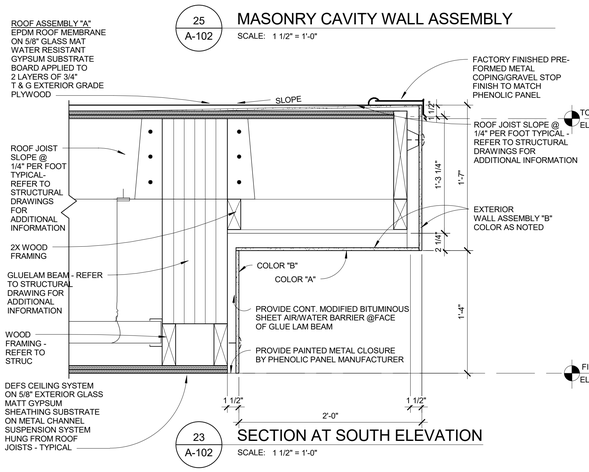
17 / A-101 **TYPICAL CORNER PLAN DETAIL**
SCALE: 1 1/2" = 1'-0"



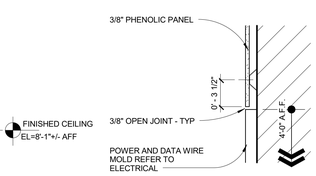
9 / A-101 **SOUTH EXTERIOR ELEVATION**
SCALE: 1/4" = 1'-0"



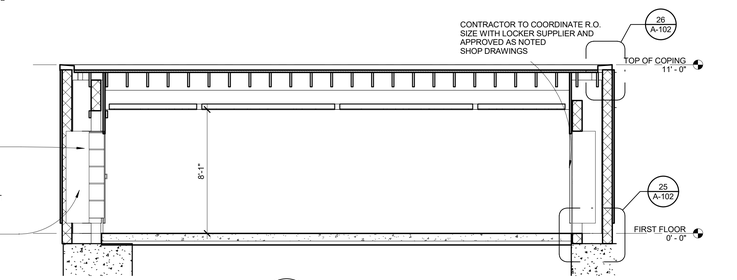
2 / A-101 **INTERIOR ELEVATION LOOKING WEST**
SCALE: 1/4" = 1'-0"



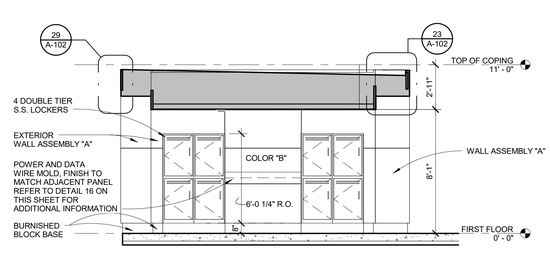
23 / A-102 **SECTION AT SOUTH ELEVATION**
SCALE: 1 1/2" = 1'-0"



16 / A-101 **INTERIOR JOINT DETAIL**
SCALE: 1 1/2" = 1'-0"



8 / A-101 **SOUTH INTERIOR SECTION /ELEVATION**
SCALE: 1/4" = 1'-0"



1 / A-101 **EAST INTERIOR SECTION/ ELEVATION**
SCALE: 1/4" = 1'-0"

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Elevations, Sections and Details

A-102

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LUMINAIRE SYMBOLS
(REFER TO LUMINAIRE SCHEDULE)

- STRIP LUMINAIRE- LENGTH AS INDICATED - RECESSED OR SURFACE MOUNTED (NORMAL POWER)
- 4' OR 8' STRIP LUMINAIRE - CEILING SURFACE OR COVE MOUNTED - EMERGENCY
- LUMINAIRE - CEILING RECESSED OR SURFACE MOUNTED (NORMAL POWER)
- LUMINAIRE - CEILING RECESSED OR SURFACE MOUNTED - NIGHT LIGHT/EMERGENCY
- EXIT LUMINAIRE - SHADING INDICATES ILLUMINATED FACE

SWITCHES AND SENSORS

- $ SINGLE POLE SWITCH
- $D DIMMER SWITCH, DIMMING SWITCH SHALL BE EQUIPPED WITH A COMPATIBLE DIMMING BALLAST / DRIVER
- ROOM OCCUPANCY SENSOR - CEILING MOUNTED, DUAL TECHNOLOGY, 360° COVERAGE (BASIS OF DESIGN - WATTSTOPPER DT-300)

RECEPTACLE SYMBOLS - WALL MOUNTED

- X 20A, 120V, 2P, 3W DUPLEX CONVENIENCE RECEPTACLE - GROUNDED X = RECEPTACLE NOTATION
- MULTI-OUTLET RACEWAY SYSTEM (DEVICES AS INDICATED)

TYPICAL NOTATIONS

"a"	SWITCHED OUTLET, "a" - INDICATES SWITCH CONTROL
"C"	MOUNTED 10" ABOVE COUNTER OR 42" AFF. COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS
"CLG"	CEILING MOUNTED
"E"	EMERGENCY
"GFCI"	GROUNG FAULT CIRCUIT INTERUPTER, PERSONAL PROTECTION
"H"	HORIZONALLY MOUNTED
"W"	WALL MOUNTED DEVICE AT 48" AFF UNLESS OTHERWISE INDICATED
"WP"	WEATHERPROOF RECEPTACLE WITH "NRTL" LISTED COVERPLATE FOR WET LOCATION WITH PLUG INSTALLED. MTD 48" AFF UNLESS OTHERWISE INDICATED
"U"	ONE CONVENIENCE RECEPTACLE AND TWO USB OUTLETS
+ XX	DIMENSIONED HEIGHT
LOH	LOCK ON HANDLE

RISER DIAGRAM SYMBOLS

- CIRCUIT BREAKER
- DISCONNECT SWITCH UNFUSED
- DISCONNECT SWITCH FUSED
- GROUNDING
- PANELBOARD

A = AMMETER
AH = AMPERE-HOUR
PF = POWER FACTOR
V = VOLT
W = WATT
WH = WATT-HOUR

POWER DISTRIBUTION SYMBOLS

- T TRANSFORMER
- RECEPTACLE PANEL OR LIGHTING PANEL
- POWER PANEL OR DISTRIBUTION PANEL
- RECEPTACLE PANEL OR LIGHTING PANEL ON EMERGENCY POWER
- POWER PANEL OR DISTRIBUTION PANEL ON EMERGENCY POWER
- XXA DISCONNECT SWITCH - NON FUSED, XXA INDICATED AMPERAGE
- XXAS / XXAF DISCONNECT SWITCH - FUSED, XXAS INDICATES AMPERAGE RATING, XXAF INDICATES FUSE SIZE
- XXAF / XXAT ENCLOSED CIRCUIT BREAKER - XXAF INDICATES BREAKER FRAME SIZE, XXAT INDICATES BREAKER TRIP SIZE

GROUNDING SYMBOLS

- GROUND ROD
- GROUND WIRE
- CADWELD CONNECTION
- BUILDING GROUND MAT

MISCELLANEOUS SYMBOLS

- J JUNCTION BOX IN CEILING OR WALL
- J JUNCTION BOX IN FLOOR
- PB PULLBOX
- R RELAY
- C CONTACTOR
- PC PHOTO CELL WATTSTOPPER LS-301

CONDUCTOR SYMBOLS

- CONDUIT ABOVE CEILING OR IN WALL IN FINISHED AREAS
- CONDUIT EXPOSED IN UNFINISHED AREAS
- CONDUIT IN FLOOR OR BELOW GRADE
- EXISTING CONDUIT TO BE REMOVED
- HOME RUN TO POWER PANEL OR MCC
- CONDUIT DOWN
- CONDUIT UP
- BREAK SYMBOL
- CONDUIT STUB TERMINATE WITH BUSHING
- NEW EQUIPMENT OR WORK
- EXISTING TO REMAIN
- (R) RE-INSTALL PREVIOUSLY REMOVED DEVICE
- (E) EXISTING DEVICE TO REMAIN

TELEPHONE AND DATA SYMBOLS

- TELE/DATA OUTLET - 4x4x2-1/8" OUTLET BOX WITH SINGLE GANG TRIM RING & 1 1/4"C. TO TELECOMMUNICATION CABINET

SECURITY SYSTEM SYMBOLS

- FC WP FUTURE CCTV CAMERA "WP" INDICATES WEATHER PROOF, AND 4X4X2-1/8" OUTLET BOX WITH SINGLE GANG TRIM RING & 1"C. FLUSH TO FINISH SURFACE TO TELECOMMUNICATION CABINET. ALL SECURITY CAMERA AND EQUIPMENT BY OWNER, PROVIDE A WEATHERPROOF COVER PLATE.

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PROJECT NAME		BY		PROJECT NO		SHT
UNIVERSITY OF MICHIGAN M-AIR LAB		DATE		2016-01099		OF
DESIGNATION	LOCATION	RATING		MAIN		
MDP2-B539	RM B-539	277/480V, 3PH, 4W+G		400A MLO		

POSITION	BREAKER	ITEM		EQUIPMENT RATING	CONN LOAD*	DF	DEM LOAD*
1	300 A/3P	TRANSF. T2-B539 (DPL2-B539)	EX		282 KVA	0.5	141 KVA
2	125 A/3P	VSD DRIVE B539 200A SAFETY SW.	EX		62 KVA	0.5	31 KVA
3		SPACE	EX				
4	100 A/3P	LP2-1536E (LP-B)	EX		50 KVA	0.5	25 KVA
5	100 A/3P	LP2-B536E (LP-A)	EX		50 KVA	0.5	25 KVA
6	100 A/3P	ELEV.	EX		50 KVA	0.5	25 KVA
7	100 A/3P	LP2-2536E (LP-C)	EX		50 KVA	0.5	25 KVA
8	90 A/3P	LASER RM. 2543	EX		45 KVA	0.5	22 KVA
9	20 A/3P	EM LIGHT SIGNAL B539	EX		10 KVA	0.5	5 KVA
10	20 A/3P	CH.WATER& HEAT.EX	EX		10 KVA	0.5	5 KVA
11	3P	SPACE	EX				
12							
				SUB TOTALS			608 KVA / 304 KVA

* LOADS INDICATED ARE ESTIMATED

TOTAL CONNECTED LOAD 733 **AMPS**

TOTAL EST. DEMAND LOAD 366 **AMPS**

PROJECT NAME		BY		PROJECT NO		SHT
UNIVERSITY OF MICHIGAN M-AIR LAB		DATE		2016-01099		OF
DESIGNATION	LOCATION	RATING		MAIN		
DPL2-B539	RM B-539	120/208V, 3PH, 4W+G		600A MLO		

POSITION	BREAKER	ITEM		EQUIPMENT RATING	CONN LOAD*	DF	DEM LOAD*
1		RP2-2536E	EX		50 KVA	0.5	25 KVA
2		RP2-1536E-1	EX		50 KVA	0.5	25 KVA
3	225 A/3P	SPARE **RP2-PAV**	**NEW**		**17 KVA**	0.5	8 KVA
4		RP2-1536E	EX		50 KVA	0.5	25 KVA
5	100 A/3P	RP2-B536E	EX		25 KVA	0.5	13 KVA
6	100 A/3P	RP2-B536E-1	EX		25 KVA	0.5	13 KVA
7	1P	SPACE	EX				
7	20 A/2P	SPARE	EX				
8	20 A/3P	DDC PANEL	EX		2 KVA	0.5	1 KVA
10	20 A/3P	CIRCULATING PUMPS	EX		2 KVA	0.5	1 KVA
12	20 A/3P	SPARE					
9	20 A/3P	WELDER OUTLET	EX		5 KVA	0.5	3 KVA
14	20 A/1P	CHAMBER LTS.	EX		2 KVA	0.5	1 KVA
16	20 A/1P	RECEPTS.	EX		2 KVA	0.5	1 KVA
18	20 A/1P	RECEPTS.	EX		2 KVA	0.5	1 KVA
11	100 A/3P	RP2-B634	EX		25 KVA	0.5	13 KVA
13	100 A/3P	RP-B500	EX		25 KVA	0.5	13 KVA
				SUB TOTALS	282 KVA		141 KVA

* LOADS INDICATED ARE ESTIMATED

TOTAL CONNECTED LOAD 340 **AMPS**

TOTAL EST. DEMAND LOAD 170 **AMPS**

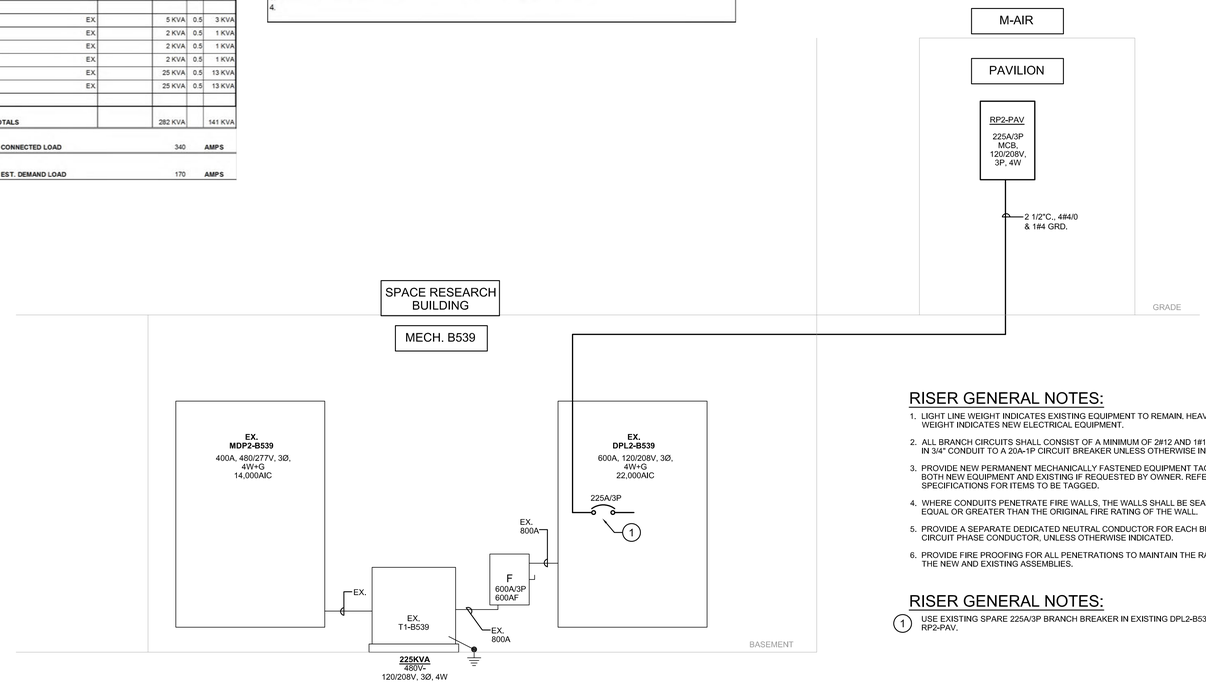
RP2-PAV

VOLTAGE: 208 / 120 — LOCATION: — MAINS: 225 A / 3P MCB — ISSUED FOR: — A.I.C. RATING: 10,000
Ø / WIRE: 3 / 4 — MAXIMUM POLE CAPACITY: 30 — NEUTRAL RATING: \ 100% — FED FROM: — MOUNTING: SURFACE

NO.	BRANCH POLE	BRANCH BREAKER	BRANCH LOAD TYPE	DESCRIPTION	VA ØA	VA ØB	VA ØC	DESCRIPTION	BRANCH LOAD TYPE	BRANCH BREAKER	BRANCH POLE	NO.
1	1	20	L	LIGHTING PAVILION	960			RACEWAY REC.	R	20	1	2
					800							
3	1	20	L	LIGHTING ENCLOSURE		1050		RACEWAY REC.	R	20	1	4
						800						
5	1	20	L	LIGHTING ENCLOSURE			1050	REC. ENCLOSURE	R	20	1	6
							800					
7	1	20	L	LIGHTING ENCLOSURE	1050			REC. ENCLOSURE	R	20	1	8
					800							
9	1	20	L	LIGHTING ENCLOSURE		1050		REC. ENCLOSURE	R	20	1	10
						800						
11	1	20	L	LIGHTING ENCLOSURE			1050	REC. ENCLOSURE	R	20	1	12
							800					
13	1	20	L	LIGHTING ENCLOSURE	1050			REC. ENCLOSURE	R	20	1	14
					800							
15	1	20	L	LIGHTING ENCLOSURE		1050		ENCLOSURE HEATER	E	20	1	16
						800						
17	1	20	L	LIGHTING ENCLOSURE			1050	ENCLOSURE HEATER	E	20	1	18
							800					
19	1	20	L	EMERGENCY LIGHTING LOH	60			RACEWAY REC.	R	20	1	20
					400							
21	1	20		SPARE		400		RACEWAY REC.	R	20	1	22
23	1	20		SPARE				BACKBOARD REC.	R	20	1	24
							400					
25	1			SPARE				SPARE		20	1	26
27	1			SPARE				SPARE		20	1	28
29	1			SPARE				SPARE		20	1	30
				TOTALS:	5920	5950	5950					

9.42 KVA CONNECTED LOAD LIGHTING (L)
6.80 KVA CONNECTED LOAD RECEPTACLE (R)
1.60 KVA EQUIPMENT LOAD (E)
0.00 KVA CONNECTED LOAD SPARE (S)
PANEL BOARD TOTAL LOAD: 17.82 KVA TOTAL CONNECTED LOAD: (LESS SPARE)
49.5 = AMPS CONNECTED 17.50 KVA TOTAL DEMAND LOAD
48.6 = AMPS DEMAND 2.36 KVA 25% OF LIGHTING LOAD
56.0 = AMPS MIN. FEEDER DESIGN 20.18 KVA KVA FOR MINIMUM FEEDER DESIGN

NOTES:
1. PROVIDE PANEL WITH GROUND BUS
2. RECEPTACLE DEMAND LOADS = FIRST 10KVA @ 100% AND THE REMAINDER @ 50%
3.
4.



ELECTRICAL RISER DIAGRAM
SCALE: NONE

RISER GENERAL NOTES:

1. LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN. HEAVY LINE WEIGHT INDICATES NEW ELECTRICAL EQUIPMENT.
2. ALL BRANCH CIRCUITS SHALL CONSIST OF A MINIMUM OF 2#12 AND 1#12 GROUND IN 3/4" CONDUIT TO A 20A-1P CIRCUIT BREAKER UNLESS OTHERWISE INDICATED.
3. PROVIDE NEW PERMANENT MECHANICALLY FASTENED EQUIPMENT TAGS FOR BOTH NEW EQUIPMENT AND EXISTING IF REQUESTED BY OWNER. REFER TO SPECIFICATIONS FOR ITEMS TO BE TAGGED.
4. WHERE CONDUITS PENETRATE FIRE WALLS, THE WALLS SHALL BE SEALED TO EQUAL OR GREATER THAN THE ORIGINAL FIRE RATING OF THE WALL.
5. PROVIDE A SEPARATE DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT PHASE CONDUCTOR, UNLESS OTHERWISE INDICATED.
6. PROVIDE FIRE PROOFING FOR ALL PENETRATIONS TO MAINTAIN THE RATINGS OF THE NEW AND EXISTING ASSEMBLIES.

RISER GENERAL NOTES:

(1) USE EXISTING SPARE 225A/3P BRANCH BREAKER IN EXISTING DPL2-B539 FOR NEW RP2-PAV.

PROJECT GENERAL NOTES:

1. THOROUGHLY COORDINATE ELECTRICAL WORK WITH OTHER TRADES TO AVOID PHYSICAL CONFLICTS AND CONFLICTS WITH WORK SEQUENCE.

2. MULTI GANG DEVICES SHALL BE GANGED UNDER SINGLE MULTI GANG COVER PLATE.

3. WHERE ELECTRICAL DEVICES ARE INDICATED ON A COLUMN, THE DEVICE SHALL BE CENTERED ON THE COLUMN SURFACE.

4. WHERE GFI PROTECTION IS INDICATED, A GFI TYPE RECEPTACLE SHALL BE PROVIDED AT EACH LOCATION. LOAD SIDE PROTECTION OF DOWN STREAM DEVICES WILL NOT BE ACCEPTABLE.

5. MINIMUM BRANCH CIRCUIT WIRE SIZE SHALL BE #12 AWG, BRANCH CIRCUITS WITH LENGTH EXCEEDING 75FT SHALL BE #10 AWG MINIMUM.

6. REFER TO RISER DIAGRAM FOR FEEDER CONDUIT AND WIRE SIZES.

7. LIGHT FIXTURES SHALL BE INDEPENDENTLY SUPPORTED FROM THE STRUCTURE ABOVE.

8. PROVIDE FIRE PROOFING FOR ALL PENETRATIONS TO MAINTAIN THE RATINGS OF THE NEW AND EXISTING ASSEMBLIES.

UNIVERSITY OF MICHIGAN EQUIPMENT NAMING CONVENTION

RP 2-XXXX-4

- D. SEQUENCE — IF THERE IS MORE THAN ONE PANEL IN A ROOM
- C. PANEL LOCATION — ROOM NUMBER OF PANEL
- B. SUBSTATION NUMBER — IF MORE THAN ONE IN BUILDING
- A. PANEL TYPE
  - MCC - MOTOR CONTROL CENTER
  - PP - POWER PANEL (PANEL PRIMARILY FEEDING LOADS DIRECTLY)
  - DP - DISTRIBUTION PANEL (PANEL PRIMARILY FEEDING OTHER PANELS)
  - LP - LIGHTING PANEL (TYPICALLY A 480/277V PANEL FEEDING LIGHTING)
  - RP - RECEPTACLE PANEL (TYPICALLY A 208/120V PANEL FEEDING RECEPTACLES)
  - EPP - EMERGENCY POWER PANEL (EMERGENCY PANEL PRIMARILY FEEDING EMERGENCY LOADS DIRECTLY)
  - EDP - EMERGENCY DISTRIBUTION PANEL (EMERGENCY PANEL PRIMARILY FEEDING OTHER EMERGENCY PANELS)
  - ELP - EMERGENCY LIGHTING PANEL (TYPICALLY A 480/277V PANEL)
  - ERP - EMERGENCY RECEPTACLE PANEL (TYPICALLY A 208/120V PANEL)

ELECTRICAL DEVICES:

TRANSFORMERS:

T - ROOM NUMBER OF TRANSFORMER (EXAMPLE: T-380). IF MORE THAN ONE TRANSFORMER IS IN A ROOM, ADD SEQUENCE NUMBERS AFTER ROOM NUMBER (T-380-1).

DISCONNECTS (SAFETY SWITCHES):

FUSED: DF - ROOM NUMBER OF SWITCH (EXAMPLE: DF-380). IF MORE THAN ONE DISCONNECT IS IN A ROOM, ADD SEQUENCE NUMBERS AFTER ROOM NUMBER (DF-380-1).

NON-FUSED: D - ROOM NUMBER OF SWITCH (EXAMPLE: D-380). IF MORE THAN ONE DISCONNECT IS IN A ROOM, ADD SEQUENCE NUMBERS AFTER ROOM NUMBER (D-380-1).

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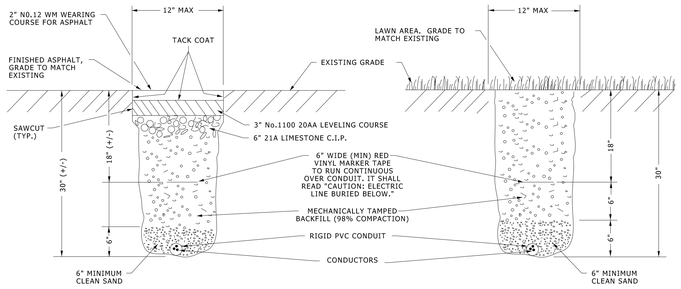
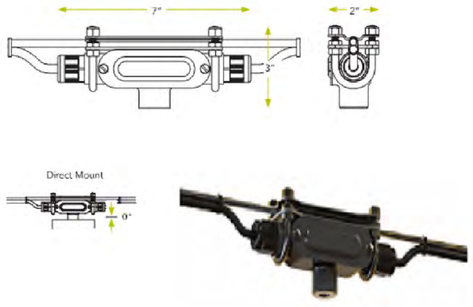
U OF M PROJECT NO. - P00011963

Electrical Symbols, Riser Diagram and Panel Schedules

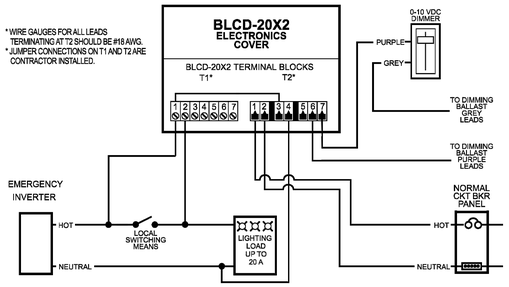
E-021



TYPICAL TRENCH DETAIL
NO SCALE



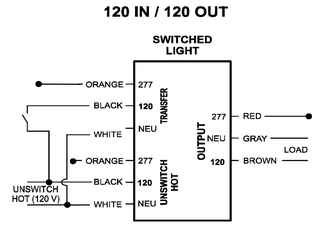
CATENARY MOUNTING DETAIL FOR TYPE "L1" LIGHTING FIXTURE
NO SCALE



BLCD-20X2 as a Lighting Relay Control Device with a 0-10 VDC Dimming System

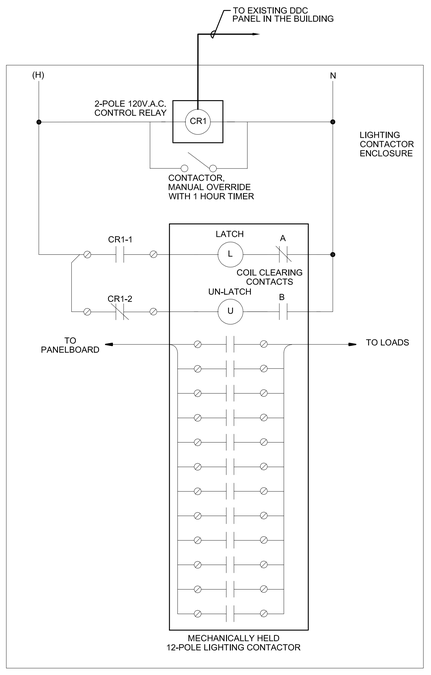
THE EMERGENCY LIGHTING TRANSFER RELAY TO WORK IN CONJUNCTION WITH THE INVERTER TO POWER DESIGNATED LIGHTING LOADS UP TO 20A REGARDLESS OF LOCAL SWITCH POSITION OR OTHER LIGHTING CONTROL MEANS. THE DEVICE SENSES THE LOSS OF NORMAL POWER AND IS USED TO BYPASS THE LIGHTING CONTROL AND CONNECTING IT TO THE INVERTER ENSURING THAT ALL EMERGENCY LIGHTING TURNS ON IMMEDIATELY TO FULL BRIGHTNESS.
THE TRANSFER RELAY TO BE UL924 LISTED.

EMERGENCY LIGHTING TRANSFER RELAY
SCHEMATIC ONLY

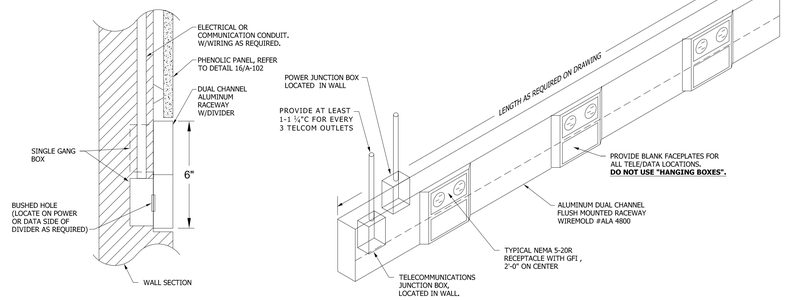


THE EMERGENCY INVERTER UNIT UPON FAILURE OF NORMAL POWER PROVIDES EMERGENCY POWER TO THE CONNECTED LIGHTING LOAD FOR A MINIMUM OF 90 MINUTES REGARDLESS OF LOCAL SWITCH POSITION. IT SHALL ALLOW CONNECTED LIGHTING TO BE ON, OFF SWITCHED OR DIMMED WITHOUT AFFECTING THE EMERGENCY OPERATION.
INVERTER TO BE UL924 LISTED FOR REMOTE INSTALLATION UP TO 1000FT FROM THE EMERGENCY FIXTURE.

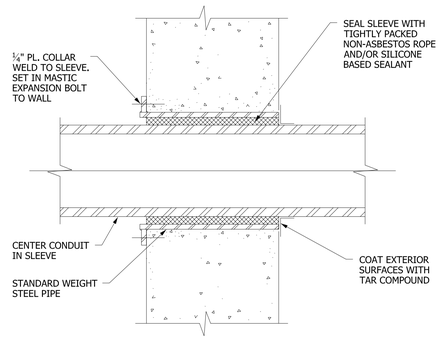
EMERGENCY INVERTER WIRING DIAGRAM
SCHEMATIC ONLY



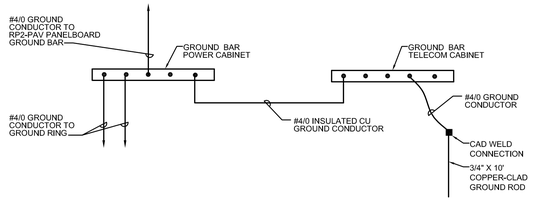
LIGHTING CONTROL CONTACTOR
SCHEMATIC ONLY



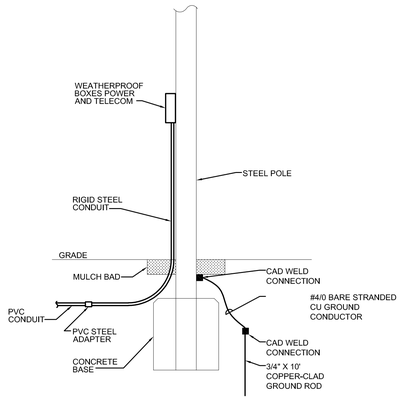
INSTALLATION DETAIL - FOR NEW WALL DUAL CHANNEL METAL FLUSH RACEWAY
NOT TO SCALE



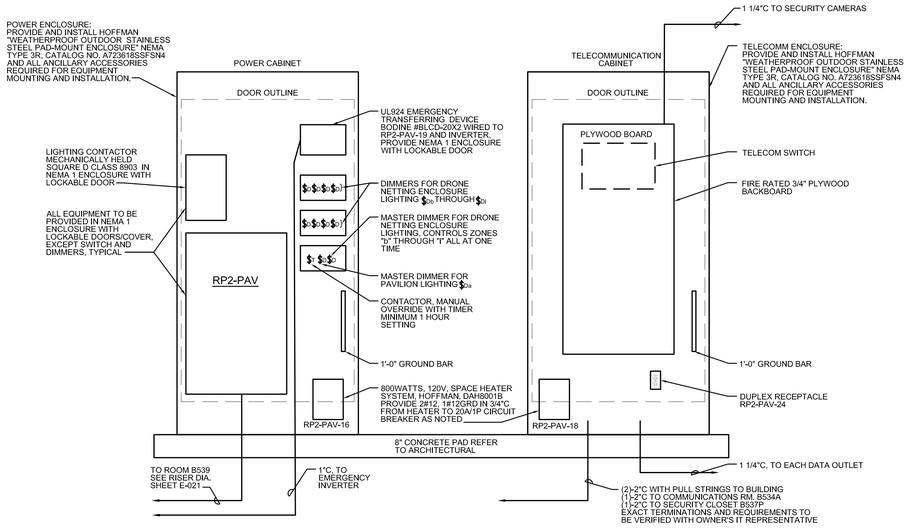
CONDUIT THROUGH EXISTING EXTERIOR WALL
NOT TO SCALE



ELECTRICAL GROUNDING DETAIL
NOT TO SCALE



TYPICAL DETAIL FOR DEVICES MOUNTED ON STEEL POLE
NOT TO SCALE



POWER AND TELECOMMUNICATION CABINETS DETAIL
NOT TO SCALE

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12/02/2016	Schematic Design
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06/19/2017	Bids
07/17/2017	Addendum No. 2
08/25/2017	Construction Set

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U OF M PROJECT NO. - P00011963

Electrical Details

E-501

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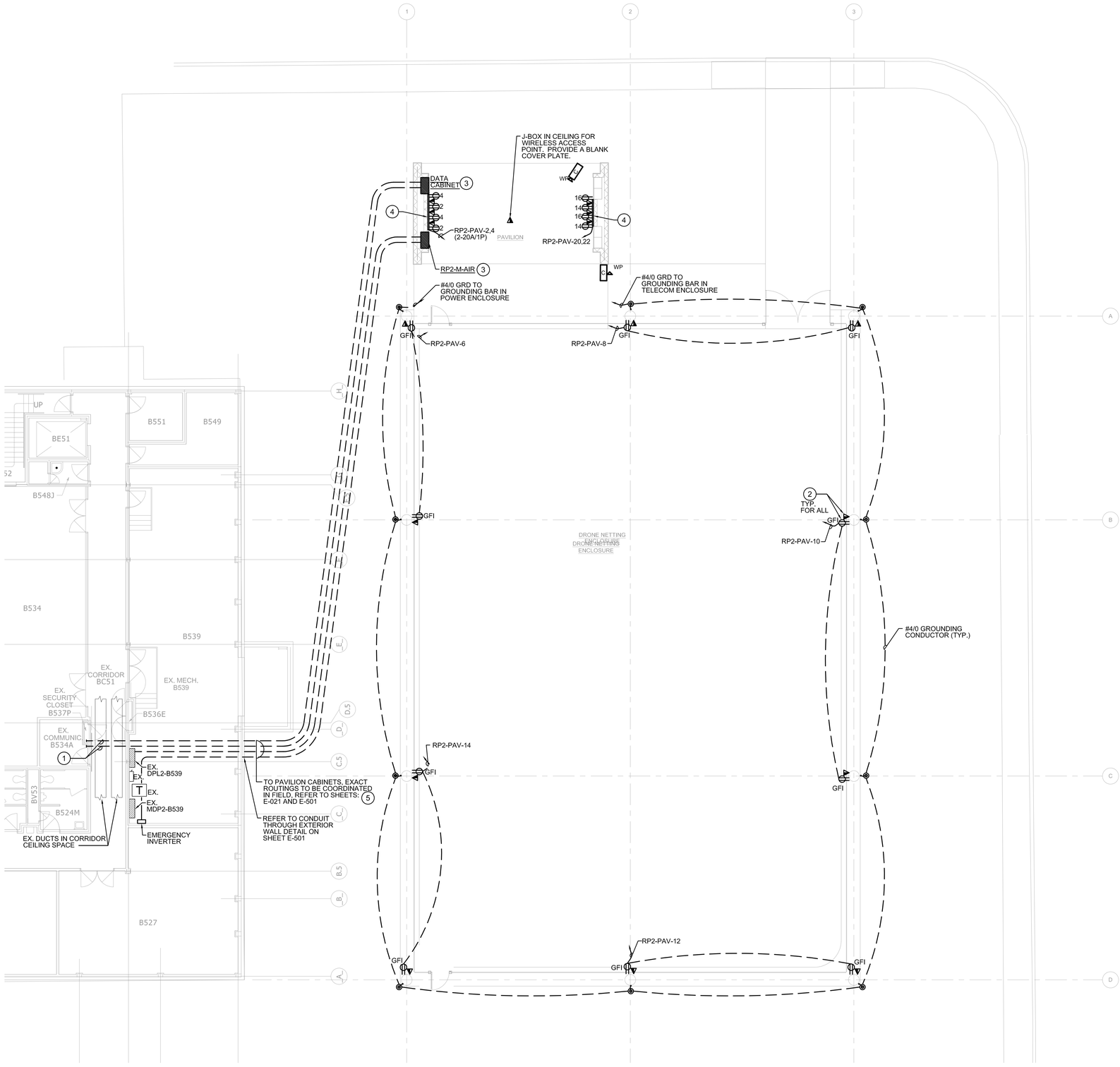
POWER GENERAL NOTES:

1. LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN. HEAVY LINE WEIGHT INDICATES NEW ELECTRICAL EQUIPMENT.
2. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR WITHIN THE RACEWAY, ALONG WITH THE PHASE CONDUCTORS FOR ALL FEEDERS AND BRANCH CIRCUITS.
3. ALL BRANCH CIRCUITS SHALL CONSIST OF A MINIMUM OF 2#12 AND 1#12 GROUND IN 3/4" CONDUIT TO A 20A-1P CIRCUIT BREAKER UNLESS OTHERWISE INDICATED.
4. PROVIDE CONDUIT BUSHINGS AND PULL STRINGS IN ALL EMPTY CONDUITS.
5. PROVIDE NEW PERMANENT MECHANICALLY FASTENED EQUIPMENT TAGS FOR BOTH NEW AND EXISTING EQUIPMENT. REFER TO SPECIFICATIONS FOR ITEMS TO BE TAGGED.
6. WHERE CONDUITS PENETRATE FIRE WALLS, THE WALLS SHALL BE SEALED TO EQUAL OR GREATER THAN THE ORIGINAL FIRE RATING OF THE WALL.
7. PROVIDE A SEPARATE DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT PHASE CONDUCTOR, UNLESS OTHERWISE INDICATED.
8. PROVIDE FIRE PROOFING FOR ALL PENETRATIONS TO MAINTAIN THE RATINGS OF THE NEW AND EXISTING ASSEMBLIES.

POWER KEY NOTES:

1. RUN NEW CONDUITS ABOVE EXISTING DUCTWORK IN CORRIDOR, COORDINATE IN FIELD EXACT ROUTING. CORRIDOR WALLS ARE 2HR FIRE RATED. REFER TO GENERAL NOTE-6 THIS SHEET.
2. PROVIDE WP TELECOMM DEVICE AND WP/GFCI DUPLEX RECEPTACLE. MOUNT DEVICES ON COLUMNS AT 36" ABOVE FINISHED GRADE ON THE EXTERIOR SIDE OF THE NET, TYPICAL FOR ALL, REFER TO DETAIL ON SHEET E-501.
3. POWER AND COMMUNICATIONS CABINETS, REFER TO DETAILS ON SHEET E-501.
4. PROVIDE TWO COMPARTMENT RACEWAY, 6" WIDE , 2 1/4" DEEP AND LENGTH AS INDICATED ON THE ARCHITECTURAL ELEVATIONS, INSTALLED FLUSH. POWER AND DATA COMPARTMENT WITH (2)-3/4"C FOR POWER TO RP2-PAV AND 2-1/2"C FOR DATA TO COMMUNICATIONS CABINET.
5. EXCAVATION FOR UNDERGROUND CONDUITS FROM SRB TO PAVILION TO BE VERIFIED FOR EXISTING UNDERGROUND SERVICES AND LANDSCAPING, COORDINATE WITH ARCHITECT.



N

ELECTRICAL POWER COMPOSITE FLOOR PLAN

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

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Electrical Power Composite Floor Plan

EP-101

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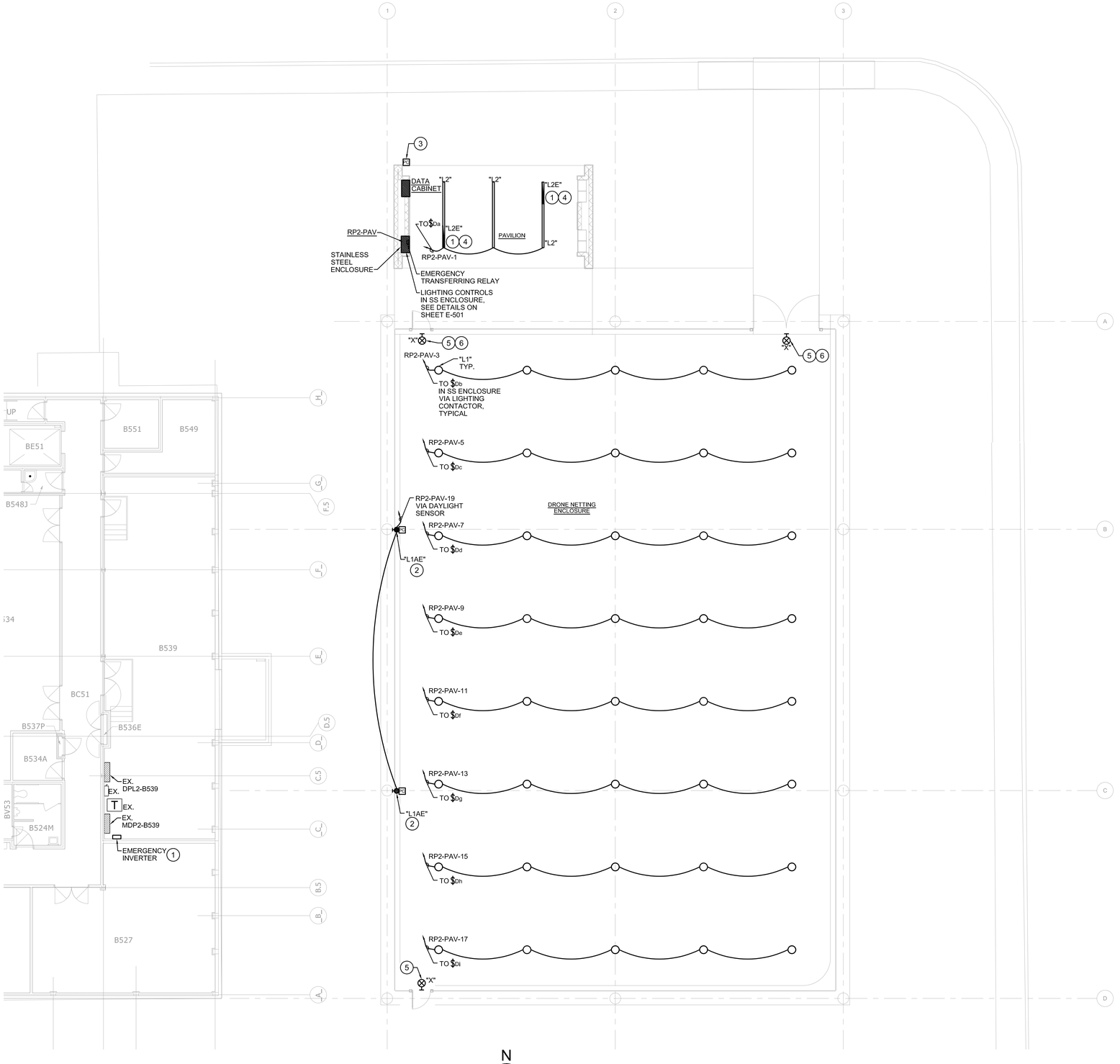
LIGHTING GENERAL NOTES:

1. LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN. HEAVY LINE WEIGHT INDICATES NEW ELECTRICAL EQUIPMENT.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS AND ELEVATIONS FOR EXACT LOCATION OF LIGHTING FIXTURES PRIOR TO INSTALLATION. COORDINATE ALL CEILING TRIMS AND MOUNTING HARDWARE WITH ARCHITECTURAL AND STRUCTURAL TRADES.
3. ALL LIGHT FIXTURES ARE TYPE 'L1' UNLESS OTHERWISE INDICATED.
6. PROVIDE FIRE PROOFING FOR ALL PENETRATIONS TO MAINTAIN THE RATINGS OF THE NEW AND EXISTING ASSEMBLIES.

LIGHTING KEY NOTES:

1. PROVIDE INVERTER FOR EMERGENCY LIGHTING FIXTURES TO OPERATE SELECTED LIGHTING FIXTURES ON LOCAL ON/OFF, DIMMING AND DAYLIGHT SENSOR CONTROL, UL 924 LISTED, DUAL VOLTAGE 120/277V INPUT/OUTPUT, 400VA, SURFACE REMOTE MOUNTING, PHILIPS BODINE ELI-S-400 OR SIMILAR BY IOTA.
2. FULLY SHADED LIGHTING FIXTURES ARE MOUNTED ON STEEL POLE AT 10'-0" AFG, WIRED TO THE EMERGENCY TRANSFERRING RELAY AND EMERGENCY INVERTER AND DAYLIGHT SENSOR CONTROL, NORMALLY OFF; ONLY TO TURN ON WHEN LOSS OF POWER AND THE DAYLIGHT SENSOR TURNS THEM ON. PROVIDE LOCK-ON HANDLE FOR BRANCH BREAKER IN RP2-PAV.
3. PROVIDE DAYLIGHT SENSOR/PHOTOCELL MOUNTED ON ROOF, AWAY FROM ARTIFICIAL LIGHTING.
4. HALF SHADED EMERGENCY LIGHTING FIXTURES TO BE WIRED TO THE TRANSFERRING RELAY, CONNECTED TO THE NORMAL POWER BRANCH CIRCUIT AND THE INVERTER OUTPUT. FIXTURES TO BE CONTROLLED AS THE NORMAL LIGHTING IN THE AREA.
5. EXIT SIGNS TO BE WIRED TO THE EMERGENCY INVERTER BRANCH CIRCUIT, CONTINUOUSLY ON, AHEAD OF LOCAL AND AUTOMATIC LIGHTING CONTROLS.
6. COORDINATE WITH ARCHITECT FOR EXACT LOCATION OF PEDESTRIAN GATE OPENING FOR EXIT SIGN.



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ELECTRICAL LIGHTING PLAN

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

LUMINAIRE SCHEDULE

NOTE 1: PROVIDE ALL MOUNTING HARDWARE FOR THE TYPE OF INSTALLATION AS REQUIRED.
NOTE 2: ALL LUMINAIRES MUST BE PURCHASED THROUGH LOCAL DISTRIBUTION HOUSE AND HAVE LOCAL MANUFACTURER REPRESENTATIVE SUPPORT.
NOTE 3: ALL LUMINAIRES SHALL BE PROVIDED WITH LAMP AND BALLAST/DRIVER AS SPECIFIED.
NOTE 4: REFER TO SPECIFICATION SECTION 265100 FOR ADDITIONAL REQUIREMENTS.

TYPE	DESCRIPTION	LAMP AND BALLAST	MAX WATTS
"L1"	LED SURFACE MOUNTED 17 1/4" DIA LIGHTING FIXTURE, OUTDOOR WET LOCATION AND LOW TEMPERATURE RATED, DIE-CAST ALUMINUM HOUSING, SEALED, CLEAR TEMPERED GLASS, HIGH OUTPUT, FLOOD DISTRIBUTION, WIRE GUARD, BLACK FINISH, 0-10V DIMMING, PROVIDE CATENARY CABLE MOUNTING SYSTEM TO SUPPORT APPROXIMATE FIXTURE WEIGHT OF 45LBS FOR EACH LIGHTING FIXTURE, COORDINATE WITH ARCHITECT AND NETTING MANUFACTURER. PROVIDE WET LOCATION POWER CORD AND NYLON STRAP CABLE TIES, BLACK FINISH. LUMENPULSE 'LUMENBEAM' #LBX-HO-120-4K-FL OR APPROVED EQUAL, MOUNTING V2 LIGHTING GROUP #CAT-BK-DM / 202-2047 / 408-0032.	4000K 10166 LUMENS	205W
"L1AE"	SAME AS TYPE "L1" EXCEPT MOUNTED ON THE STEEL POLE, MEDIUM SIZE, 7 1/4" DIA., FLOOD DISTRIBUTION, WIRE GUARD, BLACK FINISH, 28W AND WIRED TO THE EMERGENCY INVERTER, NON-DIMMING, PROVIDE SHORT YOKE, BACK PLATE AND STRAPS AROUND THE POLE FOR MOUNTING. LUMENPULSE 'LUMENBEAM MEDIUM ' #LBM-120-40K-FL-LSLH-BK-NO-SY SERIES OR APPROVED EQUAL.	4000K 1428 LUMENS	28W
"L2"	LED RECESSED MOUNTED 4" WIDTH AND 16' LONG LIGHTING FIXTURE, DAMP LOCATION AND COLD TEMPERATURE RATED, PROGRAMMABLE OUTPUT, OPAL FLUSH LENS, DIRECT DISTRIBUTION, SINGLE CIRCUIT, 120-277V INTEGRAL DIMMING DRIVER, COLD TEMPERATURE RATED. ZUMTOBEL SLOTLIGHT LED II #SLDR-4 SERIES OR APPROVED EQUAL.	4000K 850 LM/FT	19W/FT
"L2E"	SAME AS TYPE "L" EXCEPT 4FT SECTION WIRED TO THE EMERGENCY TRANSFER RELAY AND INVERTER	4000K 850 LM/FT	19W/FT
"X"	UNIVERSAL MOUNTING EXIT LIGHT, OUTDOOR WET LOCATION RATED, IMPACT RESISTANT, LOW TEMPERATURE RATED, SINGLE FACE. LITHONIA #WLTE-GY-1-R-TP OR APPROVED EQUAL.	RED LED	3W

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M-AIR Test Facility

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North Campus

Date	Issued For
12/02/2016	Schematic Design
03/28/2017	CD Review
06/19/2017	Bids
07/17/2017	Addendum No. 2
08/25/2017	Construction Set

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Suite 200
Southfield, Michigan
48033 USA

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2016-01099-000
U OF M PROJECT NO. - P00011963

Electrical Lighting Plan

EL-101

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LIGHTING GENERAL NOTES:

1. LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN. HEAVY LINE WEIGHT INDICATES NEW ELECTRICAL EQUIPMENT.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS AND ELEVATIONS FOR EXACT LOCATION OF LIGHTING FIXTURES PRIOR TO INSTALLATION. COORDINATE ALL CEILING TRIMS AND MOUNTING HARDWARE WITH ARCHITECTURAL AND STRUCTURAL TRADES.
3. ALL LIGHT FIXTURES ARE TYPE 'L1' UNLESS OTHERWISE INDICATED.
6. PROVIDE FIRE PROOFING FOR ALL PENETRATIONS TO MAINTAIN THE RATINGS OF THE NEW AND EXISTING ASSEMBLIES.

LIGHTING KEY NOTES:

1. PROVIDE INVERTER FOR EMERGENCY LIGHTING FIXTURES TO OPERATE SELECTED LIGHTING FIXTURES ON LOCAL ON/OFF, DIMMING AND DAYLIGHT SENSOR CONTROL. UL 924 LISTED, DUAL VOLTAGE 120/277V INPUT/OUTPUT, 400VA, SURFACE REMOTE MOUNTING, PHILIPS BODINE ELI-S-400 OR SIMILAR BY IOTA.
2. FULLY SHADED LIGHTING FIXTURES ARE MOUNTED ON STEEL POLE AT 10'-0" AFG. WIRED TO THE EMERGENCY TRANSFERRING RELAY AND EMERGENCY INVERTER AND DAYLIGHT SENSOR CONTROL, NORMALLY OFF; ONLY TO TURN ON WHEN LOSS OF POWER AND THE DAYLIGHT SENSOR TURNS THEM ON. PROVIDE LOCK-ON HANDLE FOR BRANCH BREAKER IN RP2-PAV.
3. PROVIDE DAYLIGHT SENSOR/PHOTOCELL MOUNTED ON ROOF, FACING NORTH, AWAY FROM ARTIFICIAL LIGHTING.
4. HALF SHADED EMERGENCY LIGHTING FIXTURES TO BE WIRED TO THE TRANSFERRING RELAY, CONNECTED TO THE NORMAL POWER BRANCH CIRCUIT AND THE INVERTER OUTPUT. FIXTURES TO BE CONTROLLED AS THE NORMAL LIGHTING IN THE AREA.
5. EXIT SIGNS TO BE WIRED TO THE EMERGENCY INVERTER BRANCH CIRCUIT, CONTINUOUSLY ON, AHEAD OF LOCAL AND AUTOMATIC LIGHTING CONTROLS.
6. COORDINATE WITH ARCHITECT FOR EXACT LOCATION OF PEDESTRIAN GATE OPENING FOR EXIT SIGN.

LUMINAIRE SCHEDULE

NOTE 1: PROVIDE ALL MOUNTING HARDWARE FOR THE TYPE OF INSTALLATION AS REQUIRED.
NOTE 2: ALL LUMINAIRES MUST BE PURCHASED THROUGH LOCAL DISTRIBUTION HOUSE AND HAVE LOCAL MANUFACTURER REPRESENTATIVE SUPPORT.
NOTE 3: ALL LUMINAIRES SHALL BE PROVIDED WITH LAMP AND BALLAST/DRIVER AS SPECIFIED.
NOTE 4: REFER TO SPECIFICATION SECTION 265100 FOR ADDITIONAL REQUIREMENTS.

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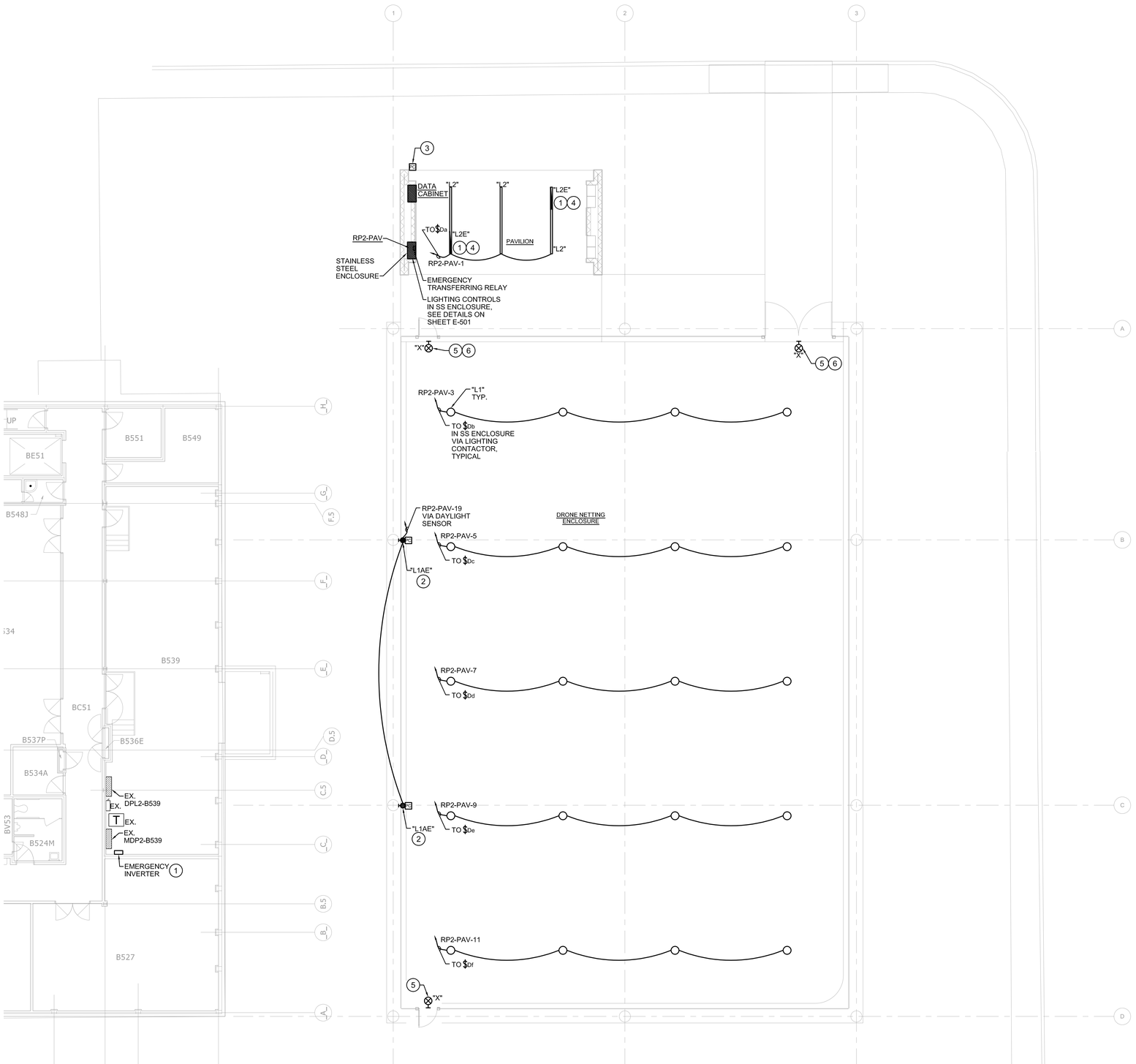

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ELECTRICAL LIGHTING PLAN - ALTERNATE #1

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

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Electrical Lighting Plan - Alternate#1

EL-102

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BENCHMARKS: GPS DERIVED – NAVD 88

BM #300:
SET "X" ON LIGHT POLE BASE, ±200' EAST OF THE NORTHEAST CORNER OF BUILDING #2455 AND ± 200' NORTH OF HAYWARD STREET.
ELEV. 897.53

BM #301:
SET "X" ON LIGHT POLE BASE, ±170 FEET NORTHEAST OF THE NORTHEAST CORNER OF BUILDING #2455 IN THE PARKING LOT NORTH OF BUILDING #2455.
ELEV. 894.69

VICINITY MAP

SITE INFORMATION:
OWNER:
SITE ADDRESS:
ZONING:

TREE LEGEND:

AP	APPLE
AS	ASPEN
B	BIRCH
BB	BURNING BUSH
BE	BOX ELDER
BC	BIRCH
CA	CRAB APPLE
CAT	CATALPA
CH	CHERRY
CS	CONIFEROUS SHRUB
CW	COTTONWOOD
D	DOGWOOD
DT	DECIDUOUS TREE
HICK	HICKORY
L	LOCUST
M	MAPLE
P	PINE
SAS	SASSAFRAS
SP	SPRUCE
SYC	SYCAMORE
W	WILLOW
WAL	WALNUT

ELECTRIC LINE
GAS MAIN
WATER MAIN
STORM LINE
SANITARY LINE
CABLE TV LINE
PHONE LINE
CHAIN LINK FENCE
WOOD FENCE
BARBED WIRE FENCE

WATER MANHOLE
FIRE HYDRANT
GATE VALVE
BEEHIVE CATCH BASIN
CURB CATCH BASIN
STORM MANHOLE
CULVERT/END SECTION
SANITARY MANHOLE
LIGHT POLE
UTILITY POLE
TELEPHONE RISER
GAS MAIN RISER

SECTION CORNER
FOUND IRON PIPE
FOUND IRON ROD
SET IRON PIPE
SET MAG NAIL
FOUND MAG NAIL
SET WOOD LATH
CONTROL POINT
MEASURED DIMENSION
RECORDED DIMENSION
SURFACE FLOW

UTILITY NOTE:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN AND FOR LOCATING ANY UTILITIES NOT SHOWN WHICH COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER SHOWN OR NOT SHOWN ON THE PLANS. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES OTHER THAN THE STRUCTURE INVENTORY SHOWN HEREON.

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STATE OF MICHIGAN — PAUL V. SCHWIMMER — No. 38343 — PROFESSIONAL LAND SURVEYOR

DATE: 10-07-2016
REVISION: –

CLIENT: UNIVERSITY OF MICHIGAN

TOPOGRAPHICAL SURVEY

COMPOSITE TOPOGRAPHICAL SURVEY
OF AN EXISTING WASHTENAW ENG.
PROJECT ON THE EAST SIDE AND NEW
TOPOGRAPHY ON THE WEST SIDE
SPACE RESEARCH BUILDING

JOB No. 10616
SHEET – OF –

SCALE: 1 INCH = 30 FEET