STRUCTURAL NOTES

DESIGN CODES AND SPECIFICATIONS.

THE INTERNATIONAL BUILDING CODE 2006 (IBC 2006).
BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE ACI 318-05
MANUAL OF STEEL CONSTRUCTION, ASD 9TH EDITION (AISC)
STRUCTURAL WELDING CODE - STEEL (D1.1) - AWS
THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS), 2005 EDITION

DESIGN LOADS

DECK LIVE LOAD = 65 psf.
SNOW LOAD
Pf = 20 psf.
Ce = .9
I = 1.1
C_t = 1
EARTHQUAKE LOAD (BUILDINGS)
Seismic Importance Factor = 1.0
Occupancy Category = II
Ss = 0.85
S1 = 0.24
Site Class = D
Seismic Design Category = D
Basic Seismic Force Resisting System
= Wood Shear Walls
Base Shear = 3.7 K
Cs = 0.109
R = 6.0
Analysis procedure = Equivalent
Lateral Force Procedure

WIND LOAD
Basic Wind speed = 90 mph (3 SECOND GUST)
Importance Factor: I = 1
Occupancy Category = II
Exposure = C
Internal Pressure Coefficient = 0.18
Components and Cladding Pressures:
Zone 4 = 16.50 psf, -17.99 psf

STRUCTURAL SPECIFICATIONS

GENERAL REQUIREMENTS

1. THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER IF THE CONTRACTOR DETERMINES OR SUSPECTS THAT ANY DETAILS, MATERIALS, MEANS OR METHODS INCLUDED IN THE STRUCTURAL SPECIFICATIONS OR STRUCTURAL DRAWINGS ARE INCORRECT, NEED TO BE CHANGED, INADEQUATE, UNFEASIBLE OR DETRIMENTAL TO THE COMPLETED CONSTRUCTION. NOTIFICATION SHALL BE MADE AT THE EARLIEST POSSIBLE TIME AND, WHEN POSSIBLE, PRIOR TO ORDERING MATERIALS OR COMMENCING WORK.

2. DEVIATION FROM THE STRUCTURAL SPECIFICATIONS AND STRUCTURAL DRAWINGS SHALL NOT BE MADE WITHOUT APPROVAL FROM THE STRUCTURAL ENGINEER.

3. DO NOT SCALE DIMENSIONS FROM STRUCTURAL DRAWINGS, (S SHEETS) WHEN SCALES ARE NOT SHOWN. WHEN SCALES AND DIMENSIONS ARE BOTH SHOWN FOR A DETAIL OR SHEET, DIMENSIONS SHALL TAKE PRECEDENCE WHEN IN CONFLICT WITH SCALE. ANY CONFLICT DISCOVERED BY THE CONTRACTOR SHALL BE REPORTED IN ACCORDANCE WITH NOTE 1. OF THIS SPECIFICATION SECTION.

4. HOLES FOR ANCHORS, DOWELS, ETC., SHALL NOT BE DRILLED THROUGH REINFORCING BARS WITHOUT APPROVAL OF THE STRUCTURAL ENGINEER.

5. NEITHER THE PRESENCE NOR LACK OF CONSTRUCTION OBSERVATION SHALL RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF COMPLETING WORK IN FULL COMPLIANCE WITH THE STRUCTURAL SPECIFICATION AND STRUCTURAL DRAWINGS.

STRUCTURAL FOUNDATION AND EXCAVATION SPECIFICATION

1. NET BEARING CAPACITY = 1,800 PSF
2. FOUNDATIONS SHALL BEAR ON UNDISTURBED NATURAL INORGANIC SOIL OR STRUCTURAL FILL OF BEARING CAPACITY CONFIRMED TO EQUAL OR EXCEED THE MINIMUM INDICATED IN NOTE 1. BOTTOMS OF FOOTINGS SHALL ALSO BE A MINIMUM OF TWELVE INCHES BELOW EXISTING NATURAL GRADE. BOTTOMS OF FOOTINGS SHALL BE DEEPENED AS NECESSARY TO SATISFY THESE REQUIREMENTS, OR UNSUITABLE SOIL SHALL BE REMOVED DOWN TO ACCEPTABLE SOIL AND REPLACED WITH LEAN CONCRETE OR CA6 PLACED IN LIFTS NOT TO EXCEED 4" AND COMPACTED TO 95 STANDARD PROCTOR.
3. BOTTOMS OF FOUNDATIONS SHALL BE FREE OF LOOSE MATERIAL AND EXCAVATOR CLAW MARKS
4. FOUNDATION CONCRETE SHALL BE PLACED BEFORE DETERIORATION OF THE SUBGRADE DUE TO WEATHER, GROUND WATER SEEPAGE, FOOT TRAFFIC, OR CONSTRUCTION OPERATIONS. ANY PORTIONS OF THE SUBGRADE PERMITTED TO DETERIORATE SHALL BE REMOVED AND REPLACED WITH COMPACTED CA6 OR LEAN CONCRETE WITHOUT ADDITIONAL COMPENSATION TO THE CONTRACTOR.
5. COMPACTED GRANULAR BACKFILL SHALL BE CA6.
6. COMPACTED GRANULAR BACKFILL SHALL BE PLACED IN MAXIMUM LIFTS OF 8".
7. COMPACTED GRANULAR BACKFILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN AND CONSTRUCTION OF TEMPORARY SHORING. TEMPORARY SHORING SHALL BE INSTALLED AS REQUIRED TO PROTECT EXISTING STRUCTURES AND CONSTRUCTION OPERATIONS.
9. THE CONTRACTOR SHALL SUBMIT DESIGN DETAILS AND CALCULATIONS SEALED BY AN ILLINOIS LICENSED STRUCTURAL ENGINEER FOR TEMPORARY SHORING.

STRUCTURAL CONCRETE SPECIFICATIONS

1. STRUCTURAL CONCRETE WORK ON THIS PROJECT SHALL BE CONFORM TO ALL REQUIREMENTS OF ACI 301-05, SPECIFICATION FOR STRUCTURAL CONCRETE, PUBLISHED BY THE AMERICAN CONCRETE INSTITUTE, FARMINGTON HILLS, MICHIGAN, EXCEPT AS MODIFIED BY THESE STRUCTURAL CONCRETE SPECIFICATIONS AND/OR STRUCTURAL DRAWINGS.
2. THE FOLLOWING INFORMATION IS EITHER MODIFIES OR IS IN ADDITION TO ACI 301-05. ACI 301-05 AND ALL DOCUMENTS REFERENCED BY ACI 301-05 MUST BE REVIEWED FOR COMPLETE REQUIREMENTS FOR STRUCTURAL CONCRETE WORK.
3. REFER TO GENERAL REQUIREMENTS OF STRUCTURAL SPECIFICATIONS. GENERAL REQUIREMENTS OF STRUCTURAL SPECIFICATIONS APPLY TO STRUCTURAL CONCRETE.
4. STRUCTURAL CONCRETE SHALL BE DEFINED AS ALL CONCRETE CONSTRUCTION DESCRIBED OR DETAILED BY THE STRUCTURAL CONCRETE SPECIFICATIONS AND STRUCTURAL DRAWINGS.
5. THE CONTRACTOR SHALL POSSESS AND BE FAMILIAR WITH ALL REFERENCED SPECIFICATIONS. A COMPLETE SET OF THE STRUCTURAL DRAWINGS AND ACI 301-05 SHALL BE MAINTAINED AT THE PROJECT SITE AND SHALL BE AVAILABLE TO ALL PARTIES (SUBCONTRACTORS, SUPERINTENDENTS, FOREMEN, ETC.) WHOSE UNDERSTANDING OF THE PROJECT REQUIREMENTS MAY AFFECT THE QUALITY OF STRUCTURAL CONCRETE CONSTRUCTION.
6. SUBMITTALS
   6.1 THE CONTRACTOR SHALL SUBMIT TO THE STRUCTURAL ENGINEER THE METHODS AND PRODUCTS THAT WILL BE USED TO PROTECT AND CURE STRUCTURAL CONCRETE.
   6.2 THE CONTRACTOR SHALL SUBMIT THE LOCATIONS, DETAILS AND MATERIALS DATA FOR ALL JOINTS IN STRUCTURAL CONCRETE THAT ARE NOT INCLUDED IN THE STRUCTURAL SPECIFICATIONS AND STRUCTURAL DRAWINGS, AND ARE PROPOSED BY THE CONTRACTOR.
   6.3 SUBMITTALS, AS APPLICABLE IN COMPLIANCE WITH THE FOLLOWING SECTIONS OF ACI 301-05: 1.6.3.2E, 1.6.3.4.1C, 3.1.1.1, 3.1.1.2, 3.1.1.3, 3.3.2.2, 3.3.2.8, 4.1.2.1, 4.1.2.5, 4.1.2.9, 4.2.1.1, 5.1.2.2B, 5.1.2.3A
7. REINFORCEMENT
   7.1 MINIMUM SPECIFIED YIELD STRENGTH OF REINFORCING BARS AND WELDED WIRE FABRIC , FY = 60,000 PSI.
   7.2 WELDED WIRE FABRIC SHALL BE FLAT SHEETS, NOT FROM ROLLS. WELDED WIRE FABRIC SHALL BE SUPPORTED ON CHAIRS THAT LOCATE THE FABRIC AT MID-DEPTH OF SLABS UNLESS SHOWN OTHERWISE. CHAIRS SHALL BE SPACED CLOSE ENOUGH TO PREVENT BENDING AND MAINTAIN FLATNESS OF THE SHEETS. CHAIRS PLACED ON SOIL OR CRUSHED ROCK SHALL HAVE CONTINUOUS RUNNERS, NOT INDIVIDUAL FEET.
   7.3 REINFORCING BARS AND FABRIC SHALL BE FIRMLY TIED IN PLACE AND NOT FLOATED IN UNLESS NOTED OTHERWISE.
   7.4 CARE SHALL BE TAKEN IN THE LOCATION OF REINFORCEMENT TO AVOID CONFLICT WITH DRILLED ANCHORS.
   7.5 REINFORCEMENT SHALL NOT BE WELDED WITHOUT APPROVAL OF THE STRUCTURAL ENGINEER.
8. CONCRETE REQUIREMENTS ACCORDING TO CLASSIFICATION.
STRUCTURAL CONCRETE SHALL BE PROVIDED ACCORDING TO THE CLASSIFICATION INDICATED IN THE STRUCTURAL CONCRETE SCHEDULE. REQUIREMENTS ACCORDING TO CLASS ARE AS FOLLOWS:

	CLASS A	CLASS B
28 DAY COMPRESSIVE STRENGTH, F'C (PSI)	4,000	4,000
MINIMUM CEMENT CONTENT (LB/CY)	540	540
WATER/CEMENTITIOUS RATIO	.45	.45
SLUMP WITHOUT HIGH RANGE WATER REDUCER (INCHES) +/- 1"	3	3
SLUMP WITH HIGH RANGE WATER REDUCER (INCHES) +/- 1 1/2"	5	5
AIR ENTRAINMENT EXPOSURE CONDITION *	MILD	SEVERE

†* PROVIDE AIR ENTRAINMENT IN ACCORDANCE WITH TABLE 4.2.2.4 OF ACI 301-05, REPRINTED.

TABLE 4.2.2.4-AIR CONTENT: OF CONCRETE FOR VARIOUS SIZES OF COARSE AGGREGATE

	AIR CONTENT, PERCENT†		
NOMINAL MAXIMUM SIZE OF AGGREGATE, IN.	SEVERE EXPOSURE	MODERATE EXPOSURE	MILD EXPOSURE
LESS THAN 3/8	9	7	5
3/8	7.5	6	4.5
1/2	7	5.5	4
3/4	6	5	3.5
1	6	4.5	3
1-1/2	5.5	4.5	2.5
2	5	4	2
3	4.5	3.5	1.5
6	4	3	1

*MEASURED IN ACCORDANCE WITH ASTM C 231, C 173, OR C 138 AIR-CONTENT TOLERANCE IS ±1-1/2%
Portland Cement Type Requirement per Concrete Class shall be as follows:
Class A - Any Type
Class B and C: Type II, Type IP (MS), Type IS (MS), Type I (PM)(MS) or Type I (SM)(MS).

9. CHLORIDE CONTENT
   9.1 CALCIUM CHLORIDE OR ADMIXTURES CONTAINING WATER SOLUBLE CHLORIDE FROM OTHER THAN INCIDENTAL IMPURITIES SHALL NOT BE USED.
   9.2 THE MAXIMUM WATER-SOLUBLE ION CONTENT, EXPRESSED AS A PERCENT OF THE CEMENT, CONTRIBUTED FROM ALL INGREDIENTS OF THE CONCRETE MIX, INCLUDING WATER, AGGREGATES, CEMENTITIOUS MATERIALS, AND ADMIXTURES, SHALL NOT EXCEED 0.10%.
10. WATER ADDED AT JOB SITE
   10.1 WATER MAY BE ADDED TO STRUCTURAL CONCRETE AT THE JOB SITE ONLY IN THE AMOUNT INDICATED ON THE BATCH TICKET.
   10.2 IF NO AMOUNT OF JOB SITE WATER IS INDICATED ON THE BATCH TICKET NO WATER SHALL BE ADDED AT THE JOB SITE.
   10.3 WHEN WATER IS ADDED AT THE JOB SITE, IT SHALL BE DONE SO AT THE CONTRACTORS RISK. A SLUMP TEST SHALL BE TAKEN AFTER WATER HAS BEEN ADDED. IF THE SLUMP EXCEEDS THE LIMIT SET BY THE STRUCTURAL CONCRETE SPECIFICATION THE CONCRETE SHALL NOT BE USED.
11. STRUCTURAL CONCRETE SHALL BE VIBRATED TO ENSURE CONSOLIDATION. VIBRATION SHALL NOT BE USED TO MOVE CONCRETE. CARE SHALL BE TAKEN TO PREVENT SEGREGATION AND LOSS OF AIR ENTRAINMENT CAUSED BY EXCESSIVE VIBRATION.
12. FINISHING UNFORMED SURFACES
   12.1 DO NOT SPRINKLE WATER ONTO CONCRETE SURFACES.
   12.2 DO NOT WORK BLEED WATER INTO CONCRETE SURFACES. WAIT UNTIL BLEED WATER HAS DISAPPEARED OR, IF BLEED WATER IS PRESENT WHEN FINISHING MUST BEGIN, REMOVE BLEED WATER BY BLOTTING.
   12.3 DO NOT SPRINKLE DRYERS SUCH AS SAND/CEMENT MIXTURES ONTO CONCRETE SURFACE.
   12.4 DO NOT USE STEEL TROWELS UNLESS INDICATED IN THE STRUCTURAL CONCRETE SCHEDULE FOR A SMOOTH FINISH.
13. PROTECTION AND CURING
   13.1 IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF PROBLEMS RESULTING FROM INADEQUATE PROTECTION AND CURING OF CONCRETE.
   13.2 THE CONTRACTOR SHALL DETERMINE WHEN PROTECTION IS NECESSARY AND WHAT METHODS AND MATERIALS WILL BE USED. PROTECTION SHALL BE IN COMPLIANCE WITH SECTION 5.3.6.5 OF ACI 301-05.
   13.3 CURING SHALL COMMENCE AS SOON AS NECESSARY TO PRESERVE MOISTURE AND SHALL BE CONTINUOUSLY MAINTAINED FOR A MINIMUM OF SEVEN DAYS. CURING SHALL BE IN ACCORDANCE WITH SECTION 5.3.6.1 OF ACI 301-05.
14. BATCH TICKET INFORMATION -
THE CONCRETE SUPPLIER SHALL INDICATE ON EACH BATCH TICKET THE AMOUNT OF WATER THAT MAY BE ADDED AT THE JOB SITE, PER CUBIC YARD OF CONCRETE, WHICH WILL NOT RESULT IN A WATER/CEMENTITIOUS RATIO IN EXCESS OF THAT SPECIFIED. THIS SHALL BE IN ADDITION TO THE INFORMATION REQUIRED BY ASTM C94/C 94M-99.

STRUCTURAL CONCRETE SCHEDULE

STRUCTURAL MEMBER OR COMPONENT	CONCRETE CLASS	UNFORMED SURFACE FINISH
BUILDING FOOTINGS	B	BOARD STRIKE OFF
INTERIOR SLABS ON GRADE	A	STEEL TROWEL FINISH
EXTERIOR WALLS	B	BROOM FINISH

STRUCTURAL STEEL SPECIFICATIONS

1. STRUCTURAL STEEL WORK ON THIS PROJECT SHALL CONFORM TO ALL REQUIREMENTS OF PART 5 SPECIFICATIONS AND CODES OF THE MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, NINTH EDITION, AND TO THESE STRUCTURAL STEEL SPECIFICATIONS AND STRUCTURAL DRAWINGS.
2. HOT ROLLED STRUCTURAL STEEL, PLATES AND BARS SHALL BE ASTM A572 GRADE 50 OR ASTM A992, UNLESS SHOWN OTHERWISE.
3. HOT ROLLED STRUCTURAL STEEL ANGLES SHALL BE ASTM A36.
4. CAST IN PLACE ANCHOR BOLTS SHALL BE ASTM A307 UNLESS NOTED OTHERWISE.
5. WELDING SHALL BE DONE WITH E70XX ELECTRODES.
6. INDICATED STRUCTURAL STEEL SHALL BE HOT DIPPED GALVANIZED PER ALL REQUIREMENTS OF ASTM A123.
7. INDICATED STRUCTURAL STEEL HARDWARE SHALL BE HOT DIPPED GALVANIZED PER ALL REQUIREMENTS OF ASTM A153.

STRUCTURAL WOOD FRAMING SPECIFICATIONS

1 STRUCTURAL FRAMING LUMBER SHALL BE NO. 2 S-P-F OR BETTER UNLESS OTHERWISE INDICATED IN THIS SPECIFICATION, OR IN THE SCHEDULES AND DETAILS ON THESE DRAWINGS. SHORT INDIVIDUAL PIECES OF BLOCKING SHALL BE FREE OF SPLITS, KNOTS, TWISTS, AND WARPS WHICH REDUCE THE STRENGTH OF MECHANICAL CONNECTIONS.

2 FRAMING ANCHORS SHALL BE FASTENED WITH THE TOTAL NUMBER OF FASTENERS WHICH THE ANCHOR CAN RECEIVE. THE TYPE AND SIZE OF FASTENERS SHALL BE AS REQUIRED BY THE MANUFACTURER. THE ANCHORS SHALL BE PLACED AND ALIGNED SO THAT ALL FASTENERS ARE FULLY EMBEDDED AND DO NOT CONFLICT WITH OTHER FASTENERS OR COMPONENTS. ANCHORS SHALL NOT BE INSTALLED AND THE ENGINEER SHALL BE CONTACTED IF PHYSICAL CONSTRAINTS PREVENT THE PROPER INSTALLATION OF ANCHORS. POWER NAILING OF FRAMING ANCHORS WILL BE PERMITTED ONLY WHEN THE NAIL TYPE AND DRIVING METHOD BOTH MEET THE REQUIREMENTS OF THE FRAMING ANCHOR MANUFACTURER.

3 THE MINIMUM HORIZONTAL OR VERTICAL DIMENSIONS OF ANY STRUCTURAL WOOD PANEL SHALL NOT BE LESS THAN 2'-0".

4 SHEATHING NAILS WHICH ARE NOT FULLY EMBEDDED INTO FRAMING SHALL BE REMEDIATED AS AND IF DEEMED NECESSARY BY THE ENGINEER. ADDITIONAL COMPENSATION WILL NOT BE PAID AND THE REMEDIATION SHALL BE COMPLETED AT THE CONTRACTORS EXPENSE.

PLATED WOOD TRUSS SPECIFICATION

1 THE TRUSS FABRICATOR SHALL PROVIDE A FRAMING PLAN, A SHOP DRAWING FOR EACH TRUSS TYPE AND DESIGN CALCULATIONS. THE FRAMING PLAN, EACH TRUSS SHOP DRAWING AND DESIGN CALCULATIONS SHALL BE SEALED BY AN ILLINOIS LICENSED STRUCTURAL ENGINEER.

2 THE TRUSS SHOP DRAWINGS SHALL INDICATE THE LOCATION, SIZE, AND FASTENING DETAILS OF PERMANENT LATERAL BRACING OF TRUSS MEMBERS.

3 IF TRUSSES ARE NOT TO BE IMMEDIATELY INSTALLED, THEY SHALL BE STORED IN A HORIZONTAL OR VERTICAL POSITION AS RECOMMENDED BY THE TRUSS PLATE MANUFACTURER. THEY SHALL NOT BE IN CONTACT WITH THE EARTH AND SHALL BE COVERED TO PREVENT CONTACT WITH WATER, SNOW OR ICE.

4 CONTRACTOR AND TRUSS FABRICATOR SHALL FIELD MEASURE AND COORDINATE TRUSS DIMENSIONS.

WOOD DECK SPECIFICATION

1 ALL SIMPSON'S SDS SCREWS SHALL HAVE A DOUBLE BARRIER COATING.

2 WOOD SHALL BE PRESSURE TREATED WITH ALKALINE COPPER QUATERNARY (ACQ) ACQ WITH NOT LESS THAN 0.25 PCF OR MORE THAN 0.30 PCF PRESERVATIVE RETENTION. ACQ PRESERVATIVE TREATMENT SHALL NOT CONTAIN AMMONIA.

3 SUBMITTALS - THE CONTRACTOR SHALL SUBMIT THE PRESSURE TREATED LUMBER MANUFACTURERS SPECIFICATIONS. THE SPECIFICATIONS SHALL INCLUDE THE AMOUNT OF PRESERVATIVE RETENTION, A LIST OF ALL CHEMICALS, AND EXPLICIT STATEMENT THAT AMMONIA IS NOT USED.

THOUVENOT, WADE & MOERCHEN, INC.
ENGINEERS ◆ SURVEYORS ◆ PLANNERS

☐ CORPORATE OFFICE
4940 OLD COLLINSVILLE RD.
SWANSEA, ILLINOIS 62226
TEL (618) 624-4488
FAX (618) 624-6688
corp@twm-inc.com

☒ WATERLOO OFFICE
113 SOUTH MAIN STREET
WATERLOO, ILLINOIS 62298
TEL (618) 939-5050
FAX (618) 939-3938
waterloo@twm-inc.com

☐ EDWARDSVILLE OFFICE
1015B CENTURY DRIVE
EDWARDSVILLE, ILLINOIS 62025
TEL (618) 656-4040
FAX (618) 656-4343
edwardsville@twm-inc.com

☐ ST. LOUIS OFFICE
1001 CRAIG ROAD, SUITE 260
ST. LOUIS, MISSOURI 63146
TEL (314) 236-5052
FAX (314) 872-2194
stlouis@twm-inc.com

PROFESSIONAL REGISTRATIONS	LICENSE NO.
ILLINOIS PROFESSIONAL DESIGN FIRM	184-001220
PROFESSIONAL ENGINEERING CORP.	62-035370
PROFESSIONAL STRUCTURAL ENGR. CORP.	81-005202
ILLINOIS PROF. LAND SURVEYING CORP.	048-000029
MISSOURI PROFESSIONAL ENGR. CORP.	NC 001528
MISSOURI LAND SURVEYING CORP.	NC 000346

SEAL

Signature:
Signature Date:
Expiration Date:

STATEMENT OF RESPONSIBILITY

I hereby confirm that the document herein to be authenticated by my seal is restricted to this sheet, and I hereby disclaim any responsibility for all other drawings, specifications, estimates, reports or other documents or instruments relating to or intended to be utilized for any other part of the architectural, engineering or survey project.

TITLE: STRUCTURAL NOTES AND SPECIFICATIONS

PROJECT: CHESTER WELCOME CENTER

REV.	DATE	DESCRIPTION
1	12/16/08	REVISIONS PER IDOT COMMENTS

DRAWN BY:	DJH
DESIGNED BY:	DJH
CHECKED BY:	KPC
APPROVED BY:	KPC
PROJECT NUMBER	050421

SHEET S1 OF 9 SHEETS

PROJECT DESCRIPTION

☒ ISSUED FOR REVIEW ☐ ISSUED FOR BIDDING
☐ ISSUED FOR CONSTR. ☐ RECORD DRAWING

H:\AutoCAD\borders\TWM200622X34.dwg 12/7/2006 9:35:09 AM CST