This Package Includes:

- Comments on Provided Solution
- Steel Quantity Takeoff
- Building Code Criteria
- 2nd Floor Framing Plan
- 3rd-4th Floor Framing Plan
- Roof Framing Plan
- Column and Frame Layout Plan
- Column Schedule
- Frame Elevations
The information contained in this document is not intended as a basis for structural design for this or any project. Rather, it is a conceptual approach to the project that demonstrates the viability of the steel system for project requirements, budget, and schedule.

1) The Conceptual Solution and estimates for this project are based on parameters defined through architectural drawings and project criteria received on January 7, 2008.
2) The steel quantities and geometry based on this investigation are provided on floor framing plans, a column and frame layout plan, a column schedule, and frame elevations on the following pages.
3) The design criteria per the 2006 International Building Code (IBC 2006) is summarized and included in the following pages.
4) Based on the available options, the Girder Slab system best fits the needs of the project. The benefits of this system are low floor to floor heights and speed of construction.
5) The Girder-Slab system is a patented, but non-proprietary, system comprised of an interior girder known as an open-web dissymmetric beam, or D-Beam, which supports precast, prestressed hollow-core slabs on its bottom flange. Upon grouting, the system develops composite action, enabling it to support residential loads. Consult the Girder-Slab Technologies website (www.girder-slab.com) for licensing, design, connections, fabrication, and erection information.
6) The application and use of the Girder-Slab System technology requires design by your registered professional engineer or architect. A registered professional engineer is engaged to design the superstructure according to customary practice, incorporating the Design-Guide information much the same as for other products, such as metal deck or bar joists.
7) See the Girder-Slab Design Guide (found on the Girder Slab Technologies website www.girder-slab.com) for information on "Tree" column as indicated on the sketches included in this document. The trees consist of a WT with a flat bar welded to the leg of the WT.
8) The lateral force-resisting system consists of steel concentrically braced frames in one direction and steel moment frames in the other.
9) The typical floor framing is 10 in precast hollow core plank supported by Girder Slab D-beams.
10) In areas where the precast plank spans parallel to the exterior of the building, the precast plank may be designed and detailed to support the façade. Therefore, structural steel beams may not required in these locations in the finished building. For this study, the steel quantity takeoff does include the quantities of the exterior steel beams.
11) Structural steel beams may be required for temporary erection bracing, however this investigation does not include an evaluation of means and methods of construction and no member sizes are provided for these beams. The weight of any such erection members are NOT included in the provided quantities.
12) The precast hollow-core plank is not cambered and is assumed to have no structural topping. Non-structural topping used to level the top of the plank may be applied. Shear studs are assumed to be provided every 24 in. along all girders supporting precast plank.
13) The non-structural topping provided is due to the balcony configurations of the floor plate. At all balcony locations, the topping tapers to provide slope for drainage and exterior waterproofing.
14) Custom-cast solid plank may be required to form the balconies and provide the required slope for drainage and exterior waterproofing.
### Suspended Steel Floor Areas:

- **61,350 ft²**
- 10 in precast hollow core plank

### Estimated Steel Quantities:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Load</th>
<th>Pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gravity Columns</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W12s</td>
<td>36</td>
<td>1.17</td>
<td>82</td>
</tr>
<tr>
<td><strong>Beams (gravity)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-beams</td>
<td>44</td>
<td>1.4</td>
<td>122</td>
</tr>
<tr>
<td>Wide Flange</td>
<td>34</td>
<td>1.1</td>
<td>126</td>
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<tr>
<td><strong>Braced Frames</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beams</td>
<td>12</td>
<td>0.39</td>
<td>44</td>
</tr>
<tr>
<td>Columns</td>
<td>32</td>
<td>1.04</td>
<td>64</td>
</tr>
<tr>
<td>Braces (HSS)</td>
<td>3</td>
<td>0.10</td>
<td>24</td>
</tr>
<tr>
<td><strong>Steel not indicated in sketches</strong></td>
<td>5%</td>
<td>0.26</td>
<td>462</td>
</tr>
</tbody>
</table>

*The quantities are based on centerline dimensions*

**Steel not indicated in sketches accounts for framing not included in the estimate such as framing for openings or various members eliminated for simplification. It does not include connection material, slab edge material or façade attachments.*

### Material Specification

- Wide flange shapes are A992, Gr. 50
- Rectangular HSS sections are A500 Gr. B
This investigation is based on the following criteria. The Steel Solutions Center does not assert that these are the criteria that apply to this project. The criteria are chosen based on the project location and the widely adopted model building code, the 2006 International Building Code. Requirements by local and state jurisdictions have not been considered. If actual project criteria differ significantly from those listed, the results presented may no longer be valid.

**Gravity Loads**

**Dead Loads**
- Typical Residential Floor Slab 70 psf (10 inch precast hollow core plank)

**Live Loads**
- Residential 60 psf (includes 20 psf for partition loads)
- Roof Live 20 psf

**Superimposed Dead Loads**
- Typical Residential 10 psf (CMEP, plank topping, etc)
- Roof 20 psf (MEP, misc)

**Cladding Loads**
- Typical 500 plf

**Wind Load Parameters**
- Basic Wind Speed = 90 mph
- Wind Importance Factor, \( I_W \) = 1.00
- Exposure Category = B
- Topographical Factor = 1.00
- Drift Limit = \( H/500 \)

**Basic Seismic-Force-Resisting System**
- Steel concentrically braced frames

**Seismic Design Parameters**
- Seismic Use Group = II
- Seismic Importance Factor, \( I_E \) = 1.00
- Seismic Design Category = B
- Site Class = D
- Spectral Response Acceleration at Short Periods (0.2s), \( S_s \) = 0.175 g
- Spectral Response Acceleration at One Second Period, \( S_1 \) = 0.043 g

**Building Period Coefficient, \( C_T \)**
- X-axis = 0.020
- Y-axis = 0.020

**Response Modification Coefficient, \( R \)**
- X-axis = 3.0
- Y-axis = 3.0

**System Overstrength Factor, \( \Omega \)**
- X-axis = 3.0
- Y-axis = 3.0

**Deflection Amplification Factor, \( C_d \)**
- X-axis = 3.0
- Y-axis = 3.0

**Note:** The requirements of the AISC Seismic Provisions WERE NOT used in determining the quantity estimate for this project. Whether or not the special seismic requirements must be taken into account in the design is based on the applicable building code and local requirements.
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The structural system consists of 3" Prestressed concrete hollow core plank.

4. See the column and Frame Layout Plan and the Column Schedule for graying column sizes.

7. The column and Frame Layout Plan and the Frame Elevations for Frame Beam, column, and beam sizes.

6. Boxes indicate lateral force-resisting frames. See the Column and Frame Layout Plan and the Frame Elevations for Frame Beam, column, and beam sizes.

5. The structural system consists of 3" Prestressed concrete hollow core plank.

NOTES:

1. Each member is marked with the estimated member size for standard wide-flange beam or Grid: D-Beam. The estimated number of studs is provided in the brackets.

2. See the Girder Span, Technology: WebSpur (www.girder-web.com) for information on the D-Beam sizes. Parent sections, and the columns. The following illustrates the D-Beam moment scheme.

Special members are not included. A local estimated number of studs is provided in the brackets.

10. Precast Plank TP

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And Floor Framing Plan
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5) The estimated floor system consists of a 10" precast concrete hollow core plank.

4) See the Column and Beam Layout Plan and the Column Schedule for varying column sizes.

3) Boxes indicate integral force-resisting frames. See the Column and Beam Layout Plan and the Frame Elevations for Frame beam column and column

2) See the Figure-8 steel connections (www.girdersltd.com) for information on the D-beam sizes, parent sections, and the columns. The following illustrates the D-beam notation scheme.

1) Each member is marked with the estimated member size for standard wide-flange beam or Girder D-beam. The estimated number of studs and

NOTES:

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<th>C2</th>
<th>C1</th>
</tr>
</thead>
</table>

COLUMN MARK

Base

W12X63
W12X68
W12X40

2nd Floor (14.0")
W12X40
W12X40

3rd Floor (24.0")
W12X40
W12X40
W12X40

4th Floor (34.0")
W12X40

Roof (44.0")

Column Schedule

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