— OCCUPANCY CLASS

— OCCUPANT COUNT

- NUMBER OF PEOPLE

- NUMBER OF PEOPLE

- FIRE RATING (MINUTES)

DESIGNATED

ALLOWED

JOSH CARDINAL

JDH ENGINEERING INC

SW, GRANDVILLE, MI 49418

3000 IVANREST AVE

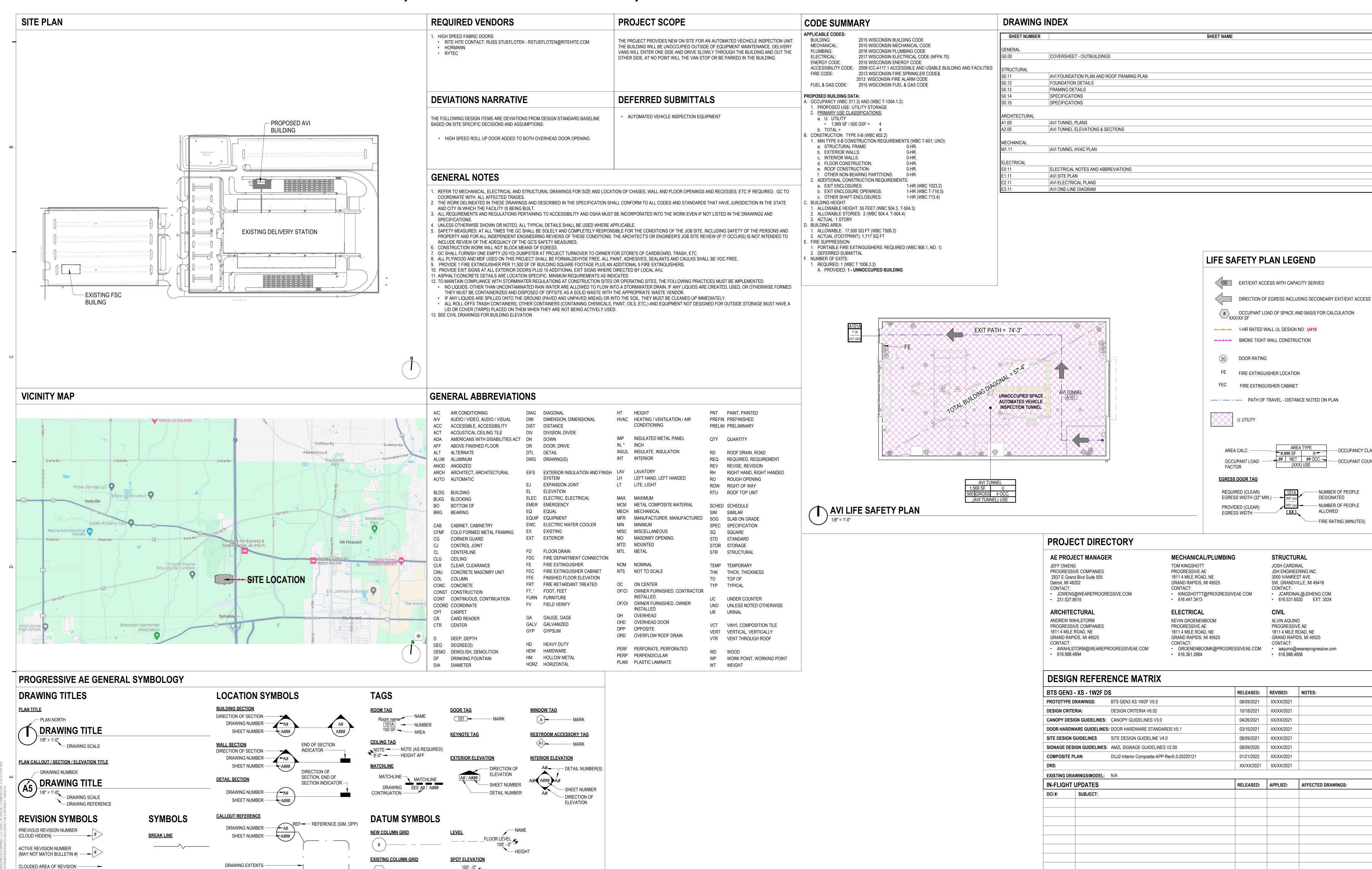
PROGRESSIVE AE

1811 4 MILE ROAD, NE

GRAND RAPIDS, MI 49525

DML8 - EXTERIOR AVI

1925 GRANDVIEW PKWY, STURTEVANT, WI 53177



COVERSHEET -OUTBUILDINGS

ROJECT NUMBER

PROJECT MANAGER

83460241

J. OWENS

D. WURL

R. ALQAYSI

A. WAHLSTROM

11/12/2024 PERMITS SET / BID

ROOF FRAMING PLAN NOTES

1. Roof deck bearing elevation varies. Field verify prior to any work related to

Beams and joists are equally spaced between grids or columns unless

A. Typical maximum live load deflection is L/360 unless noted

4. See Plumbing and Arch roof plan for Roof Drain, Overflow Drain, or Gutter

otherwise (maximum total deflection is L/240).

the roof. See Arch for roof slope and bearing.

Cold-Formed Metal Framed Trusses (CFT):

dimensioned otherwise.

ROJECT NUMBER

PROJECT MANAGER

T. DENHARTIGH

83460241

J. OWENS

M. BAKER

J. CARDINAL

loading and operations for current building usage. Top of exterior footing elevation = 96'-5" unless noted thus (xx'-x") on plan. Top of wall elevation = 100'-8" unless noted thus (xx'-x") on plan. Footings shall be centered under columns and walls unless detailed or

FOUNDATION PLAN NOTES

UNO on plan, slab on grade shall be 5" thick normal weight concrete and shall be reinforced with monofilament polypropylene or nylon fibers. Fibers shall be placed in the concrete at the batch plant in the amount and in the method

A. SOG design loading of 100 psf as indicated on plans is based upon

See plan and schedules for actual sizes. See foundation details and schedule for

1. Top of slab elevation varies refer to arch/civil. Slab shall slope uniformly

additional information, including reinforcing and dowels.

between points of unequal elevation.

recommended by the supplier.

dimensioned otherwise. Refer to architectural drawings for all dimensions not indicated. Refer to architectural drawings for all slab recesses. Line indicates potential underground utility. Contractor to coordinate all underground utility locations and elevations prior to placing foundations. Step footings such that top of footing is below pipe, or encase pipe per detail 7/S0.12 Wall footing callout example is as follows:

LATERAL FORCE RESISTANCE NOTES:

and/or strapped for resistance.

Lateral force resisting system consists of load bearing CFMF walls sheathed

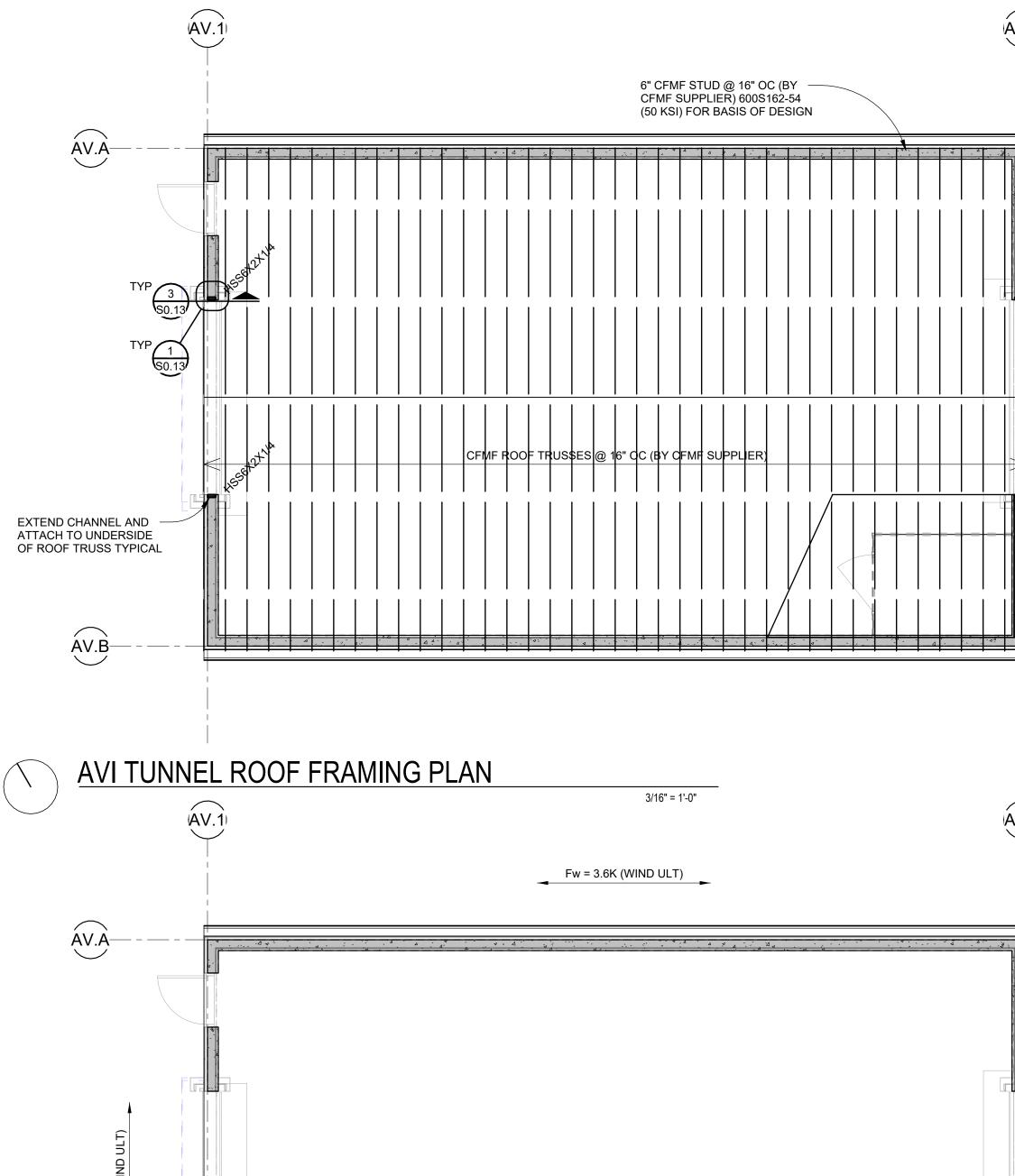
See architect for interior wall finishes. If no interior finish specified and additional

lateral resistance required, add interior strapping as required for lateral design.

Footing width "W" in inches Footing thickness "T" in inches See plan for actual sizes. See foundation detail for additional information, including reinforcing and dowels.

CFMF SUPPLIER.

DEFERRED/DELEGATED DESIGN: COLD-FORMED METAL FRAMING (CFMF) WALLS A. DESIGN OF CFMF BEARING WALLS SHALL BE BY CFMF SUPPLIER. ALL FOUNDATION AND ROOF CONNECTIONS, AS WELL AS DETAILING REQUIRED FOR LATERAL SYSTEM RESISTANCE SHALL BE INCLUDED BY CFMF SUPPLIER COLD-FORMED METAL TRUSSES (CFT) ROOF A. DESIGN OF CFMF ROOF TRUSSÉS SHALL BE BY CFMF SUPPLIER. CONNECTIONS TO WALL STUDS AND SHEATHING AS REQUIRED FOR LATERAL SYSTEM RESISTANCE SHALL BE INCLUDED BY



ÁV.B-Fw = 3.6K (<u>WIND ULT)</u>

AVI TUNNEL LATERAL FORCE RESISTANCE PLAN

AV.A	V.1	50' - 2 WF1812		– 8" STEM WALL (TYP)	(AV.2)
30' - 8" LAborate (97' - 0")	TYP AT THRESHOLDS S0.12 TYP AT THRESHOLDS	5" SLAB ON GRADE HP FFE 100'-0" SEE ARCH FOR SLOPE	SCHEMATIC SOG JOINTING PLAN SHOWN	RECESS TOW 8" BELOW FFE (TYP AT OPENINGS)	WF1812 (97' - 0")
	 	WF181	12 (97' - 0")		

3/16" = 1'-0"

AVI TUNNEL FOUNDATION PLAN

Field Verify	TOF	
Gauge	TOL	
Galvanized	TOM	
Grade Beam	TOS	
Grout Solid	TOW	
Girder Truss	TYP	
Hold Down Anchor	UNO	
Horizontal	VERT	
High Point	w/	
Headed Stud	w/o	
Height	WF	
In alda Diamaskan	MD	_

STRUCTURAL ABBREVIATION INDEX

Architect/Engineer

Augered Cast In Place

Above Finished Floor

Bottom Chord Extension

Below Finished Floor

Anchor Plate Architectural

Bond Beam

Bottom of

Bearing

Cantilever

Bottom of Steel

Bearing Plate

Center-to-Center

Column Base Plate

Construction Joint

Contraction Joint

Concrete Masonry Unit

Connection, Connect

Deck Bearing Elevation

Control Joint

Centerline

Column

Concrete

Continuous

Coordinate

Deck Angle

Deck Bar

Diameter

Deck Plate

Each Face

Elevation

Each Way

Expansion

Floor Drain

Foundation

Finished Floor

Foundation Pier

Finished Floor Elevation

Exterior

Far Side

Footing

OORD

Cold Formed Metal Framing

Complete Joint Penetration Weld

Bottom Chord

ITEM

Architecturally Exposed Structural Steel

Anchor Bolt/Column Anchor Rod

ABBREV.

STRUCTURAL ABBREVIATION INDEX

Joist Bearing Elevation

Inside Face

Lateral

Location Low Point

Long Way

Maximum

Mechanical

Not To Scale

Outside Face

Overflow Drain

Opposite Hand

Perpendicular

Radius

Roof Drain

Reinforce

Required

Reaction

Spaces

Slip Critical

Step Footing

Slab On Grade

Stainless Steel

Top and Bottom

Top Chord Extension

Unless Noted Otherwise

Welded Wire Fabric

Short Way

Top Chord

Top of Beam

Top of Footing

Top of Ledge Top of Masonry

Top of Wall

Top of

Remainder

Roof Top Unit

R, RAD

Pressure Treated

Reference, Refer to

Reinforced Masonry Wall

Structural Insulated Panel

Pre-Engineered Metal Building

Outside Diameter

Out-to-Out

On-Center

Minimum

Linear Foot

Long Leg Horizontal

Laminated Wood Beam

Masonry Control Joint

Long Leg Vertical

ITEM

ABBREV.

ENGINEERING DATA

2000 psf (Assumed)

f'c = 3500 psi

f'c = 4000 psi

23 psf + Drift

varies - per ASCE7

Ss = 0.085

S1 = 0.052

3.03 in/hr

6.20 in/hr

(IBC 2015)

ASCE 7-16

AISI S100 - 12

ACI 318

GENERAL FOUNDATION AND CONCRETE NOTES

slabs on grade shall be as recommended in the geotechnical report.

slabs as follows: (1)-#4 x 44" for each 4" of concrete thickness.

in size and number to vertical wall or pier reinforcing (UNO).

and 318 requirments, and as stated on contract documents.

compressive strength. All testing shall follow ASTM standards.

Water-Reducing Admixture: ASTM C494, Type

Air-Entraining Admixture: ASTM C260

Repair and Patch defective areas as directed by Architect.

Material Test Reports, and Material Certifications.

Cover for reinforcing shall be in accordance with ACI-318.

to details and specifications for additional information regarding slab joints.

8. Refer to "General Structural Notes" for information regarding special inspections and

CONCRETE SPEC NOTES SUMMARY

The contractor shall implement all requirements and recommendations stated in the geotchinacl engineer's report by XXX, titled "XXX", dated XXX. Reference XXX project

Fill material shall be thoroughly compacted prior to placement of concrete. Fill under all

Provide diagonal reinforcing (across each corner) of openings in foundation walls and

Coordinate finish of all foundation work, including slabs on grade, with architectural and

Lap all reinforcing as indicated in "Reinforcement Development and Lap Splice Lengths" detail. Provide corner bars for all horizontal reinforcing. Provide dowels from footing equal

All concrete shall be done in accordance with ACI 117, 211, 301, 306.1, 302, 315, 347

Provide submittals for Product Data, Design Mixes, Steel Reinforcement Shop Drawings,

All exposed exterior concrete retaining and foundation walls shall be considered to have

but is not limited to slump, air content concrete temperature, unit weight, and

of cementitious material. Do not use admixtures containing calcium chloride.

High-Range, Water-Reducing Admixture: ASTM C494, Type F

an Architecturally exposed class "A" finish, in accordance with ACI 347. Finish concrete

Testing of concrete shall be done for each 100 cu. yd. or fraction therof, and shall include

Admixtures shall contain no more than 0.1 percent water-soluble chloride ions by mass

Water-Reducing and Accelerating Admixture: ASTM C494, Type E

Water-Reducing and Retarding Admixture: ASTM C494, Type D

All slabs on grade shall have contraction or construction joints at a maximum spacing of 24 times the slab thickness (spacing need not be less than 10'-0") each way, except as noted on the drawings. Maintain an aspect ratio of not more than 1.5. Coordinate joint locations with joints in flooring materials, such as tile, and with changes in floor finish material. Refer

"Light frame (CFMF) walls with wood panels or steel sheets"

SDs = 0.091SD1 = 0.083

"Equivalent lateral force"

Wisconsin Building Code 2015

0.18

Fy = 60000 psi

Design Bearing Pressure

Footings and Foundations

Ground snow load (Pg)

Flat roof snow load (Pf)

Snow load importance factor (Is)

Ultimate design wind speed (3 sec) 107 mph

Wall stud design pressure

Snow exposure (Ce)

Thermal factor (Ct)

Wind exposure category

Internal pressure coeff (GCpi)

Componets & cladding (varies)

Seismic importance factor, le

Seismic design category

Design base shear

Analysis Procedure

100 year - 60 min rainfall

100 year - 15 min rainfall

Basic seismic force resisting system:

Seismic response coefficient (Cs) 0.022

Response modiffication factor (R) 6.5

Spectral Response

Site Class

Specific Design Dead Loads

Roof dead loads

Structure

Insulation Metal deck

Ceiling

General building code

Cold form metal framing

flooring supplier's requirements.

installation of post installed anchors.

walls as directed by Architect.

Misc

Environmental

Concrete

Design codes

number XXX.

Fire protection

Roofing (adhered)

Grade slabs

Structural design requirements

Roof live load

Risk Category

Roof snow load

Wind Loads

Earthquake

Reinforcing steel

Design stresses

GENERAL STRUCTURAL NOTES

- 1. All work shall be performed in accordance with the contract documents. In case of a conflict within the contract documents, the more stringent condition shall govern, unless directed otherwise by the engineer of record. Prior to implementation, any discrepancies shall be reported to the architect for clarification.
- 2. The structure has been designed for the in-service loads only. The methods, procedures and sequences of construction are the responsibility of the contractor. Contractor shall take all necessary precautions to maintain and ensure the integrity of the structure at all stages of construction. Contractor shall immediately notify the structural engineer of any condition which, in his opinion, might endanger the stability of the structure or cause distress in the structure.
- 3. All existing conditions and all related dimensions indicated in the contract documents shall be field verified prior to fabrication, erection and/or construction. Any condition that differs from that indicated in the contract documents shall be submitted to the architect for review prior to fabrication, erection and/or construction. 4. The structure has been designed to meet or exceed serviceability requirements of section 1604 of the Wisconsin Building Code. All non-structural components & their
- connections that are anchored to the structure shall be designed to allow for the movement of the structure caused by wind, snow, live, thermal, shrinkage/creep and earthquake loads. Non-structural components include items such as non-load bearing
- walls, MEP components, bulkheads, etc. Provide special inspection in accordance with chapter 17 of the Wisconsin Building Code
- and with project specifications. Post installed anchors shall be the specific product indicated. Where product substitutions are desired, they shall be submitted to engineer for review & approval a minimum of 2 weeks prior to planned installation. Adhesive anchors shall be installed using products that are approved by the supplier for all temperature considerations. Installation shall be in accordance with suppliers published installation instructions.

WALL FOOTING SCHEDULE |LONGITUDINAL | TRANSVERSE

WF1812 (2)#5 NONE

MARK | REINFORCING | REINFORCING | NOTE / DETAIL

	CONCRETE MIX DESIGN PERFORMANCE SPECIFICATION TABLE												
MIX TYPE	MIX DESCRIPTION		CEMENTITIOUS (% BY WEIGHT)	REQUIRED SULFATE RESISTANCE (NOTE 6)	MINIMUM FREEZE- THAW RESISTANCE	PERMEABILITY & CHLORIDE RESISTANCE	MAXIMUM ALLOWED CHLORIDE ION CONTENT (% BY WEIGHT OF CEMENT)	MAXIMUM ALLOWED 28-DAY SHRINKAGE (%)	MINIMUM COMPRESSIVE STRENGTH F'C (PSI) (NOTE 3)		AIR CONTENT (% +/- 1.5%)	MAX AGG SIZE (IN)	FIBROUS REINF DOSAGE (LB/CY) (NOTE 7)
2	FOUNDATIONS, GRADE BEAMS, BASEMENT WALLS		25% FLY ASH OR 30% GROUND BLAST FURNACE SLAG IS ACCEPTABLE	SO	F1	C1	0.3	-	3500	0.55	4.5	1	0
5	INTERIOR SLAB-ON-GRADE (NOTE 4)		20% SCM RECOMMENDED	S0	F0	C0	1	0.04	3500	0.45	NA	1.5	1.5
16	EXTERIOR STRUCTURAL CONCRETE (NOTE5)			S1	F2	C1	0.3	-	4500	0.45	6	1	0

CONCRETE MIX DESIGN PERFORMANCE SPEC SCHEDULE NOTES

- All aggregates shall be clean uniformly grades from coarse to fine. Water-reducing admixtures may be utilized to maintain water/cement ratio AND workability. Note that this may affect finish procedures. F'c values shown are code minimums. Engineering data may require a high f'c as dictated by project design requirements. Higher compressive strength requirement shall govern mix design.
- Coordinate admixtures and curing measures to be compatible with flooring materials and adhesives. Exterior Structural Concrete only covers concrete structures outside the building footprint shown on structural drawings. It does not
- include any other discipline, including Civil. Course aggregate for this mix shall be crushed limestone. See ACI 318 Table 19.3.2.1 for cementitious material restrictions, and Table 26.4.2.2(c) for maximum expansion strain limits.
- Fibrous reinforcement basis of design is fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying
- with ASTM C1116/C1116M, Type III, 1/2 to 1 1/2 inches long. See ACI 318 Table 26.4.2.2(b) for limits on cementitious materials for F3 exposure class.

AVI FOUNDATION PLAN AND ROOF FRAMING PLAN

- 1/2" EXP JOINT

FILLER w/ SEALANT

- CONCRETE SLAB

— #4 x OPENING WIDTH

+ 24" EACH SIDE

CONC WALK OR SLAB -

MIN 6x6-W1.4xW1.4 WWF CENTERED IN SLAB

CHAMFER EDGE

SLAB ON GRADE OR SUPPORTED SLAB

TYPICAL INTERIOR EQUIPMENT PAD

NOTE: COORD PAD SIZE

& LOCATIONS WITH

ARCH/MECH/ELEC

AT EXPOSED FLOORS, -

FLOORS ARE COVERED,

RADIUS. WHERE

FINISH FLUSH

EDGE EACH SIDE w/ 1/8"

(SLOPE UP FLUSH AT

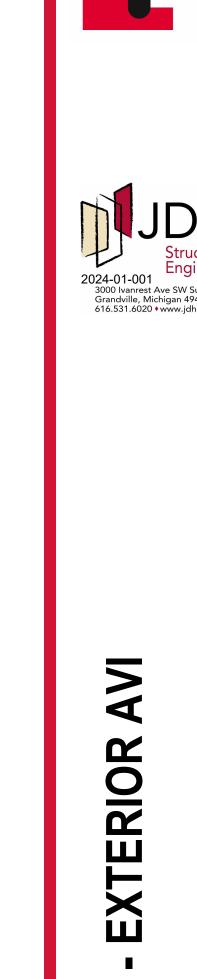
BARRIER FREE

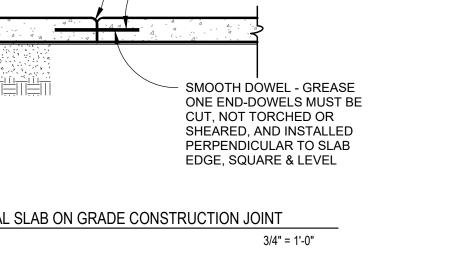
COORD w/CIVIL

CHECKED BY

J. CARDINAL

FOUNDATION DETAILS





VERTICAL SURFACE

- BOND BREAKER:

BARRIER

TURN UP VAPOR BARRIER

AND TRIM AFTER FINISHING.

USE 15# BUILDING PAPER IF

THERE IS NO VAPOR

BELOW CONCRETE

FILL. SEE GENERAL FOUNDATION NOTES

COMPACTED GRANULAR

- 1/2"Ø x14" @ 24" OC

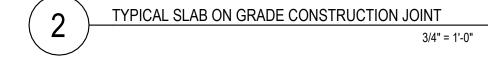
- HOUSE KEEPING PAD

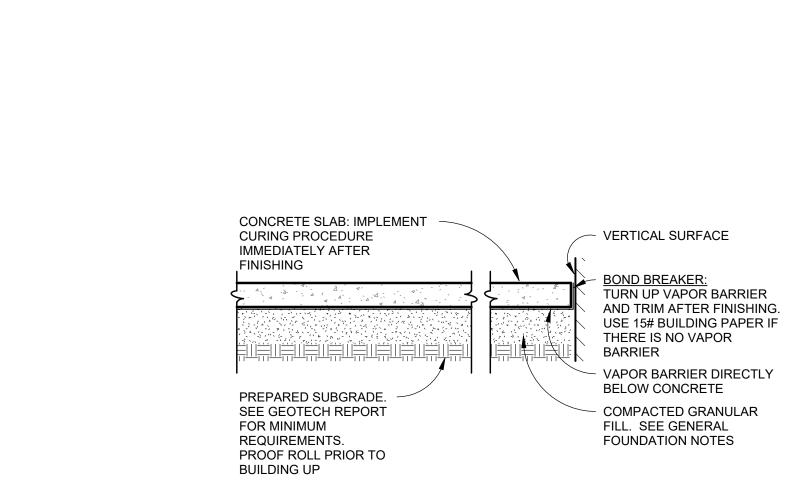
w/ 6x6-W2.9 WWF

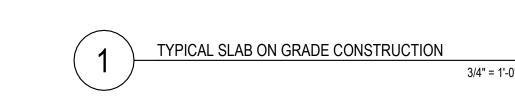
ROUGHEN SLAB

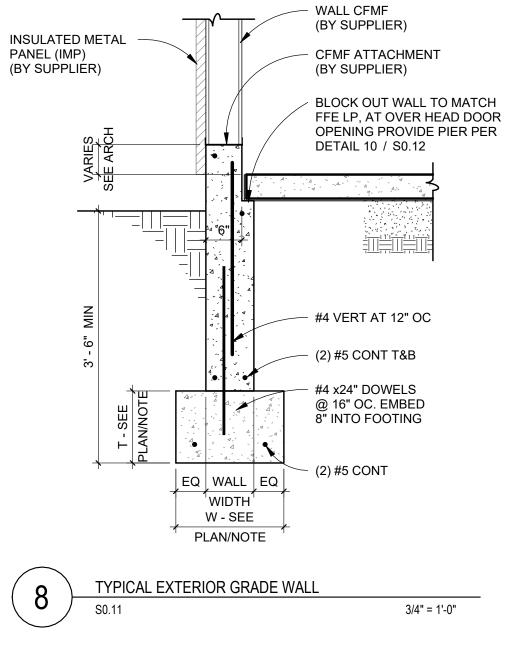
3/4" = 1'-0"

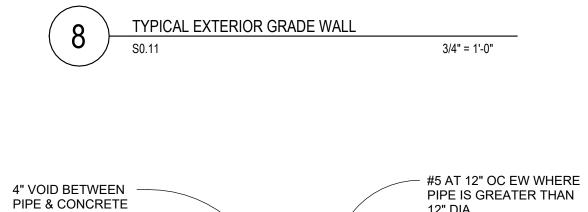
AND APPLY **BONDING AGENT**

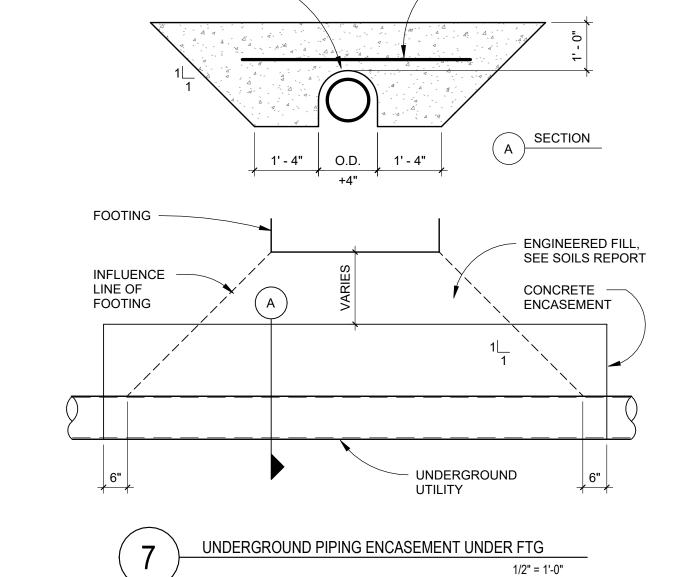


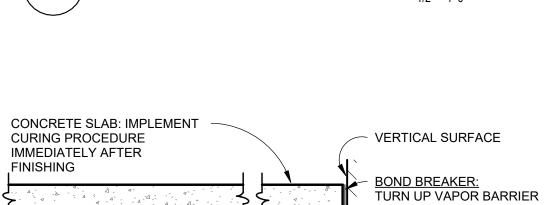




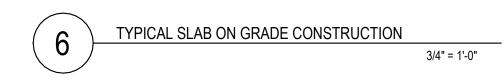


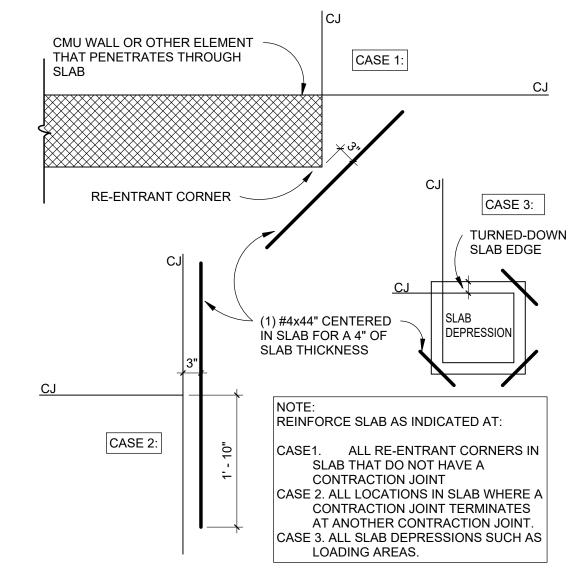






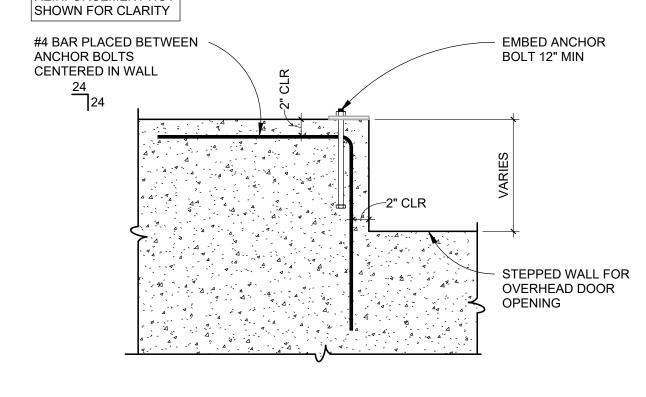
AND TRIM AFTER FINISHING. USE 15# BUILDING PAPER IF THERE IS NO VAPOR BARRIER - VAPOR BARRIER DIRECTLY BELOW CONCRETE PREPARED SUBGRADE. SEE GEOTECH REPORT - COMPACTED GRANULAR FOR MINIMUM FILL. SEE GENERAL REQUIREMENTS. FOUNDATION NOTES PROOF ROLL PRIOR TO BUILDING UP





3/4" = 1'-0"

TYPICAL SLAB ON GRADE REINF DETAIL



FOUNDATION WALL AT OVERHEAD DOOR OPENING 1" = 1'-0"

 $_{5}$

TYPICAL STEM -WALL FOR DOOR THRESHOLD

PIER AT FOUNDATION WALL OPENING AT OVERHEAD 1 1/2" = 1'-0"

NOTE: OTHER WALL REINFORCEMENT NOT

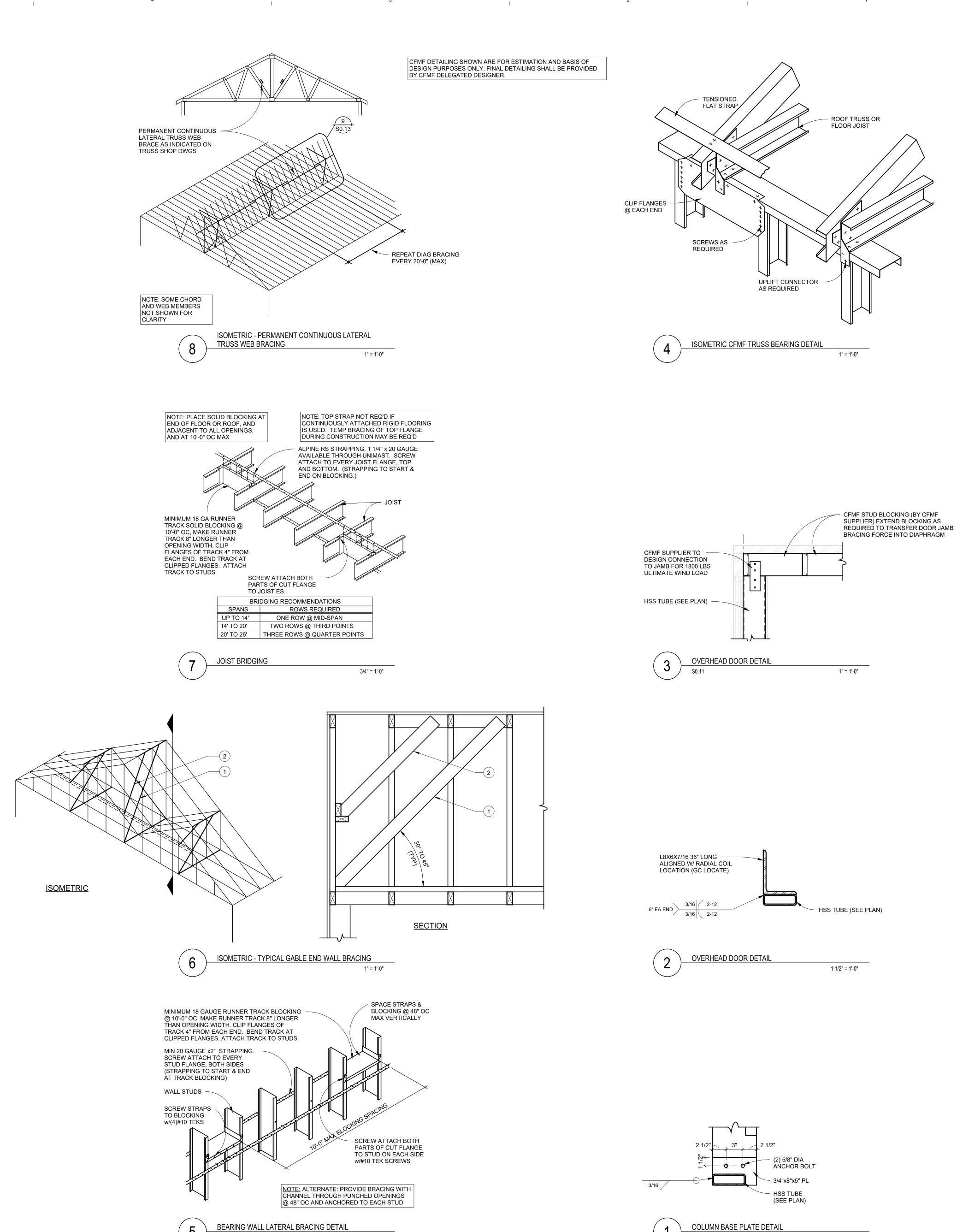
11/13/2024 BIDS/PERMITS

CHECKED BY

J. CARDINAL

FRAMING DETAILS

1 1/2" = 1'-0"



PERMANENT CONTINUOUS LATERAL TRUSS WEB BRACING AS REQ'D BY

TRUSS SUPPLIER AND AS INDICATED

ON TRUSS SHOP DRAWINGS

NOTE: PROVIDE A MIN OF 1 SET

OF DIAGONAL BRACES FOR

5

EACH HORIZ WEB BRACE

1/2" = 1'-0"

CONTINUE TO

GABLE END WALL

ROOF SHEATHING

INSTALL TIGHT —

PERMANENT CONTINUOUS LATERAL TRUSS WEB

- PERMANENT DIAGONAL BRACING

BRACING DETAIL

BOTTOM CHORD SHEATHING

(ADD CONTINUOUS BLOCKING IF NO SHEATHING)

EVERY 20'

11/13/2024 BIDS/PERMITS

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES SECTION 032000 - CONCRETE REINFORCING PART 1 - GENERAL PART 1 - GENERAL A. SUMMARY a. Section Includes: ACTION S Prod INFORMA a. Field 2. PART 2 - PRO A. PERFORM appli FORM-FAC WATERST of flu chai of flu chan Selftrape trape rubb D. 2.4 REL thick Char Rust remo Form Form 3. PART 3 - EXE INSTALLA^{*} Com Cons DCo e. At co INSTALLA^{*} a. Plac INSTALLA^{*} Self-D. FIELD QUA a. Spec END OF SECTION 0310

RY	Α.	SUMMARY	A.
ection Includes: Form-facing material for cast-in-place concrete.		a. Section Includes:• Steel reinforcement bars.	
Shoring, bracing, and anchoring.	_	Welded-wire reinforcement.	
Concrete accessories I SUBMITTALS	В.	ACTION SUBMITTALS a. Product Data: For the following:	
roduct Data: For each of the following:		Each type of steel reinforcement.	
hop Drawings: Indicate location of waterstops (if present on project). MATIONAL SUBMITTALS		 Mechanical splice couplers. Shop Drawings: Comply with ACI SP-066: 	В.
eld quality-control reports.		 Include placing drawings that detail fabrication, bending, and placement. 	
RODUCTS RMANCE REQUIREMENTS		 Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, 	
oncrete Formwork: Design, engineer, erect, shore, brace, and maintain		lengths of lap splices, details of mechanical splice couplers, details of	
rmwork, shores, and reshores in accordance with ACI 301, to support ertical, lateral, static, and dynamic loads, and construction loads that might be		welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.	C.
oplied, until structure can support such loads, so that resulting concrete	C.	INFORMATIONAL SUBMITTALS	
onforms to the required shapes, lines, and dimensions. FACING MATERIALS	Б	a. Field quality-control reports.	
s-Cast Surface Form-Facing Material:	D.	QUALITY ASSURANCE a. Welding Qualifications: Qualify procedures and personnel in accordance with	
Provide continuous, true, and smooth concrete surfaces.	0 040	AWS D1.4/D 1.4M.	
Furnish in largest practicable sizes to minimize number of joints. oncealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or	2. PAR ⁻ A.	「2- PRODUCTS STEEL REINFORCEMENT	
nother approved material.		a. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.	
STOPS exible Rubber Waterstops: U.S. Army Corps of Engineers CRD-C 513, with		b. Low-Alloy Steel Reinforcing Bars: ASTM A706/A706M, deformed.c. Headed-Steel Reinforcing Bars: ASTM A970/A970M.	
ctory-installed metal eyelets, for embedding in concrete to prevent passage		d. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain,	
fluids through joints. Factory fabricate corners, intersections, and directional nanges.		fabricated from as-drawn steel wire into flat sheets. e. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat	
exible PVC Waterstops: U.S. Army Corps of Engineers CRD-C 572, with	_	sheet.	
ctory-installed metal eyelets, for embedding in concrete to prevent passage fluids through joints. Factory fabricate corners, intersections, and directional	В.	REINFORCEMENT ACCESSORIES a. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing,	
nanges.		supporting, and fastening reinforcing bars and welded-wire reinforcement in	
elf-Expanding Butyl Strip Waterstops: Manufactured rectangular or apezoidal strip, butyl rubber with sodium bentonite or other hydrophilic		place.Manufacture bar supports from steel wire, plastic, or precast concrete in	
plymers, for adhesive bonding to concrete, 3/4 by 1 inch.		accordance with CRSI's "Manual of Standard Practice," of greater	
elf-Expanding Rubber Strip Waterstops: Manufactured rectangular or apezoidal strip, bentonite-free hydrophilic polymer-modified chloroprene		compressive strength than concrete and as follows: 1. For concrete surfaces exposed to view, where legs of wire bar	
ibber, for adhesive bonding to concrete, 3/8 by 3/4 inch.		supports contact forms, use CRSI Class 1 plastic-protected steel	
ELATED MATERIALS		wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar	
eglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel neet. Temporarily fill or cover face opening of reglet to prevent intrusion of		supports. b. Mechanical Splice Couplers: ACI 318 Type 1, same material of reinforcing bar	
oncrete or debris.	_	being spliced; tension-compression type.	
ovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch ick, with bent tab anchors. Temporarily fill or cover face opening of slots to	C.	FABRICATING REINFORCEMENT a. Fabricate steel reinforcement according to CRSI's "Manual of Standard	
revent intrusion of concrete or debris.	0 545	Practice."	_
hamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum. ustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form	3. PAR ⁻ A.	「3- EXECUTION PREPARATION	D.
moval.		a. Protection of In-Place Conditions:	
orm-Release Agent: Commercially formulated form-release agent that does of bond with, stain, or adversely affect concrete surfaces and does not impair		 Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete. 	
ubsequent treatments of concrete surfaces.		b. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign	_
orm Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced astic or metal form ties designed to resist lateral pressure of fresh concrete	В.	materials that reduce bond to concrete. INSTALLATION OF STEEL REINFORCEMENT	E.
n forms and to prevent spalling of concrete on removal.		a. Comply with CRSI's "Manual of Standard Practice" for placing and supporting	
XECUTION LATION OF FORMWORK		reinforcement. b. Accurately position, support, and secure reinforcement against displacement.	
omply with ACI 301.		 Locate and support reinforcement with bar supports to maintain 	F
onstruct formwork within tolerance limits of ACI 117. mit concrete surface irregularities as follows:		minimum concrete cover. Do not tack weld crossing reinforcing bars.	F.
Surface Finish-1.0: ACI 117 Class D, 1 inch. (concealed concrete only)		c. Provide concrete coverage in accordance with ACI 318.	2. PAR
Surface Finish-2.0: ACI 117 Class B, 1/4 inch. (all exposed concrete) Construct forms tight enough to prevent loss of concrete mortar.		 Set wire ties with ends directed into concrete, not toward exposed concrete surfaces. 	A.
t construction joints, overlap forms onto previously placed concrete not less		e. Splices: Lap splices as indicated on Drawings or as follows whichever is	B.
an 12 inches. LATION OF EMBEDDED ITEMS		greater. • Bars indicated to be continuous, and all vertical bars shall be lapped per	
lace and secure anchorage devices and other embedded items required for		ACI 318.	
djoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions		 Stagger splices in accordance with ACI 318. Mechanical Splice Couplers: Install in accordance with manufacturer's 	
furnished with items to be embedded.		instructions.	
Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.		 Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings. 	
Install reglets to receive waterproofing and to receive through-wall		f. Install welded-wire reinforcement in longest practicable lengths.	
flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.		 Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice." 	
Install dovetail anchor slots in concrete structures, as indicated on		 Lap edges and ends of adjoining sheets at least one mesh spacing plus 	
Drawings. Clean embedded items immediate prior to concrete placement.		 2 inches for plain wire and 8 inches for deformed wire. Offset laps of adjoining sheet widths to prevent continuous laps in either 	
LATION OF WATERSTOPS		direction.	
exible Waterstops: Install in construction joints and at other joints indicated to rm a continuous diaphragm.	C.	Lace overlaps with wire. JOINTS	
Install in longest lengths practicable.		a. Construction Joints: Install so strength and appearance of concrete are not	
Locate waterstops in center of joint unless otherwise indicated on Drawings.		impaired, at locations indicated or as approved by Architect.Place joints perpendicular to main reinforcement.	
Allow clearance between waterstop and reinforcing steel of not less than		 Continue reinforcement across construction joints unless otherwise 	
2 times the largest concrete aggregate size specified in Section 033000 "Cast-In-Place Concrete."	D.	indicated. INSTALLATION TOLERANCES	
Secure waterstops in correct position at 12 inches on center.		a. Comply with ACI 117.	
Field fabricate joints in accordance with manufacturer's instructions using heat welding.	E.	FIELD QUALITY CONTROL a. Special Inspections: Owner will engage a special inspector and qualified	C.
Miter corners, intersections, and directional changes in		testing and inspecting agency to perform field tests and inspections and	O .
waterstops. 2. Align center bulbs.		prepare test reports. b. Testing Agency: Engage a qualified testing and inspecting agency to perform	
Clean waterstops immediately prior to placement of concrete.		tests and inspections and to submit reports.	D.
Support and protect exposed waterstops during progress of the Work. elf-Expanding Strip Waterstops: Install in construction joints and at other		c. Inspections:Steel-reinforcement placement.	
cations indicated on Drawings, according to manufacturer's written		Steel-reinforcement mechanical splice couplers.	
structions, by adhesive bonding, mechanically fastening, and firmly pressing to place.	END OF SE	Steel-reinforcement welding. ECTION 032000	
Install in longest lengths practicable.			
Locate waterstops in center of joint unless otherwise indicated on Drawings.			
Protect exposed waterstops during progress of the Work.			
QUALITY CONTROL pecial Inspections: Owner will engage a special inspector and qualified			
sting and inspecting agency to perform field tests and inspections and			
repare test reports. spections:			
Inspect formwork for shape, location, and dimensions of the concrete			E.
member being formed. Inspect insulating concrete forms for shape, location, and dimensions of			
the concrete member being formed. 31000			F.

 $_{7}$

	a.	Section Includes: Cast-in-place concrete, including concrete materials, mixture design,
	b.	placement procedures, and finishes. Related Requirements:
		 Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
	DEFII a.	NITIONS Cementitious Materials: Portland cement alone or in combination with one or
		more of the following: blended hydraulic cement, fly ash, slag cement, and other pozzolans materials subject to compliance with requirements.
	b.	Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.
	ACTION ACTION	ON SUBMITTALS Product Data: For each of the following.
		Portland cement.Fly ash.
		 Slag cement. Blended hydraulic cement.
		 Aggregates. Admixtures:
		Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment,
		aggregates, temperature at time of concrete placement, relative
		humidity at time of concrete placement, curing conditions, and use of other admixtures.
		Vapor retarders.Curing materials.
	b.	Joint fillers. Design Mixtures: For each concrete mixture, include the following:
		 Mixture identification. Minimum 28-day compressive strength.
		Durability exposure class.Maximum w/cm.
		 Calculated equilibrium unit weight, for lightweight concrete. Slump limit.
		Air content.Nominal maximum aggregate size.
		 Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
		Intended placement method.Submit alternate design mixtures when characteristics of materials,
		Project conditions, weather, test results, or other circumstances warrant adjustments.
	INFO	 Proportions or historical strength data in accordance with ACI 301. RMATIONAL SUBMITTALS
	a.	Material Certificates: For each of the following, signed by manufacturers: • Cementitious materials.
		 Admixtures. Curing compounds.
-	b. QUAL	Field quality-control reports. ITY ASSURANCE
•	a.	Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with
		ASTM C94/C94M requirements for production facilities and equipment. • Manufacturer certified in accordance with NRMCA's "Certification of
	חבו ״	Ready Mixed Concrete Production Facilities." /ERY, STORAGE, AND HANDLING: Comply with ASTM C94/C94M and
	ACI 3	• •
AKI	CON	CRETE, GENERAL
•		ACI Publications: Comply with ACI 301. CRETE MATERIALS
	a.	Cementitious Materials: Portland Cement: ASTM C150/C150M, Type I.
		Fly Ash: ASTM C618, Class C or F.Slag Cement: ASTM C989/C989M, Grade 100 or 120.
	b.	Normal-Weight Aggregates: ASTM C33/C33M, Class 1N coarse aggregate or better, graded. Provide aggregates from a single source.
		 Maximum Coarse-Aggregate Size: as indicated. Fine Aggregate: Free of materials with deleterious reactivity to alkali in
	C.	cement. Air-Entraining Admixture: ASTM C260/C260M.
	d.	Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those
		permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.
		 Water-Reducing Admixture: ASTM C494/C494M, Type A. Retarding Admixture: ASTM C494/C494M, Type B.
		 Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
		 High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F. High-Range, Water-Reducing and -Retarding Admixture:
		ASTM C494/C494M, Type G. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
	e.	Water and Water Used to Make Ice: ASTM C94/C94M, potable or complying
	\/A DC	with ASTM C1602/C1602M, including all limits listed in Table 2 and the requirements of paragraph 5.4
-	a.	OR BARRIER Sheet Vapor Barrier: ASTM E 1745, Class A, except with maximum perm
		rating of 0.01 or lower. Include manufacturer's recommended adhesive or pressure-sensitive tape.
	CURI a.	NG MATERIALS Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or
	b.	kenaf, weighing approximately 9 oz./sq. yd. when dry. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene
	C.	sheet. Curing Paper: Eight-feet-wide paper, consisting of two layers of fibered kraft
	d.	paper laminated with double coating of asphalt. Water: Potable or complying with ASTM C1602/C1602M.
	e.	Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.
	f.	Clear, Waterborne, Membrane-Forming, Nondissipating Curing Compound: ASTM C309, Type 1, Class B, certified by curing compound manufacturer to
	g.	not interfere with bonding of floor covering. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound:
		ASTM C1315, Type 1, Class A. TED MATERIALS
	a.	Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
		CRETE MIXTURES, GENERAL
	a.	Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACL 201
		 with ACI 301. Use a qualified testing agency for preparing and reporting proposed
	b.	mixture designs, based on laboratory trial mixtures. Cementitious Materials: Limit percentage, by weight, of cementitious materials
		 other than portland cement in concrete as follows: Fly Ash or Other Pozzolans: 25 percent by mass.
		 Slag Cement: 50 percent by mass. Total of Fly Ash or Other Pozzolans, Slag Cement: 50 percent by mass,
		 with fly ash or pozzolans not exceeding 25 percent by mass. Total of Fly Ash or Other Pozzolans: 35 percent by mass with fly ash or
	C.	pozzolans not exceeding 25 percent by mass. Admixtures: Use admixtures in accordance with manufacturer's written
		instructions. CRETE MIXTURES: As indicated on drawings.
		CRETE MIXING Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in
		accordance with ASTM C94/C94M and ASTM C1116/C1116M, and furnish batch ticket information.
ART		EXECUTION ALLATION OF VAPOR BARRIER
-	a.	Sheet Vapor Barrier: Place, protect, and repair sheet vapor retarder in
		 accordance with ASTM E1643 and manufacturer's written instructions. Lap joints 6 inches and seal with manufacturer's recommended tape.
		Seal penetrations in accordance with vapor retarder manufacturer's instructions.
		 Protect vapor retarder during placement of reinforcement and concrete. Repair damaged areas by patching with vapor retarder material,
		overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.
	JOIN a.	
	b.	concrete. Construction Joints: Coordinate with floor slab pattern and concrete placement
	~ .	sequence.
		Install so strength and appearance of concrete are not impaired, at

SECTION 033000 - CAST-IN-PLACE CONCRETE

1. PART 1 - GENERAL

2. Do not continue reinforcement through sides of strip placements

of floors and slabs.

a. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed. Immediately prior to concrete placement, inspect vapor retarder for Provide continuous inspection of vapor retarder during concrete b. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket. Do not add water to concrete after adding high-range water-reducing Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as Consolidate placed concrete with mechanical vibrating equipment in G. 3.7 CONCRETE CURING Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply in accordance with Concrete Temperature: ASTM C1064/C1064M:

D. CONCRETE PLACEMENT

admixtures to mixture.

damage and deficient installation, and repair defective areas.

placement and make necessary repairs to damaged areas as Work

accordance with ACI 301. Deposit 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. E. FINISHING FORMED SURFACES a. As-Cast Surface Finishes: ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material. Apply to concrete surfaces not exposed to public view. ACI 301Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. 1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete. Provide mockup. F. FINISHING FLOORS AND SLABS a. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.. Trowel Finish: Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage Engineering membrane, paint, or another thin-film-finish coating system. 3000 Ivanrest Ave SW Suite B Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface. 616.531.6020 • www.jdheng.com Slabs on Ground: A. Typical office floor unless otherwise listed a. SO FF 25/FL 20 with MLFF 17/MLFL 15. B. Warehouse floor a. SOI FF 50/FL 35 with MLFF 35/MLFL 24. a. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 301 and ACI 306.1 for cold weather protection during Comply with ACI 301 and ACI 305.1 for hot-weather protection during

manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing. c. Curing: Comply with ACI 308.1. H. TOLERANCES: Conform to ACI 117. FIELD QUALITY CONTROL a. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:

 Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof. 1. When frequency of testing provides fewer than five compressivestrength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used. Slump: ASTM C143/C143M:

1. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to

 Slump Flow: ASTM C1611/C1611M: 1. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to Air Content: ASTM C231/C231M pressure method, for normal-weight 1. One test for each composite sample, but not less than one test for

One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample. Compressive-Strength Tests: ASTM C39/C39M. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days. 3. A compressive-strength test shall be the average compressive

strength from a set of two specimens obtained from same composite sample and tested at age indicated. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used

each day's pour of each concrete mixture.

as sole basis for approval or rejection of concrete. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect 2. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect. A. Acceptance criteria for concrete strength shall be in accordance with ACI 301 section 1.6.6.3. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with

specified requirements. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

J. PROTECTION a. Protect concrete surfaces as follows: Protect from petroleum stains. Diaper hydraulic equipment used over concrete surfaces. Prohibit vehicles from interior concrete slabs. Prohibit use of pipe-cutting machinery over concrete surfaces.

 Prohibit placement of steel items on concrete surfaces. Prohibit use of acids or acidic detergents over concrete surfaces. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 033000

Perform classification and testing of compacted fill materials Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly Items marked with an 'X' shall be inspected in accordance with chapter 17 of the building code by a certified special inspector from an established testing agency. For material sampling and testing requirements, refer to the project specifications and the specific general notes sections. The testing agency shall send copies of all structural testing and inspection reports directly to the architect, engineer, contractor, and building official. Any items which fail to comply with the approved construction documents shall immediately be brought to the attention of the contractor for correction. If discrepancies are not corrected, they shall be brought to the attention of the building official, architect, and engineer prior to completion of that phase of the work. Special inspection testing requirements apply equally to all bidder designed components. Continuous special inspection means the full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed. Periodic special

STRUCTURAL SPECIAL INSPECTION SCHEDULE (2021 IBC - Chapter 17)

REFERENCE STANDARD

ACI 318: Ch. 20, Ch 25, 26.6 IBC: 1908.4

ACI 318: Ch 19, 26.4.3, 26.4.4 IBC: 1904.1,

ACI 318: 26.5.3, 26.5.4 IBC:1908.9

ACI 318: 17.8.2.4, 17.8.2, 26.7

ASTM C 172/ASTM C 31/ACI 318: 26.4.5, 26.12

ACI 318: 26.4, 26.5 IBC: 1908.6, 1908.7, 1908.8

AWS D1.4/ACI 318: 26.6.4

AWS D1.4/ACI 318 - 26.6

AWS D1.4/ACI 318 - 26.6

ACI 318: 17.8.2, 26.7, 26.8

1904.2, 1908.2, 1908.3

ACI 318: 26.12

ACI 318: 26.11

AWS D1.4/ACI 318 - 26.6

AWS D1.4/ACI 318 - 26.6

inspection means the part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work has been or is being performed and at the completion of the work. (sect 1702) Special inspection is not required for work performed by an approved fabricator per section 1704.2.5.2. Inspection for pre-fabricated construction shall be the same as if the material used in the construction took place on site. Continuous inspection will not be required during pre-fabrication if the approved agency

certifies the construction and furnishes evidence of compliance. Slip-critical connections may have periodic special inspection provided that direct tension indicators, twist-off bolts, or turn-of-the-nut method with match marking techniques are used. All welds shall be visibly inspected. All complete penetration welds shall be tested ultrasonically or by using another approved method.

Periodic special inspection is allowed for verification of the weldability of reinforcing steel other than ASTM A 706 in accordance with building code section 1705.2.2. Continuous special inspection is required for reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, boundary elements of special reinforced concrete shear walls, and shear reinforcement. Periodic special inspection is allowed for welding of other ASTM A 706 reinforcing steel not included in the continuous special inspection requirements noted above. Special inspection is not required for isolated spread footings (\leq 3 stories), non-structural slabs, foundation walls, patios, driveways and sidewalks provided the requirements of section 1705.3 are met.

Post-installed anchors into masonry or concrete may be used only when approved by architect and/or engineer using an approved product with current published ICBO research report numbers. 12. Special inspection of soils shall reference the approved soils report to determine compliance. 13. Special inspection for structural steel shall be per AISC 303, Section 8 or the project contract documents, whichever is more stringent.

PRE-FABRICATED CONSTRUCTION (1704.2.5)

Verification of weldability of reinforcing steel other than ASTM A 706

elements of special structural walls of concrete and shear reinforcement.

Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary

Verify materials below shallow foundations are adequate to achieve the deign bearing capacity

Verify excavations are extended to proper depth and have reach proper material

CONCRETE CONSTRUCTION (1705.3)

Reinforcing Steel Placement

Welding of Reinforcing Steel

Shear reinforcement

Concrete Sampling

Verify In-Situ Strength

Other reinforcing steel

Embedded Bolts & Plates

Verify Required Mix Design

Concrete / Shotcrete Placement

Post-Installed Anchor Placement

Curing Temperature & Techniques

Formwork Shape, Location & Dimensions

14. Any construction or material that has failed inspection shall be subject to removal and replacement. 15. This table and notes represent code requirements for structural portions of the project and is not a complete representation of what may be required by chapter 17 of the building code. See chapter 17 and project

Periodic special inspection is required for verification of in-situ concrete strength for post-tensioned concrete prior to tensioning tendons and for beams and structural slabs before removing shoring or forms.

16. Comply with all applicable AWS D1.8 special inspections related to demand critical welds and welds part of the seismic force resistance system.

GRE

a. Verify, with certified steel erector present, elevations of concrete- and

b. Proceed with installation only after unsatisfactory conditions have been

b. Baseplates, Bearing Plates and Leveling Plates: Clean concrete- and

a. Set structural steel accurately in locations and to elevations indicated and in

other embedments for compliance with requirements.

accordance with ANSI/AISC 303 and ANSI/AISC 360.

prior to setting plates. Clean bottom surface of plates.

Weld plate washers to top of baseplate.

installation instructions for grouting.

used in correcting welding work.

inspections as noted in the plans.

adjacent to field welds.

be submitted to the architect for approval.

SP 3 power-tool cleaning.

and repair galvanizing to comply with ASTM A 780.

corrected.

C. FIELD CONNECTIONS

D. FIELD QUALITY CONTROL

E. REPAIRS AND PROTECTION

B. ERECTION

masonry-bearing surfaces and locations of anchor rods, bearing plates, and

masonry-bearing surfaces of bond-reducing materials, and roughen surfaces

1. Set plates for structural members on wedges, shims, or setting nuts as

protruding, cut off flush with edge of plate before packing with grout.

protect grout and allow to cure. Comply with manufacturer's written

Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if

4. Promptly pack shrinkage-resistant grout solidly between bearing

c. Maintain erection tolerances of structural steel within ANSI/AISC 303.

b. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances,

a. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's

"Specification for Structural Joints Using High-Strength Bolts" for bolt and

appearances, welding procedure specifications, weld quality, and methods

a. All modifications or changes to structural steel framing and connections must

c. Touchup Painting: Immediately after erection, clean exposed areas where

primer is damaged or missing and paint with the same material as used for

shop painting to comply with SSPC-PA 1 for touching up shop-painted

adequacy of temporary connections, and removal of paint on surfaces

SPECIFICATIONS

A. SUMMARY a. Section Includes: Structural steel. Shear stud connectors. Shrinkage-resistant grout. B. DEFINITIONS a. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303. C. ACTION SUBMITTALS a. Product Data: Structural-steel materials. High-strength, bolt-nut-washer assemblies. Shear stud connectors. Anchor rods. Threaded rods. Forged-steel hardware. Galvanized-steel primer. Galvanized repair paint. Shrinkage-resistant grout. Shop Drawings: Show fabrication of structural-steel components. Delegated-Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation. D. INFORMATIONAL SUBMITTALS a. Mill test reports for structural-steel materials, including chemical and physical Field quality-control reports. E. QUALITY ASSURANCE a. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172). Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M. 2. PART 2 - PRODUCTS A. PERFORMANCE REQUIREMENTS a. Comply with applicable provisions of the following specifications and documents: ANSI/AISC 303. ANSI/AISC 360. RCSC's "Specification for Structural Joints Using High-Strength Bolts." b. Connection Design Information: 1. Fabricator's experienced steel detailer shall select or complete connections in accordance with ANSI/AISC 303. A. Select and complete connections using schematic details indicated and ANSI/AISC 360. END OF SECTION 051200 B. Use Allowable Stress Design; data are given at service-load level. 2. Option 3 and 3A: Design connections in accordance with ANSI/AISC 303 by fabricator's qualified professional engineer. Member reinforcement at connections is indicated on Drawings. A. Use Allowable Stress Design; data are given at service-3. Construction: [Moment frame] [Braced frame] [Shear wall system] [Combined system of moment frame and braced frame] [Combined system of moment frame and shear walls] [Combined system of braced frame and shear walls] [Combined system of moment frame, braced frame, and shear walls]. B. STRUCTURAL-STEEL MATERIALS a. W-Shapes: ASTM A992/A992M. Channels, Angles: ASTM A36/A36M. Plate and Bar: ASTM A36/A36M. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B structural tubing. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B. Welding Electrodes: Comply with AWS requirements. C. BOLTS AND CONNECTORS High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish. b. High-Strength A490 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A490, Type 1, heavy-hex steel structural bolts or Grade F2280 tensioncontrol, bolt-nut-washer assemblies with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish. c. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers. 1. Finish: Hot-dip or mechanically deposited zinc coating. d. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, heavy-hex or round head assemblies, consisting of steel structural bolts with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers. e. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headedstud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B. D. RODS Unheaded Anchor Rods: ASTM F1554, Grade 36]. Headed Anchor Rods: ASTM F1554, Grade 55, weldable, straight. Threaded Rods: ASTM A36/A36M. E. FORGED-STEEL STRUCTURAL HARDWARE a. Clevises and Turnbuckles: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1035. a. Steel Primer: 1. Fabricator's standard lead- and chromate-free, nonasphaltic, rustinhibiting primer complying with MPI#79 and compatible with topcoat. G. SHRINKAGE-RESISTANT GROUT a. Metallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time. b. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factorypackaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time. a. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360. b. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions. SHOP CONNECTIONS a. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified. Joint Type: Snug tightened. b. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work. J. GALVANIZING a. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M. 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off K. SHOP PRIMING a. Shop prime steel surfaces, except the following: 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches. Surfaces to be field welded. Surfaces of high-strength bolted, slip-critical connections. Surfaces to receive sprayed fire-resistive materials (applied Galvanized surfaces. Surfaces enclosed in interior construction. b. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards: SSPC-SP 3. c. Surface Preparation of Galvanized Steel: Prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner or in accordance with SSPC-

SECTION 051200 - STRUCTURAL STEEL FRAMING 3. PART 3 - EXECUTION A. EXAMINATION

1. PART 1 - GENERAL

d. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that

result in full coverage of joints, corners, edges, and exposed surfaces. L. SOURCE QUALITY CONTROL a. If one of the two conditions below is followed then source quality control need not be required: 1. The fabricator is AISC certified and provides documentation they are

approved to perform such work without special inspection, and at the completion of fabrication the approved fabricator shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents. 2. The fabrication process does not require any welding, thermal cutting, heating operations of any kind. In such cases the fabricator shall submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material

b. Testing Agency: Engage a qualified testing agency to perform shop tests and 1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

7 4

DOOR GENERAL NOTES

2. DOOR NUMBERING MUST BE FOLLOWED EXACTLY PER PLANS. ANY CONFLICTS SHOULD BE BROUGHT TO ARCHITECTS OR CONSTRUCTION MANAGERS ATTENTION.

5. VERIFY ROUGH OPENING SIZES AND REQUIREMENTS WITH DOOR / FRAME MANUFACTURER.

6. MAXIMUM PULL FORCES FOR EXTERIOR DOORS TO BE 15 LBS.

7. MAXIMUM PULL FORCES FOR INTERIOR DOORS TO BE 5 LBS.

8 A2.00

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CHAIN LINK CAP

1/8" / 12"

AS -15B POST MOUNTED TO SLAB -

METAL LINER PANEL

4_}

OVERALL

8. PAINT INTERIOR SIDE OF ALL WAREHOUSE EXTERIOR HOLLOW METAL DOORS AND FRAMES "SEMI- GLOSS" -

CLEAR WATER BASED POLYURETHANE. LIGHTLY SAND BETWEEN COATS.

10. ALL INTERIOR HOLLOW METAL WELDED DOOR FRAMES ARE TO BE PAINTED SEMI-GLOSS TO MATCH

11. PROVIDE RUST INHIBITOR COATING AND STAINLESS STEEL SCREWS / FASTENERS ON ALL HARDWARE ITEMS AT EXTERIOR DOORS PER MANUFACTURER SPECIFICATIONS.

13. ALL HOLLOW METAL DOORS TO BE 1-3/4" THICK. EXTERIOR HOLLOW METAL DOORS TO BE INSULATED WITH A

14. G.C. TO PROVIDE BEST 7-PIN SFIC GREEN METAL CONSTRUCTION CORES. PLASTIC CORES NOT ALLOWED.

16. WITHIN 2 WEEKS OF CONTRACT, G.C. TO EVALUATE AND ORDER DOOR HARDWARE. COORDINATE WITH

EQUIPMENT SCHEDULE		
EQUIPMENT NAME	PROVIDED BY	INSTALLED BY
FLEXIBLE LANE DELINEATORS	BY OTHERS	BY OTHERS
AVI SCANNING EQUIPMENT	BY OTHERS	BY OTHERS
FLOOR-MOUNTED CABLE PROTECTION MATS	BY OTHERS	BY OTHERS
UVEYE SERVER STACK	BY OTHERS	BY OTHERS
ATLAS CONTROL CABINET	BY OTHERS	BY OTHERS
33" IFLEX BOLLARD	BY GC	BY OTHERS
SPEED BUMP	BY GC	BY GC

EYNOTE	ES
NUMBER	

NUMBER	NOTE
A03	6" CONCRETE FILLED, SCHEDULE 40 STEEL PIPE BOLLARD. 4'-0" ABOVE GRADE.
A04	INTERIOR SURFACE MOUNTED BOLLARD, TYP. SEE 1/A5.03
A10	2 ADJACENT 6'-0" REMOVABLE HEAVY-DUTY RUBBER SPEED BUMPS CENTERED ON AVI ENTRANCE ARCHITECTURAL
A118	PREFINISHED METAL DOWNSPOUT
A128	PREFINISHED 8" METAL GUTTER. COLOR TO MATCH MP-1
A201	G.C. TO LOCATE CENTERLINE OF AVI LANE GUARDRAIL OPENINGS WITH TEMPORARY TAP ON FLOOR Architecture
A202	ATLAS CONTROL CABINET, BY OWNER'S VENDOR Architecture
A203	UVEYE EQUIPMENT CABINET, BY OWNER'S VENDOR
A205	IDF, REFER TO LOW VOLTAGE DRAWINGS
A206	FLEXIBLE LANE DELINEATOR, BY OWNER'S VENDOR
A208	AVI EQUIPMENT, REFER TO THE EQUIPMENT SCHEDULE.
A210	FIRE EXTINUISHER AND MOUNTING BRACKET.
Λ011	22" A CAFE ISLEVITEAN OUTVIOULADD DEFED TO FOUIDMENT COURDING

I. CEILING HEIGHTS INDICATED ARE DIMENSIONED FROM THE FINISHED FLOOR BELOW. 2. ALL LIGHT FIXTURES, SPRINKLER HEADS, RETURN AIR GRILLES AND SUPPLY AIR GRILLES ARE TO BE LOCATED IN THE CENTER OF THE CEILING PAD, UNLESS NOTED OTHERWISE.

3. COORDINATE MECHANICAL, ELECTRICAL AND FIRE PROTECTION TO ASSURE PROPER CLEARANCES 4. MECHANICAL, ELECTRICAL AND FIRE PROTECTION CONTRACTORS TO PROVIDE ACCESS PANELS IN CEILINGS AS REQUIRED FOR MAINTENANCE OF EQUIPMENT. COORDINATE SIZE AND LOCATIONS OF ACCESS PANELS TO MINIMIZE QUANTITIES. CONTRACTOR IS REQUIRED TO PROVIDE LAYOUT TO ARCHITECT FOR REVIEW PRIOR TO INSTALLATION, UNLESS NOTED OTHERWISE.

AND LAYOUT.

FIRE EXIT SIGN LOCATION LINEAR LIGHT FIXTURE

ROOF LEGEND

METAL ROOF PANELS - STANDING SEAM

REFLECTED CEILING PLAN LEGEND

ROOF SLOPE - 1/4" PER FOOT UNLESS NOTED OTHERWISE

1. NOT ALL DOOR AND FRAME TYPES ARE USED. COORDINATE WITH SCHEDULE.

3. ALL WOOD BLOCKING REQUIRED AT EXTERIOR WALL / WINDOW DETAILS TO BE PRESSURE TREATED.

4. G.C. TO VERIFY ALL HARDWARE FUNCTION, KEYING AND SECURITY REQUIREMENTS WITH OWNER PRIOR TO PURCHASE. ALL EXISTING DOORS TO BE REUSED TO GET NEW CORES. COORDINATE KEYING WITH OWNER.

SAFETY RED (P-10). 9. ALL WOOD DOORS TO BE 1-3/4" SOLID CORE, WOOD VENEER. VENEER TO BE MAPLE WITH THREE COATS OF

ADJACENT WALL FINISH TYP.

12. ALL ELECTRICAL HARDWARE SHALL BE COORDINATED WITH ELECTRICAL AND SECURITY CONTRACTORS.

15. COORDINATE CAGE DOORS WITH SECURITY.

SECURITY DRAWINGS FROM IES AND CONSTRUCTION MANAGER FOR APPROVAL. 17. ABBREVIATIONS:

ALUM ALUMINUM CLF CHAIN LINK FENCE GWB GYPSUM WALL BOARD HM HOLLOW METAL PREFIN PREFINISHED SCWD SOLID CORE WOOD DOOR

EQUIPMENT SCHEDULE		
EQUIPMENT NAME	PROVIDED BY	INSTALLED BY
FLEXIBLE LANE DELINEATORS	BY OTHERS	BY OTHERS
AVI SCANNING EQUIPMENT	BY OTHERS	BY OTHERS
FLOOR-MOUNTED CABLE PROTECTION MATS	BY OTHERS	BY OTHERS
UVEYE SERVER STACK	BY OTHERS	BY OTHERS
ATLAS CONTROL CABINET	BY OTHERS	BY OTHERS
33" IFLEX BOLLARD	BY GC	BY OTHERS
SPEED BUMP	BY GC	BY GC

EYNOTE	ES
NIIMRER	

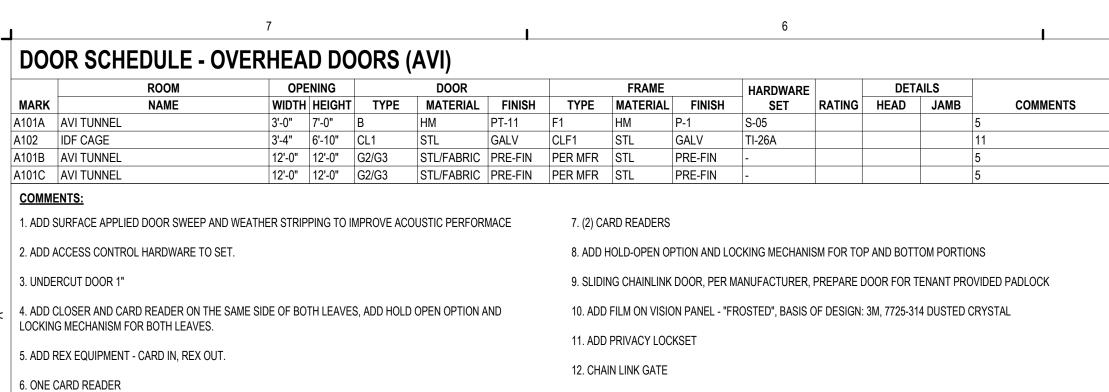
NOWDER	NOTE
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A208	AVI EQUIPMENT, REFER TO THE EQUIPMENT SCHEDULE.
A210	FIRE EXTINUISHER AND MOUNTING BRACKET.
A211	33" A- SAFE IFLEX HEAVY DUTY BOLLARD. REFER TO EQUIPMENT SCHEDULE.

ISSUANCE 11/12/2024 PERMITS SET/BID

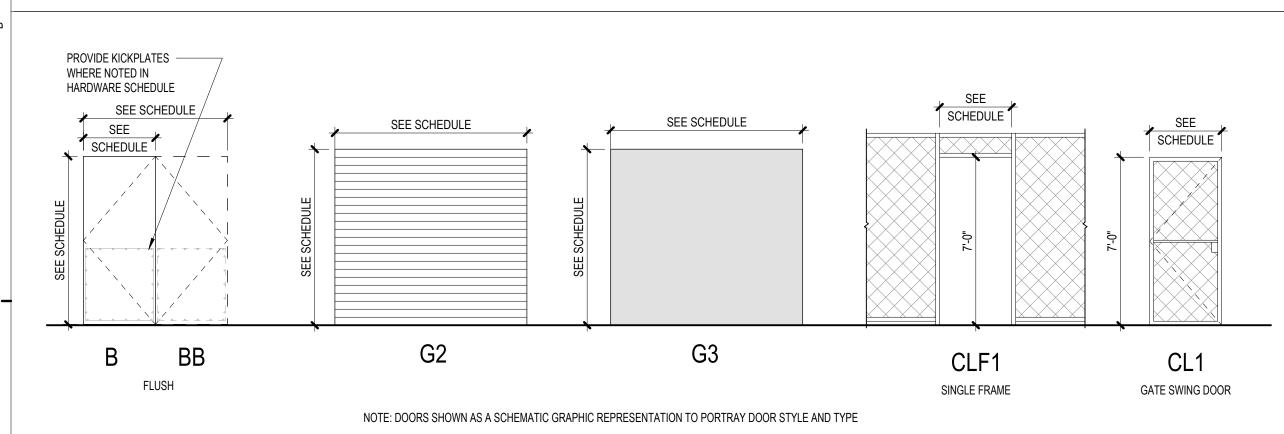
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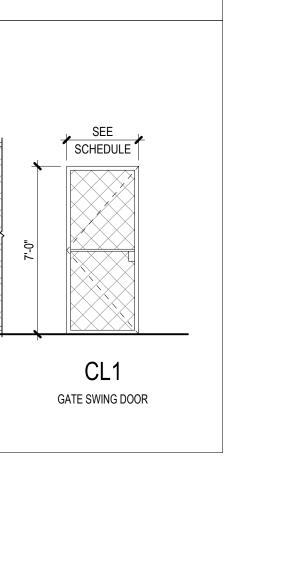
PROJECT NUMBER R. ALQAYSI A. WAHLSTROM

AVI TUNNEL PLANS









(AV.A)—

(AV.B)—

(AV.A)

(AV.B)—

SEE STRUCTURAL AND OH

DOOR SUPPLIER FOR JAMB

STEEL AND RADIAL DOOR

TYPICAL BOLLARD SPACING -

1

FRAME ATTACHMENT -

AVI ROOF PLAN

AVI TUNNEL REFLECTED CEILING PLAN

AG -16 POST

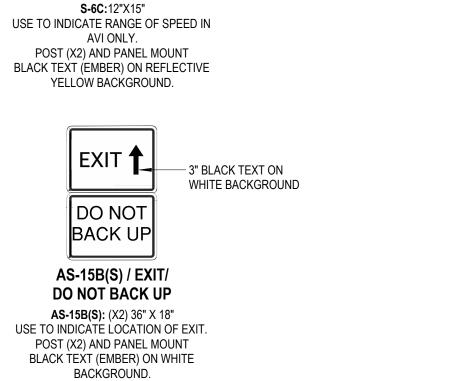
MOUNTED TO SLAB

12'-1 1/8"

1/8" / 12"

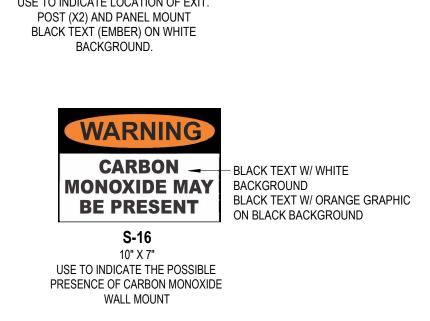
AVI TUNNEL FLOOR PLAN

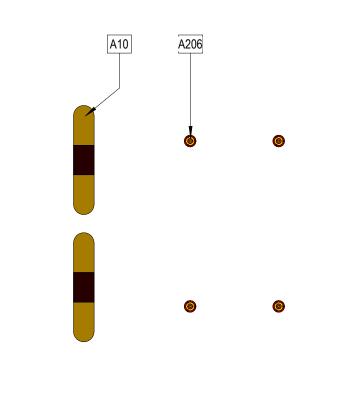


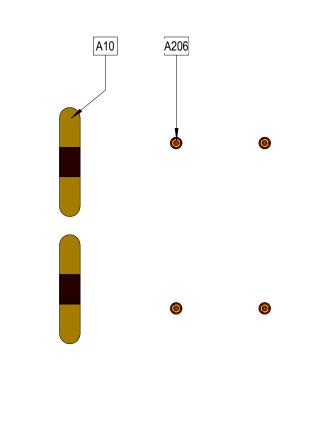


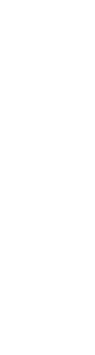
S-6: 24"x30"

DOOR TYPES

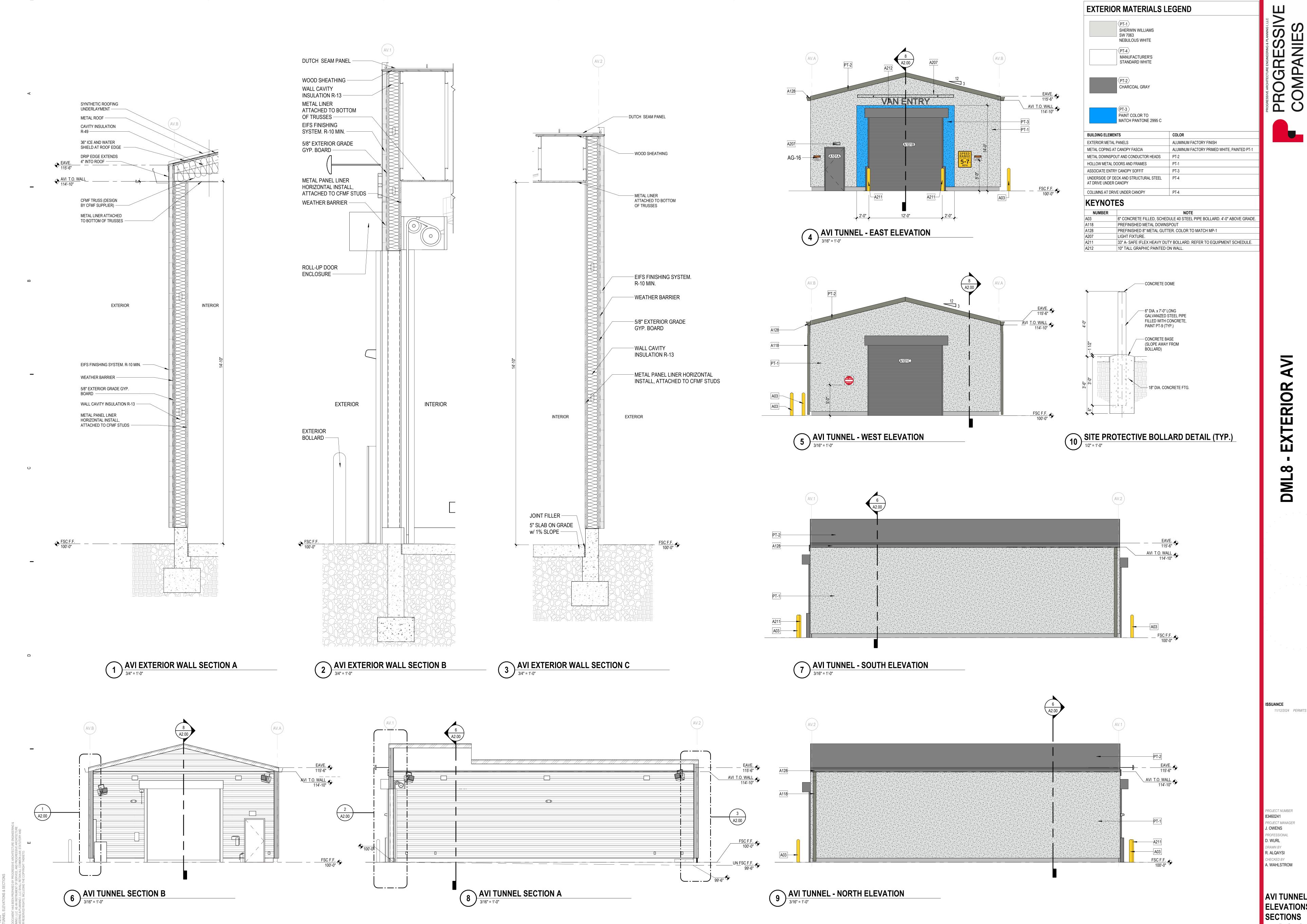












EXTERIOR

EXTERIOR MATERIALS LEGEND

DML8

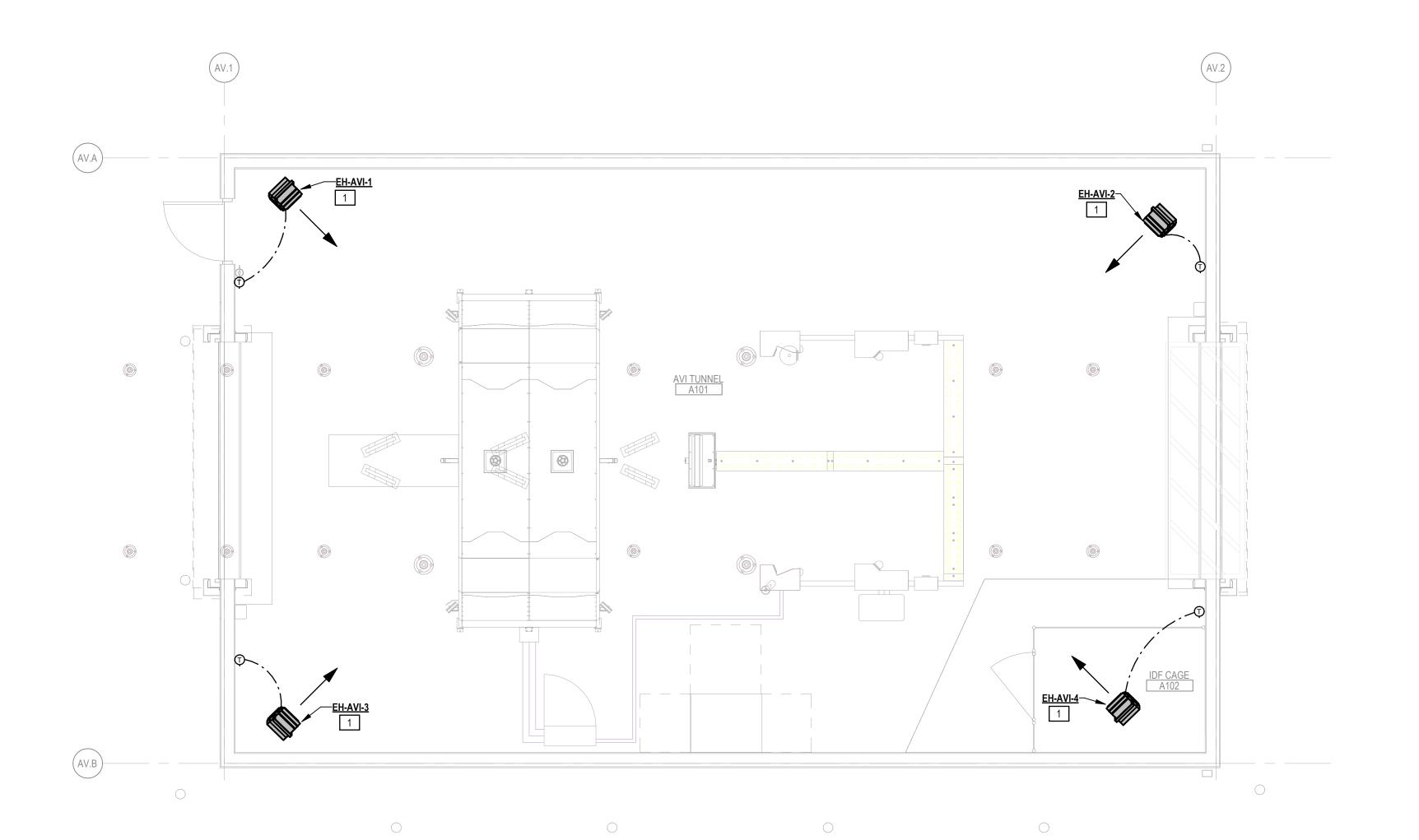
11/12/2024 PERMITS SET/BID

PROJECT NUMBER

AVI TUNNEL **ELEVATIONS &** SECTIONS
A2.00

ELECTRIC HEATER SCHEDULE										
					HEATING	ELE	CTRICA	AL		
RK	BUILDING	SERVICE	MANUFACTURER	MODEL	LOAD (WATTS)	V	PH	HZ	AMPS	REMARKS
VI-1	AUTOMATIC VEHICLE INSPECTION	A101 AVI TUNNEL	QMARK	IUH-1020	9600	208	3	60	27.6	1,2,3
VI-2	AUTOMATIC VEHICLE INSPECTION	A101 AVI TUNNEL	QMARK	IUH-1020	9600	208	3	60	27.6	1,2,3
VI-3	AUTOMATIC VEHICLE INSPECTION	A101 AVI TUNNEL	QMARK	IUH-1020	9600	208	3	60	27.6	1,2,3
VI-4	AUTOMATIC VEHICLE INSPECTION	A101 AVI TUNNEL	QMARK	IUH-1020	9600	208	3	60	27.6	1,2,3

REMARKS: 1. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. 2. HEATER TO BE CONTROLLED BY REMOTE THERMOSTAT FURNISHED WITH ELECTRIC HEATER. 3. PROVIDE WITH 3-POLE POWER DISCONNECT SWITCH KIT FOR FIELD INSTALLATION.



AVI TUNNEL HVAC PLAN

1/4" = 1'-0"

MECHANICAL GENERAL NOTES

- COMPLY WITH ALL APPLICABLE LOCAL, STATE AND/OR REGULATORY AGENCIES, CODES AND REGULATIONS FOR NEW WORK.
- 2. DO NOT INSTALL EQUIPMENT, PIPING OR DUCTWORK OVER ANY ELECTRICAL EQUIPMENT OR COMMUNICATION ROOMS.
- 3. DO NOT RUN ANY PIPING OR DUCTWORK INTO THE ELECTRICAL ROOM UNLESS DEDICATED TO SERVE THAT ROOM.
- 4. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND
- REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH A MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS. 5. LOCATE THERMOSTAT/TEMPERATURE SENSORS 48" ABOVE FINISHED FLOOR OR AS
- NOTED ON THE PLANS. 6. WORK IDENTIFIED WITH MECHANICAL, PLUMBING, AND ELECTRICAL NOTES AND KEY NOTES SHALL BE PERFORMED BY QUALIFIED MECHANICAL, PLUMBING, AND ELECTRICAL CONTRACTORS RESPECTIVELY UNDER DIRECTION OF THE CONSTRUCTION MANAGER. COORDINATE WITH OWNER'S REPRESENTATIVE OR CONSTRUCTION MANAGER.
- 7. INSTALL SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS. 8. VERIFY ALL CONDITIONS IN FIELD BEFORE START OF CONSTRUCTION. NOTIFY
- ARCHITECT/ENGINEER OF DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS. 9. COORDINATE WORK WITH OTHER TRADES AND WITH THE CONSTRUCTION
- MANAGER. 10. COORDINATE ANY REQUIRED SHUTDOWN OF SERVICES OR EQUIPMENT WITH
- OWNER'S REPRESENTATIVE OR CONSTRUCTION MANAGER, MINIMIZE INTERRUPTION OF EXISTING SERVICES. 11. PROVIDE ALL MISCELLANEOUS STEEL AND ITEMS REQUIRED FOR THE PROPER
- INSTALLATION OF ALL PIPE, SHEET METAL AND EQUIPMENT. 12. COORDINATE FLOOR, WALL & ROOF PENETRATIONS ETC. WITH ARCHITECTURAL
- 13. FIRESTOP SHALL BE PROVIDED IN HOLES AND PENETRATIONS IN RATED ASSEMBLIES.

PROOF HVAC KEYNOTES

1. MOUNT ELECTRICAL UNIT HEATER AT 11'-0" AFF SUSPENDED FROM CEILING. WALL OR COLUMN MOUNT HEATING ONLY THERMOSTAT AT 48" A.F.F. WHERE SHOWN ON PLANS. WHERE THERMOSTAT IS LOCATED ON AN EXTERIOR WALL, PROVIDE INSULATED WOOD BLOCKING BEHIND THERMOSTAT TO ISOLATE FROM EXTERIOR

DML8-

AVI TUNNEL HVAC PLAN M1.11

COMPRESSOR COLUMN

COMBINATION

CONNECT, CONNECTED, CONNECTION

CONCRETE

CONVECTOR CIRCULATING PUMP CARD READER COOLING TOWER CURRENT TRANSFORMER

COPPER DEPARTMENT

DISCONNECT DISTRIBUTION DEAD LOAD DAMPER DOOR SWITCH DOUBLE THROW DISHWASHER

EXHAUST FAN

ELEVATOR

FEEDER

FIXTURE FLUORESCENT FULL LOAD AMPS **FLEXIBLE**

FUSE

FLOOR, FLOORING

FLEXIBLE METAL CONDUIT FIRE PROTECTION CONTRACTOR

FURNISH, FURNISHED

GROUND FAULT CIRCUIT INTERRUPTOR

GROUND FAULT CIRCUIT PROTECTOR

GALVANIZED RIGID METAL CONDUIT

GALVANIZED

GENERATOR

HOSPITAL GRADE

HAND-OFF AUTOMATIC HORSEPOWER

HIGH POWER FACTOR

HYDRONIC WATER PUMP

INTERRUPTING CAPACITY

ISOLATED GROUND

INTERNATIONAL BUILDING CODE

INTERMEDIATE METAL CONDUIT

HOUSEKEEPING PAD

GROUND

HEATING **HEAT PUMP**

HEATER

HUMIDIFIER HIGH VOLTAGE

INFRARED

KNOCKOUT

JUNCTION BOX

HEATER

EMERGENCY

ELECTRICAL STRIKE

DOMESTIC WATER HEATER

ENERGY MANAGEMENT SYSTEM

ELECTRICAL METALLIC TUBING

ELECTRIC WATER COOLER ELECTRIC WATER HEATER EXPLOSION PROOF FAHRENHEIT FIRE ALARM

FIRE ALARM CONTROL PANEL FURNISHED BY OTHERS FLEXIBLE CONNECTION FAN COIL UNIT

FUSED DISCONNECT SWITCH

ELECTRIC HEATING COIL ELECTRIC INFARED HEATER ELECTRIC, ELECTRICAL

AUX

BSMT

CCTV

CMPR

COMB

CONC

CONN

CONV

ELEV

FDR

FIXT

GALV

GND

JBOX

FI FCTRICAL ARREVIATIONS **ELECTRICAL ABBREVIATIONS**

LECTRICAL ABBREVIATIONS	El	LECTRICAL ABBREVIATIONS
AMPERES	KS	KEY SWITCH
ABOVE ACCESSIBLE CEILING	KV	KILOVOLT
AIR COMPRESSER	KVA	KILOVOLT-AMPERES
AIR CONDITIONING UNIT	KVAR	KILOVOLT-AMPERES REACTIVE
ACCESS DOOR	KW	KILOWATTS
AUTOMATIC DOOR OPENER	KWH	KILOWATT-HOURS
ABOVE FINISH GRADE	LEED	LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN
ARC FAULT CIRCUIT INTERRUPTER	LP	LIGHT POLE
AUTHORITY HAVING JURISDICTION	LT	LITE, LIGHT
AIR HANDLING UNIT	LTG	LIGHTING
ALUMINUM	LV	LOW VOLTAGE
AMPLIFIER	M/C	MOMENTARY CONTACT
ANNUNCIATOR	MAX	MAXIMUM
ACCESS PANEL	MC	MECHANICAL CONTRACTOR
APPROXIMATE	MCA	MINIMUM CIRCUIT AMPS
AMP SWITCH	MCB	MAIN CIRCUIT BREAKER
AMP TRIP	MCC	MOTOR CONTROL CENTER
AUTOMATIC TRANSFER SWITCH	MD	MOTORIZED DAMPER
AUXILARY	MD	MOTION DETECTOR
AMERICAN WIRE GAUGE	MDC	MAIN DISTRIBUTION CENTER
BOILER	MDP	MAIN DISTRIBUTION PANEL
BUILDING AUTOMATION SYSTEM	MECH	MECHANICAL
BATTERY	MFDS	MAIN FUSED DISCONNECT SWITCH
BARRIER FREE	MH	MANHOLE
BELOW FINISHED GRADE	MIC	MICROPHONE
BUILDING MANAGEMENT SYSTEM	ML	MAGNETIC DOOR LOCK
BOTTOM OF DEVICE	MLO	MAIN LUGS ONLY
BASEMENT	MMS	MANUAL MOTOR STARTER
CONDUIT	MOA	MULTIOUTLET ASSEMBLY
CABINET	MOP	MAXIMUM OVERCURRENT PROTECTION
CAPACITY	MS	MAGNETIC STARTER
COMMUNITY ANTENNA TELEVISION	MSBD	MAIN SWITCH BOARD
CIRCUIT BREAKER	MT	MOUNT
CLOSED-CIRCUIT TELEVISION	MTR	MOTOR, MOTORIZED
CEILING FAN	MTS	MANUAL TRANSFER SWITCH
COMPACT FLUORESCENT	NC	NORMALLY CLOSED
CABINET HEATER	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
CIRCUIT	NF	NONFUSED
CENTERLINE	NFDS	NONFUSED DISCONNECT SWITCH
CLEAR CLEARANCE	NI	NIGHT-LIGHT

MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MD	MOTION DETECTOR
MDC	MAIN DISTRIBUTION CENTE
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MFDS	MAIN FUSED DISCONNECT S
MH	MANHOLE
MIC	MICROPHONE
ML	MAGNETIC DOOR LOCK
MLO	MAIN LUGS ONLY
MMS	MANUAL MOTOR STARTER
MOA	MULTIOUTLET ASSEMBLY
MOP	MAXIMUM OVERCURRENT F
MS	MAGNETIC STARTER
MSBD	MAIN SWITCH BOARD
MT	MOUNT
MTR	MOTOR, MOTORIZED
MTS	MANUAL TRANSFER SWITCH
	NORMALLY CLOSED
NEMA	NATIONAL ELECTRICAL MAN
	NONFUSED
NFDS	NONFUSED DISCONNECT S
NL	NIGHT-LIGHT
NO	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
OH	OVERHEAD
OHD	OVERHEAD DOOR
OL	OVERLOAD
Р	PUMP
PA	PUBLIC ADDRESS
PB	PULL BOX
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PERF	PERFORATE, PERFORATED
PF	PUMP - FIRE PROTECTION
PH	PHASE
PIV	POST INDICATING VALVE
PNL	PANEL
PP	POWER POLE
PRI	PRIMARY
PROJ	PROJECTOR
PRV	POWER ROOF VENTILATOR
PTZ	PAN TILT ZOOM

NC	NORMALLY CLOSED
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S AS
NF	NONFUSED
NFDS	NONFUSED DISCONNECT SWITCH
NL	NIGHT-LIGHT
NO	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
OH	OVERHEAD
OHD	OVERHEAD DOOR
OL	OVERLOAD
P	PUMP
PA	PUBLIC ADDRESS
PB	PULL BOX
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PERF	PERFORATE, PERFORATED
PERF	PUMP - FIRE PROTECTION
	PHASE
PH	
PIV	POST INDICATING VALVE
PNL	PANEL
PP	POWER POLE
PRI	PRIMARY
PROJ	PROJECTOR
PRV	POWER ROOF VENTILATOR
PTZ	PAN TILT ZOOM
PVC	POLYVINYL CHLORIDE
PWR	POWER
RA	RETURN AIR
RAF	RETURN AIR FAN
RECEPT	RECEPTACLE
RIO	ROUGH-IN ONLY
RMC	RIGID METAL CONDUIT
RNMC	RIGID NONMETALLIC CONDUIT
RT	RAINTIGHT
RTU	ROOFTOP UNIT
S/S	START/STOP PUSHBUTTONS
SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SEC	SECONDARY
SECT	SECTION
SHT	SHEET
SM	SURFACE MOUNTED
SN	SOLID NEUTRAL
SP	SPARE
SPD	SURGE PROTECTIVE DEVICE
SPKR	SPEAKER
SS	STAINLESS STEEL
SSW	SELECTOR SWITCH
STA	STATION
STOR	STORAGE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRY, SYMMETRICAL
CVC	CVCTEM

SYS

SYSTEM

TELEPHONE

TWIST LOCK

TOP OF DEVICE

TERMINAL UNIT

UNIT VENTILATOR

UNDER CABINET

UNDERGROUND

UNIT HEATER

ULTRA VIOLET VOLTS

VOLT-AMPERES

WATTS

XFER

WIRE GUARD

TRANSFER

PHASE

WATER HEATER

WEATHERPROOF

TRANSFORMER

TELEVISION

TAMPER RESISTANT

TELEPHONE TERMINAL CABINET

TELEVISION TERMINAL CABINET

UNDERGROUND ELECTRICAL

UNDERGROUND TELEPHONE

VIDEO DISPLAY TERMINAL

VARIABLE FREQUENCY DRIVE

TERMINAL

					DATA SYMBOL LEGEND	
BACKBOX & RACEWAY BY	DEVICE BY	INSTALLED BY	WIRED BY	<u>SYMBOL</u>	E - ELECTRICAL CONTRACTOR X - OTHERS DESCRIPTION	HEIGHT MIDDLE DEVIC (U.N.C
Е	Е	Е	Е	abla	DATA/PHONE OUTLET, 3/4" TO ACCESSIBLE CEILING OR CABLETRAY	18
Е	Е	Е	Е	▼	ABOVE COUNTERTOP DATA/PHONE OUTLET, MOUNT 4" ABOVE BACKSPLASH OR	44
E	E	Е	Е		MULTIOUTLET WIREMOLD ASSEMBLY, MOUNT 4" ABOVE BACKSPLASH OR PROVIDE DATA OUTLETS AS SHOWN ON DRAWING	44
Е	Е	Е	Е		FLOOR DATA/PHONE OUTLET	
Е	Е	Е	Е	\bigcirc	CEILING DATA/PHONE OUTLET	
Е	Χ	Х	Е	WAP CLG	CEILING WIRELESS ACCESS POINT	
Е	Χ	Х	Х	TV ▽	TELEVISION OUTLET	18'
Е	Е	Е	Е	Φ	CLOCK	84'
Е	Х	Х	Х	© +	INTERCOM OUTLET LOCATION	48
Е	Χ	Х	Х	© AV	INTERCOM - AUDIO/VISUAL	48
Е	Χ	Х	Е	S	SPEAKER (WALL OR CEILING MT.)	84'
Е	Е	Е	Е	E	SOUND MASKING EMITTER (WALL OR CEILING MT.)	84'
Е	Χ	Х	Х	\$ ^V	VOLUME CONTROL	48'
Е	Χ	Х	Х	M	MICROPHONE OUTLET	18'
Е	Χ	Х	Х	P	PROJECTOR CONTROL OUTLET	18
Е	М	М	Е	\bigoplus_{\perp}	HUMIDISTAT	48'
Е	М	М	Е		THERMOSTAT	48'
Е	Χ	Х	Х	M	OUTLET IN FLOOR (MICROPHONE SHOWN)	

					WIRING SYMBOL LEGEND
BACKBOX & RACEWAY BY	DEVICE BY	INSTALLED BY	WIRED BY	<u>SYMBOL</u>	E - ELECTRICAL CONTRACTOR M - MECHANICAL CONTRACTOR X - OTHERS TO MIDDLE OF DESCRIPTION (U.N.O.)
E	Е	E	Е		CONDUIT CONCEALED IN WALL OR OVERHEAD
Е	Е	Е	Е		CONDUIT CONCEALED BELOW FLOOR
Е	Е	Е	Е		CONDUIT EXPOSED
Е	Е	Е	Е	o	CONDUIT TRANSITION UP
Е	Е	Е	Е		CONDUIT TRANSITION DOWN
Е	Е	Е	Е	7	CONDUIT STUBBED OUT
Е	Е	Е	Е	[J] <u></u>	UNDERFLOOR RACEWAY SYSTEM
Е	Е	Е	Е		CABLE TRAY (TYPE DENOTED)
Е	Е	Е	Е	E3	CONDUIT SLEEVE (SIZE DENOTED)
Е	Е	Е	Е		BRANCH CIRCUIT HOME RUN
Е	Е	Е	Е	<i>_</i>	LOW VOLTAGE POWER WIRING
Е	Е	Е	Е		UNDERGROUND ELECTRICAL
Е	Е	Е	Е	—оне—	OVERHEAD ELECTRIC
Е	Х	Х	Е	-(P)	UTILITY SERVICE POWER POLE (SITE)
Е	Е	Е	Е	—-G—-	GROUND CONDUCTOR
Е	Е	Е	Е	•	LIGHTNING PROTECTION AIR TERMINAL
Е	Е	Е	Е		LIGHTNING PROTECTION CONDUCTOR SPLICE
E	Е	Е	Е	Φ	GROUND ROD (PLAN VIEW)
Е	Е	Е	Е		GROUND CONNECTION TO STEEL OR STRUCTURE
Е	Е	Е	Е	•	GROUND CONNECTION - EXOTHERMIC WELD

					POWER SYMBOL LEGEND	
BACKBOX & RACEWAY BY	STANDON OF STANDON O	E - ELECTRICAL CONTRACTOR M - MECHANICAL CONTRACTOR X - OTHERS	HEIGHT TO MIDDLE O DEVICE (U.N.O.)			
					DESCRIPTION SINGLE RECEPT ("EM" = EMERGENCY, "HG" = HOSPITAL GRADE, "TR" = TAMPER RESIST	
				'		,
E	E	E	E		SINGLE RECEPT ON CORD DROP (SEE CONVEYOR POWER DROP DETAIL ON SHEET ES	i.02)
Е	Е	E	E	+	GFCI RATED SINGLE RECEPT	18"
Е	Е	E	E	Ф	ISOLATED GROUND SINGLE RECEPT	18"
Е	Е	Е	Е	Ф	SWITCHED SINGLE RECEPT	18"
E	E	E	E	\Box	DUPLEX RECEPT ("C" = PLUG LOAD CONTROL ,CONTROLLED BY LOCAL OCCUPANCY CONTROL)	18"
Е	Е	Е	Е	+	GFCI RATED DUPLEX RECEPT	18"
Е	Е	Е	Е	•	ISOLATED GROUND DUPLEX RECEPT	18"
Е	Е	Е	Е	•	SWITCHED DUPLEX RECEPT (SPLIT-WIRE)	18"
Е	Е	Е	Е	$\widehat{\mathbb{Q}}$	USB/DUPLEX RECEPT	18"
Е	Е	Е	Е	1	ABOVE COUNTERTOP DUPLEX RECEPT, MOUNT 4" ABOVE BACKSPLASH OR 44"	
Е	Е	Е	Е		FOURPLEX RECEPT ("C" = PLUG LOAD CONTROL ,CONTROLLED BY LOCAL OCCUPANCY CONTROL)	′ 18"
Е	Е	Е	Е		FOURPLEX RECEPT ON CORD DROP (SEE MODULE POWER DROP DETAIL ON SHEET ES	5.02)
Е	Е	Е	Е	#	GFCI RATED FOURPLEX RECEPT	18"
Е	Е	Е	Е	•	ISOLATED GROUND FOURPLEX RECEPT	18"
Е	Е	Е	Е		SWITCHED FOURPLEX RECEPT (SPLIT-WIRE)	18"
Е	Е	Е	Е		ABOVE COUNTERTOP FOURPLEX RECEPT, MOUNT 4" ABOVE BACKSPLASH OR 44"	
E	Е	Е	Е		SPECIAL RECEPT OR CONNECTION, PROVIDE DIRECT POWER CONNECTION OR MATCHING RECEPTACLE AS REQUIRED, COORDINATE W/ EQUIPMENT MANUFACTURER	18"
Е	Е	Е	Е	Φ	MULTIOUTLET WIREMOLD ASSEMBLY, MOUNT 4" ABOVE BACKSPLASH OR PROVIDE POWER RECEPTS AS SHOWN ON DRAWING	44"
Е	Е	Е	Е		FLOOR RECEPT (DUPLEX SHOWN)	
Е	Е	Е	Е		CEILING RECEPT (DUPLEX SHOWN)	
Е	Х	Х	Х		JUNCTION BOX (FLOOR, WALL, CEILING SHOWN)	AS NOTED
Е	Е	Е	Е	•	PUSH BUTTON STATION	44"
Е	Е	Е	Е	м \$	MOTOR HORSEPOWER RATED SWITCH	44"
Е	Е	E	E	F \$	FUSED SWITCH	44"
Е	Е	Е	Е	42	SAFETY DISCONNECT SWITCH (FUSED)	72"
Е	Е	E	E	4	COMBO MOTOR STARTER/DISCONNECT SWITCH (FUSED)	72"
Е	E/M	E/M	E	VFD	VARIABLE FREQUENCY DRIVE	
Е	E/M	E/M	E		SINGLE PHASE MOTOR (SEE SCHEDULE)	
Е	E/M	E/M	E		THREE PHASE MOTOR (SEE SCHEDULE)	
E	E	E	E		CIRCUIT BREAKER PANEL	72"
			<u> </u>			

POWER OR DISTRIBUTION PANEL

SPECIAL CABINET (TYPE DENOTED)

TRANSFORMER (TYPE DENOTED)

25 KVA GENERATOR (KVA DENOTED)

				L	IGHTING SYMBOL LEGEND	
BACKBOX & _ RACEWAY BY	DEVICE BY	INSTALLED BY	WIRED BY	<u>SYMBOL</u>	E - ELECTRICAL CONTRACTOR M - MECHANICAL CONTRACTOR X - OTHERS DESCRIPTION	HEIGHT TO MIDDLE OF DEVICE (U.N.O.)
Е	Е	Е	E	\$	SINGLE POLE SWITCH	44"
Е	Е	Е	Е	3 \$	3-WAY SWITCH	44"
Е	Е	Е	Е	к \$	KEYED SWITCH	44"
Е	Е	Е	Е	D \$	DIMMER SWITCH	44"
Е	Е	Е	Е	os \$	OCCUPANCY SENSOR SWITCH	44"
Е	Е	Е	Е	MC \$	MOMENTARY CONTACT SWITCH	44"
Е	Е	Е	Е	T \$	TIMER SWITCH	44"
Е	Е	Е	Е	GTD	GENERATOR TRANSFER DEVICE	
Е	Е	Е	Е	(OS)	CEILING OCCUPANCY SENSOR - DUAL TECHNOLOGY TYPE	
Е	Е	Е	Е	LS	CEILING LIGHT LEVEL SENSOR	
Е	Е	Е	Е	PC	PHOTOCELL	
Е	Е	Е	Е	•-	POLE MOUNTED LIGHT (TYPE DENOTED)	PER SCHED
Е	Е	Е	Е	Q P	WALL MOUNTED LIGHT (TYPE DENOTED)	AS NOTED
Е	Е	Е	Е	0	RECESSED LIGHT (TYPE DENOTED)	
Е	Е	Е	Е	X o	SURFACE LIGHT (TYPE DENOTED)	
Е	Е	Е	Е	P1 • • P2	SUSPENDED OR PENDANT LIGHT (TYPE DENOTED)	
Е	Е	Е	Е	⊢	INDUSTRIAL LIGHT (TYPE DENOTED)	
Е	Е	Е	Е		TRACK AND TRACK LIGHT (TYPES DENOTED)	AS NOTED
Е	Е	Е	Е		EMERGENCY DOUBLE HEAD WALL LIGHT (TYPE DENOTED)	96"
Е	Е	Е	Е	•	EXIT SIGN (TYPE DENOTED)	12"
Е	Е	Е	Е		LIGHT FIXTURE ON (EM) LIFE SAFETY OR CRITICAL BRANCH	AS NOTED

- THE ROOF DECK. 4. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND DETAILS. ARCHITECTURAL ELEVATIONS AND DETAILS TAKE PRECEDENCE OVER
- LOCATIONS SHOWN ON ELECTRICAL DRAWINGS. 5. ALL ELEVATION HEIGHTS SHOWN ARE MEASURED TO THE MIDDLE OF THE DEVICE
- UNLESS NOTED OTHERWISE. 6. ALL RECESSED LIGHTING FIXTURES IN LAY-IN CEILINGS SHALL BE INSTALLLED WITH
- 7. WHERE CONNECTED TO A 20A BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL
- RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A. 8. CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING ALL ELECTRICAL ITEMS SHOWN
- ON THE DRAWINGS. 9. TV OUTLETS, VOLUME CONTROLS, TELEPHONE OUTLETS, DATA OUTLETS, AND FIRE ALARM DEVICES SHALL CONSIST OF A BACK BOX WITH CONDUIT STUBBED ABOVE

THE ACCESSIBLE CEILING VERIFY SIZE OF BACK BOX REQUIRED WITH DEVICE TO

BE |3/4"C_LLED. TV OUTLETSK ROXES 6" FROM ADJACENT POWER RECEPTACLE
INTE3/4"CD FOR (TELEPHONE OUTLETS
3/4"C INFORMATION OUTLETS 10. FUR3/4"C AND INFIRE ALARM DEVICES BACK BOXES FOR THE FOLLOWING DEVICES INTO THE ACCESSIBLE CEILING SPACE IN THE CORRIDOR, UNLESS NOTED

6' LONG FLEXIBLE METAL CONDUIT.

OTHERWISE:

E

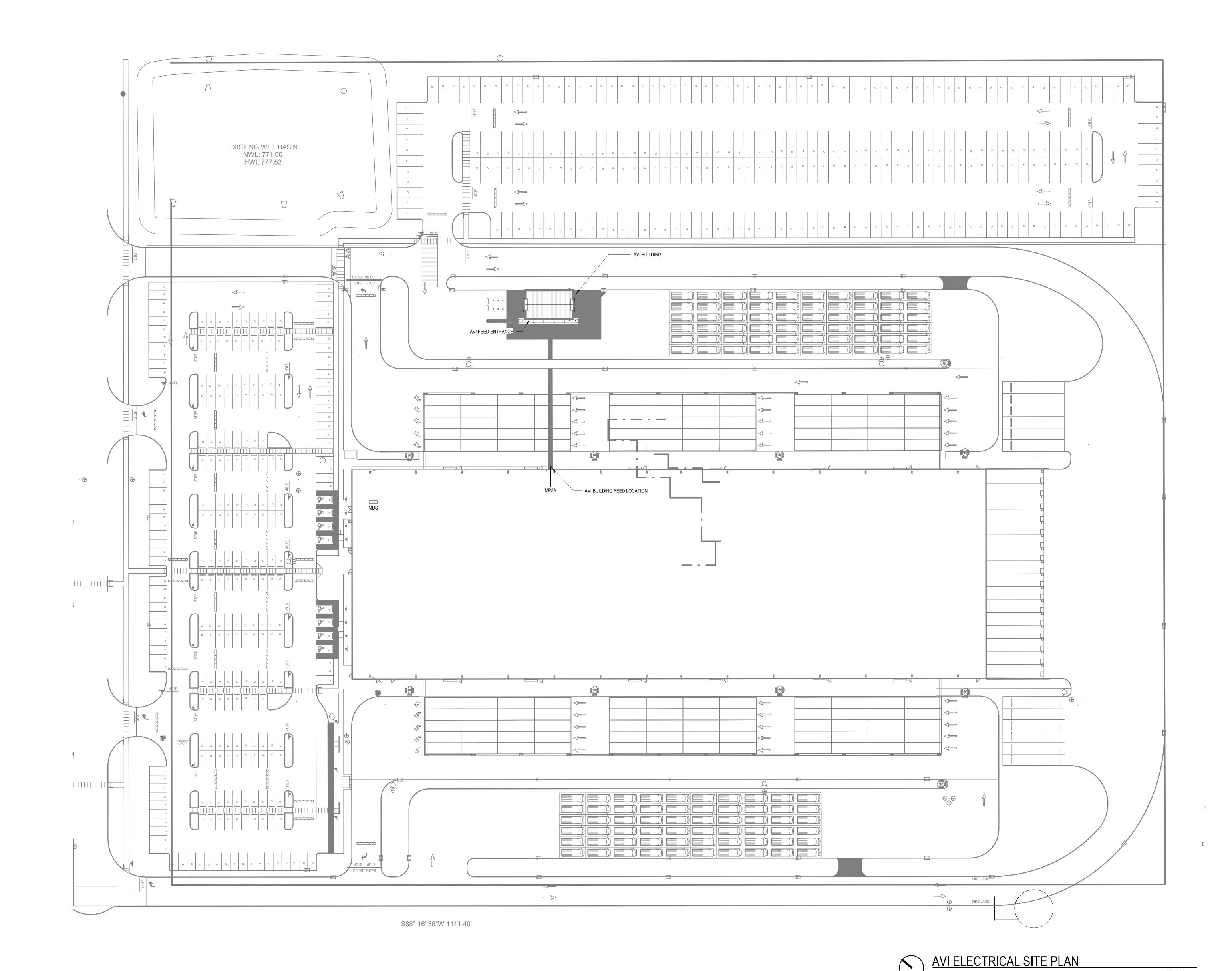
RE

EXTERIOF DML8

11/13/2024 BIDS / PERMITS

ELECTRICAL NOTES AND ABBREVIATIONS E0.11





6 **I** 5

SECURITY CONDUIT ROUTING WIT LV DRAWINGS.

TELECOMMUNICATIONS DRAWINGS.

POWER GENERAL NOTES

EQUIPMENT PRIOR TO ROUGH-IN.

INDICATED ON PLAN BY DASHED CONDUIT.

EQUIPMENT SCHEDULE.

SECURITY SYSTEMS.

WET LOCATION RATED.

A. VERIFY LOCATIONS AND ROUGH-IN REQUIREMENTS OF ALL OWNER FURNISHED

B. PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED

ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED,

BE PLACED ON IT. REFER TO ELECTRICAL DETAIL DRAWINGS FOR TRANSFORMER,

GENERATOR, OR SWITCHGEAR PADS THAT MAY EXCEED THESE REQUIREMENTS.

D. CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE

E. REFERENCE IES COMMUNICATIONS DRAWINGS FOR WORK RELATED TO IT AND

H. COORDINATE EXACT LOCATION OF LOW VOLTAGE CABLE ENTRIES WITH

WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL

RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

PANELBOARD SCHEDULE). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE

CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL

C. CONDUIT AND WIRE SHALL NOT BE INSTALLED BELOW FLOOR SLAB UNLESS

POLYFIBER REINFORCED CONCRETE, 4" WIDER AND 4" LONGER THAN EQUIPMENT TO

DUPLEX RECEPTACLE. BOTTOM OF ENCLOSURE IS TO BE MOUNTED AT 8' AFF. MOUNT RECEPTACLE INSIDE OF ENCLOSURE FOR CONNECTION OF ENCLOSURE MOUNTED UPS. PROVIDE HANDLE TIE-ON BREAKER & DEDICATED CIRCUIT IN PANEL AVI. PROVIDE (4) 2" CONDUITS FROM ENCLOSURE TO 1' 6" BELOW ROOF STRUCTURE. PROVIDE EQUIPMENT GROUND WITH #6 AWG BONDING STRAP TO TGB LOCATED IN DEMARC ROOM. VERIFY EXACT LOCATION & ELECTRICAL REQUIREMENTS WITH SECURITY SYSTEM VENDOR & TELECOM DRAWINGS PRIOR TO INSTALLATION.

TELECOMMUNICATIONS BACKBONE & IDF ENCLOSURE. FURNISH & INSTALL NEMA 5-20R

POWER FOR HVAC FOR DATA RACKS. COORDINATE EXACT LOCATION & POWER REQUIREMENTS WITH OWNER & EQUIPMENT PROVIDER.

3. RECEPTACLE FOR UV EYE CABINET. COORDINATE EXACT LOCATION WITH OWNER. 4. 120V, 20A CIRCUIT JUNCTION BOX FOR SECURITY PANEL. MOUNTING HEIGHT AND

EXACT LOCATION TO BE COORDINATED ON SITE WITH SECURITY EQUIPMENT . AVI EQUIPMENT CONTROL CABINET POWER. COORDINATE EXACT LOCATION AND

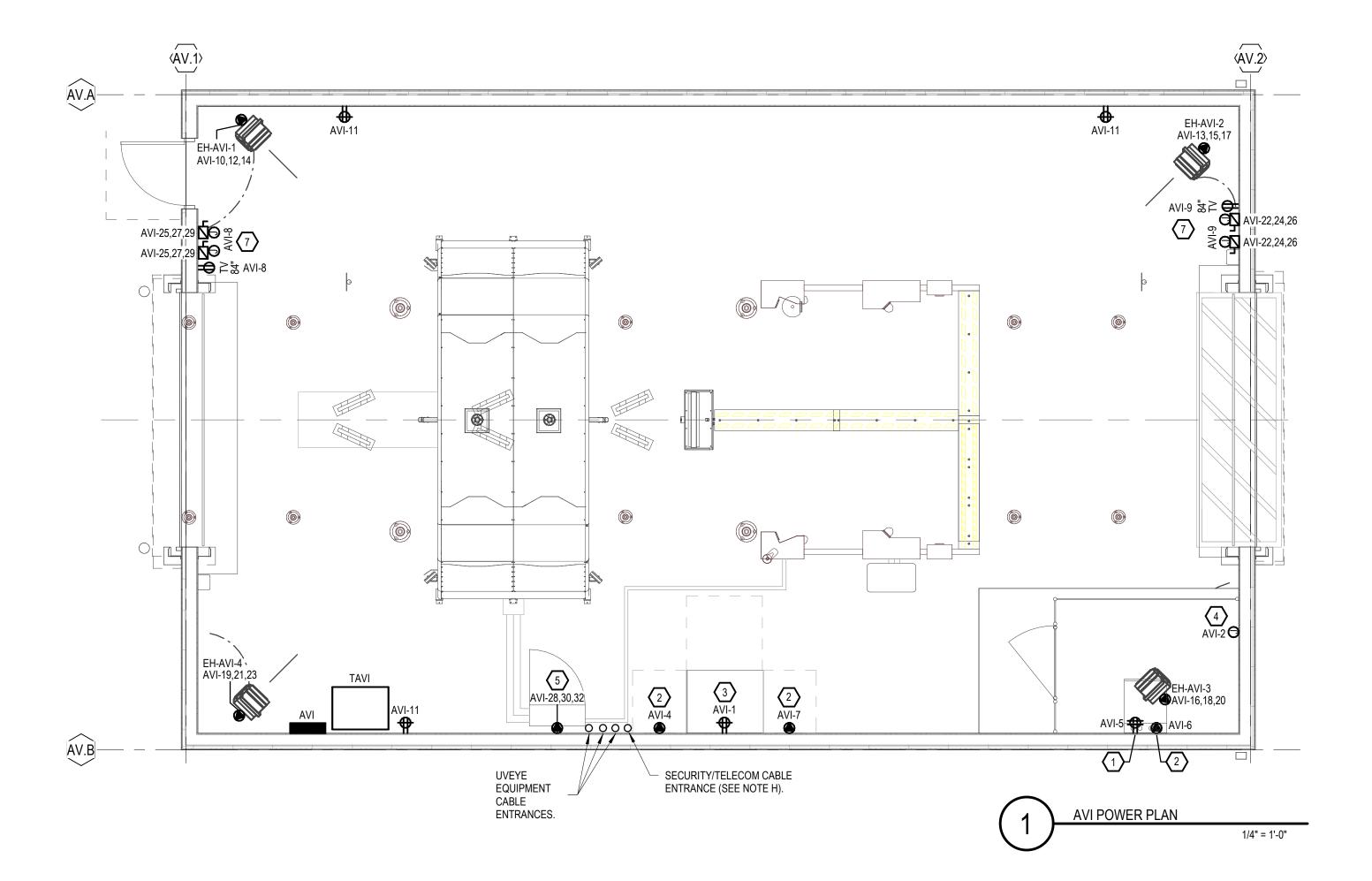
POWER REQUIREMENTS WITH EQUIPMENT PROVIDER.

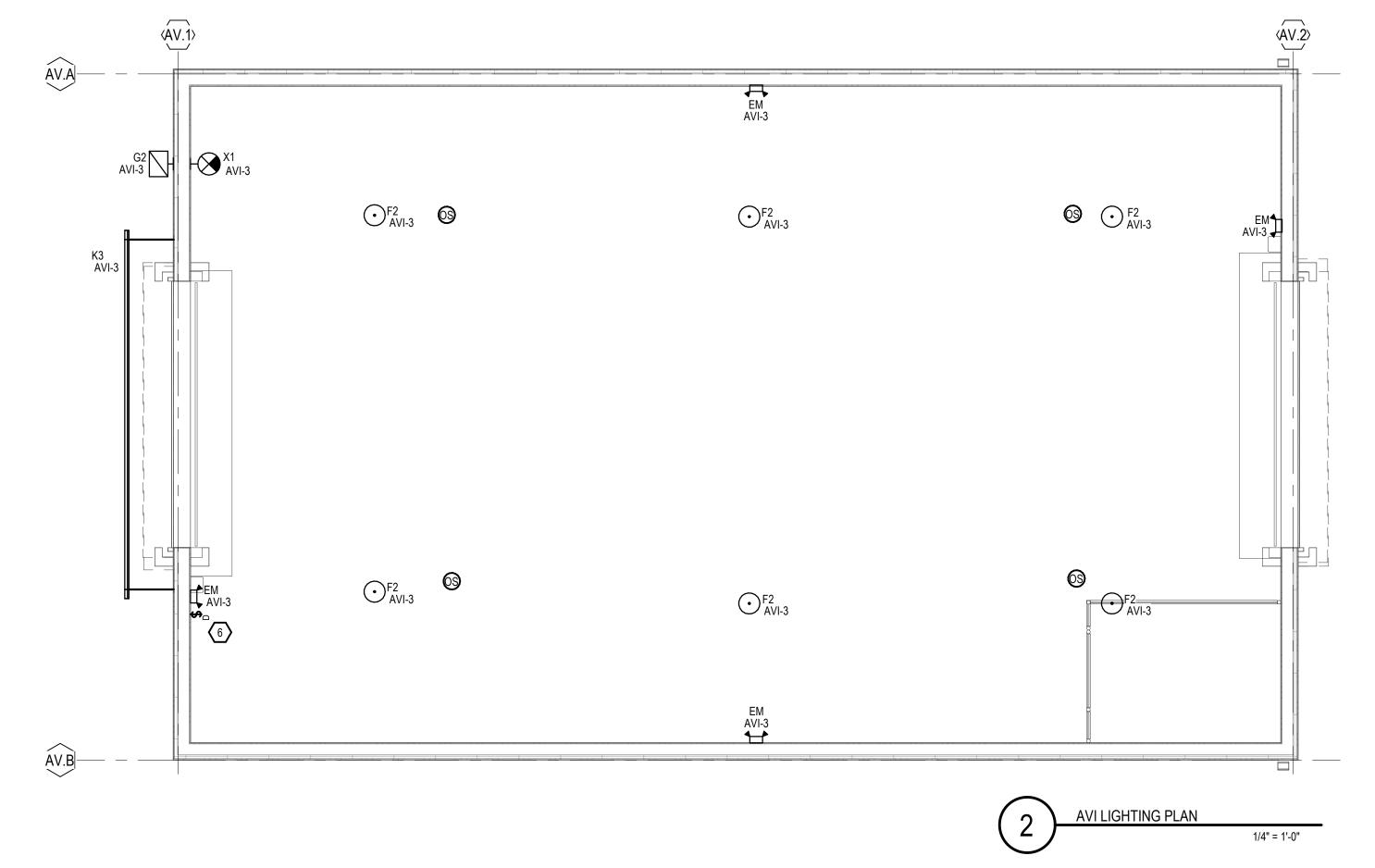
6. DIMMER SWITCH TO BE MULTI LEVEL DIMMING. NORMAL OPERATION LEVEL TO BE SET AT 25% OUTPUT. MAINTENANCE LEVEL TO BE SET AT 100% OUTPUT.

7. EXTERIOR DOOR CONTROLLERS - REFER TO DETAIL 1/E5.04. FURNISH AND INSTALL 120V JUNCTION BOX FOR CONNECTION TO (2) TWO DOOR CONTROLLERS. ONE JUNCTION BOX IS FOR THE OUTER METAL OVERHEAD DOOR CONTROLLER AND THE OTHER JUNCTION BOX IS FOR THE INNER FABRIC DOOR CONTROLLER. COORDINATE LOCATION OF JUNCTION BOXES AND ALL OTHER ELECTRICAL CONNECTION REQUIREMENTS ASSOCIATED WITH THE DOOR CONTROLLER WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN.

LUMINAIRE SCHEDULE TYPE DESCRIPTION MOUNTING VOLT WATT MANUFACTURER CATALOG NUMBER EM SURFACE MOUNTED WALL MT @ 10'-0" AFF | 120 V | 13 W | LITHONIA INDL SP1100L UVOLT LTP SDRT CW **EMERGENCY BATTERY** FIXTURE WITH -20 TO 50 DEGREE C OPERATING TEMPERATURE RANGE F2 PENDANT MOUNTED LOW-BAY SUSPEND @ 13'-6" AFF | 120 V | 108 W | LITHONIA VCPG LED V4 P6 40K 80CRI T5W MVOLT PM DMG DDBXD TO BOTTOM WALL MT @ 8'-0" AFF | 120 V | 19 W | LITHONIA EMERGENCY BATTERY BACKUP AND INTEGRAL MOTION AND DSXW1 10C 530 30K T4M MVOLT PIR1FC3V E20WC G2 EXTERIOR LED WALL MOUNTED LUMINAIRE PHOTO SENSOR SO THAT AFTER 15 MINUTES OF VACANCY, LIGHTING FIXTURE WILL DIM TO 50%. WALL MT @ 15'-3" AFF | 120 V | 65 W | THE LIGHTING PROVIDE WITH 3-18" CANTILEVERS AND END CAPS, CONTROL S175 R08G H 02 M 00 0 840 00 C K3 EXTERIOR WALL MOUNTED FACADE LIGHTING QUOTIENT WITH PHOTO CELL AND TIME CLOCK TO COME ON AT DUSK AND OFF AT MIDNIGHT X1 LED EXIT SIGN WITH 120 V 3 W LITHONIA WLTE W 1 R EL SD UNIVERSAL EMERGENCY BATTERY BACK-UP AND -20 TO 50 DEGREE C OPERATION

		ME	CHANICA	AL EQU	IPMENT COI	NNECTION SCHEE	DULE	
TAG	DESCRIPTION	POWER	VOLTAGE	PHASE	FEEDER	DISCONNECTING MEANS	DISC FURNISH/INSTALL	NOTES
EH-AVI-1	ELECTRIC HEATER	9600 VA	208 V	1	3 #8, #10 GND, 1"C	FURNISHED WITH UNIT		
EH-AVI-2	ELECTRIC HEATER	9600 VA	208 V	1	3 #8, #10 GND, 1"C	FURNISHED WITH UNIT		
EH-AVI-3	ELECTRIC HEATER	9600 VA	208 V	1	3 #8, #10 GND, 1"C	FURNISHED WITH UNIT		
EH-AVI-4	ELECTRIC HEATER	9600 VA	208 V	1	3 #8, #10 GND, 1"C	FURNISHED WITH UNIT		





BUS AMPS: 400 AMPS MAIN DEVICE: 400 A MAIN CB A.I.C. RATING: EXISTING

PANELBOARD: MP3A

PANEL TYPE:

VOLTAGE: 480Y/277V / 3 ø / 4W

Demand Factor

75.00%

93.75%

100.00%

100.00%

125.00%

100.00%

125.00%

Volts: 480Y/277

of Poles

Frame Size

100 A

400 A

400 A

400 A

400 A

400 A

400 A

100 A

400 A

400 A

400 A

400 A

100 A

400 A

400 A

100 A

400 A

100 A

Estimated Demand

15000 VA

28779 VA

720 VA

735351 VA

48000 VA

2380 VA

985 VA

Trip Rating

40 A

400 A

225 A

400 A

225 A

400 A

60 A

125 A

175 A

175 A

175 A

70 A

125 A

125 A

15 A

400 A

225 A

225 A

Phases: 3

A.I.C. Rating: EXISTING

MCB Rating: 2500 A

Mains Type:

Mains Rating:

Load

11400 VA

130600 VA

0 VA

55800 VA

10200 VA

28500 VA

116836 VA

131500 VA

200 VA

11900 VA

53500 VA

84100 VA

106400 VA

6000 VA

47600 VA

33600 VA

200 VA

0 VA

Panel Totals

Total Conn. Load: 828336 VA

Total Conn.: 996 A

Total Est. Demand: 831214 VA

Total Est. Demand: 1000 A

60 A 0 VA

Total Conn. Load: 828336 VA Total Amps: 996 A

MOUNTING: SURFACE NEMA 1 FEEDER: SEE ONE-LINE DIAGRAM

Connected Load

20000 VA

30698 VA

720 VA

735351 VA

38400 VA

788 VA

2380 VA

Switchboard: MDS

Supply From:

Mounting:

Enclosure:

PANEL "INV"

2 PANEL "LP1A"

3 PANEL "LP EXT

4 PANEL "MP1A"

5 PANEL "MP1B"

6 PANEL "MP2A"

7 PANEL "MP3A'

8 PANEL "MP4A"

11 112.5 KVA "T3"

12 112.5 KVA "T4" 13 112.5 KVA "T5"

14 45 KVA "T6"

15 75 KVA "T7"

16 75 KVA "T8"

17 METERING

18 SPARE

19 SURGE

Load Classification

LOCATION:

FED FROM: MDS

75 KVA "T2"

Circuit Description

LOAD DESCRIPTION	LOAD TYPE	P	TRIP	СКТ	1	۹	i	3	(C	CKT	TRIP	P	LOAD TYPE	LOAD DESCRIPTION	
				1	900	900					2					
HIGH SPEED ROLL UP DOOR		3	20 A	3			900	900			4	20 A	3		HIGH SPEED ROLL UP DOOR	
				5					900	900	6					
				7	900						8		1		SPACE	
HIGH SPEED ROLL UP DOOR		3	20 A	9			900				10		1		SPACE	
				11					900		12		1		SPACE	
				13	900						14		1		SPACE	
HIGH SPEED ROLL UP DOOR		3	20 A	15			900				16		1		SPACE	
				17					900		18		1		SPACE	
				19	1136	1136					20					
GUH-1		3	15 A	21			1136	1136			22	20 A	3		GUH-7	
				23					1136	1136	24					
SPACE		1		25		30919					26			DI D. Lighting: Motor:		
SPACE		1		27				31026			28	175 A	3	DLB; Lighting; Motor; RCPT; EHT	TAVI(PANEL AVI)	
SPACE		1		29						31039	30					
				31	1247	0					32					
HVLS-3		3	20 A	33			1247	1247			34	20 A	3		HVLS-6	
				35					1247	1247	36					
SPARE		1	20 A	37	0	0					38	20 A	1		SPARE	
SPARE		1	20 A	39			0	0			40	20 A	1		SPARE	
SPARE		1	20 A	41					0	0	42	20 A	1		SPARE	

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS		
EXISTING LOADS	23851 VA	100.00%	23851 VA	FANEL TOTALS		
RECEPTACLE	2380 VA	100.00%	2380 VA	CONNECTED LOAD: 116836 VA		
LIGHTING	788 VA	125.00%	985 VA	EST. DEMAND LOAD: 119714 VA		
MOTORS	20000 VA	75.00%	15000 VA			
OTHER	30698 VA	93.75%	28779 VA	CONNECTED CURRENT: 141 A		
KITCHEN	0 VA	0	0 VA	EST. DEMAND CURRENT: 144 A		
NOTES:						

PANELBOARD: AVI

LOCATION: MOUNTING: SURFACE NEMA 1 FED FROM: TAVI FEEDER: SEE ONE-LINE DIAGRAM PANEL TYPE: **VOLTAGE**: 208Y/120V / 3 ø / 4W BUS AMPS: 400 AMPS

MAIN DEVICE: 400 A MAIN CB A.I.C. RATING: GREATER THAN AVAILABLE FAULT CURRENT

LOAD DESCRIPTION	LOAD	LOAD TYPE	Р	BKR AMP		CIRCUIT		BH AMP	(R P	LOAD TYPE	LOAD	LOAD DESCRIPTION	
UV EYE CABINET	180	RCPT	1	20 A	1		2	20 A	1	Receptacle	500	SECURITY PANEL	
AVI LIGHTING	787	Lighting	1	20 A	3		4	25 A	1	Other	2,427	HVAC RACK POWER	
IDF CABINET	800	Receptacle	1	20 A	5		6	25 A	1	Other	2,427	IDF HVAC	
HVAC RACK POWER	2,427	Other	1	25 A	7		8	20 A	1	Receptacle	540	DOOR CONTROLS	
DOOR CONTROLS	540	Receptacle	1	20 A	9		10						
AVI MAINTENANCE	540	RCPT	1	20 A	11		12	35 A	3	EHT	9,600	EH-AVI-1	
					13		14						
EH-AVI-2	9,600	EHT	3	35 A	15		16						
					17		18	35 A	3	EHT	9,600	EH-AVI-3	
					19		20						
EH-AVI-4	9,600	EHT	3	35 A	21		22			Motor			
					23		24	20 A	3		10,000	COILING DOORS	
					25		26						
COILING DOORS	10,000	Motor	3	20 A	27		28						
					29		30	70 A	3	Other	23,417	AVI RACK	
SPARE			1	20 A	31		32						
SPARE			1	20 A	33		34	20 A	1			SPARE	
SPACE			1		35		36		1			SPACE	
SPACE			1		37		38		1			SPACE	
Space			1		39		40		1			SPACE	
SPACE			1		41		42		1			SPACE	
LOAD CLASSIFICATION	CC	NNECTED	Ti	DEMAND	FACTOR	2	CALCU	LATED				NEL TOTAL O	
Motor	2	20000 VA		75.0	0%		1500	0 VA			PA	NEL TOTALS	
Other	;	30698 VA		93.7	5%		2877	9 VA			CONN	ECTED LOAD: 92985 VA	
RCPT		720 VA		100.0	00%		720	VA			EST. D	EMAND LOAD: 95863 VA	
EHT		38400 VA		125.0	00%		4800	0 VA				<u>.</u>	
Lighting		788 VA		125.0	00%		985	VA			CONNECT	ED CURRENT: 258 A	
Receptacle		2380 VA		100.0	00%		2380) VA			EST. DEMA	ND CURRENT: 266 A	

11/13/2024 BIDS / PERMITS

EXTERIOR

DML8

AVI ELECTRICAL PLANS

ELECTRICAL AVI ONE-LINE DIAGRAM
12" = 1'-0"

AVI ONE-LINE DIAGRAM

E3.11

