SECTION 013350

COMPUTER AIDED DESIGN COORDINATION DRAWINGS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS AND INFORMATION SPECIFIED ELSEWHERE

A. Project Meetings: Section 013119.

B. Submittals: Section 013300.

C. Coordination of Trades: Work of different trades that interfere between mechanical, plumbing electrical, architectural, and structural work shall be avoided by the contractor, within the limits of the practical amount of space required for operation and service of equipment. Keep pipe, duct, conduit, and the like as close to ceiling slabs, walls, columns, etc. to assure maximum benefit of the minimal space allowed. Locate piping, ductwork, and equipment so they do not interfere with the intended use of the operational equipment, and architectural elements. Organize piping, conduit and ductwork in all areas neatly, in an organized arrangement in accordance with approved coordination drawing submittals, in straight, plumb layouts utilizing best quality workmanship for appearance, function and serviceability.

1.02 COORDINATION DRAWINGS

A. The Director’s Representative will establish a CAD Administrator (CA) to administer and monitor progress of Coordination Drawings, coordinate and schedule review meetings and protocol for all contractors, and distribute information as outlined in this section.

B. The “Base” architectural and structural background drawings will be provided as Computer Aided Design (CAD) files in Autodesk’s AutoCAD 2004 or 2007 file format by the CA. The CA will meet with the contractors to determine which version of AutoCAD and which file format they will be using to produce drawings for this project. These “Base” background documents are to be provided to each Contractor in the coordination process to establish a common platform for each Contractor to use for their design drawings. This same information will be used to communicate their respective coordination with the other Contractors.

C. Each Contractor and all of their subcontractors shall prepare as part of its costs, shop drawings in compatible format which will be used for incorporation into the coordination drawings.

D. Work shall start on the coordination drawings within seven (7) days after the initial job meeting. The initial coordination drawing(s) shall be produced by the “C” Contractor starting with the “Base” CAD background drawing supplied by the Director’s Representative. These backgrounds shall be updated and modified with integration and revision of CAD drawings for new construction to indicate
conditions for approved final layouts for foundations, steel framing, concrete reinforcing, and access flooring approved rough-in layout plans. All building structural elements, walls, doors, windows, louvers, openings, ceiling layouts, access floor layouts and major equipment provided by the C contractor and other significant elements shall be shown on designated layers. Scheduled heights for finished ceilings above finished floor, and height above finished floor of underside of concrete and metal decks and all beams and joists including provision for fireproofing and finished enclosures shall be indicated at all areas.

1. The “C” Contractor shall provide full size “CAD” files for each level, to be plotted at 3/8” or approved coordination scale as directed by the CA.
   a. All larger coordination drawings, broken up with match lines to correlate with phases and distinct plan areas with drawing designations, shall be supplied by the “C” Contractor and approved by the CA.
   b. All coordination drawings will have the location of plan view information the same. The CA shall establish a point of origin for each drawing and these X and Y positions will not be altered by any Contractor.

2. Each Contractor in the “CAD” Coordination process shall utilize prefixes as established by the CA. Examples of some of those prefixes to be used are as follows:
   b. “SM” - HVAC Ductwork.
   c. “HV” - HVAC, Piping, Controls, etc.
   d. “PL” – Plumbing.
   e. “EL” – Electrical.
   g. “ST” – Structural.
   h. “RC” – Reflected Ceilings.
   i. “AF” – Access Flooring.

3. All fonts utilized shall be as found in the agreed upon version of AutoCAD software. If not as specified, the *.shx or *.ttf file shall be provided by the respective Contractor and approved by the Director’s Representative. All text height shall be a minimum of 3/32” when plotted in scaled plans.
   a. Compatible hardware and software for completion of designated coordination drawings and communication to the CA is to be included into the bid price.
   b. It shall be the responsibility of each contractor to translate drawings submitted by sub-contractors that were created in alternate CAD programs to the correct format before submission to the CA.

4. Transferring of coordination information drawings from Contractor to Contractor will be by the use of the OGS Project FTP site. Instructions for access to the site will be provided after award of contracts.

5. The final “BASE” Architectural Background drawings will be provided to each Contractor in the coordination process on the FTP site by the “C” contractor. The coordination drawings on disks, including one original vellum and nine prints, shall be forwarded to the CA for approval at each stage in the process by the contractor making the latest modifications.
6. A cross-reference list of drawings shall be provided by each Contractor correlating the drawings list with the “CAD” file name.

7. All altered, changed and/or revised coordination drawings, after resolution of conflicts by the Contractors, shall be submitted via the FTP site.

8. Coordination drawings shall be prepared for the following areas:
   a. All areas (above ceiling).
   b. Below raised access floors, slab penetrations and inserts.

9. Separate coordination plans shall be prepared for the following areas:
   a. Mechanical rooms.
   b. Electronics rooms.
   c. Electrical rooms.
   d. Communications rooms.
   e. Radio room.
   f. UPS.

E. The sequence of drawings being passed on from one Contractor to another, and the responsibility of each shall be as follows:

1. The initial base Architectural Background drawing, including architectural elements as noted above, shall be placed on the FTP site for each Contractor to access. The CA shall be responsible for periodically updating the base drawings with approved architectural revisions. Each Contractor shall be responsible for submitting drawing files to the FTP site, in the same manner outlined and in the format outlined in this Section. It is the responsibility of each Contractor to check the FTP daily for updates to the drawing files.

2. Within 10 days from date of issue of the Architectural Background by the CA, the “C” Contractor will submit proposed plan layouts and drawing designations. The “C” Contractor will promptly update the backgrounds with detailed layout information based on verification of conditions and dimensions including but not limited to column and beam locations and clear height from finished floors to underside of structure indicating all permanent obstructions. The base drawings provided by the Director’s Representative are drawings that were prepared for use in the printing of bid documents. While generally accurate, there is no guarantee of perfect dimensional accuracy of these initial CAD files. It is the responsibility of the “C” Contractor to verify conditions that may vary and to assure the accuracy of drawings showing new construction. The background drawings shall be further updated by the “C” contractor with detailed layout information based on approved shop drawing submittals for steel framing, decking and reinforcing, ceilings and access flooring. Within 60 days from award of contract the “C” Contractor will complete the final Architectural Backgrounds with information outlined above and post on the FTP site, and will notify the CA, the Director’s Representative, and all other contractors. Shop drawing submittals must be expedited for all necessary components to complete this work in a timely manner. The “C” contractor will plot the final background drawings and submit 5 sets of prints for approval to the CA.

3. Within 21 days of date of issue of final background drawings by the “C” contractor, the “H” contractor will post updated drawings to the FTP site indicating accurate layouts for all his work including equipment size and
locations, HVAC piping and ductwork indicating all sizes and height above finished floors, grilles, registers, diffusers, dampers, valves, equipment connections and all major components based on approved submittals, and will notify the CA, the Director’s Representative, and all other contractors. Shop drawing submittals must be expedited for all necessary components to complete this work in a timely manner. HVAC ductwork shop drawing submittals and approvals must precede the application of this information to the coordination drawings and the addition of piping and other work. The “H” contractor will plot the updated background drawings and submit 5 sets of prints for approval to the CA.

4. Within 15 days from date of approval of updated backgrounds by the “H” contractor, the “P” contractor will post updated drawings to the FTP site indicating accurate layouts for all plumbing systems indicating sizes and height above finished floor at regular intervals, fixture locations and fire protection systems, and will notify the CA, the Director’s Representative, and all other contractors.

5. Within 15 days from date of issue of updated backgrounds by the “P” contractor, the “E” contractor will post updated drawings to the FTP site indicating accurate layouts for all electrical equipment, conduit runs, all lighting fixtures and electrical devices indicating mounting locations and height above finished floor, and will notify the CA, the Director’s Representative, and all other contractors.

6. Contractors may submit completed drawings to the FTP Site prior to the total duration established for each contractor. The CA will schedule the sequence for early submissions.

F. Computer Software/Hardware
1. Contractors shall produce their drawings using the agreed upon version of AutoCAD. Contractors may request to use other CAD software, but only with the understanding that they must submit drawings that follow the requirements outlined in this Section.

2. Contractors shall be equipped with a 56 Kbps or greater modem for file transfer with the FTP site, using Microsoft’s Internet Explorer version 6.0 (service pack 2) or later for file transfer. Contractors shall be experienced in the use of that modem software before commencement of the drawing process outlined above.

G. Computer Drawings/Files
1. Each Contractor shall be assigned a “Contractor Code” that shall be used throughout the Computer drawings in computer file names and drawing layer names. Those prefixes for example are assigned as follows:

<table>
<thead>
<tr>
<th>CONTRACTOR</th>
<th>SUBCONTRACTOR CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C............</td>
<td>ST - Structural</td>
</tr>
<tr>
<td>E............</td>
<td>EL - Electrical</td>
</tr>
<tr>
<td>C............</td>
<td>EV - Elevator</td>
</tr>
<tr>
<td>E............</td>
<td>FA - Fire Alarm</td>
</tr>
<tr>
<td>P............</td>
<td>FP - Fire Protection</td>
</tr>
<tr>
<td>H............</td>
<td>HV - HVAC</td>
</tr>
<tr>
<td>P............</td>
<td>PL - Plumbing</td>
</tr>
</tbody>
</table>
2. Each base drawing file shall be renumbered with each revision with the addition of the Contractor Code. The original drawing file names shall be issued by the “C” Contractor with the release of each approved final background drawing.

3. Each Contractor shall place their work on drawing layers starting with the two letter designations. A layer list will be issued at the initial coordination meeting.

4. Each Contractor shall be assigned a color for their layers to easily distinguish their work from the other Contractors. Contractors shall not deviate from that color without specific instructions.

5. Text size shall be a minimum of 8” in a 1/8” drawing. All text shall be on a separate layer. See attached layer list for each Contractors text layer. All text and callouts shall be located on drawing as not to interfere with other existing data. Contractors shall not deviate from the fonts assigned unless approved by the CA. If non-standard AUTOCAD fonts are used, Contractor shall supply fonts with drawing files.

6. All dimensions shall be placed on their own layer. See attached layer list for each Contractors dimension layer. Each Contractor shall have their own dimension style defined in the DIMS command as SM-DIMS, HV-DIMS, PL-DIMS etc.

7. Any and all blocks used in the drawings shall be created on layer 0 unless otherwise directed. Blocks can then be inserted on Contractor’s layer.

8. All questions to be addressed by the Director’s Representative shall be placed on the Contractors Questions layer.

9. All beam and slab penetrations shall be shown on the drawings on separate layers with special designations and unique colors to be determined.

10. When a revision is made to a drawing that has been previously issued, or when a specific question or problem area needs attention by others, it shall be clouded and referenced by the Contractor with a revision number. The revision number symbols shall be issued by the CA. The clouds shall be constructed with the cloud command list routine issued by the CA. Clouds and revision numbers shall be placed wherever an addition, deletion, or a change is made, or where an unresolved question remains. The Contractor shall be responsible for checking with the CA for the Revision number to be placed on any particular drawing, and the layer on which that revision number shall be placed.

H. Once the CA receives each final background drawing from the “C” Contractor, the “C”, “H”, “P”, and “E” Contractors shall meet at a minimum weekly meetings to be held to review the status of the coordination process, and drawings which the foremen and/or Superintendent of each Contractor will be required to attend. Each Contractor will be required to bring at least one color plot of all areas to be coordinated of the most current version on the FTP site at that weeks meeting. Each affected Contractor shall review, sign and date each updated coordinated drawing which will indicate their agreement that the
coordination drawing(s) has (have) been fully coordinated and are void of all
conflicts at each stage. Final completed coordination drawings (after submission
by the “E” Contractor) shall be signed off by each Contractor, the Director’s
Representative, and the CA. Any work in place not in conformance with final
approved coordination drawings will be required to be removed and relocated
unless specific written approval has been obtained by the Director’s
Representative to proceed with certain specific work in advance of final
approval.

I. Any conflicts, etc., discovered in the coordination stages prior to Contractor(s)
sign-off which cannot be resolved by the Contractor(s) shall be brought to the
attention of the Director’s Representative for immediate resolution by the
Director at no additional costs to the State. Contractors shall allow for a
minimum of one coordination meeting per week.

J. Any conflicts, etc., discovered after coordination sign-off and during the
installation of the Work will be the responsibility of the Contractor(s) to resolve
with the approval of the Director. Additional costs, if any, for these resolutions
shall be solely the responsibility of the Contractor(s).

K. It is the responsibility of the “C” Contractor to verify the accuracy of the final
background drawings, and of each subsequent Contractor to verify the
completeness and accuracy of the updated information of their own work and to
confirm the absence of conflict with other work.

L. A coordination drawing schedule will be developed by the CA for tracking and
reporting the status of coordination drawings with the overall project schedule to
which all Contractors shall be responsible.

M. Work fabricated/installed prior to the completion of this process is performed at
the Contractors own risk, and compensation of time/costs for corrections will not
be allowed.

N. During the project these drawings shall be kept up to date by each prime
contractor to reflect any and all changes due to field changes, change orders and
field orders and shall be used as a basis of the required “As-Built” drawings. At
the completion of the contract the construction contractor shall gather the latest
information and turn over 5 paper sets and two CD’s of the final updated
Coordination drawings which is in addition to the specified trade “as-built”
drawings for each prime contract

O. Each Contractor shall be responsible for timely updates to the coordination
drawings to indicate as-built conditions for their own work. Updates are required
to include all changes regardless of the source or reason for the change, including
changes initiated by the Director or the Director’s Representative. These “as-
built” coordination drawing documents (diskettes, mylars, and prints) shall be
turned over by each Contractor with certification as to their accuracy, to the
Director’s Representative upon substantial completion of the project.

PART 2   PRODUCTS (Not Used)
PART 3 EXECUTION (Not Used)

END OF SECTION

a. when coordination of mechanicals is necessary between multiple prime contractors

END OF INFORMATION