

2015 INTERNATIONAL FIRE CODE AND ASSOCIATED 2015 CODES TYPE OF CONSTRUCTION: **BUILDING MATERIALS:** STRUCTURE: STEEL COLUMNS AND BAR JOISTS, CMU BEARING WALLS EXTERIOR WALLS: REINF. CMU WALLS INTERIOR PARTITIONS: GYP. BD. ON METAL STUDS FIRE RESISTANCE RATINGS: TABLE 601 (2009 IBC) PRIMARY STRUCTURAL FRAME: 0 HOUR **BEARING WALLS** INTERIOR: NONBEARING WALLS AND PARTITIONS EXTERIOR: INTERIOR FLOOR CONSTRUCTION: ROOF CONSTRUCTION: FULLY SPRINKLERED S-2 - STORAGE USE GROUP: **BUILDING HEIGHT:** 20'-0" FEET ABOVE GRADE UNLIMITED (IBC 507.2)

> SECTION 1016 (2009 IBC) 175 FEET APPROX. (200 FEET ALLOWED) MAX. DEAD-END OF STORAGE AREAS = 75 FT SEE GENERAL NOTES ON SHEET G102 307 INTEGRAM DRIVE PACIFIC, MO 63069

BEN MCINTOSH - (214) 399-8990 VERVE DESIGN STUDIO 1558 S. BROADWAY

> WWW.VERVEDS.COM CONTACT: KURT KRUEGER/GEOFF CROWLEY CIVIL & ENVIRONMENTAL CONSULTANTS INC 3000 LITTLE HILLS EXPRESSWAY #102

ST CHARLES, MO 63301 (314) 656 - 4566 WWW.CECINC.COM CONTACT: PATRICK BENNETT CASE ENGINEERING

796 MERUS CT ST LOUIS, MO 63026 (636) 349 - 1600 WWW.CASEENGINEERINGINC.COM CONTACT: CONNER STEPHENS

PKM ENGINEERING 830 NYKIEL CT BALLWIN, MO 63011 (314) 568 - 3361

GENERAL CONDITIONS: NEW CONSTRUCTION 1. THE G.C. SHALL OBSERVE ALL REGULATIONS IMPOSED BY THE APPROPRIATE GOVERNING BODIES, & ALL WORK SHALL COMPLY W/ THE REQUIREMENTS OF THE BUILDING CODES, ACCIDENT & FIRE PREVENTION REGULATION COMPLIANCE: ALL MATERIALS, EQUIPMENT, WORKMANSHIP, WORKING CONDITIONS, & CONSTRUCTION METHODS SHALL COMPLY W/ THE LATEST APPLICABLE SECTIONS OF LOCAL, MUNICIPAL, COUNTY, STATE, & FEDERAL CODES, ORDINANCES, & THE STANDARD REQUIREMENTS OF THE BLDG. CODE, ADA, & /OR

G.C. TO VERIFY ALL DIMENSIONS & CONDITIONS PRIOR TO STARTING ANY CONSTRUCTION. NOTIFY THE ARCHITECT OF ANY DISCREPANCIES OR INCONSISTENCIES AT THE BLDG. SITE. G.C. TO VERIFY ALL EXIST. CONDITIONS SHOWN ON DRAWINGS & CONSTRUCT ALL NEW WORK IN A NEAT & APPROVED MANNER. ESTABLISH & VERIFY ALL OPENINGS & INSERTS FOR MECHANICAL &

PROVIDE ALL NECESSARY TEMPORARY BRACING, SHORING, GUYING, OR OTHER MEANS TO AVOID EXCESSIVE STRESSES & TO HOLD STRUCTURAL ELEMENTS IN PLACE. THE G.C. IS RESPONSIBLE FOR SAFETY & SECURITY IN & AROUND THE JOB

SITE DURING CONSTRUCTION. THE A.I.A. GENERAL CONDITIONS (FORM A-201 LATEST ISSUE) SHALL GOVERN & BE PART OF THIS PROJECT. THE G.C. SHALL SUBMIT FOR , PAY, & SECURE ALL APPROVALS, BLDG. PERMITS, FIRE PERMITS, TEST, & CERTIFICATES OF COMPLIANCE & OCCUPANCY.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RUBBISH SWEPT UP & REMOVED. UPON COMPLETION OF WORK, HE SHALL LEAVE WORK IN A IT WILL BE THE DUTY OF THE CONTRACTOR, AS WELL AS THE SUBCONTRACTORS EMPLOYED, TO COMMUNICATE IMMEDIATELY W/ EACH OTHER IN ORDER TO SCHEDULE WORK, STORAGE AREAS, ETC. IN A MANNER & WITH IN THE TIME SPECIFIED. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO OWNER'S

THROUGH NEGLIGENCE. 13. NOTE: ALL UTILITIES & STRUCTURES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION & THEIR LOCATION MUST BE CONSIDERED COMPANIES BEFORE ACTUAL CONSTRUCTION.,

14. MECH., ELECTRICAL, PLUMBING, & SPRINKLER CONTRACTORS SHALL FURNISH ALL NECESSARY (SEALED) DRAWINGS & CALCULATIONS. ISOMETRIC DRAWINGS, SHOWING EXACT &/OR PROPOSED LOCATIONS OF SOIL, WASTE, VENT PIPING, DRAINAGE SYSTEM, WATER LINES, GAS PIPING, WATER HEATER, HVAC, ELEC. SERVICE RISERS, METERS, & LIGHT FIXTURES.

15. ALL ARCHITECTURAL DRAWINGS ARE IN CONFIDENCE OR DISSEMINATION MAY NOT BE MADE WITH OUT PRIOR WRITTEN CONSENT OF THE ARCHITECT. ALL COMMON LAW RIGHTS OF COPYRIGHTS & OTHERWISE ARE HEREBY SPECIFICALLY RESERVED. THE G.C. IS RESPONSIBLE FOR ERECTING & MAINTAINING A JOB SIGN

PROVIDED BY VERVE DESIGN STUDIO. LOCATE IN A PROMINENT LOCATION ON THE JOB SITE DURING CONSTRUCTION. UPON COMPLETION OF THE PROJECT THE SIGN SHALL BE RETURNED TO THE ARCHITECT.

ST. LOUIS, MISSOURI 63104 314-822-4007 www.VERVEDS.com STATE OF MISSOURI CERTIFICATE OF AUTHORITY # A-2013038641 0 HOUR 0 HOUR 0 HOUR 0-HOUR **KURTIS ROY KRUEGER NUMBER A - 6259** I hereby specify, pursuant to RSMo 327.411 this drawing sheet is authenticated by my sec

DA		307 Pac
Projec	t Status	
MARK	DATE	DESCRIPTION
		E A COMPLETE SET DESED

THIS SHEET IS PART OF A COMPLETE SET. REFER TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

**VERVE PROJECT NO.:** Nov 18, 2020 ISSUE DATE:

SHEET NO.

DRAWING INDEX PROJECT DATA SYMBOLS AND ABBREVIATIONS DEVELOPMENT/BUILDING NAME DAP PRODUCTS INC CODE SUMMARY, LIFE SAFETY DAP IXOL + STORAGE 307 INTEGRAM DR PACIFIC, MO 63069 EXISTING CONDITIONS/DEMOLITION PLAN SITE / UTILITY PLAN PROJECT DESCRIPTION: NEW BUILDING FOR EXISTING OWNER SITE / UTILITY PLAN **GRADING PLAN** MUNICIPALITY: CITY OF PACIFIC & PACIFIC FIRE DEPT GRADING PLAN 2009 INTERNATIONAL BUILDING CODE DETAILS 2009 INTERNATIONAL RESIDENTIAL CODE EXISTING DRAINAGE AREA MAP 307 INTEGRAM DR. 2009 INTERNATIONAL EXISTING BUILDING CODE PROPOSED DRAINAGE AREA MAP 2009 INTERNATIONAL MECHANICAL CODE 2009 UNIFORM PLUMBING CODE 2008 NATIONAL ELECTRIC CODE **GENERAL NOTES** 2009 INTERNATIONAL PROPERTY MAINTENANCE CODE GENERAL NOTES AND SCHEDULES PACIFIC, MO 63069 2009 INTERNATIONAL ENERGY CODE TYPICAL DETAILS 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN TYPICAL DETAILS TYPICAL DETAILS MUNICIPALITY: PACIFIC FIRE DEPT. 2015 INTERNATIONAL BUILDING CODE SECTIONS **ARCHITECTURAL SITE** FLOOR PLAN **ROOF PLAN & DETAILS EXTERIOR ELEVATIONS** BUILDING SECTIONS WALL SECTIONS PARTITION TYPES & DETAILS SYMBOLS LEGEND DISCLAIMER OF RESPONSIBILITY ABBREVIATIONS AND SCHEDULES MECHANICAL PLAN WE SPECIFY (PURSUANT TO APPLICABLE STATE REGULATIONS) THAT DRAWINGS EXISTING WALL - TO REMAIN MECHANICAL PIPING - SCHEMATIC AUTHENTICATED BY OUR ORIGINAL SIGNATURE AND SEAL ARE LIMITED TO THE MECHANICAL SPECIFICATIONS ARCHITECTURAL CONSTRUCTION DOCUMENTS & THAT THESE DRAWINGS HAVE BEEN EXISTING WALL - TO BE REMOVED PREPARED BY OR UNDER OUR DIRECT SUPERVISION. WE THEREFORE DISCLAIM ANY (OR GENERAL DEMOLITION WORK) RESPONSIBILITY FOR ALL OTHER PLANS, DRAWINGS, SPECIFICATIONS, ESTIMATES, PLUMBING COVER REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY ONE OF THE PLUMBING PLAN NEW WALL CONSTRUCTION DESIGN PROFESSIONALS LISTED BELOW, RELATED TO OR INTENDED TO BE USED FOR PLUMBING SPECIFICATIONS ANY PART OR PARTS OF THE PROJECT TO WHICH THESE DRAWINGS REFER. FIRE PROTECTION LEGENDS AND NOTES VERVE DESIGN STUDIO: FIRE PROTECTION PLAN KURTIS R. KRUEGER, PRINCIPAL ARCHITECT **NEW DOOR & FRAME** FIRE PROTECTION DETAILS GEOFFREY L. CROWLEY, PRINCIPAL ARCHITECT ELECTRICAL POWER AND LIGHTING PLANS ELECTRICAL SYMBOLS, ABBREVIATIONS, DIAGRAMS ELECTRICAL POWER AND LIGHTING PLANS PHOTOMETRIC LAYOUTS **EXISTING DOOR & FRAME ELECTRICAL PANELBOARD SCHEDULES** 9,600 S.F. (APPROXIMATE) **ELECTRICAL SPECIFICATIONS** TABLE 1004.1.1 (2009 IBC) 20 OCCUPANTS 2x2 FLUORESCENT LIGHT FIXTURE SECTION 1015.1 (2009 IBC) NO. OF EXITS: 1 REQUIRED, 2 PROVIDED 2x2 FLUORESCENT LIGHT **EXIT ACCESS TRAVEL DISTANCE:** FIXTURE W/ PARABOLIC LENS 2x4 FLUORESCENT LIGHT FIXTURE **ALARM NOTES** MECHANICAL NOTES DESIGN BUILD CONTRACTOR TO REWORK AND MODIFY ALARM SYSTEM AS 2x4 FLUORESCENT LIGHT FIXTURE REFER TO MECHANICAL DRAWINGS REQ'D BY LOCAL AUTHORITIES INCLUDING ENGINEERING & PERMITTING. W/ PARABOLIC LENS DESIGN BUILD ALARM CONTRACTOR TO INSTALL/EXTEND/REWORK EXIST. ALARM SYSTEM AS REQ'D BY ALL LOCAL BLDG. CODES AND PER NFPA72. VERIFY EXIST. CONDITIONS & REQUIREMENTS W/ LOCAL BLDG. OFFICIALS & SURFACE MOUNTED FLUORESCENT LIGHT FIXTURE (SIZE VARIES) ST. LOUIS, MO 63104 DESIGN BUILD ALARM CONTRACTOR TO OBTAIN ALL REQ'D PERMITS. (314) 822 - 4007 INDICATE ON DRAWINGS FOR LOCAL BLDG. OFFICIALS & FIRE MARSHAL THE PLUMBING NOTES LINEAR TRACK LIGHT EXIST. AND PROPOSED LOCATIONS OF PULL STATIONS AND HORNS/STROBES REFER TO PLUMBING DRAWINGS RECESSED CAN LIGHT FIXTURE (DOWN LIGHT) W/ RINGS & BAFFLES AS REQ'D CIVIL ENGINEER: FIRE EXTINGUISHER NOTES PENDANT OR SURFACE MOUNTED LIGHT FIXTURE GENERAL CONTRACTOR TO PROVIDE & INSTALL BLDG. STANDARD FIRE EXIT LIGHT W/ 90 MIN. BATTERY PACK EXTINGUISHERS THROUGH OUT THE SPACES PER ALL LOCAL CODE (CEILING OR WALL MOUNTED) REQUIREMENTS & THE LOCAL FIRE MARSHAL. SECT. 906 IFC MAXIMUM SPACING (25', 50', 75', 100') O.C. ALLOWED EMERGENCY LIGHT STRUCTURAL ENGINEER: W/ 90 MIN. BATTERY PACK EMERGENCY / EXIT LIGHT COMBO W/ 90 MIN. BATTERY PACK FIRE PROTECTION NOTES **ELECTRICAL NOTES** M.E.P./FP ENGINEER: DESIGN BUILD CONTRACTOR TO ENGINEER, PERMIT, REWORK & MODIFY REFER TO ELECTRICAL DRAWINGS SPEAKER (CEILING OR WALL MOUNT) EXIST. SPRINKLER HEADS & LOCATIONS AS REQ'D BY LOCAL CODES FOR PROPOSED ARCHITECTURAL MODIFICATIONS. FIELD VERIFY ALL EXISTING EXHAUST FAN (VENTED TO EXTERIOR) WWW.PKMENGG.COM CONTACT: PROMOD KUMAR SUPPLY AIR GRILLE (SIZE VARIES) RETURN AIR GRILLE (SIZE VARIES) SPRINKLER HEAD ALSO DENOTED BY 100 SERIES NUMBER\$ SMOKE DETECTOR ALSO DENOTED BY 200 SERIES NUMBER\$ CEILING FAN W/ LIGHT **THERMOSTAT** ELECTRICAL WORK AS REQ'D FOR THEIR INSTALLATION & PER DRAWINGS. DUPLEX OUTLET QUADPLEX OUTLET **GFI OUTLET** DEDICATED OUTLET THE DIMENSIONS ON THESE DRAWINGS IN ALL CASES SUPERSEDE SCALE. DUPLEX FLOOR OUTLET (FLUSH) CONTRACTOR IS NOT TO SCALE DRAWINGS. SWITCH - THREE-WAY SWITCH - DIMMER

MATERIALS LEGEND EARTH COMPACTED WOOD BLOCKING & FRAMING **GRANULAR FILL** SHIM BLOCKING FINISH WOOD CONCRETE CONCRETE MASONRY UNITS PLYWOOD GYPSUM BOARD - PLASTER CAST STONE GLASS RIGID INSULATION (XXXX)**BATT INSULATION** 

OUTLET - TELEPHONE (F=FAX, W=WALL, NO

OUTLET - DATA (# INDICATES # OF HOMERUN

LETTER INDICATES TYP. TELEPHONE @ 48"

DROPS HOMERUN TO DATA CLOSET)

HOMERUN DROPS TO DATA CLOSET)

OUTLET - TELE/DATA (# INDICATES # OF

A.F.F. UNO

OUTLET - CATV

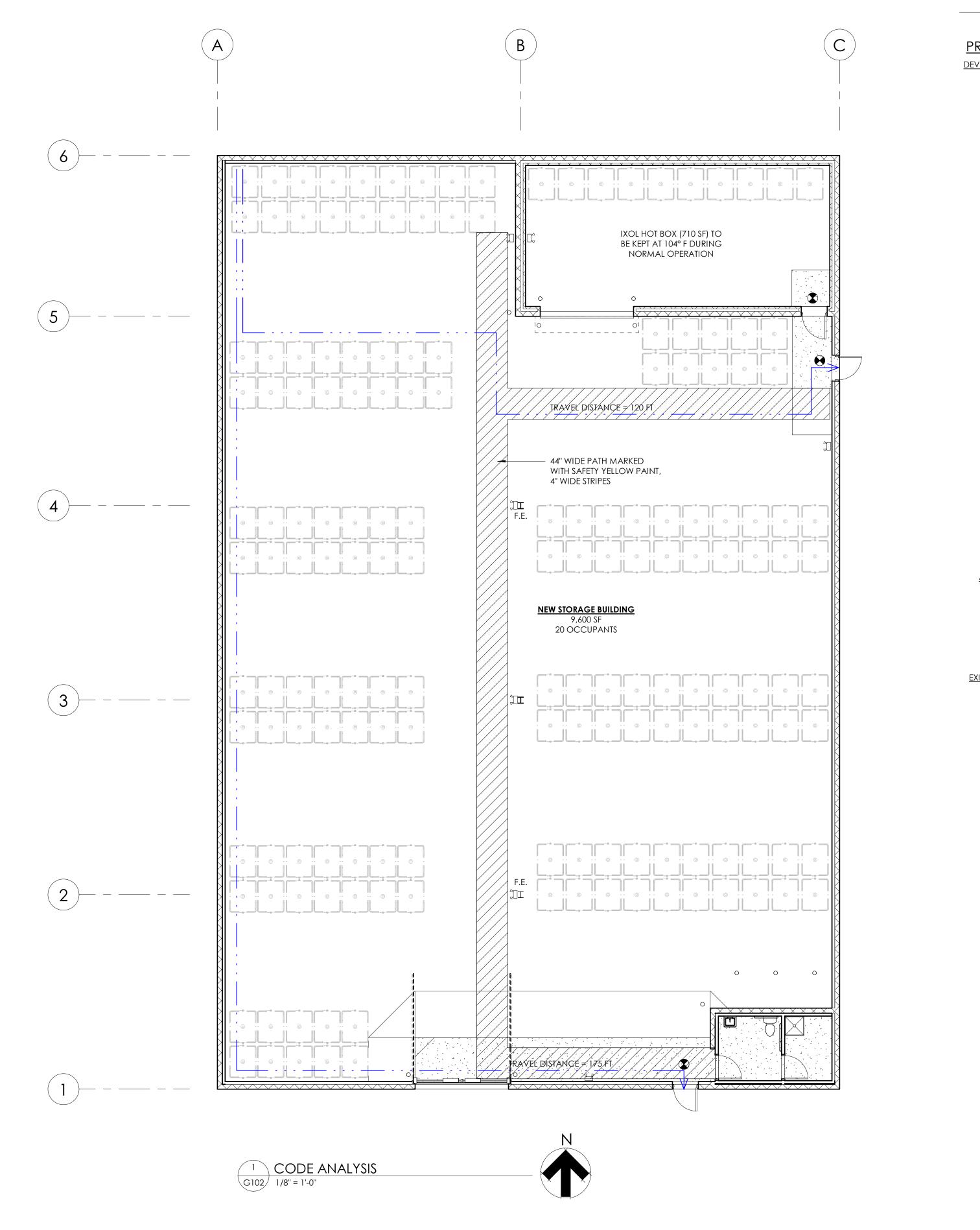
FLOOR DRAIN

EXISTING

RELOCATED

OR OTHERS PROPERTY DONE BY HIM OR MEN IN HIS EMPLOY, OR

SYMBOLS AND ABBREVIATIONS



CODE ANALYSIS NOTES:
1. THE BUILDING HAS BEEN DESIGNED TO MEET THE MOST STRINGENT OF THE CODES ADOPTED BY THE AHJ,

- BUILDING OFFICIALS AND FIRE DISTRICT.

  THE MAIN STORAGE SPACE HAS BEEN ANALYZED AS A SEMI-HEATED SPACE PER ASHRAE 90.1-2007 AND THE
- BUILDING ENVELOPE REQUIREMENTS SET FORTH BY THAT CODE

  A. THE IXOL HOT BOX HAS BEEN DESIGNED TO MEET 2015 IECC ENVELOPE REQUIREMENTS

  CLOSED CELL SPRAY INSUL CREATES AN AIR BARRIER AT THE EXTERIOR CMU WALLS.
- NONE OF THE CHEMICALS STORED WITHIN THIS SPACE ARE TO BE REACTIVE WITH OTHER ITEMS STORED WITHIN THE SPACE TO CREATE A FIRE HAZARD
- 5. NONE OF THE ITEMS STORED WITHIN THIS SPACE ARE TO CREATE A HIGH-HAZARD OCCUPANCY
  6. PROVIDE 15 LBS TYPE ABC FIRE EXTINGUISHERS WITHIN 75 FT TRAVEL DISTANCE FROM ALL PARTS OF THE BUILDING.

  PRACE TO AND SIGNACE AT TWO OF THE INTERPORT STEEL COLUMNIS SHOULD COVER THE AREA.
- BRACKETS AND SIGNAGE AT TWO OF THE INTERIOR STEEL COLUMNS SHOULD COVER THE AREA.

  7. REFER TO ELECTRICAL DRAWINGS FOR LOCATIONS OF EMERGENCY LIGHTING.

PROJECT DATA DEVELOPMENT/BUILDING NAME: DAP PRODUCTS INC. 307 INTEGRAM DR PACIFIC, MO 63069 PROJECT NAME: PROJECT DESCRIPTION: NEW BUILDING FOR EXISTING OWNER MUNICIPALITY: CITY OF PACIFIC & PACIFIC FIRE DEPT. 2009 INTERNATIONAL BUILDING CODE 2009 INTERNATIONAL RESIDENTIAL CODE 2009 INTERNATIONAL EXISTING BUILDING CODE 2009 INTERNATIONAL MECHANICAL CODE 2009 UNIFORM PLUMBING CODE 2008 NATIONAL ELECTRIC CODE 2009 INTERNATIONAL PROPERTY MAINTENANCE CODE 2009 INTERNATIONAL ENERGY CODE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN MUNICIPALITY: PACIFIC FIRE DEPT. 2015 INTERNATIONAL BUILDING CODE 2015 INTERNATIONAL FIRE CODE AND ASSOCIATED 2015 CODES TYPE OF CONSTRUCTION: **BUILDING MATERIALS:** STRUCTURE: STEEL COLUMNS AND BAR JOISTS, CMU BEARING WALLS EXTERIOR WALLS: REINF. CMU WALLS INTERIOR PARTITIONS: GYP. BD. ON METAL STUDS FIRE RESISTANCE RATINGS: TABLE 601 (2009 IBC) PRIMARY STRUCTURAL FRAME: 0 HOUR BEARING WALLS EXTERIOR: 2 HOUR 0 HOUR INTERIOR: NONBEARING WALLS AND PARTITIONS EXTERIOR: 0 HOUR INTERIOR 0 HOUR FLOOR CONSTRUCTION: 0-HOUR ROOF CONSTRUCTION: 0-HOUR FIRE PROTECTION: FULLY SPRINKLERED **USE GROUP:** S-2 - STORAGE **BUILDING HEIGHT:** 20'-0" FEET ABOVE GRADE ALLOWABLE BUILDING AREA: UNLIMITED (IBC 507.2) TOTAL BUILDING AREA: 9,600 S.F. (APPROXIMATE) TABLE 1004.1.1 (2009 IBC) OCCUPANT LOAD: 20 OCCUPANTS SECTION 1015.1 (2009 IBC) 1 REQUIRED, 2 PROVIDED EXIT ACCESS TRAVEL DISTANCE: SECTION 1016 (2009 IBC) 175 FEET APPROX. (200 FEET ALLOWED) MAX. DEAD-END OF STORAGE AREAS = 75 FT CODE CLARIFICATIONS: SEE GENERAL NOTES ON SHEET G102

307 INTEGRAM DRIVE PACIFIC, MO 63069

VERVE DESIGN STUDIO

1558 S. BROADWAY ST. LOUIS, MO 63104 (314) 822 - 4007 WWW.VERVEDS.COM

BEN MCINTOSH - (214) 399-8990

ARCHITECT:

1 HR RATED PARTITION
2 HR RATED PARTITION
COMMON PATH OF TRAVEL (75' MAX)

CONTACT: KURT KRUEGER/GEOFF CROWLEY

EXIT TRAVEL DISTANCE PATH (200' MAX)
DEAD END CORRIDOR PATH (20' MAX)

EXIT LIGHT- SHADED REPRESENTS LIT
EXIT SIGN FACE

ARROW REPRESENTS DIRECTION
OF EXIT PATH

EMERGENCY LIGHT W/ 1HR BATTERY PACK

EMERGENCY / EXIT LIGHT COMBO W/ 1HR BATTERY PACK 307 Integram Drive
Pacific, Missouri 63069

1558 S. BROADWAY

ST. LOUIS, MISSOURI 63104 314-822-4007

www.VERVEDS.com
STATE OF MISSOURI CERTIFICATE

OF AUTHORITY # A-2013038641

KURTIS ROY KRUEGER NUMBER A - 6259

I hereby specify, pursuant to RSMo 327.411, this drawing sheet is authenticated by my seal

Projec	ct Status	
MARK	DATE	DESCRIPTION

THIS SHEET IS PART OF A COMPLETE SET. REFER TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

ISSUE DATE: Nov 18, 2020

**SHEET NAME:**CODE SUMMARY, LIFE SAFETY

SHEET NO. **G102** 

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# DESIGN LOADS

**DESIGN LOADS ROOF LIVE LOAD ROOF DEAD LOAD:** SNOW LOAD DESIGN CRITERIA SNOW LOAD IMPORTANCE FACTOR, I: GROUND SNOW LOAD, Pg: 20 psf FLAT ROOF SNOW LOAD. Pf: 13 psf THERMAL FACTOR, Ct: EXPOSURE FACTOR, Ce 0.9 2'-6" MINIMUM FROST DEPTH WIND LOAD DESIGN CRITERIA WIND IMPORTANCE FACTOR, I: **BASIC WIND SPEED:** WIND EXPOSURE CATEGORY: WIND ENCLOSURE CLASSIFICATION

90 MPH (3 SEC GUST) **ENCLOSED** +/- 0.18 POSITIVE WIND ROOF PRESSURES (ASD VALUES) - ZONE 1 - ZONE 2 & 3 NET UPLIFT VALUES (ASD VALUES): - ZONE 1

- ZONE 2 -20.8 psf - ZONE 3 -20.8 psf - 'a' DIMENSION 8 ft 4. SEISMIC LOAD DESIGN CRITERIA SEISMIC IMPORTANCE FACTOR. SITE CLASS:

SPECTRAL RESPONSE ACCELERATION: Ss=0.488g, S1=0.18g SPECTRAL RESPONSE COEFFICIENTS: Sds=0.39g, Sd1=0.194g SEISMIC DESIGN CATEGORY: BASIC SEISMIC-FORCE RESISTING SYSTEM: ORDINARY REINF. MASONRY SHEAR WALLS RESPONSE MODIFICATION FACTOR, R: SYSTEM OVER-STRENGTH FACTOR, OMEGAo:

DEFLECTION AMPLIFICATION FACTOR, Cd: SEISMIC RESPONSE COEFFICIENT. Cs: 0.195 ANALYSIS PROCEDURE USED: **EQUIVALENT LATERAL FORCE** 

## SHOP DRAWING AND SUBMITTAL NOTES

- 1. SHOP DRAWINGS AND/OR SUBMITTALS SHALL BE FURNISHED FOR ALL STRUCTURAL COMPONENTS. UNLESS OTHERWISE NOTED. THESE SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION IN ACCORDANCE WITH THESE CONTRACT DRAWINGS, AND PROJECT SPECIFICATIONS (IF APPLICABLE). CONTRACTOR SHALL ALLOW A MINIMUM OF 2 WEEKS FROM RECEIPT OF SHOP DRAWINGS FOR CASE ENGINEERING INC. TO
- PRIOR TO SUBMITTAL TO THE ENGINEER, THE CONTRACTOR AND ARCHITECT SHALL HAVE REVIEWED THE SHOP DRAWINGS AND MADE ANY CORRECTIONS REQUIRED. THE CONTRACTOR AND ARCHITECT SHALL STAMP AND SIGN THE DRAWINGS, INDICATING THE SUBMITTAL HAS BEEN REVIEWED.
- STRUCTURAL DRAWINGS ARE THE SOLE PROPERTY OF CASE ENGINEERING. REPRODUCTION OF STRUCTURAL DRAWINGS FOR USE IN SHOP DRAWING SUBMITTALS IS NOT ACCEPTABLE WITHOUT OUR WRITTEN AGREEMENT.

#### **GENERAL STRUCTURAL NOTES**

- THIS DRAWING SET IS TO BE VIEWED AS A WHOLE AND COORDINATED WITH ARCHITECTURAL, MECHANICAL, CIVIL, AND OTHER DISCIPLINES. ALL WORK PERTAINING TO A SPECIFIC CONTRACTOR MAY OR MAY NOT BE SHOWN ON SPECIFIC DRAWING SECTIONS. IT IS EACH SUBCONTRACTOR'S RESPONSIBILITY TO PREPARE HIS BID FROM A COMPLETE SET OF PLANS
- THE CONTRACTOR SHALL FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE DRAWINGS. DIMENSIONS NOT SHOWN ON PLAN TO BE COORDINATED WITH ARCHITECTURAL PLANS
- ALL DETAILS AND SECTIONS SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY AT ANY SIMILAR SITUATION ELSEWHERE ON THE JOB, EXCEPT WHERE A DIFFERENT DETAIL OR SECTION IS
- THE STRUCTURE SHALL BE ADEQUATELY BRACED AND SHORED DURING ERECTION AGAINST WIND AND
- ERECTION LOADS. STRUCTURAL MEMBERS ARE DESIGNED FOR "IN-PLACE" LOADS ONLY THE GENERAL CONTRACTOR SHALL VERIFY ALL OPENING SIZES, PAD SIZES, AND LOCATIONS WITH THE RESPECTIVE CONTRACTORS
- THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER IMMEDIATELY OF ANY DISCREPANCIES BETWEEN CONSTRUCTION DOCUMENTS AND ACTUAL FIELD CONDITIONS.
- THE VARIOUS SUBCONTRACTORS ARE RESPONSIBLE FOR PLACING SLEEVES, OUTLET BOXES, ANCHORS, VENT OPENINGS, ETC. THAT MAY BE REQUIRED IN FOUNDATION WALLS. CONSTRUCTION MANAGER SHALL COORDINATE ALL PLACEMENT OF ITEMS IN FOUNDATION WALLS
- ALL ELEVATIONS GIVEN ARE REFERENCED TO FINISHED FLOOR ELEVATIONS AT 100'-0", UNLESS SHOWN AS USGS ELEVATIONS.
- 10. WHERE GENERAL NOTES OR TYPICAL DETAILS CONTRADICT INFORMATION PROVIDED IN BUILDING SECTIONS, THE BUILDING SECTIONS TAKE PRECEDENCE

SEE ARCHITECTURAL PLANS FOR ADDITIONAL DETAILS AND INFORMATION.

- 11. ALL HOLES THROUGH CONSTRUCTION SHALL BE CORE DRILLED OR SAWCUT 12. WHERE INFORMATION PROVIDED IN THESE STRUCTURAL DRAWINGS CONTRADICTS INFORMATION PROVIDED IN PROJECT SPECIFICATIONS, THE SPECIFICATIONS SHALL TAKE PRECEDENCE.
- FOR ARCHITECTURAL, MEP, & STRUCTURAL COORDINATION: MODELED ELEMENTS SHOWN ON STRUCTURAL DRAWINGS SUCH AS TRUSSES, OPEN-WEB JOISTS, AND JOIST GIRDERS, ARE NOT THE FINAL CONFIGURATION. ALL COORDINATION SHALL BE PERFORMED BETWEEN THE VARIOUS TRADES AND THE
- SUPPLIERS OF THESE ELEMENTS ON THE STRUCTURE, NOT WITH THE STRUCTURAL MODEL 14. THIS DRAWING SET IS TO BE VIEWED AS A WHOLE. ALL TYPICAL DETAILS AND GENERAL NOTES SHOWN IN THESE DRAWINGS ARE APPLICABLE TO THE PROJECT EVEN IF THEY ARE NOT SHOWN ON PLANS OR SECTIONS.

#### DEFERRED SUBMITTALS

THE FOLLOWING DESIGN ELEMENTS MUST BE SIGNED & SEALED BY A PROFESSIONAL ENGINEER (PE/SE) REGISTERED IN THE STATE WHERE THIS PROJECT IS LOCATED, AND SUBMITTED TO THE ENGINEER OF RECORD. DESIGNED DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED FOR REVIEW AND RECORD STRUCTURAL STEEL CONNECTION CALCULATIONS AND SHOP FABRICATION DRAWINGS FOR CONNECTIONS. STEEL JOIST CALCULATIONS AND FABRICATION DRAWINGS (INCLUDING ACCESSORIES)

#### SPECIAL INSPECTIONS

- REFER TO THE SPECIAL INSPECTION TABLES FOR THE LIST OF ELEMENTS OF CONSTRUCTION THAT SHALL REQUIRE SPECIAL INSPECTION. THIS SHALL BE CONSIDERED A GUIDE, AND THE CONTRACTOR AND INSPECTOR SHALL REFER TO THE IBC FOR COMPLETE REQUIREMENTS, QUALIFICATIONS, EXCEPTIONS, AND SUBMITTALS. REFER TO IBC SECTION 1704 FOR 2003-2009 CODES, AND SECTION 1705 FOR 2012-2015 CODES. THE OWNER SHALL BE RESPONSIBLE FOR EMPLOYING THE SPECIAL INSPECTION AGENCY. ANY "OBSERVATIONS" BY THE EOR WILL NOT BE TO PERFORM SPECIAL INSPECTIONS AND SHALL NOT BE INTERPRETED AS SUCH.
- COPIES OF ALL INSPECTION REPORTS THAT REPORT COMPLIANCE SHALL BE SUBMITTED TO THE ARCHITECT OF RECORD, STRUCTURAL ENGINEER OF RECORD, AND BUILDING INSPECTOR WITHIN 7 CALENDAR DAYS OF COMPLETION OF THAT PORTION OF WORK. A MINIMUM OF ONE (1) PROGRESS REPORT PER MONTH FOR EACH TYPE OF CONSTRUCTION REQUIRING SPECIAL INSPECTION SHALL BE SUBMITTED TO THE STRUCTUAL ENGINEER OF RECORD.
- SPECIAL INSPECTOR SHALL INFORM ENGINEER OF RECORD IMMEDIATELY OF NON-COMPLIANCE WITH CONSTRUCTION DOCUMENTS OR APPROVED SUBMITTALS. CONTACT ENGINEER OF RECORD THE SAME DAY NON-COMPLIANCE IS DISCOVERED AND FOLLOW UP WITH AN OFFICIAL REPORT WITHIN 2 BUSINESS DAYS. THE SPECIAL INSPECTIONS IDENTIFIED ON THE PLANS ARE IN ADDITION TO, AND NOT A SUBSTITUTE FOR,
- THOSE INSPECTIONS REQUIRED TO BE PERFORMED BY A BUILDING INSPECTOR SPECIAL INSPECTIONS ARE NOTED AS EITHER "CONTINUOUS" OR "PERIODIC". A "CONTINUOUS" INSPECTION REQUIRES THE PRESENCE OF A QUALIFIED INSPECTOR IN THE VICINITY OF THE WORK BEING PERFORMED FOR 100% OF THAT WORK. A "PERIODIC" INSPECTION REQUIRES PART-TIME OBSERVATION OF THE WORK BEING PERFORMED. THE INSPECTOR SHALL ALSO OBSERVE THE FINAL CONDITION OF THE WORK BEFORE IT
- IS CLOSED FROM VIEW. WHEN WORK IN MORE THAN ONE CATEGORY OF WORK REQUIRING SPECIAL INSPECTION IS TO BE PERFORMED SIMULTANEOUSLY, OR THE GEOGRAPHIC LOCATION OF THE WORK IS SUCH THAT IT CANNOT BE CONTINUOUSLY OBSERVED, IT SHALL BE THE RESPONSIBILITY OF THE AGENT TO EMPLOY A SUFFICIENT NUMBER OF SPECIAL INSPECTORS TO ASSURE THAT ALL WORK IS CONTINUOUSLY INSPECTED IN ACCORDANCE WITH THOSE PROVISIONS.

## **EXCAVATION AND EARTHWORK NOTES**

- THE BEARING VALUE AND LATERAL EARTH PRESSURES OF THE SOILS IS PER REPORT BY: TERRACON, DATED JULY 23, 2020. THE FOUNDATION DESIGN IS BASED ON THE FOLLOWING NET ALLOWABLE BEARING AND LATERAL EARTH PRESSURES:
- SPREAD FOOTINGS CONT. WALL FOOTINGS 2,500 psf PASSIVE PRESSURE
- 250psf/ft 0.3 FRICTION COEFFICIENT WATER LEVELS INDICATED ON THE BORING LOGS MAY BE SUBJECT TO SEASONAL AND/OR ANNUAL VARIATIONS. A DEWATERING SYSTEM OF SUFFICIENT CAPACITY SHALL BE INSTALLED AND OPERATED TO MAINTAIN THE CONSTRUCTION AREA FREE OF WATER AT ALL TIMES.
- ALL FOOTING EXCAVATIONS SHALL BE INSPECTED, PRIOR TO CONCRETE PLACEMENT, BY A SOILS ENGINEER TO VERIFY SUITABLE BEARING MATERIAL OF CAPACITY AS SPECIFIED. NOTIFY THE OWNER'S REPRESENTATIVE WHEN ADDITIONAL EXCAVATION IS REQUIRED TO REACH SUITABLE
- **BEARING MATERIAL** THE SOILS ENGINEER SHALL CERTIFY IN WRITING THAT ALL FOUNDATIONS WERE PLACED ON SOIL WITH THE
- BEARING VALUE AS SPECIFIED. WITHIN THE EXCAVATION AREA OF FOUNDATIONS, ALL VEGETATION, TOPSOIL, PREVIOUSLY PLACED FILL AND UNSUITABLE SOILS SHALL BE REMOVED. ALL FOOTINGS TO BEAR ON VIRGIN SOIL OR PROPERLY PLACED AND COMPACTED ENGINEERED FILL.
- FOUNDATION DESIGN DOES NOT ACCOUNT FOR WINTER CONSTRUCTION. ANY UNENCLOSED / UNHEATED SPACES SHALL BE ADEQUATELY PROTECTED AGAINST FROST DURING WINTER CONSTRUCTION BY THE
- IF ANY SOFT SPOTS, OR AREAS QUESTIONABLE FOR ANY REASONS ARE ENCOUNTERED BY THE CONTRACTOR, ARCHITECT/ENGINEER SHALL BE NOTIFIED IMMEDIATELY SO THAT ANY REQUIRED ACTION MAY BE TAKEN PRIOR TO CONTINUATION OF CONSTRUCTION IN THAT AREA.

## REINFORCING STEEL NOTES

- NON-WELDED STEEL BAR REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60. WELDED STEEL BAR REINFORCING SHALL CONFORM TO ASTM A706
- WELDING OF REINFORCING STEEL SHALL BE PERFORMED BY AWS QUALIFIED WELDERS IN CONFORMANCE WITH AWS D1.1 USING E90 ELECTRODES FOR ASTM A615 REBAR, AND E80 ELECTRODES FOR ASTM A706 REBAR UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- WELDED WIRE REINFORCEMENT (WWR) SHALL BE SMOOTH WIRE PER ASTM A185 WITH MINIMUM YIELD STRENGTH, fy = 65 ksi, OR DEFORMED WIRE PER ASTM A497 WITH MINIMUM YIELD STRENGTH, fy = 70 ksi,
- UNLESS NOTED OTHERWISE. MINIMUM CONCRETE COVER FOR REINFORCING STEEL IN CAST-IN-PLACE (NON-PRESTRESSED) CONCRETE SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED ON THE DRAWINGS
- CONCRETE CAST AGAINST EARTH = 3" CONCRETE EXPOSED TO WEATHER:
- #6 BAR AND LARGER = 2" #5 BAR AND SMALLER = 1 1/2"
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER (SLABS, WALLS, & JOISTS): #14 BARS AND LARGER = 1 1/2"
- #11 BARS AND SMALLER = 3/4"
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER (BEAMS & COLUMNS)
- PRIMARY REINFORCEMENT, TIES, STIRRUPS, & SPIRALS = 1 1/2" ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING STEEL SHALL CONFORM TO THE LATEST EDITION OF ACI 315 (SP-66), DETAILS AND DETAILING OF CONCRETE REINFORCEMENT
- LAP SPLICE LENGTHS FOR BARS INSTALLED IN CONCRETE AND CMU SHALL BE IN ACCORDANCE WITH THE

#### **CONCRETE NOTES**

- ALL CONCRETE WORK INCLUDING FORMING, REINFORCING, MIXING, PLACING, FINISHING AND CURING SHALL BE DONE IN ACCORDANCE WITH THE ACI MANUAL OF CONCRETE PRACTICE INCLUDING "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", ACI 318, AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE", ACI 301 LATEST EDITIONS.
- IT SHALL BE THE RESPONSIBILITY OF THE MIX DESIGN SUPPLIER TO PROPORTION MIXES APPROPRIATELY TO REACH THE REQUIRED PROPERTIES NOTED, AND SHALL BE APPROPRIATE FOR THEIR INTENDED USE. ADMIXTURES MEETING ASTM C494 ARE OPTIONAL. HOWEVER, AIR-ENTRAINING ADMIXTURES MEETING ASTM 4. C260 SHALL BE USED FOR CONCRETE EXPOSED TO THE EXTERIOR OR FREEZE-THAW CYCLES
- CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS FOR EACH INTENDED USE ON THE PROJECT FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD. CONTENTS OF THE MIX DESIGN SHALL COMPLY WITH, AND INCLUDE ALL INFORMATION REQUIRED BY, ACI 318, CHAPTER 5 (FOR 2011 AND EARLIER CODE EDITIONS), & CHAPTER 26 (FOR 2014 CODE EDITION). THIS INCLUDES, BUT IS NOT LIMITED TO NUMBER OF TESTS AND AGE OF TESTS INCLUDED IN THE MIX DESIGN REPORT
- ALL CONCRETE DENSITY SHALL BE NORMAL WEIGHT (145 pcf +/- 5) UNLESS OTHERWISE INDICATED. FLY ASH ALLOWANCES:
- 20% MAXIMUM BY WEIGHT OF CEMENTITIOUS IN FOOTINGS
- 15% MAXIMUM BY WEIGHT OF CEMENTITIOUS MATERIAL IN SLABS
- 0% (NONE) ALLOWED IN SLABS TO RECIEVE SHAKE ON HARDENERS MACRO SYNTHETIC FIBER: POLYPROPYLENE/POLYETHYLENE SYNTHETIC MACRO FIBER COMPLYING WITH ASTM C1116 TYPE 3, MINIMUM 2 INCH LENGTH. ASPECT RATION 50 TO 90. BASIS OF DESIGN: EUCLID CHEMICAL COMPANY (THE): TUFSTRAND SF; WWW.EUCLIDCHEMICAL.COM
- OR APPROVED EQUAL FIBER MANUFACTURER SHALL HAVE ISO 9001 CERTIFICATION.
- MACRO SYNTHETIC FIBER SHALL BE TESTED IN CONCRETE TO MEET THE REQUIREMENTS OF ICC-
- COORDINATE CONCRETE WORK WITH THAT OF OTHER TRADES TO ALLOW FOR SETTING OF SLEEVES, ACCESSORIES, ETC.
- ALL REINFORCING STEEL, ANCHOR RODS, DOWELS, AND INSERTS SHALL BE WELL-SECURED IN POSITION PRIOR TO PLACING CONCRETE. TEST CYLINDERS WILL BE REQUIRED, AND RECORDS OF RESULTS SHALL BE SUBMITTED TO ENGINEER OF RECORD. PROVIDE A MINIMUM OF (4) 6"x12" CYLINDERS FOR TESTING (1 AT 7 DAYS, 2 AT 28 DAYS, ONE SPARE). ALTERNATIVELY, PROVIDE A MINIMUM (5) 4"x8" CYLINDERS FOR TESTING (1 AT 7 DAYS, 3 AT 28
- DAYS, ONE SPARE). SLUMP TESTS ARE RECOMMENDED. 10. CONSTRUCTION JOINTS IN CONCRETE INDICATED WITH A ROUGH, CLEAN SURFACE SHALL HAVE A 1/4" AVERAGE AMPLITUDE.
- ALL COLD JOINTS SHALL BE ROUGHENED AND CLEANED PRIOR TO PLACING CONCRETE 12. SLUMP: CONCRETE MIXES SHALL BE PROPORTIONED TO ACHIEVE A MAXIMUM SLUMP OF 8" FOR CONCRETE CONTAINING HIGH RANGE WATER REDUCING ADMIXTURE. 6" FOR CONCRETE CONTAINING A MID-RANGE WATER REDUCING ADMIXTURE. MIXES SHALL HAVE A WATER SLUMP OF 2"-3" (3" TO 4" FOR CONCRETE
- RECIEVING A "DRY-SHAKE" HARDENER). MAXIMUM 4" WATER SLUMP FOR ALL OTHER CONCRETE 13. SELF-CONSOLIDATING CONCRETE MAY BE USED FOR ALL ARCHITECTURAL CONCRETE AND HEAVILY REINFORCED MEMBERS AS SHOWN ON THE DRAWINGS. ALL SELF-CONSOLIDATING CONCRETE SHALL CONTAIN THE SPECIFIED HIGH-RANGE WATER-REDUCING ADMIXTURE AND VISCOSITY-MODIFYING ADMIXTURE WHERE REQUIRED. MINIMUM SPREAD OF 22"-30" WHEN MEASURED IN ACCORDANCE WITH ASTM C1611 OR AS REQUIRED BY THE SUCCESSFUL TEST PLACEMENT. THE WORKABILITY, PUMPABILITY FINISHABILITY, AND SETTING TIME OF THE PROPOSED MIX DESIGN SHALL BE VERIFIED WITH A SUCCESSFUL TEST PLACEMENT ONSITE. COMPRESSIVE STRENGTH: 5000 PSI AT 28 DAYS OR AS NOTED ON THE
- 14. AIR CONTENT: ALL CONCRETE EXPOSED TO FREEZING AND THAWING AND/OR REQUIRED TO BE WATER TIGHT SHALL HAVE AN AIR CONTENT OF 4.5% TO 7.5%. ALL INTERIOR SLABS AND ALL SLABS TO RECIEVE DRY-SHAKE SHALL HAVE A MAXIMUM AIR CONTENT OF 3%.
- DEPOSITE AND CONSOLIDATE CONCRETE FOR FLOORS AND SLABS IN A CONTINUOUS OPERATION, WITHIN LIMITS OF CONSTRUCTION JOINTS, UNTIL PLACEMENT OF A PANEL OR SECTION IS COMPLETE CONSOLIDATE CONCRETE DURING PLACEMENT OPERATIONS, SO CONCRETE IS THOROUGHLY
- WORKED AROUND REINFORCEMENT AND OTHER EMBEDDED ITEMS AND INTO CORNERS. MAINTAIN REINFORCEMENT IN POSITION ON CHAIRS DURING CONCRETE PLACEMENT SCREED SLAB SURFACES WITH A STRAIGHT EDGE AND STRIKE OFF TO CORRECT ELEVATIONS
- UTILIZE A VIBRATORY SCREED FOR CONCRETE THAT WILL RECIEVE DIAMOND POLISH FINISH. KEEP VIBRATING SCREED MOVING CONTINUOUSLY ACROSS SURFACE. DO NOT STOP SCREED IN ANY ONE PLACE WHILE VIBRATING.
- SLOPE SURFACES UNIFORMLY TO DRAINS WHERE REQUIRED. BEGIN INITIAL FLOATING USING BULL FLOATS OR DARBIES TO FORM A UNIFORM AND OPEN-TEXTURED
- SURFACE PLANE BEFORE EXCESS BLEED WATER APPEARS ON THE SURFACE. DO NOT FURTHER DISTURB SLAB SURFACES BEFORE STARTING FINISHING OPERATIONS. ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE
- FOLLOWING: A. "N" IN COLUMN INDICATES THE ADDITION OF ENTRAINED AIR IS NOT REQUIRED, BUT IS PERMITTED. AIR
- ENTRAINMENT IS NOT RECOMMENDED FOR SURFACES TO BE GIVEN A SMOOTH, DENSE, HARD-TROWELED FINISH. COORDINATE FINISH REQUIREMENTS WITH ARCHITECTURAL DRAWINGS AND/ OR SPECIFICATIONS.

CONCRETE TABLE						
INTENDED USE	MINIMUM 28 DAY STRENGTH (PSI)	MAX WATER-CEMENT RATIO	% TOTAL AIR LIMITS	MACRO SYNTHETIC FIBER (1)	% MAX SHRINKAG E @ 28 DAYS ASTM C157 (2)	
INTERIOR SLAB ON GRADE	4,000	0.50	3	YES	0.04	
FOOTINGS/FOUNDATION WALLS	4,000	0.48	6-4.5 TO 7.5 (WHERE EXPOSED TO EXT.)	-	0.05	
ALL CONCRETE NOT OTHERWISE SPECIFIED	4,000	0.40	6-4.5 TO 7.5	-	0.05	

## **TABLE NOTES**

- SYNTHETIC MACRO FIBER REINFORCEMENT MAY BE USED TO REPLACE REINFORCING STEEL IN CONCRETE SLABS ON GRADE AND TOPPING SLABS WHERE INDICATED ON DRAWINGS. SUBMIT FIBER MANUFACTURER'S DOCUMNETATION INDICATING THAT PROPOSED FIBER DOSAGE WILL PROVIDE A MINIMUM Fe3 VALUE AS FOLLOWS IN ACCORDANCE WITH ASTM C 1609. UNDER NO CIRCUMSTANCES SHALL DOSAGE RATE BE LESS THAN 3.0lbs PER CUBIC YARD OF CONCRETE IN SLABS ON GRADE AND TOPPING SLABS (4lbs PER CUBIC YARD FOR SLABS ON METAL DECK). SYNTHETIC MACRO FIBER REINFORCEMENT IS PROHIBITED IN CONCRETE TO RECIEVE POLISHED CONCRETE FINISHES.
- A. SLABS ON GRADE AND TOPPING SLABS
  - 4" DEEP SLAB: Fe3 = 94psi
  - 6" DEEP SLAB: Fe3 = 128psi 8" DEEP SLAB: Fe3 = 180 psi
- MAXIMUM SHRINKAGE PERCENT PER ASTM C 157 (MAY BE MODIFIED BY CURING PERIOD DURATION). TEST TAKES 35 DAYS MINIMUM. BEGIN TESTS AS SOON AS POSSIBLE SO FINAL TEST RESULTS AVAILABLE FOR SUBMITTAL TO ENGINEER. SUBMIT ASTM C 157 RESUKTS FOR AT LEAST 3 SPECIMENS. COORDINATE MIX DESIGN WITH ADMIXTURE MANUFACTURER.

## <u>DEVELOPMENT LENGTH OF STANDARD HOOKS IN CONCRETE NOTES</u>

- VALUES IN TABLE ARE BASED ON 60ksi REBAR. FOR OTHER REBAR YIELD STRENGTHS, MULTIPLY VALUES THE TABLE BY THE SPECIFIED YIELD STRENGTH DIVIDED BY 60.
- SEE ACI 318 SECTION 12.5 FOR ALLOWABLE REDUCTIONS IN DEVELOPMENT LENGTH. IT SHALL NOT BE LES THAN 8 BAR DIAMETERS OR 6 INCHES.
- HOOKED BARS ARE NOT CONSIDERED EFFECTIVE IN DEVELOPING BARS IN COMPRESSION.

DEVELOPMENT LENGTH OF STANDARD HOOKS IN CONCRETE - 60 ksi REBAR TABLE (INCHES)									
BAR SIZE	f'c = 3,000 psi	f'c = 3,500 psi	f'c = 4,000 psi	f'c = 5,000 p					
#3	9	8	8	7					
#4	11	11	10	9					
#5	14	13	12	11					
#6	17	16	15	13					
#7	20	18	17	15					
#8	22	21	19	17					
#9	25	23	22	20					
#10	28	26	25	22					
#11	31	29	27	24					

#### TENSION LAP SPLICE LENGTH IN CONCRETE NOTES

- FOR HORIZONTAL BARS, VALUES IN THE TABLE SHALL BE MULTIPLIED BY 1.3 WHERE MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST BELOW THE BAR
- LAP SPLICES IN TENSION ARE NOT PERMITTED FOR BAR LARGER THAN #11. A FULL MECHANICAL OR FULL WELDED SPLICE SHALL DEVELOP AT LEAST 1.25fy OF THE BAR.
- WHERE CLEAR SPACING OF BARS BEING SPLICED IS AT LEAST 2 BAR DIAMETERS AND CLEAR COVER AT
- LEAST 1 BAR DIAMETER, USE CASE 1. FOR ALL OTHER BAR ARRANGEMENTS, USE CASE 2.
- VALUES IN THE TABLE ARE BASED ON 60ksi REBAR. FOR OTHER REBAR YIELD STRENGTHS, MULTIPLY VALUES IN THE TABLE BY THE SPECIFIED YIELD STRENGTH DIVIDED BY 60.
- WHERE BARS OF DIFFERENT SIZES ARE SPLICED, PROVIDED THE LAP LENGTH OF THE LARGER BAR WELDED WIRE REINFORCEMENT (DEFORMED OR PLAIN WIRE) SHALL BE LAPPED ONE FULL MESH SQUARE
- PLUS 2 INCHES MINIMUM, BUT NOT LESS THAN 12 INCHES. REBAR IN ALL CONCRETE MEMBERS SHALL BE SPLICED IN ACCORDANCE WITH "TENSION LAP SPLICE LENGTH" TABLE, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.

TENSION	TENSION LAP SPLICE LENGTH IN CONCRETE - 60 KSI REBAR TABLE (INCHES)							
f'c =	3,000psi	3,000psi	3,500psi	3,500psi	4,000psi	4,000psi	5,000psi	5,000psi
BAR SIZE	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2
#3	22	33	20	30	19	28	17	25
#4	29	43	27	40	25	37	23	34
#5	36	54	33	50	31	47	28	42
#6	43	65	40	60	37	56	34	50
#7	63	94	58	87	54	81	49	73
#8	72	107	66	99	62	93	56	83
#9	81	121	75	112	70	105	63	94
#10	91	136	84	126	79	118	71	106
#11	101	151	93	140	87	131	78	117

### REINFORCED MASONRY NOTES

- MASONRY CONSTRUCTION SHALL CONFORM TO THE APPLICABLE PORTIONS OF TMS 602, "SPECIFICATIONS FOR MASONRY STRUCTURES". CONCRETE MASONRY UNITS SHALL BE CLASSIFIED AS NORMAL WEIGHT DENSITY AND CONFORM TO ASTM C90. THE MASONRY ASSEMBLY SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, (f'm) = 1.500 ps
- GROUT IN ACCORDANCE WITH ASTM C476 MAY BE FINE OR COARSE, SELF-CONSOLIDATING OR CONVENTIONAL (AT CONTRACTOR'S OPTION), AND SHALL BE PROPORTIONED TO ACHIEVE THE MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF MASONRY. GROUT SHALL HAVE A DRY DENSITY OF 135 +/- 3pcf. NORMAL WEIGHT AGGREGATES IN GROUT SHALL COMPLY WITH ASTM C404. MORTAR SHALL COMPLY WITH PROPORTION SPECIFICATION REQUIREMENTS OF ASTM C270.
- ALL MASONRY WALLS SHALL HAVE HEAVY DUTY LADDER TYPE HORIZONTAL JOINT REINFORCING PER
- MASONRY WALL ELEVATION VERTICAL REINFORCEMENT IS PER FOUNDATION PLAN. SUPPLY VERTICAL REINFORCING IN MINIMUM LENGTHS EQUAL TO 4'-0" PLUS LAP SPLICE LENGTH PER
- WALL CONSTRUCTION LIFTS FOR REINFORCING BARS AND INSULATION FILL SHALL BE PER ACI 530. TYPE "S" MORTAR IS REQUIRED FOR ALL WALLS UNLESS NOTED OTHERWISE
- SEE ARCHITECTURAL PLANS FOR LOCATION AND DETAIL OF CONTROL JOINTS AND EXPANSION JOINTS. SEE TYPICAL CONTROL JOINT DETAIL FOR GUIDANCE. ALL STEEL BEAMS BEARING ON MASONRY SHALL HAVE MINIMUM 3 CORES WIDE (24") AND FULL HEIGHT
- FILLED WITH GROUT DIRECTLY BELOW THE BEARING POINT EXCEPT AS NOTED ON THE PLANS. REINFORCE EACH CELL WITH VERTICAL STEEL BAR MATCHING ADJACENT WALL REBAR SIZE VERTICAL REINFORCING IS TO BE CONTINUOUS ABOVE LINTELS TO TOP OF WALL. WELD REBAR OR WHS
- PER SECTIONS TO TOP OF STEEL LINTEL, GROUT CELLS SOLID AROUND REINFORCING AS NOTED ON PLANS. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND DETAILS OF DOOR AND WINDOW OPENINGS FOR SPECIAL COURSING AND OTHER MASONRY DETAILS. THE INFORMATION SHOWN ON THE STRUCTURAL DRAWINGS IS INTENDED TO DEFINE THE STRUCTURAL REQUIREMENTS ONLY.
- ALL BOLTS, ANCHORS, ETC., INSERTED IN THE WALLS SHALL BE GROUTED SOLID INTO POSITION WITH MINIMUM EDGE DISTANCE FROM ANCHOR TO EDGE OF GROUTED PORTION OF CMU IN ALL DIRECTIONS AS
- REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS NOTED ON DRAWINGS. REINFORCING TO BE WELDED SHALL CONFORM TO ASTM A706.
- WHEN A FOUNDATION DOWEL DOES NOT LINE UP WITH A VERTICAL BLOCK CORE. IT SHALL NOT BE SLOPED MORE THAN (ONE HORIZONTAL IN 6 VERTICAL), OR 10 DEGREES. DOWEL MAY BE GROUTED INTO CELL IN VERTICAL ALIGNMENT, EVEN THOUGH IT IS IN AN ADJACENT CELL TO THE VERTICAL WALL REINFORCING, AS LONG AS THE CENTER-TO-CENTER SPACE BETWEEN THE WALL REINFORCING AND THE DOWEL DOES NOT EXCEED 8 INCHES. DOWELS SHALL NOT BE BENT INTO ALIGNMENT AFTER CONCRETE HAS BEEN CAST.
- SPLICED REINFORCING SHALL BE LAPPED ACCORDING TO "MASONRY LAP SPLICE LENGTH" TABLE. SPLICED BARS SHALL BE WIRED TOGETHER. CONTRACTOR MAY OPT TO STAGGER SPLICES. VERTICAL BARS SHALL BE HELD IN POSITION AT TOP AND BOTTOM AND AT INTERVALS NOT EXCEEDING 192
- DIAMETERS OF THE REINFORCING OR 10'-0"
- REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE AND INSPECTED BEFORE GROUTING STARTS VERTICAL GROUTING MAY BE EITHER "LOW LIFT" OR "HIGH LIFT" AT THE CONTRACTOR'S OPTION. VERTICAL CELLS THAT WILL BE GROUTED SHALL HAVE VERTICAL ALIGNMENT TO MAINTAIN A CONTINUOUS
- UNOBSTRUCTED CELL AREA NOT LESS THAN 2"x3". GROUTING OF MASONRY BEAMS OVER OPENINGS SHALL BE DONE IN ONE CONTINUOUS OPERATION. VERTICAL REINFORCING BARS SHALL MAINTAIN MINIMUM CLEARANCES AS FOLLOWS UNLESS NOTED
- OTHERWISE ON DRAWINGS: INSIDE FACE OF MASONRY = 3/4" ADJACENT BARS NOT SPLICED = 1" OR 1 BAR DIAMETER, WHICHEVER IS GREATER.
- INSULATION INSERTS ARE NOT PERMITTED IN GROUTED CELLS. PRISM TESTS IN ACCORDANCE WITH ASTM C1314 AND ASTM C140 SHALL BE PERFORMED WITH TEST REPORTS SENT TO ARCHITECT AND EOR FOR RECORD. REFER TO SPECIAL INSPECTIONS TABLE ITEM "EVALUATION OF STRENGTH" FOR ADDITIONAL INFORMATION.

## MASONRY LAP SPLICE LENGTH NOTES

CONTRACTOR SHALL PROVIDE DEVELOPMENT AND REBAR SPLICE LENGTHS SHOWN IN THE TABLES AS A MINIMUM UNLESS INDICATED OTHERWISE IN STRUCTURAL DETAILS OR NOTES "SINGLE" INDICATES ONE BAR PER CELL. "DOUBLE" INDICATES TWO BARS PER CELL. SEE PLAN.

<u>f'm</u>	f'm = 1,500 psi - MASONRY LAP SPLICE LENGTH TABLE (INCHES)							
	CMU SIZE	8"	10"	10"	12"	12"		
BAR SIZE	STD HOOK DEVELOPMENT LENGTH (IN)		SINGLE	DOUBLE	SINGLE	DOUBLE		
#3	5	12	12	13	12	13		
#4	6	15	12	23	12	23		
#5	8	23	18	36	15	36		
#6	9	43	34	70	28	70		
#7	10	60	46	84	38	84		
#8	12	92	71	96	57	96		

## **POST-INSTALLED ANCHOR NOTES**

POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE CONSTRUCTION DOCUMENTS THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER OF RECORD PRIOR TO INSTALLING POST INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REBAR. HOLES SHALL BE DRILLED AND CLEANED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE SPECIFIED ON THESE DRAWINGS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER OF RECORD ALONG WITH CALCULATIONS THAT ARE PREPARED & SEALED BY A REGISTERED PROFESSIONAL ENGINEER. THE CALCULATIONS SHALL DEMONSTRATE THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING, AT A MINIMUM, THE PERTINENT EQUIVALENT PERFORMANCE VALUES OF THE SPECIFIED PRODUCT USING THE BUILDING CODE.

- TYPICAL POST-INSTALLED ANCHORS IN CONCRETE AND CMU SHALL COMPLY WITH THE LATEST OF THEIR RESPECTIVE ICC EVALUATION REPORTS.
- WHEN INSTALLING ANCHORS IN CONCRETE AND CMU, CONTRACTOR SHALL LOCATE EXISTING REINFORCING STEEL, CONDUITS, ETC, PRIOR TO DRILLING FOR ANCHORS. CONTRACTOR SHALL USE
- CARE AND CAUTION TO PREVENT DAMAGE TO EXISTING REINFORCING BARS. CONTRACTOR SHALL PROVIDE 1" MINIMUM CLEARANCE BETWEEN EDGES OF ANY HOLES FOR POST-INSTALLED ANCHORS AND EXISTING REINFORCING STEEL.
- CONTRACTOR SHALL PROVIDE INSPECTION AND TESTING AS REQUIRED PER THE "SPECIAL INSPECTIONS" SECTION OF THESE GENERAL STRUCTURAL NOTES.

THIS SHEET IS PART OF A COMPLETE SET. REFER TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

VERVE PROJECT NO.: VDS-MO-02-20 NOV. 18, 2020 SSUE DATE:

HEET NAME:

GENERAL NOTES

SHEET NO.

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STEPHEN J. SACCO

STEPHEN J

SACEO

NUMBER

PE-21871

1558 S. BROADWAY

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STATE OF MISSOURI CERTIFICATE

OF AUTHORITY # A-2013038641

oject Status

DESCRIPTION

## STRUCTURAL STEEL NOTES

- 1. FABRICATION AND ERECTION OF STRUCTURAL STEEL MEMBERS IS TO BE IN ACCORDANCE WITH "AISC CODE OF STANDARD PRACTICE", LATEST EDITION.
- 2. STEEL FABRICATOR SHALL PARTICIPATE IN THE AISC QUALITY CERTIFICATION PROGRAM AND BE DESIGNATED AN AISC-CERTIFIED PLANT. CATEGORY STD.
- IT IS THE RESPONSIBILITY OF THE STEEL FABRICATOR TO DESIGN THE CONNECTIONS. CONNECTIONS ARE TO BE IN ACCORDANCE WITH CURRENT AISC STANDARDS AND APPLICABLE GOVERNMENT CODES. ALL CONNECTIONS SHALL BE BOLTED OR WELDED AND SHALL DEVELOP 60% OF THE ALLOWABLE UNIFORM LOAD TABULATED IN THE AISC "MANUAL OF STEEL CONSTRUCTION" FOR ALLOWABLE STRESS DESIGN, 10k (ASD), OR SHEAR REACTION SHOWN ON THE DRAWINGS, WHICHEVER IS GREATER. PROVIDE MINIMUM NUMBER OF ASTM F3125 GRADE A325 OR A490 BOLTS AS SHOWN IN THE "STRUCTURAL STEEL BOLTED"
- CONNECTIONS" TABLE.

  4. ANCHOR RODS TO BE ASTM F1554, GRADE 36 FULLY-THREADED RODS WITH PLATE WASHERS AND NUTS ON THE BOTTOM UNLESS NOTED OTHERWISE-SEE "TYPICAL ANCHOR BOLT" DETAIL.
- 5. BOLT HOLES SHALL BE 1/16" OVERSIZE UNLESS OTHERWISE NOTED ON THE DRAWINGS. FIELD BURNING OF BOLT HOLES SHALL NOT BE PERMITTED.
- **6.** WELDING SHALL BE PERFORMED BY AWS QUALIFIED WELDERS IN CONFORMANCE WITH AWS D1.1, USING E70 SERIES ELECTRODES, UNLESS OTHERWISE NOTED ON THE DRAWINGS. ADDITIONALLY, WELDING IN LOS ANGELES, CA SHALL BE PERFORMED BY LADBS CERTIFIED WELDERS.
- 7. ALL STEEL SHALL BE SHOP PAINTED WITH A STANDARD ALKYD PRIMER (GRAY). FOR HARSH ENVIROMENTS USE A GRAY ZINC ORGANIC OR INORGANIC PRIMER.
- FABRICATE ALL BEAMS WITH THE MILL CAMBER UP.
   CONNECTION NOTATION IS AS FOLLOWS. SEE PLAN NOTES TO DETERMINE IF LOADS SHOWN ON PLANTED AND ADDRESS OF THE THAT IS TO DETERMINE IF LOADS SHOWN ON THE PROPERTY OF THE
- PLAN/DETAILS ARE ALLOWABLE (ASD) OR ULTIMATE (LRFD):
- AXIAL FORCE = PSHEAR = V OR []
- MOMENT = MTORSION = T
- 10. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS AND GRADES:
- WIDE FLANGE = A992, fy = 50ksi
  ANGLES, CHANNELS, PLATES, BARS, AND RODS = A36, fy = 36ksi
- RECTANGULAR HSS = A500 GRADE B, fy = 46ksi
- RECTANGULAR HSS = A500 GRADE B, ty = 46ksi
   REFER TO "DEFERRED SUBMITTALS" FOR ADDITIONAL REQUIREMENTS

KEFE	REFER TO "DEFERRED SUBMITTALS" FOR ADDITIONAL REQUIREMENTS.						
	STRUCTURAL STEEL BOLTED CONNECTIONS TABLE						
	NOMINAL MEMBER DEPTH	MINIMUM NUMBER OF BOLTS					
	8" - 10"	2					
	12" - 14"	3					
	16" - 18"	4					
	21" - 24"	5					
	27" OR DEEPER	6					

#### STEEL JOIST NOTES

- 1. ALL STEEL JOISTS AND BRIDGING SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST STEEL JOIST INSTITUTE STANDARD SPECIFICATIONS. JOIST FABRICATOR SHALL BE A MEMBER OF THE SJI.
- 2. PROVIDE STANDARD CAMBER ON ALL JOIST PER SJI UNO. PROVIDE HALF CAMBER AT NEAREST JOIST PARALLEL TO CONCRETE AND MASONRY WALLS.
- 3. PROVIDE BOTTOM CHORD CEILING EXTENSIONS AS SHOWN ON ARCHITECTURAL DRAWINGS OR AS NOTED OTHERWISE.
- 4. HEADER ANGLES FOR STEEL JOISTS SHALL BE DESIGNED AND FURNISHED BY THE JOIST SUPPLIER AS NOTED ON THE DRAWINGS.
- 5. ALL STEEL BAR JOISTS SHALL BE SPACED AND SIZED AS SHOWN ON PLANS.
- 6. TOP AND BOTTOM CHORDS OF ALL JOISTS SHALL BE IN STRAIGHT ALIGNMENT BEFORE WELDING OR FINAL-BOLTING ANY BRIDGING IN PLACE.
- 7. THE ENDS OF ALL BRIDGING TERMINATING AT CONCRETE OR MASONRY WALLS SHALL BE ANCHORED THERETO AT TOP AND BOTTOM CHORDS PER TYPICAL DETAILS
- THERETO AT TOP AND BOTTOM CHORDS PER TYPICAL DETAILS.

  8. ALL BAR JOISTS AT COLUMN CENTERLINES (OR ADJACENT TO COLUMN CENTERLINES) TO HAVE BOTTOM
- CHORD EXTENDED TO COLUMN OR BEAM. DO NOT WELD UNLESS SPECIFICALLY NOTED AS SUCH.

  9. ALL STEEL BAR JOISTS SHALL BE SHOP PAINTED WITH MANUFACTURER'S STANDARD SHOP PRIMER
- COMPLYING TO SSPC-PAINT 15.

  10. REFER TO "DEFERRED SUBMITTALS" FOR ADDITIONAL REQUIREMENTS.

#### **ROOF DECK NOTES**

- 1. DECK SHALL BE GALVANIZED WITH G60 COATING MINIMUM, UNLESS NOTED OTHERWISE. REFER TO PLAN FOR TYPES AND GAUGES. DECK TO BE FINISHED AND INSTALLED IN ACCORDANCE WITH ALL CURRENT PROVISIONS, RECOMMENDED PRACTICES, AND STANDARDS OF THE STEEL DECK INSTITUTE.
- 2. DECK SHALL SPAN A MINIMUM 3 SUPPORT SPACES. LOCATE JOINTS OVER SUPPORTING MEMBERS ONLY, AND LAP 2" MINIMUM. DECK SHALL NOT BE INSTALLED UNTIL THE JOISTS (OR FRAMING) HAVE BEEN ALIGNED, AND ALL BRACING AND BRIDGING IS INSTALLED.
- 3. FURNISH AND INSTALL SHEET METAL CLOSURES, JOINT COVERS, CONCRETE STOPS, AND OTHER
- ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.

  4. DO NOT SUSPEND PIPES OR DUCTS DIRECTLY FROM DECK.
- 5. CONTRACTOR AND DECKING SUPPLIER SHALL COORDINATE SIZE AND LOCATIONS OF ANY OPENINGS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS. PROVIDE SUPPORT FRAMING FOR OPENINGS PER TYPICAL DETAILS.
- ROOF DECK HAS BEEN DESIGNED TO FUNCTION AS A DIAPHRAGM FOR THE TRANSMISSION OF LATERAL LOADS. ATTACH DECK UNITS TO EACH OTHER PER PLAN NOTES. CONNECT DECK UNITS TO EXTERIOR SUPPORTS AND ALL OTHER DECK BOUNDARIES PER PLAN NOTES. ALL DECK SHALL BE FASTENED TO JOIST SUPPORTS AND AT SIDELAPS PER PLAN NOTES AND TYPICAL DETAILS.

## COLD-FORMED STEEL FRAMING NOTES

- 1. STEEL FOR COLD-FORMED SECTIONS, AND STEEL SHEET AND PLATE USED IN COLD-FORMED STEEL CONSTRUCTION SHALL CONFORM TO SECTION A2.1 OF AISI STANDARD: "NORTH AMERICAN
- SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS", LATEST EDITION.

  2. ALL 12, 14, AND 16 GAUGE MEMBERS SHALL MEET THE REQUIREMENTS OF ASTM A1003, GRADE ST50H (MINIMUM YIELD OF 50,000 psi). ALL 18 AND 20 GAUGE MEMBERS SHALL MEET THE REQUIREMENTS OF ASTM A1003 GRADE ST33H (MINIMUM YIELD OF 33,000 psi).
- 3. SCREWS FOR COLD-FORMED STEEL CONSTRUCTION SHALL BE ITW BUILDEX TEK SCREWS (ICC ESR-1976) OR APPROVED EQUAL.
- 4. ALL SCREWS SHALL BE INSTALLED SO THAT HEADS ARE FLUSH WITH OUTSIDE MATERIAL. DO NOT
- OVERDRIVE SCREWS. SCREWS WITH WING-TIPS ARE NOT PERMITTED IN SHEAR WALLS OR DIAPHRAGMS.

  5. SCREW FASTENERS MUST BE INSTALLED PERPENDICULAR, FULLY SEATED AND WITH A MIMIMUM (3)

  SCREW THREADS EXPOSED BACKSIDE OF CONNECTION (UNO).
- 6. SECTION PROPERTIES ARE ASSUMED TO BE IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE "NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS" 2012 EDITION WITH SUPPLEMENTS. THE CONTRACTORS IS TO VERIFY THAT THE MATERIALS
- INSTALLED MEET OR EXCEED THESE DESIGN VALUES.

  7. MECHANICAL BRIDING SHALL BE USED IN ALL CASES WHERE INDICATED. INSTALLATION OF BRIDGING MUST BE COMPLETED BEFORE ANY LOADS ARE APPLIED TO THE SYSTEM. ALL BRIDGING SHALL BE TERMINATED AT JAMBS, CORNER STUDS OR COLUMNS. BRIDGING ENDS SHALL NOT HANG LOOSE. STUDS
- SHALL BE BRACED AGAINST ROTATION.

  8. ALL FRAMING COMPONENTS SHALL BE CUT SQUARELY FOR ATTACHMENT TO PERPENDICULAR MEMBERS. STUD ENDS MUST SEAT TIGHTLY INTO TRACKS IN ALL BEARING APPLICATIONS.
- NO SPLICES IN STUDS, JOISTS, HEADERS, OR OTHER LOAD CARRYING MEMBERS MAY BE MADE WITHOUT PRIOR ENGINEERING REVIEW AND SPECIFIC DETAILS FOR ANY SUCH REVISION TO THE ORIGINAL DESIGN.
   ALL WELDING SHALL BE PERFORMED BY AWS WELDERS QUALIFIED FOR WELDING COLD-FORMED STEEL CONFORMANCE WITH AWS D1.3 USING E60 ELECTRODES, UNLESS OTHERWISE NOTED. STEEL REQUIRING
- WELDING SHALL BE 16ga MINIMUM.

  11. ALL COLD-FORMED STUDS AND JOISTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS
- REGARDING MINIMUM INSTALLATION STANDARDS FOR BEARING, BRIDGING, AND BRACING.

  12. BOTTOM TRACK TO MATCH STUD GAUGE WITH A MINIMUM 1-1/4" FLANGE UNLESS OTHERWISE NOTED.

SPECIAL INSPECTIONS - CONCRETE TABLE				
ITEM	INSPECTION FREQUENCY	SCOPE		
REINFORCEMENT	PERIODIC	INSPECT REINFORCEMENT (INCLUDING PRESTRESSING TENDONS) AND PLACEMENT; VERIFY CONFORMANCE WITH CONSTRUCTION DOCUMENTS, AND THAT BARS ARE FREE FROM MATERIALS THAT COULD PREVENT BOND, ARE ADEQUATELY LAPPED, SPLICED, TIED, AND SUPPORTED		
ANCHOR INSTALLATION	PERIODIC	INSPECT CAST-IN-PLACE ANCHORS AND BOLTS		
ANCHOR INSTALLATION	PERIODIC	INSPECT POST-INSTALLED MECHANICAL AND ADHESIVE ANCHORS NOT OTHERWISE SPECIFIED		
ANCHOR INSTALLATION	CONTINUOUS	INSPECT POST-INSTALLED MECHANICAL AND ADHESIVE ANCHORS PER THE REQUIREMENTS IN THEIR RESPECTIVE ICC-ES REPORTS		
MIX DESIGN	PERIODIC	VERIFY USE OF APPROVED MIX DESIGN		
SAMPLING AND TESTING	CONTINUOUS	PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTING; PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE TEMPERATURE OF THE CONCRETE		
CONCRETE PLACEMENT	PERIODIC	VERIFY MAINTENANCE OF CURING TEMPERATURE AND TECHNIQUES		
CONCRETE PLACEMENT	PERIODIC	INSPECT FORMWORK FOR SHAPE, LOCATION, AND DIMENSIONS OF CONCRETE MEMBER BEING FORMED		
CONCRETE PLACEMENT	CONTINUOUS	CONCRETE PLACEMENT		

SPECIAL INSPECTIONS - SOILS AND FOUNDATIONS TABLE						
ITEM	INSPECTION FREQUENCY	SCOPE				
SOILS	PERIODIC	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY; VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL; PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS; PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY				
SOILS	CONTINUOUS	VERIFY USE OF PROPER MATERIALS, DENSITIES, LIFT THICKNESSES, AND COMPACTION OF FILL; VERIFY MATERIALS AND PROCEDURES COMPLY WITH THE GEOTECHNICAL REPORT				

	SPECIAL INSPECTIONS - STEEL TABLE					
ITEM	INSPECTION FREQUENCY	SCOPE				
MATERIAL VERIFICATION	PERIODIC	HIGH STRENGTH BOLTS, NUTS, AND WASHERS: REVIEW MANUFACTURER'S CERTIFICATE OF COMPLIANCE; IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE CONSTRUCTION DOCUMENTS				
MATERIAL VERIFICATION	PERIODIC	STRUCTURAL STEEL: REVIEW MANUFACTURER'S CERTIFIED MILL TEST REPORTS; IDENTIFICATION MARKINGS OF STEEL SHAPES TO CONFORM TO AISC STANDARDS SPECIFIED IN THE CONSTRUCTION DOCUMENTS				
MATERIAL VERIFICATION	PERIODIC	WELD FILLER MATERIALS: REVIEW MANUFACTURER'S CERTIFICATE OF COMPLIANCE; IDENTIFICATION MARKINGS TO CONFORM WITH AWS SPECIFICATIONS IN THE CONSTRUCTION DOCUMENTS				
MATERIAL VERIFICATION	PERIODIC	COLD-FORMED STEEL DECK: REVIEW MANUFACTURER'S CERTIFIED TEST REPORTS; IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE CONSTRUCTION DOCUMENTS				
HIGH-STRENGTH BOLTING	PERIODIC	BEARING-TYPE CONNECTIONS: VERIFY BOLTS, NUTS, WASHERS, PAINT, INSTALLATION, AND TIGHTENING CONFOF TO THEIR RESPECTIVE STANDARDS				
WELDING	PERIODIC	SINGLE PASS FILLET WELDS NOT GREATE THAN 5/16"				
WELDING	PERIODIC	VERIFY WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706; ALL REINFORCING STEEL NOT REQUIRING CONTINUOUS INSPECTION				
STRUCTURAL DETAILS	PERIODIC	INSPECT STEEL FRAME FOR COMPLIANC WITH CONSTRUCTION DOCUMENTS FOR MEMBER SIZES AND LOCATIONS, BRACING AND CONNECTIONS				
METAL DECK	PERIODIC	INSPECT PUDDLE WELDING, SCREW ATTACHMENTS, AND SIDELAP FASTENING OF ROOF AND FLOOR DECK				
OPEN WEB STEEL JOISTS	PERIODIC	INSPECT JOIST AND JOIST GIRDERS FOR WELDED OR BOLTED END CONNECTIONS HORIZONTAL AND DIAGONAL BRIDGING; BRIDGING THAT DIFFERS FROM SJI SPECIFICATIONS				

SPECIA		6 - MASONRY - LEVEL 1 INSPECTION				
FO	(LEVEL B QUALITY ASSURANCE) FOR OCCUPANCY CATEGORY I, II, III STRUCTURES					
ITEM	INSPECTION FREQUENCY	SCOPE				
REINFORCEMENT	PERIODIC	LAPPING AND SPLICING OF REBAR; LOCATION, PLACEMENT, GRADE, SIZE, AND TYPE OF REINFORCEMENT AND CONNECTORS				
INSTALLATION OF MASONRY, GROUT, AND MORTAR	PERIODIC	CONSTRUCTION OF MORTAR JOINTS; SIZE AND LOCATION OF STRUCTURAL ELEMENTS; PROTECTION OF MASONRY IN COLD WEATHER (BELOW 40°F) OR HOT WEATHER (ABOVE 90°F); CLEAN GROUT SPACE				
INSTALLATION OF MASONRY, GROUT, AND MORTAR	CONTINUOUS	GROUT PLACEMENT IN CELLS WITH STEEL REINFORCEMENT				
MIXING OF MORTAR AND GROUT	PERIODIC	PROPORTIONS OF SITE-PREPARED MORTAR AND GROUT				
ANCHORS	PERIODIC	GROUT PLACEMENT IN CELLS WITH STEEL REINFORCEMENT OR PRESTRESSING BONDED TENDONS				
ANCHORS	PERIODIC	INSPECT POST-INSTALLED MECHANICAL AND ADHESIVE ANCHORS PER THE REQUIREMENTS IN THEIR RESPECTIVE ICC-ES REPORTS				
EVALUATION OF STRENGTH	CONTINUOUS	PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/ OR PRISMS; VERIFY I'M PRIOR TO CONSTRUCTION. A "SET" IS HEREBY DEFINED AS A MINIMUM OF 4 PRISM SPECIMENS. A MINIMUM OF 1 SET SHALL BE PREPARED AND TESTED FOR EACH DAY MASONRY IS INSTALLED. TEST 1 PRISM AT 7 DAYS, 2 AT 28 DAYS, AND THE 4th PRISM AT THE EOR'S DIRECTION, IF REQUIRED. REPORT ALL TEST RESULTS TO THE ARCHITECT AND EOR WITHIN 3 WORKING DAYS OF TESTING.				
MISCELLANEOUS	PERIODIC	COMPLIANCE WITH REQUIRED INSPECTION PROVISIONS OF THE CONSTRUCTION DOCUMENTS AND THE APPROVED SUBMITTALS SHALL BE VERIFIED				

SPECIAL INSPECTIONS - OFF-SITE FABRICATION (INCLUDING PRE-MANUFACTURED WOOD STRUCTURAL					
ELEM	ENTS AND ASSE	MBLIES, AND STEEL FABRICATING)			
ITEM	INSPECTION FREQUENCY	SCOPE			
FABRICATION AND IMPLEMENTATIO N PROCEDURES	PERIODIC	VERIFY THAT FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES THAT PROVIDE A BASIS FOR INSPECTION CONTROL OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS; REVIEW PROCEDURES FOR COMPLETENESS AND ADEQUACY RELATIVE TO THE CODE REQUIREMENTS FOR THE FABRICATOR'S SCOPE OF WORK			
NOTE	-	SPECIAL INSPECTION FOR OFF-SITE FABRICATION IS NOT REQUIRED FOR FABRICATORS APPROVED BY THE BUILDING OFFICIAL IN ACCORDANCE WITH THE CODE			

	REINFORCED MASONRY LINTEL SCHEDULE												
MAX.		R	EINFORCING	(ALL REINF.	IS AT BOTTO	M, UNLESS NOTED (	OTHERWISE (T=TOP, B=BOTTOM, & M=MIDDLE)						
CLEAR SPAN	DEPTH	6" WALL	8" WALL	10" WALL	12" WALL	SHEAR REINF.	MAS. WIDTH PER MASONRY REINF						
2'-0"	8"	(1) #3	(2) #5	(2) #5	(2) #5	N/A	PLAN/SCHED PER PLAN						
4'-0"	16"	(1) #4	(2) #5	(2) #5	(2) #5	#3 TIES @ 16"oc	TOP REINF LOCATION						
6'-0"	24"	(1) #4	(2) #5	(3) #5	(3) #5	#3 TIES @ 16"oc	THE CHEVE BEINE						
8'-0"	24"	(1) #4	(2) #5 T&B	(3) #5 T&B	(3) #5 T&B	#3 TIES @ 16"oc	DOT DEINE LOCATION						
10'-0"	24"	(1) #4	(2) #5 T&B	(3) #5 T&B	(3) #5 T&B	#3 TIES @ 16"oc							
16'-0"	24"	N/A	(2) #5 T&B&M	(3) #5 T&B	(3) #5 T&B	#3 TIES @ 8"oc							

NOTES:

1. EXTEND REINFORCING 24" EACH SIDE OF OPENING (MINIMUM).

2. ALL CELLS SHALL BE FULLY GROUTED.
3. PROVIDE ADDITIONAL WALL REINF FOR TWO CELLS ADJACENT TO OPENING EACH SIDE; USE TYP. VERTICAL WALL REINF (UNO).



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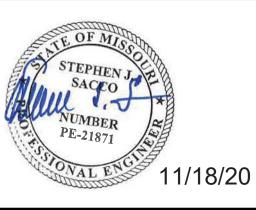
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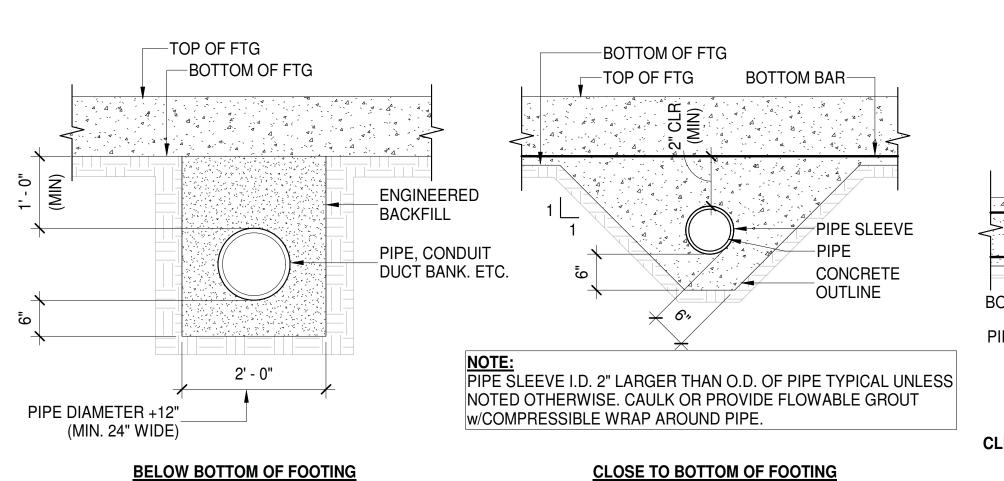
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ISSUE DATE: VDS-MO-02-20

GENERAL NOTES AND SCHEDULES

SHEET NO.



TOP OF FTG TOP BAR (AS APPLICABLE) **BOTTOM OF** FOOTING PIPE SLEEVE

FOUNDATION WALL (OR TRENCH FOOTING/GRADE BM.)

| S1.3 | N.T.S.

S1.3 \ N.T.S.

3. CONSTRUCTION JOINTS TO BE USED AT END OF EACH POUR. SAWCUT 1/8"x t/4 DEEP-SLAB REINF CONTINUITY SHALL BE MAINTAINED CONT BEVELED SAWCUT 1/8"x t/4 DEEP-KEYWAY KEYWAY ALTERNATE PROVIDE CAST IN JOINT PLATES OR DOWELS, & SUBMIT PRODUCT DATA. COMPACTED VAPOR BARRIER-**VAPOR BARRIER-**GRANULAR FILL **CLEAR OF TOP & BOTTOM BAR IN FOOTING OR CONTROL JOINT CONSTRUCTION JOINT** 

1. SAW-CUT CONTROL JOINTS TO BE CUT AS SOON AS SURFACE WILL NOT BE TORN, ABRADED, OR

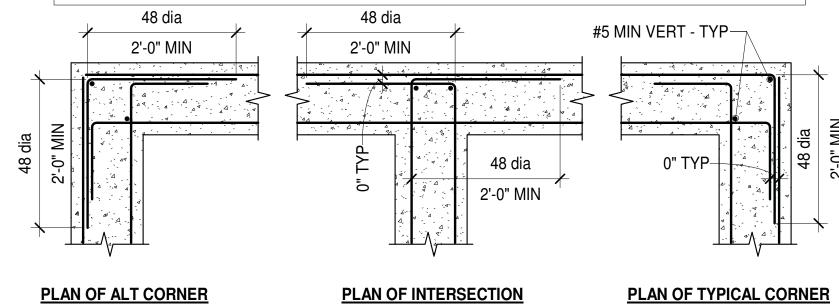
OTHERWISE DAMAGED BY CUTTING ACTION. (WITHIN 8 TO 10 HR. OF BURNISHING)

2. SPACE CONTROL JOINTS AT 15'-0" MAX. FOR INTERIOR SLABS UNO ON PLANS.

B TYPICAL SLAB-ON-GRADE CONSTRUCTION & CONTROL JOINT DETAILS

NOTES:

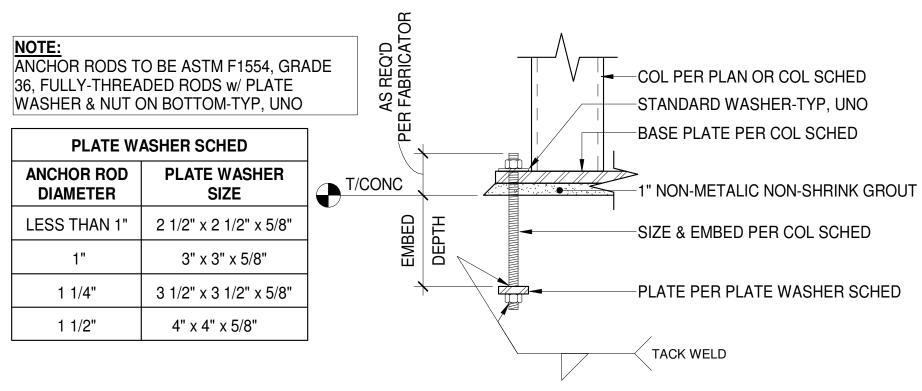
1. WHERE SINGLE CURTAIN OF REINFORCING OCCURS, BEND BARS AS SHOWN FOR OUTSIDE BARS. 2. FOR MORE THAN 2 BARS PER LAYER, EXTEND INNER BARS 12" INTO PERPENDICULAR FOOTING. OUTER BARS SHALL BE PLACED AS INDICATED. 3. CORNER BARS TO MATCH WALL REINFORCEMENT.

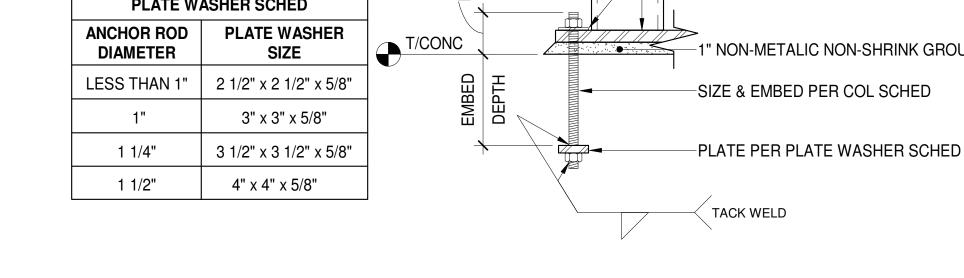


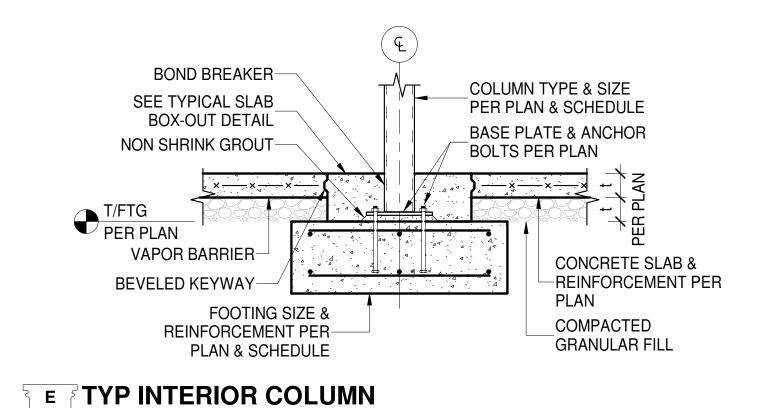
PLAN OF TYPICAL CORNER

**TYP CONCRETE WALL REINFORCEMENT** S1.3 N.T.S.

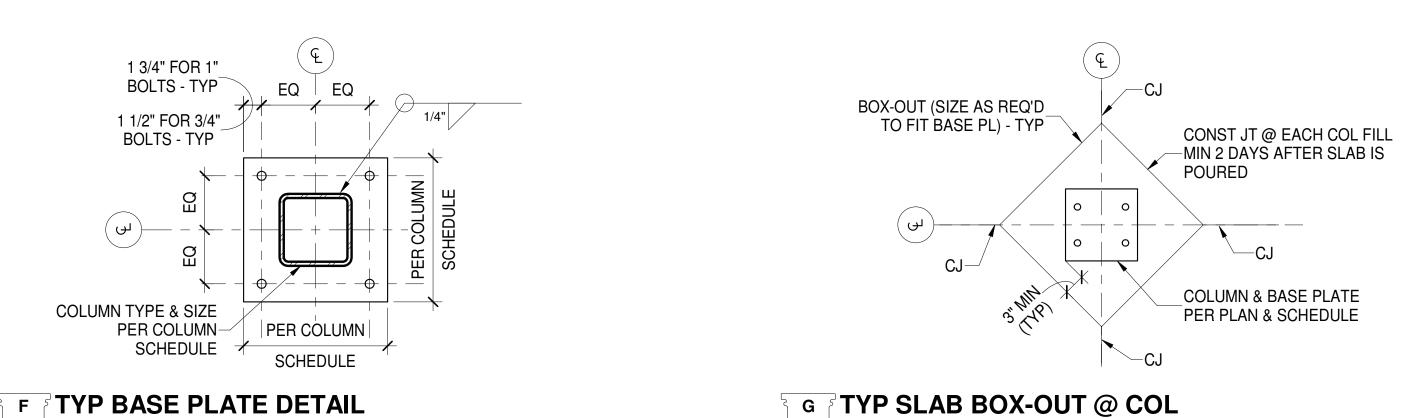
**TAPTYPICAL FOUNDATION PIPE PENETRATION DETAILS** S1.3 N.T.S.

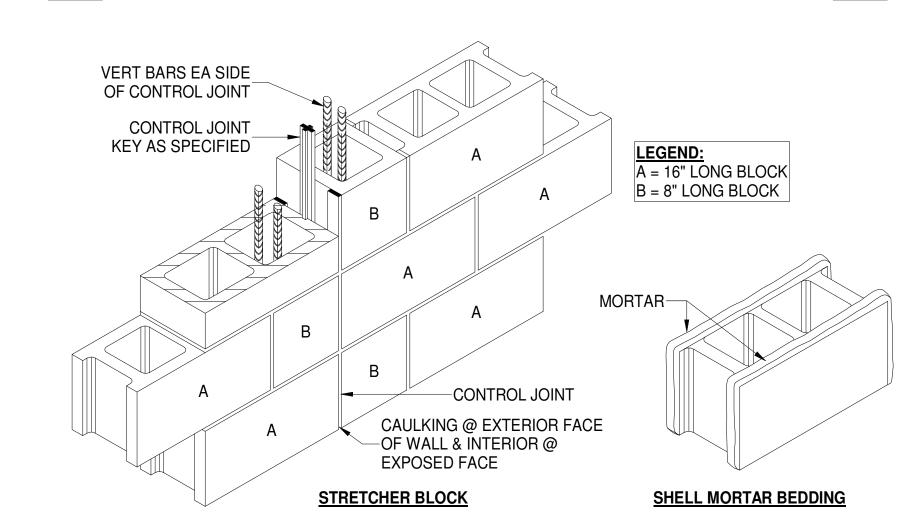






\$1.3 **N.T.S.** 





NOTES:

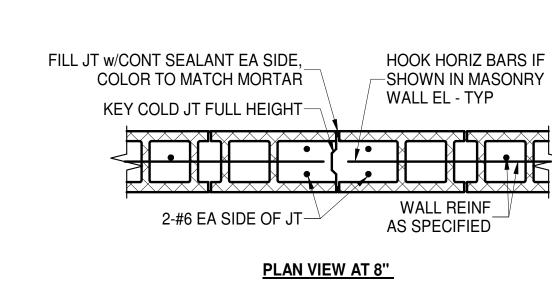
1. FIGURE ABOVE IS APPLICABLE TO THE CONSTRUCTION OF ALL CONTROL JOINTS IN THE 8" & 10" HOLLOW BLOCK WALLS EXCEPT WHERE STEEL OR CONCRETE COLUMNS OCCUR. SEE STRUCTURAL &

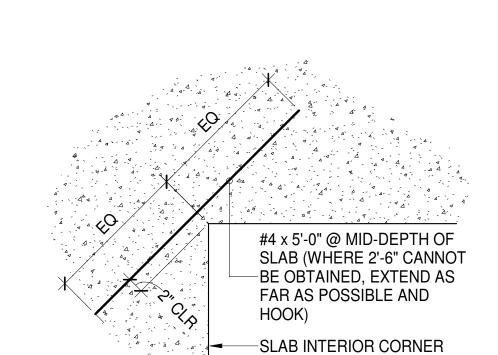
SLAB REINF CONTINUITY

SHALL BE MAINTAINED

COMPACTED

GRANULAR FILL

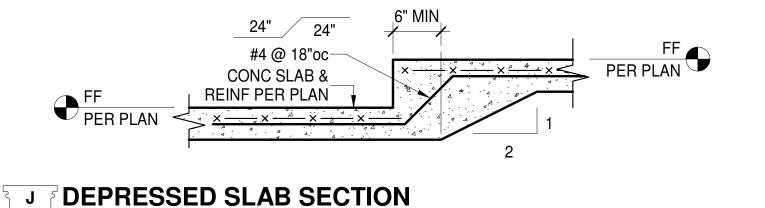




THE REINF @ INTERIOR CORNERS S1.3 \ N.T.S.

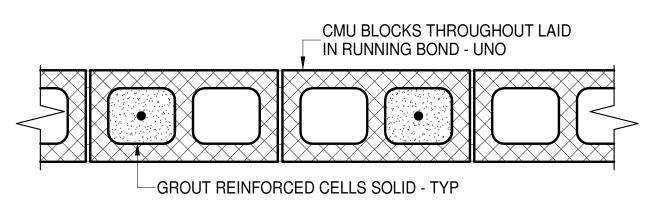
TYP ANCHOR BOLT DETAIL

S1.3 \ N.T.S.

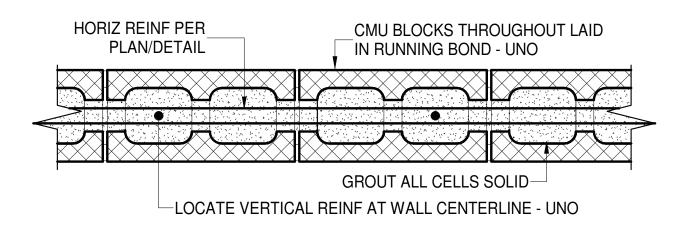




S1.3 N.T.S.

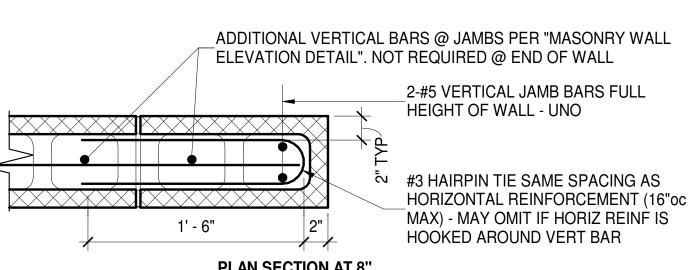


TYPICAL CMU WALL COURSE BETWEEN BOND BEAM COURSES

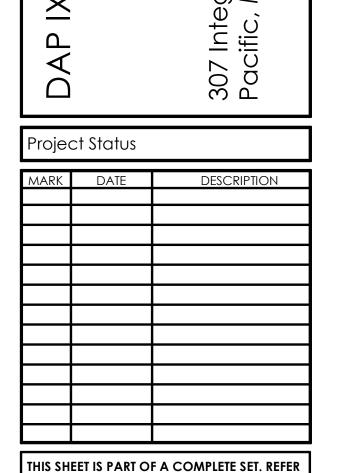


TYPICAL CMU WALL BOND BEAM COURSE

TYPICAL CMU WALL COURSES S1.3 \ N.T.S.



TYPICAL CMU JAMB DETAILS | S1.3 | N.T.S.



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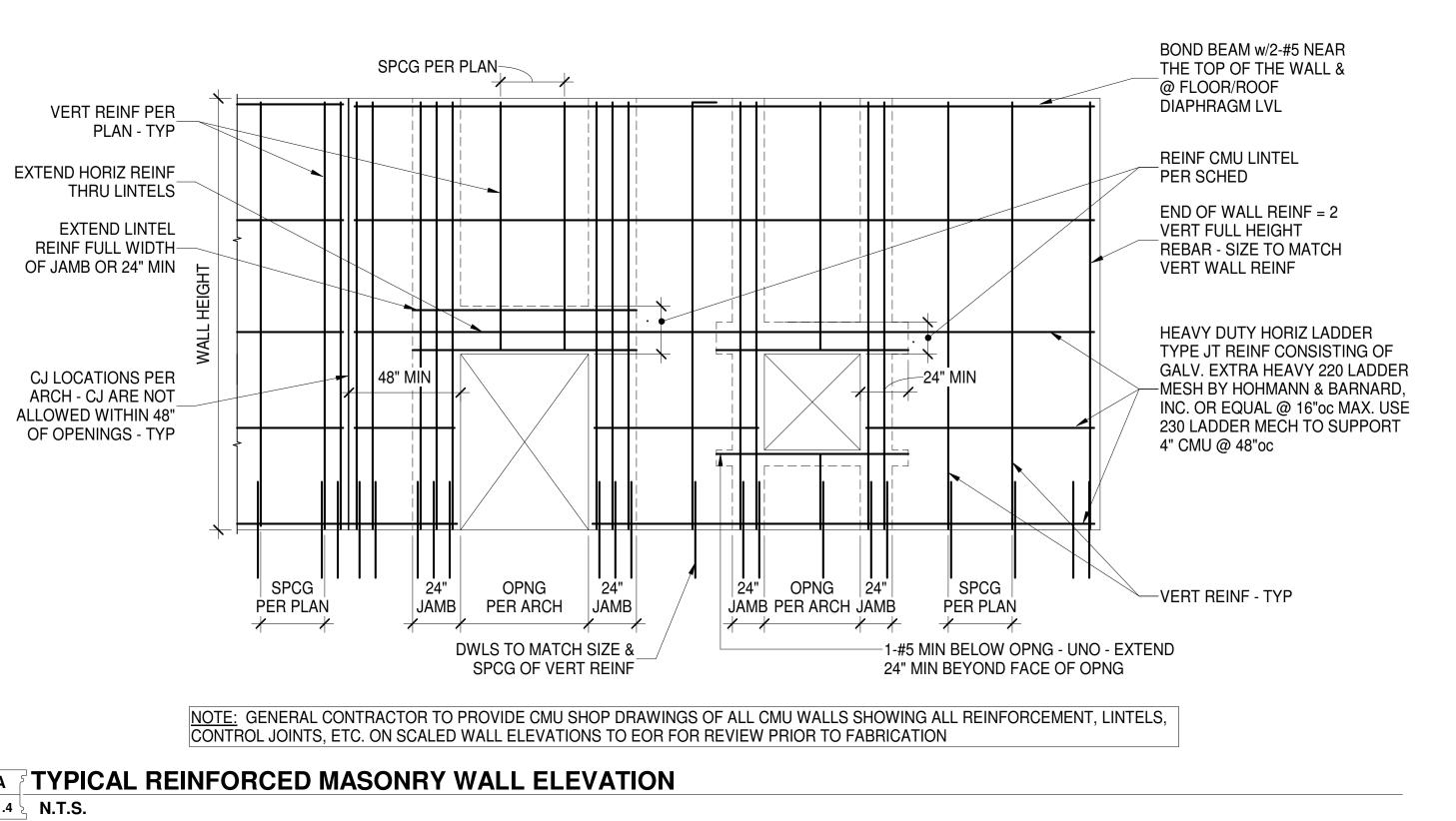
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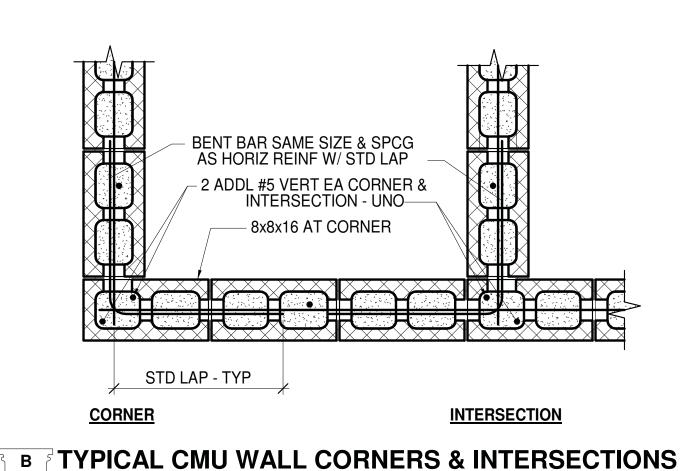
TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42 VERVE PROJECT NO.: VDS-MO-02-20 NOV. 18, 2020 SSUE DATE:

TYPICAL DETAILS SHEET NO.

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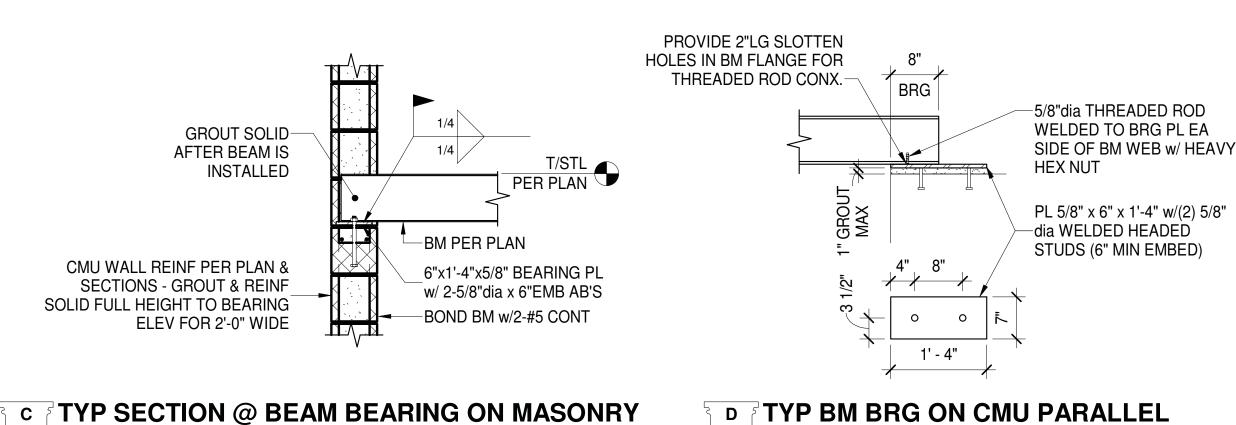
**PLAN SECTION AT 8"** 



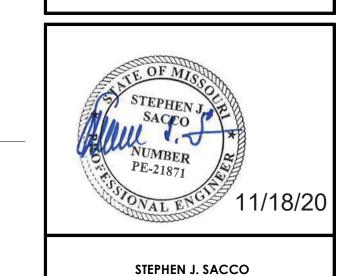


S1.4 \ N.T.S.

\_CONT L5x5x5/16" w/ 3/4"dia x 6 1/4" EMB HILTI KWIK HUS-EZ SCREW ANCHORS @ 24"oc



S1.4 N.T.S.



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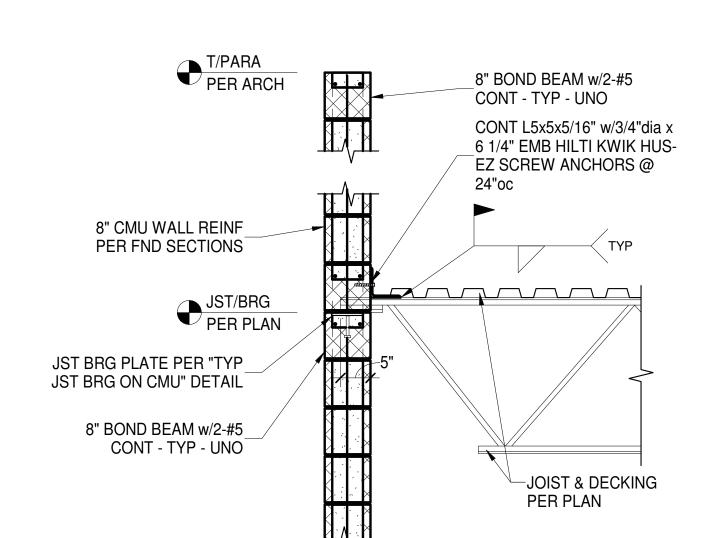
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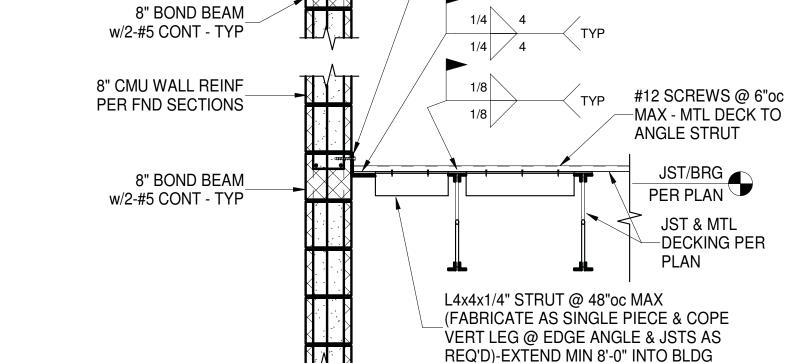
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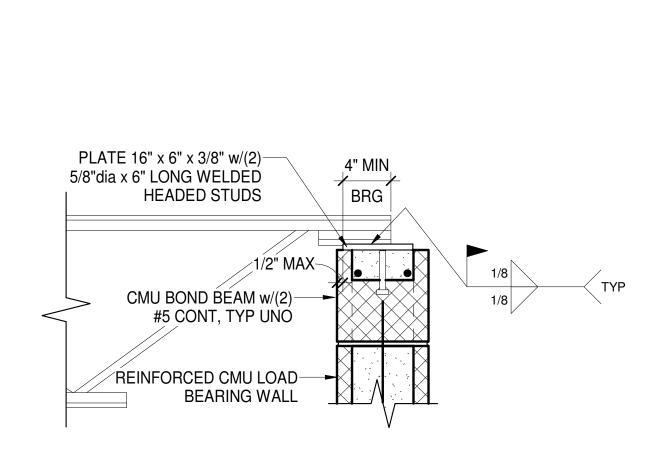
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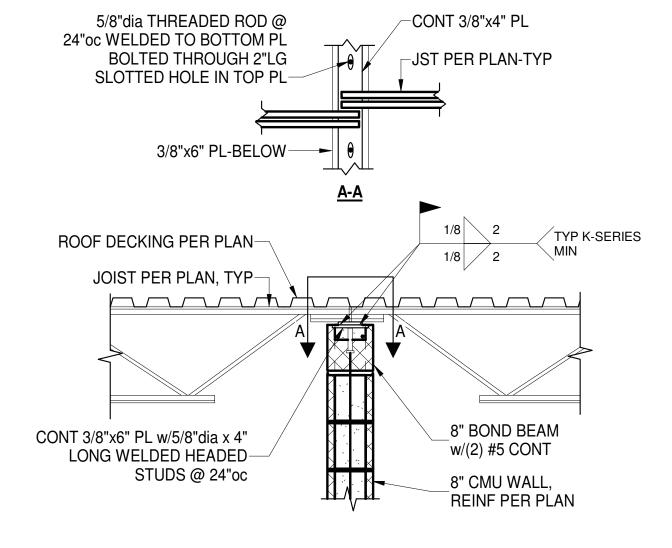
TA TYPICAL REINFORCED MASONRY WALL ELEVATION







\$1.4 \ N.T.S.



TETTYP JST BRG ON CMU SECTION S1.4 \ N.T.S.

F TYP DECK BEARING ON CMU SECTION S1.4 N.T.S.

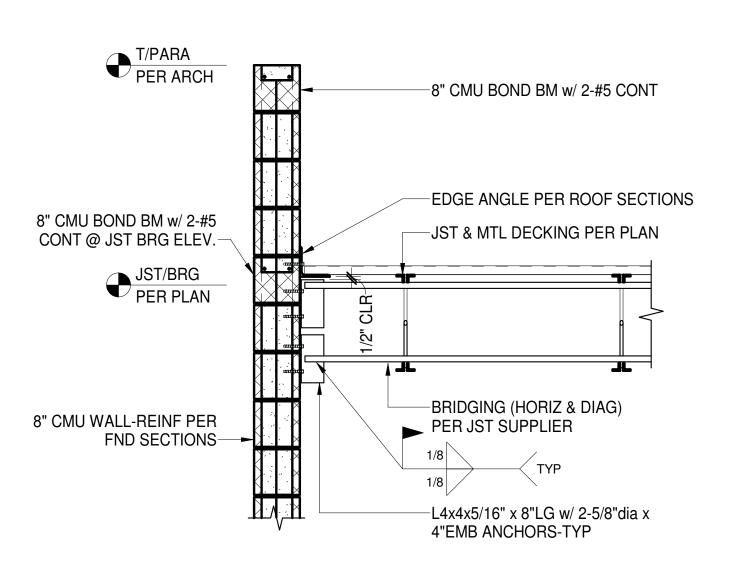
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T/PARA
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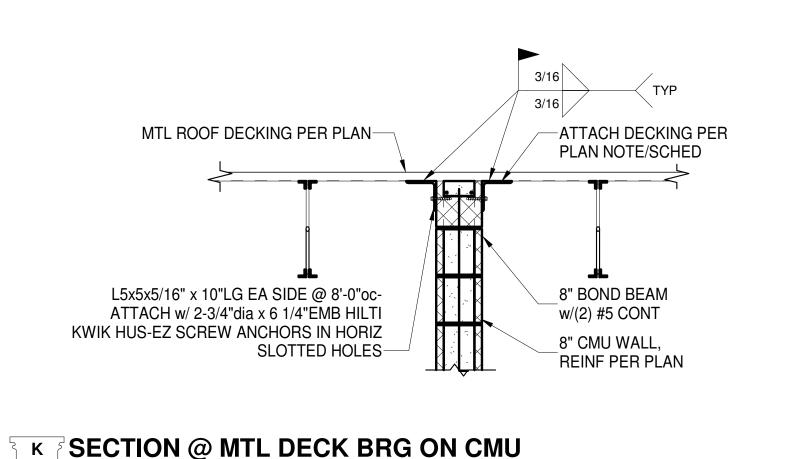
G TYP JST BRG ON CMU WALL S1.4 N.T.S.

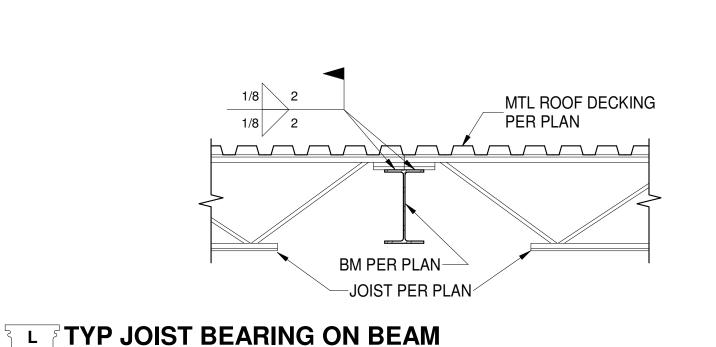
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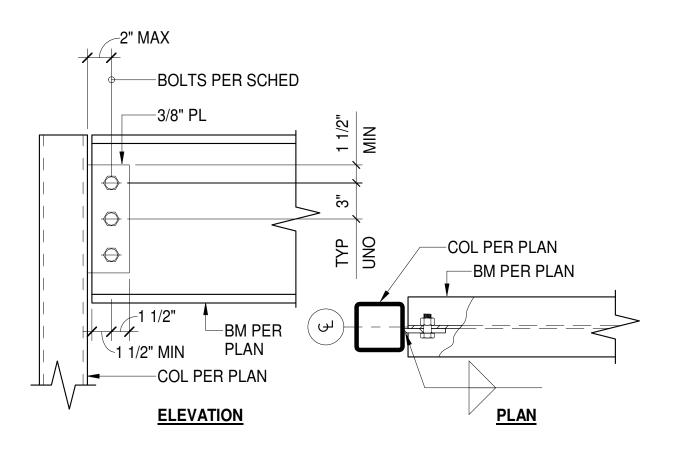
H SECTION @ JOIST BRG ON CMU S1.4 N.T.S.



BRIDGING TERMINATING INTO CMU WALL







M TYP BM TO COL CONNECTION DETAILS S1.4 N.T.S.

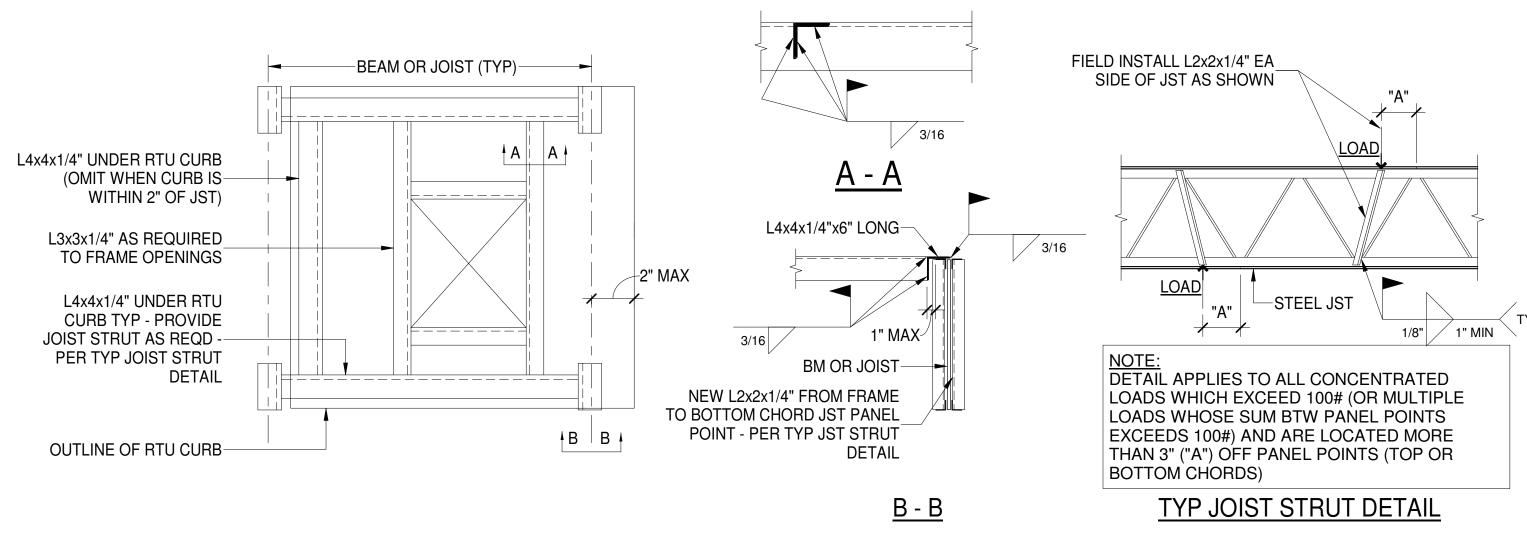
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S1.4 \ N.T.S.

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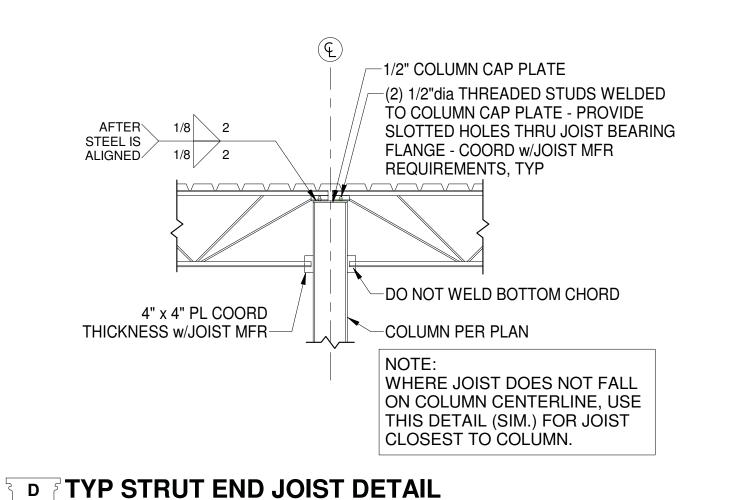
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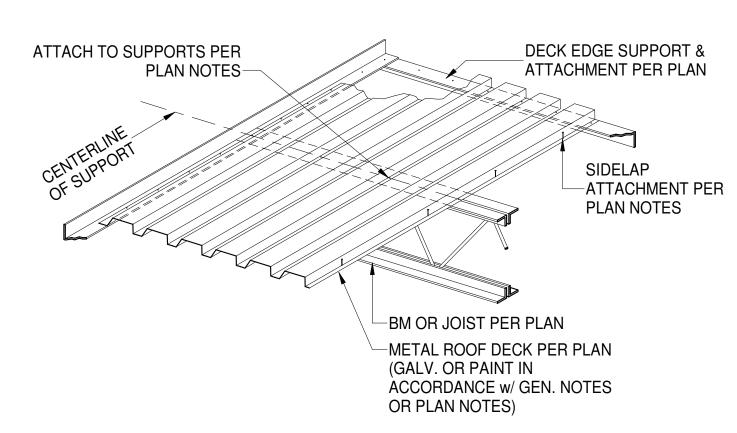


## **TATRTU SUPPORTS & OPENINGS**

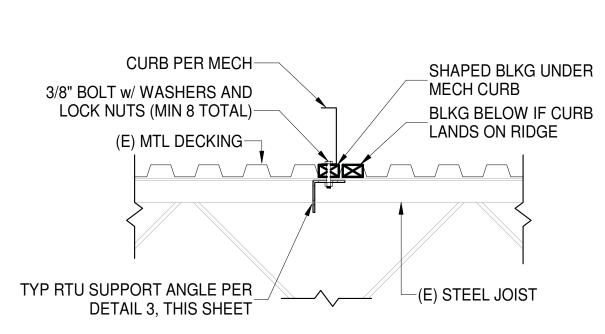
S1.5 N.T.S.

S1.5 N.T.S.





TYP ROOF DECK ATTACHMENT DETAIL S1.5 \ N.T.S.

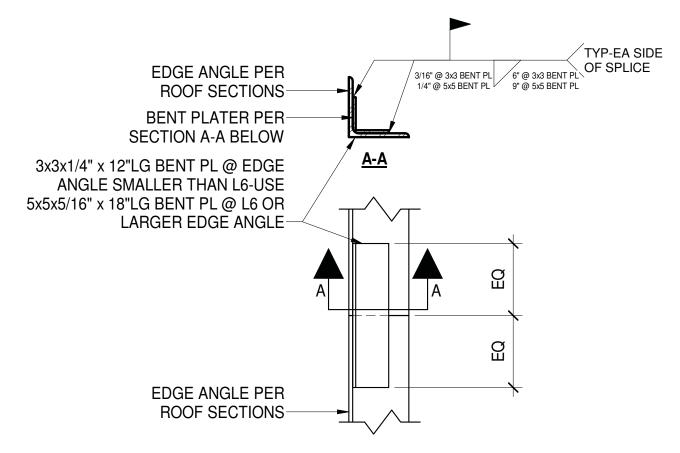


B DETAIL (RIDGE BLKG WOOD)

ATTACH TO SUPPORTS PER

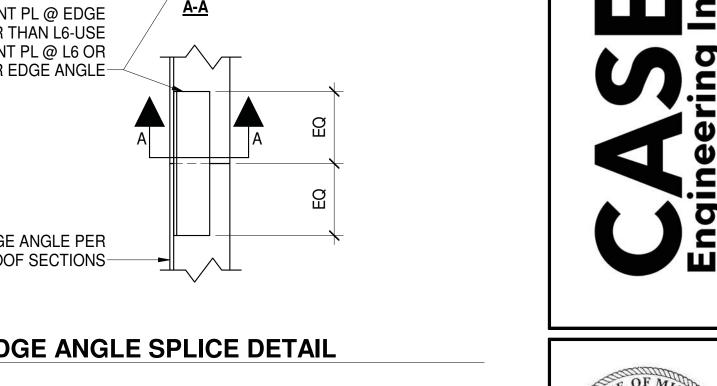
PLAN NOTES

S1.5 N.T.S.



**TYP DECK EDGE ANGLE SPLICE DETAIL** 

S1.5 N.T.S.



11/18/20

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STEPHEN J. SACCO

— DECK EDGE SUPPORT & ATTACHMENT PER PLAN SIDELAP

ATTACHMENT PER
PLAN NOTES

JOIST PER PLAN METAL ROOF DECK PER PLAN (GALV. OR PAINT IN ACCORDANCE w/ GEN. NOTES OR PLAN NOTES)

F TYPICAL ROOF DECK ATTACHMENT DETAIL S1.5 N.T.S.

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VERVE PROJECT NO.: VDS-MO-02-20 NOV. 18, 2020 ISSUE DATE:

TYPICAL DETAILS

SHEET NO.

80' - 0"

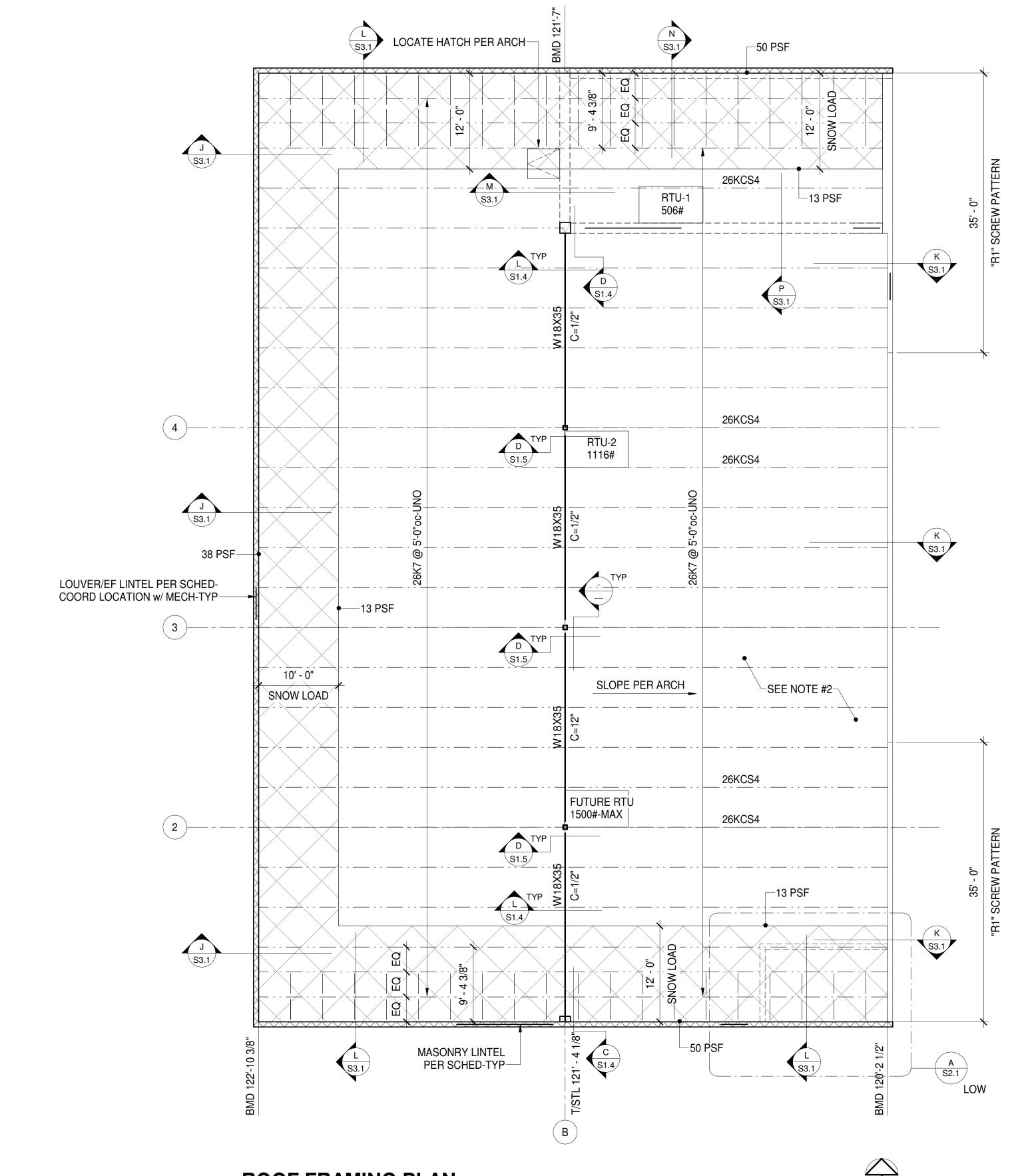
41' - 8"

25' - 0" SHEARWALL

38' - 4"

25' - 0" SHEARWALL

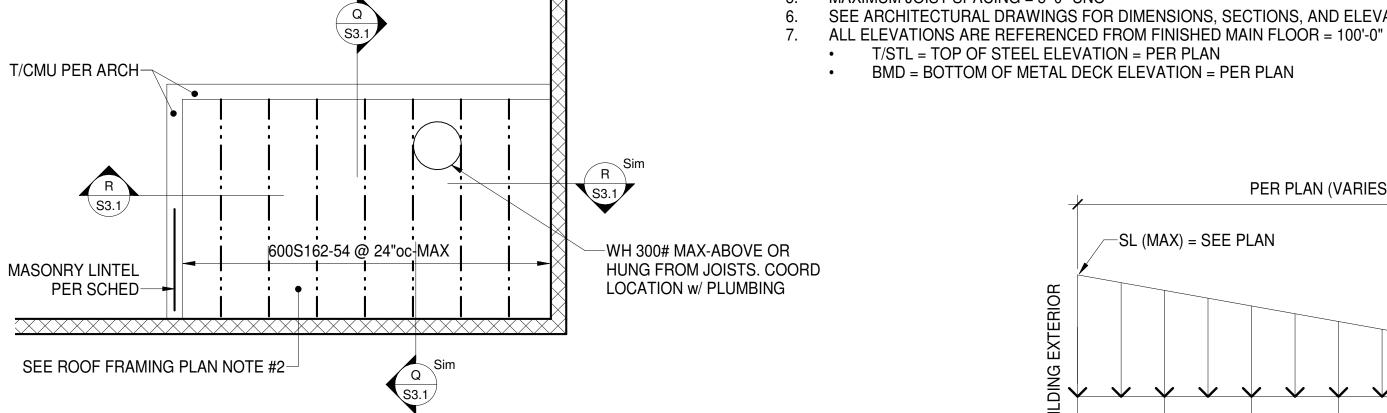
	FOOTING S	CHEDULE	COLUMN SCHEDULE						
1ARK	SIZE	REINFORCING	MARK	SIZE	BASE PLATE	ANCHOR BOLTS			
F1	4'-6" x 4'-6" x 1'-0"	5 - #5 EW TOP & BOT	C1	HSS6x6x1/4"	14" x 14" x 3/4"	4 - 3/4"dia w/ 9" EMBED			



## **ROOF FRAMING PLAN**

**PLAN NOTES** 

- SEE SHEETS S1.1 S1.5 FOR GENERAL NOTES AND TYPICAL DETAILS. ROOF CONSTRUCTION: 1 1/2"x22ga GALVANIZED TYPE "B" STEEL ROOF DECK ATTACHED TO SUPPORTS WITH #14 TEK SCREWS AND AT SIDELAPS WITH #10 TEK SCREWS. ATTACH IN A 36/7 SCREW PATTERN WITH (5) SIDELAP SCREWS PER JOIST SPAN IN AREAS MARKED "R1". ATTACH IN A 36/5 SCREW PATTERN WITH (1) SIDELAP SCREWS PER JOIST SPAN FOR THE REMAINDER OF
- THE ROOF. SEE TYPICAL DETAILS FOR ATTACHMENT. PROVIDE HORIZONTAL JOIST BRIDGING AND SPACING PER LATEST SJI MANUAL.
- JOIST MANUFACTURER TO COORDINATE WITH CONTRACTORS TO DETERMINE RTU AND TRANSFORMER LAYOUTS, WEIGHTS, AND FOOTPRINTS. MANUFACTURER TO COORDINATE WITH ROOF HATCH SUPPLIER FOR SIZE AND LOCATION. RTU AND EXHAUST HOOD LOADS ARE TO BE IN ADDITION TO OTHER DESIGN LOADS.
- MAXIMUM JOIST SPACING = 5'-0" UNO SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS, SECTIONS, AND ELEVATIONS NOT SHOWN HEREON.
- T/STL = TOP OF STEEL ELEVATION = PER PLAN



PER PLAN (VARIES) —SL (MAX) = SEE PLAN SL (MIN) = 13 PSF

DEAD = PER GEN NOTES

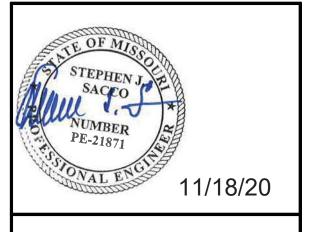
WIND = PER GEN NOTES

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

B TYPICAL SNOW DRIFT LOAD DIAGRAM S2.1 \ N.T.S.

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Projec	t Status	
MARK	DATE	DESCRIPTION
	+	

TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

VERVE PROJECT NO.: VDS-MO-02-20 NOV. 18, 2020

PLANS SHEET NO.

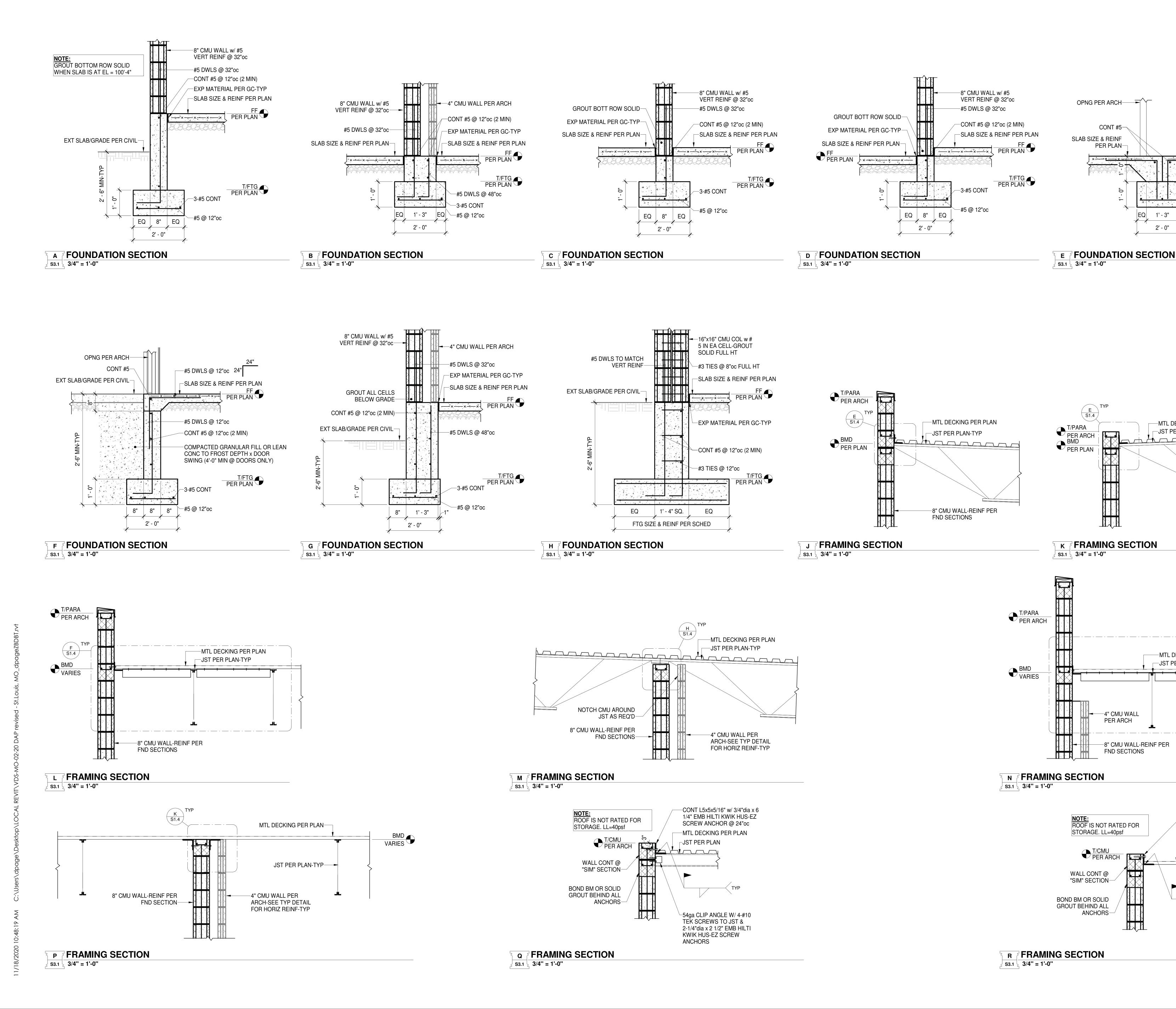
**SHEET NAME:** 

**S2**.

S2.1 1/4" = 1'-0"

MASONRY LINTEL PER SCHED-

ROOF CALLOUT @ TLT





CONT #5-

PER PLAN-

-#5 DWLS @ 12"oc

-3-#5 CONT

-MTL DECKING PER PLAN-TYP

-MTL DECKING PER PLAN

-CONT L5x5x5/16" w/ 3/4"dia x 6

1/4" EMB HILTI KWIK HUS-EZ

SCREW ANCHOR @ 24"oc

—MTL DECKING PER PLAN

-JST PER PLAN-TYP

-4" CMU WALL PER ARCH

FND SECTIONS

-8" CMU WALL-REINF PER

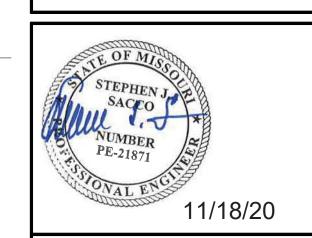
JST PER PLAN-TYP

EQ 1' - 3" EQ

2' - 0"

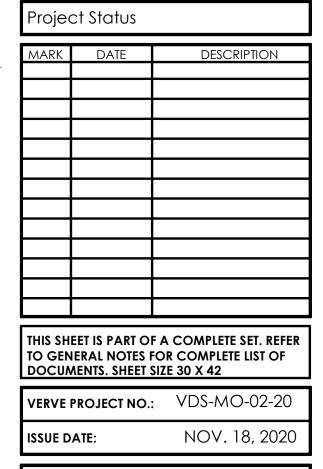
-SLAB SIZE & REINF PER PLAN

PER PLAN



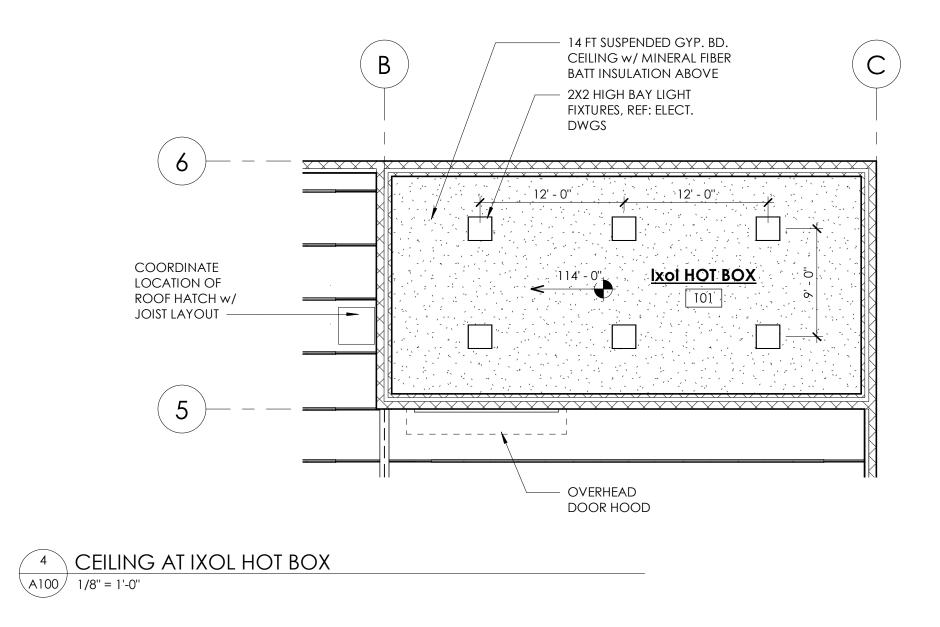
STEPHEN J. SACCO

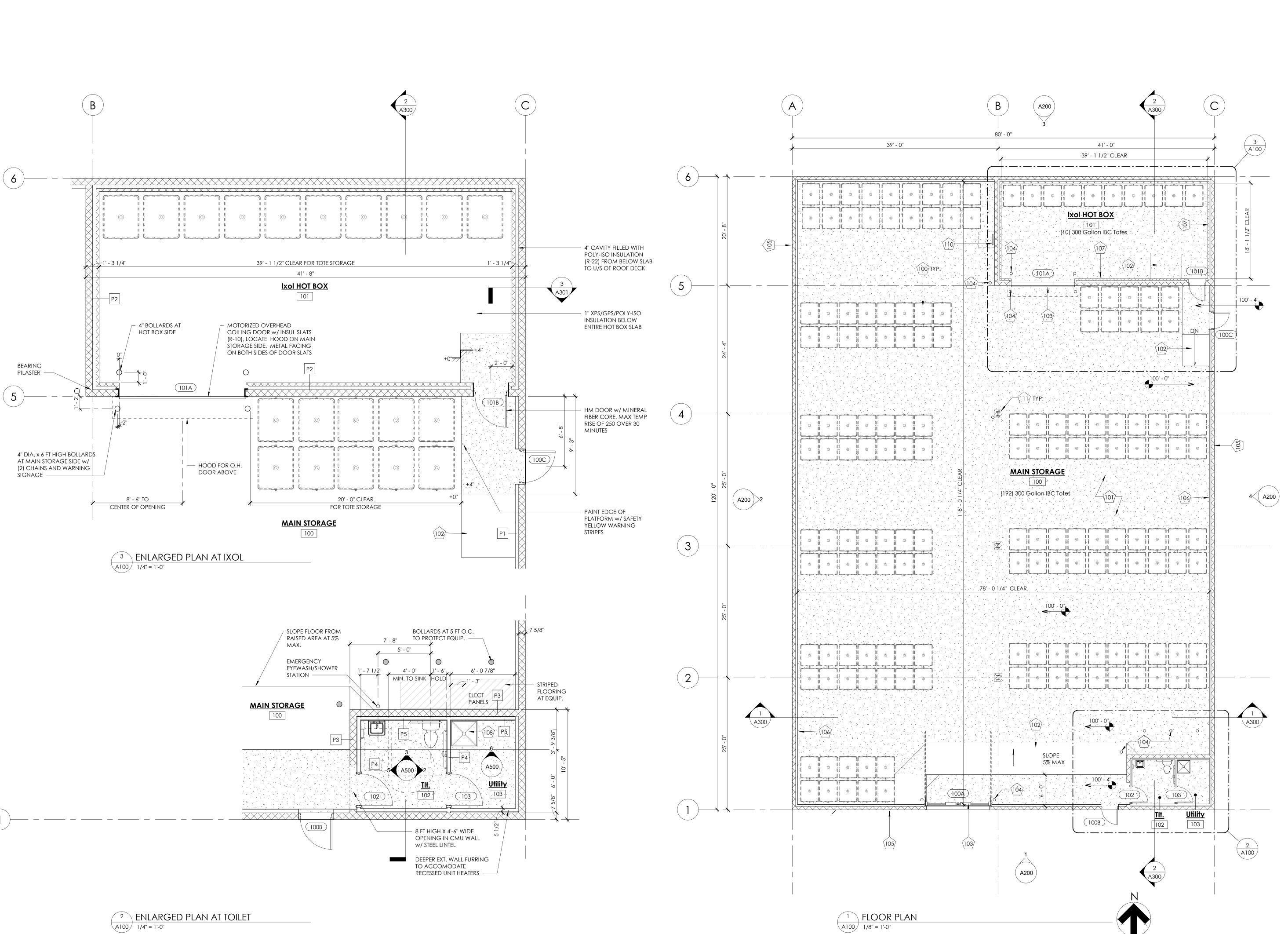
Drive uri 63069 307 Integram [ Pacific, Missou

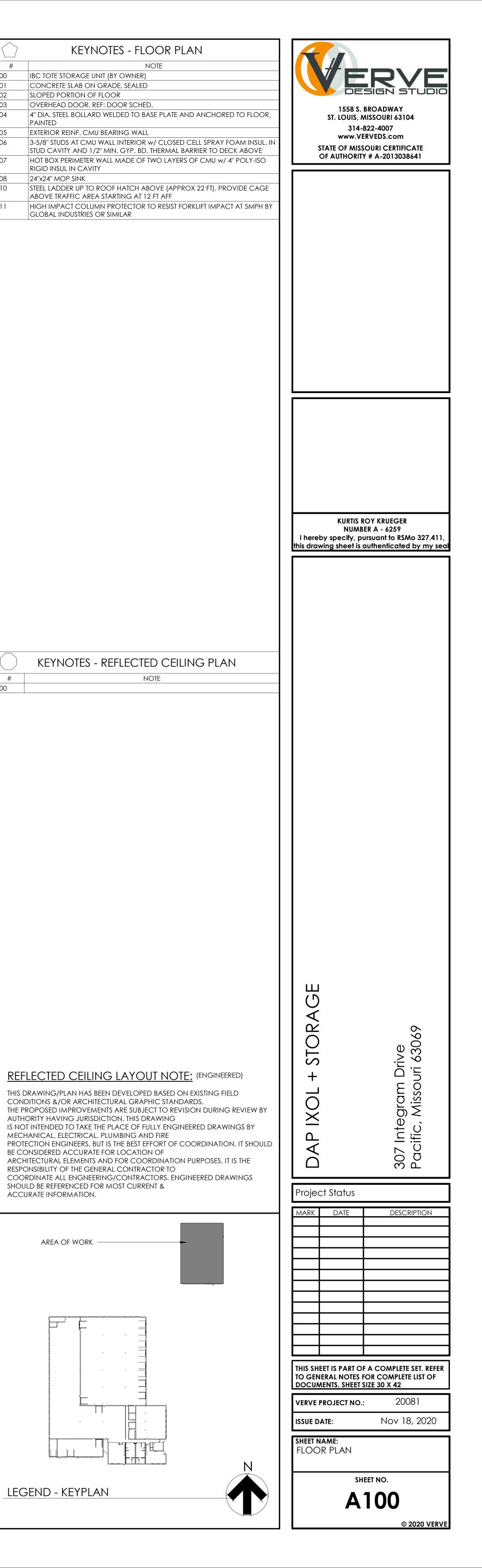


SECTIONS

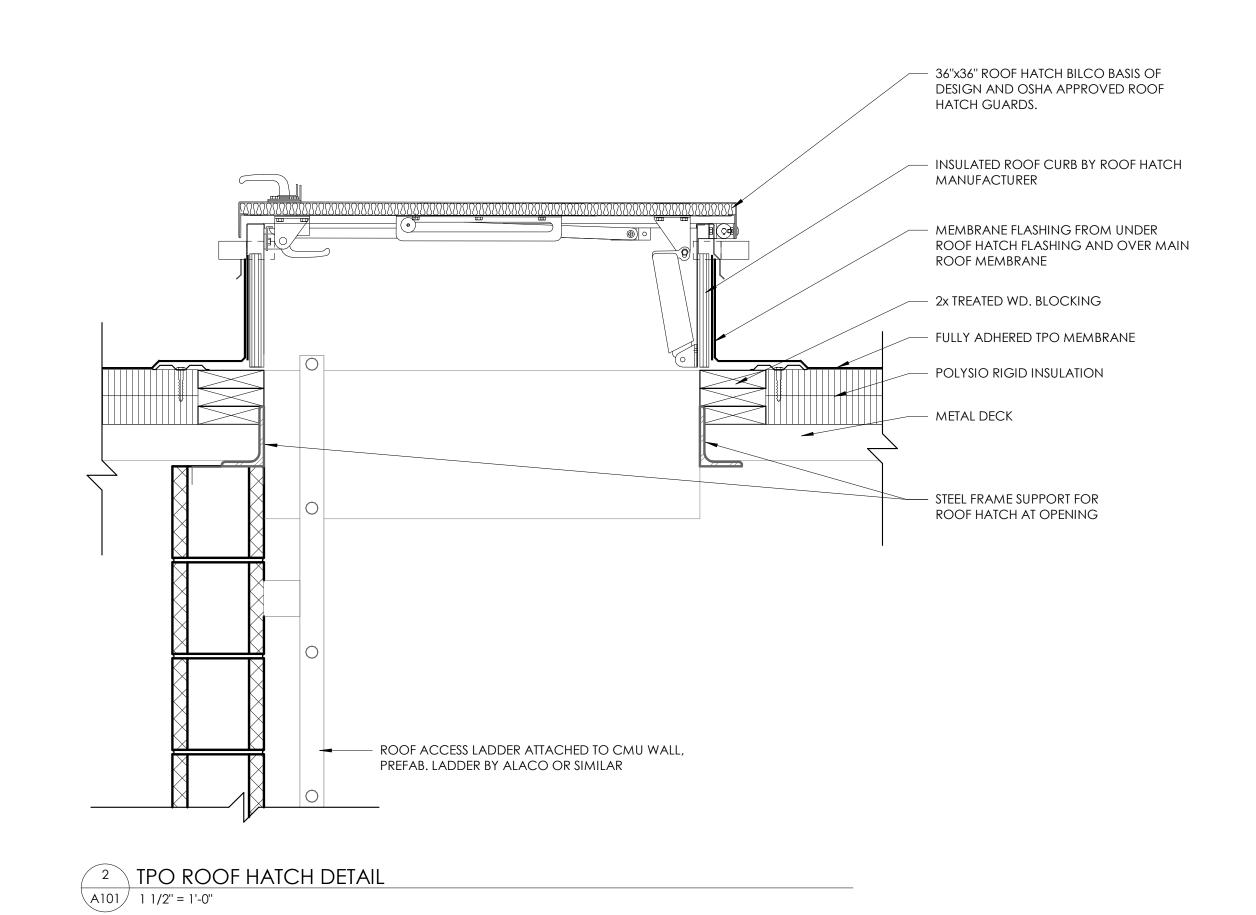
SHEET NO. **S3**.

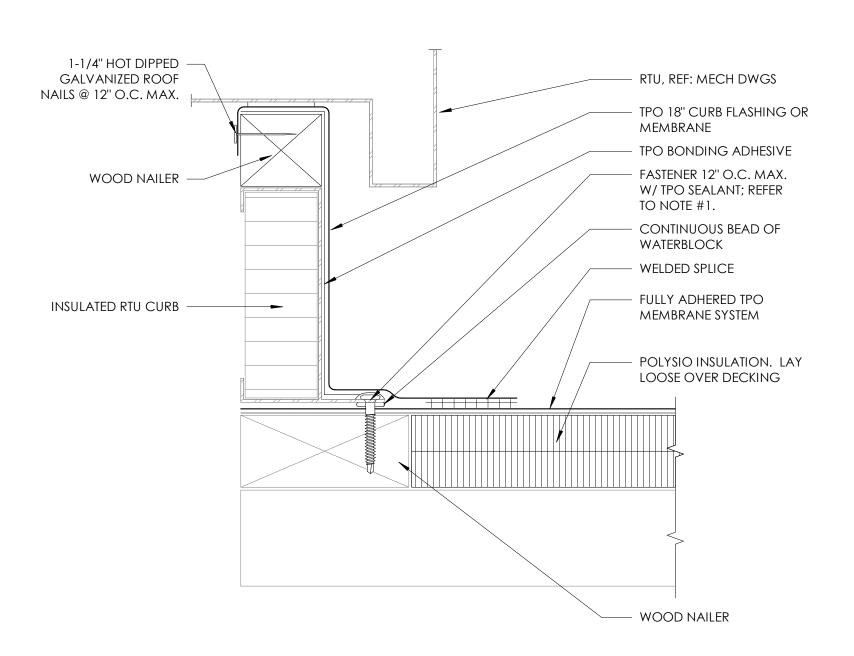






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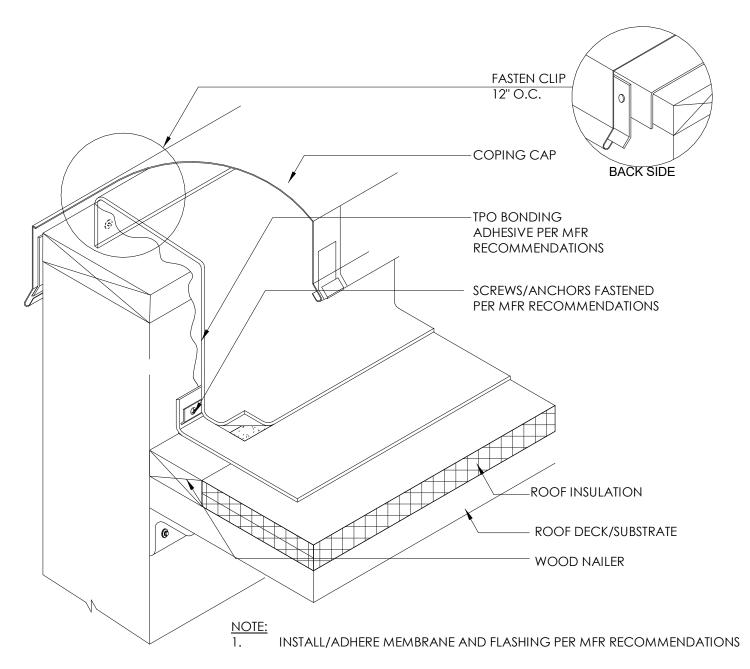




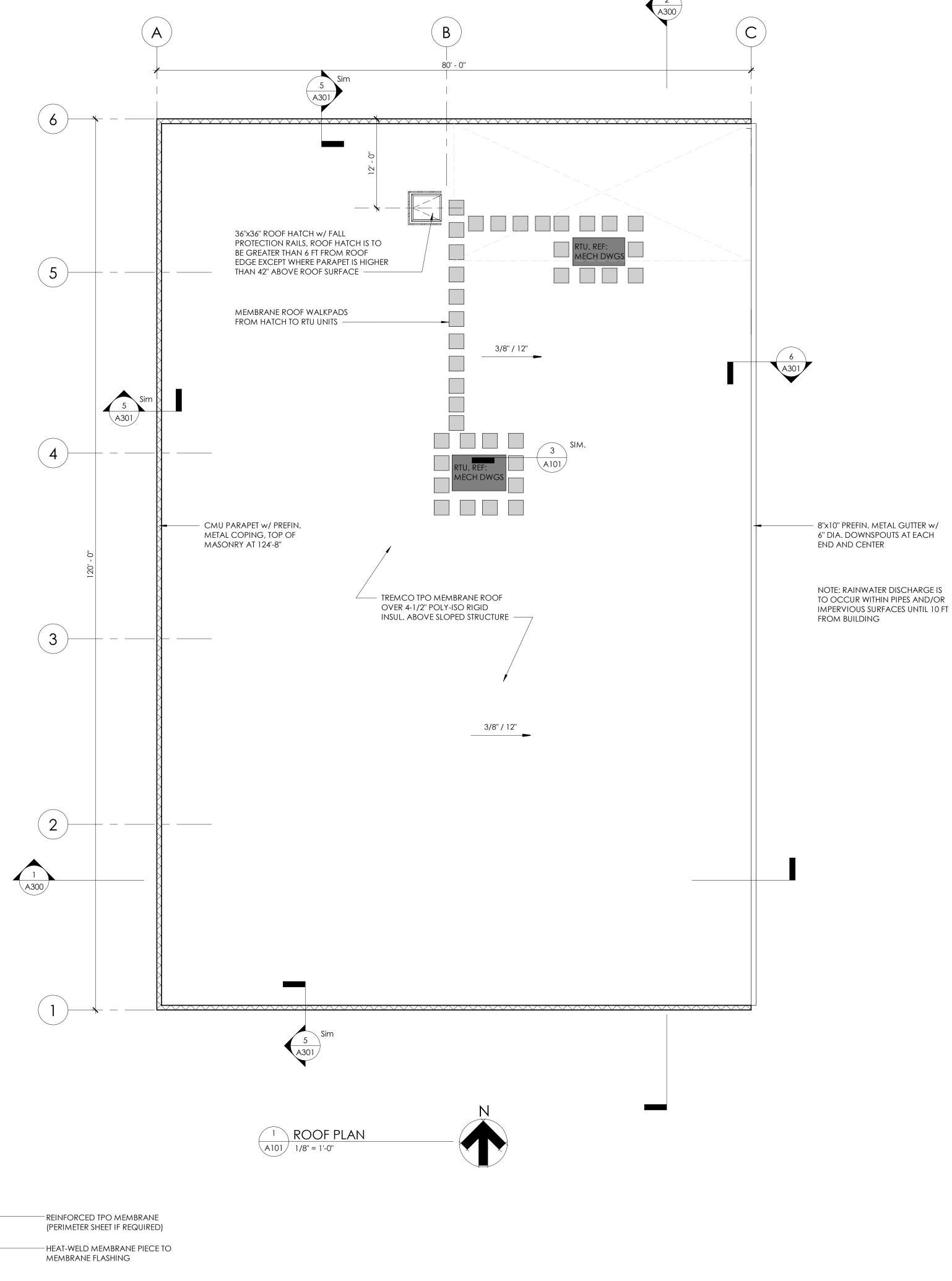
NOTE:

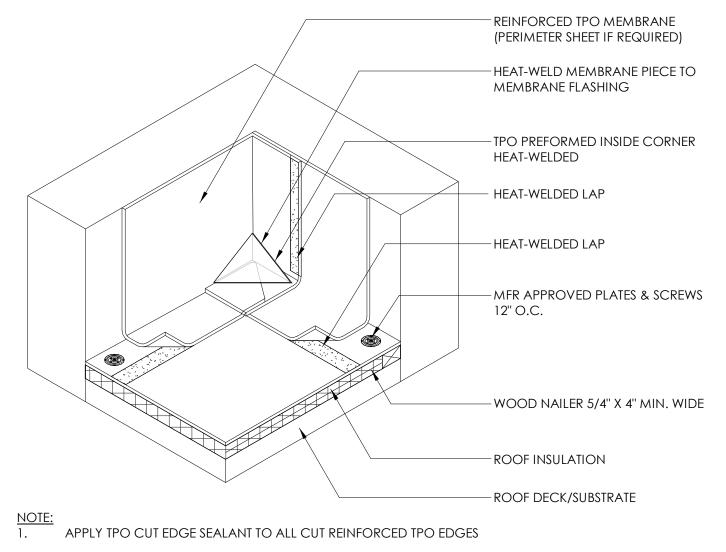
1. FASTENER WITH SEALANT OVER FASTENER HEADS. SEALANT ALSO REQUIRED ALONG ENTIRE EDGE OF CURB FLANGE
2. WOOD NAILER INSTALLED TO MEET APPLICABLE BUILDING CODES.
3. BONDING ADHESIVE REQUIRED BETWEEN MEMBRANE AND INSULATION FOR FULLY ADHERED SYSTEMS

3 TPO RTU DETAIL
A101 6" = 1'-0"



4 TPO PARAPET A101 12" = 1'-0"





5 TPO INSIDE CORNER 12" = 1'-0"

1 10,00	t Status	
MARK	DATE	DESCRIPTION
-		
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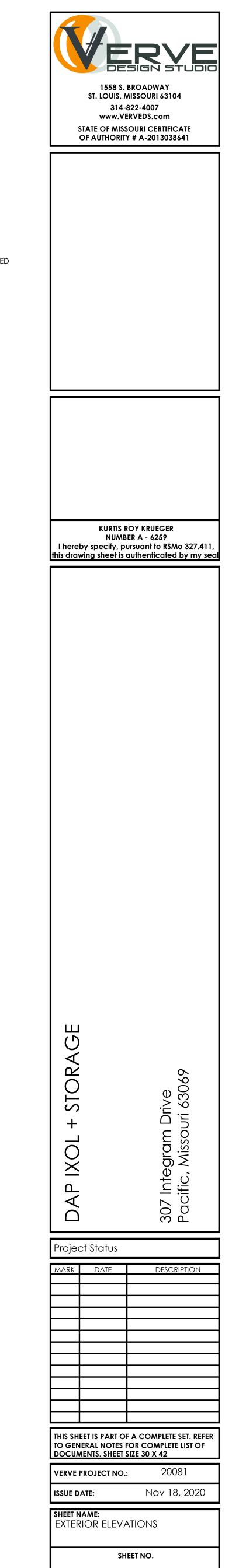
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TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

VERVE PROJECT NO.: 20081

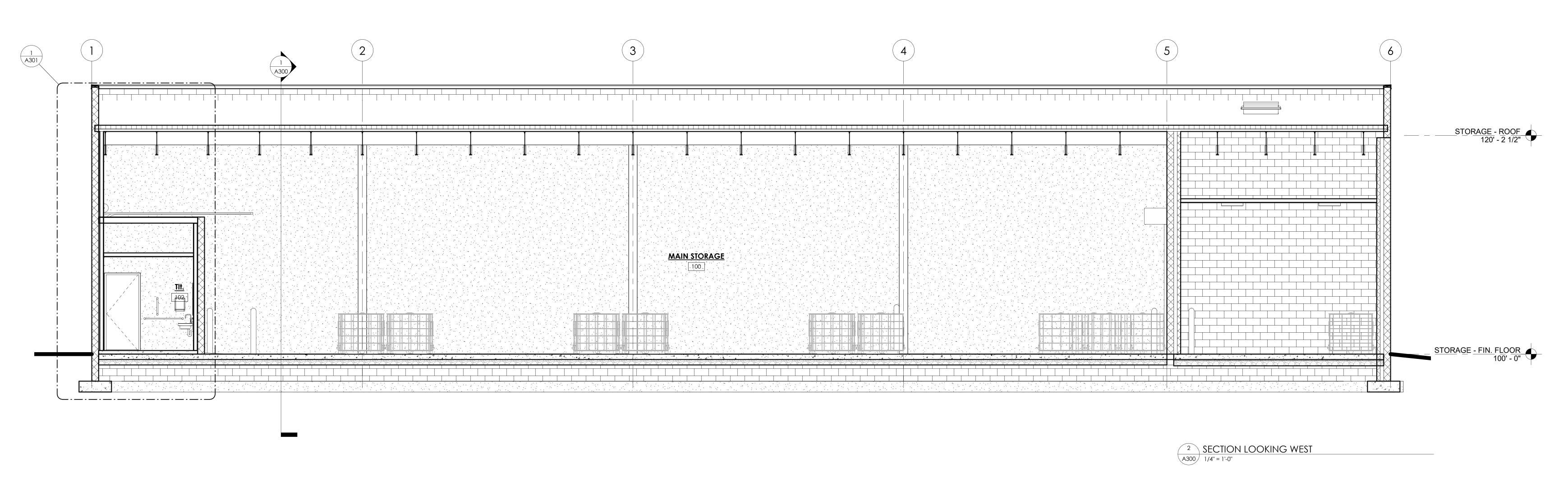
SHEET NAME:
ROOF PLAN & DETAILS

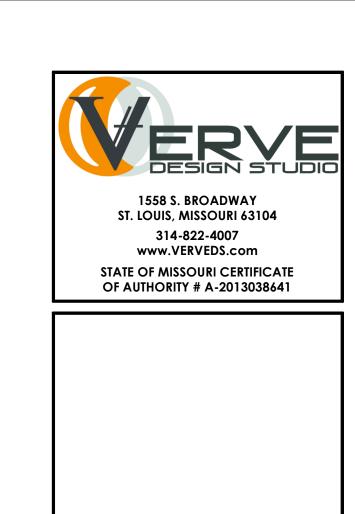
SHEET NO. **A101** 



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SHEET NO. **A200** 





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Pacific, Missouri 63069

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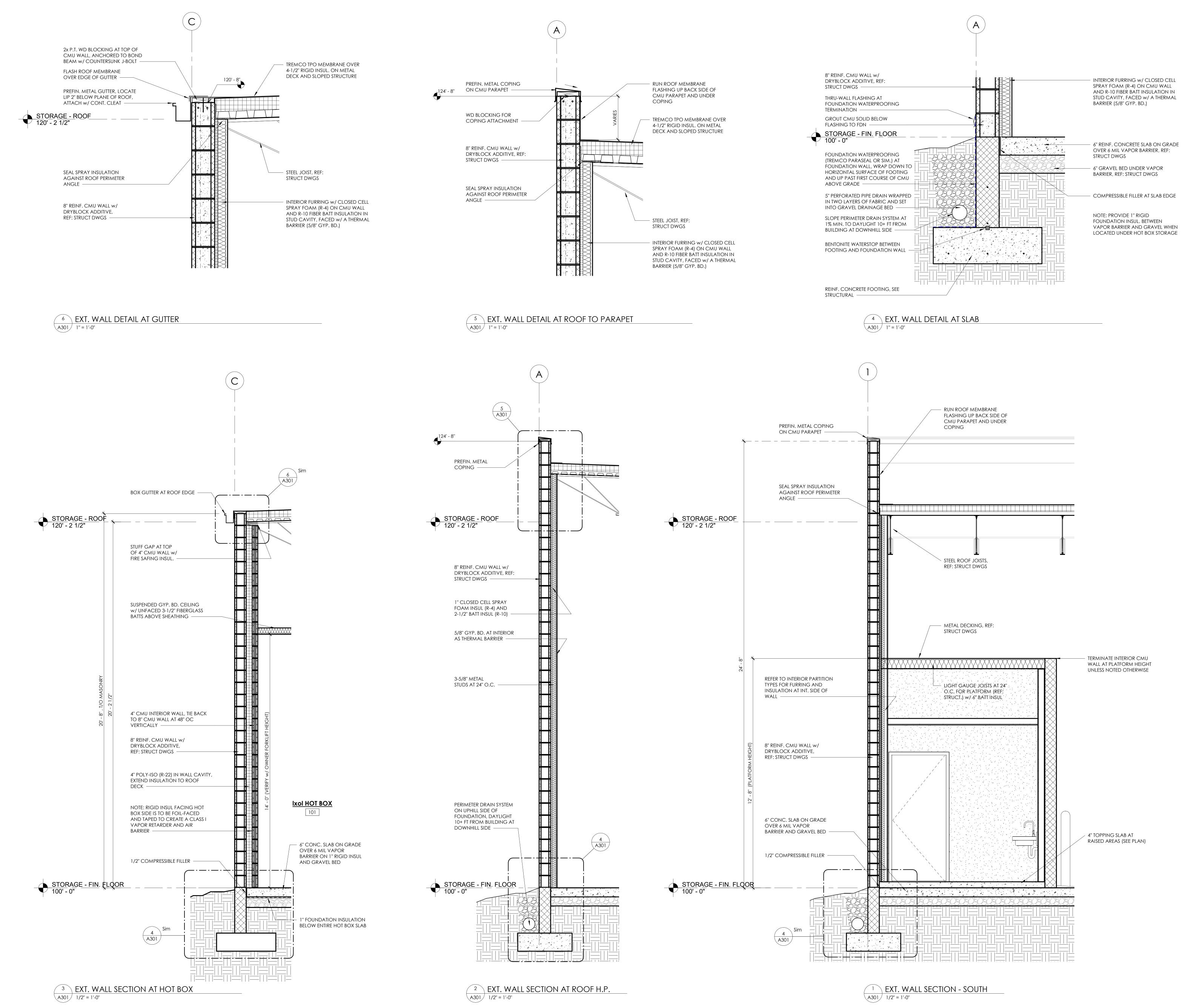
THIS SHEET IS PART OF A COMPLETE SET. REFER TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

VERVE PROJECT NO.: 20081

ISSUE DATE: Nov 18, 2020

SHEET NAME:
BUILDING SECTIONS

SHEET NO. **A300** 





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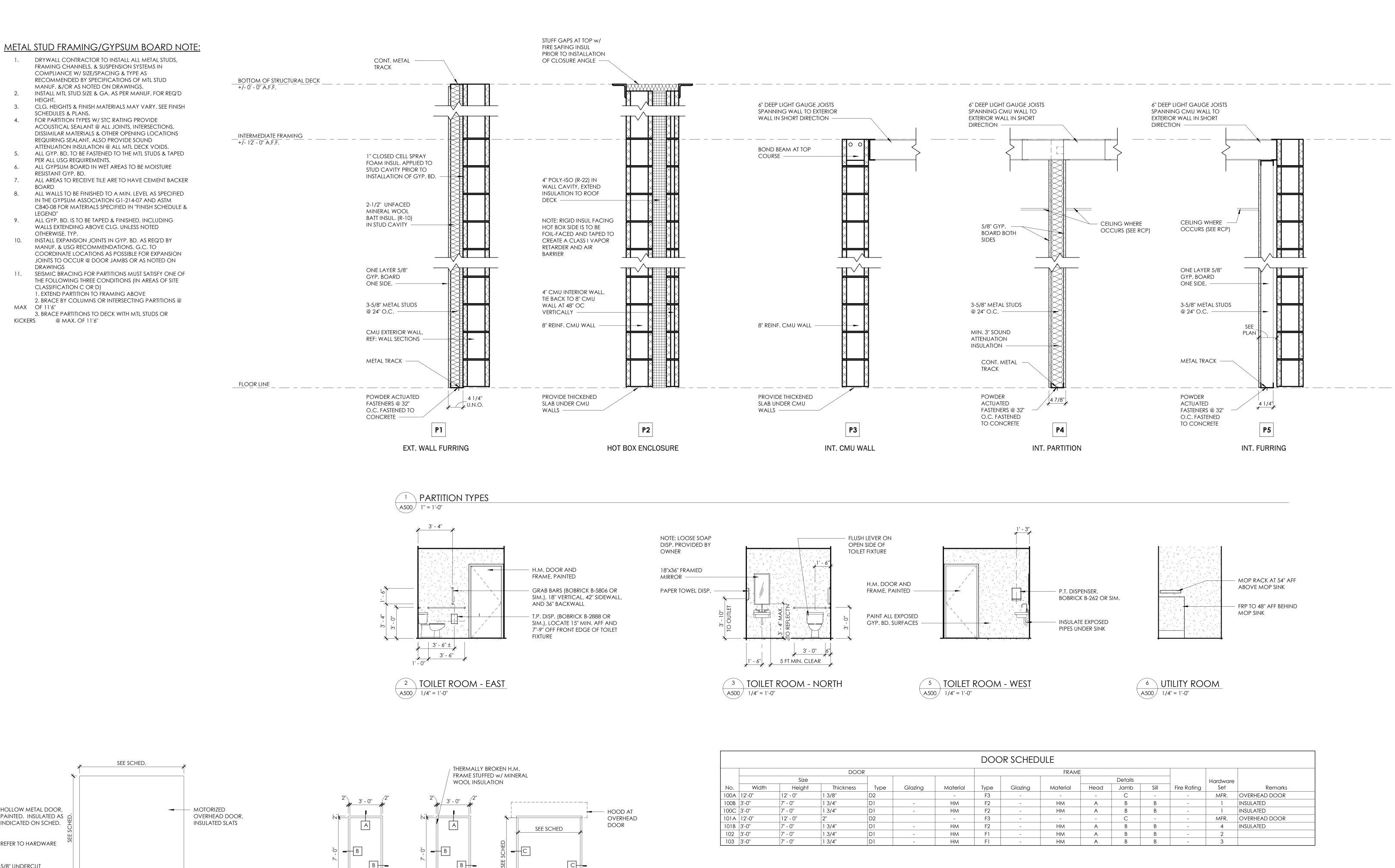
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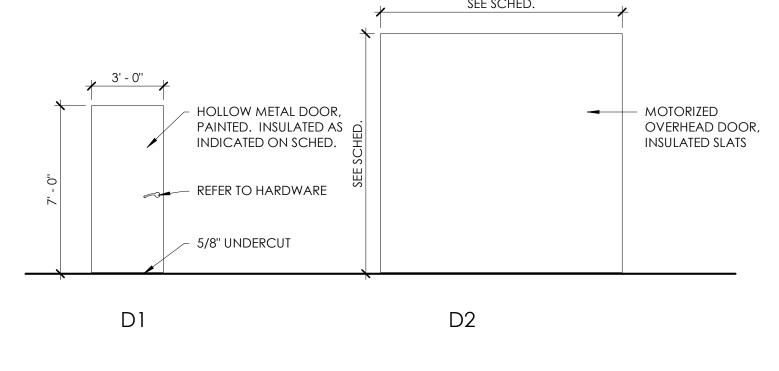
VERVE PROJECT NO.: 20081

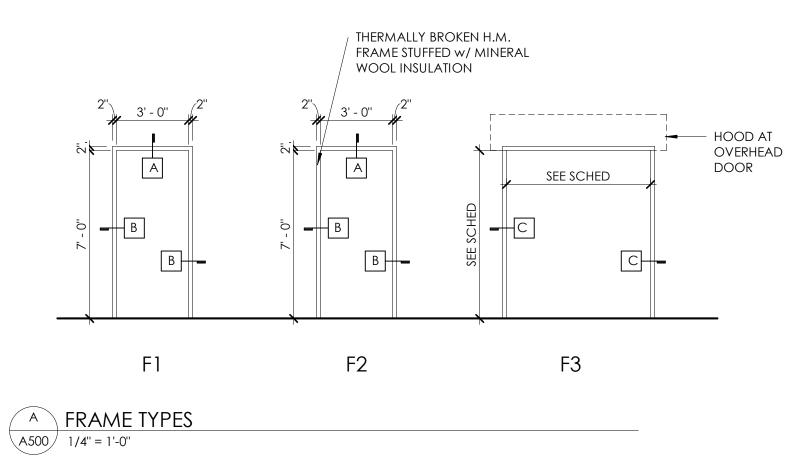
ISSUE DATE: Nov 18, 2020

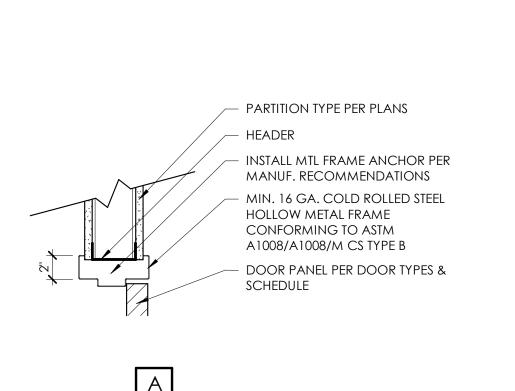
SHEET NAME: WALL SECTIONS

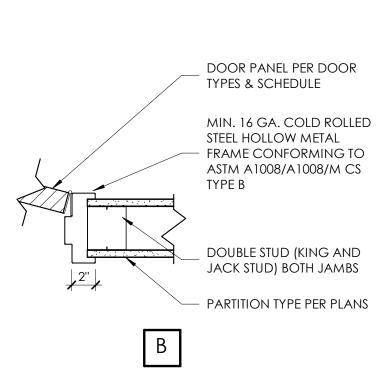
SHEET NO.
A301

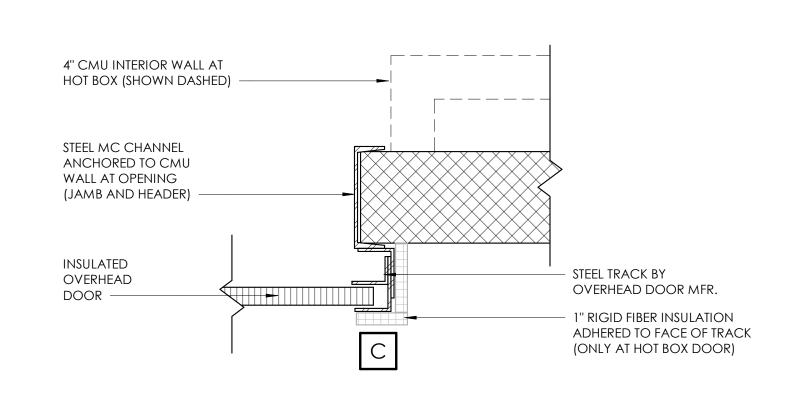












	LATERIOR			
3	Hinges	BB1191 NRP	HGR	630
1	Exit Device	4500 x RIM	HGR	626
1	Trim	45NL x AUG	HGR	626
1	Rim Cylinder	3901 Match Keying	HGR	626
1	Closer	5100 Series HDCS	HGR	689
1	Kick plate	194S 10"x2" LDW	HGR	630
1	Threshold	520SN	HGR	628
1	Weatherstrip	881SN	HGR	628
1	Rain Drip	810S 4" Larger than Door	HGR	628
1	Latch Protector	340D	HGR	630
3	Silencers	308D	HGR	Grey
GROUP #2-	PRIVACY DOORS			
3	Hinges	BB1191 4-1/2"x4-1/2"	HGR	630
1	Lockset	3440 series x AUG	HGR	626
1	Coat Hook	#P27305-CH	Belwith	
1	Wall Stop	236W	HGR	630
3	Silencers	308D	HGR	Grey
GROUP #3 –	STOREROOM/UTILITY			
3	Hinges	BB1191 4-1/2"x4-1/2"	HGR	630
1	Lockset	3480 series x AUG	HGR	626
1	Wall Stop	236W	HGR	630
3	Silencers	308D	HGR	Grey
GROUP #4-	HOT BOX MAN-DOOR			
3	Hinges	BB1191 4-1/2"x4-1/2"	HGR	630
1	Exit Device	4500 x RIM	HGR	626
1	Trim	45NL x AUG	HGR	626
1	Closer	5100 Series HDCS	HGR	689
	* REGULAR ARM INS	TALLATION (PULL SIDE)		
1	Kick plate	194S 10"x2" LDW	HGR	630
1	Threshold	421\$	HGR	628
	Weatherstrip	881SN	HGR	628

BASIS OF DESIGN EQUAL SUBSTITUTIONS WILL BE ACCEPTED. VERIFY EXISTING BUILDING STANDARD DOOR HARDWARE AND CORE SETS. COORDINATE W/ OWNER FOR INSTALLATION OF CORES

HARDWARE SETS:

GROUP #1 – EXTERIOR

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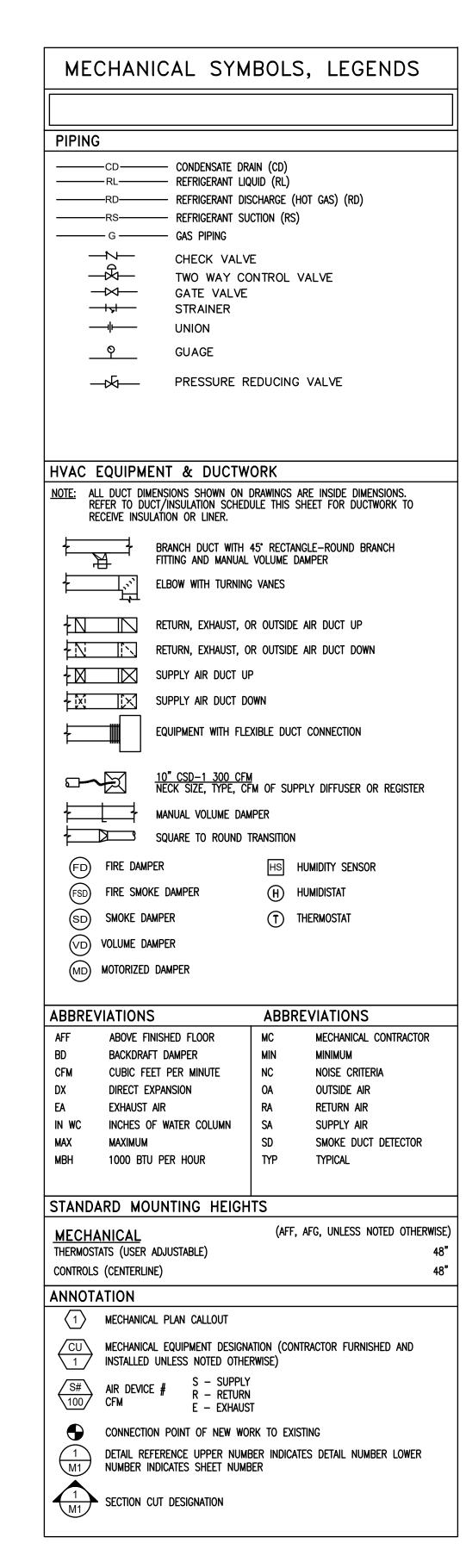
TO GENERAL NOTES FOR COMPLETE LIST OF **VERVE PROJECT NO.:** 

Nov 18, 2020 **ISSUE DATE:** PARTITION TYPES & DETAILS

SHEET NO.

B FRAME DETAILS A500 1 1/2" = 1'-0"

C DOOR TYPES
A500 1/4" = 1'-0"



)EMARKO
)EMARKO
REMARKS
THRU 7
THRU 7

						FFLISI	FR	REGIS	STFR	ΔΝΓ	CRILLE S	CHED	III F						
	DIFFUSER, REGISTER, SUPPLY DIFFUSERS									_		AUST / RETI	URN /	TRA	NSFER	R GR	ILLES		
CFM PLAN MARK	MANUFACTURER & MODEL NO.	NECK SIZE	FACE SIZE	MOUNT	MATE- RIAL	ACCES- SORIES	FINISH	TYPE	NOTES	PLA MAR	MODEL NO	NECK SIZE	FACE SIZE	MOUNT	MATE- RIAL	ACCES- SORIES	FINISH	TYPE	NOTES
S1	LIMA MODEL 602	24x24	25-1/2 x 25-1/2	SURFACE	AL	MLDPR	BWE	DD	1										
S2	LIMA MODEL 633	12x6	13-1/2 x 7-1/2	SURFACE	ST	MLDPR	BWE	DD	1										
																			<u> </u>
2. P	INGS ROVIDE ROUND TO REC HERE REQUIRED. ROVIDE 1" FILTER FRAI INGE AND TURN SCREV	ME WITH	COLLAR ST AL	<b>TERIAL</b> — STEEL  — ALUMIN	IUM	<b>FINISH</b> BWE —	BAKED	WHITE ENA	AMEL	M O	CCESSORIES  LDPR — MULTI—LOUVE  BD — OPPOSED BLADI  LTR — 1" DISPOSABLE	E DAMPER				DSC — DI EGG — E			

	EXHAUST FAN SCHEDULE										
MARK EF #	MFR	MODEL	СҒМ	VOLT/PH	HP	SERVES	ACCESSORIES	WEIGHT (LBS)	NOTES		
EF-1	COOLAIR	CBL24HE1231	4000	120/1	1/3	TOTE STORAGE	BD, DS, VI	-	-		
EF-2	COOLAIR	CBL24HE1231	4000	120/1	1/3	TOTE STORAGE	BD, DS, VI		_		
EF-3	COOLAIR	CBL24HE1231	4000	120/1	1/3	TOTE STORAGE	BD, DS, VI		-		
EF-4	соок	GN-148	200	120/1	34 W	RESTROOM AND JANITOR	BD, CG, DS	12	1		
<u>NOTES:</u> 1. PROV	IDE WALL LOUVE	R				ACCESSORIES:  BD — BACKDRAFT DAMPER  DS — DISCONNECT SWITCH  CG — CEILING/WALL GRILLE  VI — VIBRATION ISOLATORS  WS — WALL SWITCH ON/OFF					

		L	.OUVER	SCH	EDULE		
MARK	MFR.	MODEL NO.	LISTED SIZE LxW (IN.)	FREE AREA (%)	WATER PENTRATION (FPM)	SERVICE	NOTES
L-1	RUSKIN	CFL-D-4	48×48	7.31	924	INTAKE	1,2
L-2	RUSKIN	CFL-D-4	48×48	7.31	924	INTAKE	1,2
L-3	RUSKIN	CFL-D-4	48×48	7.31	924	INTAKE	1,2
NOTES:	RLOCK OPEN	AND CLOSE OF	PERATION OF MO	TORIZED DA	MPER WITH THE ON/OFF	OPERATION	

2. LOUVER SHALL BE PROVIDED WITH A FACTORY PROVIDED 70% PVDF BLACK PAINT FINISH. PROVIDE

3. PROVIDE GRAVITY BACKDRAFT DAMPER. DAMPER SHALL HAVE AN AIR LEAKAGE RATE NO GREATER THAN

OF EACH EXHAUST FAN (EF-1, EF-2, & EF-3).

WITH BIRDSCREEN.

20 CFM/SF.

MECHANICAL GENERAL NOTES

#### <u>SCOPE</u>

- PROVIDE COORDINATION DRAWINGS: PRIOR TO CONSTRUCTION PROVIDE COORDINATION SHOP DRAWINGS. DRAWINGS SHALL SHOW THAT THERE WILL NOT BE ANY INTERFERENCE WITH BUILDING STRUCTURE, MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION COMPONENTS AS INDICATED ON CONSTRUCTION DOCUMENTS.
- PROVIDE COORDINATION AND AS-BUILT DRAWINGS: DURING CONSTRUCTION, AS WORK PROCEEDS, MAINTAIN AS-BUILT MARK-UPS OF ACTUAL INSTALLATION. AT CONSTRUCTION COMPLETION AND PRIOR TO TURNOVER TO OWNER, PROVIDE FINAL MARK-UPS IN PDF FORMAT TO ARCHITECT AND
- PROVIDE FINAL CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS, AS NOTED (GAS FIRED EQUIPMENT, ETC.).

#### PROTECTION OF WORK AND PROPERTY

1. PROTECT ALL WORK FROM DAMAGE AND PROTECT THE OWNER'S PROPERTY FROM DAMAGE OR LOSS ARISING FROM CONTRACTOR'S WORK.

#### DRAWINGS AND SPECIFICATIONS

DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW GENERAL LOCATIONS OF PIPES, DUCTS, CONDUITS, FIXTURES, AND EQUIPMENT AND THE METHODS OF CONNECTING AND CONTROL. IT IS NOT INTENDED TO SHOW EVERY CONNECTION IN DETAIL OR ALL FITTINGS REQUIRED FOR A COMPLETE SYSTEM. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR EXACT LOCATION OF DOORS, WINDOWS, LIGHTS, PRIOR TO INSTALLING EQUIPMENT, PIPE, OR FABRICATING DUCT, COORDINATE PROPOSED LOCATIONS OF EQUIPMENTS, PIPE, AND DUCT WITH GC AND OTHER TRADES. RESOLVE ALL CONFLICTS WITH GC AND OTHER TRADES PRIOR TO PROCEEDING.

#### <u>CONTROLS</u>

PROVIDE COMPLETE EQUIPMENT CONTROLS, INCLUSIVE OF ALL COMPONENTS, VOLTAGES, PROGRAMMING, WIRING, FOR COMPLETE AND OPERATIONAL SYSTEMS. MOUNT THERMOSTATS AND SWITCHES 4'-0" ABOVE FINISHED FLOOR. PRIOR TO MOUNTING, COORDINATE THERMOSTAT LOCATION(S) WITH FINAL FIXTURES AND EQUIPMENT. DO NOT MOUNT THERMOSTATS IN DIRECT SUNLIGHT, IN DISCHARGE OF SUPPLY GRILLE(S), NEAR HEAT PRODUCT APPLIANCES OR EQUIPMENT, OR ON EXTERIOR WALLS. IF EXTERIOR WALL MOUNTING IS NECESSARY, PROVIDE INSULATED MOUNTING BASE. WHERE THERMOSTAT LOCATION IS SUBJECT TO DAMAGE, PROVIDE LOCKABLE HIGH-IMPACT GUARD.

DO NOT INSTALL PVC PIPING IN PLENUM AREAS. 2. STEEL GAS PIPING ON BUILDING EXTERIOR SHALL BE PAINTED WITH TWO (2) COATS OF RUST INHIBITING PAINT.

### SHOP DRAWINGS

1. SUBMIT SHOP DRAWINGS ON SCHEDULED AND NOTED EQUIPMENT AND MATERIALS. **DUCT INSULATION** 

#### 1. SEE SPECIFICATIONS, SEE SCHEDULES. FIRE AND FIRE-SMOKE DAMPERS

FIRE AND FIRE-SMOKE DAMPERS PROVIDE FIRE DAMPERS AND/OR FIRE SMOKE DAMPERS AT DUCT PENTRATIONS OF RATED ASSÉMBLIES AND AS REQUIRED BY AHJ. REFER TO ARCHITECTURAL DRAWINGS FOR ASSEMBLY RATINGS. PROVIDE ACCESS

PANELS OF ADEQUATE SIZE TO FACILITATE SERVICE ACCESS OF DAMPER.

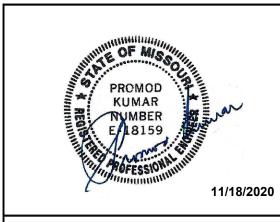
IN LIEU OF ACCESS PANELS, A REMOVABLE DUCT SECTION IS ACCEPTABLE.

## FINAL ACCEPTANCE

1. ALL FILTERS SHALL BE REPLACED AND ALL STRAINERS SHALL BE CLEANED AFTER START UP AND COMMISSIONING AND PRIOR TO FINAL ACCEPTANCE.



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PROMOD KUMAR **NUMBER E-18159** I hereby specify, pursuant to RSMo 327.411, this drawing sheet is authenticated by my seal.

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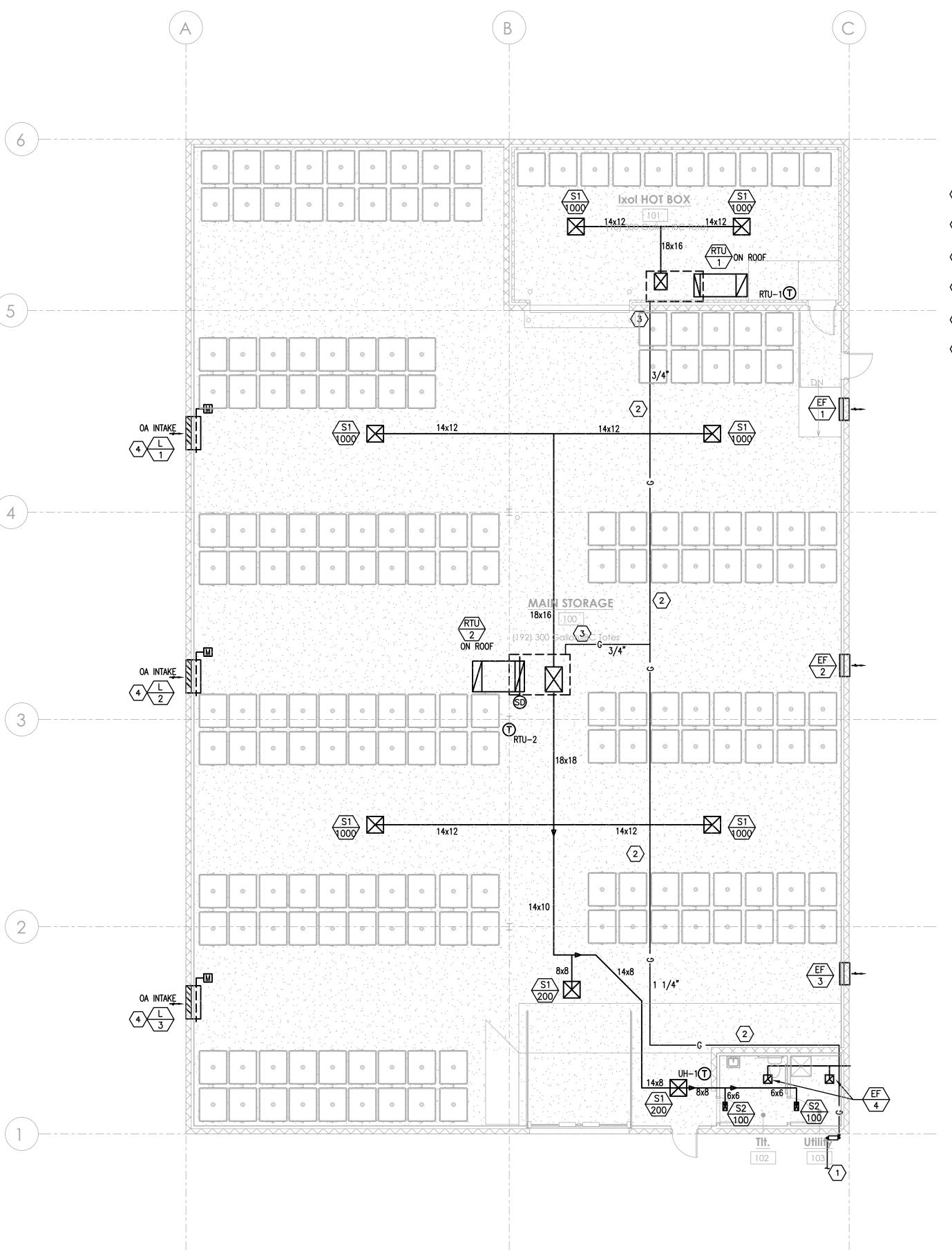
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		EET IS PART O		
		<b>ERAL NOTES F</b>		TE LIST OF
	DOCUM	ENTS. SHEET S	SIZE 30 X 42	

VERVE PROJECT NO.: 20033 ISSUE DATE: NOVEMBER 18, 2020

ABBREVIATIONS AND SCHEDULES

SHEET NAME:

M-01



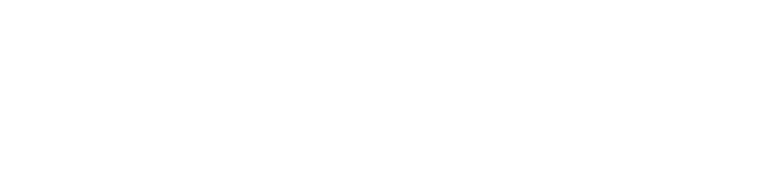
FLOOR PLAN - DUCTWORK AND RTU

1/8" = 1'-0"

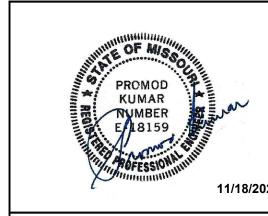
MECHANICAL KEYED NOTES:

- PROVIDE NEW GAS METER 2#. PROVIDE SHUT-OFF VALVE. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- 2 1-1/4 GAS PIPING ON ROOF AND PROVIDE GAS PIPING SUPPORT ON ROOF. GAS PIPING TO BE SCH. 40 WELDED PIPE. SEE "B" GAS PIPING SUPPORT DETAIL ON SHEET M-03.
- 3/4" GAS PIPING TO RTU AND PROVIDE LBS TO INCHES REGULATOR AND SHUT OFF VALVE. SEE "C" RTU CURB AND PIPING DETAIL ON SHEET M-03
- PROVIDE 30x18 LOUVER WITH MOTORIZED DAMPER. SEE LOUVER SCHEDULE ON SHEET M-01.

  PIPING WORK RELATED TO STORAGE TANKS IN MAIN BUILDING TO BE COORDINATED WITH
- PIPING WORK RELATED TO STORAGE TANKS IN MAIN BUILDING TO BE COORDINATED WITH OWNER.
- ALL PIPING TO GAS-FIRED EQUIPMENT SHALL BE FURNISHED AND INSTALL BY THIS CONTRACTOR. ALL PIPING TO BE IN ACCORDANCE WITH LOCAL CODES, NFPA-54, UPC-1985, ETC. ALL GAS PIPING TO BE INSTALLED IN ACCORDANCE WITH NFPA-54 AND LOCAL CODES AND REGULATIONS. ALL GAS PIPING SHALL BE SCHEDULE 40 BLACK OR GALVANIZED STEEL WITH BLACK OR GALVANIZED MALLEABLE SCREWED FITTINGS. FITTINGS LARGER THAN TWO INCHES (2") SHALL BE WELDED. PROVIDE UNION AND GAS SHUT-OFF VALVE TO EACH PIECE OF GAS-FIRED EQUIPMENT OR APPLIANCE. ALL PIPE SHALL BE SCHEDULE 40 STEEL WITH MALLEABLE FITTINGS AND USE TEFLON TAPE ON ALL THREADED JOINTS.







PROMOD KUMAR
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<u> </u>	307 In	Pacific

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TO GENERAL NOTES FOR COMPLETE LIST OF
DOCUMENTS. SHEET SIZE 30 X 42

VERVE PROJECT NO.: 20033

ISSUE DATE: NOVEMBER 18, 2020

SHEET NAME: MECHANICAL PLAN

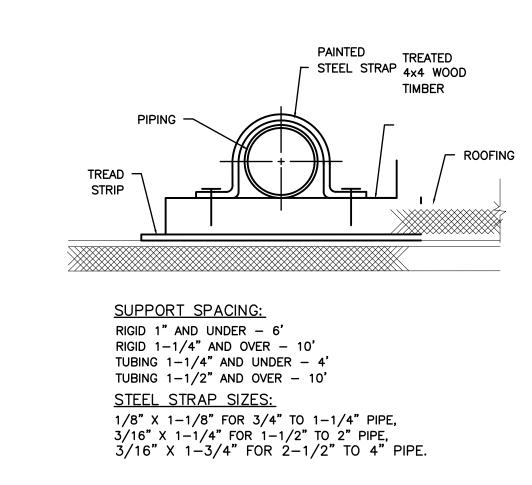
SHEET NO.

M-02

2020 VERVE



- THIS DETAIL IS APPLICABLE FOR FLEXIBLE ROUND DUCT TAKE-OFFS FROM BRANCH DUCTS TO DIFFUSERS.
- 2. FLEXIBLE DUCT INSULATION SHALL TERMINATE AT SIDE OF BRANCH DUCT SO NO UNINSULATED METAL PARTS
- 3. SIDE TAP FITTING SHALL BE FLEX MASTER U.S.A, INC. OR APPROVED EQUAL, NUMBER FLD WITH DAMPER.

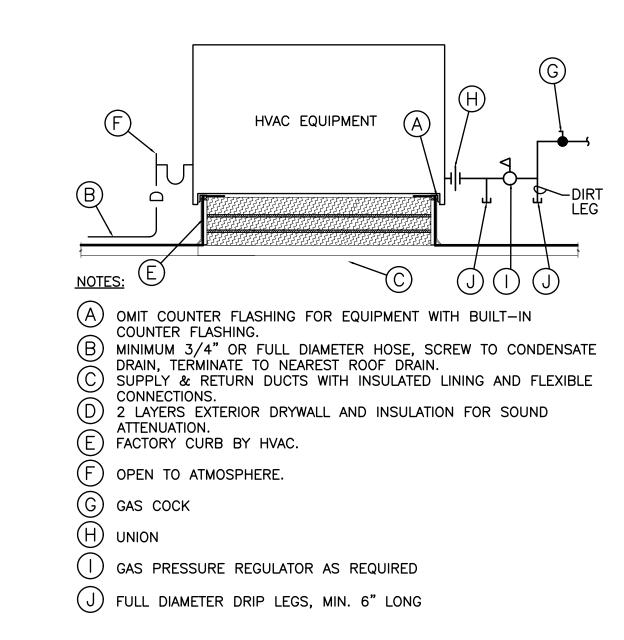


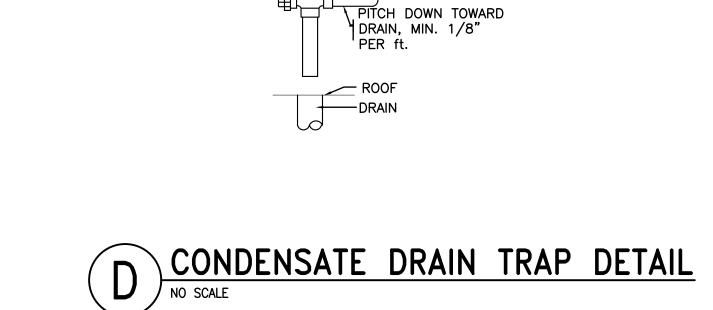
FLEXIBLE DUCT CONNECTION TO BRANCH
NO SCALE



CONDENSATE DRAIN
TRAP WITH
SUFFICIENT TRAP
SEAL TO OFFSET
PRESSURE AT
DRAIN PAN.

DRAIN LINE SHALL BE AT LEAST THE SAME SIZE AS THE NIPPLE ON THE





C.O. @ EVERY CHANGE IN DIRECTION GREATER THAN 45 AND AT MAX. OF 25 INTERVALS.

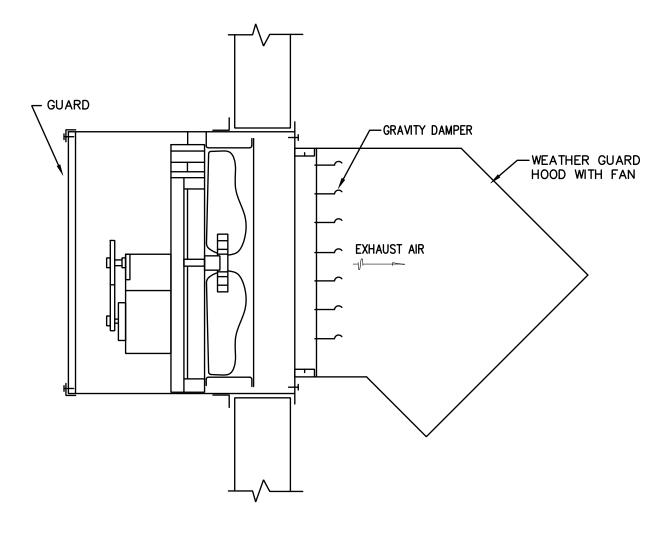
OPEN NIPPLE ABOVE |----TOP OF DRAIN PAN.

PIPE TO GUTTER

T.S.P. OF FAN PLUS |-1" WATER

RTU CURB AND PIPING DETAIL

NO SCALE



E SIDEWALL EXHAUST FAN DETAIL
NO SCALE



1558 S. BROADWAY ST. LOUIS, MISSOURI 63104

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PROMOD KUMAR
NUMBER E-18159
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this drawing sheet is authenticated by my seal.

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THIS SHEET IS PART OF A COMPLETE SET. REFE
TO GENERAL NOTES FOR COMPLETE LIST OF
DOCUMENTS. SHEET SIZE 30 X 42

ISSUE DATE: NOVEMBER 18, 2020

SHEET NAME: MECHANICAL PIPING SCHEMATIC

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VERVE PROJECT NO.: 20033

M-03

ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH ALL APPLICABLE CODES AND THE LANDLORD'S MINIMUM REQUIREMENTS AS STATED HEREIN OR OTHERWISE INDICATED BY THE LANDLORD.

NOTE: MANUFACTURERS' NAMES ON WHICH THIS SPECIFICATION IS BASED

SEE ARCHITECTURAL GENERAL AND SPECIAL CONDITIONS. ALL CONDITION REQUIREMENTS SHALL APPLY UNLESS OTHERWISE NOTED.

ALL WORK SHALL BE PERFORMED AS INDICATED ON DRAWINGS UNLESS FIELD CONDITIONS REQUIRE MINOR CHANGES BE MADE. MINOR CHANGES SHALL BE MADE WITH NO ADDITIONAL COST.

AFTER FINAL ACCEPTANCE OF THE WORK BY THE OWNER.

ACTUAL LOCATIONS OF LANDLORD'S SERVICES MUST BE FIELD VERIFIED. CHANGES TO CONFORM TO ACTUAL POINTS OF

CONNECTION SHALL BE MADE AT NO ADDITIONAL COST.

ALL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR

CONTRACTOR SHALL PREPARE AND SUBMIT AS—BUILT DRAWINGS TO THE TENANT AND THE LANDLORD. AS—BUILT DRAWINGS SHALL INDICATE THE ACTUAL MANUFACTURER OF THE EQUIPMENT THAT WAS INSTALLED, THE EXACT LOCATION OF THE EQUIPMENT AND PERTINENT CAPACITIES FOR HEATING, COOLING, ETC.

EQUIPMENT, FIXTURES, AND ACCESSORIES SHALL NOT BE SUPPORTED FROM CEILING, SOFFIT, NEUTRAL PIERS, PIPING, DUCTWORK, METAL ROOF DECK, LATERAL BRACING, BRIDGING OR CONDUIT. ITEMS SHALL ONLY BE SUPPORTED FROM STRUCTURE WHICH HAS BEEN APPROVED BY THE LANDLORD FOR SUPPORT.

ALL ROOF WORK PENETRATIONS AND REPAIRS SHALL BE TOTALLY PERFORMED BY ONLY THOSE ROOFING CONTRACTORS APPROVED BY THE LANDLORD. THIS CONTRACTOR SHALL ONLY EMPLOY ROOFING CONTRACTORS APPROVED BY THE LANDLORD FOR ALL ROOF WORK REQUIRED BY THE TENANT'S APPROVED DESIGN.

INSTALLATION OF ROOF MOUNTED EQUIPMENT SHALL BE COORDINATED WITH THE LANDLORD'S DESIGNATED REPRESENTATIVE.

DEFICIENCIES AND NON-CONFORMING ITEMS SHALL BE CORRECTED BY THE CONTRACTOR. FAILURE TO CORRECT SUCH ITEMS SHALL PERMIT THE LANDLORD TO CORRECT SAME AT A COST TO THE CONTRACTOR.

INSTALLATIONS OF EQUIPMENT, i.e. FANS, AIR HANDLING UNITS, ETC., SHALL CONFORM TO THE LANDLORD'S STANDARD DETAILS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FAMILIARIZE HIMSELF WITH THE LANDLORD'S MINIMUM STANDARDS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL PERMITS AND PAYING FOR SAME. HE SHALL INCLUDE IN HIS BID CHARGES FOR ALL FEES ASSOCIATED WITH THE CONSTRUCTION OF THE SPACE INCLUDING BUT NOT LIMITED TO LOCAL, COUNTY, OR STATE SERVICE CHARGES AND PERMIT FEES, AND LANDLORD'S UTILITY AND/OR EQUIPMENT CHARGES.

THE SCOPE OF WORK OF THIS CONTRACT INCLUDES, BUT SHALL NOT BE LIMITED TO:

- A. PROVIDE AND INSTALL ALL EQUIPMENT, APPLIANCES, CONTROL DEVICES, ACCESSORIES, MATERIAL AND LABOR.
- B. PROVIDE AND INSTALL ALL DUCTWORK, INSULATION, AIR DEVICES, DUCT ACCESSORIES, MATERIAL AND LABOR.
- C. PROVIDE AND INSTALL ALL PIPING, FITTINGS, VALVES,
- INSULATION, ACCESSORIES, MATERIAL AND LABOR.
- D. PROVIDE AND INSTALL EXHAUST SYSTEM(S) INDICATED.
   E. PROVIDE AND INSTALL ALL ROOF WORK, INCLUDING EQUIPMENT SUPPORTS, ROOF PENETRATIONS, PATCHING AND
- F. PROVIDE ALL EQUIPMENT SUPPORTS AND HANGERS INCLUDING ANY AUXILIARY STEEL REQUIRED. ANY STRUCTURAL MODIFICATION TO THE BUILDING STRUCTURE SHALL BE MADE ONLY WITH THE WRITTEN APPROVAL OF THE LANDLORD.
- G. CLEAN, TEST AND PUT INTO SERVICE ALL SYSTEMS SPECIFIED.

  H. PROVIDE A BALANCE REPORT PREPARED BY AN INDEPENDENT
- I. WARRANTY ALL WORK AND MATERIALS HEREIN SPECIFIED FOR A PERIOD OF NOT LESS THAN ONE YEAR.

AABC OR NEBB CERTIFIED AIR BALANCE CONTRACTOR.

J. PROVIDE AS-BUILT DRAWINGS

WATERPROOFING OF ROOF.

## 15.2 EXECUTION

ACCESSIBILITY — ALL EQUIPMENT SHALL BE INSTALLED IN SUCH A MANNER THAT ALL COMPONENTS REQUIRING ACCESS ARE LOCATED AND INSTALLED THAT THEY MAY BE SERVICED, RESET, REPLACED, OR RECALIBRATED, ETC., BY SERVICE PEOPLE WITH NORMAL SERVICE TOOLS AND EQUIPMENT.

WORK BY OTHER TRADES — FOR THE WORK REQUIRED BY OTHER TRADES FOR CHANGES MADE BY THIS CONTRACTOR IN TYPE OR SIZE OF EQUIPMENT PURCHASED, ANY CUTTING, PATCHING, FURRING, PAINTING, ELECTRICAL OR PLUMBING WORK SHALL BE DONE BY THE AFFECTED TRADE AT THIS CONTRACTOR'S EXPENSE.

WORK NOT INCLUDED — POWER WIRING, INCLUDING FINAL CONNECTIONS, IS BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL INSTALL ALL MOTORS AND FURNISH THE STARTING EQUIPMENT TO THE ELECTRICAL CONTRACTOR FOR INSTALLATION.

DUCT MOUNTED SMOKE DETECTORS SHALL BE FACTORY INSTALLED. THE REMOTE INDICATOR/TESTSTATION FOR EACH SMOKE DETECTOR BE SHIPPED WITH THE ROOF TOP UNIT AND INSTALLED BY THE ELECTRICAL CONTRACTOR. SMOKE DETECTOR WIRING NOT FACTORY INSTALLED, ALL REMOTE INDICATOR/TEST STATION WIRING, AND ALL RELATED CONDUIT SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

EARLY START-UP — THIS CONTRACTOR SHALL ENSURE THAT ALL MECHANICAL EQUIPMENT IS CONNECTED WITH ELECTRICAL POWER AS EARLY AS POSSIBLE SO THAT BALANCING AND TESTING CAN BEGIN AT THE EARLIEST DATE AVAILABLE.

CLEANING AND PAINTING — THOROUGHLY CLEAN ALL EQUIPMENT AND REMOVE ALL TRASH, CARTONS, ETC., FROM THE WORK AREA. MAKE ANY NECESSARY COR— RECTIONS OR REPAIR/REPLACE ANY DAMAGED MATER— IALS OR EQUIPMENT. LEAVE THE ENTIRE WORK SPACE IN A THOROUGHLY CLEAN AND ORDERLY MANNER. ANY FINISHED SURFACES THAT HAVE BEEN SCRATCHED OR DISCOLORED SHALL BE TOUCHED UP OR REPAINTED TO MATCH THE ORIGINAL COLOR. IF ANY PART HAS BEEN BENT, BROKEN OR OTHERWISE DAMAGED, IT SHALL BE REPLACED PRIOR TO PROJECT CLOSEOUT. ALL METAL ITEMS INSIDE THE BUILDING SUBJECT TO RUSTING, AND ALL FERROUS METAL EXPOSED TO THE WEATHER SHALL BE GIVEN ONE COAT OF RUST PREVENTIVE PRIMER AS SOON AS INSTALLED.

PROVIDE LISTED FIRESTOPPING AT ALL PENETRATIONS THROUGH RATED WALLS, FLOORS, PARTITIONS, ETC.

#### 15.3 EQUIPMENT

HVAC EQUIPMENT SHALL BE AS SCHEDULED ON THE DRAWINGS AND/OR SPECIFIED HEREIN. EQUIVALENT EQUIPMENT AND/OR COMPONENTS THEREOF MAY BE SUBSTITUTED FOR SPECIFIED EQUIPMENT ONLY AS APPROVED BY THE OWNER AND/OR THE PROJECT ENGINEER.

ALL EQUIPMENT AND RELATED PIPING, DUCTWORK, CONTROL WIRING AND ACCESSORIES SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO BUILDING LINES AND, IF INSTALLED WITHIN THE BUILDING ENVELOPE SHALL BE INSTALLED AS HIGH AS POSSIBLE TO ALLOW THE MAXIMUM AMOUNT OF HEADROOM. EQUIPMENT THAT REQUIRES ROUTINE MAINTENANCE SUCH AS FILTER REPLACEMENT SHALL BE INSTALLED AND ARRANGED TO BE ACCESSIBLE. PROVIDE ACCESS PANEL(S) AS REQUIRED AND/OR AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER. ALL EQUIPMENT SHALL BE INSTALLED WITH THE REQUIRED CLEARANCES AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER OR AS REQUIRED BY GOVERNING CODES. WHICHEVER IS GREATER.

#### 15.4 DUCTWORK

ALL DUCTWORK SHALL BE GALVANIZED STEEL WITH TRANSVERSE DUCT JOINTS SEALED WITH 4" WIDE HARDCAST TAPE. DUCT TAPE IS NOT ACCEPTABLE. FIBERGLASS FLEXIBLE DUCTS WITH LINER MAY BE USED FOR BRANCH DUCT CONNECTIONS TO OUTLETS WITH 8 FT. MAXIMUM LENGTH.

LOW PRESSURE DUCTWORK AND FITTINGS SHALL BE MADE TIGHT FOR MINIMUM AIR LEAKAGE. DUCT TAPE SHALL NOT BE USED TO SEAL JOINTS, TO MAKE TRANSITIONS OR FOR ANY OTHER REASON ON THE OUTSIDE OF WRAPPED INSULATION.

INSTALL HORIZONTAL DUCTWORK AS HIGH AS POSSIBLE.

PROVIDE TURNING VANES AT ALL CHANGES IN DIRECTION. PROVIDE VANED TEES AT BRANCH CONNECTIONS SERVING MORE THAN ONE DIFFUSER.

PROVIDE VOLUME CONTROL DAMPERS AND BALANCING DEVICES AS REQUIRED TO DISTRIBUTE THE AIR AND AS INDICATED ON THE DRAWINGS.

NOTE: DUCT DIMENSIONS INDICATED ON THE DRAWINGS ARE INSIDE CLEAR, OR "FREE AREA" DIMENSIONS. CONTRACTOR SHALL MAKE ALLOWANCE FOR INTERNAL DUCT LINER WHEN ORDERING PRE—FABRICATED DUCTWORK OR WHEN FABRICATING DUCTS IN THE FIELD.

ALL BRANCH DUCT CONNECTIONS TO OUTLETS SHALL INCLUDE A MANUAL BALANCE DAMPER WITH LOCKING QUADRANT LOCATED AT THE BRANCH DUCT CONNECTION TO THE HEADER DUCT.

THE COMPLETE SHEET METAL SYSTEM SHALL BE FABRICATED AND INSTALLED IN STRICT ACCORDANCE WITH SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION MANUALS. DUCT DIMENSIONS ARE CLEAR INSIDE DIMENSIONS INCREASE DIMENSIONS WHERE LINER IS PROVIDED.

#### 15.5 FLEXIBLE DUCTWORK

DUCTWORK SHALL BE LIMITED IN LENGTH TO THAT NECESSARY TO MAKE CONNECTIONS BETWEEN TRUNK OR BRANCH DUCTS AND AIR DEVICES. FLEX DUCT LENGTH SHALL NOT EXCEED 8'-0".

ALL FLEX DUCT SHALL BE FULLY STRETCHED OUT TO REDUCE AIR RESISTANCE.

CONNECTIONS TO FITTINGS OR AIR DEVICES SHALL BE MADE WITH TWO (2) STAINLESS STEEL BANDS. THE INNER LINER SHALL BE CLAMPED TIGHT WITH THE FIRST BAND, THEN THE INSULATION AND VAPOR—PROOF JACKET PULLED TO BE TIGHT AGAINST THE DUCT FITTING OR AIR DEVICE AND SECURED WITH THE SECOND BAND. INSTALLATION SHALL BE AS RECOMMENDED BY THE DUCT MANUFACTURER AND

SUPPORT THE FLEXIBLE DUCT WITH ADEQUATE HANGERS TO RELIEVE STRAIN ON ANY FITTING. UNNECESSARY BENDS, SAGS, TWISTS, ETC., WILL NOT BE ALLOWED.

## 15.6 DUCT INSULATION/LINER

SUPPLY DUCTWORK SHALL HAVE 1" THICK, ONE POUND DENSITY FIBERGLASS LINER. RETURN DUCTS WITHIN 10' OF RTU UNITS SHALL HAVE SAME LINER. TRAVERSE JOINTS SHALL BE NEATLY BUTTED AND THERE SHALL BE NO INTERRUPTIONS OR GAPS. DUCT LINER SHALL BE CUT AS REQUIRED TO ENSURE OVERLAPPED AND COMPRESSED LONGITUDINAL CORNER JOINTS.

## 15.7 AIR DEVICES

INSTALL ALL GRILLES AND DIFFUSERS TO BE FLUSH WITH THE PENETRATED SURFACE AND LEVEL OR STRAIGHT WITH WITH SURROUNDING FEATURES. ALL CEILING MOUNTED AIR DEVICES SHALL BE LOCATED IN THE CEILING TILE INDICATED ON THE DRAWINGS. SUPPORT CEILING MOUNTED GRILLES AND DIFFUSERS AT THE PROPER HEIGHT TO HOLD IT SNUG AGAINST THE CEILING.

15.8 PIPING AND FITTINGS (AS REQUIRED)

CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC WITH SCREWED FITTINGS.

## 15.9 FIRE/SMOKE DAMPERS

COMBINATION FIRE/SMOKE DAMPERS SHALL BE SUPPLIED AND INSTALLED BY HVAC CONTRACTOR AT DUCT PENETRATIONS IN FIRE RATED CHASES AS REQUIRED. COORDINATE WITH ALL CODES. CODES AND GOVERNING AUTHORITIES HAVING JURISDICTION.

15.10 SEISMIC RESTRAINT

PROVIDE SEISMIC AND VIBRATION ISOLATION EQUIPMENT AND MATERIALS AS REQUIRED BY A SINGLE MANUFACTURER. REFER TO SEISMIC CODE BLOCK.

## 15.11 ROOF MOUNTED EQUIPMENT

INSTALL ROOF MOUNTED EQUIPMENT SUPPORT RAILS OR ROOF CURB AS REQUIRED FOR THE JOB CONDITIONS AND AS RECOMMENDED BY THE MANUFACTURER FOR THE INSTALLATION OF ROOF MOUNTED EQUIPMENT. THE EXACT LOCATION OF ALL ROOF MOUNTED EQUIPMENT IS SUBJECT TO THE APPROVAL OF THE LANDLORD. COORDINATE THE ENTIRE INSTALLATION WITH THE LANDLORD'S REPRESENTATIVE.

ALL ROOF PENETRATIONS SHALL BE INSTALLED PER THE LANDLORD'S REQUIREMENTS. IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO FAMILIARIZE HIMSELF WITH THE REQUIREMENTS OF THE LANDLORD.

CONTRACTOR SHALL PROVIDE A TEMPORARY PLYWOOD WORK PLATFORM THAT COMPLETELY SURROUNDS THE AREA WHERE NEW ROOF MOUNTED EQUIPMENT AND/OR DUCTS ARE TO BE INSTALLED. THE ENTIRE WORK AREA SHALL REMAIN ON THE ROOF DURING THE ENTIRE PERIOD OF INSTALLATION AND SHALL BE REMOVED FROM THE ROOF AND THE SITE BY THIS CONTRACTOR UPON COMPLETION OF THE INSTALLATION.

ROUTE TRAPPED PVC RTU CONDENSATE DRAIN AWAY FROM TO RTU MINIMUM 6' FROM UNIT. PIPING SIZE SHALL BE EQUAL TO RTU OUTLET SIZE.

ALL ROOF PENETRATIONS FOR POWER AND CONTROL WIRING CONDUITS AND GAS, CONDENSATE, OR REFRIGERANT PIPING SHALL BE MADE WITH WATERPROOF PIPE SLEEVES OR CURB(S) PER THE LANDLORD'S REQUIREMENTS. THIS CONTRACTOR SHALL VERIFY ALL REQUIREMENTS PRIOR TO START OF WORK.

ALL HOISTING COSTS SHALL BE INCLUDED AS PART OF THIS CONTRACTOR'S PROPOSAL. THE HOISTING SHALL BE DONE IN ACCORDANCE WITH THE GENERAL CONTRACTOR'S REQUIREMENTS, AND IN STRICT ACCORDANCE WITH ALL CITY, STATE, AND FEDERAL RULES AND REGULATIONS.

## MECHANICAL SPECIFICATIONS

15.12 SYSTEM SHALL CONSIST OF TWO CONSTANT VOLUME HEATING ONLY ROOFTOP UNITS (RTU-1 AND RTU-2). EACH UNIT SUPPLIED WITH A PROGRAMMABLE THERMOSTAT LOCATED AS SHOWN. RTU-1 SERVES THE HOT-BOX ROOM 101 WHICH WILL BE MAINTAINED AT 104°F ALL YEAR ROUND. UNIT WILL RUN CONTINUOUSLY TO MAINTAIN 104°F.

RTU-2 SERVES THE MAIN STORAGE SPACE ROOM 100. WHENEVER OUTSIDE AIR TEMPERATURE IS BELOW 60°F (ADJ) UNIT TO RUN SO AS TO MAINTAIN 55°F (ADJ). ABOVE 65°F RTU-2 WILL NOT RUN AND VENTILATION FANS (EF-1, EF-2, EF-3) WILL BE ENERGIZED SUCH THAT ALL FANS RUN WHEN TEMPERATURE IS ABOVE 90°F (ADJ). WHEN FAN RUN MOTORIZED DAMPER SHALL OPEN.

EXHAUST FAN (EF-4) WILL RUN THRU WHENEVER BUILDING IS

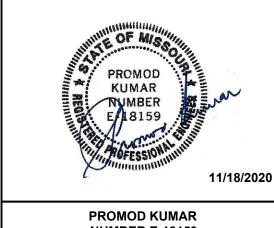
15.13 TESTING, ADJUSTING & BALANCING: THIS CONTRACTOR SHALL ENGAGE THE SERVICES OF AN AABC, TABB, OR NEBB CERTIFIED AIR BALANCE CONTRACTOR TO ADJUST AND COMPLETELY BALANCE THE INSTALLED SYSTEM(S) TO THE DESIGN AIR QUANTITIES. CONTRACTOR SHALL PROVIDE THE OWNER AND THE LANDLORD A COPY OF THE CERTIFIED AIR BALANCE REPORT SHOWING DESIGN AND MEASURED AIR QUANTITIES, STATIC PRESSURES, FAN MOTOR RPM AND MOTOR CURRENT. DEVIATION BETWEEN DESIGN AND MEASURED QUANTITIES SHALL NOT BE GREATER THAN 10%.

15.14 ALL MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTOR'S EXPENSE.

FOR THE SAME PERIOD, THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED TO THE PREMISES BY DEFECTS IN HIS WORKMANSHIP OR WORK AND/OR EQUIPMENT INSTALLED BY OTHERS UNDER HIS CONTRACT.



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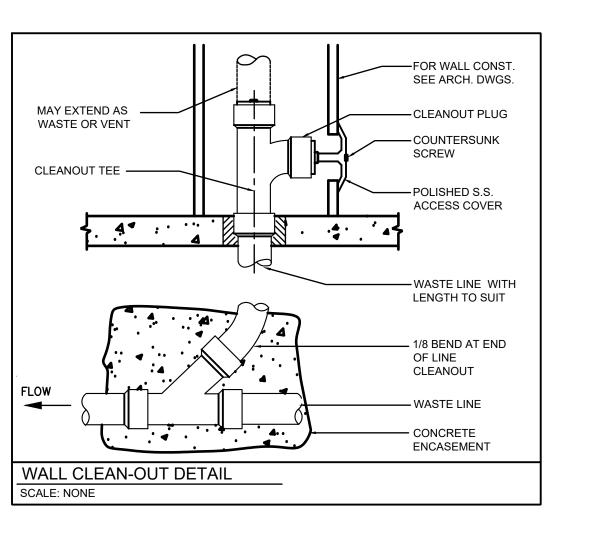
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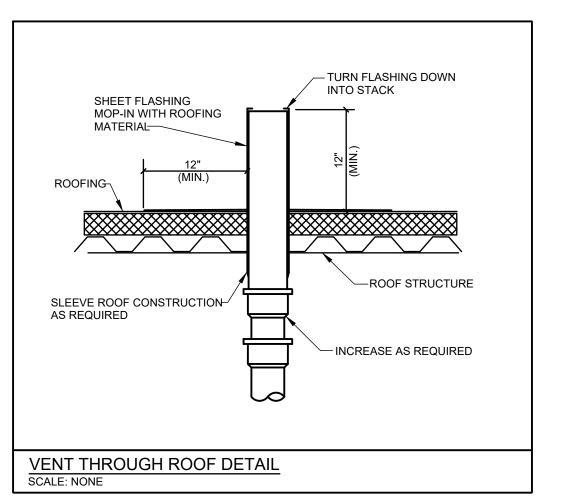
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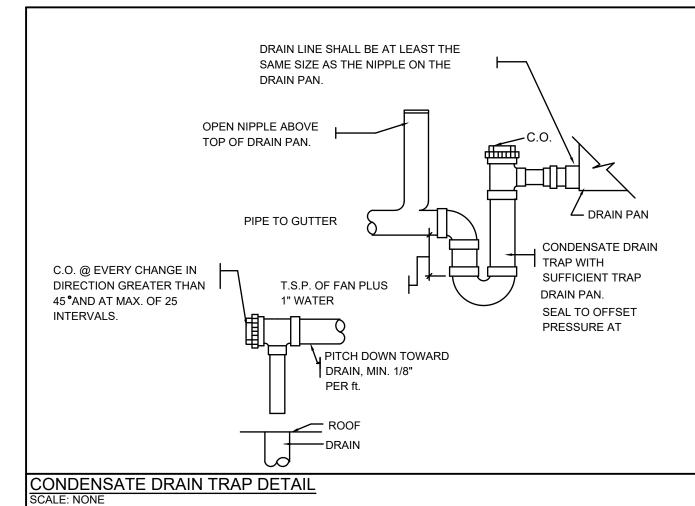
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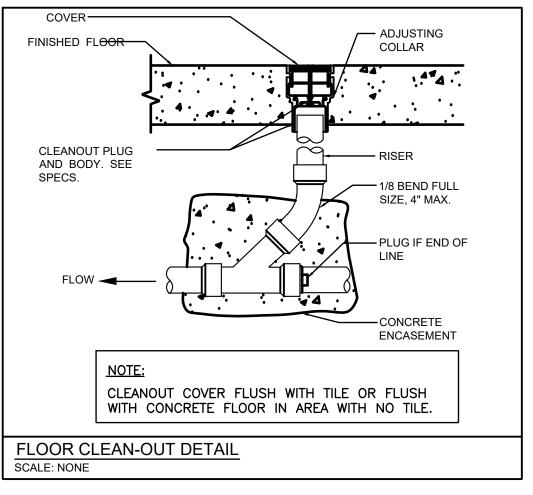
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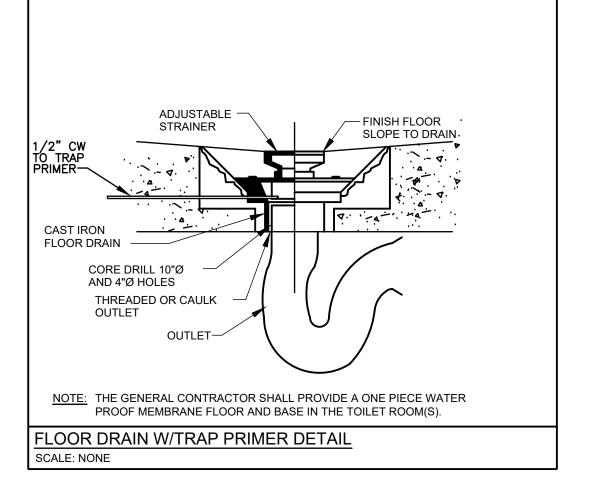
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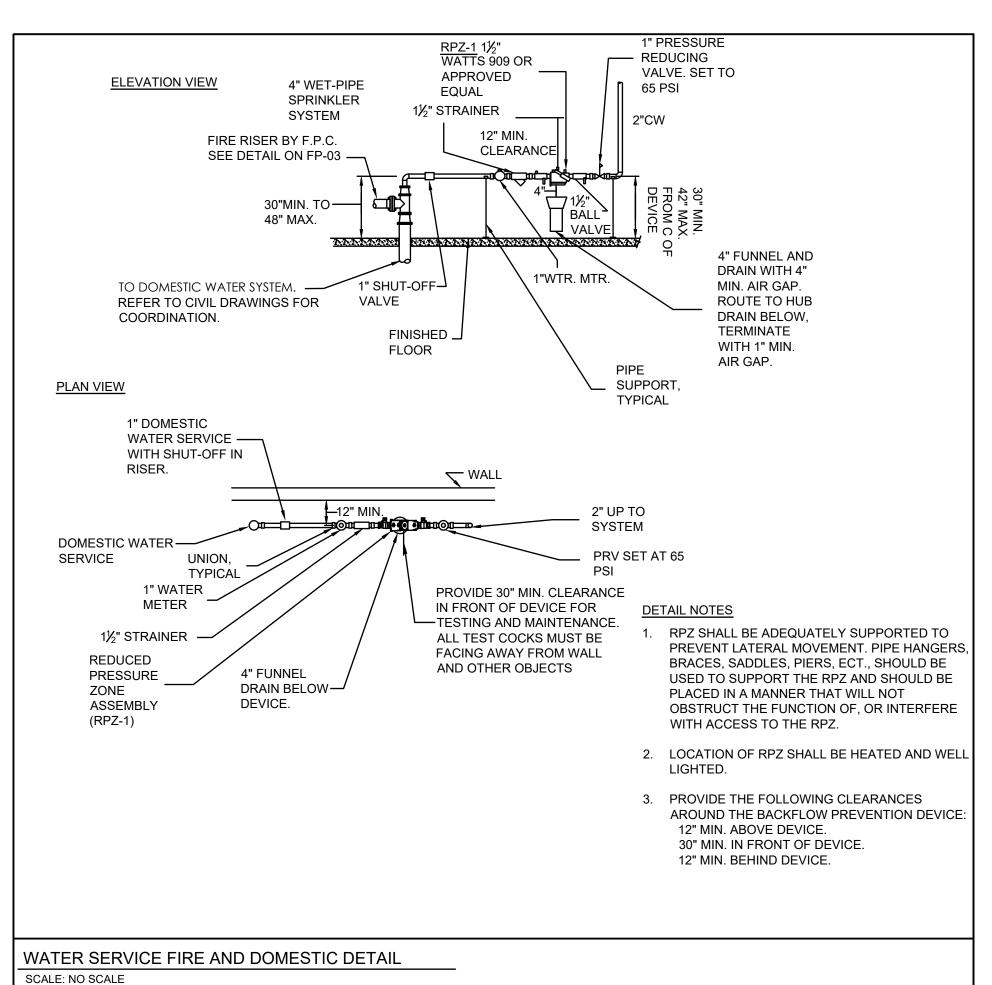


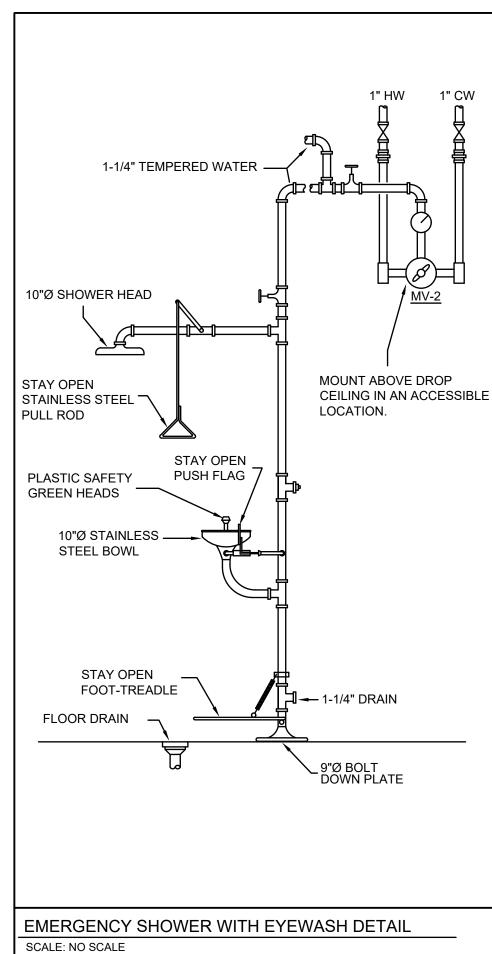


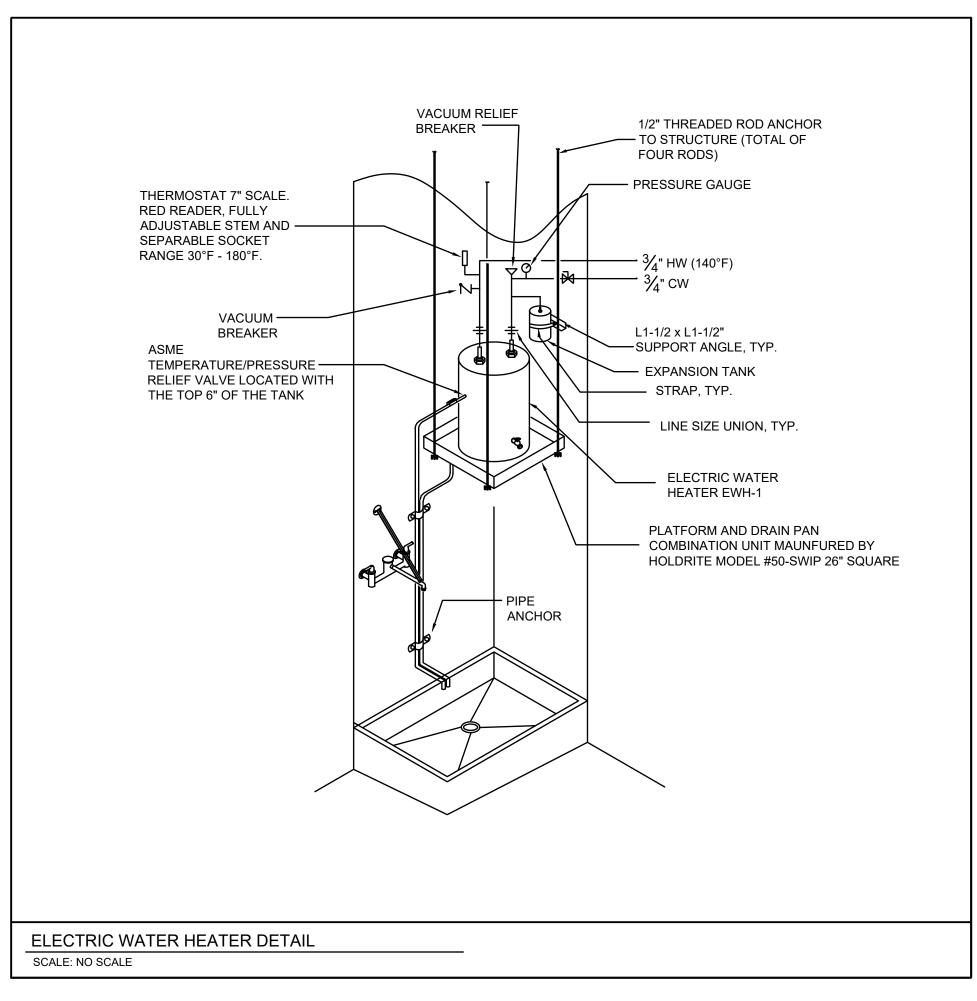








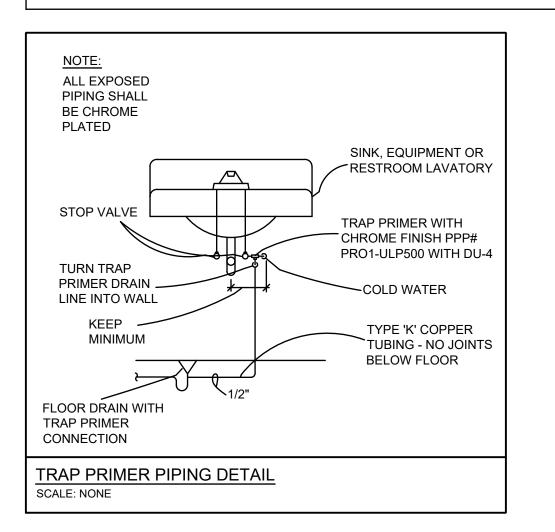


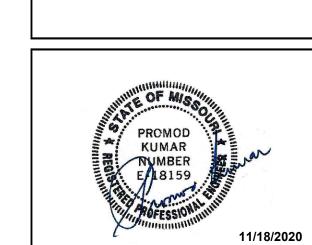


	1	, PL	<u>'UMBI</u>	NG FIX I	URE S	CHEDULE
MARK	FIXTURE	SAN.	VENT	C.W.	H.W.	REMARKS
WC-1	FLOOR MOUNTED WATER CLOSET AMERICAN STANDARD # 2377.100 ADA COMPLIANT. MOUNT AT 17" A.F.FNO EQUALS	4"	2"	1-1/2"	-	CHURCH SEAT; 9500SSC WHITE OPEN-FRONT CONTOURED, "CADET" TANK TYPE WHITE VITREOUS CHINA FIXTURE WITH ELONGATED BOWL, MOUNT AT 17" FROM FLOOR TO TOP OF RIM.
LAV-1	LAVATORY, AMERICAN STANDARD #0355.012 "LUCERNE" 20-1/2"x 18-1/4" WALL MOUNTED WHITE VITREOUS CHINA FIXTURE. ADA COMPLIANT -NO EQUALS	2"	2"	1/2"	1/2"	CHICAGO FAUCET #802-VCP, 4" CENTERSET, VANDAL RESIST FAUCET WITH # 390 LEVER HANDLES AND # E12 2.2 GPM AER
FD-1	FLOOR DRAIN JR SMITH 2010-A CAST IRON BODY, 6" POLISHED BRASS DIAMETER STRAINER.	2"	2"	-	-	PROVIDE WITH SURE SEAL MODEL SS3000 3" FLOOR DRAIN TRAP SEALER.
FCO-1	FLOOR CLEANOUT JR SMITH 4420 SERIES	4"	2"	-	-	LEVELEZE COATED CAST IRON BODY WITH ADJUSTABLE HOUSING, SATIN NICKEL ALLOY TOP.
MSB-1	MOP SINK FIAT MSB-2424	3"	2"	3/4"	3/4"	FAUCET W/VACUUM BREAKER. ROUGH CHROME FINISH, 30" W/BRACKET, MOP HANGER.

MARK	MFR	MODEL	STORAGE	RECOVERY	°F. RISE	VOLT/PHASE	HEAT INPUT	REMARKS
EWH-1	A.O. SMITH	DEL-10	10	20	80	120/1	1500 WATTS	-

OMINAL PIPE DIAMETER NPS (IN)			MAX	KIMUM SUPPORT SPACIN (FEET)	NG			
	CAST IRON	COPPER	STEEL	SCH 40 PVC		SCH 40	) CPVC	
				60°F	73°F	100°F	120°F	140°F
1/2		8		-	5	4.5	4.5	4
3/4		9		5	5	5	4.5	4
1	5	9		5.5	5.5	5.5	5	4.5
1 1/4	5	12	7	5.5	5.5	5.5	5.5	5
1 1/2	5	12	9	6	6	5.5	5.5	5
2	5	13	10	6	6	6	5.5	5
2 1/2	5	14	11	7	7	6.5	6.5	6
3	5	15	12	7	7	7	7	6
4	5	17	12	7.5	7.5	7.5	7	6.5
6	5	21	12	8.5	8.5	8	7.5	7
8	5	24	12	9	9.5	9.5	8.5	7.5
10	5	26	12	10	10.5	10.5	9.5	8
12	5	30	12	11.5	11.5	10.5	10	8.5





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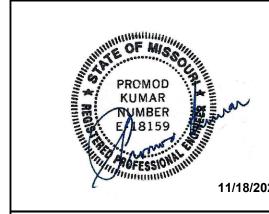
SHEET NAME: PLUMBING COVER

Ixol HOT BOX



- 1 VENT PIPING THROUGH ROOF. MAINTAIN MINIMUM 10'-0" CLEARANCE FROM OUTSIDE AIR INTAKES.
- PROVIDE FREEZE- PROOF HOSE BIBB WITH LOCKABLE RECESSED WALL BOX, INTEGRAL VACUUM BREAKER AND UNIT WITH KEY.
- PROVIDE EMERGENCY EYE WASH/SHOWER, ECON SAFETY PRODUCTS MODEL #01050207.
- CONNECT 4" BUILDING SANITARY SEWER TO SITE SANITARY SEWER. REFER TO CIVIL DRAWINGS FOR COORDINATION.
- 5 PROVIDE WATER/FIRE SERVICE. SEE WATER SERVICE FIRE AND DOMESTIC DETAIL ON SHEET P-01.
- 6 PROVIDE ROOF DOWNSPOUT LINE AND ROUTED TO POND. REFER TO CIVIL DRAWINGS FOR COORDINATION.
- PROVIDE ROOF DOWNSPOUT LINE AND ROUTED TO EXISTING STORM SEWER. REFER TO CIVIL DRAWINGS FOR COORDINATION.

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SHEET NAME: PLUMBING PLAN

P-02

A PLUMBING FLOOR PLAN

1/8" = 1'-0"



## PLUMBING SPECIFICATIONS

#### PLUMBING SPECIFICATIONS

#### GENERAL

THE "ARCHITECTURAL GENERAL CONDITIONS" GOVERN WORK UNDER THIS SECTION. THIS CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND SHALL CAREFULLY EXAMINE THE DRAWINGS AND SPECIFICATIONS. IT IS EXPRESSLY UNDERSTOOD THAT THIS PROPOSAL IS BASED ON THE ABOVE REQUIREMENTS AND THAT IT COVERS EVERYTHING NECESSARY TO DO AND COMPLETE THE WORK.

#### 2. <u>INSPECTION AND COOPERATION</u>

NO DEVIATION FROM THE DRAWINGS AND /OR SPECIFICATIONS WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF ARCHITECT OR ENGINEER. THIS CONTRACTOR SHALL COOPERATE WITH THE OTHER CONTRACTORS TO ALLOW FOR THE INSTALLATION OF THEIR WORK AS WELL AS HIS OWN.

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK FITTING IN PLACE WITHOUT CONFLICT WITH THE OTHER TRADES, WHERE PROPER PLANNING COULD AVOID INTERFERENCE.

#### 3. <u>CODES AND PERMITS</u>

NOTHING IN THE DRAWINGS AND/OR SPECIFICATIONS SHALL BE INTERPRETED TO CONFLICT WITH ANY CITY OR PROVINCIAL LAW. REGULATION. CODE. ORDINANCE, RULING, OR FIRE UNDERWRITER'S REQUIREMENT APPLICABLE TO THIS CLASS OF WORK.

SHOULD THE DRAWINGS AND/OR SPECIFICATIONS CONFLICT WITH SUCH LAWS OR ORDINANCES. THE CONFLICTING PORTION OF THE WORK SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH SUCH LAWS AND ORDINANCES WITHOUT EXTRA COST. THIS CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED FOR THIS INSTALLATION OF HIS WORK.

#### 4. <u>ACCURACY OF DATA</u>

THE INFORMATION GIVEN HEREIN AND ON THE DRAWINGS IS AS EXACT AS COULD BE SECURED. BUT ITS EXTREME ACCURACY IS NOT GUARANTEED. THIS CONTRACTOR SHALL EXAMINE THE LOCATIONS AND VERIFY ALL MEASUREMENTS, DISTANCES, ELEVATIONS AND EXISTING PIPE SIZES BEFORE STARTING THE

THIS CONTRACTOR SHALL PROVIDE ALL NECESSARY OFFSETS, RAISED AND DROPS IN PIPING AND DUCTWORK AS REQUIRED BY BUILDING CONDITIONS AT NO ADDITIONAL COST.

MECHANICAL DRAWINGS SHALL NOT BE USED FOR GENERAL CONSTRUCTION DIMENSIONS OR FOR TYPE OF MATERIAL USED. FOR EXACT BUILDING LAYOUT, DIMENSIONS AND BUILDING MATERIAL USED, THIS CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS.

#### 5. SHOP DRAWINGS

FIVE (5) COPIES OF ALL SHOP OR INSTALLATION DRAWINGS, FOUNDATION PLANS, EQUIPMENT OR APPARATUS DRAWINGS SHALL BE FURNISHED BY THIS CONTRACTOR. THESE DRAWINGS SHALL BE CLEARLY MARKED INDICATING WHICH ITEMS ARE TO BE SUPPLIED AND SHALL STATE CAPACITIES, SIZES AND GENERAL DESCRIPTION OF ALL EQUIPMENT. ANY CHANGES FROM THE SPECIFIED ITEMS SHALL BE NOTED ON THE SUBMITTALS.

SHOP DRAWINGS OF SPECIAL APPARATUS OR EQUIPMENT WHICH IS TO BE FABRICATED INDIVIDUALLY FOR THIS PROJECT AND IS NOT DESCRIBED BY STANDARD MANUFACTURER'S DRAWINGS OR BULLETINS SHALL BE SUBMITTED FOR PROCESSING BEFORE FABRICATION.

#### THESE DRAWINGS SHALL BE SUBMITTED IN A TIMELY MANNER.

IT SHALL BE THIS CONTRACTORS RESPONSIBILITY TO MAINTAIN LIAISON WITH ALL PARTIES CONCERNED WITH THE MATERIAL SUBMITTED. THIS CONTRACTOR SHALL NOT PURCHASE ANY EQUIPMENT UNTIL SHOP DRAWINGS HAVE BEEN PROCESSED.

THIS CONTRACTOR SHALL SUBMIT NO DRAWINGS WITHOUT NOTATION OF EACH COPY INDICATING DATE OF CONTRACTOR'S REVIEW AND SIGNATURE OF CHECK FOR CONTRACTOR TOGETHER WITH CONTRACTOR'S NAME AND PROJECT IDENTIFICATION.

ARCHITECT'S PROCESSING WILL NOT CONSTITUTE A COMPLETE CHECK BUT WILL INDICATE ONLY THAT GENERAL METHOD OF CONSTRUCTION AND DETAILING IS SATISFACTORY.

ARCHITECT'S PROCESSING WILL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ERRORS SINCE THIS CONTRACTOR IS SOLELY RESPONSIBLE FOR DIMENSIONS AND DESIGNS OF ADEQUATE CONNECTIONS. DETAILS AND SATISFACTORY CONSTRUCTION OF ALL WORK, AS WELL AS FURNISHING MATERIALS AND WORKMANSHIP REQUIRED BY DRAWINGS AND SPECIFICATIONS WHICH MAY NOT BE INDICATED ON THE SUBMITTALS WHEN APPROVED.

#### 6. SUBSTITUTIONS OF EQUIPMENT OR MATERIAL

THE BRAND NAMES OF EQUIPMENT OR MATERIALS SPECIFIED HEREIN SHALL ESTABLISH QUALITY, CAPACITY, TYPE AND DIMENSIONS TO BE INCLUDED IN THE BASE BID.

APPROVAL OF SUBSTITUTED ITEMS WILL BE BASED ON ABILITY AND CAPACITY TO PERFORM FUNCTION SERVED, QUALITY AND AVAILABILITY OF PARTS AND SERVICE, QUALITY OF EQUIPMENT, DELIVERY SCHEDULE, ETC. THE ARCHITECT SHALL REVIEW ALL SUCH REQUESTS BUT RESERVES THE SOLE RIGHT OF JUDGEMENT TO APPROVE OR REJECT THE PROPOSED SUBSTITUTIONS.

ACCEPTANCE OR REJECTION OF PROPOSED SUBSTITUTIONS SHALL NOT CAUSE ADDITIONAL COST. ANY CHANGES OF PIPING, DUCTWORK, ELECTRICAL CONTROLS OR INSTALLATION REQUIRED BECAUSE OF THE SUBSTITUTION OR EQUIPMENT SHALL BE PAID FOR BY THIS CONTRACTOR PROPOSING THE SUBSTITUTION.

## 7. ERECTION OF APPARATUS

ALL WORK SHALL BE DONE UNDER THE PERSONAL SUPERVISION OF THIS CONTRACTOR WHO SHALL PROVIDE A COMPETENT FOREMAN TO LAY OUT ALL WORK. ALL WORK SHALL BE LAID OUT WITH DUE REGARD FOR THE SPACE REQUIREMENTS OF THE OTHER CONTRACTORS. THIS CONTRACTOR SHALL REPORT ANY CONFLICTS OR DIFFICULTIES IN REGARD TO THE INSTALLATION IMMEDIATELY.

WHERE CROWDED LOCATIONS EXIST OR WHERE THERE IS A POSSIBILITY OF CONFLICT BETWEEN TRADES. THIS CONTRACTOR SHALL MAKE COMPOSITE DRAWINGS SHOWING THE EXACT LOCATIONS OF PIPES, DUCT, CONDUIT AND EQUIPMENT. DRAWINGS SHALL BE BASED ON FIELD MEASUREMENTS AND AFTER CONSULTATION AND AGREEMENT BETWEEN THE TRADES.

EQUIPMENT OF A TYPE TO REQUIRE REPLACEMENT, SERVICING, ADJUSTING OR MAINTENANCE SHALL BE LOCATED TO ALLOW EASY ACCESS AND SPACE FOR REMOVAL OF INTERNAL ASSEMBLIES, IT REQUIRED.

8. EXCAVATION AND BACKFILL THIS CONTRACTOR SHALL DO ALL EXCAVATION REQUIRED TO INSTALL PIPES AND EQUIPMENT SHOWN ON THE PLANS OR REQUIRED FOR PROPER OPERATION. EXCESS EXCAVATION BELOW THE REQUIRED LEVEL SHALL BE BACKFILLED WITH EARTH AND THOROUGHLY TAMPED. UTILITIES SERVICES LINES SHALL BE INSPECTED AND APPROVED BY THE PROPER INSPECTION AUTHORITY BEFORE BACKFILLING.

THE BOTTOM OF TRENCHES SHALL BE TAMPED HARD AN GRADED TO SECURE THE REQUIRED FALL. ROCK, WHERE ENCOUNTERED SHALL BE EXCAVATED TO A DEPTH OF SIX INCHES (6") BELOW THE BOTTOM OF THE PIPE, AND BEFORE THE PIPE IS LAID, THE SPACE BETWEEN BOTTOM PIPE AND ROCK SURFACE SHALL BE FILLED WITH GRAVEL. IF TRENCHES ARE DEEPER THAN BOTTOM OF FLOORING OR CLOSER THAN THREE FEET (3'0") TO FOOTING THEY MUST BE FILLED WITH COHESIVE SOIL AND COMPACTED TO 95% OF MAXIMUM DENSITY, STANDARD PROCTOR, ASTM D- 698. ALL OTHER EXCAVATIONS UNDER FLOOR SLABS COMPACTED TO 95% STANDARD PROCTOR.

WHEN EXCESS DIRT HAS BEEN REMOVED, THE TRENCH SHALL BE BROUGHT TO THE REQUIRED LEVEL WITH SAND AND GRAVEL FIRMLY COMPACTED.

TRENCHES AND EXCAVATION SHALL BE BACKFILLED IN 6" LAYERS OF EARTH, FREE FROM CLODS, AND STONES THOROUGHLY TAMPED TO A DEPTH OF 12" ABOVE THE PIPE. AFTER THAT DEPTH HAS BEEN REACHED, BACKFILLING SHALL BE DONE IN 12" LAYERS, THOROUGHLY TAMPED.

9. EQUIPMENT SUPPORTS

ANY STRUCTURAL STEEL MEMBERS REQUIRED TO ADAPT THE EQUIPMENT AND PIPING AS FURNISHED BY THIS CONTRACTOR. TO THE BUILDING STEEL OR STRUCTURE, SHALL BE INCLUDED IN THE BID OF THE CONTRACTOR FURNISHING THE EQUIPMENT OR PIPING. HANGING OF ALL EQUIPMENT AND REQUIRED SUPPORTING STEEL AND BRACING SHALL BE FURNISHED BY THE CONTRACTOR WHO SUPPLIES THE EQUIPMENT.

## 10. <u>CUTTING AND PATCHING</u>

THIS CONTRACTOR SHALL INCLUDE ALL CUTTING, PATCHING AND PAINTING OF PATCHED AREAS REQUIRED FOR AND RESULTING FROM THE INSTALLATION OF ALL OF THIS CONTRACTOR'S WORK, EXCEPT WHERE NOTED OTHERWISE.

ALL OPENINGS AROUND PIPE PENETRATIONS THROUGH SMOKE OR FIRE-RATED FLOORS, CEILINGS OR WALLS SHALL BE SEALED AIRTIGHT WITH MATERIAL HAVING A RATING EQUAL TO THE MATERIAL OF THE WALL, CEILING AND/OR FLOOR PENETRATED.

ALL PATCHING SHALL BE NEATLY FINISHED TO THE SATISFACTION OF THE ARCHITECT.

#### 11. ACCESS PANELS

THIS CONTRACTOR SHALL LOCATE AND FURNISH FOR INSTALLATION BY THE GENERAL CONTRACTOR, ALL ACCESS PANELS AS REQUIRED FOR ACCESS TO VALVES, AND THE PROPER SERVICING OF EQUIPMENT AND LINES INSTALLED UNDER THE CONTRACT.

ALL PANELS SHALL BE MILCOR, STYLE "M" FOR MASONRY, "A" FOR ACOUSTICAL TILE AND "K" FOR PLASTER; EXCEPT FOR FIRE-RATED UL 1-1/2 HOUR AND "B" LABEL ACCESS PANELS SHALL BE FURNISHED IN FIRE-RATED WALLS AND CEILINGS AS INDICATED ON THE DRAWINGS. ACCESS DOORS SHALL BE 12" X 12" MINIMUM SIZE FOR VALVES.

#### 12. <u>DIELECTRIC UNIONS</u> FOR THE PREVENTION OF ELECTROLYTIC CORROSION AT CONNECTIONS BETWEEN PIPE OF DISSIMILAR METALS OR BETWEEN PIPE AND EQUIPMENT CONNECTIONS OF DISSIMILAR METALS, PROVIDE DIELECTRIC

## 13. MOTORS, STARTERS AND DISCONNECTS

UNLESS SPECIFIED TO BE FURNISHED WITH EQUIPMENT, ALL MOTOR STARTERS AND DISCONNECT SWITCHES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

## 14. <u>JOINTS AND FITTINGS</u>

THREADS ON SCREWED PIPE SHALL BE STANDARD, CLEAN BUTT AND TAPERED. PIPE SHALL BE REAMED OF BURRS AND KEPT CLEAN OF SCALE, DIRT AND SHAVINGS. TREADS SHALL BE MADE WITH FLAKED GRAPHITE AND LUBRICATING OIL OR APPROVED PIPE COMPOUND ON THE MALE THREAD ONLY.

COPPER-TO-STEEL AND COPPER-TO-BRASS JOINTS SHALL BE MADE WITH SILVER SOLDER. ALL OTHER COPPER-TO-COPPER JOINTS ABOVE GROUND SHALL BE MADE WITH LEAD FREE SOLDER. COPPER PIPE SHALL BE CUT SQUARE, BURRS REMOVED AND CARE SHALL BE GIVEN TO KEEP THE LINES FREE OF DIRT AND MOISTURE. ALL TUBING AND FITTINGS SHALL BE THOROUGHLY CLEANED.

WELDED PIPE SHALL HAVE BUTT WELDED SINGLE "V" TYPE JOINTS FOR WHICH PIPE HAS BEEN BEVELED TO 45 DEGREES. WELD SHALL BE ONE-FOURTH GREATER THICKNESS THAN THE PIPE. CONNECTIONS TO EQUIPMENT, ACCESSORIES, ETC. SHALL BE MADE BY MEANS OF FLANGES AND/OR ADAPTERS.

UNIONS SHALL BE PROVIDED AT EACH SCREWED VALVE AND UNIONS OR FLANGES AT EACH EQUIPMENT CONNECTION.

### 15. EXPANSION JOINTS

FURNISH AND INSTALL FLEXONICS EXPANSION JOINTS IN PIPING SYSTEM WHERE SHOWN OR NECESSARY FOR EXPANSION AND CONTRACTION.

EXPANSION JOINTS IN PIPE 4" AND GREATER SHALL BE THE PACKLESS TYPE WITH STAINLESS STEEL BELLOWS AND HAVE WELDED OR FLANGED END. JOINTS SHALL HAVE TRAVERSE AS INDICATED ON THE PLANS. EXPANSION JOINTS SHALL BE OF THE CONTROLLED FLEXING TYPE.

EXPANSION JOINTS IN COPPER PIPE UNDER 4" IN SIZE SHALL BE OF THE COMPENSATOR TYPE CONSTRUCTED OF TWO-PLY STAINLESS STEEL BELLOWS AND CARBON STEEL SHROUDS AND END FITTINGS, INTERNAL GUIDES AND ANTI-TORQUE DEVICES.

EXPANSION JOINTS IN STEEL PIPE UNDER 4" IN SIZE SHALL BE OF THE COMPENSATOR TYPE CONSTRUCTED OF TWO-PLY STAINLESS STEEL ELBOWS AND CARBON STEEL SHROUDS AND END FITTINGS, INTERNAL GUIDES AND ANTI-TORQUE DEVICES.

PROVIDE GUIDES ON EACH SIDE OF EXPANSION JOINT, AT 4 PIPE DIAMETERS, 14 PIPE DIAMETERS, AND A THIRD GUIDE AS RECOMMENDED BY THE MANUFACTURER 16. PIPE FLEXIBLE CONNECTIONS

FLEXIBLE PIPE CONNECTIONS SHALL BE RESISTOFLEX #R6904 OR APPROVED EQUAL FLEXIBLE CONNECTIONS MADE FROM TEFLON.

PROVIDE FOR MOVEMENT IN PIPING BY USE OF SWING JOINTS AT CONNECTION OF ALL BRANCHES TO MAINS AND RISERS. ALL BRANCHES FROM MAINS AND RISERS SHALL HAVE 1/4" CLEARANCE BETWEEN PIPE INSULATION AND SLEEVE TO PERMIT PIPE MOVEMENT.

17. <u>VALVES</u> ALL FIXTURES AND EQUIPMENT THAT REQUIRE COLD AND OR HOT WATER CONNECTIONS SHALL BE PROVIDED WITH ISOLATION VALVES PRIOR TO CONNECTION TO EQUIPMENT.

THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL VALVES OF ONE MANUFACTURER, FIGURE NUMBER AND TYPE THROUGHOUT THE ENTIRE INSTALLATION OF THE WORK, UNLESS OTHERWISE SPECIFIED, THE FOLLOWING NUMBERS ARE FROM THE CRANE CATALOG. EQUAL VALVES OF REPUTABLE MANUFACTURERS. SUCH AS HAMMOND, NIBCO-SCOTT AND/OR JENKINS WILL BE CONSIDERED EQUIVALENT.

ALL VALVES SHALL BE BUILT FOR A MINIMUM OF 125 PSIG WORKING PRESSURE. GATE VALVES 2-1/2" AND SMALLER SHALL BE #438 (SCREWED ENDS) OR #1320 (SOLDER-JOINT ENDS)

WITH BRONZE BODY, BRONZE TRIM AND RISING STEM.

CHECK VALVES 2-1/2" AND SMALLER SHALL BE #36 (SCREWED ENDS) OR #1342 (SOLDER-JOINT ENDS) SWING-TYPE WITH BRONZE BODY AND BRONZE TRIM. BUTTERFLY VALVES 2" AND LARGER SHALL BE #12F, IRON BODY, CAST-IRON WAFER W/LOCK LEVER. BALL

VALVE UP TO 3" IN SIZE SHALL BE APOLLO SERIES #70 BRONZE VALVE WITH CHROME-PLATED BALL AND TEFLON SEAT. GAS LINE COCKS UP TO 4" SHALL BE #320. HOSE END VALVES SHALL BE #438 GATE VALVES WITH HOSE END NIPPLES.

## 18. PIPE SLEEVES AND COLLARS

THIS CONTRACTOR SHALL LAY OUT ALL HIS WORK AND SET SLEEVES IN NEW CONSTRUCTION AS CONCRETE FORMS AND WALL ARE ERECTED SO AS TO BE ABLE TO INSTALL HIS WORK WITHOUT CUTTING OR BREAKING OF FLOORS OR WALLS. ALL SLEEVES FOR INSULATED PIPING SHALL BE LARGE ENOUGH TO ALLOW INSULATION TO PASS THROUGH SLEEVE.

ALL SLEEVES PASSING THROUGH FLOORS WHICH ARE WATERPROOFED SHALL BE COPPER TUBING SLEEVES EXTENDING 1" ABOVE FINISHED FLOOR. ALL OTHER SLEEVES SHALL BE 24 GAUGE GALVANIZED PIPES AND SLEEVES TO BE THOROUGHLY PACKED WITH OAKUM AND THE REMAINING SPACE FILLED WITH MASTIC AND MUST BE WATERTIGHT.

ALL SLEEVES PASSING THROUGH INNER WALLS SHALL BE STANDARD PIPE THIMBLES EQUAL TO THE THICKNESS OF THE WALL.

SPACES BETWEEN PIPES AND SLEEVES THROUGH OUTSIDE WALLS, ABOVE GRADE, SHALL BE CAULKED WITH CAULKING COMPOUND: THOSE BELOW GRADE SHALL BE MADE WATERTIGHT.

SPACE AROUND ALL PIPING THROUGH FIRE OR SMOKE RATED PARTITIONS OR FLOORS SHALL BE SEALED AIRTIGHT WITH MATERIAL AS SPECIFIED UNDER FIRESTOPPING . ALL PIPE PENETRATIONS OF SLABS ON GRADE SHALL BE WRAPPED WITH #15 BUILDING FELTS OR FOAM WRAP.

ALL DOMESTIC PIPING BELOW 3" TO BE COPPER TYPE "L" WITH WROUGHT COPPER OR PMEUMATIC PIPING CONNECT FITTINGS. INSULATE PIPING WITH 1" ARMAFLEX. ALL UNDERGROUND SANITARY PIPING TO BE CAST IRON WITH NO HUB FITTINGS.

## 19. <u>HANGERS</u>

- A. PIPE HANGER AND SUPPORT PRODUCTS INSTALLATION
- a. VERTICAL PIPING: MSS TYPE 8 OR 42 CLAMPS INDIVIDUAL, STRAIGHT, HORIZONTAL PIPING RUNS: 100 FEET AND LESS: MSS TYPE 1, ADJUSTABLE, STEEL CLEVIS HANGERS.
- LONGER THAN 100 FEET: MSS TYPE 43, ADJUSTABLE ROLLER HANGERS. LONGER THAN 100 FEET IF INDICATED: MSS TYPE 49, SPRING CUSHION ROLLS. c. MULTIPLE, STRAIGHT, HORIZONTAL PIPING RUNS 100 FEET OR LONGER: MSS TYPE 44, PIPE ROLLS. SUPPORT PIPE ROLLS ON TRAPEZE.

- d. BASE OF VERTICAL PIPING: MSS TYPE 52, SPRING HANGERS. SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR.
- C. ROD DIAMETER MAY BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, TO A MINIMUM OF 3/8 INCH.
- INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
- a. NPS 3/4 AND SMALLER: 60 INCHES WITH 3/8-INCH ROD. b. NPS 1 AND NPS 1-1/4: 72 INCHES WITH 3/8-INCH ROD.
- c. NPS 1-1/2 AND NPS 2: 96 INCHES WITH 3/8-INCH ROD. d. NPS 2-1/2: 108 INCHES WITH 1/2-INCH ROD.

e. NPS 3 TO NPS 5: 10 FEET WITH 1/2-INCH ROD.

- INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET INSTALL HANGERS FOR STEEL PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND
- MINIMUM ROD DIAMETERS: a. NPS 1-1/4 AND SMALLER: 84 INCHES WITH 3/8-INCH ROD.
- b. NPS 1-1/2: 108 INCHES WITH 3/8-INCH ROD. c. NPS 2: 10 FEET WITH 3/8-INCH ROD.
- d. NPS 2-1/2: 11 FEET WITH 1/2-INCH ROD.
- e. NPS 3 AND NPS 3-1/2: 12 FEET WITH 1/2-INCH ROD. f. NPS 4 AND NPS 5: 12 FEET WITH 5/8-INCH ROD.
- INSTALL SUPPORTS FOR VERTICAL STEEL PIPING EVERY 15 FEET H. SUPPORT PIPING AND TUBING NOT LISTED IN THIS ARTICLE ACCORDING TO MSS SP-69 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

## 20. <u>DAMAGE BY LEAKS</u>

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO THE GROUNDS. WALKS. ROADS. ALL BUILDING COMPONENTS AND FINISHES, PIPING SYSTEMS, ELECTRICAL SYSTEMS AND THEIR EQUIPMENT AND CONTENT, CAUSED BY LEAKS IN THE PIPING SYSTEMS BEING INSTALLED OR HAVING BEEN INSTALLED HEREIN. ALL REPAIRS WILL BE MADE AT THIS CONTRACTOR'S EXPENSE.

#### 21. <u>PIPE MARKERS</u>

FURNISH AND INSTALL BRADY #B-350 THIN FILM OR APPROVED EQUAL PIPE MARKERS. MARKERS SHALL BE 1-1/8" HIGH FOR PIPES 3" AND UNDER AND 2-1/4" HIGH FOR PIPES OVER 3". MARKERS SHALL INDICATE TYPE OF SERVICE AND DIRECTION OF FLOW.

PIPE MARKERS SHALL BE LOCATED: AT EQUIPMENT CONNECTIONS

> AT ACCESS DOORS AT BRANCH MAINS ON ALL ACCESSIBLE PIPE A MAXIMUM OF 75' BETWEEN MARKERS.

#### 22. FLOOR, WALL AND CEILING PLATES

PIPES PASSING THROUGH FLOORS AND FINISHED CEILINGS, FITTED WITH CHROME- PLATED PLATES OR ESCUTCHEONS LARGE ENOUGH TO COMPLETELY CLOSE OPENING AROUND PIPE OR PIPE COVERING AND FLOOR SUPPORT IN THE CASE OF VERTICAL PIPING, SECURELY HELD IN PLACE; CAULK WATERTIGHT AROUND PIPE IN UNFINISHED ROOMS.

ASSEMBLY.

23. FIRE STOPPING THE PENETRATIONS OF FIRE AND/OR SMOKE RATED WALLS OR FLOORS SHALL BE PROTECTED BY A UL APPROVED MATERIAL TO RETAIN THE INTEGRITY OF THE TIME-RATED CONSTRUCTION BY MAINTAINING AS EFFECTIVE BARRIER AGAINST THE SPREAD OF FLAME, SMOKE AND GASES. IT SHALL BE USED IN ALL DUCT CABLE, CONDUIT AND PIPING PENETRATIONS THROUGH FLOOR SLABS AND TIME-RATED WALLS, AND/OR FLOORS. THE RATING OF THE FIRESTOPPING SHALL EQUAL THE RATING OF THE TIME-RATED

FIRESTOPPING MATERIAL SHALL BE 3M FIRE BARRIER SEALING SYSTEM OF APPROVED EQUAL. FIRESTOPPING MATERIAL SHALL CONSTITUTE ONE OR MORE OF THE FOLLOWING PRODUCTS:

PUTTY: #303 WRAP/STRIP: FS195

COMPOSITE SHEET: CS195 PENETRATING SEALING SYSTEMS: 7900 SERIES

INSTALLATION OF FIRESTOPPING SHALL BE INSTALLED IN ACCORDANCE WITH AND IN STRICT CONFORMITY WITH MANUFACTURER'S PRINTED INSTRUCTIONS AS TO SURFACE PREPARATION, INSTALLATION AND QUALITY CONTROL. AREAS OF WORK SHALL REMAIN ACCESSIBLE UNTIL INSPECTION AND APPROVAL BY THE APPLICABLE CODE AUTHORITIES.

ON INSULATED PIPES, THE FIRE-RATING CLASSIFICATION SHALL NOT REQUIRE REMOVAL OF THE INSULATION.

### QUALITY ASSURANCE:

SUBMIT MANUFACTURER'S PRODUCT DATA, LETTER OF CERTIFICATION OR CERTIFIED LABORATORY TEST REPORT THAT THE MATERIAL OR COMBINATION OF MATERIALS MEET THE REQUIREMENTS SPECIFIED IN

ASTM E814 AND ARE SO CLASSIFIED IN UL'S BUILDING MATERIALS DIRECTORY. MATERIALS SHALL MEET AND BE ACCEPTABLE FOR USE BY ALL MODEL BUILDING CODES.

MATERIALS SHALL MEET THE REQUIREMENTS OF NFPME61- LIFE SAFETY CODE AND NFPA 70 NATIONAL ELECTRICAL CODE.

SUBMITTALS: SUBMIT SHOP DRAWINGS, PRODUCT DATA, CERTIFICATES AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

SUBMIT MANUFACTURER'S PRODUCT DATA FOR ALL MATERIALS AND PREFABRICATED DEVICES, PROVIDING DESCRIPTIONS SUFFICIENT FOR IDENTIFICATION AT THE JOB SITE. INCLUDE MANUFACTURER'S INSTRUCTIONS

SUBMIT SHOP DRAWINGS SHOWING PROPOSED MATERIAL, REINFORCEMENT, ANCHORAGE, FASTENINGS, AND METHOD OF INSTALLATION. CONSTRUCTION DETAILS SHALL ACCURATELY REFLECT ACTUAL JOB CONDITIONS.

## 24. CLEANUP AND ADJUSTMENT

FOR INSTALLATION.

ALL PARTS WORK LEFT CLEAN: EQUIPMENT, FIXTURES, VALVES, PIPES AND FITTINGS CLEANED OF GREASE AND METAL CUTTINGS. ANY DISCOLORATION OR OTHER DAMAGE TO PORTIONS OF BUILDING, ITS FINISH OR FURNISHING DUE TO THIS CONTRACTORS FAILURE TO PROPERLY CLEAN INTERIOR OF PIPING, REPAIRED AT THIS CONTRACTOR'S EXPENSE. ALL AUTOMATIC CONTROL DEVISES ADJUSTED FOR PROPER OPERATION. ALL SURPLUS MATERIALS AND ANY RUBBISH REMOVED AS IT ACCUMULATES. ALL EQUIPMENT LEFT IN SAFE, PROPER OPERATING CONDITION.

DAMAGE TO ANY PORTIONS MUST BE REPAIRED OF THE PART REPLACED BY THIS CONTRACTOR AND ALL PARTS LEFT WITHOUT DENTS, SCRATCHES, THROUGH THE FINISH PAINT, LOOSE PLASTER, STAINS OR OTHER BLEMISHES.

## 25. PIPE TESTING AND START-UP

ALL PIPING TO BE TESTED IN ACCORDANCE WITH THE FOLLOWING:

## WATER - TEST AS PER MANUFACTURERS MANUALS

ALL TESTING MUST HOLD FOR AT LEAST 24 HOURS WITHOUT LOSS OF PRESSURE OR VACUUM. ALL CONCEALED PIPING SHALL BE TESTED IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE PRIOR TO

BEFORE STARTING ANY SYSTEM. ALL MECHANICAL AND ELECTRICAL EQUIPMENT SHALL BE LUBRICATED BY THIS CONTRACTOR. TEST ENTIRE PLANT FOR HEATING, VENTILATING, AND AIR CONDITIONING UNDER FULL LOAD CONDITIONS FOR A PERIOD OF NOT LESS THAT ONE (1) WEEK DURING WHICH TIME THE AARON BROTHERS OPERATING PERSONNEL SHALL BE FULLY INSTRUCTED IN THE OPERATION AND MAINTENANCE OF THE PLANT. AFTER THE PLANT IS IN FULL OPERATION, THIS CONTRACTOR IS TO FURNISH WHATEVER ADDITIONAL SERVICE IS REQUIRED TO RECALIBRATE AND RESET CONTROLS, VALVES, BALANCING COCKS, ETC. TO ENSURE PROPER OPERATION OF THIS SYSTEM.

## 26. <u>TESTING AND BALANCING</u>

THIS CONTRACTOR SHALL AT THE TIME OF INSTALLATION ENSURE THAT ALL DEVICES TO COMPLETE TESTING AND BALANCING AS DIRECTED HEREIN ARE FURNISHED AND INSTALLED DURING FABRICATION AND INSTALLATION OF WORK.

27. SEISMIC RESTRAINTS ON MECHANICAL EQUIPMENT

ALL PLUMBING EQUIPMENT SHALL BE PROVIDED WITH SEISMIC RESTRAINING SERVICES AS REQUIRED BY LOCAL BUILDING CODES. CONTRACTOR SHALL HAVE LOCAL BUILDING OFFICE REVIEW EACH PIECE OF EQUIPMENT WHEN INSTALLED AND THE CONTRACTOR SHALL INSTALL ALL REQUIRED TIE DOWN, ANCHORS, STRAPS OR OTHER DEVICES REQUIRED.

### 28. GUARANTEE

THIS CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT, MATERIALS, AND LABOR FURNISHED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION AND SHALL REPAIR OR REPLACE ANY EQUIPMENT OR MATERIAL WHICH IS DEFECTIVE OR IMPROPERLY INSTALLED. IN ADDITION, THIS CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE TO THE BUILDINGS AND ITS CONTENTS OR OTHER EQUIPMENT, CAUSED BY DEFECTS OR IMPROPER INSTALLATION OF EQUIPMENT OR MATERIALS INSTALLED UNDER THIS SECTION OF THE SPECIFICATIONS.

#### 29. <u>TEMPORARY WATER</u>

DURING CONSTRUCTION.

TEMPORARY WATER SERVICE TO THE BUILDING SHALL BE PROVIDED BY THIS CONTRACTOR TO THE BUILDING FOR CONSTRUCTION PURPOSES. THIS CONTRACTOR TO MAINTAIN WATER SERVICE AS REQUIRED

#### 30. <u>DOMESTIC WATER SERVICE</u>

PROVIDE PRESSURE REDUCING VALVES WITH STRAINER IN LOCATIONS AS SHOWN ON PLANS.

PROVIDE WATER HAMMER ARRESTORS ON ALL FIXTURES. AIR CHAMBERS NOT ALLOWED.

JOINTS SHALL BE CLEANED AND DE-BURRED AS RECOMMENDED BY THE MANUFACTURER AND FEDERAL, STATE, AND LOCAL CODES AND SOLDERED AS LISTED BELOW. FLUX SHALL BE NON-CORROSIVE.

ABOVE GRADE - WHERE FITTINGS ARE SOLDERED BOTH FITTINGS AND TUBING SHALL BE CLEANED AS DESCRIBED ABOVE. UNDER NO CIRCUMSTANCES SHALL DISSIMILAR METALS COME INTO DIRECT CONTACT WITH COPPER TUBING: E.G., GALVANIZED STRAPPING, HANGERS, OR CLAMPS TO SECURE THE TUBING.

BELOW GRADE, OR FLOOR SLAB ON EARTH OR STONE FILL - HIGH TEMPERATURE, SOLDER, 1200 DEG. F OR GREATER MELTING POINT.

NOTE: WATER PIPE TO BE PROPERLY SECURED AND ALIGNED SO AS NOT TO EXERT VERTICAL OR HORIZONTAL STRESSES ON THE SEATING OF THE MATING (MALE AND FEMALE) SURFACES OF THE UNIONS.

MATERIALS - UNDERGROUND: PEX-A UPONOR MATERIALS - ABOVEGROUND: PEX-A UPONOR AND FITTINGS.

ALTERNATE MATERIALS - CPVC IS AN ACCEPTABLE ALTERNATE IF NOT INSTALLED IN A PLENUM AND APPROVED BY LOCAL CODE OFFICIALS.

#### 31. STERILIZATION OF DOMESTIC WATER SYSTEM

OF FLOW PRIOR TO ANY ROUGH-IN WORK.

THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE THOROUGHLY STERILIZED WITH A SOLUTION CONTAINING NOT LESS THAN 100 PARTS PER MILLION OF AVAILABLE CHLORINE. THE SOLUTION SHALL REMAIN IN THE SYSTEM FOR TWO (2) HOURS DURING WHICH TIME ALL VALVES AND FAUCETS SHALL BE OPENED AND CLOSED SEVERAL TIMES. AFTER STERILIZATION, THE SOLUTION SHALL BE FLUSHED FROM THE SYSTEM WITH CLEAN WATER UNTIL THE RESIDUE CHLORINE CONTENT IS NOT GREATER THAN THE CHLORINE LEVEL OF THE AVAILABLE WATER SUPPLY.

THIS CONTRACTOR SHALL HAVE THE WATER TESTED AND APPROVED BY THE HEALTH DEPARTMENT.

#### 32. SANITARY SEWERS THIS CONTRACTOR SHALL CONNECT SANITARY SEWER AS INDICATED ON THE DRAWINGS. VERIFY DIRECTION

PIPING SHALL BE SCHEDULE 40 PVC. PVC IS NOT ALLOWED IN PLENUMS PROVIDE CAST IRON PIPING IN THOSE LOCATIONS.

FACH PIPE SHALL BE LAID TO THE LINE AND GRADE INDICATED ON THE PLANS AND SUCH A MANNER AS TO FORM A CLOSE CONCENTRIC JOINT WITH THE ADJOINING PIPE AND TO PRESENT OFFSETS IN FLOW LINE ALL PIPE SHALL BE LAID WITH THE BELLS UPHILL. THE SUB-GRADES SHALL BE KEPT FREE FROM WATER WHILE PIPES ARE BEING LAID. ALL PIPE SHALL BE LAID WITH ENDS ABUTTING AND TRUE TO LINE AND GRADE. THEY SHALL BE FITTED AND MATCHED SO THAT THEY WILL FORM A SEWER WITH A SMOOTH AND UNIFORM INVERT. EACH JOINT SHALL BE CLEANED AS IT IS LAID AND ALL BELLS SHALL BE CLEANED

BEFORE PIPES ARE JOINED. PVC SEWER PIPE MAY BE USED IN LIEU OF THAT SPECIFIED ABOVE IF

ALLOWED BY LOCAL CODES. END OF SPECIFICATIONS.



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TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

ISSUE DATE: NOVEMBER 18, 2020 SHEET NAME: PLUMBING SPECIFICATIONS

VERVE PROJECT NO.: 20033

LEGEND:

NOTE: NOT ALL SYMBOLS, ABBREVIATIONS OR DESIGNATIONS MAY REFER TO THIS PROJECT

Symbol		Abbrev.	<u>Description</u>	Symbol	Abbrev.	<u>Description</u>
— — F —	- —	F	FIRE MAIN PIPING BELOW GRADE (BURIED PIPING - TRENCHING AND SLAB REPAIR BY G.C.)	• •	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
—— F —		F	FIRE MAIN PIPING ABOVE GRADE		DCVA	DOUBLE CHECK VALVE ASSEMBLY WITH TAMPER SWITCHES
WS		WS	WET SPRINKLER PIPING	$\bigoplus$		HEAT DETECTOR
——— DS —		DS	DRY SPRINKLER PIPING	(\$)		SMOKE DETECTOR
——— DR —		DR	DRAIN PIPING	$\longrightarrow \bowtie \vdash$	FDV-1	FIRE DEPARTMENT VALVE & TYPE
——— PA —		PA	PREACTION SPRINKLER PIPING		FDVC-1	FIRE DEPARTMENT VALVE CABINET (SURFACE MOUNT) & TYPE
		SP	STANDPIPE PIPING		FDVC-1	FIRE DEPARTMENT VALVE CABINET (RECESSED) & TYPE
FM		FM	FM 2000 PIPING		FHC-1	FIRE HOSE CABINET (SURFACE MOUNT) & TYPE
—— IN —		IN	INERGEN PIPING			PENDENT/RECESSED SPRINKLER HEAD
———ANTI —		ANTI	ANTIFREEZE SPRINKLER PIPING			PENDENT/RECESSED SPRINKLER HEAD (EXTENDED COVERAGE)
——ТН —		TH	FIRE PUMP TEST HEADER PIPING	EC		UPRIGHT SPRINKLER HEAD
—— FDC —		FDC	FIRE DEPT. CONNECTION PIPING			UPRIGHT SPRINKLER HEAD
——— A/1 —			DENOTES ZONE (SECTOR/FLOOR)			
	<b>-</b> ₩-II	DV	DRAIN VALVE			
	<del></del>	DN	PIPE DOWN THROUGH FLOOR			
	<u> </u>	UP	PIPE UP THROUGH FLOOR ABOVE			
	<del></del> э		PIPE DROP OR RISE			
	—]		PIPE CAP			
			PIPE BREAK			
	<del></del>		UNION			
	<del>^</del>		STRAINER			
	P		PRESSURE GAUGE			
>	<b>←</b>		SHUT-OFF VALVE (TYPE PER SPECS)			
□ OR — □	<b>—</b>		SHUT-OFF VALVE WITH TAMPER SWITCH			
			RELIEF VALVE			
F <sub>S</sub> OR —		FS	FLOW SWITCH			
——D	<u> </u>	PRV	PRESSURE REGULATING VALVE			
	<b>→</b>	CV	CHECK VALVE			
->	-		FLOW ARROW			

TAMPER SWITCH

#### NOTES FOR FIRE PROTECTION:

- 1. THE CONTRACTOR TO PROVIDE COMPLETE, OPERATIONAL AND CODE COMPLIANT SPRINKLER SYSTEM FOR THE BUILDING. THE CONTRACTOR SCOPE STARTS AT FIRE WATER CONNECTION. THE AREA WILL BE PROTECTED BY A COMBINATION STANDPIPE/AUTOMATIC WET PIPE SPRINKLER SYSTEM. THE SPRINKLER COVERAGE SHALL BE DESIGNED AS PER THE NFPA -13, CITY OF PACIFIC AND THE STATE OF MISSOURI REQUIREMENTS. THE OCCUPANCY HAZARD CLASSIFICATION IS EXTRA HAZARD (WET PIPE). THE DENSITY IS 0.40 GPM PER 2000 SQUARE FEET. MAXIMUM COVERAGE PER SPRINKLER HEAD IS USING HIGH TEMP, K11.2 TYPE.
- 2. THE WET-PIPE AUTOMATIC SPRINKLER SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH NFPA-13. THE SYSTEM SHALL BE INSTALLED, TESTED AND OPERATIONAL AS PER NFPA-13.
- 3. THE SPRINKLER SYSTEM, SPRINKLER PIPING AND SUPPORTS SHALL COMPLY WITH THE SEISMIC REQUIREMENTS OF THE CITY OF PACIFIC AND STATE OF MISSOURI.
- 4. THE CONTRACTOR TO COORDINATE SPRINKLER PIPING LAYOUT AND INSTALLTION WITH HVAC DUCTWORK, ELECTRICAL LIGHTING AND STRUCTURAL MEMBERS.
- 5. STEEL PIPE SIZES 2 INCHES AND SMALLER SHALL BE SCHEDULE 40 AND MUST BE THREADED. STEEL PIPE SIZES LARGER THAN 2 INCHES MUST BE MINIMUM SCHEDULE 10. FITTINGS SHALL COMPLY WITH NFPA 13 REQUIREMENTS.
- 6. THE WATER FLOW TEST DATA WILL BE PROVIDED TO THE CONTRACTOR.
- 7. THE CONTRACTOR SHALL PERFORM THE HYDRAULIC CALCULATIONS IN ACCORDANCE WITH NFPA-13. HYDRAULIC CALCULATIONS SHALL INCLUDE AN ALLOWANCE OF 500 GPM FOR HOSE STREAMS, ADDED AT THE POINT OF CONNECTION TO THE WATER SUPPLY.
- 8. SPRINKLER SYSTEM LAYOUT, DRAWINGS AND HYDRAULIC CALCULATION SHALL BE PERFORMED BY A NICET LEVEL III OR IV TECHNICIAN CERTIFIED IN AUTOMATIC SPRINKLER SYSTEMS LAYOUT OR A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MISOURI.
- 9. SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY DESIGN TEAM'S ENGINEER AND CITY OF PACIFIC FIRE MARSHALL. SHOP DRAWING SUBMITTALS SHALL COMPLY WITH THE NFPA-13.
- 10. ANY REFERENCE TO "AUTHORITY HAVING JURISDICTION" SHALL BE INTERPRETED TO MEAN THE CITY OF PACIFIC FIRE MARSHALL.
- 11. THE SYSTEM WILL BE HYDROSTATICALLY TESTED AS REQUIRED BY NFPA-13. TESTING TO BE WITNESSED BY THE CITY OF PACIFIC FIRE MARSHALL. PROVIDE CERTIFICATES IN ACCORDANCE WITH NFPA-13.
- 12. THE SPRINKLER HEADS SHALL BE STANDARD RESPONSE TYPE AND WILL COMPLY WITH NFPA-13. THE TEMPERATURE RATING OF THE SPRINKLER HEADS SHOULD BE SUITABLE FOR THE AMBIENT CONDITIONS. THE IXOL HOT BOX IS MAINTAINED AT 104° F. THE STORAGE BUILDING IS VENTILATED AND WILL HAVE HIGHER TEMPERATURE THAN THE MAXIMUM OUTSIDE DESIGN TEMPERATURE.
- 13. CONTRACTOR TO PROVIDE FINAL AS-BUILT DRAWINGS OF THE FIRE SUPPRESSION
- 14. THE CONTRACTOR SHALL COMPLY WITH NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS AND 29 CFR 1910.34, COVERAGE AND DEFINITIONS, 29CFR 1910-35, COMPLIANCE WITH NFPA 101, LIFE SAFETY CODE, 29CFR 1910-36, DESIGN AND CONSTRUCTION REQUIREMENTS FOR EXIT ROUTES, 29CFR 1910-37, MAINTENANCE, SAFEGUARDS, AND OPERATIONAL FEATURES FOR EXIT
- 15. CONTRACTOR SHALL PROVIDE FIRE CAULKING AT ALL PIPE PENETRATIONS FOR FLOORS, WALLS AND CEILINGS. FIRE STOPPING SHALL COMPLY WITH FIRESTOP CONTRACTORS INTERNATIONAL ASSOCIATION (FCIA) SPECIFICATION LISTED FOR APPLICATION BEING
- 16. ALL FIRE SPRINKLER/FIRE PROTECTION SYSTEM WORK INCLUDING BUT NOT LIMITED TO SHUTDOWN, INSTALLATION, AND COMMISSIONING SHALL BE COORDINATED WITH THE PROJECT MANAGER.



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VERVE PROJECT NO.: 20033 ISSUE DATE: NOVEMBER 18, 2020

SHEET NAME: FIRE PROTECTION LEGENDS AND NOTES

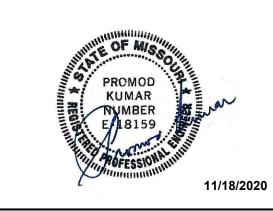




## FIRE PROTECTION KEYED NOTES:

- HATCHED AREA REPRESENTS FIRE SPRINKLERS AND ALARM BELL TO BE ADDED PER NEW LAYOUT.
- 2 PROVIDE A GYP BOARD CEILING AT 14'-0" ELEVATION.





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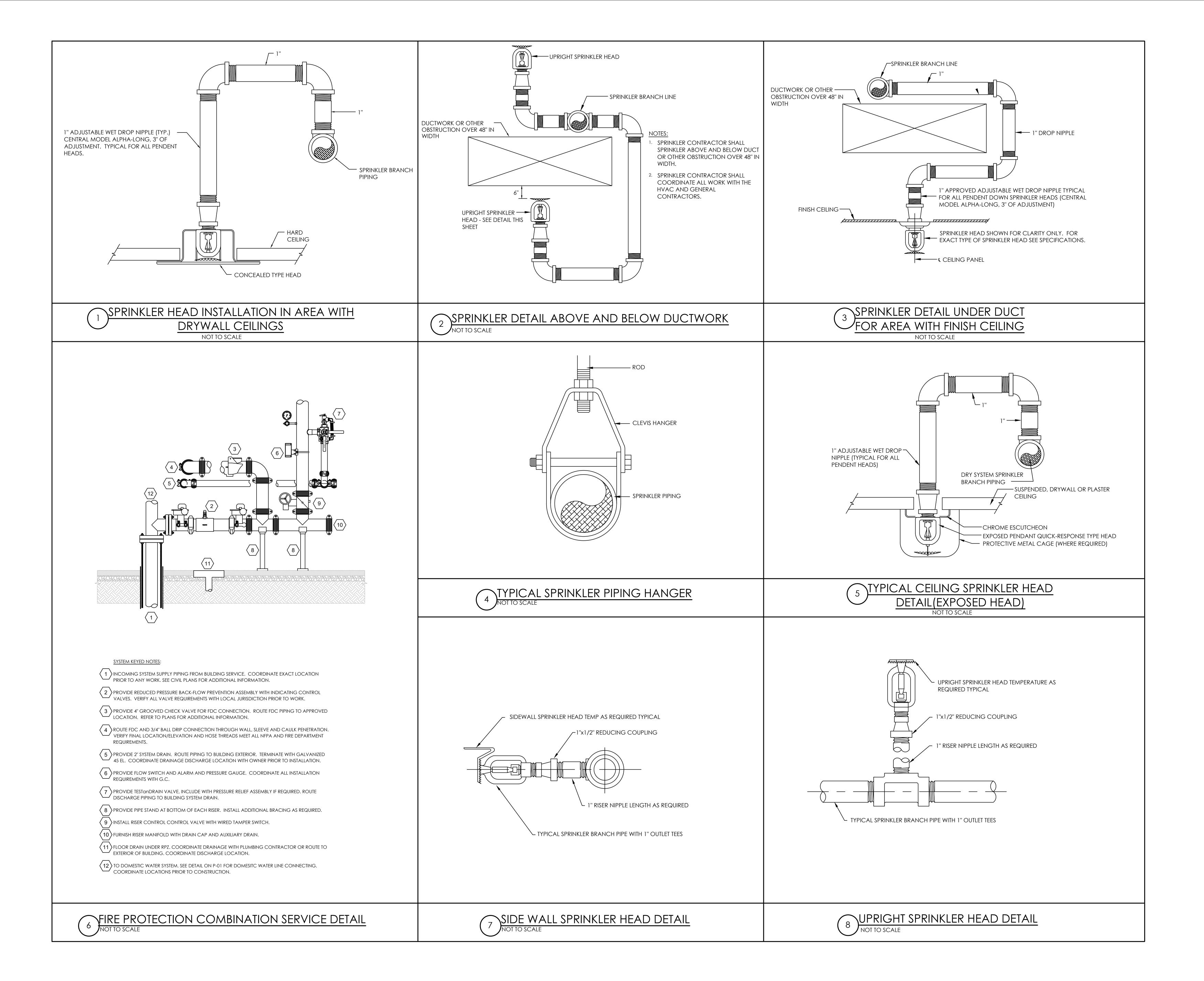
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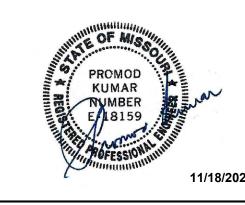
FIRE PROTECTION PLAN

SHEET NAME:

SHEET NO. **FP-02** 







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SHEET NAME:

FIRE PROTECTION DETAILS

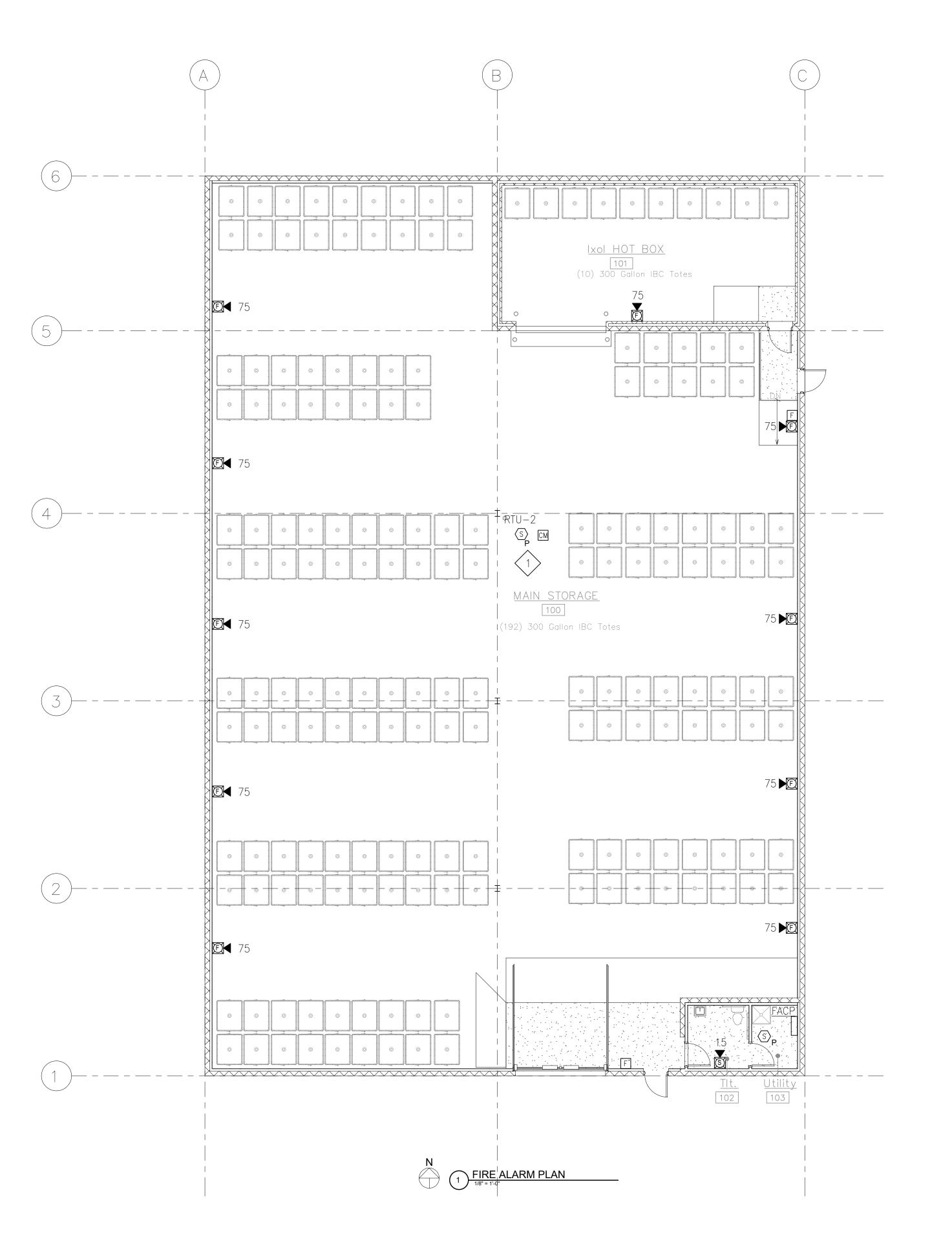
SHEET NO.

## ELECTRICAL GENERAL NOTES:

1. ALL FIRE ALARM WORK SHALL COMPLY WITH NFPA 72 AND ALL LOCAL REQUIREMNTS.

KEYED NOTES:

FIRE ALARM CONTROL MODULE SHALL SHUT DOWN THE ROOF TOP UNIT UPON ALARM OF SMOKE DETECTOR IN THE RETURN.







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VERVE PROJECT NO.: 20033

ISSUE DATE: NOVEMBER 18, 2020

SHEET NAME:
ELECTRICAL POWER AND
LIGHTING PLANS
SHEET NO.

FA-01

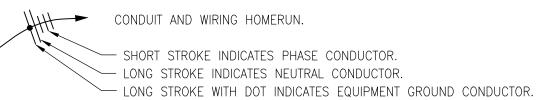
## GENERAL NOTES

- IN GENERAL, CONDUIT ROUTING SHOWN ON THE DRAWINGS
  IS DIAGRAMMATIC. ACTUAL CONDUIT ROUTING SHALL BE
  DETERMINED IN THE FIELD.
- 2. PENETRATIONS OF CONDUITS, RACEWAYS AND WIRING THROUGH FIRE RATED WALLS AND CEILING SHALL BE FIRE STOPPED USING A FIRE STOPPING U.L. LISTED ASSEMBLY BY A CERTIFIED INSTALLER SO AS TO MAINTAIN THE UL RATING OF THE ASSEMBLY.
- 3. NOT ALL SYMBOLS USED.
- 4. INTERIOR CONDUIT SHALL BE EMT. EXTERIOR CONDUIT SHALL BE IMC OR RGS. FITTINGS SHALL BE STEEL; DIE CAST IS NOT ACCEPTABLE. MINIMUM CONDUIT SIZE SHALL BE 1/2".
- 5. WIRE SHALL BE THHN/THWN COPPER; #12 AWG MINIMUM. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN EVERY CIRCUIT AND FEEDER.
- 6. BOXES SHALL BE SHEET METAL.
- 7. LIGHT FIXTURES SHALL BE AS INDICATED OR APPROVED EQUAL.
- 8. WIRING DEVICES SHALL BE HUBBELL INDUSTRIAL GRADE OR APPROVED EQUAL.
- 9. NEW CIRCUIT BREAKERS SHALL MATCH THE MANUFACTURER, TYPE, AND AIC RATING OF THE EXISTING CIRCUIT BREAKERS IN THE PANEL.

## <u>DEFINITIONS</u>

PROVIDE: FURNISH AND INSTALL AS INDICATED AND AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.

## <u>CONDUIT</u>



## MISCELLANEOUS

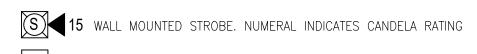


EQUIPMENT DESIGNATION

## 1 KEYED NOTE

## <u>FIRE ALARM</u>

F 15 WALL MOUNTED HORN/STROBE. NUMERAL INDICATES CANDELA RATING



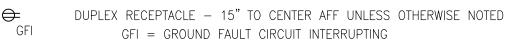
## M RELAY CONTROL MODULE

S PHOTOELECTRIC SMOKE DETECTOR

## ABBREVIATIONS

FACP FIRE ALARM CONTROL PANEL
FVNR FULL VOLTAGE NON—REVERSING
LOC MASS NOTIFICATION LOCAL OPERATING CONSOLE
TV TELEVISION

## <u>POWER</u>



- DOUBLE DUPLEX RECEPTACLE 15" AFF UNLESS OTHERWISE NOTED
- SPECIAL PURPOSE OUTLET 18" AFF UNLESS OTHERWISE NOTED
- MOTOR
- $\Box$  30/3 15AF DISCONNECT SWITCH - 30/3 = SWITCH AMPS/POLES, 15AF = 15 AMP FUSE
- $\bigcirc_3$  Junction box # indicates number of circuit for furniture connection
- BRANCH CIRCUIT PANELBOARD
- DISTRIBUTION PANELBOARD
  - THE FUSIBLE COMBINATION FVNR MOTOR STARTER, SIZE 1, HOA. PROVIDE HEATERS

## LIGHTING FIXTURE DESIGNATION MATRIX

SYMBOL VARIES BY FIXTURE TYPE

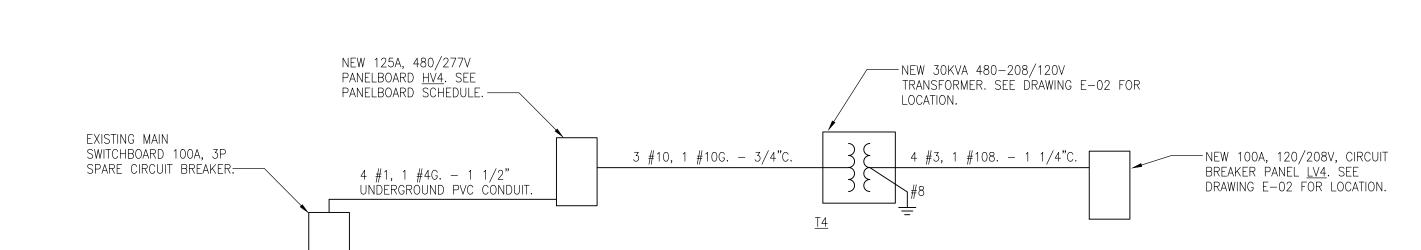
A 1

CIRCUIT NUMBER

FIXTURE TYPE

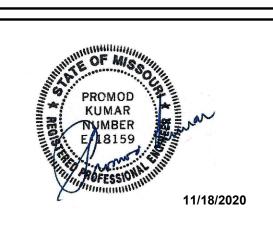
## <u>LIGHTING</u>

- SWITCH -3 = 3—WAY, 4 = 4—WAY, 0S = OCCUPANCY SENSOR TYPE, (LETTER INDICATES SWITCHLEG), CENTERLINE OF DEVICE 48" AFF.
- WALL MOUNTED EMERGENCY LIGHT
- ⊢**⊘** WALL MOUNTED EXIT SIGN
- ├── WALL MOUNTED EXTERIOR LIGHT









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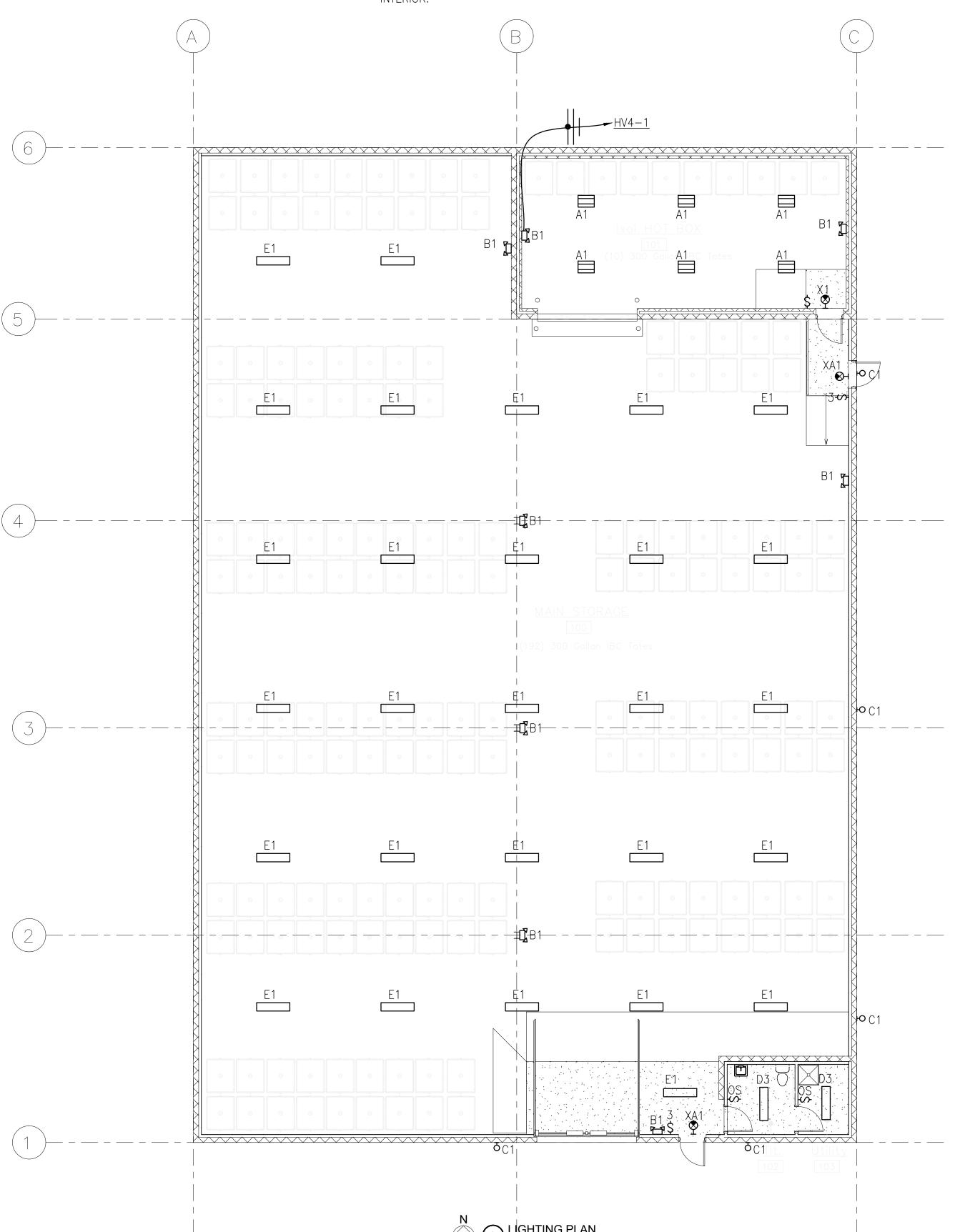
ISSUE DATE: NOVEMBER 18, 2020

ELECTRICAL SYMBOLS,
ABBREVIATIONS, DIAGRAMS
SHEET NO.

E-01

## **LIGHTING GENERAL NOTES:**

- TYPE A LIGHT FIXTURE: COLUMBIA PEL240-MH-FA-W-EDU-NXSPH-LHVQM5.
- 2. TYPE B LIGHT FIXTURE: DUAL-LITE DYN-12-I-06L
- 3. TYPE C LIGHT FIXTURE:
  HUBBELL QSP2-24L50-4K7-4-277-BLT-PC-EH
- 4. TYPE D LIGHT FIXTURE:
- COLUMBIA LAW4-35-MW-E-U 5. TYPE E LIGHT FIXTURE:
- COLUMBIA MPL4-9-40-HL-AD-E
- 6. TYPE X LIGHT FIXTURE:
  DUAL-LITE DYNC-D-R-W-12-06L.
- 7. TYPE XA LIGHT FIXTURE: DUAL—LITE EVE—U—R—W—EI
- 8. INSTALL TYPE A AT 14' ABOVE FINISHED FLOOR WITH AIRCRAFT CABLE SUPPORTS. INSTALL TYPE B 10'-0" ABOVE THE FLOOR. INSTALL TYPE C 9'-0" ABOVE FINISHED FLOOR. INSTALL TYPE E AT 1'-0" BELOW THE LOWEST STRUCTURAL MEMBER WITH AIRCRAFT CABLE SUPPORTS. INSTALL TYPE X 9'-0" ABOVE THE FLOOR CENTERED ON THE DOOR.
- 9. TYPES B AND X SHALL BE UNSWITCHED.
- 10. CONDUIT FOR TYPE C SHALL BE ROUTED WITHIN BUILDING INTERIOR.

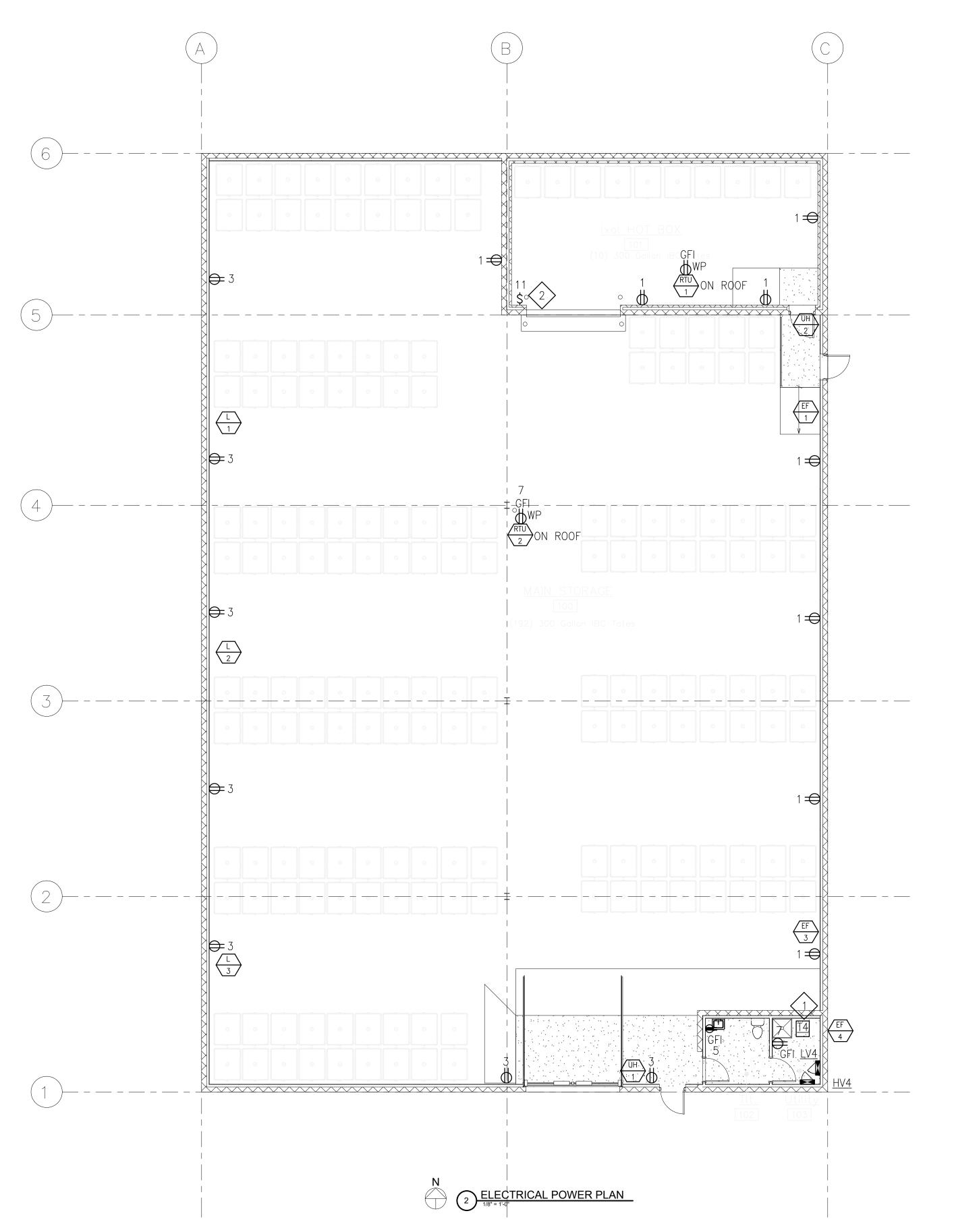


### **ELECTRICAL GENERAL NOTES:**

- 1. SEE THE MECHANICAL SHEETS FOR EXACT EQUIPMENT LOCATIONS AND ELECTRICAL REQUIREMENTS.
- 2. ALL HOMERUNS REFERENCE NEW PANELBOARDS. SEE THE PANELBOARD SCHEDULES.



PROVIDE A MOTOR RATED TOGGLE SWITCH DISCONNECT FOR THE COILING DOOR MOTOR. PROVIDE ALL RACEWAY AND CONDUCTORS FOR THE DOOR CONTROLS AND INSTALL THE DOOR CONTROLS.







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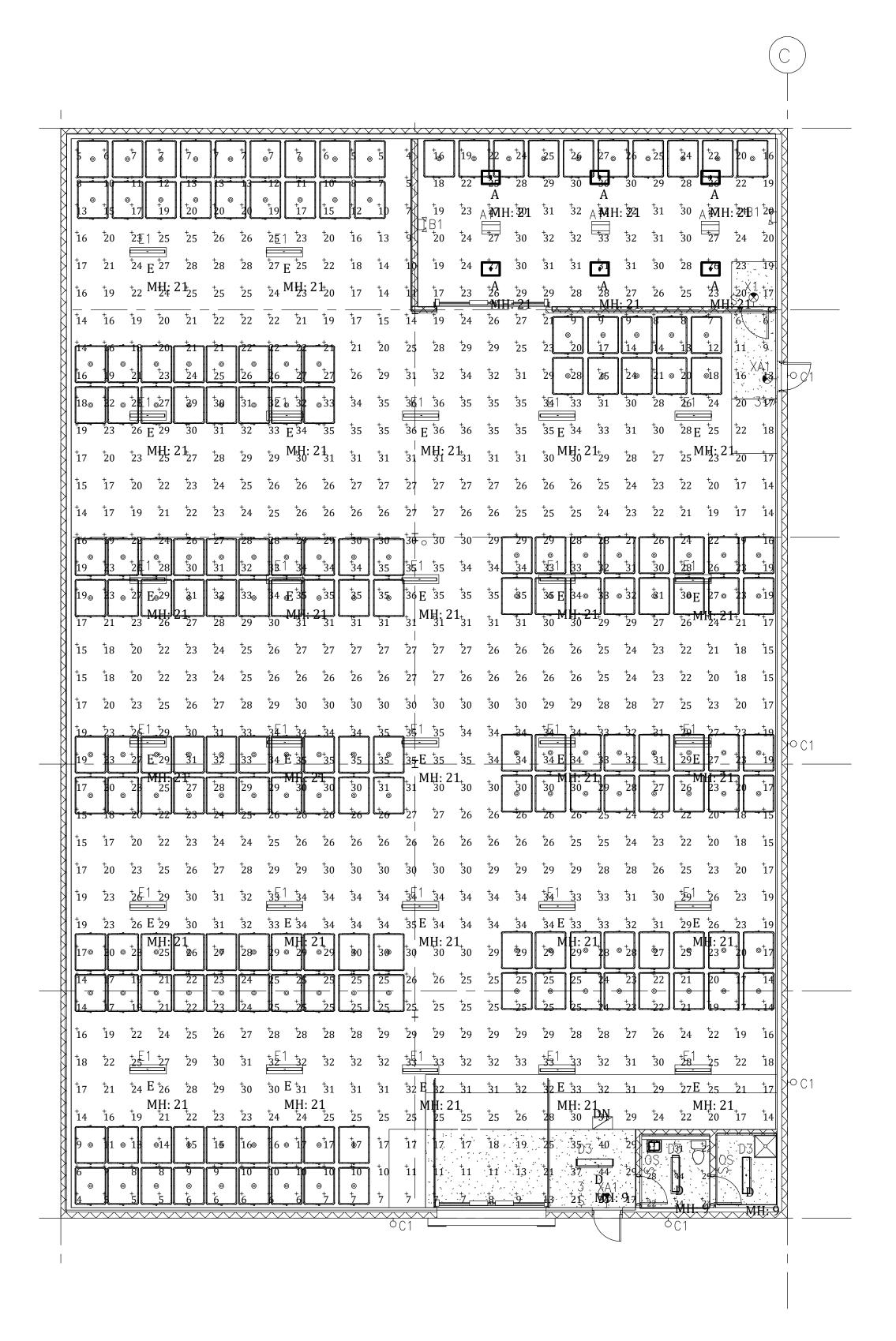
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VERVE PROJECT NO.: 20033

ISSUE DATE: NOVEMBER 18, 2020

ELECTRICAL POWER AND LIGHTING PLANS

SHEET NO.



N O LIQUEINO PLIOTOMETRIO PLANI

#### ROOM REFLECTANCES USED IN LARGE AREA 50/30/20 ROOM REFLECTANCES USED IN LOW CELING AREAS 50/30/20 WORKPLANE: 2.5' AFF

Luminaire Sch	edule				
Symbol	Qty	Label	Description	Arrangement	LLF
•	6	A	PEL2-40LH-FAW-EDU-NXSPH/LHVQM5	SINGLE	0.900
<b>→</b>	3	D	LAW4-35MW-EU	SINGLE	0.900
+	27	Е	MPL4-9-40HL-AD-EU	SINGLE	0.780

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
OPEN SPACE_Workplane	Fc	24.46	44	4	6.12	11.00
RESTROOM_Workplane	Fc	28.33	44	21	1.35	2.10



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VERVE PROJECT NO.: 20033

ISSUE DATE: NOVEMBER 18, 2020

SHEET NAME:
PHOTOMETRIC LAYOUTS

SHEET NO. **E-03** 

PANELBOARD -	Н	V4			VC	DLTAGE	480	/ 2	277		A۱	MP BUS	125	S	PECIAL FE	EATURES - N	<b>IEW</b>
MOUNTING -	SUR	FACE	_			PHASE	3			_	AM	IP MCB	100	_			
- -	14,00	00 AIC	-			WIRE	4				AN	MP MLO		- -			
LOAD DESCRIPTION		LOAD	) (VA)		BRE	AKER	OUD OU II T	3 PI	<b></b>	OUD OU UIT	BREA	AKER		LOAD	) (VA)	Τ	LOAD DECORIDEION
LOAD DESCRIPTION	LIGHT	RECEP.	HVAC	MISC.	AMP	POLES	CIRCUIT	АВ	С	CIRCUIT	POLES	AMP	LIGHT	RECEP.	HVAC	MISC.	LOAD DESCRIPTION
NORTH LIGHTING	3089				20	1	1			2	1	20					SPA
RMS 102, 103, EXTERIOR LIGHTING	268				20	1	3			4	1	20					SPA
SPARE					20	1	5			6	1	20					SPA
SPARE					20	1	7			8	1						SPA
SPARE					20	1	9			10	1						SPA
SPARE					20	1	11			12	1						SPA
			5915				13			14	1						SPA
FRANSFORMER T-4			5915		50	3	15			16	1						SPA
			5915				17			18	1						SPA
SPACE						1	19			20	1						SPA
SPACE						1	21			22	1						SP <i>A</i>
SPACE						1	23			24	1						SP/
SPACE						1	25			26	1						SP <i>A</i>
SPACE						1	27			28	1						SPA
SPACE						1	29			30	1						SPA

Demand Factors
Lighting 1.00
Receptacles 0.50
HVAC 1.00
Miscellaneous 0.65

Spare Capacity 30%

Total Demand Loads By Type (VA)

Spare \_\_\_\_\_6,331

Total Demand Load 27,434

Total Demand Amps \_\_\_\_\_\_33\_\_\_

Connected Loads By Phase (VA)Total Phase A9,004Lighting3,357Total Phase B6,183Receptacles0Total Phase C5,915HVAC17,746

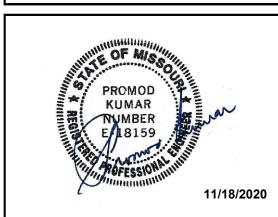
HVAC 17,746
Miscellaneous 0

PANELBOARD -	L	V4			V	OLTAGE	208	1	120	_	AN	MP BUS	100	S	PECIAL FE	ATURES -	NEW PANELBOARD
MOUNTING -	SUR	FACE				PHASE	3			_	ΑM	IP MCB	100				
	10,00	00 AIC	•			WIRE	4	<del>-</del> -			AN	MP MLO		-			
LOAD DESCRIPTION		LOAD	(VA)		BRE	AKER	CIRCUIT	3 P	PH.	CIRCUIT	BREA	AKER		LOAD	) (VA)		LOAD DESCRIPTION
EOAD DESCRIPTION	LIGHT	RECEP.	HVAC	MISC.	AMP	POLES	CIICOII	АВ	зС	Circon	POLES	AMP	LIGHT	RECEP.	HVAC	MISC.	LOAD DESCRIPTION
RECEPTACLES		1440			20	1	1			2	1	15			200		UI
RECEPTACLES		1260			20	1	3			4	1	15			864		E
RESTROOM RECEPT		1500			20	1	5			6	1	15			864		El
ROOF AND JAN CLSET RECEPT		540			20	1	7			8	0	00			1685		DT
FIRE ALARM SYSTEM				1000	20	1	9			10	2	30			1685		RT
COILING DOOR				1500	20	1	11			12	0	40			2340		RTI
SPARE					20	1	13			14	2	40			2340		l Ki
SPARE					20	1	15			16	1	15			864		E
SPARE					20	1	17			18	1	15			34		E
SPARE					20	1	19			20	1	15			350		LOUVERS 1, 2
SPACE						1	21			22	1	20					SPA
SPACE						1	23			24	1	20					SPA
SPACE						1	25			26	1	20					SPA
SPACE						1	27			28	1	20					SPA
SPACE						1	29			30	1	20					SPA
SPACE						1	31			32	1						SPA
SPACE						1	33			34	1						SPA
SPACE						1	35			36	1						SPA
SPACE						1	37			38	1						SPA
SPACE						1	39			40	1						SPA
SPACE						1	41			42	1						SPA
NOTES:  1. EACH OVERCURRENT DEVICE WITH	HIN THIS P	ANEL SHAL	L MATCH	EXISTING													

Connected Loa	ds By Phase (VA)	Total Connected Lo	oads By Type (VA)	Demand Fact	ors	Total Demand Loa	ds By Type (VA)
Total Phase A	6,555	Lighting	0	Lighting	1.00	Lighting	0
Total Phase B	5,673	Receptacles	4,740	Receptacles	1.00	Receptacles	4,740
Total Phase C	6,238	HVAC	11,226	HVAC	0.80	HVAC	8,981
		Miscellaneous	2,500	Miscellaneous	0.65	Miscellaneous	1,625
		Total	18,466	-		Subtotal	15,346
				Spare Capacity	30%	Spare	4,604
						Total Demand Load	19,950
						Total Demand Amps	55



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THIS SHEET IS PART OF A COMPLETE SET. REFER TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

VERVE PROJECT NO.: 20033 ISSUE DATE: NOVEMBER 18, 2020

SHEET NAME:
ELECTRICAL PANELBOARD
SCHEDULES

SHEET NO.

E-04

## ELECTRICAL SPECIFICATION

#### ELECTRICAL GENERAL

- 1.1 ELECTRICAL GENERAL A. WORK UNDER THIS CONTRACT INCLUDES PROVIDING ALL LABOR. MATERIALS. EQUIPMENT. TRANSPORTATION. SCAFFOLDING, RIGGING, TOOLS AND RELATED ITEMS AND SUBCONTRACT WORK FOR A COMPLETE
- OPERATING ELECTRICAL SYSTEM AND INCLUDES BUT IS NOT LIMITED TO OBTAINING ALL PERMITS AND APPROVALS FROM AUTHORITIES WHERE APPLICABLE. 2. REMOVALS, ALTERATIONS, RELOCATIONS AND CONNECTIONS TO EXISTING SYSTEMS
- 3. IDENTIFICATION. 4. CUTTING AND PATCHING.
- GUARANTEE. 6. TESTING AND ADJUSTMENTS.
- 7. CLEAN-UP. 8. FEEDERS AND PANELBOARDS

16.NURSE CALL SYSTEM.

- 9. WIRING DEVICES. 10. GROUNDING SYSTEM.
- 11.LIGHTING AND POWER BRANCH CIRCUIT CONDUIT AND WIRING.
- 12.LIGHTING FIXTURES AND LAMPS. 13.LIGHTING CONTROLS.
- 14. COORDINATION WITH OTHER TRADES. 15.GENERATOR, AUTOMATIC TRANSFER SWITCH, AND UNINTERRUPTIBLE POWER SUPPLY.
- 1.2 EXECUTION OF WORK A. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS TO PROVIDE A COMPLETE WORKABLE SYSTEM READY FOR THE OWNER'S OPERATION. ANY ITEM NOT SPECIFICALLY SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS, BUT REQUIRED TO CONFORM WITH THE INTENT, ARE TO BE CONSIDERED A
- PART OF THE CONTRACT. B. ALL MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE NEW AND UNUSED AND FREE FROM DEFECTS. ALL MATERIALS USED SHALL BEAR THE UNDERWRITER'S LABORATORY, INC. LABEL.
- C. KEEP A SUITABLE FORCE OF WORKERS ON THE JOB AT ALL TIMES, TO COMPLY WITH THE JOB PROGRESS SCHEDULE, UNTIL THE COMPLETION OF ALL ELECTRICAL CONSTRUCTION.
- D. COORDINATE THE LOCATIONS OF ALL ELECTRICAL EQUIPMENT WITH THE EQUIPMENT OF OTHER TRADES AND THE BUILDING CONSTRUCTION. E. COMPLY WITH THE LATEST RULES AND REGULATIONS OF THE NATIONAL ELECTRICAL CODE, THE NATIONAL
- ELECTRICAL SAFETY CODE, ALL NFPA CODES, THE RULES SET FORTH BY THE UTILITY COMPANIES SERVING THIS SITE AND ALL OTHER NATIONAL, STATE OR MUNICIPAL CODES APPLICABLE TO THIS PROJECT. 1.3 EXAMINATION AND PATCHING A. PRIOR TO THE SUBMITTING OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE OF THE JOB AND SHALL BECOME FAMILIAR WITH ALL CONDITIONS AFFECTING THE PROPOSED INSTALLATION AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. FAILURE TO COMPLY WITH THE INTENT OF THIS PARAGRAPH WILL
- IN NO WAY RELIEVE THE CONTRACTOR OF PERFORMING ALL NECESSARY WORK SHOWN ON THE DRAWINGS OR SPECIFIED HEREIN. 1.4 CUTTING AND PATCHING
- A. WHERE CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER CONSTRUCTION IS NECESSARY FOR PROPER INSTALLATION, THE WORK SHALL BE DONE CAREFULLY TO PRESERVE THE INTEGRITY OF THE CONSTRUCTION. PATCH AND REPAIR ALL HOLES TO THEIR ORIGINAL CONSTRUCTION, FIRE RATING AND FINISH.
- 1.5 MOUNTING HEIGHTS A. MOUNTING HEIGHTS LISTED ARE TO THE CENTER OF THE DEVICE AND WHEREVER APPLICABLE 1. CONVENIENCE AND GFI OUTLETS - 15 INCHES TO CENTER
- 2. SWITCHES 48 INCHES TO CENTER 3. TELEPHONE OR DATA OUTLETS - 18 INCHES
- 4. WALL TELEPHONE OUTLETS 4 FEET 6 INCHES
- 5. DISCONNECT SWITCHES 5 FEET TO CENTER
- 6. EXIT LIGHTS AS NOTED ON DRAWINGS 7. RECEPTACLES INDICATED AS ABOVE COUNTER - 44 INCHES TO CENTER B. THE MOUNTING HEIGHT SHALL FALL WITHIN THE RANGES GIVEN IN THE LATEST PUBLICATION OF ADA.
- 1.6 CLEANING UP A. CONTRACTOR SHALL TAKE CARE TO AVOID ACCUMULATION OF DEBRIS, BOXES, CRATES, ETC., RESULTING FROM THE INSTALLATION OF THE WORK. CONTRACTOR SHALL REMOVE FROM THE PREMISES EACH DAY ALL
- INSTRUCTIONS, WHICH SHALL BE PROMPTLY CARRIED OUT. B. CONTRACTOR SHALL CLEAN ALL FIXTURES AND EQUIPMENT AT THE COMPLETION OF THE PROJECT.

DEBRIS, BOXES, ETC., AND KEEP THE PREMISES CLEAN, SUBJECT TO THE ARCHITECT/ENGINEER'S

- 1.7 DEFINITIONS A. "PROVIDE" MEANS TO SUPPLY, PURCHASE, INSTALL, CONNECT, TEST AND TURN OVER TO THE OWNER,
- COMPLETE AND READY FOR OPERATION, THE PARTICULAR WORK REFERRED TO. B. "INSTALL" MEANS TO SET IN PLACE, FASTEN, JOIN, ATTACH, CONNECT, TEST AND TURN OVER TO THE OWNER COMPLETE AND READY FOR OPERATION, THE PARTICULAR WORK REFERRED TO
- C. "FURNISH" MEANS TO PURCHASE AND SUPPLY ALL MATERIALS, EQUIPMENT, TESTING, ACCESSORIES AND ALL OTHER ITEMS CUSTOMARILY REQUIRED FOR THE PROPER AND COMPLETE APPLICATION FOR THE PARTICULAR WORK REFERRED TO.
- D. "CONCEALED" MEANS EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED WITHIN WALL CONSTRUCTION OR INSTALLED ABOVE SUSPENDED CEILINGS. 1.8 RECORD DRAWINGS
- A. DURING CONSTRUCTION, KEEP A SET OF BLUEPRINTS AT THE SITE AND RECORD ALL DEVIATIONS BETWEEN THE WORK SHOWN ON THE CONTRACT DOCUMENTS AND THAT WHICH IS ACTUALLY INSTALLED. B. UPON COMPLETION OF THE INSTALLATION AND ACCEPTANCE BY THE OWNER, OBTAIN A SET OF MYLAR REPRODUCIBLES. TRANSFER THE ABOVE INFORMATION TO THE REPRODUCIBLES AND DELIVER THEM TO THE ARCHITECT FOR REVIEW AND IF ACCEPTABLE, TRANSMITTAL TO THE OWNER. THE COST FOR MYLAR REPRODUCIBLES AND FOR MAKING THE REQUIRED CHANGES SHALL BE BORNE BY THE CONTRACTOR.
- 1.9 SHOP DRAWINGS A. PREPARE AND SUBMIT SHOP DRAWINGS FOR MATERIALS AND SYSTEMS LISTED HEREIN. SHOP DRAWINGS MAY BE IN THE FORM OF STANDARD MANUFACTURERS CATALOG CUTS. SPECIAL SYSTEMS SUCH AS FIRE ALARM, SECURITY, ETC. WILL REQUIRE MANUFACTURER'S WIRING DIAGRAMS OF THE SYSTEM BEING INSTALLED. SHOP DRAWINGS SHALL BE CLEARLY MARKED TO INDICATE THE EXACT ITEMS BEING
- B. SUBMIT SHOP DRAWING FOR THE FOLLOWING EQUIPMENT AND SYSTEMS:
- 1. LIGHTING FIXTURES. 2. DEVICES.
- 3. WIRE AND CABLE. 4. SPECIAL SYSTEMS
- 5. PANELBOARDS. 1.10 GUARANTEE
- A. SUBMIT A SINGLE GUARANTEE STATING THAT ALL PORTIONS OF THE WORK ARE IN ACCORDANCE WITH CONTRACT REQUIREMENTS. GUARANTEE ALL WORK AGAINST FAULTY AND IMPROPER MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE BY THE OWNER. OBTAIN SIMILAR GUARANTEES FROM SUBCONTRACTORS, MANUFACTURERS, SUPPLIERS AND SUBTRADE SPECIALISTS.
- 1.11 IDENTIFICATION A. PROVIDE FIXED IDENTIFICATION OF ALL DISTRIBUTION EQUIPMENT AND CONDUCTORS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- B. UNLESS OTHERWISE NOTED, NAMEPLATES SHALL BE BLACK LAMACOID PLATES WITH WHITE ENGRAVED UPPER CASE LETTERS ENCLOSED BY WHITE BORDER ON BEVELED EDGE
- C. ALL NAMEPLATES MUST BE ENGRAVED AND MUST BE SECURED WITH RIVETS, BRASS OR CADMIUM PLATE SCREWS. THE USE OF DYMO TAPE OR THE LIKE IS UNACCEPTABLE.
- D. LETTERING HEIGHTS UNLESS OTHERWISE NOTED MUST BE AS FOLLOWS: 1. ITEM/ LETTERING
- a. WALL PLATE/ 1/8" b. PANELBOARDS/ 1/2"
- E. CABLE TAGS MUST BE FLAMEPROOF SECURED WITH FLAMEPROOF NONMETALLIC CORD. F. FURNISH AND INSTALL CABLE TAGS ON EACH CABLE WHICH ENTERS A PULLBOX, ENCLOSURE PANELBOARD, AND AT TERMINATIONS. MARK TAGS WITH TYPE WRITTEN INSCRIPTION NOTING THE LOAD SERVED, TYPE AND SIZE OF CABLE, AND THE OVERCURRENT DEVICE PROTECTING THE CABLE.
- 1.12 TESTING, INSPECTIONS AND CERTIFICATIONS A. PRIOR TO TURNING OVER ELECTRICAL SYSTEMS TO THE OWNER, THE CONTRACTOR SHALL COMPLETELY TEST ALL SYSTEMS AND SHALL CERTIFY THAT ALL SYSTEMS HAVE BEEN TESTED AND ARE IN SAFE AND COMPLETE WORKING ORDER
- B. PERFORM THE FOLLOWING TESTS OR INSPECTIONS: 1. TEST ALL WIRING FOR SHORTS, OPENS OR GROUNDS.
- 2. TEST ALL CIRCUIT BREAKERS, SWITCHES, STARTERS OR OTHER CONTROL DEVICES. 3. TEST ALL RECEPTACLES FOR PROPER POLARITY AND GROUND.
- 4. TEST ALL LIGHTING AND SWITCHES FOR PROPER OPERATION. ASSURE THAT ALL LAMPS ARE WORKING AND BALLASTS ARE "QUIET".
- 1.13 PENETRATIONS A. PROVIDE FIRE SEALS AT ALL CABLE AND CONDUIT PENETRATIONS THRU FIRE RATED WALLS, WALLS, FLOORS, CEILINGS OR OTHER CONSTRUCTION. REFER TO THE ARCHITECTURAL DRAWINGS FOR RATINGS. B. FIRE SEALING MATERIAL SHALL CONSIST OF A PRE-MANUFACTURED BARRIER OR PRE-MIXED PUTTY AS
- MANUFACTURED BY NELSON ELECTRIC, CROUSE-HINDS COMPANY OR APPROVED APPROVED EQUAL. C. FIRE SEAL AND SEPARATE ELECTRICAL OUTLETS A MINIMUM OF 24" WHEN BACK TO BACK WITHIN FIRE RATED PARTITIONS PER fbc 714.3.2.

## PART 2 - PRODUCTS

PART 3 - EXECUTION

- A. UNLESS SPECIFICALLY STATED OTHERWISE ON THE DRAWINGS, ALL MATERIALS SHALL BE NEW AND SHALL BEAR A U.L. LABEL WHERE STANDARDS HAVE BEEN ESTABLISHED BY U.L. FOR SUCH EQUIPMENT.
- A. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR INSTALLING, CONNECTING AND ADJUSTING ALL EQUIPMENT. PROVIDE ALL SPECIAL SUPPORTS, CONNECTIONS, WIRING AND ACCESSORIES ACCESSORIES NECESSARY FOR A
- B. USE ELECTRICIANS, SKILLED IN THEIR TRADE FOR ALL WORK. C. KEEP ALL EQUIPMENT CLEAN AND PROTECTED BEFORE AND AFTER INSTALLATION.
- D. PERFORM ALL TESTS REQUIRED BY LOCAL AUTHORITIES FOR SYSTEMS GOVERNED BY LOCAL CODES OR LAWS SUCH AS LIFE SAFETY SYSTEMS.

- SECTION 260534 RACEWAYS AND BOXES
- PART 1 GENERAL
- 1.1 REGULATORY REQUIREMENTS A. MATERIALS: UL AND NEC APPROVED FOR THE APPLICATION INTENDED.
- 1.2 SYSTEM DESCRIPTION A. PERFORMANCE REQUIREMENTS
  - 1. PROVIDE CONDUIT SYSTEMS FOR WIRING EXCEPT WHERE THE DRAWINGS AND SECTIONS INDICATE THAT WIRING 3.2 INSTALLATION OF WIRES AND CABLES IS NOT INSTALLED IN CONDUIT.

#### PARTS 2 - PRODUCTS

- A. ELECTRICAL METALLIC TUBING (EMT): THINWALL, ELECTRICALLY WELDED COLD ROLLED STEEL CONDUIT, GALVANIZED INSIDE AND OUT BY ELECTRO GALVANIZED PROCESS. BAKED CLEAR ELASTIC ENAMEL COATING IN
- 1. USE FOR CONDUIT SIZES UP TO 4" INSTALLED IN STUD WALLS, MASONRY WALLS, ABOVE SUSPENDED CEILINGS AND WHERE EXPOSED. B. FLEXIBLE METAL CONDUIT: FORMED OF ONE CONTINUOUS LENGTH OF SPIRALLY WOUND ELECTRO GALVANIZED
- 1. USE FOR: FINAL CONNECTIONS FROM JUNCTION BOXES TO LIGHTING DEVICES IN ACCESSIBLE CEILING, AND FOR WIRING WITHIN CASEWORK AND MILLWORK. 2.2 CONDUIT FITTINGS A. METALLIC TUBING FITTINGS: COMPRESSION TYPE GALVANIZED MALLEABLE IRON OR STEEL, WATER AND CONCRETE TIGHT. CONNECTORS WITH NYLON INSULATED THROATS AT CABINETS, BOXES AND GUTTERS. INDENTOR OR SET
- SCREW TYPE FITTINGS WILL NOT BE ALLOWED. DIE CAST FITTINGS SHALL NOT BE ACCEPTABLE. a. FLEXIBLE METAL CONDUIT FITTINGS: SQUEEZE OR SCREW TYPE GALVANIZED MALLEABLE IRON, ALUMINUM OR STEEL WITH NYLON INSULATED THROATS
- 2.3 OUTLET BOXES A. MATERIAL, SIZE AND INSTALLATION: COMPLY WITH NEC, ARTICLE 370 AND SHALL BE UL LISTED. B. PROVIDE THE FOLLOWING:
  - 1. IN STUD WALLS: a. SINGLE OUTLET: 4" SQUARE BY 2-1/8" DEEP BOX RACO NO. 232 OR 233 OR EQUAL. b. FOR GANGED OUTLETS: 4-1/2" HIGH BY 1-5/8" DEEP MULTIPLE GANG BOXES RACO NO. 951 THRU NO.
  - c. PROVIDE BOXES WITH RAISED COVERS OF DEPTH AS REQUIRED FOR THICKNESS OF WALL MATERIALS. d. OUTET BOXES BACK TO BACK IN FIRE RATED INTERIOR PARTITIONS SHALL BE SEPARATED BY A MINIMUM OF 24" PER FBC 714.3.2 EXCEPTION 1. SEALING MEMBRANE PENETRATIONS FOR CONDUIT AND BOXES
- 2. SURFACE MOUNTED WALL OUTLETS: a. SINGLE OUTLET: 2-1/2" DEEP HANDY BOX RACO NO. 674 OR EQUAL.
- b. TWO OUTLETS, 4" SQUARE BY 2-1/2" DEEP BOX RACO NO. 232 OR 233 OR EQUAL. FIXTURE STUDS AND STEEL MOUNTING BARS. c. FOR MORE THAN TWO GANGED OUTLETS. 3-3/4" X 2-1/2" DEEP MULTIPLE GANG MASONRY BOXES RACO NO. 692 THRU NO. 694 AND NO. 960 THRU NO. 964 OR EQUAL.

INSTALLED IN THE FIRE RESISTANT RATED WALL SHALL COMPLY WITH FBC 704.1 AND 704.4.

- d. PROVIDE BOXES WITH 1/2" RAISED COVER AS REQUIRED FOR DEVICE. 3. IN SUSPENDED CEILINGS, 3-1/2" DEEP OCTAGON BOX RACO NO. 280 OR NO. 281 OR EQUAL WITH FIXTURE PART 2 - PRODUCTS STUDS AND STEEL MOUNTING BARS.
- 4. SWITCH OUTLETS IN DOOR JAMBS, PARTITION BOXES, RACO NO. 426 OR EQUAL FOR SINGLE SWITCH. a. TWO SWITCHES: RACO NO. 426 TWO GANG TANDEM BOX OR EQUAL. b. THREE SWITCHES: RACO NO. 428 THREE GANG TANDEM BOX OR EQUAL. 5. THE ANNULAR SPACE BETWEEN THE WALL MEMBRANE AND THE OUTLET BOX SHALL NOT EXCEED 1/8".
- 6. SEALING MEMBRANE PENETRATIONS FOR ELECTRICAL CONDUIT AND BOXES IN A FIRE RESISTANCE RATED WALL SHALL COMPLY WITH fbc SECT 704.1, 704.4.
- 2.4 PULL AND JUNCTION A. CONSTRUCTION, SIZES AND INSTALLATION: COMPLY WITH NEC, ARTICLE 370. B. PULL AND JUNCTION BOXES NOT SPECIFICALLY DESCRIBED IN NEC, ARTICLE 370: FABRICATE OF HEAVY GAGE
- GALVANIZED STEEL WITH SCREW COVERS, BRASS SCREWS AND HARDWARE WITH ENAMEL FINISH. A. PROVIDE CONDUIT HANGER AND SUPPORT DEVICES OF APPROVED TYPE FOR METHOD OF SUPPORTING REQUIRED.
- CLAMPS AND WELDING PINS. FINISH: GALVANIZED FINISH OR OTHER APPROVED CORROSION RESISTANCE FINISH B. PROVIDE HANGERS AND SUPPORTS AS FOLLOWS:

1. INCLUDE: STRUCTURAL STEEL MEMBERS, SUSPENSION RODS, CONDUIT CLAMPS, EXPANSION SHIELDS, BEAM

- 1. WHERE SINGLE OR MULTIPLE RUN OF CONDUIT IS ROUTED ON SURFACE OF STRUCTURE, USE CONDUIT CLAMPS MOUNTED ON UNISTRUT CHANNEL TO MAINTAIN NOT LESS THAN 1" CLEARANCE BETWEEN CONDUIT
- 2. WHERE SINGLE RUN OF CONDUIT IS SUSPENDED FROM OVERHEAD, USE SPLIT RING CONDUIT CLAMP SUSPENDED BY STEEL DROP ROD.
- 3. ANY FORM OF STRAP IRON OR WIRE HANGERS WILL NOT BE ACCEPTED 4. MAXIMUM HANGER AND SUPPORT SPACING: IN ACCORDANCE WITH NEC, SECTIONS 345-12, 346-12 AND 348-12.
- C. ANCHOR HANGERS AND SUPPORTS TO STRUCTURE AS FOLLOWS: 1. ANCHORED TO STRUCTURAL STEEL: BEAM CLAMPS AND/OR STEEL CHANNELS AS REQUIRED BY STRUCTURAL
- 2. ANCHORED TO METAL DECK: SPRING CLIPS OR APPROVED WELDING PINS. a. MAXIMUM PERMISSIBLE LOAD ON EACH HANGER: NOT TO EXCEED 50 POUNDS. 3. THE USE OF EXPLOSIVE FORCE HAMMER ACTUATED, BOOSTER ASSIST OR SIMILAR ANCHORING DEVICE WILL
- PART 3 EXECUTION

NOT BE PERMITTED WITHOUT PRIOR APPROVAL OF THE ARCHITECT.

- A. INSTALL HORIZONTAL RUNS OF CONDUIT IN CEILING PLENUM. ROUTE CONDUIT FOR CONVENIENCE OUTLETS, WALL 3.1 SWITCHES MOUNTED FIXTURES AND OTHER WALL OUTLETS OVERHEAD AND DROPPED THROUGH WALL TO THE OUTLET. B. INSTALL CONDUIT IN CONCEALED LOCATION EXCEPT IN MECHANICAL EQUIPMENT ROOMS, AND AT CONNECTIONS TO SURFACE PANELS AND FREE STANDING EQUIPMENT, AND AS OTHERWISE NOTED. C. MINIMUM SIZE CONDUIT: 3/4" TRADE SIZE, EXCEPT SWITCH LEGS, DEAD ENDS AND CONDUIT FOR SIGNAL,
- CONTROL AND COMMUNICATIONS MAY BE 1/2" WHERE ADEQUATE. 3.2 OUTLET BOX INSTALLATION A. INSTALL FOR ALL FIXTURES, SWITCHES, RECEPTACLES AND OTHER DEVICES. B. DO NOT INSTALL BACK-TO-BACK OR THROUGH WALL TYPE BOXES FLUSH IN COMMON WALL CAVITY. C. SEAL BOXES LOCATED ON OPPOSITE SIDES OF COMMON WALLS AND CLOSELY CONNECTED BY CONDUIT WITH
- DUCT SEAL. 3.3 PULL AND JUNCTION BOX AND GUTTER INSTALLATION
- A. INSTALL WHERE REQUIRED TO FACILITATE INSTALLATION OF THE WIRING. 3.4 HANGER AND SUPPORT INSTALLATION A. INSTALL FOR ALL CONDUIT AND BOXES.
- B. DO NOT ATTACH CONDUIT AND BOXES TO OR SUPPORT FROM MECHANICAL PIPES, PLUMBING PIPES, SHEET METAL DUCTS OR CEILING SUPPORT WIRES.
- SECTION 260519 CONDUCTORS AND CABLES
- PART 1 GENERAL
- A. THIS SECTION INCLUDES WIRES, CABLES, AND CONNECTORS FOR POWER, LIGHTING, SIGNAL, CONTROL AND RELATED SYSTEMS RATED 600 VOLTS AND LESS.
- PART 2 PRODUCTS
- 2.1 MANUFACTURERS A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: 1. WIRE AND CABLE: ALPHA, BELDEN, CABLE, ROME, SOUTHWIRE OR APPROVED EQUAL 2. CONNECTORS FOR WIRES AND CABLE CONDUCTORS: AMP, BUCHANAN, BURNDY, GOULD, IDEAL, GEDNEY,
- SCOTCH, T & B OR APPROVED EQUAL 3. INSULATING MATERIALS: RAYCHEM, SCOTCH OR APPROVED EQUAL.
- A. GENERAL: PROVIDE WIRE AND CABLE SUITABLE FOR THE TEMPERATURE, CONDITIONS AND LOCATION WHERE INSTALLED. MATERIALS SHALL BE FREE FROM DEFECT OR DAMAGE. B. CONDUCTORS:
- 1. PROVIDE STRANDED COPPER CONDUCTORS FOR ALL WIRES AND CABLES. SOLID COPPER IS ACCEPTABLE FOR PART 2 PRODUCTS #12 AWG AND #10 AWG BRANCH CIRCUITS. C. CONDUCTOR SIZE:
- 1. FEEDERS AND BRANCH CIRCUITS MINIMUM #12 AWG. 2. FIRE PROTECTION SIGNAL WIRING MINIMUM #14 AWG.
- 3. CLASS 1 CONTROL CIRCUITS MINIMUM #14 AWG. 4. CLASS 2 CONTROL CIRCUITS MINIMUM #18 AWG.
- D. INSULATION: 1. #18-16 TYPE TFN.
- 2. #14-10 TYPE THHN/THWN.
- 3. #8 AND LARGER TYPE THHN/THWN OR XHHW. F. COLOR CODE: USE COLOR CODING SAME AS PRESENTLY USED. 2.3 CONNECTORS FOR CONDUCTORS
- A. PROVIDE UL-LISTED FACTORY-FABRICATED, SOLDERLESS METAL CONNECTORS OF SIZES, AMPACITY RATINGS. MATERIALS, TYPES AND CLASSES FOR APPLICATIONS AND FOR SERVICES INDICATED. USE CONNECTORS WITH TEMPERATURE RATINGS EQUAL TO OR GREATER THAN THOSE OF THE WIRES UPON WHICH USED.
- 5. CONDUCTORS #8 AWG AND LARGER SHALL USE COMPRESSION CRIMP CONNECTORS 6. CONDUCTORS #10 AWG AND SMALLER MAY USE EITHER COMPRESSION CRIMP OR TWIST ON PRESSURE CONNECTORS. TWIST-ON CONNECTORS SHALL NOT BE USED FOR MOTOR CONNECTIONS. CONTROL CONDUCTORS SHALL USE INSULATED COMPRESSION CRIMP CONNECTORS.
- 2.4 INSULATING MATERIALS FOR CONDUCTORS A. PROVIDE INSULATING MATERIALS, TAPES, SLEEVES, COMPOUND AND FILLERS WHICH MEET OR EXCEED THE VOLTAGE AND TEMPERATURE. 1. VINYL TAPE SHALL BE 7 MILS THICK, RATED FOR 600V FROM 118 TO 105 DEG C.

RUBBER TAPE SHALL BE 30 MILS THICK, RATED FOR 600V, AND BE SELF FUSING.

- PART 3 EXECUTION
- 3.1 WIRING METHOD A. USE #10 AWG MINIMUM FOR 120/208V CIRCUITS OVER 75 FEET IN LENGTH. B. USE THE FOLLOWING WIRING METHODS AS INDICATED:
- 1. WIRE: INSTALL ALL WIRE IN RACEWAY. C. THE USE OF MC CABLE FOR BRANCH CIRCUITS IS NOT ALLOWED.
- A. MULTIWIRE BRANCH CIRCUITS SHALL BE INSTALLED ONLY WHERE SPECIFICALLY INDICATED OR FOR COMMON TRIP

CONDUCTORS INTACT AND FREE OF SPLICES.

- MULTIPLE CIRCUIT BREAKERS. NEUTRAL CONDUCTOR SHALL BE INCREASED BY ONE SIZE GREATER THAN PHASE CONDUCTORS. IN NO CASE, SHALL MORE THAN THREE (3) PHASE WIRES, ONE (1) NEUTRAL AND ONE (1) GROUND WIRE OCCUPY THE SAME CONDUIT UNLESS SPECIFICALLY CALLED FOR ON THE DRAWINGS. B. PROVIDE INDIVIDUAL PHASE AND NEUTRAL CONDUCTORS FOR EACH CIRCUIT. A COMMON GROUND WIRE SHALL BE PULLED FOR EACH CIRCUIT. A COMMON GROUND WIRE SHALL BE PULLED FOR EACH RACEWAY. INSTALL
- 3.3 SPLICES, TAPS AND CONNECTIONS A. SPLICES ARE PERMITTED FOR CONNECTING MULTIPLE LOADS TO A COMMON SOURCE, I.E., DIVISION OF CIRCUITS AND FIXTURE TAP CONDUCTORS. B. KEEP CONDUCTOR SPLICES TO MINIMUM. SPLICES AND CONNECTIONS SHALL BE MADE IN ACCESSIBLE OUTLET,
- PULL OR JUNCTION BOXES. 3.4 INSULATING MATERIALS A. INSULATE ALL SPLICES AND TAPS WITH UL APPROVED PLASTIC TAPE OR MOLDED COMPOSITION CAPS WITH VOLTAGE RATING EQUAL TO OR GREATER THAN INSULATING RATING OF CONDUCTORS BEING SPLICED.

B. INSTALL RUBBER SPLICING TAPE AND A FINAL LAYER OF VINYL ELECTRICAL TAPE WHEN INSULATING SURFACES

3.5 FIELD QUALITY CONTROL A. PRIOR TO ENERGIZING, CHECK INSTALLED WIRES AND CABLES WITH 500 VDC MEGOHM METER TO DETERMINE INSULATION RESISTANCE LEVELS TO ASSURE REQUIREMENTS ARE FULFILLED. 1. PHASE TO PHASE, PHASE TO NEUTRAL, PHASE TO GROUND SHALL EXCEED 1 MEGOHM.

#### 2. NEUTRAL TO GROUND SHALL BE 3 OHMS OR LESS. SECTION 242726 - WIRING DEVICES

WITH TAPE.

- A. GENERAL: PROVIDE WIRING DEVICES AS DESCRIBED HEREIN AND AS SHOWN ON THE DRAWINGS.
- 1.2 STANDARDS A. EXCEPT AS MODIFIED BY GOVERNING CODES AND BY THE CONTRACT DOCUMENTS, COMPLY WITH THE LATEST APPLICABLE PROVISIONS AND LATEST RECOMMENDATIONS OF THE FOLLOWING:
- a. FEDERAL SPECIFICATION STANDARD WS-896E.
- 2. RECEPTACLES a. NEMA STANDARD WD-1, 3.2 THROUGH 3.10. b. UL STANDARD 498 FEDERAL SPECIFICATION WC596-D.
- c. ANSI
- 2.1 CATALOG NUMBERS AND APPROVED MANUFACTURERS A. DEVICES LISTED BELOW ARE BY HUBBELL. EQUIVALENT DEVICES AS MANUFACTURED BY PASS & SEYMOUR,
- COOPER, GENERAL ELECTRIC, AND LEVITON ARE ACCEPTABLE. ALL DEVICES SHALL BE OF THE SAME MANUFACTURER. CONFIRM THE DEVICE AND DEVICE PLATE COLOR PRIOR TO ORDERING. B. SWITCHES - SINGLE POLE
- 1. HUBBELL HBL1221I C. SWITCHES - THREE WAY
- 1. HUBBELL HBL1223I
- D. SWITCH FOUR WAY 1. HUBBELL - HBL1224L E. DUPLEX CONVENIENCE RECEPTACLES AND GFI: HEAVY DUTY OR INDUSTRIAL GRADE AND TAMPER RESISTANT
- 1. DUPLEX: HUBBELL 5362TR 2. GFI: HUBBELL GFR5362TR 3. CONTROLLED DUPLEX: HUBBELL 5362LC2
- 1. TYPE 302 STAINLESS STEEL.
- 2.2 SWITCHES E. PROVIDE HEAVY DUTY, SPECIFICATION GRADE, FLUSH MOUNTING, QUIET-OPERATING AC TYPE, WITH TOGGLE OPERATOR, HEAT-RESISTANT PLASTIC HOUSING AND SELF GROUNDING METAL STRAP SILVER ALLOY CONTACT RATED 20A AT 120-277V AND CAPABLE OF FULL CAPACITY ON TUNGSTEN OR FLUORESCENT LAMP LOAD. DESIGN FOR SIDE OR BACK WIRING WITH UP TO NUMBER 10 WIRE. VERIFIED BY UL TO MEET OR EXCEED FEDERAL
- SPECIFICATION WS-896E. F. COLOR OF DEVICES SHALL BE VERIFIED BY THE ARCHITECT.
- 2.3 DUPLEX CONVENIENCE RECEPTACLES A. PROVIDE 3-POLE NEMA AND ANSI STANDARD TYPE, WITH BRONZE CONTACTS THAT ACCEPT PLUG WITH 2 PARALLEL BLADES AND 1 GROUNDING BLADE. HEAT-RESISTANT, THERMOPLASTIC BASE WITH IMPACT RESISTANT, NYLON FACE. TWO GROUNDING SCREWS. BREAK-OFF TERMINALS FOR 2-CIRCUIT WIRING. RATED 20 AMPERES AT 125-VOLT ELECTRICAL ALTERNATING CURRENT. (HOSPITAL GRADE)
- B. COLOR OF DEVICES SHALL BE VERIFIED BY THE ARCHITECT. 2.4 FACEPLATES A. PROVIDE COVER PLATES FOR WALL RECEPTACLES, OUTLETS, AND SWITCHES OF TYPE 302 STAINLESS STEEL CONSTRUCTION, UNLESS OTHERWISE NOTED. WHEN TWO OR MORE SWITCHES OR OR DEVICES ARE SHOWN IN ONE

## LOCATION, MOUNT UNDER A COMMON PLATE.

PART 3 - EXECUTION

3.2 RECEPTACLES

- A. MOUNT SWITCHES VERTICALLY WITH THE "ON" POSITION ON TOP, UNLESS NOTED OR SPECIFIED OTHERWISE. B. CAREFULLY COORDINATE THE LOCATION OF SWITCHES TO INSURE LOCATIONS AT THE STRIKE SIDE OF DOORS.
- A. UNLESS OTHERWISE NOTED, MOUNT RECEPTACLE VERTICALLY WITH U-SHAPED GROUND POSITION ON BOTTOM. 3.3 GENERAL INSTALLATION A. ALL DEVICES SHALL BE FLUSH-MOUNTED EXCEPT AS OTHERWISE NOTED ON THE DRAWINGS.. B. LOCATIONS
- 1. COMPLY WITH LAYOUT DRAWINGS FOR GENERAL LOCATION: CONTACT OWNER'S REPRESENTATIVE FOR QUESTIONS ABOUT LOCATIONS AND MOUNTING METHODS. 2. RELOCATE OUTLETS OBVIOUSLY PLACED IN A LOCATION OR MANNER NOT SUITABLE TO THE ROOM FINISH.
- 3. AVOID PLACING OUTLETS BEHIND OPEN DOORS. C. MOUNTING HEIGHTS AS SPECIFIED IN SECTION 16010 AND AS INDICATED ON THE DRAWINGS ). GANGING OF SWITCHES — PROVIDE BARRIERS BETWEEN GANGED 277 VOLT SWITCHES OF DIFFERENT PHASES. E. POWER OUTLETS — INSTALL POWER OUTLETS COMPLETE WITH BACK BOXES, WHERE INSTALLED IN EXISTING BUILDINGS OR EXTENSIONS OF EXISTING BUILDINGS. COORDINATE PHASE CONNECTIONS FOR ROTATING EQUIPMENT 1.1 DESCRIPTION

WITH CONNECTIONS IN EXISTING BUILDING. VERIFY THE EXACT AMPERAGE AND CONFIGURATION OF EACH POWER

- OUTLET WITH THE EQUIPMENT THEY SERVE PRIOR TO ORDERING SUCH. <u>SECTION 262818 - ENCLOSED SWITCHES</u>
- PART 1 GENERAL
- A. GENERAL: PROVIDE FUSED AND UNFUSED DISCONNECT SWITCHES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. 1.2 STANDARDS A. EXCEPT AS MODIFIED BY GOVERNING CODES AND BY THE CONTRACT DOCUMENTS, COMPLY WITH THE LATEST
  - 1. DISCONNECT SWITCHES a. U.L. STANDARDS #98 (FILE #4776) AND #508
- b. FEDERAL SPECIFICATIONS W-S-865C. c. NEMA STANDARD KS1-865C. d. U.L. 20 AND FEDERAL SPECIFICATION TEST STANDARDS FOR TOGGLE SWITCHES. 1.3 SUBMITTALS

APPLICABLE PROVISIONS AND LATEST RECOMMENDATIONS OF THE FOLLOWING:

- A. SUBMIT MANUFACTURER'S DATA FOR ALL DISCONNECT SWITCHES. B. IDENTIFY MOTOR OR EQUIPMENT SERVED BY EACH SWITCH, INDICATE NAMEPLATE INSCRIPTION.
- 2.1 ACCEPTABLE MANUFACTURERS
- A. SAFETY SWITCHES 1. SHALL BE OF THE SAME MANUFACTURER AS THE PANELBOARDS.
- B. TOGGLE TYPE MANUAL CONTROL SWITCHES 1. SQUARE D CLASS 2510,11,12 OR APPROVED EQUAL. 2.2 SAFETY SWITCHES
- A. HEAVY DUTY, HORSEPOWER RATED, SINGLE THROW KNIFE SWITCH WITH QUICK MAKE, QUICK BREAK MECHANISM, CAPABLE OF FULL LOAD OPERATIONS. MEET NEMA AND U.S. GOVERNMENT SPECIFICATIONS FOR CLASS A B. PROVIDE WITH CONTACT ARC-QUENCHING DEVICES, SUCH AS MAGNETIC BLOWOUTS OR SNUFFING PLATE. PROVIDE SECTION 265100 - LUMINARIES AND ACCESSORIES SELF-ALIGNING SWITCHBLADES WITH SILVER ALLOY CONTACTS AREAS AND DESIGNED SO THAT ARCING UPON MAKING AND BREAKING DOES NOT OCCUR ON THE FINAL CONTACT SURFACES. PROVIDE WITH HIGH-PRESSURE,
- C. ENCLOSURE-NEMA 1 OR NEMA 3R WITH HINGED DOOR, AND DEFEATABLE INTERLOCK WHEN SWITCH IS IN "ON" 1.1 SUMMARY POSITION AND CAN BE POSITIVELY PADLOCKED IN "ON" AND "OFF" POSITIONS. UTILIZE NEMA 3R (RAIN-TIGHT) FNCLOSURE FOR EXTERIOR INSTALLATIONS. D. SIZE, FUSING AND NUMBER OF POLES AS SHOWN OR AS REQUIRED. WHERE FUSED, THE DEVICES MUST BE

SPRING-LOADED CONTACT. MOUNT SWITCH PARTS ON HIGH-GRADE INSULATING BASE.

PROVIDED WITH UL LISTED REJECTION FEATURE TO REJECT ALL BUT CLASS R FUSES. PROVIDE HORSEPOWER FOUR WIRE CIRCUITS AND 3 POLE SWITCHES ON ALL OTHER CIRCUITS. UNLESS OTHERWISE NOTED. E. LUGS MUST BE UL LISTED FOR COPPER CONDUCTORS AND BE FRONT REMOVABLE.

A. PROVIDE SWITCHES THAT OPERATE AT THEIR FULL RATING WITH FLUORESCENT, TUNGSTEN AND RESISTANCE LOADS.

B. SWITCHES TO BE HEAVY DUTY AND HAVE: 1. ARC-RESISTING BODIES

2.3 TOGGLE TYPE MANUAL CONTROL SWITCHES

2. SLOW MAKE-AND-BREAK MECHANISMS 3. SILVER ALLOY CONTACT BUTTONS 4. SIDE OR BACK WIRING WITH UP TO NO. 10 AWG SOLID CONDUCTORS

AND AT 80% OF THEIR RATED CAPACITY WITH MOTOR LOAD.

### PART 3 - EXECUTION

- 3.1 APPLICATIONS A. EACH MOTOR OVER 1/2HP SHALL BE PROVIDED WITH A HORSEPOWER-RATED SAFETY TYPE DISCONNECT SWITCH. B. EACH PIECE OF EQUIPMENT UTILIZING MULTI-PHASE POWER SHALL BE SUPPLIED WITH A SAFETY-TYPE
- DISCONNECT SWITCH. C. EACH PIECE OF EQUIPMENT UTILIZING SINGLE-PHASE POWER BUT PROTECTED AT OVER 30 AMPERES SHALL BE SUPPLIED WITH A SAFETY-TYPE DISCONNECT SWITCH. D. EQUIPMENT OTHER THAN THAT MENTIONED ABOVE MAY UTILIZE A TOGGLE TYPE MANUAL CONTROL SWITCH
- PROPERLY SIZED AND RATED FOR THE EQUIPMENT IT DISCONNECTS. TOGGLE DISCONNECT SWITCHES SHALL INCLUDE A RED LED INDICATING LIGHT. 3.2 MOUNTING A. PROVIDE CONNECTIONS AND WIRING TO AND FROM EACH DISCONNECT SWITCH. SUPPORT CONDUIT FEEDER FROM CEILING OR FLOOR.
- B. DISCONNECT SWITCHES SHALL BE MOUNTED ON ADJACENT WALL OF FROM THE FLOOR WITH INDEPENDENT SUPPORTS. SWITCHES SHALL BE MOUNTED ON FAN HOUSINGS. C. INSTALL FUSES AS SPECIFIED.
- A. PROVIDE IDENTIFICATION OF ALL DISCONNECTS IN ACCORDANCE WITH SECTION 16010. B. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LIGHTING FIXTURES AND LAMPS. ALL MISSING, DAMAGED, OR

#### DEFECTIVE PARTS SHALL BE REPLACED PRIOR TO ACCEPTANCE BY OWNER. <u>SECTION 264300 - SURGE SUPPRESSION DEVICES</u>

#### PART 1 – GENERAL

- 1.1 DESCRIPTION A. GENERAL
  - 1. ALSO REFERRED TO AS "SPD" 2. FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND SERVICES AS INDICATED IN ACCORDANCE WITH PROVISIONS OF CONTRACT DOCUMENTS.
- 3. COMPLETELY COORDINATE WITH WORK OF ALL OTHER TRADES. 4. ALTHOUGH SUCH WORK IS NOT SPECIFICALLY INDICATED, FURNISH AND INSTALL ALL SUPPLEMENTARY OR MISCELLANEOUS ITEMS, APPURTENANCES AND DEVICES INCIDENTAL TO OR NECESSARY FOR A SOUND, SECURE AND COMPLETE INSTALLATION.
- B. SUBMITTAL 1. PRODUCT DATA
- a. TECHNICAL DATA ON EACH PRODUCT, INCLUDING FINISHES. 2. PROJECT DATA

## PART 2 - PRODUCTS

B. TYPE: 2

2.1 DESCRIPTION A. FACTORY-ASSEMBLED AND TESTED UNITS FOR 60-HERTZ SERVICE.

a. OPERATING AND MAINTENANCE DATA

- D. RATING: SUITABLE FOR THE REQUIRED VOLTAGE INDICATED ON DRAWINGS.
- PART 3 EXECUTION
- 3.1 INSTALLATION A. INSTALL ALL COMPONENTS AND COMPLETE SYSTEM AS INDICATED IN ACCORD WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. B. INSTALL AS FIRST OCP DEVICE OF THE MAIN PANELBOARD INDICATED.
- POSSIBLE AND STRAIGHTEST ROUTE BETWEEN SPD AND OCP CONNECTION AT BUS. A. TEST EACH COMPONENT AND COMPLETE SYSTEM FOR PROPER OPERATION, INCLUDING THE VARIOUS MODES.

C. UNIT SHALL BE MOUNTED WITHIN 4" ADJACENT TO OCP DEVICVE CONNECTION; MAINTAIN SHORTEST LENGTH

#### SECTION 262200 - LOW VOLTAGE TRANSFORMERS

PERFORM CORRECTIONAL WORK WHEN REQUIRED.

C. UL LISTING: 1449, 4TH EDITION

## PART 1 – GENERAL

B. SUBMITTAL

- 1.1 DESCRIPTION 1. FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND SERVICES AS INDICATED IN ACCORDANCE WITH PROVISIONS OF CONTRACT DOCUMENTS.
- 2. COMPLETELY COORDINATE WITH WORK OF ALL OTHER TRADES. 3. ALTHOUGH SUCH WORK IS NOT SPECIFICALLY INDICATED, FURNISH AND INSTALL ALL SUPPLEMENTARY OR MISCELLANEOUS ITEMS, APPURTENANCES AND DEVICES INCIDENTAL TO OR NECESSARY FOR A SOUND, SECURE AND COMPLETE INSTALLATION.
- 1. PRODUCT DATA a. TECHNICAL DATA ON EACH PRODUCT, INCLUDING FINISHES.

a. OPERATING AND MAINTENANCE DATA

B. CORE: GRAIN-ORIENTED, NON-AGING SILICON STEEL

## PART 2 - PRODUCTS

C. ENCLOSURE: NEMA 1

2. PROJECT DATA

- D. COILS: CONTINUOUS WINDINGS WITHOUT SPLICES EXCEPT AT TAPS 1. COIL MATERIAL: ALUMINUM OR COPPER
- PART 3 EXECUTION

A. FACTORY-ASSEMBLED AND TESTED, AIR-COOLED UNITS FOR 60-HERTZ SERVICE.

A. INSTALL ALL COMPONENTS AND COMPLETE SYSTEM AS INDICATED IN ACCORD WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS.

#### A. TEST EACH COMPONENT AND COMPLETE SYSTEM FOR PROPER OPERATION, INCLUDING THE VARIOUS MODES. PERFORM CORRECTIONAL WORK WHEN REQUIRED. SECTION 262416 - PANELBOARDS

## PART 1 – GENERAL

- 1. FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND SERVICES AS INDICATED IN ACCORDANCE WITH PROVISIONS OF CONTRACT DOCUMENTS 2. COMPLETELY COORDINATE WITH WORK OF ALL OTHER TRADES. 3. ALTHOUGH SUCH WORK IS NOT SPECIFICALLY INDICATED, FURNISH AND INSTALL ALL SUPPLEMENTARY OR

MISCELLANEOUS ITEMS, APPURTENANCES AND DEVICES INCIDENTAL TO OR NECESSARY FOR A SOUND, SECURE

- AND COMPLETE INSTALLATION. B. SUBMITTAL 1. PRODUCT DATA
- a. TECHNICAL DATA ON EACH PRODUCT, INCLUDING FINISHES.

#### 2. PROJECT DATA a. OPERATING AND MAINTENANCE DATA

PART 2 - PRODUCTS

- A. FABRICATED, TESTED AND AIC RATED TO WITHSTAND MAXIMUM PEAK LET-THRU OF TRANSFORMERS UPSTREAM OF PANELBOARDS PLUS ANY DEGRADATION RESULTING FROM LENGTH, MEDIA, CONDUIT MATERIALS, ETC.
- B. BUS: ALUMINUM OR COPPER C. ENCLOSURE: NEMA

## D. TYPE: LIGHTING AND APPLIANCE TYPE.

PART 3 - EXECUTION

SUPPLYING CRITICAL/EMERGENCY SYSTEMS; SPD/TVSS; FACP; TELECOMMUNICATION-IDF CIRCUITS; ETC.

- 3.1 INSTALLATION A. INSTALL ALL COMPONENTS AND COMPLETE SYSTEM AS INDICATED IN ACCORD WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. B. PROVIDE LOCK-ON OR LOCK-OFF HANDLE TIES W/LOCKING-DETERENT FEATURE FOR ALL OCP DEVICES
- 3.2 SYSTEM TESTING A. TEST EACH COMPONENT AND COMPLETE SYSTEM FOR PROPER OPERATION, INCLUDING THE VARIOUS MODES.

## PERFORM CORRECTIONAL WORK WHEN REQUIRED.

1. INTERIOR LED LIGHTING FIXTURES. 2. SITE LIGHTING LED FIXTURES

SHOWN AND SPECIFIED.

- A. THIS SECTION SHALL INCLUDE FIXTURES, LAMPS, AND ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION AS
- 1.2 DELIVER, STORAGE AND HANDLING A. DELIVER INTERIOR LIGHTING FIXTURES IN FACTORY-FABRICATED CONTAINERS OR WRAPPINGS, WHICH PROPERLY PROTECT FIXTURES FROM DAMAGE. DO NOT STORE OUTSIDE OR WHERE SUBJECT TO MOISTURE.
- PART 2 PRODUCTS 2.1 MANUFACTURERS A. THE "LIGHTING FIXTURE SCHEDULE" ON THE DRAWINGS INDICATES THE TYPE AND QUALITY OF LIGHTING FIXTURES
- b. LIGHTING FIXTURES SHALL CARRY INSPECTION LABEL OF THE UNDERWRITER'S LABORATORIES, INC.
- STEEL OR AN ACCEPTABLE EQUIVALENT OF NON-CORROSIVE MATERIAL. PART 3 - EXECUTION

<u>SECTION 283100 - FIRE ALARM SYSTEM</u>

#### PROVIDE A COMPLETE AND NEW FIRE ALARM SYSTEM.

- A. GENERAL
- 3. ALTHOUGH SUCH WORK IS NOT SPECIFICALLY INDICATED, FURNISH AND INSTALL ALL SUPPLEMENTARY OR MISCELLANEOUS ITEMS, APPURTENANCES AND DEVICES INCIDENTAL TO OR NECESSARY FOR A SOUND, SECURE AND
- B. QUALITY ASSURANCE
- a. BUILT TO U.L. STANDARD 864.
- d. COMPLY WITH ALL LOCAL AND STATE REQUIREMENTS.
- 1. PRODUCT DATA a. TECHNICAL DATA ON EACH PRODUCT, INCLUDING FINISHES. b. DESCRIPTION OF SYSTEM OPERATION.
- c. RISER DIAGRAM AND SYSTEM DATA. d. EQUIPMENT DESIGN CONSIDERATIONS FOR FUTURE EXPANSION. e. MATERIALS LIST.
- a. OPERATING AND MAINTENANCE DATA: FACTORY—PREPARED OPERATION AND SERVICE MANUAL FOR EACH

D. APPROVED EQUAL

- A. NOTIFIER/FIRE WARDEN (BASIS OF DESIGN) C. SIEMENS
- B. STROBES AND HORN STROBES SHALL HAVE FIELD SELECTABLE SETTINGS. C. PROVIDE SURGE PROTECTION FOR THE CONTROL SYSTEM. D. FULL FEATURE ANALOG ADDRESSABLE FIRE ALARM VOICE SYSTEM. CONNECTED TO THE FIRE ALARM SYSTEM TO ROUTE ALARM, TROUBLE

## TO PROJECT COMPLETION.

3.3 OWNER PERSONNEL INSTRUCTION

- PART 3 EXECUTION
- ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. 3.2 SYSTEM TESTING A. TEST FACH COMPONENT AND COMPLETE SYSTEM FOR PROPER OPERATION. INCLUDING THE VARIOUS MODES. PERFORM CORRECTIONAL WORK WHEN REQUIRED. PROVIDE COMPLETED NFPA 72 CHECK LIST.

A. INSTALL ALL COMPONENTS AND COMPLETE SYSTEM AS INDICATED IN

- OVERVIEW

- 1. FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND SERVICES FOR A FULL FEATURE FIRE ALARM SYSTEM AS INDICATED IN ACCORDANCE WITH
- PROVISIONS OF CONTRACT DOCUMENTS. 2. COMPLETELY COORDINATE WITH WORK OF ALL OTHER TRADES.
- COMPLETE INSTALLATION.
- 1. FIRE ALARM SYSTEMS AND EQUIPMENT STANDARDS
- b. COMPLY WITH NFPA 70. c. COMPLY WITH NFPA 72.
- C. SUBMITTAL
- 2. PROJECT DATA
- PART 2 PRODUCTS
- 2.1 ACCEPTABLE MANUFACTURERS:
- 2.2 DESCRIPTION A. SMOKE DETECTORS SHALL BE PHOTOELECTRIC TYPE.
- E. PROVIDE A DIGITAL COMMUNICATOR. THE DIGITAL COMMUNICATOR SHALL BE CONDITIONS AND SUPERVISOR CONDITIONS THROUGH AN IP/GSM TRANSMITTER UTILIZING IP AND CELLULAR COMMUNICATIONS TO THE CENTRAL STATION. THE DIGITAL COMMUNICATOR SHALL BE A NOTIFIER 411UDAC AND THE IP/GSM TRANSMITTER SHALL BE A HONEYWELL HWF2V-COM (VERIZON) OR HWF2A-COM (ATTT). MONITORING SERVICE AND COMMUNICATOR PROGRAMMING FROM SHALL

BE PROVIDED BY OWNER AND COORDINATED WITH THE CENTRAL STATION PRIOR

A. INSTRUCT MAINTENANCE STAFF PERSONNEL IN COMPLETE OPERATION, INCLUDING

ACTUAL STAFF USE OF SYSTEM, BY AUTHORIZED DISTRIBUTOR PERSONNEL

PROMOD

KUMAR

PROMOD KUMAR

**NUMBER E-18159** 

I hereby specify, pursuant to RSMo 327.411,

this drawing sheet is authenticated by my seal.

NUMBER

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STATE OF MISSOURI CERTIFICATE

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20033

REQUIRED. FIXTURES, LENSES, LAMPS, BALLASTS, ETC. SHALL MATCH THE SCHEDULED FIXTURES. B. LIGHTING FIXTURES AND LAMPS GENERAL a. LIGHTING FIXTURES SHALL BE FURNISHED AS SHOWN ON DRAWING SCHEDULES

c. UNPAINTED FIXTURE PARTS SHALL BE EITHER ANODIZED ALUMINUM, NON-CORROSIVE GRADE STAINLESS

3.1 COORDINATION

A. COORDINATE WITH OTHER ELECTRICAL WORK, AS WELL AS, OTHER TRADES AS APPROPRIATE TO PROPERLY INTERFACE INSTALLATION OF INTERIOR LIGHTING FIXTURES.

THIS SHEET IS PART OF A COMPLETE SET. REFER TO GENERAL NOTES FOR COMPLETE LIST OF DOCUMENTS. SHEET SIZE 30 X 42

ISSUE DATE: NOVEMBER 18, 2020

**ELECTRICAL SPECIFICATIONS** 

VERVE PROJECT NO.:

SHEET NAME:

E-05