STRUCTURAL NOTES

THE STRUCTURAL NOTES DEFINE GENERAL DESIGN AND MATERIAL REQUIREMENTS AND ARE INTENDED TO SUPPLEMENT, BUT NOT REPLACE, THE PROJECT SPECIFICATIONS

DESIGN CRITERIA

1. Building Code: 1997 Kentucky Building Code
2. Design Loads
   - 2.1 Uniform Live Loads (reduced per Building Code, unless noted otherwise)

Classrooms	50 psf
Corridors	80 psf
Mechanical Rooms	125 psf
Stairs	100 psf
Roof	20 psf (with ponding loads per Code)
Ground Snow	15 psf (with drift loads per Code)

Snow Exposure Coefficient = 0.7
Importance Factor = 1.0

   - 2.2 Concentrated Live Loads (distributed over an area of 2.5 square feet, unless noted otherwise)

Schools	1000 lb

   - 2.3 Wind Loads: Wind Speed: 70 mph
     Importance Factor = 1.0
     Exposure B
   - 2.4 Earthquake Loads

Effective Peak Velocity-Related Acceleration: Av = 0.19
Effective Peak Acceleration: Aa = 0.19
Seismic Hazard Exposure Group: II
Seismic Performance Category: D
Soil Profile Type: S2 (S=1.2)
Basic Structural System: Moment-Resisting Frame System
Seismic Resisting System: Ordinary Moment Frame of Steel
Response Modification Factor: R = 4.5
Deflection Amplification Factor: Cd = 4
Anaysis Procedure: Equivalent Lateral Force Procedure
Seismic Risk Zone III

3. Estimated Deflections of Lorizontal Structural Members

	Live	Dead + Live Load
Floor Members	L/360	L/240
Roof Members	L/360 or 1"	L/240

where L = member span (for cantilevers, L = twice the cantilever length)

4. Structural Engineer is not responsible for the design of steel stairs, handrails, curtain wall/window wall systems, cold-formed metal framing, or other systems not shown in the Structural Documents. Such systems shall be designed, furnished, and installed as required by other portions of the Contract Documents.
5. No provisions have been made for future building expansion.

GENERAL

1. Reference to standards or specifications of technical societies, organizations, or associations, or to codes of local/state authorities, means the latest standard, specification, or code adopted by the date shown on the Drawings, unless specifically noted otherwise.
2. Material, workmanship, and design shall conform to the referenced Building Code.
3. For dimensions not shown on the Structural Documents, see the Architectural Documents.
4. Contractor responsibilities include, but are not limited to, the following:
   - 4.1 Coordinate the Structural Documents with the Architectural, Mechanical, Electrical, Plumbing, and Civil Documents. Architect/Structural Engineer shall be notified of any discrepancy or omission.
   - 4.2 Verify existing dimensions, elevations, and site conditions before starting work. Architect/Structural Engineer shall be notified of any discrepancy or omission.
   - 4.3 Verify the structurally supported mechanical equipment weights, opening sizes and locations identified on the Structural Drawings with Architectural and Mechanical Drawings.
   - 4.4 Verify that miscellaneous framing shown on the Structural Drawings for mechanical equipment, Owner-furnished items, partitions, etc. is consistent with the requirements of such items.
   - 4.5 Contractor is solely responsible for the means, methods, techniques, sequences, and procedures of construction.
   - 4.6 The structure is stable only in its completed form. Temporary supports required for stability during all intermediate stages of construction shall be designed, furnished, and installed by the Contractor.
   - 4.7 Contactor has sole responsibility to comply with OSHA regulations.

SUBMITTALS AND STRUCTURAL TESTING/INSPECTIONS (SEE DIVISION 1 SPECIFICATIONS)

1. Shop Drawings and Submittals
   - 1.1 Reproduction of Structural Drawings for shop drawings is not permitted.
   - 1.2 Electronic drawing files will not be provided to the Contractor.
   - 1.3 Review of shop drawings will be for conformance with the Contract Documents regarding arrangement and sizes of members and the Contractor's interpretation of the design loads, if applicable, and Contract Document details. Such review shall not relieve the Contractor of the full responsibility to comply with the Contract Documents.
2. Special Inspections
   - 2.1 Special inspections in accordance with Chapter 17 of the Building Code and as defined below shall be made by a qualified person approved by the Building Official. Special inspector shall observe work for conformance with the approved Drawings and Specifications.
   - 2.2 Inspection reports shall be furnished to the Building Official, Architect, and Structural Engineer. Discrepancies shall be brought to the attention of the Contractor, and, if not corrected, shall be reported to the Building Official, Architect, and Structural Engineer.
   - 2.3 Special inspector shall submit a final report stating that the structural work was, to the best of his knowledge, performed in accordance with the approved Drawings, Specifications, and the Building Code.
   - 2.4 Special Inspection Required for the Following Work: (Refer to Building Code and Specifications for detailed inspection requirements.)

Installation of High-Strength Bolts
Welding
Structural Frame and Details
Installation of Reinforcing Steel
Formwork
Concrete Placement
Masonry Construction
Structural Fill

   - 2.5 Weld inspectors shall be qualified under AWS D1.1 and approved by the local building authority. Inspectors performing nondestructive testing shall be qualified in accordance with The American Society for Nondestructive Testing, Inc. (refer to the Specifications for additional Information).

FOUNDATION (SEE DIVISION 2 SPECIFICATIONS)

1. Geotechnical Report: Farris McIntosh & Tremper, Inc. Dated 11/07/00
2. Building Pad Preparation
   - 2.1 Strip pavement, vegetation and topsoil.
   - 2.2 Proofroll building areas with a minimum of two complete coverages of a loaded dump-truck or scraper in each of two perpendicular directions. Replace soft areas with compacted structural fill.
3. Soil Bearing Capacity: Isolated Footings 2,500 psf
   Strip Footings 2,500 psf
4. Foundation Walls - Lateral Pressures

Walls supported at top (at-rest): 55 pcf Equivalent Fluid Density
Walls free to displace at top (active): 45 pcf Equivalent Fluid Density

REINFORCEMENT (SEE SPECIFICATION 03200)

1. Reinforcing Bars: ASTM A615, Grade 60
2. Welded Wire Fabric (WWF): ASTM A185, 8" minimum side and end laps
3. Reinforcement Placement (unless noted otherwise)
   - 3.1 Concrete Reinforcement Cover

Below Grade:	Unformed	3"	clear
	Formed	2"	clear
Walls		3/4"	clear
Columns/Pilasters (Ties)		1-1/2"	clear
Slabs		3/4"	clear

   - 3.2 Masonry reinforcing steel: Place in the center of CMU cells.
4. Reinforcement Splices
   - 4.1 Reinforcement marked "Continuous" can be spliced at locations determined by Contractor.
   - 4.2 All other reinforcement shall be spliced only at locations shown or noted, unless approved in writing by Structural Engineer.
   - 4.3 Splice Lengths (unless noted otherwise)

Concrete Reinforcement: Class B Tension Lap
Masonry Reinforcement: 48 bar diameters

5. Adhesive for Dowels in Existing Concrete: HIT HY150 injection adhesive supplied by Hilti Fastening Systems, EPCON System Ceramic 6 Epoxy adhesive supplied by ITW Ramset/Red Head, Power-Fast epoxy injection gel supplied by Powers Fastening, or approved equal.
   - 5.1 Minimum Embedment Length: 12 bar diameters, unless noted otherwise.

CAST-IN-PLACE CONCRETE (SEE SPECIFICATIONS 03100 AND 03300)

1. Concrete Minimum 28-day Compressive Strength, f'c
   - 1.1 Normal Weight Structural Concrete

Footings, Pedestals	3,000 psi
Foundation Walls	4,000 psi
Slabs-on-grade	3,000 psi
Slabs on Metal Forms	3,000 psi

2. Construction Joint Locations: No horizontal construction joints are permitted except those shown on the Structural Drawings or have written consent of the Structural Engineer.
3. Pipes or ducts shall not exceed one-third the slab or wall thickness unless specifically detailed. See mechanical and electrical drawings for location of sleeves, accessories, etc.
4. Special Finishes: Refer to Architectural Drawings for molds, grooves, ornaments, clips or grounds required to be encased in concrete and for location of floor finishes and slab depressions.
5. Defect Repair: Honey-combing, spalls, cracks, etc. shall be repaired. Extent of defective area to be determined by the Structural Engineer.

CONCRETE MASONRY (SEE SPECIFICATION 04200)

1. CMU Minimum Compressive Strength, f'm = 1,500 psi.
2. Mortar: Walls below grade Type M
   Bearing walls Type M or S
3. Coarse Grout: 2,500 psi min. compressive strength conforming to ASTM C476. Grout solid all bond beams, reinforced CMU cores, and all CMU cores below grade.
4. Horizontal Joint Reinforcement: No. 9 gage longitudinal wires at 8" vertically, unless noted otherwise. Provide special accessories for corners, intersections, etc. 1
5. Contraction Joints: Maximum spacing of 3 times of wall height or 30 feet (whichever is less) in all concrete masonry walls.
6. Dovetail Anchors: At 16" vertically, unless noted otherwise, where CMU walls abut concrete surfaces.
7. Submit written construction procedures prior to the start of masonry construction.

STRUCTURAL STEEL (SEE SPECIFICATION 05100)

1. Steel Shapes
   - 1.1 W-Shapes: ASTM A992 (Grade 50)
   - 1.2 Angles, Channels, Plates: ASTM A36
   - 1.3 Square/Rectangular Hollow Structural Sections (HSS): ASTM A500, Grade B
   - 1.4 Round Hollow Structural Sections: ASTM A501 or ASTM A53, Grade B
   - 1.5 Structural steel exposed to weather shall be galvanized.
2. Anchors, Bolts, and Studs
   - 2.1 Anchor Rods: Headed A307 Bolts or A36 Rods with plate washer
   - 2.2 Expansion Anchors: Hilti Kwik Bolt II anchors, Trubolt Wedge Anchors, Power-Stud anchors, or approved equal. Minimum embedment = 6 times anchor diameter, unless noted otherwise.
   - 2.3 Adhesive Anchors: HIT HY150 Injection Adhesive Anchors (HIT HY20 for masonry construction), EPCON System Ceramic 6 Epoxy Adhesive Anchors, Power-Fast Epoxy Injection Gel, or approved equal. Minimum Embedment = 6 times anchor diameter, unless noted otherwise.
   - 2.4 Bolts: 3/4" Diameter A325 minimum. The following connections are slip-critical:

Shear connection in welded moment connections (Rigid Frames, etc.)
Braced frame connections
Hanger connections
Any field modified connection

All other connections may be bearing type. Design bearing type connections for load values with threads included in the shear plane. Submit proposed bolt tightening procedure for review.

3. Structural steel shall be fabricated and erected according to the "Load and Resistance Factor Design Specification for Structural Steel Buildings" and the AISC "Code of Standard Practice for Steel Buildings and Bridges."
4. Connections shall be detailed based on the design information provided in the Structural Documents.
   - 4.1 Standard Shear Connections: Detail as bolted or welded double-angle, single-plate, single-angle, or tee connections in accordance with the connection tables in the "Manual of Steel Construction: LRFD", Second Edition, Volume II, Part 9.
   - 4.2 Welded Connections: Prequalified welded joints in accordance with AISC and the Structural Welding Code of the American Welding Society; "Non-prequalified joints" shall be qualified prior to fabrication.
   - 4.3 Factored Design Forces/Reactions: As shown on the Structural Drawings or, if not shown, the factored design reaction shall be half of the maximum factored uniform load tabulated in the "Manual of Steel Construction: LRFD", Second Edition, Volume I, Part 4.
5. Shop Drawings: Submittal shall adequately depict structural members and connections.
6. Architecturally Exposed Structural Steel (AESS): Conform to AISC Code of Standard Practice, Section 10. AESS shall be sandblasted (SSPC-SP6-82) prior to primer coat application. Primer shall be compatible with final paint coat and shall be approved by finish paint contractor. Metal deck shall be painted after installation. See Architectural Documents for paint specifications. AESS includes the following:

Structural steel members exposed to view
Structural steel members identified as AESS in the Structural Drawings

STEEL JOISTS (SEE SPECIFICATION 05200)

1. Steel Joists, Bridging, and Connections: Designed, fabricated, and erected according to Specifications of the Steel Joist Institute (SJI).
   - 1.1 Net Uniform Uplift Design Load for Roof Joists = 10 psf
2. Design of steel joists, bridging, and their connections shall be the sole responsibility of the Contractor. Submit shop drawings sealed by an Engineer licensed in the project state.
3. Contractor shall coordinate the construction and erection of walls, beam framing, metal decking, etc. to ensure compatibility of roof and wall systems considering pitch and camber of steel joists.

STEEL DECK (SEE SPECIFICATION 05300)

1. Non-Composite Steel Form Floor Deck: 26 gage, galvanized
2. Steel Roof Deck: 22 gage, galvanized
3. Submit shop drawings with the manufacturer's catalog demonstrating compliance with the Contract Documents and the Steel Deck Institute.

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STRUCTURAL ABBREVIATIONS

AFF	Above Finished Floor
ALT	Alternate
ARCH.	Architect/Architectural
BLDG	Building
B or BOT.	Bottom
B/xxx	Bottom of Something, e.g. B/FTG
CJ	Contraction/Construction Joint
CL	Centerline
CLR	Clear
CMU	Concrete Masonry Unit
COL.	Column
CONC.	Concrete
CONT.	Continuous
DBL	Double
DIA.	Diameter
DL	Dead Load
DP	Drilled Pier
DWG	Drawing
EE	Each End
EF	Each Face
EW	Each Way
EJ	Expansion Joint
EL.	Elevation
EQ.	Equal
ELEV.	Elevator
EMBED.	Embedment/Embedded
EOS	Edge of Slab
EXP.	Expansion
EXT.	Exterior
EQUIP.	Equipment
F/xxx	Face of Something, e.g. F/BEAM
FDN	Foundation
FIN.	Finished
FLR	Floor
FS	Far Side
FT	Feet
GA.	Gage
GALV.	Galvanized
HDD	Headed
HORIZ.	Horizontal
INT.	Interior
JT	Joint
K	Kips
ksi	Kips per square inch
ksf	Kips per square foot
lbs or #	Pounds
LL	Live Load
LLH	Long Leg Horizontal
LLV	Long Leg Vertical
MPE	Mechanical, Plumbing and Electrical
MFR	Manufacturer
MATL	Material
MAX.	Maximum
MECH.	Mechanical
MIN.	Minimum
MISC.	Miscellaneous
NS	Near Side
N/A	Not Applicable
NTS	Not to Scale
OPP.	Opposite
PART.	Partial
PEN.	Penetration
PL	Plate
psf	Pounds per square foot
psi	Pounds per square inch
R	Reaction
RAD.	Radius
RD	Roof Drain
REINF.	Reinforcing/Reinforcement
REQD	Required
REV.	Revision/Revised
SECT.	Section
SIM.	Similar
SPECS	Specifications
SQ.	Square
STD	Standard
STIFF.	Stiffener
STL	Steel
SYM.	Symmetrical
T	Top
T/xxx	Top of Something, e.g. T/SLAB
THK	Thick
TYP.	Typical
UNO	Unless Noted Otherwise
VERT.	Vertical
w/	With
w/o	Without
WP	Work Point
WT	Weight
WWF	Welded Wire Fabric

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Crisp Building Replacement
Paducah Community College

RECORD DRAWINGS SEPTEMBER 23, 2002

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REVISIONS
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