STRUCTURAL SPECIFICATIONS AND GENERAL CONDITIONS (04-12)

GENERAL

1. Where these specifications conflict with other project specifications, these specifications shall govern.
2. C.S. Davidson, Inc. will assume no responsibility and/or liability for problems which arise from failure to follow these plans, specifications, and the design intent they convey or for problems which arise from others' failure to obtain and/or follow the COR guidance.
3. All work shall be performed in accordance with local applicable codes and regulations. Appropriate safety measures satisfying local and OSHA requirements shall be provided.
4. Proper temporary bracing of all construction work in progress is the Contractor's responsibility.
5. If during demolition existing conditions do not agree with information shown on the design drawings, the Contractor shall notify the COR immediately.
6. The Contractor shall be responsible for the location and protection of all existing utilities during construction and the repair of any damaged facilities.
7. Sections and details shown, while drawn for specific locations, are intended to establish the general types of details to be used throughout.
8. Drawings should not be scaled. Contact the COR for clarification of any dimension in question.
9. Anchor bolt layout shall be performed under the direction of a professional land surveyor.
10. All dimensions shall be verified by the Contractor. Layout shall be checked and coordinated between all construction documents and specifications prior to the start of work.
11. Shop drawings prepared by the subcontractors, suppliers, etc. shall be reviewed by the COR for conformance with design concept only. Each shop drawing submitted shall be stamped, initialed and dated as being reviewed by the construction manager/general contractor. Work shall not begin without the review by the COR.
12. Any engineering design provided by others and submitted for review or record shall bear the stamp and signature of a professional structural engineer registered in the state in which the project is located.
13. Relation of Specifications and Drawings are as follows:
    - a. To be equal authority and priority. Should they disagree in themselves, or with each other, bids shall be based on the most expensive combination of quality and quantity of work indicated. The appropriate work, in the event of the above mentioned disagreements shall be determined by the COR.
    - b. Figures take precedence over scaled measurements.
    - c. Large scale details take precedence over smaller scale details.
    - d. Architectural drawings, if applicable, shall take precedence in regard to dimensions, when in conflict with Mechanical and Structural drawings, except for the size of structural members.
    - e. Specifically titled drawings and sections of the specifications take precedence over indications of items in a collateral way.

DESIGN DATA

Building Code = 2018 International Building Code

Floor Load:
    Dead Load
        6" Thick Concrete composite deck = 95 PSF (includes structural weight)
        Precast plank = 150 psf (includes 100 psf plank weight)
    Live Loads (reduced as permitted by Code):
    Lobbies = 100 PSF
    1st Floor Corridors = 100 PSF
    Stairs / Exit Ways = 100 PSF
    Mechanical Rooms = 150 PSF
Roof Load:
    Dead Load = Top Chord 15 PSF; Bottom Chord 10 PSF (includes structure weight)
    Live Load = 20 PSF
    Snow Load: (Roof Live Load May Control)
        Ground Snow Load, Pg = 30 PSF
        Flat Roof Snow Load, Pf = 25.4 PSF
        Snow Exposure Factor, Ce = 1.0
        Snow Load Importance Factor, Is = 1.10
        Thermal Factor, Ct = 1.10

Lateral Soil Load (Per Geotech Report):
    Soil Unit Weight = 120 PCF
    At-Rest Pressure = 40 PSF/FT.
    Active Pressure = 60 PSF/FT.

Wind Load:
    Basic Wind Speed (3-second gust) = 122 MPH
    Building Category = III
    Exposure Category = B
    Internal Pressure Coefficient, GCpi = ±0.18
    Wind Design Pressure (MWFRS) = 25 PSF (1.0W)
    Net Uplift Load Varies, See Load Diagram. Min. Net Uplift load = 10 PSF

Earthquake Design Data:
    Building Category = III
    Seismic Importance Factor, Ie = 1.25
    Mapped Spectral Response Accelerations:
        Ss = 0.286
        S1 = 0.061
        Site Class = C (PER GEOTECH REPORT)
    Spectral Response Coefficients:
        Sds = 0.300
        Sd1 = 0.098
    Seismic Design Category = B
    Basic Seismic Force-Resisting System = Structural Steel not specifically designed for seismic resistance and Light Gauge X-braced shear walls.
    Design Base Shear = 126 kips (0.7E For ASD Load Combinations/1.0E for LRFD Load Combinations)
    Seismic Response Coefficient, Cs = 0.114
    Response Modification Factor, R = 3
    Analysis Procedure = Equivalent Lateral Force Procedure

Blast Loading:
    All building elements shall be designed per the Physical Security and Resiliency Design Manual (PSRDM) for blast criteria and requirements for Life-Safety Protected (LSP) Facilities Dated October 1,2020.
    Blast loads (Refer to Project Design Narrative section 3.5 for additional details):
        All building structure shall resist min. vehicle level threat of (W1) at 47 ft standoff.
        All Loading Docks, Mailrooms, and Lobbies shall resist min. satchel level threat of (W0).
    Basis of design Information is included in the structural drawings for convenience to the contractor. Refer to project Narravtive for basis of design loads including but limited to the following elements:
        Roof Trusses for Roof Pressure*
        Exterior Metal Studs*
        Jambs and Headers Around Window Openings
        Masonry Wall in Lobby
        Concrete Floor and Roofs
    At above noted asterisks the contractor is responsible for the final design of the affected elements for the noted blast loads and shall submit signed and sealed calculations as indicated by the project specifications. C.S. Davidson has ensured these elements meet or exceed typical building code requirements. Refer to confidential signed and sealed confidential blast loading report attainable from COR once the contract is awarded for additional details.

Roof Blast Loading Design:

LEVEL	RAMP-UP/RAMP-DOWN DYNAMIC BLAST LOADING SCENARIO 1	RAMP-UP/RAMP-DOWN DYNAMIC BLAST LOADING SCENARIO 2
HIGH ROOF	PRESSURE = 3.24 PSI IMPULSE = 16.99 PSI-MSEC RISE TIME = 5.24 MSEC TOTAL DUR. = 10.49 MSEC	PRESSURE = 0.98 PSI IMPULSE = 20.56 PSI-MSEC RISE TIME = 20.98 MSEC TOTAL DUR. = 41.96 MSEC
LOW ROOF	PRESSURE = 7.81 PSI IMPULSE = 27.94 PSI-MSEC RISE TIME = 3.58 MSEC TOTAL DUR. = 7.15 MSEC	PRESSURE = 2.07 PSI IMPULSE = 33.75 PSI-MSEC RISE TIME = 16.30 MSEC TOTAL DUR. = 32.61 MSEC

Lobby Blast Loading Design:

LOBBY	PRESSURE = 233.12 PSI IMPULSE = 182.39 PSI-MSEC TOTAL DUR. = 1.56 MSEC

Concrete Design Method:
    Design per LRFD
    Loads indicated are ASD loads
Structural Steel Design Method:
    Design per ASD
    Loads indicated are ASD loads
Cold-formed Steel Framing Design Method:
    Design per ASD
    Loads indicated are ASD loads

CAST-IN-PLACE CONCRETE CONSTRUCTION

1. All concrete work shall conform to the requirements of ACI 318, Building Code Requirements for Reinforced Concrete, latest edition and ACI 301, Specifications for Structural Concrete for Buildings, latest edition, including all revisions, except as modified herein.
2. Concrete shall be supplied by a qualified ready-mixed concrete plant in accordance with the requirements of items **3-12** and the Table below.
3. Entrained Air = 4 to 7% for all exposed concrete, footings, piers, exterior slabs, all concrete exposed to freezing temperatures, and where otherwise noted.
4. Coarse aggregate shall be AASHTO NO. 57 stone. Maximum aggregate size = 1.5"
5. Submit mix designs to Engineer for approval. No admixtures permitted without Engineer's approval.
6. Chloride containing admixtures are not permitted.
7. Fine aggregate must be natural sand, unless approved by the Engineer.
8. Air-entraining admixtures are not permitted on trowel finished slabs.
9. For Interior Slabs-on-grade <= 4" thick: 1.) When specified as temperature and shrinkage reinforcement, micro synthetic fibers made from 100% virgin homopolymer polypropelene fibrillated fibers meeting ASTM C1116, Type III shall be added at a minimum rate of 1.5 lb/cu.yd. 2.) Fibrous reinforcement shall be manufactured by Propex, BASF, Grace, or approved equal.
10. For Interior Slabs-on-grade > 4" thick: 1.) When specified as temperature and shrinkage reinforcement, cold-drawn steel fibers meeting ASTM A820 criteria shall be added at a minimum rate of 25 lb. / cu. yd. or macro synthetic fibers made from virgin polyolefin shall have an equivalent diameter between 0.016" and 0.05" with a minimum aspect ratio (length / equivalent diameter) of 50, and added at a minimum rate of 4 lb. / cu. yd. 2.) Fibrous reinforcement shall be manufactured by Propex, BASF, Grace, or approved equal. 3.) Slabs must be laser-screeded, U.N.O.
11. For Slabs-on-metal deck: 1.) When specified as temperature and shrinkage reinforcement, cold-drawn steel fibers meeting ASTM A820 criteria shall be added at a minimum rate of 25 lb. / cu. yd. or macro synthetic fibers made from virgin polyolefin shall have an equivalent diameter between 0.016" and 0.05" with a minimum aspect ratio (length / equivalent diameter) of 50, and added at a minimum rate of 4 lb. / cu. yd. 2.) Fibrous reinforcement shall be manufactured by Propex, BASF, Grace, or approved equal.
12. For Exterior Slabs <= 5" thick: 6x6 W2.9 x W2.9 welded wire reinforcement, U.N.O.
13. At Contractor's option, fly ash, ground granulated blast furnace slag, or other pozzolans may be substituted for Portland cement, up to 25% of the cementitious content. Concrete mixes using these materials must be approved by the COR.
14. When concrete arrives at the project with slump below that suitable for placement, as indicated by the Specifications, water may be added only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. The water shall be incorporated by additional mixing equal to at least half of the total mixing required. Discharge of the concrete shall be completed within 1-1/2 hours, or before the truck drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates. Truck batch slips must include time of batching, total drum revolutions upon arrival at site, and quantity of water (in gallons) per cubic yard available to be added to attain the maximum design water-cement ratio.
15. Reinforcing steel shall be deformed, billet-steel conforming to ASTM A615 - Grade 60. Welding of reinforcing steel must be approved by the COR and shall be performed in accordance with the requirements of the AWS Code, D1.4, Structural Welding Code - Reinforcing Steel latest edition and be performed only by qualified welders.
16. When specified, welded wire fabric shall conform to ASTM A185 and supplied in flat sheets only. Bar chairs are required at the recommended spacing for structural slabs.
17. Reinforcing steel splices shall be ACI Class B splices unless indicated otherwise.
18. Provide adequate bolsters, hi-chairs, support bars, etc., to maintain specified clearance for the entire length of all reinforcing bars. Provide accessories which are plastic tipped or galvanized with turned-up ends for reinforcement at all faces of exposed concrete, interior or exterior.
19. Shop drawings for the fabrication and placement of reinforcing steel shall be submitted to and approved by the COR before fabrication commences.
20. Concrete shall be placed only after approval of the reinforcement and mix designs by the acting special inspection agency or the COR. Contractor is responsible for coordinating inspections prior to concrete placement.
21. Schedule the pouring of foundations on the same day the excavation is completed.
22. Cure all concrete in accordance with accepted ACI Standards and conformance to ACI 308.1, Standard Specification for Curing Concrete, latest edition, for the worst case weather conditions anticipated during the curing period. All concrete construction and procedures shall conform to the requirements of ACI 306.1, Standard Specification for Cold Weather Concreting, latest edition.
23. No aluminum of any type shall be allowed in the concrete work unless coated to prevent aluminum-concrete reaction.
24. Mechanically vibrate concrete. Slabs-on-grade need only be vibrated around floor ducts and other embedded items.
25. Do not place pipes, ducts, reglets or chases in structural concrete or composite floor systems without approval of the COR.
26. Maximum free drop of any concrete = 5'-0".
27. Chamfer all exposed concrete edges a minimum of 3/4" x 3/4".
28. Provide a minimum of concrete cover for reinforcing bars as follows unless noted otherwise on drawings:1.) Footings = 3 inches earth face, 2 inches all others, U.N.O. 2.) Concrete walls, beams, and piers = 2 inches earth face, 1-1/2 inches all others, U.N.O.
29. Six (6) test cylinders shall be prepared for every 50 cubic yards of concrete placed on any given day to represent all concrete placed on that day. Three (3) cylinders shall be tested at seven (7) days and three (3) cylinders shall be tested at 28 days for verification of concrete design strength.
30. Concrete Finishes, as defined in Chapter 5 of ACI 301, shall be as follows, U.N.O.: 1.) Formed surfaces not exposed to public view: Rough-form finish 2.) Formed surfaces exposed to public view: Smooth-form finish. 3.) Walls as indicated: Rubbed finish 4.) Typical interior commercial/industrial floor: Troweled finish 5.) Floors to receive ceramic tile, portland cement, terrazzo, etc.: Scratch finish 6.) Exterior slabs on grade, walkways, etc.: Non-slip broom finish
31. Provide vertical control joints in concrete walls at a maximum 30'-0" O.C. spacing. Submit a control joint location plan to the Engineer for approval prior to construction. Control joints shall not be placed in concrete shear walls.
32. Concrete submittals required to be reviewed and approved by the COR prior to cast-in-place concrete construction include, but are not limited to: Mix designs, Reinforcement Shop Drawings, Control Joint Plans for Walls, and Control Joint Plans for Slabs.
33. Slabs on Grade:
    - a. Slabs on grade shall be placed in accordance with the requirements of ACI 302.1R.
    - b. Slab finishing operations shall meet ACI Class 5 floor requirements in accordance with Chapter 8 of ACI 302. Floors receiving a surface hardener must be finished to ACI Class 6 floor requirements.
    - c. Refer to the floor flatness requirements noted in the Cast in Place project specification section 3.13.11.
    - d. Curing of slabs shall begin as soon as finishing operations are complete by either water curing, wet covering, or liquid membrane-forming curing compound in accordance with Chapter 9 of ACI 302.1R for a period of seven (7) days.
    - e. Sawcut control joints must be completed within 1 to 4 hours of finishing and to a minimum depth of 1/3 the slab thickness (1/4 for slabs with welded wire fabric). Provide joints at a maximum 15'-0" O.C. spacing Submit a sawcut joint location plan to the COR for approval.
    - f. Slab joint sealant shall be a two-component, epoxy resin with a minimum shore A hardness of 80 in accordance with ASTM D 2240.
    - g. Do not allow construction equipment on newly placed slabs for a minimum of seven (7) days.
    - h. When strip pouring, allow seven (7) days before placing adjacent slab sections.
    - i. A slab on grade pre-construction conference involving the COR Contractor is recommended to review installation procedures and requirements.

TYPE OF CONSTRUCTION	MIN. 28-DAY COMP. STRENGTH	MAX. W/C RATIO	TYPE 1 PORTLANDCEMENT	SLUMP RANGE
(1) Footings, interior slabs-on-grade & slabs-on-metal deck	3,000 PSI	0.53	5 BAGS	3" - 6"
(3) Exterior slabs, walls, beams, columns, piers & grade beams	4,500 PSI	0.45	6 BAGS	3" - 6"

CONSTRUCTION PROCEDURES AND SAFETY REQUIREMENTS

1. The contract structural drawings and specifications represent the finished structure. Unless otherwise indicated, they do not indicate the means or methods of construction.
2. Provide all measures necessary to protect the workmen and other persons during construction. Provide all necessary measures to avoid excessive stresses and to hold the structural elements in place during construction. Such measures shall include, but not be limited to, bracing, shoring for construction equipment, shoring for earth banks, forms, scaffolding, planking, safety nets, support and bracing for cranes and hoists, guying, etc.
3. Engage properly qualified persons to determine where and how temporary precautionary measures shall be used. Observation visits to the site by structural engineer's field representative shall not include the items noted above.
4. Supervise and direct the work so as to maintain sole responsibility for all construction means, methods, techniques, sequences, and procedures. Retain the services of a professional structural engineer licensed in the state in which the project is located to design and supervise any scaffolding for workmen, and all shoring of forms and elements of the construction.

STRUCTURAL STEEL

1. All steel construction shall be in accordance with the Specification for Structural Steel Buildings, July 7, 2016 (AISC 360), the Specification for Structural Joints Using High-Strength Bolts, August 1, 2014, the Code of Standard Practice for Steel Buildings and Bridges, June 15, 2016 (AISC 303), and the AISC Steel Construction Manual, 15th edition.
2. All welding shall be performed in accordance with the requirements of the AWS Code, D1.1, Structural Welding Code - Steel, latest edition, and AISC Specifications using the proper electrode from AWS D1.1 Table 3.1 and performed only by qualified welders. Complete Joint Penetration (CJP) welds shall be tested per AISC's 15th Edition Steel Manual, Part 16, Chapter N, Section N5.5. The Risk Category for this building is III. As indicated in AISC's 15th Edition, 100% of the CJP welds shall be tested. This work should be coordinated by the Contractor with the firm hired by the Owner.
3. Structural steel shall conform to the requirements of ASTM A992, with a minimum yield stress of 50 ksi for all wide flange and WT shapes. All other shapes, miscellaneous plates, and connection material shall conform to ASTM A36.
4. Square or rectangular structural steel sections (HSS) shall conform to the requirements of ASTM A500, Grade B, with a minimum yield stress of 46 ksi.
5. Round hollow structural steel sections (HSS) shall conform to the requirements of ASTM A500, Grade B, with a minimum yield stress of 42 ksi.
6. Structural steel pipe shall conform to the requirements of ASTM A53, Type S, Grade B, with a minimum yield stress of 35 ksi.
7. All galvanized structural steel shall conform to the requirements of ASTM A123.All galvanizing holes shall be plug welded or sealed with zinc plugs.
8. Shop drawings for the fabrication and erection of all structural steel shall be submitted to and approved by the COR prior to fabrication.
9. The Contractor shall notify the COR of any fabrication or erection errors or deviations and receive written approval before field corrections are made.
10. Fabricator and erector of structural steel shall be AISC certified. A current copy of the AISC certificate shall be submitted to the COR prior to fabrication and erection. If not certified by AISC, fabricator shall be subjected to the special inspection requirements.
11. Bolted connections of structural steel shall be made using high strength steel bolts conforming to ASTM A325. Bolts shall be 3/4" minimum in diameter unless noted otherwise.
12. The faying surfaces at slip-critical connections shall be Class A surfaces, and shall not be painted or primed. Galvanized surfaces shall be roughened by means of hand wire brushing as indicated in the 2004 RCSC specification.
13. All steel connections shall be designed by a professional engineer licensed in the state in which the project is located. The design shall be in accordance with the AISC steel manual and AISC 360 specification referenced by the adopted Building Code for the project. The fabricator shall submit sealed connection design calculations for all shear, moment, and bracing connections before shop drawings are submitted for review. Connection designs varying from typical details shown on the construction documents shall be submitted with design calculations for approval prior to submitting show drawings. The licensed engineer responsible for the connection design shall review the steel shop drawings and confirm in writing that the steel shop drawings have properly incorporated the connections as designed. The document shall be submitted along with the steel shop drawings for the COR to review.
14. Simple shear connections shall be standard double angle or shear plates, unless noted otherwise. All bolted connections shall have a minimum of 2 bolts.
15. All high strength bolts shall be snug tight unless noted otherwise. A snug tight condition is as defined in Section 1.2.2. in the AISC Design Guide 17. Bolts used in slip-critical connections shall be pretensioned in accordance with the 2004 RCSC specification.
16. Anchor bolts shall conform to the requirements of ASTM F1554, with a minimum yield strength of 36 ksi, unless noted otherwise. Bolts shall be 3/4" minimum diameter unless noted otherwise. All columns shall have a minimum of 4 anchor bolts unless noted otherwise.
17. The Contractor shall be responsible for the temporary bracing of all steel during erection and until construction is complete.
18. The Contractor shall furnish all plates, clip and seat angles, and connections for completion of the structure, even if such items are not specifically called for on the structural drawings.
19. Structural and miscellaneous steel fabricators shall be responsible for obtaining all field dimensions necessary for the completion of their work.
20. Minimum size of fillet welds, unless otherwise noted, is to be 3/16-inch fillet. Chip, wirebrush clean, and prime paint all field welds.
21. Summary of Paint System (Reference Steel Structures Painting Council - A Guide to the Shop Painting of Structural Steel):
    - a. For all work temporarily exposed to weather for six (6) months or less : No paint required.
    - b. For all work temporarily exposed to weather for greater than six (6) months:
        - aa. Surface Preparation = SSPC-SP 2
        - bb. Pretreat = None required
        - cc. Paint Application = SSPC-PA 11
        - dd. Number of Coats = One
        - ee. Primer = SSPC-Paint 15
        - ff. Touch-up = As per manufacturer specifications
    - c. For all work permanently exposed to weather:
        - aa. Surface Preparation = SSPC-SP 3
        - bb. Pretreat = None required
        - cc. Paint Application = SSPC-PA 1
        - dd. Number of Coats = Three minimum
        - ee. Primer = SSPC-Paint 25
        - ff. Touch-up = As per manufacturer specifications
        - gg. 2nd Coat = SSPC Paint 21
        - hh. Finish Coat = SSPC Paint 21
        - ii. Dry Film Thickness =
            First Coat: 1.5 to 2.0 mils.
            Second Coat: 20. mils
            Finish Coat: 2.0 mils
            Total = 5.5 to 6.0 mils
    - d. Surfaced within 2 inches of welds shall be free of material that would prevent proper welding or prouce objectionable fumes while welding is being done.
    - e. For Structural steel that will receive sprayed fireproofing: no primer or finish paint. If steel is painted, a proper bonding agent must be applied to ensure proper adhesion of the sprayed fireproofing.

FOUNDATION CONSTRUCTION

1. Allowable soil bearing pressure (net) assumed in design is 3,000 PSF (pounds per square foot) based on the geotechnical engineering investigation prepared by Terracon, Project No. J6205175 dated 11/30/2020.
2. Soil bearing capacity shall be field verified by an approved soil testing agency and documented in writing to the COR.
3. If soil of design capacity is not encountered at footing elevations shown, excavate to a depth necessary to attain design capacity and extend foundations as required. Obtain COR approval prior to lowering the foundations.
4. The bottoms of all exterior footings shall extend a minimum of 3'-0" below finished grade unless noted otherwise.
5. Excavate all foundations to reasonable exact outline and depth avoiding over-excavation and cave-in of surrounding material. Bottoms of all foundations shall be dry, soil proof-rolled, and rock surfaces leveled and cleared of loose debris prior to pouring.
6. Neatly level and trim all foundation excavations prior to setting steel.
7. Pipes extending under footings shall be placed before footing is placed and the void produced in laying the pipe shall be filled with 3,000 psi concrete.
8. Thoroughly compact all foundation and slab subgrade material prior to placement of stone bases or concrete.
9. Provide weathertight covering for all foundations after excavation; do not expose to rainwater or freezing.
10. Where foundations are formed, backfill edges immediately after form removal.
11. No fill or backfill shall be placed against retaining or foundation walls until grout or concrete has attained design strength and supporting members are in place, unless prior written approval is obtained from the COR.
12. All backfill shall be granular material approved by the COR. Backfill shall be deposited and machine compacted in 8-inch maximum layers. Compaction shall be a minimum of 95% of the maximum dry weight density at the optimum moisture content in accordance with ASTM D1557 (Modified Proctor) as verified by a testing laboratory.
13. All backfill adjacent to retaining structures shall be compacted using hand operated equipment; no heavy equipment shall be allowed within 5 feet of any wall.
14. For all foundation construction that will be exposed to freezing temperatures during construction, the bottom of all footings (interior and exterior) shall extend a minimum of 3'-0" below grade (at no additional cost to the owner). Contractor shall contact the COR for approval to lower foundations and obtain concrete pier sizes, if necessary.

STEEL STAIR DESIGN

1. The stair supplier shall be responsible for the design of all stairs, landings, and connections, unless noted otherwise. Drawings and calculations sealed by a structural engineer licensed in the state in which the project is located shall be submitted to the COR for approval.
2. Stairs & landings shall be designed for a minimum live load of 100 PSF in addition to any applicable dead loads; including their self-weight.
3. Contractor shall coordinate the steel stair design with masonry wall construction to ensure proper bearing conditions & attachments are provided.

COLD-FORMED STEEL FRAMING

1. All structural members shall be in conformance with the Specification for the Design of Cold-Formed Steel Structural Members, AISI, latest edition. Manufacturer shall verify all design applications of framing members shown on the drawings.
2. Cold-formed steel supplier shall prepare complete structural design calculations for all framing members and accessories. Framing shall be designed for the loads listed on the drawings and all applicable building code requirements. All exterior cold-formed framing shall be design for the blast requirements indicated by section 08 56 53 blast resistant facade systems. Framing shall also be designed to meet the deflection criteria listed in items 3, 4, & 5.
3. Interior and Exterior Walls: Horizontal deflection due to wind loas shall not exceed L/360 of the wall height unless supporting masonry veneer, in which case deflection shall not exceed L/600 of the wall height.
4. Floor Joists or Trusses: Vertical deflection shall not exceed L/360 of the span for Live Load, and L/240 of the span for Total Load.
5. Roof Joists or Trusses: Vertical deflection shall not exceed L/360 of the span for Live Load, and L/240 of the span for Total Load. (If members do not support a plaster or drywall ceiling, deflection shall not exceed L/240 of the span for Live Load, and L/180 of the span for Total Load).
6. Cold-formed steel trusses shall be designed for the following loads indicated in items 7-11:
7. All wind loads and snow loads, including balanced, unbalanced, drift, & sliding snow, shall be determined using the 2018 International Building Code (IBC).
8. Minimum Top chord live load = 30 psf
9. Top chord dead load = 15 psf
10. Bottom chord dead load = 10 psf
11. All trusses shall be designed for the blast requirements indicated by section 05 40 00 cold-formed metal framing.
12. Supplier shall submit the following items, at a minimum, for review: 1.) Product data. 2.) Shop drawings showing framing, accessories, anchorages, and connection details. 3.) Structural design calculations sealed by a structural engineer licensed in the state in which the project is located. 4.) Manufacturer's installation instructions for framing members and accessories.
13. All framing members shall be formed from corrosion-resistant steel corresponding to the following requirements: 1.) 16 Gage (54 Mils), 14 Gage (68 Mils), and 12 Gage (97 Mils) framing components shall be formed from steel conforming to the minimum requirements of ASTM A653, Grade D, with a minimum yield stress of 50,000 psi. 2.) 18 gage (43 Mils) and 20 gage (33 Mils) framing components shall be formed from steel conforming to the minimum requirements of ASTM A653, Grade A with a minimum yield stress of 33,000 psi. 3.) Galvanized framing products shall be coated in accordance with the requirements of ASTM A525.
14. When masonry veneer is anchored to cold-form steel backing, framing shall be corrosion resistant and have a minimum base metal thickness of 0.043 in. (43 mils. - 18 gage).
15. Connections of all framing components shall be with self-drilling screws or welding. When connecting materials greater than 1/4" in thickness, holes shall be pre-drilled prior to installation of fastener. Screws shall be of sufficient size to insure the strength of the connection. Wire tying of framing components shall not be permitted. All welds shall be touched up with paint conforming to the manufacturer's requirements.
16. All welding shall be performed in accordance with the requirements of the AWS Code, D1.3, Structural Welding Code - Sheet Steel, latest edition, and shall be performed only by qualified welders.
17. End bearing and bridging details shall be as stipulated in the AISI Specifications and as shown on the drawings.
18. Field cutting of steel framing members shall be by saw or shear. Torch cutting will not be permitted.
19. Temporary bracing shall be provided and remain in place until work is permanently stabilized.
20. Installation - Stud Wall Systems:
    - a. Provide web stiffeners at support locations where indicated.
    - b. Mechanical bridging of the type and spacing described shall be installed before loading.
    - c. End blocking shall be provided where joist ends are not restrained against rotation.
    - d. Provide additional framing around openings when the width of the opening exceeds the typical joist spacing.
    - e. During construction, the joist system shall not be loaded beyond the limits for which it was designed.
    - f. Minimum end bearing shall be 1 1/2".
21. Installation - Horizontal Joists:
    - a. Where splicing of track is necessary between stud spacings, a piece of stud shall be placed between adjacent tracks and fastened by weld or screw to each side of the track, each end.
    - b. Splicing of framing components, other than track or multi-story stud walls, is not permitted.
    - c. Studs shall be plumbed, aligned and secured to the continuous runner tracks at each end and each side.
    - d. Mechanical bridging of the type and spacing described shall be installed prior to the installation of facing materials. Minimum spacing of bridging shall be 4'-0", unless indicated otherwise by light-gauge framing engineer.
    - e. Installation of sheathing, wallboard or any other collateral material shall be performed in accordance with the product manufacturer's specification

PRECAST CONCRETE FLOOR AND WALL PANELS

1. Planks shall be pretensioned, solid or hollow core, flat slabs machine cast by a member of the Precast Concrete Institute and designed for the loads listed on the drawings and in accordance with Precast Concrete Institute standards.
2. Shop drawings & sealed calculations prepared by a structural engineer licensed in the state in which the project is located shall be submitted to the COR for approval prior to fabrication and shall include all material strengths and specifications.
3. See drawings for thickness and spanning directions.
4. All grout keys shall be properly filled for full length and properly tied into bearing points as detailed on the drawings.
5. Fabricate plank to a length tolerance of ±1/2 inch.
6. Provide openings in precast for all penetrations. No field cutting of plank for openings will be permitted. For openings up to 8 inches in diameter field drilling or coring may be allowed provided that all such openings be marked and approved by the precast manufacturer prior to any drilling or coring. All openings over 8 inches in diameter must be shop-formed or framed.
7. Design reinforcement for any plank with field-drilled or cored openings to support all dead and live loads with any one strand cut.
8. Supply all headers required for plank support around openings as required.

METAL DECKING

1. Installation of all decking shall be in strict accordance with the Steel Deck Institute (SDI) specifications and with manufacturer's recommendations. Steel deck shall be manufactured by a member of the Steel Deck Institute.
2. All floor deck shall be galvanized and all roof deck shall be painted, U.N.O. Composite metal deck for floor slabs shall have a min. yield strength = 40 KSI. Deck shall be a minimum 3-span continuous where possible.
3. Deck shall be attached to the steel structure using #12 screws at 12" o.c. with sidelaps fastened with #10 TEK screws at 12" O.C., U.N.O. Alternate fasteners must be approved by the COR.
4. Store and handle decking so as to prevent damage.
5. Submit shop drawings to the COR for approval prior to installation.
6. Provide a 1/4" thick bent plate or angle at all floor/roof edges U.N.O.
7. Provide accessories as needed to provide a complete system. Contractor shall refer to Manufacturer's specifications for accessories for specialty deck types (e.g. Epicore, Arch Deck, etc.).
8. All floor or roof deck penetrations > 6" (square or dia.) shall be properly reinforced with angle frames or slab reinforcing as specified by the Engineer.
9. All welding shall be performed in accordance with the requirements of the AWS Code, D1.3, Structural Welding Code - Sheet Steel, latest edition, and shall be performed only by qualified welders.

CONCRETE MASONRY CONSTRUCTION

1. All concrete masonry shall conform to the requirements of ASTM C90 unless noted otherwise. Concrete masonry construction shall conform to the requirements of ACI 530/ASCE 5/TMS 402, building code requirements for Masonry Structures, latest edition and ACI 530.1/ASCE 6/TMS 602, Specifications for Masonry Structures, latest edition, including all supplements.
2. 28 day design compressive strength of masonry (f'm) used is as follows: a.) Standard Masonry = 2,000 psi. b.) Ivany = 2,800 psi
3. The Contractor shall be responsible for the temporary bracing of all masonry construction. Bracing shall remain in place until masonry has had sufficient time to gain design strength. Where masonry attaches to floor and/or roof systems, bracing shall remain in place until the diaphragm has been anchored in its final position.
4. Grout lifts for reinforced masonry walls shall not exceed 5' -4" in height. High lift grout procedures may be used only after written approval is provided by the Engineer.
5. All mortar shall conform to ASTM C270. Mortar shall be Type S (2/1/9 mix ratio of cement/lime/sand) with an average 28 day compressive strength of 1,800 psi for above grade walls (except Ivany Block). Mortar shall be Type M (4/2/12 mix) with an average 28 day compressive strength of 2,500 psi for Ivany walls, walls below grade, or walls exposed to earth.
6. Grout shall conform to the requirements of ASTM C476. Fill grouted cores, bond beams, and wall reinforcement where shown on plans with 3,000 psi small aggregate concrete mix with 8"-11" slump. Grout samples shall be tested per the Cast-in-place Concrete Construction specifications.
7. All steel lintels for exterior masonry shall be galvanized.
8. Provide vertical control joints in above grade masonry walls so that the distance between joints does not exceed the lesser of 1 1/2 times the overall wall height, or 25 feet. Control joints shall not be placed greater than 8" from a bearing plate or jamb of an opening. A control joint shall be placed at one side of an opening less than 6'-0" wide and at both sides of openings over 6'-0" wide. Provide vertical control joints at intersections of reinforced & unreinforced walls, U.N.O. Submit a shop drawing showing control joint locations to the Engineer for approval prior to construction. Coordinate exact control joint & expansion joint locations with architectural drawings.
9. Horizontal joint reinforcement shall consist of truss type ASTM A1064 cold drawn No. 9 gauge galvanized wire steel, located 16" o.c. Cross rods to be welded to side rods at 16" o.c. to form a truss. Lap splices 6" minimum. Provide horizontal reinforcing in the two courses above and below openings and at the top of walls or partitions.
10. Masonry cores shall be grouted solid.
11. Head joints shall be mortared solid the full depth of the face shell. Webs shall be fully mortared at grouted cores.
12. A minimum of one course of masonry shall be grouted solid below transitions in masonry thickness.
13. Cold Weather Masonry Construction shall conform to the requirements of AC1 530.1/ASCE 6/TMS602, latest edition.
14. Masonry stair shafts and elevator shafts shall be grouted solid, unless noted otherwise.
15. Reinforcing steel shall be deformed, billet-steel conforming to ASTM A615 - Grade 60. Welding of reinforcing steel must be approved by the Engineer and shall be performed in accordance with the requirements of the AWS Code, D1.4, Structural Welding Code - Reinforcing Steel latest edition and be performed only by qualified welders. Shop drawings for the fabrication and placement of reinforcing steel shall be submitted to and approved by the Engineer before fabrication commences.
16. Submittals required to be reviewed and approved by the Engineer prior to concrete masonry construction include, but are not limited to: Mix designs, Reinforcement Shop Drawings, Vertical Control Joint Location Plans.
17. Mortar shall be sampled and tested according to ASTM C 270, C 780, and C 1586.
18. Wet setting of reinforcing steel is prohibited unless approved by the Engineer.

LEGEND OF ACRONYMS & ABBREVIATIONS

&	USE FOR "AND" WHEN APPROPRIATE	H.M.	HOLLOW METAL
@	USE FOR "AT" WHEN APPROPRIATE	HORIZ.	HORIZONTAL
A.C.T.	ACOUSTICAL CEILING TILE	HVAC	HEATING / VENTILATION / AIR CONDITIONING
ADDL.	ADDITIONAL	I.F.	INSIDE FACE
A.F.F.	ABOVE FINISHED FLOOR	INSUL.	INSULATION
ALUM.	ALUMINUM	INT.	INTERIOR
ARCH.	ARCHITECTURAL	L.	LENGTH
BL	BUILDING LINE	L.L.H.	LONG LEG HORIZONTAL
BLDG.	BUILDING	L.L.V.	LONG LEG VERTICAL
BLK.	BLOCK	MAX.	MAXIMUM
B.O.F.	BOTTOM OF FOOTING	MET.	METAL
BRG.	BEARING	MFG.	MANUFACTURER
BTWN.	BETWEEN	MIN.	MINIMUM
C.	CARPET	MISC.	MISCELLANEOUS
C.I.P.	CAST-IN-PLACE	N.I.C	NOT IN CONTRACT
CL	CENTERLINE	NO.	NUMBER
CLG.	CEILING	O.C.	ON CENTER
CLR.	CLEAR	O.F.	OUTSIDE FACE
CMU	CONCRETE MASONRY UNIT	PennDOT	PENNSYLVANIA DEPT. OF TRANSPORTATION
COL.	COLUMN	PL.	PLATE
CONC.	CONCRETE	PLF	POUNDS PER LINEAL FOOT
CONT.	CONTINUOUS	PNT.	PAINT
D. OR DP.	DEEP	PWD.	POWDER
db	REINFORCING BAR DIAMETER	PSF	POUNDS PER SQUARE FOOT
DIA.	DIAMETER	PSI	POUNDS PER SQUARE INCH
DIM.	DIMENSION	RAD.	RADIUS
DN.	DOWN	REQ.	REQUIRED
DWG.	DRAWING	REINF.	REINFORCING
EA.	EACH	RET.	RETURN
E.F.	EACH FACE	SC	SLIP CRITICAL
ENG.	ENGINEER(S) / ENGINEERING	SECT.	SECTION
ELEC.	ELECTRIC / ELECTRICAL	SIM.	SIMILAR
ELEV.	ELEVATOR	SLR.	SEALER
EQ.	EQUAL	SPC.	SPACE
EQUIP.	EQUIPMENT	S.S.	STAINLESS STEEL
E.W.	EACH WAY	STL.	STEEL
EX.	EXISTING	T&B	TOP AND BOTTOM
EXT.	EXTERIOR	THK.	THICK
F.E.	FIRE EXTINGUISHER	T.O.F.	TOP OF FOOTING
F.E./C	FIRE EXTINGUISHER WITH CABINET	T.O.S.	TOP OF STEEL
F.F.	FINISHED FLOOR	T.O.W.	TOP OF WALL
F.G.	FINISHED GRADE	TYP.	TYPICAL
FIB.	FIBERGLASS	U.N.O.	UNLESS NOTED OTHERWISE
FIN.	FINISH(ED)	V.	VINYL
FLR.	FLOOR	VAR.	VARIES
FTG.	FOOTING	V.C.T.	VINYL COMPOSITION TILE
GA.	GAUGE	VERT.	VERTICAL
GALV.	GALVANIZED	W.	WIDE / WIDTH
GYP.	GYPSUM	W/	WITH
GPDW	GYPSUM DRYWALL	WD.	WOOD
HGT.	HEIGHT	W.W.R	WELDED WIRE REINFORCING

DRAWING LIST

SHEET NUMBER	SHEET NAME
S-001	GENERAL NOTES
S-002	WIND UPLIFT & SNOW DRIFT
S-101	FOUNDATION PLAN
S-102	ENLARGED FOUNDATION PLANS
S-103	TUNNEL FRAMING PLAN
S-104	ALTERNATE FOUNDATION PLAN
S-105	FLOOR FRAMING & LOW ROOF FRAMING PLAN
S-106	FLOOR FRAMING & LOW ROOF FRAMING PLAN
S-107	ENLARGED FRAMING PLANS
S-108	ENLARGED FRAMING PLANS
S-109	PATIENT HOIST PLAN
S-110	ROOF FRAMING PLAN
S-111	ENLARGED FRAMING PLANS
S-112	ISOMETRIC OF STRUCTURAL STEEL
S-201	FOUNDATION DETAILS
S-202	FOUNDATION DETAILS
S-203	FOUNDATION SECTIONS & DETAILS
S-204	FOUNDATION SECTIONS & DETAILS
S-205	FOUNDATION SECTIONS & DETAILS
S-301	FRAMING DETAILS
S-302	FRAMING DETAILS
S-303	FRAMING SECTIONS
S-304	FRAMING SECTIONS
S-305	FRAMING SECTIONS
S-306	FRAMING SECTIONS
S-307	FRAMING SECTIONS
S-308	FRAMING SECTIONS
S-309	FRAMING SECTIONS
S-310	FRAMING SECTIONS
S-401	CONNECTION INFORMATION
S-501	LIGHT GAUGE STUD DETAILS
S-502	LIGHT GAUGE STUD DETAILS

GENERAL LEGEND

▨	- REINFORCED MASONRY WALL
⬚	- CONCRETE
▒	- 2" DEPRESSED SLAB; REFER TO ARCH
■	- 5" CONCRETE SLAB W/ TURNDOWN EDGES
▧	- SHEAR WALL LOCATIONS
"TEXT"	- PROPOSED CONDITIONS
"Text"	- EXISTING CONDITIONS
SIM 1 S1	- SECTION MARK
▶—	- MOMENT CONNECTION
(-2'-9") (-4'-9")	- INDICATES STEP FOOTING LOCATION
▬ ▬ ▬ ▬	- INDICATES DEDUCTIVE ALTERNATE ITEM

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Office of Construction and Facilities Management
VA U.S. Department of Veterans Affairs

Drawing Title: GENERAL NOTES
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FULLY SPRINKLERED
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