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Executive Summary

The purpose of this report is to analyze and assess the life safety and fire protections systems of the KIPP Academy of Opportunity (KAO) charter school located in South Los Angeles. KAO is a 3-story building with a total area of 27,429 ft² that was originally built in 2003 to serve 400 students.

Two separate fire and life safety assessments were performed in this project to ensure the building meets the requirements by the building code and fire safety standards.

The prescriptive based analysis includes assessment of structural design, construction materials, egress design, fire alarm, communication system, fire suppression system, flammability analysis, and smoke management. The results of the prescriptive based analysis showed that the building complies with the requirements of the building code and fire safety standards.

In the performance-based analysis, two different fire scenarios were evaluated using FDS and Pathfinder programs. The Available Safe Egress Time (ASET) and Required Safe Egress Time (RSET) were calculated for each scenario to evaluate how occupants evacuate the building during a real-life fire event.

The first fire scenario in the performance-based analysis was based on the 2nd recommended scenario in the life safety code. It is based on the assumption that an arson fire starts from a cluttered space under the first-floor stairways, compromises 1 of the 2 exits, and spreads into the corridors.

The RSET was calculated as 4 minutes for the first floor, 15 minutes for the second floor, and 13 minutes for the third floor. However, the ASET was calculated as 3, 2.8, and 2 minutes for the first, second, and third floor, respectively. Therefore, the first fire scenario failed because ASET
was smaller than RSET. It is recommended that the egress route be kept free of clutter and stairways doors kept closed at all times as a precaution.

The second fire scenario was based on the 3rd fire scenario recommended in the life safety code. This fire occurs in an unoccupied staff lounge next to a multipurpose area which is considered a high occupancy room. Using FDS, the ASET was calculated as 4 minutes for the multi-purpose area and 90 seconds for the staff lounge. Also, the RSET for the multi-purpose area is calculated as 3.7 minutes. Since detection time starts when the staff lounge smoke detector is activated, the RSET is smaller than ASET. Therefore, this design was acceptable.

Keywords: LIFE SAFETY CODE, PRESCRIPTIVE DESIGN, PERFORMANCE-BASED DESIGN, FIRE PROTECTION ENGINEERING, EDUCATIONAL BUILDING, SCHOOL
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Background

The U.S. fire departments responded to an estimated average of 3,570 structure fires in school properties in 2009-2013, annually. These fires caused annual averages of 64 civilian fire injuries and $62 million in direct property damage (Campbell, 2016).

Two-thirds of the civilian injuries and half of the fires and direct property damage occurred in middle and high schools, while one-third of the fires occurred in elementary schools. Fires in elementary schools accounted for 29% of direct property damage and one-quarter of civilian injuries. (Campbell, 2016)

In 2009-2013, nearly one-half (47%) of structure fires in school properties were intentionally set. These fires resulted in 51% of the civilian injuries and 37% of the direct property damage. Cooking equipment was the second leading cause of fires in school properties, accounting for 27% of fires, 14% of civilian injuries, and 6% of the direct property damage. Playing with a heat source was responsible for 19% of fires, 21% of civilian injuries, and 18% of direct property damage. Therefore, the fire hazard in educational properties is a great issue that needs to be addressed (Campbell, 2016).

Heat Source

- Lighter (23% of fires, 33% of injuries, 19% of direct property damage)
- Unclassified heat from operating equipment (15% of fires, 12% of injuries, and 7% of direct property damage)
- Radiated or conducted heat from operating equipment (13% of fires, 13% of injuries, and 6% of direct property damage)

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• Match (10% of fires, no injuries, and 9% of direct property damage) (Campbell, 2016)

Area of Origin

• Lavatory, bathroom, locker room, or checkroom (33% of fires, 22% of injuries, 3% of direct property damage)
• Kitchen or cooking area (14% of fires, 9% of injuries, 5% of direct property damage)

Item 1st Ignited:

• Rubbish, trash, or waste (24% of fires, 16% of injuries, 11% of direct property damage)
• Cooking materials (13% of fires, 3% of injuries, and 0% of direct property damage)
• Magazine, newspaper, or writing a paper (11% of fires, 3% of injuries, and 3% of direct property damage) (Campbell, 2016)

Scope of Project

The scope of this project is to analyze and evaluate the KAO building, as well as the fire and life safety systems to ensure the building was designed to meet the building codes and fire safety standards. The evaluation of the KAO building includes a prescriptive based analysis and a performance-based analysis.
General Description

KIPP Academy of Opportunity (KAO) is a public charter middle school opened in summer 2003 in South Los Angeles with 90 fifth-grade students, under the leadership of founder Mikelle Willis. It was rebuilt in 2017 and now is serving 400 students from 5th grade to 9th grade. This building was constructed as a modular type with unprotected combustible materials (Type IIIB). It is a 3-story building with a total area of 27,429 ft².

Project Location

KIPP Academy of Opportunity (KAO) is located at 8500 S. Figueroa St. Los Angeles, CA 90003 as it is shown in Figure 1. Also, a picture of the area is shown in Figure 2.

Figure 1 - Vicinity Map
Building Information

- Number of Stories: 3
- Sprinklered: Yes
- Fire Alarm: Manual & Automatic WI Voice EVAC PER CFC 907
- Building Area: 27,429 ft²
- Ceiling Height: 9.5 ft.
- Building Height: 42 ft.
- Foundation: Concrete
- Occupancy: E
- Number of Story: 3
Construction Classification:

According to IBC 2017, Section 305, this building is classified as Group E (educational) and it has all the requirements of for type III-B construction.

Building introduction

This building is a 3-story building with an overall height of 42ft. ceiling height of each floor is 9.5 ft. the total area of the building 27,429 ft². The area of each floor is mentioned below:

- 1st Floor: 9,054 ft²
- 2nd Floor: 9,192 ft²
- 3rd Floor: 9,192 ft²

As illustrated in Figure 3, the first floor includes a multi-purpose area, 2 classrooms, 4 offices, a workroom, a staff lounge, and a student room. All these rooms are connected through a corridor. At each end of the corridor, there is an exit door. In the north of the multi-purpose area, there is a stairway that connects to the other floors and another stairway is in the south of the building at the end of the corridor.
As shown in Figure 4, the second floor, contains 8 classrooms and a lavatory area. A corridor has connected all classrooms together exit doors are at each end of the corridor.
The 3rd floor, Figure 5, is identical to the second floor. Except for 2 classrooms, the area is less than the second floor, because of the added closets.

---

*Figure 5 - Third Floor (9192 ft²)*
Applicable Codes

- California Building Code (CBC) – 2016
- California Fire Code (CBC) -2016
- NFPA 72-National Fire Alarm Codes -2016
- NFPA 13-Standard for Installation of Sprinkler System -2016
- International Building Code (IBC) -2018

Prescriptive Design Analysis

In this section, the KAO school building is evaluated to ensure it was designed to meet the prescriptive codes such as International Building Code (IBC) and NFPA 101, and whether code restrictions are applicable to the design of the school building. The following criteria have been analyzed and evaluated in the prescriptive design method:

- Egress requirements
- Suppression requirements
- Fire alarm requirements
- Structural requirements
- Flammability and Smoke Control Requirements

Egress Requirements

Occupancy Classifications.

The floor plan of each level is color-coded to indicate and distinguish different occupancy classifications. The first-floor occupancy as shown in Figure 6, is a mix of education,
business, assembly, storage, and collaboration occupancies. Figure 7 shows the legend for color codes.

Figure 6 - First Floor Occupancy classification

Figure 7 - Legends

The occupancy of the second and third floors is only education on the second and third floors. They are shown in green in Figure 8 and Figure 9.

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Figure 8 - Second Floor Occupancy classification

Figure 9 - Third Floor Occupancy classification
**Exits and Exit Access**

The exit doors for the first floor are shown in Figure 10. They are located at each end of the corridor, in the lobby, in the multipurpose area, and at each stairway.

![First Floor Exit Signs](image)

**Figure 10 - First Floor Exit Signs**

On the 2nd floor and 3rd-floor exit doors, as they are shown in Figure 11 and Figure 12, are located at each end of the corridor.
The adequacy and building requirements will be discussed in section Egress Capacity.
**Occupant Loads**

The occupant loads per each floor are calculated in Table 1. The occupant load on the 1st floor is 319 people; on the second floor it is 316 people and on the 3rd floor 313 people. The occupant load for each room has been calculated based on NFPA 101 section 7.3.3.1.

*Table 1- Occupancy Load Calculation*

<table>
<thead>
<tr>
<th>Space</th>
<th>used space</th>
<th>Occupant load factor(ft/person)</th>
<th>Net/Gross</th>
<th>Area [ft²]</th>
<th>Occupant load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Floor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>319</td>
</tr>
<tr>
<td>Music Classroom C01</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>673</td>
<td>33</td>
</tr>
<tr>
<td>Classroom C02</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>691</td>
<td>35</td>
</tr>
<tr>
<td>Multipurpose room</td>
<td>Less concentrated use,</td>
<td>15</td>
<td>Net</td>
<td>3155</td>
<td>211</td>
</tr>
<tr>
<td></td>
<td>without fixed seating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Lounge</td>
<td>Less concentrated use,</td>
<td>15</td>
<td>Net</td>
<td>218</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>without fixed seating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office 102</td>
<td>Business</td>
<td>150</td>
<td>Gross</td>
<td>148</td>
<td>1</td>
</tr>
<tr>
<td>Office 103</td>
<td>Business</td>
<td>150</td>
<td>Gross</td>
<td>104</td>
<td>1</td>
</tr>
<tr>
<td>Office 104</td>
<td>Business</td>
<td>150</td>
<td>Gross</td>
<td>102</td>
<td>1</td>
</tr>
<tr>
<td>Administration</td>
<td>Business</td>
<td>150</td>
<td>Gross</td>
<td>409</td>
<td>3</td>
</tr>
<tr>
<td>Workroom</td>
<td>Shops, laboratories,</td>
<td>50</td>
<td>Net</td>
<td>347</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>vocational rooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lobby</td>
<td>Collaboration rooms/spaces</td>
<td>30</td>
<td>Gross</td>
<td>161</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>≤450 ft² (41.8 m²) in area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student room</td>
<td>Shops, laboratories,</td>
<td>50</td>
<td>Net</td>
<td>114</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>vocational rooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>Storage</td>
<td>300</td>
<td>Gross</td>
<td>48</td>
<td>1</td>
</tr>
<tr>
<td>Utility</td>
<td>Storage</td>
<td>300</td>
<td>Gross</td>
<td>200</td>
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</tr>
<tr>
<td>Custodial</td>
<td>Storage</td>
<td>300</td>
<td>Gross</td>
<td>87</td>
<td>1</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Second Floor</th>
<th>Type</th>
<th>Rooms</th>
<th>Net</th>
<th>Occupant Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom C03</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>793</td>
</tr>
<tr>
<td>Classroom C04</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>779</td>
</tr>
<tr>
<td>Classroom C05</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>779</td>
</tr>
<tr>
<td>Classroom C06</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>780</td>
</tr>
<tr>
<td>Classroom C07</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>770</td>
</tr>
<tr>
<td>Classroom C08</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>783</td>
</tr>
<tr>
<td>Classroom C09</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>749</td>
</tr>
<tr>
<td>Classroom C10</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>810</td>
</tr>
<tr>
<td>Custodial</td>
<td>Storage</td>
<td>300</td>
<td>Net</td>
<td>35</td>
</tr>
<tr>
<td>Third Floor</td>
<td></td>
<td></td>
<td></td>
<td>313</td>
</tr>
<tr>
<td>Classroom C11</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>780</td>
</tr>
<tr>
<td>Classroom C12</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>779</td>
</tr>
<tr>
<td>Classroom C13</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>768</td>
</tr>
<tr>
<td>Classroom C14</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>768</td>
</tr>
<tr>
<td>Classroom C15</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>770</td>
</tr>
<tr>
<td>Classroom C16</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>770</td>
</tr>
<tr>
<td>Classroom C17</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>749</td>
</tr>
<tr>
<td>Classroom C18</td>
<td>Classrooms</td>
<td>20</td>
<td>Net</td>
<td>797</td>
</tr>
<tr>
<td>Custodial</td>
<td>Storage</td>
<td>300</td>
<td>Net</td>
<td>35</td>
</tr>
<tr>
<td>Occupant load</td>
<td></td>
<td></td>
<td></td>
<td>948</td>
</tr>
</tbody>
</table>

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Egress Capacity

The egress capacity for each floor is calculated in Table 2 based on the stairway or doorway width. All stairways are 48” wide and all doors, except the lobby door, are 36”. The width of 48” provides 166 people egress capacity and 36” door provides 180 exit capacity. The lesser of the door and stairway capacities governs the design. The egress capacity is calculated based on (NFPA, 2018) using the following formula:

\[ C = 146.7 + \left( \frac{W_d - 44}{0.218} \right) \]

**Table 2: Exit Capacity**

<table>
<thead>
<tr>
<th>Component</th>
<th>Width [In]</th>
<th>Egress Capacity</th>
<th>Governing Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stairway</td>
<td>Door</td>
<td>Stairway [person]</td>
</tr>
<tr>
<td>3rd Floor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd floor- North Stairs</td>
<td>48</td>
<td>36</td>
<td>166</td>
</tr>
<tr>
<td>3rd floor- South Stairs</td>
<td>48</td>
<td>36</td>
<td>166</td>
</tr>
<tr>
<td>2nd Floor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd floor- North Stairs</td>
<td>48</td>
<td>36</td>
<td>166</td>
</tr>
<tr>
<td>2nd floor- South Stairs</td>
<td>48</td>
<td>36</td>
<td>166</td>
</tr>
<tr>
<td>1st Floor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st floor- North Stairs</td>
<td>48</td>
<td>36</td>
<td>166</td>
</tr>
<tr>
<td>1st floor- South Stairs</td>
<td>48</td>
<td>36</td>
<td>166</td>
</tr>
<tr>
<td>Multipurpose 1</td>
<td>36</td>
<td>0</td>
<td>180</td>
</tr>
<tr>
<td>Multipurpose 2</td>
<td>36</td>
<td>0</td>
<td>180</td>
</tr>
<tr>
<td>Elevator Lobby</td>
<td>36</td>
<td>0</td>
<td>180</td>
</tr>
<tr>
<td>Lobby</td>
<td>48</td>
<td>0</td>
<td>240</td>
</tr>
<tr>
<td>Corridor</td>
<td>36</td>
<td>0</td>
<td>180</td>
</tr>
</tbody>
</table>

A summary of the comparison of occupant load and exit capacity is shown in Table 3. Adequate capacity is provided to evacuate the calculated occupant load for all 3 floors.
**Table 3: Exit Capacity vs. Occupant Load**

<table>
<thead>
<tr>
<th>Room</th>
<th>Occupant Load</th>
<th>Exit Capacity</th>
<th>Adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Floor</td>
<td>319</td>
<td>1292</td>
<td>Adequate</td>
</tr>
<tr>
<td>Second Floor</td>
<td>316</td>
<td>332</td>
<td>Adequate</td>
</tr>
<tr>
<td>Third Floor</td>
<td>313</td>
<td>332</td>
<td>Adequate</td>
</tr>
</tbody>
</table>

**Number of Exit Doors**

According to section 7.4.1.1 of the Life Safety Code (NFPA 101), where the occupancy is less than 500 people, 2 exits will be adequate. Also based on section 15.2.5.4, every room or space larger than 1000 ft\(^2\) (93 m\(^2\)), or with an occupant load of more than 50 persons shall have a minimum of two exit access doors. The only room that has occupant load more than 50 people and an area of more than 1000 ft\(^2\) is the multi-purpose area in which 2 exit doors are provided. Therefore, the number of exit doors meets the code requirements.

**Exit Doors Arrangement**

According to section 7.5.1.3.3 for sprinklered building, the minimum separation distance between two exits shall not be less than one-third the length of the maximum overall diagonal dimension of the building or area. The multi-purpose area is the only room that requires more than 1 door. The diagonal length of this room is 82’-3” and the distance between the exit doors, as shown in Figure 13, is 44’-4” which is more than 1/3 of the diagonal length of the room and in compliance with the code. On the 2\(^{nd}\) and 3\(^{rd}\) floor all the rooms are smaller than 1000 ft\(^2\) and their occupancy load is smaller than 50 people so only one door is provided for each room.

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Figure 13 - Exit Door Separation on the First Floor

Travel distance

According to NFPA 101 15.2.6.3, travel distance shall not exceed 200 ft (61 m) in educational occupancies protected throughout by an approved automatic sprinkler system. Also, according to IBC 2018, Table 1017 for sprinklered building of educational type, the maximum travel distance should not exceed 250 ft. In Figure 14, the travel distance from the most remote area of each area has been shown. The maximum travel distance is calculated as 118 ft. which satisfies both IBC and NFPA 101 requirements.
**Dead-end**

In occupancies in Groups B, E, F, M, R-1, R-2, R-2.1, R-2.2, S and U, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of the dead-end corridors shall not exceed 50 feet (15 240 mm). (CBC 1020.4 Exception 2).

In this building, the south of the main corridor on the 2\(^{nd}\) and 3\(^{rd}\) floor has dead-ends but the length of the dead-end is only 8 ft. (Figure 15) which is less than 50 ft. and it’s conforming with the code.

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Exit Signs

Exit signs are required in the corridors every 100 ft. but they are not required in rooms with only one exit door. Exit signs in this building are all installed in compliance with the code. The exit sign locations are shown in Figure 10, Figure 11, and Figure 12.
**Evacuation Time using Hand Calculation**

The total evacuation time is calculated using hand calculation in Table 4. This calculation shows that it takes 9 minutes to evacuate the entire building and pass through all the exit doors. Later in section RSET Calculation, an evacuation model using Pathfinder provides more details about the evacuation of each floor.

**Table 4- Evacuation Time Calculation Steps**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stairway</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$S_{\text{Stairway}}$</td>
<td>4</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td><strong>Boundary-Layer</strong></td>
<td>6</td>
<td>in</td>
<td>Table 4.2.4 NFPA HB</td>
</tr>
<tr>
<td><strong>We stairway</strong></td>
<td>3</td>
<td>ft</td>
<td>$We=W-2BL$</td>
</tr>
<tr>
<td><strong>F_{\text{sm stairway}}</strong></td>
<td>18.5</td>
<td>Person/min/ft of We</td>
<td>Table 4.2.8</td>
</tr>
<tr>
<td><strong>F_c stairway</strong></td>
<td>55.5</td>
<td>Person/min</td>
<td>$F_c=F_s*W_e$</td>
</tr>
<tr>
<td><strong>Door</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>W_{\text{door}}</strong></td>
<td>3</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td><strong>Boundary-Layer</strong></td>
<td>6</td>
<td>in</td>
<td></td>
</tr>
<tr>
<td><strong>We door</strong></td>
<td>2</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td><strong>F_{\text{sm door}}</strong></td>
<td>24</td>
<td>Person/min/ft of We</td>
<td></td>
</tr>
<tr>
<td><strong>F_c door</strong></td>
<td>48</td>
<td>Person/min</td>
<td>$F_{c\text{ door}}&lt;F_{c\text{ stairway}}$</td>
</tr>
<tr>
<td><strong>Speed Movement for Estimated Stairway Flow</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>K</strong></td>
<td>212</td>
<td></td>
<td>Table 4.2.5 NFPA HB for 7/11 stair</td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>2.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>0.11</td>
<td>person/ft$^2$</td>
<td>$(1-aD)kDWe=F_{s}W_e$</td>
</tr>
<tr>
<td><strong>S</strong></td>
<td>145</td>
<td>ft/min</td>
<td></td>
</tr>
</tbody>
</table>

Shahrzad Alaei
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor to Floor</td>
<td>13</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Conversion factor</td>
<td>1.85</td>
<td>4.2.6 NFPA handbook for 7/11 stairs</td>
<td></td>
</tr>
<tr>
<td>travel distance in stairs</td>
<td>24.05</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Travel time</td>
<td>0.17</td>
<td>min/floor</td>
<td></td>
</tr>
<tr>
<td>Building Evacuation Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The discharge rate of the stairway (controlled by a door)</td>
<td>48</td>
<td>Person/min</td>
<td></td>
</tr>
<tr>
<td>The occupant load for 3 floors</td>
<td>907</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The occupant load for per door</td>
<td>453.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evacuation time</td>
<td>9</td>
<td>min to pass through exits</td>
<td></td>
</tr>
</tbody>
</table>

**Summary:**

Evaluation of egress requirements for this building, based on NFPA 101 and CBC 2019 shows that the design is conforming with the code. In the next section construction elements will be evaluated.
Structural Design and Construction Material

**Structural Element Requirements:**

This building is constructed as a type III-B and it meets all height and area requirements for this type. Analysis in Table 5 shows that design has used area increase for sprinkler system and the height of the building is below 55 ft and the area is below 43,500 ft$^2$ and meets the area and height requirements.

<table>
<thead>
<tr>
<th>Occupancy</th>
<th>Allowable Height</th>
<th>Allowable Number of Stories</th>
<th>Allowable Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>E (without area increase)</td>
<td>75</td>
<td>3</td>
<td>43,500 ft$^2$</td>
</tr>
<tr>
<td>E (with area increase)</td>
<td>55</td>
<td>2</td>
<td>14,500 ft$^2$</td>
</tr>
<tr>
<td>Existing</td>
<td>42</td>
<td>3</td>
<td>27,429</td>
</tr>
</tbody>
</table>

According to IBC Code Section 601, Table 6, for III-B construction only exterior bearing walls need to be fire rated for 2 hours and fire rating is not required for any other building elements.
According to table 602 (Table 7) of IBC code if the fire separation is between 10 to 30 ft, for educational buildings with type III-B 1-hr fire rating is required and 1-hr fire rating for the exterior walls are provided. The fire separation distance for this building is 25 ft.
Fire rating for structural elements are listed below and it is mentioned how many hours of fire protection they proved:

- **Columns: Special Concentric Steel Brace Frame**
  - Intumescent coating
  - 1 hr. Fire Resistance Rating

- **Exterior Walls**
  - Siding: ½” Plywood covered with 7/8” Plaster
  - 1 hr. Fire Resistance as Fire Barrier Exterior Wall

- **Interior Walls**
  - Siding: Gypsum Board
  - 1 hr. Fire Resistance as Fire Barrier Interior Wall

- **Floors**

\[ \text{Shahrzad Alaei} \]
- Plywood 2 Layers of 5/8” Gypsum Board
- 1 hr. Fire Resistance as Floor Ceiling Assembly

Based on the structural elements that are provided, this design has fulfilled more than IBC Code requirements.

**Means of Egress Requirements:**

**Corridor:** Based on CBC Code Table 1020.1(Table 8), Corridors in Sprinklered building which are type E occupancy, don’t need to be fire rated.

*Table 8- CBC 2019 Table 1020.1*

<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>OCCUPANT LOAD SERVED BY CORRIDOR</th>
<th>REQUIRED FIRE-RESISTANCE RATING (hours)</th>
<th>With sprinkler system</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-1, H-2, H-3</td>
<td>All</td>
<td>Not Permitted</td>
<td>1</td>
</tr>
<tr>
<td>H-4, H-5, L</td>
<td>Greater than 30</td>
<td>Not Permitted</td>
<td>1</td>
</tr>
<tr>
<td>A, B, E, F, M, S, U</td>
<td>Greater than 30</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>R-1, R-2, R-3, R-3.1, R-4</td>
<td>Greater than 10</td>
<td>Not Permitted</td>
<td>1</td>
</tr>
<tr>
<td>I-2a, I-2.1</td>
<td>Greater than 6</td>
<td>Not Permitted</td>
<td>0</td>
</tr>
<tr>
<td>I-3, R-2.1</td>
<td>Greater than 6</td>
<td>Not Permitted</td>
<td>1&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>I-4</td>
<td>All</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>E</td>
<td>Greater than 10</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Interior Exit Stairway and Ramps:** according to IBC Code section 1023.2, exit stairways need to be 1-hour fire resistance if they are connecting less than 4 stories together.
Shaft Enclosure shall have a fire-resistance of minimum 1-hour if they are connecting less than 4 stories together.

The fire resistance for different elements of the egress path has been shown in Table 9.

*Table 9-Egress path Fire Resistance*

<table>
<thead>
<tr>
<th>Component</th>
<th>Fire rating (hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3rd Floor</strong></td>
<td></td>
</tr>
<tr>
<td>3rd floor- North Interior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>3rd floor- South Interior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>3rd floor- North Exterior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>3rd floor- South Exterior Stairs</td>
<td>1</td>
</tr>
<tr>
<td><strong>2nd Floor</strong></td>
<td></td>
</tr>
<tr>
<td>2nd floor- North Interior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>2nd floor- South Interior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>2nd floor- North Exterior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>2nd floor- South Exterior Stairs</td>
<td>1</td>
</tr>
<tr>
<td><strong>1st Floor</strong></td>
<td></td>
</tr>
<tr>
<td>1st floor- North Interior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>1st floor- South Interior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>1st floor- North Exterior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>1st floor- South Exterior Stairs</td>
<td>1</td>
</tr>
<tr>
<td>Elevator Shaft</td>
<td>1</td>
</tr>
<tr>
<td>Corridor</td>
<td>1</td>
</tr>
</tbody>
</table>
Based on the IBC requirement and Table 9, design for this building follows the IBC code.

**Summary**

KIIP academy of opportunity is built as Type III-B construction that requires all exterior walls as well as means of egress and shaft enclosures to be fire rated. The design meets all the requirements and provides more protection than is required. In the next section, all requirements for fire alarm and notification systems will be discussed.
Fire Alarm Requirements

Fire Alarm System and Components

The KIPP School is a 3-story building and each floor is equipped with wet-pipe sprinklers. The riser has a water flow sensor. Also, smoke detectors and horn/strobes are installed in all rooms. The elevator machine room and custodial room are equipped with heat detectors. Recall smoke detectors are installed in front of 2nd and 3rd-floor elevators.

This building has an EVAC system and an annunciator. The EVAC system is also connected to the same speaker/strobes for the fire alarm. The control panel has a built-in Digital Alarm Communicator/Transmitter (DACT) that gets signals from initiation devices such as heat detectors, smoke detectors, riser water flow sensor, and conveys those signals to the alarm notification appliances. These system components are as follows:

Fire Alarm Panel

The Fire alarm panel is installed on the first floor in the electrical room which is located on the north side of the building (FACP).

Fire-Lite MS-9200UDLS was selected as the Fire Alarm Panel for this project and is a combination Fire Alarm Control Panel (FACP) and Digital Alarm Communicator/Transmitter (DACT), all on one circuit board. This compact intelligent addressable control panel has an extensive list of powerful features. It receives signals from the smoke detector, heat detector, or hand-activated pull switch and responds to any of these signals by lighting up or making noise, activating local bells or other signals. Figure 16 shows the control panel.
Initiation Devices

Smoke Detector

Fire-Lite SD-355 smoke detector was selected for this project and is an addressable ceiling-mounted photoelectric smoke detector. They are installed in every classroom, hallway, offices, and restrooms.

Since these detectors are addressable, they will help emergency personnel quickly locate a fire during its early stages, potentially saving precious rescue time while also reducing property damage. These smoke detectors that are shown in Figure 17 are provided in all classrooms, corridors, multipurpose area, offices, restrooms, IT and electrical rooms.
Heat Detector

The heat detectors used for this building are Fire-Lite HD-355 and are installed in the elevator machine rooms on each floor and in the custodial room. These heat detectors provide fixed temperature alarm detection at 135°F. Figure 18 shows the heat detector that is used for this building.

![Figure 18: Heat Detector](image)

Wet Pipe Sprinkler System

TYCO TY 313, Figure 19, sprinkler heads are one type of fire detection system. The sprinkler heads installed in this building are quick response sprinklers with an activation temperature of 155°F meaning the bulb inside of the sprinkler head will melt in temperature above the 155°F and acts as an open valve and causes a water flow in the riser pipe. A water flow alarm is installed in the riser pipe and it will be activated by sensing the water flow. This building is classified as light hazard occupancy.
**Manual pull station**

BG-12LX, Figure 20, is dual-action and requires 2 motions to activate. Because the BG-12LX is addressable, the control panel can display the exact location of the activated manual station. They are installed within 5 ft. of exit doors which are in compliance with the code.
Annunciation Devices

Speakers & Speaker Strobes

The Wheelock E70 Wall and E90 Ceiling Speakers and Speaker Strobes were installed in this project. Those speakers are designed for high-efficiency sound output for indoor applications. The speakers and speaker strobes are installed in all classrooms, corridors, and offices which is in compliance with the code. The E product line features intelligible communications with crisp, clear voice messages and tone signaling, ideal for mass notification, and voice evacuation. Figure 21 shows a picture of these products.

![Horns and Strobes](image)

Figure 21-Horns and Strobes

EVAC

The EVAC installed in this building is ECC-50/100(E), Figure 22, is a multipurpose emergency voice evacuation panel. It is designed for fire applications, mass notification applications, or both. The EVAC is installed in the first-floor lobby.
Smoke Detector Location and Spacing

According to NFPA 72 (17.6.3.1), the maximum spacing from a detector to the furthest point of a sidewall or corner with its zone of protection shall not be greater than 0.7 times the listed nominal spacing. The nominal spacing between detectors is 30 ft. All the classroom is less than 900 ft² (30-ft x 30-ft). Therefore, one detector in the middle can cover the whole room. Spacing in corridors also should correlate with 17.6.3.1 In narrow rooms and corridor and spacing between fire and the detector should not be more than 0.7 of nominal spacing. The space between all smoke detectors in the corridor is less than 42 ft. If a fire starts right in the middle of them, it will be less than 21 ft. distance between fire and detector. The smoke detectors installed in the corridor can cover the whole corridor.

Fire Alarm, Disposition of Alarm, Supervisory, & Trouble Signals

All fire alarm circuits shall be in conduit, surface raceway or open run above ceilings, under floors and in walls in a neat and protected manner as indicated on the design documents. Exposed circuits are only permitted when noted as exposed on design documents. As shown in the sequence of operation in Table 10, the smoke detector in front of the elevators recalls all
elevators to either the first floor or second floor. The manual pull station, smoke and heat detectors will activate the sound alarm and horns/strobe. The duct detector will activate the sound supervisory and shuts down the HVAC system. If there is any circuit failure, it will activate sound supervisory and annunciates on the LED.

*Table 10-Sequenve of Operation*

<table>
<thead>
<tr>
<th>Device</th>
<th>Sound General Alarm</th>
<th>Sound Supervisory</th>
<th>Horn / Strobes</th>
<th>Annunciator on LED</th>
<th>HVAC Shutdown</th>
<th>Central Alarm STA Alarm</th>
<th>Central Alarm Trouble</th>
<th>Elevator Recall 1st Floor</th>
<th>Elevator Recall 2nd Floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke Detector Elevator Recall #1</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke Detector Elevator Recall #2</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Manual Pull</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke / Heat Detector</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duct Detection</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow Switch</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSY / Tamper Switch</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Power Failure</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circuit Failure</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Audible and Visible notification appliances performance

The purpose of this section is to propose a revised speaker layout that ensures intelligibility for the voice system. According to NFPA 72 handbook section 24.4.2.2, the rule of thumbs for designing the number of speakers is to install speakers in every occupied space and in intervals of twice the ceiling height. Also, One-Way ECS (Emergency Communication System) is not required in the following locations:

- Private bathroom, shower
- Mechanical, electrical and elevator rooms
- Kitchen
- Individual offices
- Storage room
- Closets

In the KIPP building, as shown on the plan drawings in Appendix A, the speakers are installed in all classrooms, lobbies, lounges, corridors, workrooms, restrooms, and multi-purpose areas. Speakers are not installed in the offices, closets, storages, and elevators as recommended in the NFPA 72. Therefore, speaker locations meet the code requirements.

Regarding the speaker spacing, since the ceiling is 8 feet on each floor, one speaker needs to be installed in every 16 feet in each room. That requires some rooms to have more than one speaker installed. However, there is only one speaker installed in each room of the building. The proposed revised speaker plan that meets the code requirements is shown in Figure 23
Secondary Power Supply

According to NFPA 72 section 10.6.7.2.1.2, the secondary power supply for in-building fire emergency voice/alarm communications service shall be capable of operating the system under quiescent load for a period of 24 hours and then shall be capable of operating the system during a fire or other emergency condition for a period of 15 minutes at maximum connected load.
load. 2 different secondary power supplies are designed for this project. One is for NAC and the other for ECS. The total load for the NAC is calculated as 5.92 Amp-hours and a battery size of 7A-H is recommended. The calculations are shown in Table 11.

Table 11 - Secondary Power Calculation for control panel (MS-9200UDL)
Required load for the ECS system is calculated as 8.13 A-H and a battery with a capacity of 12 A-H is recommended. Calculations are shown in Table 12:

Table 12-Secondary power supply calculations for ECC
**Inspection, Testing, and Maintenance**

Record of completion forms needs to be done for all component including control panel initiation devices, notification appliances. Also, separate records of completion forms are required for the emergency communication system and power system these forms shall be provided to the service personnel upon request.

**Inspection**

Periodic visual inspections shall be done according to NFPA 72 table 14.3.1 or more often if it is required by AHJ a visual inspection should be done prior to any testing. Improperly installed, damaged or nonfunctional components should be identified.

An annual inspection is required for the following components for this project:

- Fire alarm systems monitored and unmonitored for alarm, supervisory, and trouble signals.
- Supervising station alarm system
- Notification appliance circuit power extenders
- Remote power supplies
- Fiber-optic cable connections

Semi-Annual inspections shall be done for followings in this project:

- Trouble signals
- Batteries-Nickel
- Remote annunciators
- Transient suppressors
- Duct detectors
• Manual fire alarm boxes
• Heat detectors
• Smoke detectors
• Projected beam smoke detectors
• Fire extinguisher

A quarterly inspection shall be done for the following in this project:

• Radiant energy fire detectors
• Supervisory signal devices
• Water flow devices

**Testing**

NFPA 72 requiring a 100 percent test of the system, including all devices, appliances, circuits, and functions. AHJ should be notified prior to the initial test.

Annual testing is required for the following:

• Control equipment and transponder
• Fire alarm control unit trouble signals
• Supervising station alarm systems — transmission equipment
• Emergency communications equipment
• Secondary (standby) power supply
• Uninterruptible power supply (UPS)
• Initiating devices

Batteries should be tested annually or quarterly based upon their type.
**Maintenance**

The Code requires that maintenance be performed in accordance with the manufacturer’s published instructions, with an emphasis on cleaning. Cleaning should be in strict accordance with the manufacturer’s instructions and as frequently as the ambient conditions of the placement area necessitate. Overall, the fire detection, alarm and communication system design has fulfilled all the requirements. In the next chapter building, the suppression system will be discussed.

**Summary**

The fire alarm system includes smoke detectors, heat detectors, manual pull stations, horns, strobes, control panel, and EVAC system. The spacing and number of initiation and notification devices are all in compliance with the code requirements. The calculated secondary power and provided battery is adequate and could support the system. In the next section, fire suppression requirements for this building will be evaluated.
Fire Suppression System

The wet pipe sprinkler system is designed based on NFPA 13. For this 3-story building, the city supply is adequate, and no pump is required. This building is classified as type E (Education) according to IBC Section 302 and based on the area hazard classifications in NFPA 13 – A.5.2, education occupancies are classified as light hazard area.

According to Figure 24, the design density for light hazard area is 0.1 gpm/ft$^2$ over 1500 ft$^2$. However, since the ceiling height is less than 10 feet, the area of sprinkler operation is permitted to be reduced to 900 ft$^2$ (Figure 25, obtained from NFPA 13 -11.2.3.2.3.1).

![Figure 24 - Design Density Curve](image-url)
System components

Sprinkler heads

For this building, pendent sprinklers are used. However, on the 3rd floor, upright sprinklers are used for protecting the attic area. Above the ceiling, heads are spaced at 168 ft$^2$ due to the structure being in the category of combustible obstruction. Joists are also spaced more than 3’-0” apart per NFPA 13 table 8.6.2.2.1. The sprinklers are a maximum of 225 ft$^2$ spacing below the ceiling. The following Sprinkler Heads are used for this project and they are shown in Figure 26.
- Model: Tyco TY 313 & 323
- Type: Upright & Pendent
- Response: Quick Response
- K-Factor: 5.6
- Size: 1/2”

**Piping**

All Pipe (1”-1 ½”) schedule 30 Dyna-thread or 40 and 175 lb. WWP cast iron fittings to schedule 40 is used in the hydraulic calculation. All pipe 2” and larger are schedule 10 Dyna flow with grooved coupling and style #750 reducing coupling.

**Riser**

The riser is located on the Northwest side of the building, between the IT room and the Electrical room (Figure 3 - First Floor (9054 ft²)). The riser schematic is shown in Figure 28.

![Figure 27- Riser Location](image-url)
The fire department connection is located on the west of the building. The Figure 29 shows the fire department connection. There is no more information available about the connection to the piping.
**Water Supply**

The only source of water supply for the KIPP academy is the supply from the City of LA. The records provided by the city of Los Angeles on February 11, 2016, shows the static Pressure is 79 psi, residual pressure of 71 psi, and supply flow of 1620 gpm.

**Hydraulic calculation**

Hydraulic calculations are conducted to determine the water delivery requirements. In this project, 9 sprinklers in the most remote area of the building, which is the classroom on the southwest corner of the 3rd floor are considered for the hydraulic calculations (Figure 30).

![Figure 30 - 3rd Floor sprinkler system showing the most remote area](image)

Based on the calculations, the system flow demand is 150.41 gpm at 58 psi. Moreover, according to Table 11.2.3.1.2 of NFPA 13, this system requires a 100 gpm at 58 psi hose stream allowance for a duration of 30 minutes. Therefore, the total demand for this system is 250.41 gpm.
gpm at 58 psi. A summary of inputs and outputs is listed in Table 11. Detailed hydraulic calculations are shown in Appendix B.

In the graph shown in Figure 31, the system water requirement and the city water supply are indicated as red and green lines, respectively. The graph shows that the water supply is adequate for this system, and therefore, no pump is required.

**Table 13-Summary of hydraulic calculation inputs and outputs**

<table>
<thead>
<tr>
<th>System</th>
<th>Density</th>
<th>5.102 gpm/ft²</th>
<th>5.8 K-Factor</th>
<th>15.48 at 7.563</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total System Demand</td>
<td>154.000</td>
<td>Number of Sprinklers Calculated</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>System Pressure Demand</td>
<td>58.150</td>
<td>System Flow Demand</td>
<td>150.41</td>
</tr>
<tr>
<td></td>
<td>Total Demand</td>
<td>280.41 @ 58.150</td>
<td>Pressure Ratio</td>
<td>+20.817 (26.2%)</td>
</tr>
</tbody>
</table>

**Figure 31-Hydraulic graph**

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**Maintenance, Inspection, and Testing Procedure**

The maintenance, inspection, and testing of the Fire Sprinkler System are the owner’s responsibility and should be performed by sprinkler maintenance companies. The maintenance, testing, and inspection frequency of the sprinkler system components are provided in Table 5.1.1.2 of the NFPA 25 Standard. A copy of the Maintenance Frequency Table is listed in Table 14.

*Table 14: Summary of sprinkler system inspection, testing, and maintenance*

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inspection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control valves</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Fire department connections</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Gauges (and deluge systems)</td>
<td>Quarterly</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Gauges (dry and preaction systems)</td>
<td>Monthly/quarterly</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Hanger/braces/supports</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Heat tracing</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Hydraulic design information sign</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Information signs</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Internal piping condition</td>
<td>Annually</td>
<td>Chapter 14</td>
</tr>
<tr>
<td>Pipe and fittings</td>
<td>Annually</td>
<td>Chapter 14</td>
</tr>
<tr>
<td>Sprinklers</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Sprinklers (open)</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Supervisory signal devices (except valve supervisory switches)</td>
<td>Quarterly</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>System valves</td>
<td></td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Valve supervisory signal devices</td>
<td>Quarterly</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Waterflow alarm devices</td>
<td>Quarterly</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Waterflow alarm devices (Valves and pressure switch type)</td>
<td>Semi-annually</td>
<td>Chapter 14</td>
</tr>
<tr>
<td><strong>Test</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antifoam solution</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Control valves</td>
<td>Annually</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Gauges</td>
<td>5 years</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Main drain</td>
<td>As required</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Sprinklers</td>
<td>As required</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Sprinklers (dry)</td>
<td>As required</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Sprinklers (high or greater temperature)</td>
<td>5 years</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Sprinklers (basement environments)</td>
<td>5 years</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Supervisory signal devices (except valve supervisory switches)</td>
<td>As required</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>System valves</td>
<td></td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Valve supervisory signal devices</td>
<td></td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Waterflow alarm devices (Valves and pressure switch type)</td>
<td>Quarterly</td>
<td>Chapter 14</td>
</tr>
<tr>
<td>Waterflow alarm devices</td>
<td>Semi-annually</td>
<td>Chapter 14</td>
</tr>
</tbody>
</table>

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Summary

KIPP academy is equipped with wet pipe system with a light hazard occupancy that requires design density of 1500 ft$^2$ over 0.1 gpm/ft$^2$. However, a 900 ft$^2$ area reduction has been considered in the design. The sprinkler heads used for this system are all quick response type. Hydraulic calculation shows that system requires 150 gpm of water in addition to 100 gpm hose stream allowance at 58 psi. Since the city of LA provides water with a flow of 1620 gpm at 72 psi, the supply is adequate and therefore, no pump is required. In the next section, flammability of different elements of the building will be discussed.
Flammability Analysis

The Life Safety Code and IBC code require that all the interior wall and ceiling finish materials be tested according to the ASTM E84 or NFPA 286. The most widely accepted classification system is described in the National Fire Protection Association publication NFPA 101 Life Safety Code (S, 2007), where:

<table>
<thead>
<tr>
<th>Class</th>
<th>Flame Spread Index</th>
<th>Smoke Development Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or A</td>
<td>0 – 25</td>
<td>0 - 450 maximum</td>
</tr>
<tr>
<td>2 or B</td>
<td>26 – 75</td>
<td>0 - 450 maximum</td>
</tr>
<tr>
<td>3 or C</td>
<td>76 – 200</td>
<td>0 - 450 maximum</td>
</tr>
</tbody>
</table>

The interior finish shall comply with the following (IBC, 2018):

- During the 40 kW exposure, the flame shall not spread to the ceiling
- The flame shall not spread to the outer extremity of the sample on any wall or ceiling
- Flashover shall not occur
- The peak heat release rate throughout the test shall not exceed 800 kW
- The total smoke released throughout the test shall not exceed 1000 m²

Interior walls and ceiling finish shall have a flame spread index not greater than specified in Table 15.

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The finish materials should be class B for the interior exit stairways, and class C for the corridors and enclosure for the exit access stairways and ramps, and also for the rooms and enclosed spaces.

The wall finish material used in the KIPP academy building is a ½” Vinyl Covered Tackable Wall Panel.

Based on the test results listed on the manufacture website, these materials are all listed as class A material. However, based on the previous table, only class B in interior exit ways and class C for other parts of the building were required. So, the listed material meets the requirements of the life safety and IBC codes.

The ceiling finish materials used in this building are ARMSTRONG #755, #2910 and #895 lie-in tiles. These materials are listed on their website as class A (UL). Therefore, the ceiling materials also meet the requirements of the life safety and IBC codes.

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Summary

The code requires that interior finish materials be of class B and C for the means of egress, corridors, and enclosures. All the finish materials that have been used in this building are categorized as class A. Therefore, the design exceeds the code requirements. The next section will discuss smoke control requirements.
Smoke Management

According to the IBC and the Life safety code, there is no specific requirements for the smoke management system.

The heating-cooling system installed in this building is York XN060 (Figure 32), which is equipped with automatic smoke detectors for the sucked air as well as supply air. These smoke detectors will shut down the system automatically.

![York XN060](image)

*Figure 32-York XN060*

Also, Ruskin FSD-35 fire dampers (Figure 33) are installed at the 2nd and 3rd level floor penetrations for all the ductwork to the first-floor level as well as all the duct penetrations through the fire-rated walls. The location and assembly of the fire dampers are shown in Figure 34.

![Ruskin FSD-35 fire dampers](image)

*Figure 33-Ruskin FSD-35 fire dampers*
Summary

According to the code, no smoke control system shall be required for this building. However, the heating and cooling system is equipped with built-in smoke detectors that control the ducts. In addition, all wall penetrations are equipped with a smoke damper.

Prescriptive Design Summary

Evaluation of egress, fire alarm, fire suppression, flammability, and smoke control shows that the design is in compliance with the code. In the next section, the performance-based design will show if this building that is designed based on the code, will perform well in case of a real fire.
Performance-Based Design Analysis

The performance-based design analysis is an alternative approach to the prescriptive design. In a performance-based design, specific objectives are defined, and the performance of the project is evaluated to determine if the objectives are met. The objectives are to maintain the life safety, minimize fire-related injuries, the loss of life from fire, and also to protect property by minimizing damage to property and minimizing the downtime of the facility use from fire damage.

**Objectives**

In order to quantify the objective of the performance-based design, the ASET must be greater than the RSET. Definition of RSET and ASET are as follow:

**RSET:** The required safe egress time is the time required for occupants to reach an area of safety in the event of a fire from the time of fire ignition to the time evacuation is complete.

**ASET:** The available safe egress time of the occupants in the event of a fire, from the time of fire ignition to the time untenable conditions occur in the evacuation route. For the purpose of performance-based analysis for the KIPP Academy building, two fire scenarios are going to be discussed. Then, ASET will be calculated using FDS and Pyrosim modeling, and RSET will be calculated using Pathfinder. In the end, the results for ASET and RSET will be compared to see if all occupants of the building can evacuate to an area of safety on time.

**Tenability criteria**

According to the SFPE Handbook, section 57, tenability in fires can be quantified in terms of thermal effects, visibility through smoke, smoke toxicity, or limiting the impact of falling materials. The desired quantity is listed below:
Visibility

According to the SFPE handbook, table 63.5, the minimum visibility for small enclosures like classrooms or restrooms is 5 meters (OD/m = 0.2); and minimum visibility for large enclosures, corridors, entry areas, and travel path is 10 meters (OD/m = 0.08). In order to assess the visual obscuration effects of smoke, a concept of fractional effective concentration (FEC) has been developed, whereby the smoke concentration is expressed as a fraction of the concentration considered to significantly affect escape efficiency. If the total FECsmoke reaches unity, then it is predicted that the level of visual obscuration would be sufficient to seriously affect escape attempts. The building occupants are mainly from 13 to 15 years of age and the rest are teachers and office staff with age higher than 22 years old. If visibility is less than these values occupants may stop attempting to exit the building.

Smoke Toxicity

Exposure to toxic gases shall be limited to allow safe evacuation of students and teachers. According to the SFPE Handbook, Table 63.28, the maximum exposure to carbon monoxide (CO) is 1,400-1700 ppm for a duration of 30 minutes or 6000-8000 ppm for the duration of 5 minutes. After this threshold, toxicity causes incapacitation in humans. Due to most of the occupants being children, the lower values are being used to reduce risk and danger to them.

Thermal Effect

According to the SFPE Handbook, table 63.20, the tenability limit for exposure of skin to radiant heat is less than 2.5 kW/m² for a duration of fewer than 5 minutes. Radiant heat at this level and higher causes skin burn and pain. Also, the limiting condition for convection heat is 60°C for a duration of less than 30 minutes.
### Tenability Criteria Summary:

- **Visibility in corridors:** 10m
- **Visibility in small enclosure:** 5m
- **CO exposure:** 1400 ppm for 30 minutes
- **Radiant heat:** <2.5 kW/m² for less than 5 minutes
- **Convection Heat:** <60°C for less than 30 minutes
**Fire Scenarios**

NFPA 101 requires all fire scenarios shall comply with 8 different fire scenarios. For the purpose of this project, the following scenarios are used based on the type of building, combustibles, occupant response, and type of fire. NFPA 101 has suggested 8 different fire scenarios in section 5.5.3 based on the initial location of the fire, early rate of growth in fire severity, and some generation.

**Fire Scenario #1**

The first scenario is based on the second recommended fire scenario, which is an ultrafast-developing fire in the primary means of egress. (NFPA 101 5.5.3.2).

An intentional fire originating from a wooden desk abandoned in the south interior exit stairway on level 1 which compromises all egress from this stairway. At the time of this fire, the interior door to the hallway remains open. The location of the fire is shown in Figure 35 as a schematic fire on the floor plan. Figure 36 shows pictures that are taken during the site visit that shows objects that are stored under the stairways blocking the exit door.
Figure 35 - Location of Fire

Figure 36 - Exit door and Stairway
For the selected fire, the below Heat Release Rate (HRR) curve has been obtained from the SFPE Handbook, section 26, which is a wooden desk with a dimension of 0.6x1.2x0.8 m. The desk has been ignited with 0.5 liters of gasoline. For the purpose of this report, HRR curve shown in Figure 37 has shifted to 0 kW at 0 seconds.

![HRR Curve of a wooden desk](image)

**Figure 37-HRR Curve of a wooden desk**

**ASET Calculation**

For calculation of ASET FDS has been used to model the fire scenario. The maximum HRR is 633 W based on Figure 37. The soot yield is considered to be 0.015 and this number is chosen from Table 39 of NFPA 101 for wood. The test will be running for 500 seconds. All doors are assumed closed except the internal exit doors to the stairways.

The FDS model was run for this scenario using the Pyrosim interface. The fire has been entered into Pyrosim as a T-Squared fire with HRRPUA of 903kW/m². It is assumed that the fire wouldn't spread to adjacent rooms. The model was run for 500 seconds. In 110 seconds, smoke-
filled stairways in all 3 floors and made the stairway untenable due to visibility less than 5 meters. The first floor became untenable in 103 seconds. In Figure 38, visibility of fewer than 5 meters is shown in black and visibility of less than 10 is shown in dark blue. Figure 39 shows in 116 seconds smoke spreads into all stairways and visibility on all 3 floors is less than 5 meters.

*Figure 38 - FDS Model @ 103 seconds*
Figure 39 - FDS model @116 seconds

Figure 40 - FDS model @120 seconds

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Figure 40 is a screenshot from the FDS model that shows smoke eventually will spread into the corridors on all 3 floors. First, the 3rd-floor corridor becomes untenable due to lack of visibility of 10 meters in 120 seconds, and later in 170 seconds (Figure 41), the 2nd floor becomes untenable, and finally, the 1st floor becomes untenable in 191 seconds (Figure 42).

*Figure 41 - FDS Model @ 170 seconds*
In this model, CO Concentration never exceeded 0.0017 mol/mol in the entire 500 seconds. (Figure 43)
We discussed that tenability criteria for temperature are 60 °C and after above that temperature skin burns. Figure 44 shows that the stairways become untenable in 240 seconds because the temperature goes above 60 °C.

Sprinkler system will be activated in 270 seconds on the first floor and it is assumed that sprinkler will prevent flashover.

**RSET Calculation:**

To calculate RSET, the 3 elements that influence evacuation time need to be calculated. The first element is detection. When a fire occurs, it takes some time until the smoke detectors, heat detectors, or sprinklers sense the fire. Occupants may also notice the fire and pull the manual pull station while the fire is still burning.
The second element is the pre-movement time. After the detection of fire and notification, it takes some time until occupants react. The time to show reaction depends on the population, age, condition, status, and training of the occupants. The pre-movement time can be obtained from either fire drills or studies.

The third element is the evacuation time that could be modeled based on Pathfinder simulation. All these stages are shown in Figure 45.

![Figure 45 - RSET Stages](source: slides from FPE 521 Module 6)

**Detection Time**

To calculate detection time a DETACT Model has been used. The ceiling height is 9.5 ft and an ultra-fast fire is assumed. All the inputs are listed in Table 16.

*Table 16: DETACT model inputs*

<table>
<thead>
<tr>
<th>INPUT PARAMETERS</th>
<th>CALC. PARAMETERS</th>
<th>CALC. PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling height (H)</td>
<td>2.9 m</td>
<td>R/H</td>
</tr>
<tr>
<td>Radial distance (R)</td>
<td>3.2 m</td>
<td>dT(c)/dT(pl)</td>
</tr>
<tr>
<td>Ambient temperature (To)</td>
<td>20 °C</td>
<td>u(c)/u(pl)</td>
</tr>
<tr>
<td>Actuation temperature (Td)</td>
<td>33.9 °C</td>
<td>Rep. t2 coeff.</td>
</tr>
<tr>
<td>Response time index (RTI)</td>
<td>1 (m-s)1/2</td>
<td></td>
</tr>
<tr>
<td>Fire growth power (n)</td>
<td>2 -</td>
<td>Medium</td>
</tr>
<tr>
<td>Fire growth coefficient (k)</td>
<td>0.012 kW/s^4n</td>
<td></td>
</tr>
<tr>
<td>Time step (dt)</td>
<td>2 s</td>
<td></td>
</tr>
</tbody>
</table>

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Based on this model the first smoke detector will be activated after 80 seconds. Detection temperatures and gas temperatures over time are shown in Figure 46

![Figure 46-DETACT Model](image)

**Pre-movement Time**

Pre-movement time has been obtained from NFPA handbook table 4.2.1 for a midrise office building, cool day, median=0.9 min and it is considered equal to 54 Seconds. Although this is for an office building, since all occupants are middle school level and higher, and also because they participate in a regular fire drill, it will be safe to compare a midrise office building to school students and staff.

**Evacuation Time**

The evacuation time has been calculated using Pathfinder. For this scenario, because the fire has occurred in the stairway, it is blocking the internal exit door that connects the first-floor corridor to the stairway, as well as the exit door to the outside. Also, because this fire and smoke
spread in the whole stairway, it is expected for people to return once they reach the stairway filled with smoke. So south stairway will be completely excluded for this model.

As it is shown in Figure 47, it would take 107 seconds to evacuate the first floor.

![Figure 47 - Pathfinder simulation @107 seconds](image1)

The 3rd floor will be evacuated in 560 seconds as is shown in Figure 48:

![Figure 48 - Pathfinder simulation @560 seconds](image2)
And at the end, occupants of the 2\textsuperscript{nd} floor who were queuing for the stairway will evacuate in 760 seconds (Figure 49).

*Figure 49 - Pathfinder simulation @ 760 seconds*

As it was discussed earlier, RSET consists of detection time, pre-movement time evacuation time. The total RSET for each floor is calculated in Table 17.

$$\text{RSET} = \text{Detection} + \text{Pre movement} + \text{Evacuation}$$

*Table 17 - RSET calculations for the first scenario*

<table>
<thead>
<tr>
<th>Location</th>
<th>RSET[m]</th>
<th>Detection Time[s]</th>
<th>Pre-movement Time[s]</th>
<th>Evacuation Time[s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st floor</td>
<td>4</td>
<td>80</td>
<td>54</td>
<td>107</td>
</tr>
<tr>
<td>2nd floor</td>
<td>15</td>
<td>80</td>
<td>54</td>
<td>760</td>
</tr>
<tr>
<td>3rd floor</td>
<td>13</td>
<td>80</td>
<td>54</td>
<td>660</td>
</tr>
</tbody>
</table>
Summary

As the results of ASET and RSET calculations are summarized in the table below, the current design will fail in this scenario, since ASET is shorter than RSET.

<table>
<thead>
<tr>
<th>Location</th>
<th>ASET</th>
<th>RSET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stairway</td>
<td>1.7 min</td>
<td>0(^1)</td>
</tr>
<tr>
<td>1(^{st}) Floor Corridor</td>
<td>3 min</td>
<td>4 min</td>
</tr>
<tr>
<td>2(^{nd}) Floor Corridor</td>
<td>2.8 min</td>
<td>15 min</td>
</tr>
<tr>
<td>3(^{rd}) Floor Corridor</td>
<td>2 min</td>
<td>13 min</td>
</tr>
</tbody>
</table>

\(^1\) south stairway will not available during the evacuation
**Fire Scenario #2**

In this fire scenario, fire originates in the staff room located on the south side of the multi-purpose area on Level 1. Fire starts due to a short circuit in a coffee maker that is placed on a wood cabinet. There is also an overhead cabinet above the coffee maker. Next to the cabinet, there are stacks of printer paper and then 2 copy machines (Figure 51).

![Staff lounge](image1)

*Figure 51 - Staff lounge*

The staff room door opens to the multipurpose area. The multipurpose area is furnished with foldable chairs and tables as shown in Figure 52.

![Multipurpose area furniture](image2)

*Figure 52 - Multipurpose area furniture*
This scenario is based on the 3rd fire scenario of NFPA 101 which is a fire in the unoccupied room next to a high occupancy room. The location of the fire is illustrated in Figure 53.

![Figure 53 - Fire location of 2nd scenario](image)

The multipurpose area has 2 exit doors. The max Heat Release Rate of the coffee maker is assumed to be 60 kW. The heat HRR in Figure 54 has been obtained from an experiment by the NIST Engineering laboratory².

---

² Smoke Alarm Performance in Kitchen Fires and Nuisance Scenarios by Thomas Cleary
Fire Research Division Engineering Laboratory NIST
Also, the oak cabinet Heat Release Rate has been obtained from the same research and the curve is shown in Figure 55.

The combined HRR curve for both cabinet and coffee maker is as graphed in Figure 56.
Since this fire will be in a small room full of cabinets, papers, and copy machines, a flashover is expected. To calculate the maximum HRR, the Babrauskas method has been used with the following equation:

\[
\frac{Q_{fo}}{A_0\sqrt{H}} = 750
\]

Where

\( A_0 \) = area of the opening and \( H \) is height of the door. The only opening in this class is a 3x7 inches door (0.91x2.13 m). Therefore:

\[
Q_{fo} = (0.91 \times 2.13) \times 750 = 2121.6 \text{ kW}
\]

Surface area: 0.63 x 6 = 3.78 m²
HRRPUA = 2137.3 / 3.78 = 565.3 kW/m²

**ASET Calculation**

For the FDS Modeling, the fire is assumed a medium \( t^2 \) fire based on Table 18 which is obtained from the SFPE handbook. The model was run for 850 seconds. Using the FDS model, this fire caused the staff lounge to become untenable due to compromised visibility of less than 5 meters in 95 seconds. Figure 57 shows that the visibility has dropped to less than 5 meters that were untenable criteria for small enclosures.

*Table 18: \( t^2 \) fire categories*

<table>
<thead>
<tr>
<th>Growth rate</th>
<th>( t_{1000} ) (s)</th>
<th>Typical real fires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow</td>
<td>600</td>
<td>Densely packed wood products</td>
</tr>
<tr>
<td>Medium</td>
<td>300</td>
<td>Solid wood furniture (desks) Individual furniture items with small amounts of plastic</td>
</tr>
<tr>
<td>Fast</td>
<td>150</td>
<td>High stacked wood pallets Cartons on pallets Some upholstered furniture</td>
</tr>
<tr>
<td>Ultrafast</td>
<td>75</td>
<td>Upholstered furniture High stacked plastic materials Thin wood furniture (wardrobes)</td>
</tr>
</tbody>
</table>
As the fire progresses, the smoke spreads into the multipurpose area as shown in Figure 58. The multipurpose area also becomes untenable due to reduced visibility to less than 10 meters in 95 seconds.
The other tenability criteria were temperature less than 60 °C. As illustrated in Figure 59, the temperature reaches 60°C in 90 seconds in the staff lounge and also exceeds 60°C in 295 seconds in the multipurpose area (Figure 60).

*Figure 58-FDS model @ 225 seconds*
Figure 59 - FDS model @ 90 seconds

Figure 60 - FDS model @ 295 seconds
In fire scenario #2, CO concentration did never exceed 0.0017 mol/mol (Figure 60).

In this case, the first sprinkler was activated in 201 seconds in the Staff lounge, and it is assumed that it eventually put off the fire and prevented it from spreading.

**RSET Calculation**

For RSET calculation again following parameters were measured:

Detection + Pre movement + Evacuation

**Detection Time**

To calculate Detection time, a DETACT Model was used with the inputs that are shown in Table 19. The model showed that it takes 54 seconds for the ceiling-mounted fire detector to activate (Figure 61).
Table 19-DETACT model inputs for Scenario #2

<table>
<thead>
<tr>
<th>INPUT PARAMETERS</th>
<th>CALC. PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling height (H)</td>
<td>3.4 m</td>
</tr>
<tr>
<td>Radial distance (R)</td>
<td>4.5 m</td>
</tr>
<tr>
<td>Ambient temperature (T0)</td>
<td>20 °C</td>
</tr>
<tr>
<td>Actuation temperature (Td)</td>
<td>33.9 °C</td>
</tr>
<tr>
<td>Response time index (RTI)</td>
<td>1 (m-s)1/2</td>
</tr>
<tr>
<td>Fire growth power (n)</td>
<td>2</td>
</tr>
<tr>
<td>Fire growth coefficient (k)</td>
<td>0.047 kW/s^2n</td>
</tr>
<tr>
<td>Time step (dt)</td>
<td>1 s</td>
</tr>
<tr>
<td>R/H</td>
<td>1.324</td>
</tr>
<tr>
<td>dT(cj)/dT(pl)</td>
<td>0.249</td>
</tr>
<tr>
<td>u(cj)/u(pl)</td>
<td>0.158</td>
</tr>
<tr>
<td>Rep. t2 coeff</td>
<td>k</td>
</tr>
<tr>
<td>Slow</td>
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<tr>
<td>Ultrafast</td>
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Figure 61-DETACT Model

Pre-movement Time

A pre-movement time of 54 seconds has been obtained from NFPA handbook table 4.2.1 for a midrise office building, cool day, median = 0.9 min. Although this is for an office building, since all occupants are middle school level and higher, and because they participate in a regular fire drill, it will be safe to compare a midrise office building to school students and staff.

Shahrzad Alaei
**Evacuation Time**

The evacuation time is calculated using Pathfinder, but this time, all stairways are available, and people can evacuate from both north and south stairways. This model shows that the first floor will be evacuated in 115 seconds as shown in Figure 62, and the entire building will be evacuated in 399 seconds. However, the multipurpose area will be evacuated in 83 seconds.

![Pathfinder model in 115 seconds](image)

**Summary**

Based on the calculations, the RSET for the entire building is 9 minutes (54+54+399 = 507 Seconds = 8.5 min), while the RSET for the 1st floor alone is 4 minutes (54+54+115 = 223 Seconds = 3.7 min)

ASET was calculated as 4 minutes (225 seconds) for the multipurpose area and 90 seconds for the staff lounge. However, since the detection time starts when the smoke detector in
the staff lounge is activated the total ASET is 5.5 minutes and RSET is 4 minutes, this design does not fail in fire scenario #2.

**Overall Summary**

In this report, the prescriptive and performance-based design of the KIP Academy of Opportunity building was evaluated. In prescriptive design, all aspect of fire suppression, fire alarm, structural design, smoke control, and flammability were evaluated, and they all complied with the code requirements.

In the Performance-Based Design evaluation, 2 fire scenarios were analyzed. The first fire scenario was assumed to be an arson that took place in stairways, showed that occupants would not have enough time to evacuate the building safely. During the site visit, it was observed that the school uses the stairways to store some clutters and unused items such that one of the exit doors was blocked completely. In addition, all the doors toward the stairways were kept open that allows the spread of smoke into the hallways.

In the second fire scenario, the fire started from a coffee maker in the staff lounge and spread to the cabinets, and finally to the multipurpose area. However, based on this scenario the occupants of the multipurpose area could safely evacuate in time and reach the area of refugee. To avoid this scenario the following is recommended.

**Recommendation**

Based on the site observation and calculations, the followings are the maintenance and housekeeping recommendations that need to be followed in this building:

- Egress paths should be maintained clean and free of all obstructions or impediments
- Stairways should be free of clutter; any existing clutter should be removed

Shahrzad Alaei
• Doors to the stairways should be kept closed.

• Never leave electrical appliances unattended while in operation.

**References**


Shahrzad Alaei
Appendixes
Appendix A
KIPP: ACADEMY OF OPPORTUNITY
3 STORY MODULAR SCHOOL BUILDING

BUILDING DATA

- Number of Stories: 3
- Type of Construction: Ill
- Roof Slope: 3
- Snow Exposure Factor, Ce:
- Seismic Design Category: C
- Seismic Importance Factor: 1.00
- Roof Live Load: 20PSF (INCLUDING SPRINKLER LOAD)
- Roof Type: TO MATCH
- Roof Sprinkler Coverage: YES
- Roof Sprinkler System: YES

WIND DESIGN DATA

- Section Width: 44'
- Wind Exposure: C
- Wind Exposure Factor: 0.80
- Wind Pressure Coefficient: 1.0

APPLICABLE STANDARDS

- With TO AUTOMATIC SPRINKLER SYSTEM (2012 ED)
- RHR 9.4 - VACUUM BREAKER closets, WLY, TOTally BAd, WLB

APPLICABLE CODES

- 2013 CALIFORNIA ADMINISTRATIVE CODE (CAC), PART 3, TITLE 24-C.A
- 2013 CALIFORNIA BUILDING CODE (CBC), PART 3, TITLE 24, C.A
- 2013 CALIFORNIA MECHANICAL CODE (CMC), PART 3, TITLE 24, C.A
- 2013 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24, C.A
- 2013 CALIFORNIA PLUMBING CODE AND GAS CODE AMENDMENTS
- 2013 CALIFORNIA PUBLIC SAFETY CODE AMENDMENTS
- 2013 CALIFORNIA BUILDING CODE AMENDMENTS
- 2013 CALIFORNIA BUILDING CODE AND GAS CODE AMENDMENTS
- 2013 CALIFORNIA ADMINISTRATIVE CODE AMENDMENTS
- 2013 CALIFORNIA BUILDING CODE AND GAS CODE AMENDMENTS
- 2013 CALIFORNIA PUBLIC SAFETY CODE AMENDMENTS
- 2013 CALIFORNIA BUILDING CODE AMENDMENTS

NOTE

THE DRAWINGS EXECUTED IN THESE DRAWINGS IS A COMMERCIAL DOCUMENT.
THE REVIEW, APPROVAL, AND PERMISSION FOR CONSTRUCTION OF THIS DOCUMENT ARE NOT PERMITTED WITHOUT THE RECOMMENDATION OF THE CITY OF LOS ANGELES AND THE JURISDICTION OF THE COMMUNITY DEVELOPMENT DEPARTMENT.
THE REVIEW, APPROVAL, AND PERMISSION FOR CONSTRUCTION OF THIS DOCUMENT ARE NOT PERMITTED WITHOUT THE RECOMMENDATION OF THE LOCAL AUTHORITY.
### ROOM SCHEDULE

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### INSULATION SPECIFICATIONS

- **WALLS**: Insulating material for walls, ceilings, and floors shall be R-19 or greater.
- **ceilings**: Insulating material for walls, ceilings, and floors shall be R-19 or greater.
- **flooring**: Insulating material for walls, ceilings, and floors shall be R-19 or greater.

### FLOOR, WALL, CEILING MATERIALS

- **Walls**: Armstrong #755, 2'x4' Lay-In Tile
- **ceilings**: Armstrong #2910, 2'x4' Lay-In Tile
- **flooring**: Armstrong #895, 2'x4' Lay-In Tile
- **roof**: Armstrong #1300, 2'x4' Lay-In Tile
- **hardwood**: Armstrong #1300, 2'x4' Lay-In Tile
- **sheetrock**: Armstrong #1300, 2'x4' Lay-In Tile
- **metal**: Armstrong #1300, 2'x4' Lay-In Tile
- **plaster**: Armstrong #1300, 2'x4' Lay-In Tile
- **vinyl**: Armstrong #1300, 2'x4' Lay-In Tile
- **granite**: Armstrong #1300, 2'x4' Lay-In Tile
- **tile**: Armstrong #1300, 2'x4' Lay-In Tile
- **wood**: Armstrong #1300, 2'x4' Lay-In Tile
INTEGRAL LETTERS, SYMBOL & "RESTROOM" RAISED CHARACTERS SHALL BE A 3/4"\[...\]

PERMANENT ROOM IDENTIFICATION: SIGNAGE SHALL BE INSTALLED ON THE WALL DIRECTLY OR INDIRECTLY AND SHALL NOT BE USED IN THE MAKING OF DRAWINGS, PRINTS, APPARATUS OR PARTS THEREOF WITHOUT THE FULL KNOWLEDGE AND WRITTEN CONSENT OF SCI Inc.

NOTES:
1. PROVIDE AT EACH EXIT DOOR THAT LEADS DIRECTLY TO A THIRD LEVEL, EXTERIOR EXIT OR MEANS OF EXIT ENCLOSURE OR AN EXIT PASSAGEWAY. OR PROVIDE AT EACH EXIT ACCESS DOOR FROM AN INTERIOR ROOM OR AREA TO A CORRIDOR OR HALLWAY THAT IS REQUIRED TO HAVE A VISUAL EXIT SIGN.
2.  SEE 6- FOR ATTACHMENT.
3.  SEE 6- GENERAL NOTES FOR REQUIREMENTS.

NOTES:
1. **SIGNAGE SHALL BE POSTED IN A PROMINENT PLACE INDICATING THE AVAILABILITY OF ASSISTIVE LISTENING DEVICES.**
2.  DISTRICT WILL PROVIDE ASSISTIVE LISTENING SYSTEM WITH REMOTE DEVICES AVAILABLE AT THE ADMINISTRATION OFFICE.

13 ACCESSIBLE SIGNAGE (EXTERIOR/SITE)

SIGNAGE VARIES

13 ACCESSIBLE SIGNAGE (BUILDING)

MAN SYMBOL

WOMAN SYMBOL

TRIANGLE TO CONTRAST 70% MINIMUM WITH DOOR

CIRCLE TO CONTRAST 70% MINIMUM WITH DOOR

CIRCLE TO CONTRAST 79% MINIMUM WITH DOOR

WOMAN SYMBOL

CIRCLE TO CONTRAST 79% MINIMUM WITH DOOR

14" THICK AT 3M 4923 LAMINATED, CLEAR ACRYLIC PLASTIC. NON-GLARE WITH POISED EDGES

1/2" THICK MIN. RAISED CHARACTERS, LAMINATED TO NOT PEEL OFF. 3/4" HIGH MYLAR FONT, UPPERCASE.

1/4" THICK MIN. RAISED DOTS, 1/16" ON CENTER IN EACH CELL, WITH 3/16" SPACE BETWEEN CELLS. MEASURED FROM THE SECOND LOWEST BRAILLE CELLS. COLORED TO CONTRAST 70% MINIMUM WITH BACKGROUND COLOR.

PLAN AND ELEVATIONS NOT AS INDICATED.

NOTE:
1. **SIGNAGE SHALL BE LOCATED ON WALL ADJACENT TO THE LATCH SIDE OF DOOR OR NEAREST ADJACENT WALL, MIN. 4" AND MAX. 12" FROM EDGE OF DOOR.**
2.  MOUNTING LOCATION SHALL BE DETERMINED SO THAT PERSON MAY APPROACH WITHIN 3" OF SIGNAGE WITHOUT ENCOUNTERING BARriers.
3.  CHARACTER AND BACKGROUND SHALL HAVE A NON-GLARE FINISH. BACKGROUND COLOR TO BE 30% BRIGHTNESS OF CORRESPONDING WALL COLOR.
4.  ALL COLORS TO BE APPROVED BY ARCHITECT.

SIGNAGE FOR HEARING IMPAIRED

NEXT PAGE

14" THICK AT 3M 4923 LAMINATED, CLEAR ACRYLIC PLASTIC. NON-GLARE WITH POISED EDGES

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SIGNAGE FOR HEARING IMPAIRED

NEXT PAGE

ATTACH SIGN USING (5) FLAT HEAD WOOD SCREWS, COUNTER-SUNK AND ADHESIVE.

NOTES:
1. PROVIDE AT EACH EXIT ACCESS DOOR FROM AN INTERIOR ROOM OR AREA TO A CORRIDOR OR HALLWAY THAT IS REQUIRED TO HAVE A VISUAL EXIT SIGN.
2.  SEE 6- FOR ATTACHMENT.
3.  SEE 6- GENERAL NOTES FOR REQUIREMENTS.

NOTES:
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SIGNAGE FOR HEARING IMPAIRED

NEXT PAGE
**Building for the Next Generation**

KIPP: ACADEMY OF OPPORTUNITY
8500 S. FIGUEROA ST.
LOS ANGELES, CA 90033

ENERGY CALCULATIONS

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4. **ENERGY CALCULATIONS**
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   - Project Details
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**CONSTRUCTION WASTE MANAGEMENT PLAN**

1. **CONSTRUCTION AND DEMOLITION (C&D) WASTE**: INCLUDES ALL NON-HAZARDOUS SOLID WASTES RESULTING FROM CONSTRUCTION, REMODELING, ALTERATIONS, REPAIR, AND DEMOLITION. INCLUDES MATERIAL THAT IS

<table>
<thead>
<tr>
<th>Sealants and Caulks</th>
<th>Waterproofing Sealers, Primers, Flat Paints and Coatings, Non-Flat Paints and Coatings, and Rust Preventative Coatings</th>
</tr>
</thead>
</table>

1. **PERFORMANCE REQUIREMENTS**

   **GENERAL**: WASTE MATERIAL GENERATED DURING PROJECTS SHALL BE RECYCLED OR REUSED WHENEVER PRACTICABLE. DIVERT A MINIMUM OF 90% C&D WASTE, BY WEIGHT, FROM THE LANDFILL BY A CO-MINGLED

1. **PRECONSTRUCTION CONFERENCE**: REVIEW METHODS AND PROCEDURES RELATED TO WASTE MANAGEMENT INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

<table>
<thead>
<tr>
<th>Project Name: Resilient Flooring System</th>
<th>All Flooring Systems Shall Meet the Requirements of the 2013 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11, Section 5.504.4.6.</th>
</tr>
</thead>
</table>

1. **C&D WASTE MATERIALS THAT SHALL BE SALVAGED, REUSED OR RECYCLED INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:**

   | Phone: 951-943-5393, Fax: 951-943-2211 |
|-------------------|----------------------------------------|

1. **INDENTIFY AND CONTRACT WITH A WASTE MANAGEMENT SERVICES PROVIDER OR ASSIGN RESPONSIBILITY TO INHOUSE

1. **PROPOSED METHODS FOR C&D WASTE SALVAGE, REUSE, RECYCLING AND DISPOSAL**

   **A. REQUIRING SUBCONTRACTORS TO TAKE THEIR C&D WASTE TO A RECYCLING FACILITY, APPROVED RECYCLING OR MATERIAL RECOVERY FACILITY, OR DISPOSED.**

1. **TOTAL QUANTITY OF WASTE RECYCLED AS A PERCENTAGE OF TOTAL WASTE.**

1. **DISPOSAL... AND QUANTITIES, BY WEIGHT, FOR MATERIALS SALVAGED FOR REUSE ON SITE, SOLD OR DONATED TO A THIRD PARTY.**

1. **OUTDOOR AIR QUALITY**

   | Phone: 951-943-5393, Fax: 951-943-2211 |
|-------------------|----------------------------------------|

1. **TESTING, ADJUSTMENTS AND COMMISSIONING**

   **HVAC SYSTEMS SHALL BE CONTROLLED WITH A CO2 SENSOR AND PROGRAMMABLE T-STAT FOR EACH INDIVIDUAL UNIT.**

1. **PROOF OF CONSTRUCTION STANDARDS FOR METAL AND FLEXIBLE DUCTWORK.**

1. **ALL CARPET SHALL BE PER THE CARPET AND RUG INSTITUTE'S GREEN LABEL PROGRAM.**

1. **TESTING, ADJUSTMENTS AND COMMISSIONING**

   **OUTDOOR LIGHTING SYSTEMS ATTACHED TO THE BUILDING SHALL BE CONTROLLED WITH PHOTOCELLS INTEGRATED INTO THE FIXTURE.**

1. **MATERIALS WHICH EMIT A VISIBLE GAS OR ODOR MUST BE STORED IN A MANNER WHICH ALLOWS FOR OFF-GASSING, IN A DRY AND WELL VENTILATION AREA, PRIOR TO INSTALLATION.**

1. **CARPETED SURFACES SHALL BE VACUUMED PER THE CRJ/GREEN LABEL VACUUM CLEANER PROGRAM REQUIREMENTS AT COMPLETION OF CONSTRUCTION AND PRIOR TO OCCUPANCY.**

1. **PROJECT NO: DRAWN BY: DATE:**

<table>
<thead>
<tr>
<th>Sheet Number</th>
<th>Title/Description</th>
<th>Room # (S)</th>
<th>Room # (E)</th>
<th>Room Length (Ft)</th>
<th>Room Width (Ft)</th>
<th>Notes</th>
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<tbody>
<tr>
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**LOW EMITTING MATERIALS + MOISTURE MANAGEMENT**

1. **Calculation of VOC emissions during construction:**

   **OCCUPANCY:**

   **OUTDOOR LIGHTING SYSTEMS ATTACHED TO THE BUILDING SHALL BE CONTROLLED WITH PHOTOCELLS INTEGRATED INTO THE FIXTURE.**

   **VOC EMISSIONS HAVE DISSIPATED.**

   **VOE EMISSIONS HAVE DISSIPATED.**

   **FACILITY CLEANING:**

   **PROVIDED TO ENSURE THAT THE SETTINGS APPLIED IN THE MODULAR BUILDING FACTORY HAVE BEEN RETAINED AFTER LONG PERIODS WITHOUT POWER TO THE CONTROL UNITS.**

   **FIELD INSPECTION PRIOR TO FINAL APPROVAL. THIS REPORT SHALL BE SIGNED BY THE INDIVIDUAL(S) RESPONSIBLE FOR PROVIDING THE RESULTS OF THIS FIELD INSPECTION.**

   **OCCUPANCY:**

1. **PROJECT NO: DRAWN BY: DATE:**

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<thead>
<tr>
<th>Sheet Number</th>
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<th>Room # (S)</th>
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<td>PRODUCT</td>
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<td>SOAP DISPENSER</td>
<td>BOBRICK B-663</td>
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<td>TOILET TISSUE DISPENSER (RECESSED)</td>
<td>BOBRICK B-254 B-6806</td>
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<td>BOBRICK B-2111 B-264</td>
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<td>36&quot; GRAB BAR</td>
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<td>SANITARY NAPKIN DISPENSER (RECESSED)</td>
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<td>TOILET SEAT COVER DISPENSER (SURFACE)</td>
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<td>TOILET PARTITIONS</td>
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<td>HAND DRYER (RECESSED)</td>
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NOTE: SEE SHEET A-5.90 FOR TYPICAL FIXTURE, ACCESSORY AND DEVICE MOUNTING HEIGHTS, LOCATIONS AND CLEARANCES.
NOTES:
1. SEE SHEET A-2.10 FOR TYPICAL SUSPENDED CEILING INSTALLATION NOTES
2. SEE SHEET A-2.90 FOR TYPICAL HANGER WIRE ATTACHMENT
3. SEE SHEET A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT
4. SEE SHEET A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT
5. SEE SHEET A-2.90 FOR TYPICAL GRID AT WALL DETAILS
6. SEE SHEET A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL
7. CEILING HEIGHTS ARE +9'-6" AFF (UNO)

SEE SHEET A-0.30 FOR TYPICAL SUSPENDED CEILING INSTALLATION

SEE SHEET A-2.90 FOR TYPICAL HANGER WIRE ATTACHMENT

SEE SHEET A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT

SEE SHEET A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT

SEE SHEET A-2.90 FOR TYPICAL GRID AT WALL DETAILS

SEE SHEET A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL

CEILING HEIGHTS ARE +9'-6" AFF (UNO)
NOTES:

1. SEE SHEET A-0.3 FOR TYPICAL SUSPENDED CEILING INSTALLATION
2. SEE 15/A-2.90 FOR TYPICAL HANGER WIRE ATTACHMENT
3. SEE 6/A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT
4. SEE 4/A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT
5. SEE 7, 8, 12 + 13/A-2.90 FOR TYPICAL GRID AT WALL DETAILS
6. SEE 5/A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL
7. CEILING HEIGHTS ARE +9'-6" AFF (UNO)

DETAILS:

SHEET TITLE:
PROJECT NAME:
2830 BARRETT AVE, PERRIS, CA 92571
PHONE: 951-943-5393, FAX: 951-943-2211
WWW.SILVER-CREEK.NET

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KIPP: ACADEMY OF OPPORTUNITY
8500 S. FIGUEROA ST.
LOS ANGELES, CA 90003

PARTIAL REFLECTED CEILING PLAN - LEVEL 2 (NORTH)
NOTES:
1. SEE SHEET A-0.30 FOR TYPICAL SUSPENDED CEILING INSTALLATION
2. SEE 15/A-2.90 FOR TYPICAL HANGER WIRE ATTACHMENT
3. SEE 6/A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT
4. SEE 4/A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT
5. SEE 7, 8, 12 + 13/A-2.90 FOR TYPICAL GRID AT WALL DETAILS
6. SEE 5/A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL
7. CEILING HEIGHTS ARE +9'-6" AFF (UNO)

A.30
A.2
1.2.3.4.5.6.7.
SEE SHEET A-0.30 FOR TYPICAL SUSPENDED CEILING INSTALLATION
NOTES
SEE 15/A-2.90 FOR TYPICAL HANGER WIRE ATTACHMENT
SEE 6/A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT
SEE 4/A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT
SEE 7, 8, 12 + 13/A-2.90 FOR TYPICAL GRID AT WALL DETAILS
SEE 5/A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL
CEILING HEIGHTS ARE +9'-6" AFF (UNO)
NOTES:

1. SEE SHEET A-3.30 FOR TYPICAL SUSPENDED CEILING INSTALLATION
2. SEE S.2.28 FOR TYPICAL HANGER WIRE ATTACHMENT
3. SEE S.2.26 FOR TYPICAL DUCT TO BUILDING ATTACHMENT
4. SEE S.2.30 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT
5. SEE S.2.30 FOR TYPICAL GRID @ MODULE JOINT DETAIL
6. CEILING HEIGHTS ARE +9'-6" AFF (UNO)

NOTES:

A.1
A.2
A.3
A
B
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SEE SHEET A-0.30 FOR TYPICAL SUSPENDED CEILING INSTALLATION
SEE 15/A-2.90 FOR TYPICAL HANGER WIRE ATTACHMENT
SEE 6/A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT
SEE 4/A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT
SEE 7,8,12 + 13/A-2.90 FOR TYPICAL GRID AT WALL DETAILS
SEE 5/A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL
CEILING HEIGHTS ARE +9'-6" AFF (UNO)
2x STUD, TYP

2x LEDGER ATTACH TO STUDS WITH (3) 16d BOX NAILS, TYP

SIMPSON STRONG TIE LU24 FOR 2x4. ATTACH WITH MANUFACTURER'S RECOMMENDED NAILING

GYP BOARD CEILING FINISH

WALL FINISH

FIRE BLOCKING AT CEILING LEVEL

WALL

2x4 DF#2 CEILING JOIST AT 12" OC

4'-0"

#14x2 1/2" TEK SCREWS (2) PER JOIST (W/ 1 1/2" MIN EMBEDMENT)

SURFACE MOUNTED LIGHT FIXTURE. MAX WT. = 56LBS

2x4 DF#2 CEILING JOIST AT 12" OC

2'-0"

#14x2 1/2" TEK SCREWS (3) PER JOIST

SURFACE MOUNTED LIGHT FIXTURE

2x4 DF#2 CEILING JOIST AT 12" OC

GYP BOARD CEILING FINISH

DRY WALL SCREWS OR NAILS AT 6" OC EN AND 12" OC FN

FLOOR SHTGFLOOR JOIST

7/8" CORRUGATED METAL PANELS, FASTEN TO EACH CEILING JOIST w/(1) #12 STSMS @12" OC

1/2" QUIETROCK SHTG, FASTEN TO EACH JOIST WITH DRYWALL SCREWS AT 12" OC

CEILING JOIST

SUSPENDED CEILING DETAILS

A-2.91
1. All roof coverings to be Class "A"

2. See Detail 1/A-3.90 for TPO Splice at Modline

3. See Detail 2/A-3.90 for TPO Lap Splice

4. See Detail 3/A-3.90 for Typical Pipe/Penetration Flashing

5. See Detail 4/A-3.90 for Overlayment Board Attachment

6. See Detail 7/A-3.90 for Typical Parapet Cap

7. See Detail 18/A-3.90 for Typical Parapet Framing

8. Provide hose bibb on roof at 75'-0" OC max along center line, verify exact location prior to construction

9. All roof drains shall drain to the storm water infiltration basin, see Civil Plans.

NOTES:

1. Slope 1/4:12

2. Slope 1/4:12

3. No. S 4437

4. EXP. 12/31/16

5. ERUCTATE

6. SCALE: 3/16" = 1'-0"
1. All roof coverings to be Class "A"
2. See Detail 1/A-3.90 for TPO splice at modline
3. See Detail 2/A-3.90 for TPO lap splice
4. See Detail 3/A-3.90 for typical pipe/penetration flashing
5. See Detail 4/A-3.90 for overlayment board attachment
6. See Detail 7/A-3.90 for typical parapet cap
7. See Detail 18/A-3.90 for typical parapet framing
8. Provide hose bibb on roof at 75'-0" OC max along center line, verify exact location prior to construction
9. All roof drains shall drain to the storm water infiltration basin, see civil plans.

NOTES:
LEVEL 1
0'

LEVEL 2
13' - 0"
T.O. PARAPET
42' - 0"

LEVEL 3
26' - 0"
T.O. LEVEL 3
TRUSS (RIDGE)
38' - 3 5/8"

1. ALL ROOF DRAINS SHALL DRAIN TO THE STORM WATER INFILTRATION BASIN, SEE CIVIL PLANS.

EXTERIOR ELEVATION NOTES

KEYNOTE LEGEND

1 WALL MOUNTED EXHAUST WALL CAP / HOOD (PAINTED), WEIGHT LESS THAN 10 #, FASTEN EACH CORNER w/(1) 8d NAIL

2 EXTERIOR STUCCO FINISH O/ WALL PER PLAN

3 DOOR PER SCHEDULE

4 LIGHT FIXTURE, SEE ELECTRICAL

5 WINDOW PER SCHEDULE

6 5"x4" OVERFLOW SCUPPER THRU PARAPET TO MATCH WALL COLOR, SEE 9/A-3.90

A-4.00
ACCESSORY SCHEDULE

<table>
<thead>
<tr>
<th>ACCESSORY</th>
<th>COMMENT</th>
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<tbody>
<tr>
<td>SOAP DISPENSER</td>
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<tr>
<td>TOILET TISSUE DISPENSER</td>
<td>(SURFACE)</td>
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<td>42&quot; GRAB BAR</td>
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<td>36&quot; GRAB BAR</td>
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<td>(SURFACE)</td>
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<td>TOILET SEAT COVER DISPENSER</td>
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<td>TOILET PARTITIONS</td>
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<td>HAND DRYER</td>
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NOTE: SEE SHEET A-5.90 FOR TYPICAL FIXTURE, ACCESSORY AND DEVICE MOUNTING HEIGHTS, LOCATIONS AND CLEARANCES.
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LEVEL 1
0" T.O. PARAPET 42' - 0"

LEVEL 2
13' - 0" T.O. LEVEL 3
TRUSS (RIDGE) 38' - 3 5/8"

LEVEL 3
26' - 0" T.O. LEVEL 3

Building Sections

Building Section 1: Grids 3 thru 6 (East - West)

Building Section 2: Grids 7 thru 12 (East - West)

Keynote Legend:
1. Exterior Stucco Finish O/Wall Per Plan
2. Plywood Floor Deck Per Plan
3. Corrugated Metal Ceiling Panels, See XX/XXXXXX
4. Light Fixture, See Electrical
5. TPO Roof Membrane Over 1/4" DensDeck Over Roof Shtg, Where Cricket Occurs Build Up Roof Slope Using Rigid Insulation Or Wood Furring Strips/Framing (Class A)
6. Door Per Schedule
7. Suspended Ceiling Per Schedule
8. Stucco Soffit, See 1/A-5.50
9. Structural Member Per Plan
10. Footing/Stemwall, See F-1.00
11. Window Per Schedule
**SECTION A**

- **PIPING**
  - 2" PIPING TO BE ENCASED IN SLEEVES
  - 36d MIN REINF. TO MATCH LONGITUDINAL REINF.
  - TOP BARS PER APPROVED PLAN
  - BOTTOM BARS PER APPROVED PLAN

- **FOOTING**
  - 3" CLR BETWEEN PIPES
  - CRAWL SPACE PAD
  - CONCRETE IN LIEU OF SLEEVES

**NOTES:**
- #4 AT TOP, #3 VERT AT 18" OC
- #3 VERT AT 18" OC
- #4 HORZ @ 12" OC EA FACE
- #4 @ 10" OC
- #4 VERT @ 12" OC EA FACE
- #4 @ 15" OC
- #9 T&B

**PROJECT NO:**
- 3'-0" ACCESS
- 24" MIN EMBEDMENT INTO FOOTING, TYP
- 3/4" GROUT BED
- 2'-0" MIN.

**SCALE:**
- 1" = 1'-0"
- 1/4" = 1'-0"
- 1/2" = 1'-0"
- 1 1/2" = 1'-0"
- 3/4" = 1'-0"

**COMMENTS:**
- SEE 10/-
- CRAWL SPACE PAD
- TOP OF STEM WALL
- FORMWORK NOT PERMITTED
- NO DIGGING
- 36d MIN REINF. TO MATCH LONGITUDINAL REINF.
- CONCRETE TO BE PLACED BEFORE FOOTING IS Poured.
- PLACE SAME WIDTH AS FOOTING & FULL WIDTH OF PIPE TRENCH
- REMOVE LAITANCE & SCUM
- IF PIPE IS IN PLACE PRIOR TO POURING, CONCRETE IN LIEU OF SLEEVES
- CONCRETE TO BE PLACED BEFORE CONCRETE SETS CLEAN TO CONT. MIN. CLEAN-OUT
- FORMWORK TO BE REMOVED AT A SLANT (TOP TO SIDE)
CONC. FILL TO BE PLACED BEFORE FOOTING IS POURED. PLACE SAME WIDTH AS FOOTING & FULL WIDTH OF PIPES TRENCH.

STEM WALL STEP FOOTING WHERE PIPE IS LESS THAN 2'-6" BELOW BOTTOM OF FOOTING.

SLEEVE, TYP.
NO DIGGING FOR PIPE TRENCH PARALLEL TO FTG. BELOW THIS LINE.

TOP OF STEM WALL
BOT OF FTG
BOT OF FTG

NOTES:

ALL PIPES SHALL BE ENCASED IN SLEEVES W/ 1" CLEAR SPACE AROUND PIPE. SEAL AND MAKE WATER-TIGHT WITH PLASTIC MATERIAL (REF CPC SECTION 313.10 SLEEVES)

IF PIPE IS IN PLACE PRIOR TO POURING CONCRETE, WRAP PIPE WITH 1" GLASS WOOL OR POLYSTYRENE TAPE BEFORE POURING CONCRETE IN LIEU OF SLEEVES.
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MATERIALS: ALL STRUCTURAL STEEL TESTING SHALL COMPLY WITH TITLE 24, SECTION 2213A.

STEEL SHAPES (CHANNEL "C" AND "MC"): ALL STRUCTURAL STEEL SHAPES SHALL CONFORM TO THE "SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF METALS, STRUCTURAL, AND MISCELLANEOUS STEEL AS SPECIFIED AND INDICATED IN THE DRAWINGS.

METAL STUDS AND SHEETS: ALL STUDS AND SHEETS SHALL BE DIMENSIONED TO COMPLY WITH THE REQUIREMENTS OF AREA 3.02.
NOTES:

1. SEE DETAIL 16/S-1.90 FOR BEAM SPLICE (WHERE OCCURS)
2. SEE DETAIL 17/S-1.90 FOR SHIPPING HOLD DOWN (WHERE OCCURS)
3. SEE DETAIL 15/S-1.90 FOR HOLES IN FLOOR JOIST (WHERE OCCURS)
4. SEE DETAILS 11+12/S-1.90 FOR DUCT PENETRATIONS (WHERE OCCURS)
5. SEE DETAIL 9/S-1.90 FOR BLKG TO BEAM / JOIST (WHERE OCCURS)
6. SEE FOUNDATION PLANS FOR LOCATIONS OF FLOOR FRAME TO FOUNDATION CONNECTIONS
7. SEE DETAILS 5+10/S-2.94 FOR TRANSFORMER, RACK AND SWITCHBOARD ANCHORAGE
8. SEE SHEET S-3.00 FOR FRAME ELEVATION REFERENCES
9. VERIFY LOCATIONS OF OPENINGS IN FLOOR FOR DUCT PENETRATIONS WITH MECHANICAL SHOP DRAWINGS.
10. SEE SHEET 0.10 FOR PLYWOOD FLOOR DECK PROPERTIES AND ATTACHMENT.
NOTES:

1. SEE DETAIL 9/S-1.90 FOR HOLES IN FLOOR JOIST (WHERE OCCURS)
2. SEE DETAIL 16/S-1.90 FOR FOUNDATION PLUGS FOR LOCATIONS OF FLOOR FRAME TO FOUNDATION CONNECTIONS
3. SEE DETAIL 5/S-1.90 FOR TRANSFORMER, RACK AND DISTRIBUTION
4. SEE DETAIL 6.27 16 FOR LOCATION OF OPENINGS IN FLOOR FOR OUT FIT PENETRATIONS (WHERE OCCURS)
5. SEE DETAIL 15/S-1.90 FOR HOLES IN FLOOR JOIST (WHERE OCCURS)
6. SEE DETAIL 10/S-1.90 FOR FLUX WELD FLOOR DECK PROPERTIES AND ATTACHMENTS

1. SEE DETAIL 16/S-1.90 FOR HOLES IN FLOOR JOIST (WHERE OCCURS)
2. SEE DETAIL 9/S-1.90 FOR HOLES IN FLOOR JOIST (WHERE OCCURS)
3. SEE DETAIL 16/S-1.90 FOR FOUNDATION PLUGS FOR LOCATIONS OF FLOOR FRAME TO FOUNDATION CONNECTIONS
4. SEE DETAIL 5/S-1.90 FOR TRANSFORMER, RACK AND DISTRIBUTION
5. SEE DETAIL 6.27 16 FOR LOCATION OF OPENINGS IN FLOOR FOR OUT FIT PENETRATIONS (WHERE OCCURS)
6. SEE DETAIL 15/S-1.90 FOR HOLES IN FLOOR JOIST (WHERE OCCURS)
7. SEE DETAIL 10/S-1.90 FOR FLUX WELD FLOOR DECK PROPERTIES AND ATTACHMENTS
PARTIAL FLOOR FRAMING (LEVEL 3 (SOUTH))

NOTES:
1. SEE DETAILS 14.1-1.5 FOR DECK OPENINGS (WHERE OCCURS)
2. SEE DETAILS 14.1-1.5 FOR DECK OPENINGS (WHERE OCCURS)
3. SEE DETAILS 14.1-1.5 FOR DECK OPENINGS (WHERE OCCURS)
4. SEE DETAILS 14.1-1.5 FOR DECK OPENINGS (WHERE OCCURS)
5. SEE DETAILS 14.1-1.5 FOR DECK OPENINGS (WHERE OCCURS)
6. SEE FOUNDATION PLANS FOR LOCATION OF DECK FRAME TO FOUNDATION CONNECTIONS
7. SEE DETAILS 14.1-1.5 FOR TRANSVERSE, FACE AND EVENT/BOARDING
8. SUPPLY LOCATION OF OPENING/2 FOR DECK OPENING/2 (WHERE OCCURS)
9. SEE DETAIL S-1.90 FOR PLATE REINFORCEMENT AND ATTACHMENT
10. SEE DETAIL S-2.94 FOR PLATE REINFORCEMENT AND ATTACHMENT

(See Projects No: 30486)

Sheet Number: S-1.31

SCALE: 1/8" = 1'-0"

KIPP: ACADEMY OF OPPORTUNITY

8500 S. FIGUEROA ST.
LOS ANGELES, CA 90003

Page dimensions: 2592.0x1727.4
NOTES:

1. FRAMING FOR MECHANICAL UNITS: SEE DETAIL 19/S-2.91 FOR DOUBLE JOIST TO BE PROVIDED @ HVAC CURB (4 SIDES), VERIFY UNIT SIZE AND LOCATION PRIOR TO FABRICATING BUILDING FRAME, UNIT WEIGHT (INCLUDING CURB AND ACCESSORIES) SHALL NOT EXCEED 750#.

2. FRAMING FOR AC-27: PROVIDE A SINGLE ROOF JOIST BELOW CURB (4 SIDES), VERIFY UNIT SIZE AND LOCATION PRIOR TO FABRICATING BUILDING FRAME, UNIT WEIGHT (INCLUDING CURB AND ACCESSORIES) SHALL NOT EXCEED 200#.

3. SEE DETAIL 7/S-2.92 FOR BEAM PENETRATION (WHERE OCCURS)

4. SEE DETAIL 11/S-2.92 FOR BEAM SPLICE (WHERE OCCURS)

5. SEE DETAIL 18/S-2.91 FOR HVAC TO CURB ATTACHMENT

6. SEE DETAILS 18/S-2.90  FOR TYPICAL JOIST / BLKG TO BEAM / JOIST CONNECTION

7. SEE DETAIL 17/S-2.91 FOR TYPICAL SHTG ATTACHMENT

8. SEE S-0.10 FOR ROOF SHTG PROPERTIES AND FASTENERS

9. SEE 14/S-2.92 FOR LIFTING EYE BOLT IN COLUMN CAP PLATE (WHERE OCCURS)

10. SEE 18/S-2.92 FOR PARAPET POST AT BEAM

11. SEE 19/S-2.92 FOR PARAPET POST AT COLUMN

12. SEE SHEET S-3.00 FOR FRAME ELEVATION REFERENCES

13. SEE SHEET 14/S-2.90 FOR TYPICAL JOIST / BLKG TO BEAM / JOIST CONNECTION

14. SEE SHEET 17/S-2.91 FOR TYPICAL SHTG ATTACHMENT

15. SEE SHEET S-0.10 FOR PLYWOOD ROOF DECK PROPERTIES AND ATTACHMENT.
NOTES:

1. FRAMING FOR MECHANICAL UNITS: SEE DETAIL 19/S-2.91 FOR DOUBLE JOIST TO BE PROVIDED @ HVAC CURB (4 SIDES), VERIFY UNIT SIZE AND LOCATION PRIOR TO FABRICATING BUILDING FRAME, UNIT WEIGHT (INCLUDING CURB AND ACCESSORIES) SHALL NOT EXCEED 750#. 

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3. SEE DETAIL 7/S-2.92 FOR BEAM PENETRATION (WHERE OCCURS) 

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5. SEE DETAIL 18/S-2.91 FOR HVAC TO CURB ATTACHMENT 

6. SEE DETAILS 18/S-2.90 FOR TYPICAL JOIST / BLKG TO BEAM / JOIST CONNECTION 

7. SEE DETAIL 17/S-2.91 FOR TYPICAL SHTG ATTACHMENT 

8. SEE S-0.10 FOR ROOF SHTG PROPERTIES AND FASTENERS 

9. SEE 14/S-2.92 FOR LIFTING EYE BOLT IN COLUMN CAP PLATE (WHERE OCCURS) 

10. SEE 18/S-2.92 FOR PARAPET POST AT BEAM 

11. SEE 19/S-2.92 FOR PARAPET POST AT COLUMN 

12. SEE SHEET S-3.00 FOR FRAME ELEVATION REFERENCES 

13. SEE SHEET S-0.10 FOR PLYWOOD ROOF DECK PROPERTIES AND ATTACHMENT. 

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SEE S-0.10 FOR ROOF SHTG PROPERTIES AND FASTENERS 

SEE 14/S-2.92 FOR LIFTING EYE BOLT IN COLUMN CAP PLATE (WHERE OCCURS) 

SEE 18/S-2.92 FOR PARAPET POST AT BEAM 

SEE 19/S-2.92 FOR PARAPET POST AT COLUMN 

SEE SHEET S-3.00 FOR FRAME ELEVATION REFERENCES 

SEE SHEET S-0.10 FOR PLYWOOD ROOF DECK PROPERTIES AND ATTACHMENT.
S-2.40

KIPP: ACADEMY OF OPPORTUNITY
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LOS ANGELES, CA 90033

MODULE TO MODULE CONNECTION PLAN - LEVEL 1 (FLOOR)

SCALE: 1/8" = 1'-0"

DATE: 3.15.16

DRAWN BY: Author

PROJECT NO: S-2.93

EXPIRY: 12/31/16

PROJECT SPECIFIC STATE AGENCY APPROVAL

MODULAR BUILDING PROFESSIONAL OF RECORD

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TRUSS MEMBERS SCHEDULE

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NOTE:
1. SEE DETAIL 17/S-2.90 FOR TRUSS CHORD SPLICE (WHERE OCCURS).
2. SEE DETAIL 19/S-2.90 FOR WEB MEMBER CONNECTIONS AT THE 1ST TRUSS BAY.
3. SEE DETAIL 20/S-2.90 FOR TYPICAL WEB MEMBER CONNECTIONS.
4. PROVIDE 1/4" GUSSET PLATE WHERE THE REQUIRED WELD LENGTH CANNOT BE ACHIEVED BY WELDING TO THE CHORD ONLY, SEE 19/S-2.90 FOR GUSSET PLATE ATTACHMENT.
5. SEE DETAIL 18/S-2.90 FOR JOIST TO TRUSS CONNECTION.
6. SCALE: 1/2" = 1'-0"
36" MIN TO END OF BEAM OR OTHER OPENING

3"

1 1/2" DIA (MAX) OPENING IN BEAM W8x OR C8x BEAM

EYE BOLT, VERIFY DIA 3/4" MIN. CAP PLATE COLUMN PER PLAN NUT, TACK WELD TO PLATE.

CJP, WEB, FLANGES + LIPS 1/8 T&B W8x BEAM PER PLAN PLATE TO BEAM 1/4" STIFFENER, CENTER ABOVE HSS BELOW HSS COLUMN COL TO BM/PLATE 1/8 W8x BEAM PER PLAN 1/4 1/4 3/16 PJP, FLANGE TO FLANGE, T&B W8x JOIST PER PLAN HSS 3 1/2 SQ. x 1/4 PARAPET POST CL 3/16 CAP PLATE HSS PER PLAN HSS 3 1/2 SQ. x 1/4 PARAPET POST CL 3/16
STUD DIRECTION

TYPICAL SIDE WALL

TYPICAL END WALL

FIRE EXTINGUISHER CABINET BLOCKOUT

TYPICAL DOOR

TYPICAL WINDOW

BUILDING PROFESSIONAL OF RECORD

KIPP: ACADEMY OF OPPORTUNITY
8500 S. FIGUEROA ST.
LOS ANGELES, CA 90003

SCHEDULE FOR MINIMUM SPACING TYPICAL SIDE WALL FRAMING, SEE FRAMING FOR ATTACHMENT.

2x SILL PLATE

NOTE:
1. ALL STUDS/MEMBERS SUBJECT TO Layout ARE Blocked In.

BUILDING PROFESSIONAL OF RECORD

S-5.00
### EQUIPMENT ANCHORAGE NOTES

All mechanical, plumbing and electrical components shall be anchored and fastened per the plans on the drawings or construction documents. Where detail is not provided, the engineer shall be responsible for selecting bolts and fasteners for the mechanical, plumbing and electrical systems in accordance with the 2013 CBC. Any approved anchors or bolts that are incorrectly installed or improperly designed shall be the responsibility of the contractor. All attachments must be properly fastened and anchored as shown on plans.

1. All equipment and components shall be properly supported. Necessary support members shall be shown on plans. Support members that are not shown shall be the responsibility of the contractor.

2. Support for registered equipment that is either attached or fastened shall be shown on the plans. Support members that are not shown shall be the responsibility of the contractor.

3. All equipment and components shall be properly anchored. Anchoring shall be in accordance with the 2013 CBC. Any approved anchors that are not installed properly or incorrectly designed shall be the responsibility of the contractor.

### MECHANICAL EQUIPMENT SCHEDULE

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### EXHAUST FAN SCHEDULE

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**NOTES:**

1. See Sheet M-0.00 for Mechanical Equipment Schedule
2. See Sheet M-0.00 for Typical Mechanical Equipment Notes and Details
3. See Schedule 3.15.15 for Typical Duct Support
4. See Schedule 3.15.15 for Typical Register Support
5. Provide Ruskin #FSD-35 Fire Smoke Damper at 2nd & 3rd Level Floor Penetrations for all Ductwork to the 1st Level, see Detail 6/A-5.61.
6. Provide Ruskin #FSD-35 Fire/Smoke Damper at Duct Penetrations thru Rated Walls, see Detail 1/A-5.61.
7. Verify Duct and Register Sizes and Locations with Shop Drawings Prior to Construction.

---

**WALL LEGEND**

- 1.35" MGO FIRE RATED WALL PER PLAN
- 0.36" MGO NON-RATED WALL PER PLAN

**FIRE RATED WALL PER PLAN**

- Schedule 3.15.15 for Typical Mechanical Equipment Notes and Details
- See Schedule 3.15.15 for Typical Register Support
- Provide Ruskin #FSD-35 Fire Smoke Damper at 2nd & 3rd Level Floor Penetrations for all Ductwork to the 1st Level, see Detail 6/A-5.61.
- Provide Ruskin #FSD-35 Fire/Smoke Damper at Duct Penetrations thru Rated Walls, see Detail 1/A-5.61.
- Verify Duct and Register Sizes and Locations with Shop Drawings Prior to Construction.

---

**NON-RATED WALL PER PLAN**

- Schedule 3.15.15 for Typical Mechanical Equipment Notes and Details
- See Schedule 3.15.15 for Typical Register Support
- Provide Ruskin #FSD-35 Fire Smoke Damper at 2nd & 3rd Level Floor Penetrations for all Ductwork to the 1st Level, see Detail 6/A-5.61.
- Provide Ruskin #FSD-35 Fire/Smoke Damper at Duct Penetrations thru Rated Walls, see Detail 1/A-5.61.
- Verify Duct and Register Sizes and Locations with Shop Drawings Prior to Construction.

---

**M-1.10**

**PARTIAL MECHANICAL PLAN - LEVEL 1 (NORTH)**
NOTES:

1. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT SCHEDULE
2. SEE SHEET M-0.00 FOR TYPICAL MECHANICAL EQUIPMENT NOTES AND DETAILS
3. SEE WALL LEGEND FOR TYPICAL DUCT SUPPORT
4. SEE SCHEDULE ON SHEET M-0.00 FOR EQUIPMENT ANCHORAGE
5. PROVIDE FIRE RATED WALLS AT WALL CONFLUENCE OF EA LEVEL, SEE DETAIL 1/A-5.61.
6. PROVIDE FIRE RATED DEPARTMENT SHAFTS AT EACH REGISTER CLEAN AND DUCT WALLS, SEE DETAIL 1/A-5.61.
7. PROVIDE DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS PRIOR TO CONSTRUCTION.
8. PROVIDE RUSKIN #FSD-350WFIRE SMOKE DAMPER AT 2nd & 3rd LEVEL FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE DETAIL 6/A-5.61.
9. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS THRU RATED WALLS, SEE DETAIL 1/A-5.61.
10. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS PRIOR TO CONSTRUCTION.
11. VERIFY T-STAT AND CO2 SENSOR LOCATIONS WITH SHOP DRAWINGS PRIOR TO CONSTRUCTION.

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NOTES:
1. SEE SHEET M-00 FOR MECHANICAL EQUIPMENT SCHEDULE
2. SEE SHEET M-00 FOR TYPICAL MECHANICAL EQUIPMENT NOTES AND
   DETAILS
3. SEE 6/A-2.90 FOR TYPICAL DUCT SUPPORT
4. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT 2nd & 3rd LEVEL
   FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE
   DETAIL 6/A-5.61.
5. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS
   THRU RATED WALLS, SEE DETAIL 1/A-5.61.
6. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS
   PRIOR TO CONSTRUCTION.
7. VERIFY T-STAT AND SENSOR LOCATIONS WITH SHOP DRAWINGS
   PRIOR TO CONSTRUCTION.
8. VERIFY T-STAT AND SENSOR LOCATIONS WITH SHOP DRAWINGS
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NOTES:

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2. SEE SHEET M-0.00 FOR TYPICAL MECHANICAL EQUIPMENT SUPPORTS
3. SEE SHEET M-0.00 FOR TYPICAL DUCT SUPPORTS
4. SEE SHEET ON SHEET M-0.00 FOR TYPICAL REGISTER SUPPORT
5. PROVIDE RUSKIN #FSD-35 FIRE SMOKE DAMPER AT 2nd & 3rd LEVEL FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE DETAIL 6/A-5.61.
6. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS THRU RATED WALLS, SEE DETAIL 1/A-5.61.
7. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS PRIOR TO CONSTRUCTION.

RETURN LEGEND

FIRE RATED WALL PER PLAN
STAIR RATED WALL PER PLAN
NOTES:

1. FIRE RATED WALL PER PLAN
2. STAIR RATED WALL PER PLAN
3. FIRE RATED WALL PER PLAN
4. STAIR RATED WALL PER PLAN
5. FIRE RATED WALL PER PLAN
6. STAIR RATED WALL PER PLAN
7. FIRE RATED WALL PER PLAN
8. STAIR RATED WALL PER PLAN

SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT SCHEDULE
SEE SHEET M-0.00 FOR TYPICAL MECHANICAL EQUIPMENT SUPPORTS
SEE SHEET M-0.00 FOR TYPICAL DUCT SUPPORTS
SEE SHEET M-0.00 FOR TYPICAL REGISTER SUPPORT
PROVIDE RUSKIN #FSD-35 FIRE SMOKE DAMPER AT 2nd & 3rd LEVEL FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE DETAIL 6/A-5.61.
PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS THRU RATED WALLS, SEE DETAIL 1/A-5.61.
VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS PRIOR TO CONSTRUCTION.
WALL LEGEND

1. FIRE RATED WALL PER PLAN
2. NON-RATED WALL PER PLAN
3. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT SCHEDULE
4. SEE SHEET M-0.00 FOR TYPICAL MECHANICAL EQUIPMENT NOTES AND DETAILS
5. SEE 6/A-2.90 FOR TYPICAL DUCT SUPPORT
6. SEE 14/A-2.90 FOR TYPICAL REGISTER SUPPORT
7. SEE SCHEDULE ON SHEET M-0.00 FOR EQUIPMENT ANCHORAGE
8. PROVIDE RUSKIN #FSD-35OW FIRE SMOKE DAMPER AT 2nd & 3rd LEVEL FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE DETAIL 6/A-5.61.
9. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS THRU RATED WALLS, SEE DETAIL 1/A-5.61.
10. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS PRIOR TO CONSTRUCTION.

NOTES:

MECHANICAL ROOF PLAN

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MECHANICAL ROOF PLAN

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Date: 3/16" = 1'-0"
Sheet Title: MECHANICAL ROOF PLAN
Sheet Number: M-3.00
Scale: 3/16" = 1'-0"
WHERE A PIPE SIZE IS SHOWN THAT PIPE SIZE SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED.

INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

HOT WATER PIPING SHALL BE INSULATED WITH 1” MINIMUM THICKNESS WRAP.

NOTES:

POTABLE WATER - TYPE L COPPER PIPE MATERIAL + LEGEND

COLD WATER LINE
HOT WATER LINE
1. WHERE A PIPE SIZE IS SHOWN THAT PIPE SIZE SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED. INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

2. HOT WATER PIPING SHALL BE INSULATED WITH 1" MINIMUM THICKNESS WRAP.

NOTES:

- POTABLE WATER - TYPE L COPPER
  - PIPE MATERIAL + LEGEND
  - COLD WATER LINE
  - HOT WATER LINE

PLUMBING ISOMETRIC LEVEL 2 + 3 SUPPLY

SCALE: 1/4" = 1'-0"
WHERE A PIPE SIZE IS SHOWN THAT PIPE SIZE SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED.

INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

CLEAN-OUT SIZES SHALL MATCH THE SIZE OF THE PIPE THE CLEAN-OUT IS LOCATED WITHIN.

CLEAN-OUTS SHALL BE PROVIDED AT INDIVIDUAL FIXTURES AS REQUIRED (NOT SHOWN FOR CLARITY).

NOTES:

PIPE MATERIAL + LEGEND

SEWER LINE + STORM DRAIN LINE

VENT LINE

SEWER

VENT

STORM DRAIN

- ABS SCHD 40

- ABS SCHD 40

- ABS SCHD 40
WHERE A PIPE SIZE IS SHOWN THAT PIPE SIZE SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED. INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE. CLEAN-OUT SIZES SHALL MATCH THE SIZE OF THE PIPE THE CLEAN-OUT IS LOCATED WITHIN. CLEAN-OUTS SHALL BE PROVIDED AT INDIVIDUAL FIXTURES AS REQUIRED (NOT SHOWN FOR CLARITY).

NOTES:

PIPE MATERIAL + LEGEND

SEWER LINE + STORM DRAIN LINE
VENT LINE
SEWER
VENT
STORM DRAIN

- ABS SCHD 40
- ABS SCHD 40
- ABS SCHD 40

SCALE: 1/4" = 1'-0"
NOTES:

1. PIPE SIZES PROVIDED ON DRAWING. ALL PIPE SIZES SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED.

2. INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

3. CLEAN-OUT SIZES SHALL MATCH THE SIZE OF THE PIPE THE CLEAN-OUT IS LOCATED WITHIN.

4. CLEAN-OUTS SHALL BE PROVIDED AT INDIVIDUAL FIXTURES AS REQUIRED (NOT SHOWN FOR CLARITY)

PIPE MATERIAL + LEGEND

- SEVIER - ABS SCHD 40
- VENT - ABS SCHD 40
- STORM DRAIN - ABS SCHD 40
- SEVIER LINE + STORM DRAIN LINE
- VENT LINE

THESE DRAWINGS AND ALL MATERIAL CONTAINED HEREIN ARE THE PROPERTY OF SILVER CREEK INDUSTRIES, INC (SCI Inc) AND SHALL NOT BE REPRODUCED, COPIED OR otherwise DISPOSED OF DIRECTLY OR INDIRECTLY AND SHALL NOT BE USED IN WHOLE OR IN PART TO ASSIST IN THE MAKING OF OR FOR THE PURPOSE OF FURNISHING ANY INFORMATION FOR THE MAKING OF DRAWINGS, PRINTS, APPARATUS OR PARTS THEREOF WITHOUT THE FULL KNOWLEDGE AND WRITTEN CONSENT OF SCI Inc. ALL PATENTABLE MATERIAL CONTAINED HEREIN AND ORIGINATING WITH SCI Inc SHALL BE THE PROPERTY OF SCI Inc
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<th>Total Watts</th>
<th>Amperes</th>
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**Total:**
- A Watts: 2790
- B Watts: 2790
- C Watts: 360

**Total Amperes:**
- A Amperes: 1860
- B Amperes: 1860
- C Amperes: 900

**Total:**
- Total Watts: 3360
- Total Amperes: 3780

---

**Notes:**
- This electrical panel schedule is for the Kipp Academy of Opportunity, 8500 S. Figueroa St., Los Angeles, CA 90003.
- The drawings and specifications are the property of SCI Inc.
- Any information provided is for the purpose of furnishing the opportunity of bidding and is subject to change.

**Contact:**
- Phone: 951-943-5393
- Email: info@sciinc.com
- Website: www.sciinc.com

**Date:** 6.27.16

**Approval:**
- Approved by SCI Inc.
- Development approved by SCI Inc.

**Rev:** 6.27.16

---

**Drawings by:**
- BACO & CA
- VINCENT

**Modular Building Professional of Record:**
- KIPP: ACADEMY OF OPPORTUNITY

---

**Title:**
- ELECTRICAL PANEL SCHEDULES

---

**Sheet:**
- E-0.11
NOTES:

1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. ALL VOLTAGE SHOWN AT A LOCATION/WORK STATION SHALL BE INSTALLED AT 480V AC L/L
3. SEE V/I ON DRAWING FOR TRANSFORMERgetLocation
4. SEE V/I ON DRAWING FOR INSULATION/WORK STATION
5. SEE V/I ON DRAWING FOR SURFACE MOUNTED PANEL, ANCHORAGE
6. SEE V/I ON DRAWING FOR INSULATION/WORK STATION
7. CONDUIT PENETRATION THROUGH FORMED WALL SHALL BE FIRE PROPPED

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL R2 (O.N.O.)
NOTES:

1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. ALL RECEPTACES SHOWN AT A COUNTER/CASEWORK SHALL BE INSTALLED AT +44" AFF (UNO)
3. SEE 5/S-2.94 FOR TRANSFORMER ANCHORAGE
4. SEE 10/S-2.94 FOR SWITCHBOARD AND RACK ANCHORAGE
5. SEE 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
6. SEE 7/S-144 FOR RECEIVED ANCHORAGE
7. CONDUIT PENETRATIONS THRU FIRE RATED WALL SHALL BE PER 16 OR 17/A-5.60
8. NOTE: ALL CIRCUITS ON THIS SHT. ARE ON PANEL R2 (U.N.O.)
NOTES:

1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. ALL RECEPTACLES SHOWN AT COUNTERCASE IN WORK SHALL BE INSTALLED AT 14" AFF (UNO)
3. SEE 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
4. SEE 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
5. SEE 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
6. SEE 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
7. SEE 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
8. CONDUIT PENETRATIONS THRU FIRE-RATED WALL SHALL BE PER 16 OR 17/A-5.60

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL R3 (UNO)
NOTES:
1. SEE SHEET E-1.31 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. ALL RECEPTACLES SHOWN AT A COUNTER/CASEWORK SHALL BE INSTALLED AT +44" AFF (UNO)
3. SEE SHEET E-1 FOR TRANSFORMER ANCHORAGE
4. SEE SHEET E-1 FOR SWITCHBOARD AND RACK ANCHORAGE
5. SEE SHEET E-7 FOR SURFACE MOUNTED PANEL ANCHORAGE
6. SEE SHEET E-1 FOR CONDUIT SLEEVES, TYP.
8. CONDUIT PENETRATIONS THRU FIRE RATED WALL SHALL BE PEI OR 17/A-5.60 23/24
9. SEE SHEET E-1 FOR TRANSFORMER ANCHORAGE
10. SEE SHEET E-1 FOR SWITCHBOARD AND RACK ANCHORAGE
11. SEE SHEET E-7 FOR SURFACE MOUNTED PANEL ANCHORAGE

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL R3 (UNO)
NOTE: ALL CIRCUITS ON THIS SHT. ARE ON PANEL L1 (U.N.O.)

SILVER CREEK Building for the Next Generation
2830 BARRETT AVE, PERRIS, CA 92571
PHONE: 951-943-5393. FAX: 951-943-2211
WWW.SILVER-CREEK.NET

PROJECT NAME: KIPP: ACADEMY OF OPPORTUNITY
8500 S. FIGUEROA ST. LOS ANGELES, CA 90003

PARTIAL LIGHTING PLAN - LEVEL 1 (NORTH)

PROFESSIONAL OF RECORD

APPROVED
By RADCO
Department of Housing and Community Development approved 3rd party design approval agency (DM920272)

REVISIONS DESCRIPTION
ADD STAIR LIGHTING AND EXIT SIGN CIRCUIT #s
NOTES:

1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. SEE SHEET E-2.90 FOR TYPICAL LIGHT FIXTURE ANCHORAGE
3. SEE SHEET 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
4. SEE SHEET 20/S-2.94 FOR RECESSED PANEL ANCHORAGE
5. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT ANCHORAGE

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL L1 (U.N.O.)
NOTES:
1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. SEE S-2.90 FOR SURFACE MOUNTED PANEL ANCHORAGE
3. SEE S-2.94 FOR RECESSED PANEL ANCHORAGE
4. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT ANCHORAGE

NOTE:
ALL CIRCUITS ON THIS SHEET ARE ON PANEL L2 (U.N.O.)
1. See sheet E-0.00 for typical notes and symbol legend.
2. Provide 4x4 of medium density (MDF) board (AC 24/40) for.
3. A copy of the construction documents regarding the solar zone for the roof system must be provided to the client.

NOTES:

1. ELECTRICAL ROOF PLAN
2. SCALE: 3/16" = 1'-0"
3. DATE: 6.27.16
4. SHEET NUMBER: E-3.00
KIPP: Academy of Opportunity
Modular Fire Sprinkler Plans

Fire Protection Scope of Work

- Work to begin 4’ above Finished Floor
- All work to be performed by C-16 contractor
- Fire Sprinkler System in Classrooms only to be installed off site in Modular Factory
- Final connection to fire service underground at tie-ins to be performed on building site.
- NF testing of Sprinkler System to be performed on building site.
- Fire Service Main, FDC and Back Flow preventer provided by others
- Fire Alarm System provided by others

Project Design Data:

- Three Story Classroom
- Occupancy Type: E
- Hazard: Light
- Building Height: 27’-0”
- Building Area: 27,000 SQ. FT.

Sheet Index:

<table>
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<th>SHEET</th>
<th>DESCRIPTION</th>
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<td>Cover Sheet/Project Data</td>
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<td>FS 2</td>
<td>First Floor Fire Sprinkler Plans</td>
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<td>FS 3</td>
<td>Second/Floor Fire Sprinkler Plans</td>
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<td>FS 4</td>
<td>Third Floor Fire Sprinkler Plans</td>
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<td>FS 5</td>
<td>Sectional</td>
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<tr>
<td>FS 6</td>
<td>Details</td>
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## GENERAL OVERHEAD NOTES

All design information shall be in accordance with NFPA 7. 2013 Edition and NEC updated.  

Sections is required for light load practicing (D-102 general).  

Columns have column extensions (D-102 general) with splices above and below maximum level.  

Steel is double shear in the first 50% (D-102 general) of length and single shear for the rest.  

All columns are to be square, D-102 30606 and D-102 30609.  

Shear wall connections to be welded.  

For each unit, use only one mortar to be stacked.  

Properly unite entire station mortar to be applied on each floor.  

The weight of all construction over a given area shall not exceed 20.  

All areas shall be limited to the boundary line of each floor.  

All areas shall be limited to the boundary line of each floor.  

Install header at each wall at all levels.  

General notes will be reviewed and approved prior to construction.


design information shall be in accordance with NFPA 7. 2013 Edition and NEC updated.  

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Install header at each wall at all levels.  

General notes will be reviewed and approved prior to construction.

### Sway Brace #1 Zone Legend

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### Symbol Legend

- **Material:**
  - **Steel:**
  - **Concrete:**
  - **Masonry:**
  - **Wood:**

- **Finish:**
  - **Paint:**
  - **Stucco:**
  - **Plaster:**

- **Type:**
  - **Wall:**
  - **Floor:**
  - **Ceiling:**

- **Size:**
  - **Small:**
  - **Medium:**
  - **Large:**

### Scale

Scale: 1/8" = 1'
**Fire Service Main Construction Notes**

1. 4" Hot Tap int 12" City Main
2. Install new 4" Gate Valve
3. Install new 4" C-800 Class 150
4. Install new 4" Detector Check Assembly and FDC
5. Install new 4" Ductile Iron Class 52 under Foundation
6. Install new 4" Ductile Iron Riser
7. Install T rust Blocks per detail
8. All work to be installed per NFPA 14

---

**Diagram Details**

- Buildable Area: 9,975 SF
- 85th Street
- S. Figueroa
- Sidewalk
- Tamper Switches
- Wiring by Others
- FDC

---

**Contact Information**

- So Cal Fire Inc.
- 6050 Hollister Avenue
- Northridge, CA 91320
- 714-369-2338
- o@so-calfire.com

---

**Project Information**

- KIPP Academy of Opportunity
- 8500 South Figueroa Street
  - Los Angeles, CA 90033
- Fire Service Main
  - FS 5
  - 02/11/16
  - Approver: [Name]
  - Approval Date: 05/11/16
  - Issue Date: 05/11/16
  - Circulation: 3
  - Page 5 of 5

---

**811**

**Dig Alert**

- Know what's below.
- Call 811 before you dig.
3rd Floor - New Fire Alarm System - KIPP Academy of Opportunity

Scale 1/8" = 1'-0"
# PC-02-114000 Modular Elevator Hoistway with Modular Machine Room

**"A.D.A. Compliant"**

**Designed for Hydraulic Elevator System**

## Building Data

### Use or Occupancy Classification per CBC, Part 2, Chapter 3: Group E, No. ofStories: 1

*NOTE: CAN SERVE BUILDING WITH MAXIMUM OF THREE (3) STOREYS INCLUDING KITCHEN.*

### Module Size:

- **10'-0" x 7'-11"** (Ambulance Stretcher Compliant)

This plan is not approved for location in any fire or habitability security zone as specified in CBC Chapter 7A.

## Structural Design Notes

Please check with the civil engineer or design architect. Mark out the unacceptable locations of the building. Note that the floor project exceeds maximum tower height 5b + 1.7 and project size 5a + 2.0 or two stories, check appropriate structural drawings. See table EV2.20 and EV2.31.1 for tower height maximum and allowable floor loads.

## Building Codes & Standards

- **Building Permits:**
  - Building Code:
  - Public Health Code:
  - Electrical Code: CBC:
  - Electrical Code: NEC:
  - Fire Code:
  - Plumber Code:
  - Sign Code:

## Pre-Check (PC) Document

A separate project application for Pre-Check is required.

### Cover Page

- **Pre-Check Document Title:** 02-114000
- **By, or the State Architect:**
- **Cover Page:**

---

### Test and Inspections Guideline

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<td>Revision / Change on Sheet (2)</td>
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### Abbreviations

- R.O.: By others
- B.R.T.: Bent
- C.P.: Complete Penetration
- D.A.: Diameter
- D.A.B.: Diameter A.B.
- G.A.: Grate
- E.E.: Elevation
- E.V.: Evergreen
- F.: Floor
- F.F.: Fire Floor
- F.T.: Feet
- G.A.: Grade
- H.: Height
- L.: Length
- A.R.: Arc
- N.S.: Near Side
- N.T.B.: Not to Scale
- N.A.: Not applicable
- G.C.: On Center
- P.L.: Plate
- P.Q.R.: Procedure Qualification Record
- W.: With
- Ø: Diameter
- O./O.O.: Outer to Outer
- S.: Centerline

---

### Fire Sprinkler Protection

Fire sprinkler protection may be required in habitable and/or machine room based on the fire alarm system and/or fire sprinkler system. See the fire alarm system and fire sprinkler system for requirements. See NFPA 13, Installation of Sprinkler Systems - 2012 Edition.
To determine your site specific separation distance use:

\[ x = \frac{h \times \text{elevator}}{\text{minimum sectional}} \]

MEET MINIMUM SECTIONAL

1. Anchor bolts to be 4-7/8".
2. Welding joints for structural connections shall comply to A.W.S. IA-001.)
3. All steel columns and plates shall be A36.
4. All other steel shall be A572.
5. All connections shall be made with Type X fire rated gypsum board layers of 5/8" type X fire rated gypsum board.
6. All roofing materials shall be spray-on or caps of 3/4" plywood.
7. Layer of 5/8" type X fire rated gypsum board shall be installed around the perimeter of the hoistway.
8. The numbers are similar to the calculations for an elevator column:

See L.A. FABRICATOR LICENSE # FB03024
**DOOR HARDWARE SCHEDULE**

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<th>SINGLE EXTERIOR - EXIT DEVICE</th>
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<tr>
<td>Exit Device</td>
<td>TELL, BK/WR</td>
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<tr>
<td>Butt</td>
<td>HAGER 8619-1 4 (4) 1-1/2</td>
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<tr>
<td>Closer</td>
<td>T-250</td>
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<tr>
<td>Weather Strip</td>
<td>HAGER 89116</td>
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<tr>
<td>Threshold</td>
<td>HAGER 89123</td>
</tr>
<tr>
<td>Door Bottom</td>
<td>HAGER 89125</td>
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**PAIR EXTERIOR - EXIT DEVICE**

| MW-2 |
| Exit Device | TELL, BK/WR | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Threshold | HAGER 89123 | ML |
| Door Bottom | HAGER 89125 | ML |

**STAFF RESTROOM - INTERIOR DOOR**

| MW-3 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**INTERIOR EXITS - CERTIFIED DOOR**

| MW-4 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STORAGE - RATED OPENING**

| MW-5 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STORAGE - PAIR**

| MW-6 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDENT ROOM - RATED OPENING**

| MW-7 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STAFF RESTROOM - RATED OPENING**

| MW-8 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STAFF RESTROOM - RATED OPENING**

| MW-9 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDY ROOM - RATED OPENING**

| MW-10 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDY ROOM - RATED OPENING**

| MW-11 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDENT ROOM - RATED OPENING**

| MW-12 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDENT ROOM - RATED OPENING**

| MW-13 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDENT ROOM - RATED OPENING**

| MW-14 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDENT ROOM - RATED OPENING**

| MW-15 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDENT ROOM - RATED OPENING**

| MW-16 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDENT ROOM - RATED OPENING**

| MW-17 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**STUDENT ROOM - RATED OPENING**

| MW-18 |
| Closer | T-450 | 360 |
| Butt | HAGER 8619-1 4 (4) 1-1/2 | 360 |
| Closer | T-250 | 550 |
| Weather Strip | HAGER 89116 | ML |
| Louver | ANODIZED ALUM (VERIFY SIZE) | BRONZE |

**INSULATION SPECIFICATIONS**

- **DESCRIPTION OF WORK:** The furnishing and installing of all insulation for all ceiling, floor areas, and exterior walls.

- **MOISTURE PROTECTION INSULATION:**
  - **DESCRIPTION:** Insulation shall be as manufactured by Owens-Corning Fiberglas Corporation, Johns-Manville, or equal.
  - **LOCATION:** All ceiling, floor areas, and exterior walls.
  - **SKILL LEVEL:** Level 1
  - **INSTALLATION:** Level 1

- **INTEGRAL INSULATION MATERIAL:**
  - **DESCRIPTION:** Integral insulation material for all ceiling, floor, and exterior walls shall be manufactured by Owens-Corning Fiberglas Corporation, Johns-Manville, or equal.
  - **LOCATION:** All ceiling, floor areas, and exterior walls.
  - **SKILL LEVEL:** Level 1
  - **INSTALLATION:** Level 1

**FLOOR, WALL, CEILING MATERIALS**

- **DESCRIPTION:** The furnishing and installing of all floor, wall, and ceiling materials.

- **FLOORING**
  - **CLASS A = 0-25 FLAME SPREAD:**
    - **DESCRIPTION:** SMOKE DEVELOPMENT DENSITY LESS THAN 450.
    - **LOCATION:** All floor areas.
    - **INSTALLATION:** Level 1

- **WALLS**
  - **DESCRIPTION:**
    - **DESCRIPTION:** Wall materials to be 1/2" thick, color: TBD.
    - **LOCATION:** All exterior walls.
    - **INSTALLATION:** Level 1

- **CEILING**
  - **DESCRIPTION:**
    - **DESCRIPTION:** Ceiling materials to be 1/2" thick, color: TBD.
    - **LOCATION:** All interior ceilings.
    - **INSTALLATION:** Level 1

- **BASE**
  - **DESCRIPTION:**Vinyl Covered Tackable Wall Panel, Tackable Panel
  - **LOCATION:** All interior walls.
  - **INSTALLATION:** Level 1

- **FRP**
  - **DESCRIPTION:** Glasliner FRP, color: "BRIGHT WHITE," SMOOTH NO FINISH, RAW (TAPE, DRYWALL)
  - **LOCATION:** All interior walls.
  - **INSTALLATION:** Level 1

- **ACT**
  - **DESCRIPTION:** Armstrong #2910, 2'x4' Lay-In Tile
  - **LOCATION:** All interior walls.
  - **INSTALLATION:** Level 1

- **EXP**
  - **DESCRIPTION:** No Finish, Exposed Structure, Primed Only
  - **LOCATION:** All exterior walls.
  - **INSTALLATION:** Level 1

- **MP**
  - **DESCRIPTION:** Raw (Taped) Drywall
  - **LOCATION:** All interior walls.
  - **INSTALLATION:** Level 1
ABBREVIATIONS

SPECIFICATIONS

NOTES FOR FIRE SPRINKLER SYSTEM SPECIFICATIONS

REPLACEMENT DEVICES

ARCHITECT

COAT HOOKS SHALL BE INSTALLED AT 48" MAX.

ALL LIGHT-WEIGHT MISCELLANEOUS DEVICES, SUCH AS STROBE LIGHTS, SPEAKERS, ETC., SHALL BE ATTACHED TO THE CEILING GRID PER SECTION 7.2.2 OF DSA IR 25-2.13. IN ADDITION, DEVICES WEIGHING MORE THAN 10 LBS SHALL HAVE A MOUNTING DEVICE OR SUPPORTING STRUCTURE.

ELEVATOR LANDING JAMBS ON EACH LEVEL SHALL HAVE THE NUMBER OF THE FLOOR ON WHICH THE CAB / HOISTWAY DOOR SHALL BE FRONT OPENING AT BOTH STOPS.

CAB / HOISTWAY DOOR SHALL BE PROVIDED WITH A DOOR REOPENING DEVICE THAT WILL STOP AND RECLOSE THE DOOR IF OPENS MORE THAN 70 DEGREES FROM THE CLOSED POSITION.

L. CAPACITY SHALL BE DESIGNED FOR THE EB AND THE LEVER ACTION, WHERE T IS THE TOTAL TIME IN SECONDS AND D IS THE DISTANCE FROM A POINT IN THE LANDING AREA 60" DIRECTLY IN FRONT OF THE CALL BUTTON TO THE CENTERLINE OF THE HOISTWAY DOOR. THE MINIMUM TIME SHALL BE NOT LESS THAN 5 SECONDS.

THE CAR INTERIOR SHALL ALLOW FOR THE TURNING OF A WHEELCHAIR. THE MINIMUM CLEAR DISTANCE SHALL BE NOT LESS THAN 68" x 54". THE MINIMUM DISTANCE FROM THE WALL TO THE RETURN PANEL SHALL BE 31" - 33" AFF. ALLOWABLE STRESS SHALL NOT BE EXCEEDED FOR THE MATERIALS USED WHEN A LOAD IS REACTED THROUGH A MOUNTING DEVICE OR SUPPORTING STRUCTURE.

沸水 shall be provided in accordance with DSA IR 25-2.13 SECTION 8, FIGURE 7, DETAIL A TO DIVIDE THE CEILING INTO AREAS NOT EXCEEDING 2500 SQUARE FEET. ALTERNATIVELY, COMPLY WITH ASTM E580-08 SECTION 5.2.9.

ALL FLUSH OR RECEDED LIGHT FIXTURES, MECHANICAL TERMINALS, AND AIR TERMINALS SHALL BE劇記 concentrations IN ACCORDANCE WITH SECTION A-0.30 SHEET FOOTING.

FOR LOCATION OF CEILING HANGING AND BRACING WIRES AT LEAST 6" FROM ALL UNBRACED DUCTS, PIPES, CONDUITS, ETC. HANGER WIRES SHALL NOT ATTACH OR BEND AROUND INTERFERING MATERIAL OR EQUIPMENT. PROVIDE TRAPEZE OR OTHER SUPPLEMENTARY SUPPORT MEMBERS AT OBSTRUCTIONS TO TYPICAL HANGER SPACING. SEE 19/A-2.40 AND 7.2.2 OF DSA IR 25-2.13.
INTEGRAL LETTERS, SYMBOL & "RESTROOM"
HEREIN ARE THE PROPERTY OF SILVERCREEK
ATTACH SIGN USING (4) FLAT HEAD WOOD SCREWS COUNTER-SUNK AND ADHESIVE.
NOTE: THE BUILDING ENTRANCES THAT ARE ACCESSIBLE TO AND UsABLE BY PERSONS WITH DISABILITIES SHALL BE IDENTIFIED WITH AT LEAST ONE STANDARD SIGN, TO BE VISIBLE TO PERSONS APPROACHING FROM PEDESTRIAN WAYS. ATTACHMENT OF SIGNS AT LEFT (includes text: 1. This lift shall not be used to transport material or equipment. 2. Lift capacity: lbs. 3. If locked: telephone # of the key holder (213) 241-1953. 4. In case of emergency call (213) 241-1953.

ACCESSIBLE SIGNAGE (BUILDING)

EXIT ROUTE SIGNAGE

ELEVATOR DIRECTION SIGNAGE

ELEVATOR SIGNAGE

RESTROOM WALL SIGNS

RESTROOM DOOR SIGNS

DOOR SIGNAGE LOCATION

SIGNAGE DETAILS

NOTE: PERMANENT ROOM IDENTIFICATION SIGNS TO BE INSTALLED ON WALL ADJACENT TO THE LATCH SIDE OF DOOR MOUNTING LOCATION MUST ALLOW A PERSON TO APPROACH WITHIN 3" OF THE DOOR LATCH WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING PATH OF THE DOOR. SPACE SIGN IN NEAREST ADJACENT ROOM, HALLWAY OR THE LATCH SIDE OF THE DOOR. SIGN NATURAL ALIGNED OR ADHESIVE. SIGN SHALL BE CENTERED ON OR MOUNTED 60" ABOVE THE FLOOR.

IN ADDITION TO THE 12" \( \times \) 9" BACKGROUND COLOR TO BE 30% BRIGHTNESS OF CORRESPONDING WALL COLOR. 4. ALL COLORS TO BE APPROVED BY ARCHITECT. 5.CHARACTER TYPE: INTEGRAL LETTERS, SYMBOL & NUMBER INSERTED BY STICKING OR EMBossING AND SHALL BE GAVIN SERIF UPPERCASE CHARACTERS ACCOMPANIED BY GRADE 2 BRAILLE COMPLYING WITH 11B-703-4-1, SEE 7/- FOR REQUIREMENTS.

NOTE: PERMANENT ROOM IDENTIFICATION SIGNAGE TO BE INSTALLED ON THE WALL ADJACENT TO THE LATCH SIDE OF DOOR MOUNTING LOCATION. 60" MINIMUM WITH DOOR. 6. ALL COLORS TO BE APPROVED BY ARCHITECT.

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THESE DRAWINGS AND ALL MATERIAL CONTAINED HEREIN ARE THE PROPERTY OF SILVERCREEK INDUSTRIES, INC (SCI Inc) AND SHALL NOT BE REPRODUCED, COPIED OR OTHERWISE DISPOSED OF DIRECTLY OR INDIRECTLY AND SHALL NOT BE USED IN WHOLE OR IN PART TO ASSIST IN THE MAKING OF OR FOR THE PURPOSE OF FURNISHING ANY INFORMATION FOR THE MAKING OF DRAWINGS, PRINTS, APPARATUS OR PARTS THEREOF WITHOUT THE FULL KNOWLEDGE AND WRITTEN CONSENT OF SCI Inc.

DURABLE METAL SIGN COLOR TO CONTRAST THAT OF LETTERING.

1/2" LETTERING

DURABLE METAL SIGN AT EACH EXIT DOOR THAT IS NOT ACCESSIBLE.

1/2" EDGE OF SIGN (LEFT OR RIGHT AS ORIGINATING WITH SCI Inc) SHALL BE THE PROPERTY OF SCI Inc

1/2"

TO COMPLY W/ CBC 11B-703.5

60" A.F.F.

NOTES:
1. PROVIDE SIGN AT EACH EXIT DOOR THAT IS NOT AT AN EGRESS FLOOR LEVEL
2. SEE 3/A-0.31 FOR ATTACHMENT.
3. SEE 6/A-0.31 GENERAL NOTES FOR REQUIREMENTS.
4. VERIFY MAX. OCCUPANCY PRIOR TO FABRICATION
5. VISUAL CHARACTERS SHALL COMPLY WITH CBC 11B-703.5 & TABLE 11B-703.5.5

SIGNAGE DETAILS

1. Text on sign shall be capital letters, 1" high 1/32" raised on contrast background. Letters shall be 3/8" high and supported with countersinking. Bold type shall be 2" high with 1" 1/32" raised letters. Letter spaces shall be equal.
2. Verify maximum occupancy prior to fabrication
3. Visual characters shall comply with CBC 11B-703.5 & Table 11B-703.5.5

NOTE:
1. See 6/A-0.31 for attachment.
2. See 6/A-0.31 general notes for requirements.
3. See 6/A-0.31 General Notes for Similar Signage

SCALE: 3" = 1'-0"
<table>
<thead>
<tr>
<th><strong>Sheet Title:</strong></th>
<th><strong>Project Name:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2830 BARRETT AVE, PERRIS, CA 92571</td>
<td>PHONE: 951-943-5393, FAX: 951-943-2211</td>
</tr>
<tr>
<td><a href="http://WWW.SILVER-CREEK.NET">WWW.SILVER-CREEK.NET</a></td>
<td></td>
</tr>
<tr>
<td><strong>THESE DRAWINGS AND ALL MATERIAL CONTAINED HEREIN ARE THE PROPERTY OF SILVERCREEK INDUSTRIES, INC (SCI Inc) AND SHALL NOT BE REPRODUCED, COPIED OR OTHERWISE DISPOSED OF DIRECTLY OR INDIRECTLY AND SHALL NOT BE USED IN WHOLE OR IN PART TO ASSIST IN THE MAKING OF OR FOR THE PURPOSE OF FURNISHING ANY INFORMATION FOR THE MAKING OF DRAWINGS, PRINTS, APPARATUS OR PARTS THEREOF WITHOUT THE FULL KNOWLEDGE AND WRITTEN CONSENT OF SCI Inc.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ALL PATENTABLE MATERIAL CONTAINED HEREIN AND ORIGINATING WITH SCI Inc SHALL BE THE PROPERTY OF SCI Inc</strong></td>
<td></td>
</tr>
</tbody>
</table>

**ENERGY CALCULATIONS**

**PROJECT SPECIFIC STATE AGENCY APPROVAL**

**PROFESSIONAL OF RECORD**

**MODULAR BUILDING PROFESSIONAL OF RECORD**

**SCHEMATIC:**

**SCALE:**

**DATE:**

**DRAWN BY:**

**PROJECT NO:**

**SHEET NUMBER:**

| **MODIFICATIONS:** |
|-------------------|-------------------|
| **SHEET:** A-0.41 | **DATE:** 3.15.16 |
CONSTRUCTION WASTE MANAGEMENT PLAN

I. C&D WASTE MATERIALS THAT SHALL BE SALVAGED, REUSED OR RECYCLED INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

- Concrete
- Metals
- Window Glass
- Wood
- Gypsum Board
- Carpeting and Pad
- Ceiling Tiles

II. REVIEW REQUIREMENTS FOR DOCUMENTING QUANTITIES OF EACH TYPE OF MATERIALS THAT WILL BE DISPOSED OF THROUGH SALVAGE, REUSE OR RECYCLING.

III. PROPOSED METHODS FOR SALVAGE, REUSE, RECYCLING AND DISPOSAL DURING CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, ONE OR MORE OF THE FOLLOWING:

A. REQUIRING SUBCONTRACTORS TO TAKE THEIR C&D WASTE TO A RECYCLING FACILITY,

B. CONTRACTING WITH A PROFESSIONAL SERVICE PROVIDER TO PROVIDE THE SERVICES OF A PROFESSIONAL SERVICE MANAGER IN ACCORDANCE WITH THE TERMS OF THE AGREEMENT.

C. CONTRACTING WITH A PROFESSIONAL SERVICE PROVIDER TO HANDLE THE C&D WASTE IN ACCORDANCE WITH THE TERMS OF THE AGREEMENT.

D. WASTE MANAGEMENT PLAN

1. IDENTIFY AND CONTRACT WITH A WASTE MANAGEMENT SERVICES PROVIDER OR ASSIGN RESPONSIBILITY TO INHOUSE WASTE MANAGEMENT PROJECT ADMINISTRATOR

2. PROPERLY SEGREGATE WASTE AS REQUIRED BY LAW AND CONTRACTUAL REQUIREMENTS

3. CONDUCT REGULAR VISUAL INSPECTIONS OF DUMPSTERS AND RECYCLING BINS TO REMOVE CONTAMINANTS.

4. APPLY CORRECT LABELING SYSTEMS TO CONTAINERS AS REQUIRED BY LAW.

5. REGULARLY MAINTAIN MACHINERY, EQUIPMENT AND BUILDING MATERIALS.

LOW EMITTING MATERIALS + MOISTURE MANAGEMENT

I. LOW EMITTING MATERIALS SHALL BE SELECTED BASED ON THE FOLLOWING CRITERIA:

A. LOW EMITTING MATERIALS SHALL MEET THE REQUIREMENTS OF THE GREEN BUILDING STANDARDS CODE, CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 11, SECTION 5.504.4.1. PRODUCTS IN THIS CATEGORY INCLUDE BUT ARE NOT LIMITED TO SEALERS, STAINS, CLEAR WOOD FINISHES, FLOOR SEALERS AND COATINGS, WATERPROOFING SEALERS, PRIMERS, FLAT PAINTS AND COATINGS, NON-FLAT PAINTS AND COATINGS, AND RUST PREVENTATIVE COATINGS.

II. OUTDOOR AIR QUALITY

A. THE DUCT SYSTEMS SHALL BE CONSTRUCTED AND INSTALLED PER THE SMACNA HVAC DUCT INSTALLATION STANDARDS.

B. THE BUILDING HAS BEEN COMPLETELY INSTALLED AND ENCLOSED AND THE MECHANICAL SYSTEM IS READY TO BE STARTED.

C. ALL DUST AND DIRT SHALL BE REMOVED FROM BOTH THE INTERIOR AND EXTERIOR OF ALL DUCTS PRIOR TO INSTALLATION.

D. RELAY DUCT FILTERS WITH MERV RATING OF NOT LESS THAN 8. THE CONSTRUCTION FILTER SHALL BE REPLACED PRIOR TO OCCUPANCY.

E. HVAC SYSTEMS SHALL BE CONTROLLED WITH A CO2 SENSOR AND PROGRAMMABLE T-STAT FOR EACH INDIVIDUAL UNIT.

F. HVAC UNITS OPERATING THE STAIRS AND CORRIDORS SHALL NOT HAVE THE THERMOSTAT CONTROLS LOCATED IN THE FRONT FOYER OR IN A MAINTENANCE AREA. SUCH UNITS SHALL BE ACTUATED BY A WETTHER-SENSITIVE SWITCH ADJUSTED TO THE TEMPERATURE REQUIREMENTS OF THE BUILDING'S OCCUPANCY.

G. THE FIELD INSPECTION PRIOR TO FINAL APPROVAL. THIS REPORT SHALL BE SIGNED BY THE INDIVIDUAL(S) RESPONSIBLE FOR PERFORMING THESE SERVICES.

H. AN OPERATIONS AND SYSTEMS MANUAL SHALL BE PROVIDED TO THE OWNER (OR REPRESENTATIVE) AND THE FIELD TECHNICIAN PRIOR TO OCCUPANCY.

I. A FINAL REPORT FOLLOWS THE TESTING AND INSPECTION OF SPECIFIC SYSTEMS TO BE PROVIDED TO THE OWNER (OR REPRESENTATIVE) AND THE FIELD TECHNICIAN PRIOR TO OCCUPANCY.

J. THE PROJECT FILES SHALL BE PRODUCED TO THE OWNER (OR REPRESENTATIVE) AND THE FIELD TECHNICIAN PRIOR TO OCCUPANCY.
## ACCESSORY SCHEDULE

<table>
<thead>
<tr>
<th>ACCESSORY</th>
<th>MODEL #</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOAP DISPENSER</td>
<td>B-663</td>
<td>TOILET TISSUE DISPENSER (SURFACE)</td>
</tr>
<tr>
<td>TOILET TISSUE DISPENSER (RECESSED)</td>
<td>B-4353</td>
<td>SANITARY NAPKIN DISPOSAL (RECESSED)</td>
</tr>
<tr>
<td>TOILET TISSUE DISPENSER (SURFACE)</td>
<td>B-221</td>
<td>TOILET SEAT COVER DISPENSER (SURFACE)</td>
</tr>
<tr>
<td>GRAB BAR</td>
<td>B-6806</td>
<td>42&quot; GRAB BAR</td>
</tr>
<tr>
<td>GRAB BAR</td>
<td>B-6806</td>
<td>36&quot; GRAB BAR</td>
</tr>
<tr>
<td>SANITARY NAPKIN DISPOSAL (SURFACE)</td>
<td>B-221</td>
<td>TOILET SEAT COVER DISPENSER (SURFACE)</td>
</tr>
<tr>
<td>HAND DRYER</td>
<td>WORLD XRA 15A - 115V</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** SEE SHEET A-5.90 FOR TYPICAL FIXTURE, ACCESSORY AND DEVICE MOUNTING HEIGHTS, LOCATIONS AND CLEARANCES.

---

### SCALE:

- 3/8" = 1'-0"1
- 3/8" = 1'-0"2
- 3/8" = 1'-0"3
- 3/8" = 1'-0"4

### ENLARGED PLAN - LEVEL 1 - ROOMS #108 + E02

### ENLARGED PLAN - LEVEL 1 - ROOMS #105, 106 + 116

### ENLARGED PLAN - LEVEL 2 - ROOMS #201 + 202

### ENLARGED PLAN - LEVEL 3 - ROOMS #301 + 302

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ACCESSORY SCHEDULE

MIRROR 18"x30"  BOBRICK MANUF. B-290

SOAP DISPENSER
TOILET TISSUE DISPENSER (RECESSED) BOBRICK B-663
TOILET TISSUE DISPENSER (SURFACE)

42" GRAB BAR BOBRICK B-6806
36" GRAB BAR BOBRICK

SANITARY NAPKIN DISPOSAL (RECESSED) BOBRICK B-4353
SANITARY NAPKIN DISPOSAL (SURFACE)

TOILET SEAT COVER DISPENSER (SURFACE) BOBRICK B-221

TOILET PARTITIONS HADRIAN TBD BOBRICK B-2111 BOBRICK B-264 BOBRICK B-254

METAL PARTITIONS

HAND DRYER (RECESSED) WORLD XRA 15A - 115V

NOTE: SEE SHEET A-5.90 FOR TYPICAL FIXTURE, ACCESSORY AND DEVICE MOUNTING HEIGHTS, LOCATIONS AND CLEARANCES.

GIRLS RESTROOM 203 NORTH STAIR S2

BOYS RESTROOM 204 NORTH STAIR S2

5' - 1"
2' - 6"
2' - 6"
1' - 6"
44" MIN.

61" CLEAR
9' - 9" CLR.
4'-6" CLR.
2' - 8" 5' - 2"
1' - 6" 1' - 6"
1' - 6" 1' - 6"
5' - 0"
1' - 9"
48" MIN.

17' - 3 1/4"
1' - 4"
1' - 6 3/8"
4' - 5 7/8"
5' - 8 5/8"
1' - 5 3/8"
1' - 6"

1' - 0"
5' - 0"
1' - 0"
1' - 0"
1' - 0"
1' - 0"

59" MIN.
51"  CLEAR
60" DIA CLEAR FLOOR SPACE, TYP

RISER 12R @ 6 13/16" EA = 6' - 9 3/8"
RUN 11T @ 11" EA = 10' - 1" 5' - 4"

RISER 11R @ 6 13/16" EA = 6' - 2 5/8"
RUN 10T @ 11" EA = 9' - 2" 12" 24" 24" 12"

TYP 48" MIN 61" CLEAR
61" CLEAR
61" CLEAR
61" CLEAR
61" CLEAR
61" CLEAR
61" CLEAR

TYP 60" DIA CLEAR FLOOR SPACE, TYP
SEE SHEET A-0.30 FOR TYPICAL SUSPENDED CEILING INSTALLATION
SEE 15/A-2.90 FOR TYPICAL HANGER WIRE ATTACHMENT
SEE 6/A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT
SEE 4/A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT
SEE 7, 8, 12 + 13/A-2.90 FOR TYPICAL GRID AT WALL DETAILS
SEE 5/A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL
CEILING HEIGHTS ARE +9'-6" AFF (UNO)
NOTES:
1. SEE SHEET A-6 FOR TYPICAL SUSPENDED CEILING INSTALLATION
2. SEE TAA OR TYPICAL HANGER WITH ATTACHMENT
3. SEE S-2 OR TYPICAL MAIN RUNNER AND CROSS TEES LAYOUT
4. SEE S-2 OR TYPICAL MAIN RUNNER AND CROSS TEES LAYOUT
5. SEE S-2 OR TYPICAL MAIN RUNNER AND CROSS TEES LAYOUT
6. SEE S-2 OR TYPICAL MAIN RUNNER AND CROSS TEES LAYOUT
7. CEILING HEIGHTS ARE +9'-6" APP.

KEYNOTE LEGEND
1. LIGHT FIXTURE, SEE ELECTRICAL
2. EXPOSED STRUCTURE, PAINTED
3. CORRUGATED METAL CEILING PANELS, SEE 6/A-2.91
4. LIGHTING CONTROL SENSOR, SEE ELECTRICAL
5. SUSPENDED CEILING PER SCHEDULE
6. SUSPENDED CEILING PER SCHEDULE
7. SUSPENDED CEILING PER SCHEDULE
8. SUSPENDED CEILING PER SCHEDULE
9. SUSPENDED CEILING PER SCHEDULE
10. SUSPENDED CEILING PER SCHEDULE
11. SUSPENDED CEILING PER SCHEDULE
12. SUSPENDED CEILING PER SCHEDULE
13. SUSPENDED CEILING PER SCHEDULE

PROJECT NAME:
KIPP: ACADEMY OF OPPORTUNITY
8500 S. FIGUEROA ST.
LOS ANGELES, CA 90003

SHEET TITLE:
PARTIAL REFLECTED CEILING PLAN - LEVEL 1 (SOUTH)

MODULAR BUILDING PROFESSIONAL OF RECORD

# PROFESSIONAL OF RECORD

APP R OV E D By RADCO

Development approved
Third party design approval agency

PROJECT NO: 30486
DRAWN BY: Author
SCALE: 3/16" = 1'-0"
DATE: 6.27.16
SHEET NUMBER A-2.11

KEYNOTE LEGEND:
1. LIGHT FIXTURE, SEE ELECTRICAL
2. EXPOSED STRUCTURE, PAINTED
3. CORRUGATED METAL CEILING PANELS, SEE 6/A-2.91
4. LIGHTING CONTROL SENSOR, SEE ELECTRICAL
5. SUSPENDED CEILING PER SCHEDULE
6. SUSPENDED CEILING PER SCHEDULE
7. SUSPENDED CEILING PER SCHEDULE
8. SUSPENDED CEILING PER SCHEDULE
9. SUSPENDED CEILING PER SCHEDULE
10. SUSPENDED CEILING PER SCHEDULE
11. SUSPENDED CEILING PER SCHEDULE
12. SUSPENDED CEILING PER SCHEDULE
13. SUSPENDED CEILING PER SCHEDULE

REFERENCES:
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

APPROVED

approved agency

PARTIAL REFLECTED CEILING PLAN - LEVEL 1 (SOUTH)
NOTES:

1. See Sheet A-2.30 for Typical Suspended Ceiling Installation Notes
2. See 15/A-2.90 for Typical Hanger Wire Attachment
3. See 6/A-2.90 for Typical Duct to Building Attachment
4. See 4/A-2.90 for Typical Main Runner and Cross Tee Layout
5. See 7,8,12 + 13/A-2.90 for Typical Grid at Wall Details
6. See 5/A-2.90 for Typical Grid @ Module Joint Detail
7. Ceiling Heights Are +9'-6" Above Measured Grade

PARTIAL REFLECTED CEILING PLAN - LEVEL 2 (NORTH)

KEYNOTE LEGEND
1 - LIGHT FIXTURE, SEE ELECTRICAL
2 - EXPOSED STRUCTURE, PAINTED
3 - LIGHTING CONTROL SENSOR, SEE ELECTRICAL
4 - SUSPENDED CEILING PER SCHEDULE

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NOTES:
1. SEE SHEET A-0.30 FOR TYPICAL SUSPENDED CEILING INSTALLATION
2. SEE SCHEDULE FOR TYPICAL HANGER WIRE ATTACHMENT
3. SEE 8/A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT
4. SEE 6/A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT
5. SEE 7, 8, 12 + 13/A-2.90 FOR TYPICAL GRID AT WALL DETAILS
6. SEE 5/A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL
7. CEILING HEIGHTS ARE +9'-6" AFF (UNO)
SEE SHEET A-0.30 FOR TYPICAL SUSPENDED CEILING INSTALLATION

SEE 15/A-2.90 FOR TYPICAL HANGER WIRE ATTACHMENT

SEE 6/A-2.90 FOR TYPICAL DUCT TO BUILDING ATTACHMENT

SEE 4/A-2.90 FOR TYPICAL MAIN RUNNER AND CROSS TEE LAYOUT

SEE 7,8,12 + 13/A-2.90 FOR TYPICAL GRID AT WALL DETAILS

SEE 5/A-2.90 FOR TYPICAL GRID @ MODULE JOINT DETAIL

CEILING HEIGHTS ARE +9'-6" AFF (UNO)
2x STUD, TYP
2x4 DF#2 CEILING JOIST AT 12" OC
2x LEDGER ATTACH TO STUDS WITH (3) 16d BOX NAILS, TYP SIMPSON STRONG TIE LU24 FOR 2x4. ATTACH WITH MANUFACTURER'S RECOMMENDED NAILING.
GYP BOARD CEILING FINISH

WALL FINISH
FIRE BLOCKING
AT CEILING LEVEL
WALL

4'-0"
#14x2 1/2" TEK SCREWS (2) PER JOIST (W/ 1 1/2" MIN EMBEDMENT)
SURFACE MOUNTED LIGHT FIXTURE.  MAX WT. = 56LBS

2'-0"
#14x2 1/2" TEK SCREWS (3) PER JOIST
SURFACE MOUNTED LIGHT FIXTURE

FLOOR SHTG
FLOOR JOIST
7/8" CORRUGATED METAL PANELS, FASTEN TO EACH CEILING JOIST w/(1) #12 STSMS @12" OC
1/2" QUIETROCK SHTG, FASTEN TO EACH JOIST WITH DRYWALL SCREWS 12" OC

CEILING JOIST
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A-2.91
ALL ROOF COVERINGS TO BE CLASS "A"

SEE DETAIL 1/A-3.90 FOR TPO SPLICE AT MODLINE
SEE DETAIL 2/A-3.90 FOR TPO LAP SPLICE
SEE DETAIL 3/A-3.90 FOR TYPICAL PIPE/PENETRATION FLASHING
SEE DETAIL 4/A-3.90 FOR OVERLAYMENT BOARD ATTACHMENT
SEE DETAIL 7/A-3.90 FOR TYPICAL PARAPET CAP
SEE DETAIL 18/A-3.90 FOR TYPICAL PARAPET FRAMING

PROVIDE HOSE BIBB ON ROOF AT 75'-0" OC MAX ALONG CENTER LINE,
VERIFY EXACT LOCATION PRIOR TO CONSTRUCTION

ALL ROOF DRAINS SHALL DRAIN TO THE STORM WATER INFILTRATION
BASIN, SEE CIVIL PLANS.
LEVEL 1

T.O. PARAPET

LEVEL 2

T.O. LEVEL 3

TRUSS (RIDGE)

LEVEL 3

EXTERIOR ELEVATION NOTES

1. ALL ROOF DRAINS SHALL DRAIN TO THE STORM WATER INFILTRATION BASIN, SEE CIVIL PLANS.

KEYNOTE LEGEND

1 WALL MOUNTED EXHAUST WALL CAP / HOOD (PAINTED), WEIGHT LESS THAN 10 #, FASTEN EACH CORNER w/(1) 8d NAIL

2 EXTERIOR STUCCO FINISH O/ WALL PER PLAN

3 DOOR PER SCHEDULE

4 LIGHT FIXTURE, SEE ELECTRICAL

5 WINDOW PER SCHEDULE

6 5"x4" OVERFLOW SCUPPER THRU PARAPET TO MATCH WALL COLOR, SEE

A-3.90
**Interior Elevations**

**Accessory Schedule**

<table>
<thead>
<tr>
<th>Description</th>
<th>Model #</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirror Group</td>
<td>B-221</td>
<td></td>
</tr>
<tr>
<td>Coat Hanger</td>
<td>B-211</td>
<td></td>
</tr>
<tr>
<td>Coat Hook</td>
<td>B-254</td>
<td></td>
</tr>
<tr>
<td>48&quot; Grab Bar</td>
<td>B-264</td>
<td></td>
</tr>
<tr>
<td>Restroom Partition</td>
<td>B-212</td>
<td></td>
</tr>
<tr>
<td>Door Hardware</td>
<td>B-210</td>
<td></td>
</tr>
</tbody>
</table>

**Key Note Legend**

- Electrical Group: See Electrical
- Design: See Detail
- Mint Cupola: See Detail
- Metal, Color: See Detail
- Glass, Mirror, Glazing: See Detail
- Security Control, Sensor, Etc.: Etc.
- Railing (Typ): See Elevation
- M.B., M.C. (2) Railing (Typ): See Elevation

**Railing Schedule**

- Type A: See Elevation
- Type B: See Elevation

**Revisions**

- Sheet Title: INTERIOR ELEVATIONS
- Project No: 30486
- Approval No.: 589-1006
- Approved By: RADCO, CA

**Acknowledgements**

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- All information shown is for the purpose of assisting SCI Inc. in the design and construction of the project.

**Date:** 6.27.16

**By:** RADCO, CA

**Approve:** SCI Inc.

**Scale:** 1/4" = 1'-0"
SEE SHEET A-5.90 FOR TYPICAL FIXTURE, ACCESSORY SCHEDULE

- SANITARY NAPKIN
- SOAP DISPENSER
- TOILET TISSUE
- TOILET PARTITIONS
- HAND DRYER
- GRAB BAR
- MIRROR 18"x30"
- ELECTRICAL DEVICE, SEE ELECTRICAL SCHEDULE
- LIGHTING CONTROL SENSOR, SEE ELECTRICAL SCHEDULE
- CASEWORK, SEE INT ELEVATIONS
- SUSPENDED CEILING
- BOARDS, SEE 6/A5.70

ACCESSORY SCHEDULE

| KEYNOTE | DESCRIPTION | WRITTEN CONSENT OF SCI Inc. | ORIGINATING WITH SCI Inc. | PARTS | THESE DRAWINGS AND ALL PATENTABLE AND ALL OTHER PATENTABLE PRODUCTS AND ALL OTHER INFORMATION THEREOF \n|---------|-------------|-----------------------------|---------------------------|-------|------------------------------------------------------------------------------------------------------------------|
| MIRROR | SURFACE | TBD METAL | TBD METAL | TBD METAL | TBD METAL |
| SOAP CONTAINER | SURFACE | TBD METAL | TBD METAL | TBD METAL | TBD METAL |
| SOAP DISPOSER | SURFACE | TBD METAL | TBD METAL | TBD METAL | TBD METAL |
| SOAP DISPOSER (RECESSED) | SURFACE | TBD METAL | TBD METAL | TBD METAL | TBD METAL |
| TOILET PARTITIONS | TBD | TBD | TBD | TBD | TBD |
| TOILET PARTITIONS (RECESSED) | TBD | TBD | TBD | TBD | TBD |
| TOILET PARTITIONS (SURFACE) | TBD | TBD | TBD | TBD | TBD |
| ELECTRICAL CENTER, EMPLOYEE | TBD | TBD | TBD | TBD | TBD |
| ELECTRICAL CENTER, EMPLOYEE (SURFACE) | TBD | TBD | TBD | TBD | TBD |
| ELECTRICAL CENTER, EMPLOYEE (SYMMETRICAL) | TBD | TBD | TBD | TBD | TBD |
| DRAINAGE DITCH | TBD | TBD | TBD | TBD | TBD |
| DRAINAGE DITCH (SURFACE) | TBD | TBD | TBD | TBD | TBD |
### Accessory Schedule

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Accessory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mirror 18&quot;x30&quot;</td>
<td></td>
<td>Bobrick</td>
</tr>
<tr>
<td>2</td>
<td>Soap Dispenser</td>
<td></td>
<td>Bobrick B-663</td>
</tr>
<tr>
<td>3</td>
<td>Toilet Tissue Dispenser (recessed)</td>
<td></td>
<td>Bobrick B-6806</td>
</tr>
<tr>
<td>4</td>
<td>Toilet Tissue Dispenser (surface)</td>
<td></td>
<td>Bobrick B-254</td>
</tr>
<tr>
<td>5</td>
<td>Sanitary Napkin Dispenser (recessed)</td>
<td></td>
<td>Bobrick B-4353</td>
</tr>
<tr>
<td>6</td>
<td>Sanitary Napkin Dispenser (surface)</td>
<td></td>
<td>Bobrick B-221</td>
</tr>
<tr>
<td>7</td>
<td>Toilet Seat Cover Dispenser (surface)</td>
<td></td>
<td>Bobrick B-2111</td>
</tr>
<tr>
<td>8</td>
<td>Toilet Partitions</td>
<td></td>
<td>Hadrian TBD</td>
</tr>
<tr>
<td>9</td>
<td>Grab Bar 42&quot;</td>
<td></td>
<td>Bobrick B-663</td>
</tr>
<tr>
<td>10</td>
<td>Grab Bar 36&quot;</td>
<td></td>
<td>Bobrick B-264</td>
</tr>
</tbody>
</table>

Note: See Sheet A-5.04 for typical fixture, accessory and device selected for location, conditions and circumstances.

---

**Interior Elevations**

1/4" = 1'-0"

- 1st Floor Elevations (North, West, South, East)
- 2nd Floor Elevations (North, West, South, East)
- 3rd Floor Elevations (North, West, South, East)

**Keynote Legend**

- 1 Electrical Device, See Electrical
- 2 Door Per Schedule
- 3 (2) 8'x4' Marker Boards, See 6/A5.70
- 4 Lighting Control Sensor, See Electrical
- 5 Window Per Schedule
- 6 Casework, See Int Elevations
- 7 Silver Creek Keynotes - KIPP

---

**Accessory Schedule**

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty</th>
<th>Color</th>
<th>Vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirror</td>
<td>50</td>
<td>Silver</td>
<td>Bobrick</td>
</tr>
<tr>
<td>Grab Bar</td>
<td>10</td>
<td>Silver</td>
<td>Bobrick</td>
</tr>
<tr>
<td>Soap Dispenser</td>
<td>50</td>
<td>Silver</td>
<td>Bobrick</td>
</tr>
<tr>
<td>Tissue Dispenser</td>
<td>30</td>
<td>Silver</td>
<td>Bobrick</td>
</tr>
<tr>
<td>Sanitary Napkin Dispenser</td>
<td>20</td>
<td>Silver</td>
<td>Bobrick</td>
</tr>
<tr>
<td>Toilet Seat Cover Dispenser</td>
<td>10</td>
<td>Silver</td>
<td>Bobrick</td>
</tr>
<tr>
<td>Toilet Partitions</td>
<td>50</td>
<td>Silver</td>
<td>Hadrian</td>
</tr>
<tr>
<td>Grab Bar</td>
<td>15</td>
<td>Silver</td>
<td>Bobrick</td>
</tr>
<tr>
<td>Casework</td>
<td>100</td>
<td>Silver</td>
<td>Bobrick</td>
</tr>
</tbody>
</table>

Note: This is a summary for typical fixtures, accessories and devices selected for location, conditions and circumstances.
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NOTE:
SEE SHEETS S-5.00 & S-5.10 FOR TYPICAL WALL FRAMING MEMBERS SIZES AND SPACING, FASTENER SIZE AND SPACING, DOOR FRAME CONDITION AT 3" +/- AT HINGE SIDE

SCALE:  3" = 1'-0"
These drawings and all material contained herein are the property of Silvercreek Industries, Inc (SCI Inc) and shall not be reproduced, copied or otherwise disposed of for the making of drawings, prints, apparatus or parts thereof without the full knowledge and written consent of SCI Inc. All patentable material contained herein and the division of the state architect, Office of Regulation Services accepts the following dimensions as adequately serving the needs of children in projects under their jurisdiction. These dimensions are based on CBC Table 11B-604.9 suggested dimensions for serving children ages 3 to 12.

- Toilet Seat Height (Dim to top of seat): 17" - 19" (A) = Adult
- Grab Bar Height (to top): 33" - 36" (A)
- Mirror Height (to bottom of glass): 40" Max (A)
- Dispenser Height: 19" Min.
- Napkin Disposal in front of toilet: 12" Max.
- Lavatory/sink top height: 27" - 28" Min.
- Lavatory/sink knee clearance: 27" Min.
- Toilet accessory mounting heights: 15" Min.
- Toilet clearance in front: 24" (A)
- Urinal lip height: 17" Max.
- Toilet centering from wall/partition: 15" Min
- Trap primer:
- Grab bar connection detail:
- Over obstruction:
- Electrical mounting heights:
- Accessible sink cabinet:
- Accessible lavatory clearance:
- Accessible mounting heights:

Scale: 1/4" = 1'-0"
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CONC. FILL TO BE PLACED BEFORE FOOTING IS POURED. PLACE SAME WIDTH AS FOOTING & FULL WIDTH OF PIPE TRENCH.

STEM WALL

STEP FOOTING WHERE PIPE IS LESS THAN 2'-6" BELOW BOTTOM OF FOOTING

NO DIGGING FOR PIPE TRENCH PARALLEL TO FTG. BELOW THIS LINE

TOP OF STEM WALL

BOTTOM OF FTG

BOTTOM OF FTG

NOTES:

ALL PIPES SHALL BE ENCASED IN SLEEVES W/ 1" CLEAR SPACE AROUND PIPE. SEAL AND MAKE WATERTIGHT WITH PLASTIC MATERIAL (REF CPC SECTION 313.10 SLEEVES)

IF PIPE IS IN PLACE PRIOR TO POURING CONCRETE, WRAP PIPE WITH 1" GLASS WOOL OR POLYSTYRENE TAPE BEFORE POURING CONCRETE IN LIEU OF SLEEVES

1. 

2.
CONNECTIONS

1. ALL STRUCTURAL STEEL, FASTENERS, AND ACCESSORIES SHALL BE INSTALLED IN ACCORDANCE WITH TABLE 2308.10.4.1 AND THIS SPECIFICATION.

2. FASTEN WOOD BESIDES USING SCREWS.

3. ALL STRUCTURAL STEEL TESTING SHALL COMPLY WITH TITLE 24, CCR, AND UNIFORM BUILDING CODE.

4. ALL ROOF FRAMING, FLOOR FRAMING, AND WALL FRAMING SHALL BE PER MANUFACTURER'S PLANS AND PER APPLICABLE CODES.

5. MATERIALS: ALL STRUCTURAL STEEL TESTING SHALL COMPLY WITH TITLE 24, SECTION 2213A.

6. FOR ROOF SHEATHING APPLICATIONS, 8d NAILS (2 1/2" x 0.113") ARE THE MINIMUM REQUIRED FOR WOOD STRUCTURAL PANELS.

7. ALL FASTENERS SHALL BE THREAD SCREW OR FORM UP SCREW TYPE.

NOTES:
1. SEE DETAILS 15/S-1.90 FOR BEAM SPLICE (WHERE OCCURS)
2. SEE DETAILS 16/S-1.90 FOR SHEARINGホールD OWN (WHERE OCCURS)
3. SEE DETAILS 11/S-1.90 FOR HOLES IN FLOOR JOIST (WHERE OCCURS)
4. SEE DETAILS 12/S-1.90 FOR DUCT PENETRATIONS (WHERE OCCURS)
5. SEE DETAILS 1/S-1.90 FOR DUCT PENETRATIONS (WHERE OCCURS)
6. SEE FOUNDATION PLANS FOR LOCATIONS OF FLOOR FRAME TO FOUNDATION CONNECTIONS
7. SEE DETAILS 5/S-2.94 FOR TRANSFORMER, RACK AND SWITCHBOARD ANCHORAGE
8. SEE SHEET S-3.00 FOR FRAME ELEVATION REFERENCES
9. VERIFY LOCATIONS OF OPENINGS IN FLOOR FOR DUCT PENETRATIONS WITH MECHANICAL SHOP DRAWINGS.
10. SEE SHEET 5+10/S-2.94 FOR TYPICAL FLOOR USE AND ATTACHMENT
NOTES:
1. SEE DETAIL 10-1/8" FOR BEAM SPICE (WHERE OCCURS).
2. SEE DETAIL 1011-1/8" FOR SHEETING HOLD DOWN (WHERE OCCURS).
3. SEE DETAIL 10-1/8" FOR HOLES IN FLOOR JOIST WHERE OCCURS.
4. SEE DETAILS FOR DUCT VENTILATIONS (WHERE OCCURS).
5. USE DETAIL 81/2" FOR FIRE STOP (WHERE OCCURS).
6. SEE PANEL LOCATIONS FOR FLOOR FRAME (WHERE OCCURS).
7. SEE DETAILS 1011-1/4" FOR TRANSFORMER, FAN AND ENTRANCE.
8. SEE SHEET 8-15 FOR PIPE ELEVATION REFERENCES.
9. SCHEDULE LOCATIONS OF OPENING IN FLOOR FOR DUCT VENTILATIONS (WHERE OCCURS).
10. SEE SHEET 8-15 FOR PLACED FLOOR DECK PROPERTIES AND ATTACHMENT.
NOTES:
1. FRAMING FOR MECHANICAL UNITS: SEE DETAIL 19/S-2.91 FOR DOUBLE JOIST TO BE PROVIDED @ HVAC CURB (4 SIDES), VERIFY UNIT SIZE AND LOCATION PRIOR TO FABRICATING BUILDING FRAME, UNIT WEIGHT (INCLUDING CURB AND ACCESSORIES) SHALL NOT EXCEED 750#.
2. FRAMING FOR AC-27: PROVIDE A SINGLE ROOF JOIST BELOW CURB (4 SIDES), VERIFY UNIT SIZE AND LOCATION PRIOR TO FABRICATING BUILDING FRAME, UNIT WEIGHT (INCLUDING CURB AND ACCESSORIES) SHALL NOT EXCEED 200#.
3. SEE DETAIL 7/S-2.92 FOR BEAM PENETRATION (WHERE OCCURS)
4. SEE DETAIL 11/S-2.92 FOR BEAM SPLICE (WHERE OCCURS)
5. SEE DETAIL 18/S-2.91 FOR HVAC TO CURB ATTACHMENT
6. SEE DETAILS 18/S-2.90 FOR TYPICAL JOIST / BLKG TO BEAM / JOIST CONNECTION
7. SEE DETAIL 17/S-2.91 FOR TYPICAL SHTG ATTACHMENT
8. SEE S-0.10 FOR ROOF SHTG PROPERTIES AND FASTENERS
9. SEE 14/S-2.92 FOR LIFTING EYE BOLT IN COLUMN CAP PLATE (WHERE OCCURS)
10. SEE 18/S-2.92 FOR PARAPET POST AT BEAM
11. SEE 19/S-2.92 FOR PARAPET POST AT COLUMN
12. SEE SHEET S-3.00 FOR FRAME ELEVATION REFERENCES
13. SEE SHEET S-0.10 FOR PLYWOOD ROOF DECK PROPERTIES AND ATTACHMENT.
NOTES:

1. PLANS FOR MECHANICAL, H/C, SEE DETAIL 10.9.0 FOR DOUBLES.
2. FOR USE IN LIMITED SPACE, MECHANICAL H/C PIPES ARE TO BE LOCATED INSIDE WALL SHEATHING.
3. SHAPES W8X24 W8X21 INTERIOR WALL FRAMING TO BE ATTACHED TO CEILING JOIST OR CEILING MEMBERS.
4. WALL FRAMING FOR MECHANICAL, H/C, SEE DETAIL 10.9.0 FOR DOUBLES.
5. CODE 125, 125.26 FOR BEAM PENETRATION (WHERE SECURED).
6. BUILDING DETAIL 12.1 FOR BEAM PENETRATION (WHERE SECURED).
7. BUILDING DETAIL 12.2 FOR TYPICAL, COST BLUES FOR BEAM - UNIT CONNECTION.
8. BUILDING DETAIL 12.3 FOR TYPICAL, UNIT ATTACHMENT.
9. BUILDING DETAIL 12.4 FOR TYPICAL, UNIT ATTACHMENT.
10. SEE TYPICAL FOR TYPICAL, COST BLUES FOR BEAM - UNIT CONNECTION.
11. FOR TYPICAL JOIST SPICE (WHERE OCCURS)
12. FOR DOUBLE COLUMNS, VERIFY UNIT SIZE AND FASTENERS
13. FOR PARAPET WALL, PROVIDE ACCESSORIES)
14. PROVIDE ACCESSORIES)
15. PROVIDE ACCESSORIES)
16. PROVIDE ACCESSORIES)
17. PROVIDE ACCESSORIES)
NOTES:
1. FRAMING FOR MECHANICAL UNITS: SEE DETAIL 19/S-2.91 FOR DOUBLE JOIST TO BE PROVIDED @ HVAC CURB (4 SIDES), VERIFY UNIT SIZE AND LOCATION PRIOR TO FABRICATING BUILDING FRAME, UNIT WEIGHT (INCLUDING CURB AND ACCESSORIES) SHALL NOT EXCEED 750#. 
2. FRAMING FOR AC-27: PROVIDE A SINGLE ROOF JOIST BELOW CURB (4 SIDES), VERIFY UNIT SIZE AND LOCATION PRIOR TO FABRICATING BUILDING FRAME, UNIT WEIGHT (INCLUDING CURB AND ACCESSORIES) SHALL NOT EXCEED 200#. 
3. SEE DETAIL 7/S-2.92 FOR BEAM PENETRATION (WHERE OCCURS)
4. SEE DETAIL 11/S-2.92 FOR BEAM SPLICE (WHERE OCCURS)
5. SEE DETAIL 18/S-2.91 FOR HVAC TO CURB ATTACHMENT
6. SEE DETAILS 18/S-2.90  FOR TYPICAL JOIST / BLKG TO BEAM / JOIST CONNECTION
7. SEE DETAIL 17/S-2.91 FOR TYPICAL SHTG ATTACHMENT
8. SEE S-0.10 FOR ROOF SHTG PROPERTIES AND FASTENERS
9. SEE 14/S-2.92 FOR LIFTING EYE BOLT IN COLUMN CAP PLATE (WHERE OCCURS)
10. SEE 18/S-2.92 FOR PARAPET POST AT BEAM
11. SEE 19/S-2.92 FOR PARAPET POST AT COLUMN
12. SEE SHEET S-3.00 FOR FRAME ELEVATION REFERENCES
13. SEE SHEET S-0.10 FOR PLYWOOD ROOF DECK PROPERTIES AND ATTACHMENT.
TRUSS ELEVATIONS

TRUSS MEMBER SCHEDULE

TRUSS ELEVATIONS

TRUSS ELEVATIONS

TRUSS ELEVATIONS
36" MIN TO END OF BEAM OR OTHER OPENING

W8x OR C8x BEAM

3" MIN

1 1/2" DIA (MAX) OPENING IN BEAM

CJP, EYE BOLT, VERIFY DIA 3/4" MIN.

CAP PLATE COLUMN PER PLAN

NUT, TACK WELD TO PLATE CL

4" SPLICE OCCURS AS NEEDED, NO MORE THAN 1 SPLICE PER BEAM, SPLICE SHALL BE NO LESS THAN 10' FROM THE END OF THE BEAM

1/8 CJP, WEB, FLANGES + LIPS

3/16 BACK UP PLATE (TYP) ROOF BEAM TYP AT BACK-UP PLATES

1/4 x 3 x 6 3/16 T&B W8x BEAM PER PLAN PLATE TO BEAM

1/4" STIFFENER, CENTER ABOVE HSS BELOW HSS COLUMN COL TO BM/PLATE 1/8

W8x JOIST PER PLAN

HSS 3 1/2 SQ. x 1/4 PARAPET POST CL 3/16 CAP PLATE

HSS PER PLAN

HSS PER PLAN

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SCHEDULE FOR MINIMUM SPACING AND TYPICAL SIDE WALL STUD SIZE, SEE FLOOR PLAN TYPICAL FRAMING, SEE FRAMING FOR ACTUAL STUD SIZE

TYPICAL SIDE WALL

TYPICAL END WALL

FIRE EXTINGUISHER CABINET BLOCKOUT

TYPICAL DOOR

TYPICAL WINDOW
NOTES:
1. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT SCHEDULE
2. SEE SHEET M-0.00 FOR TYPICAL MECHANICAL EQUIPMENT NOTES AND
   DETAILS
3. SEE WALL LEGEND FOR TYPICAL DUCT SUPPORT
4. SEE WALL LEGEND FOR TYPICAL REGISTER SUPPORT
5. SEE SCHEDULE ON SHEET M-0.00 FOR EQUIPMENT ANCHORAGE
6. SEE SCHEDULE ON SHEET M-0.00 FOR EQUIPMENT ANCHORAGE
7. PROVIDE RUSKIN #FSD-350WFIRE SMOKE DAMPER AT 2nd & 3rd LEVEL
   FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE
   DETAIL 6/A-5.61.
8. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT
   PENETRATIONS THRU RATED WALLS, SEE DETAIL 1/A-5.61.
9. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP
   DRAWINGS PRIOR TO CONSTRUCTION.
10. VERIFY T-STAT AND CO2 SENSOR LOCATIONS IN SHOP DRAWINGS
    PRIOR TO CONSTRUCTION.

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2830 BARRETT AVE.
PERRIS, CA 92571 PHONE: 951-943-5393, FAX: 951-943-2211 WWW.SILVER-CREEK.NET

PROJECT NAME:
KIPP: ACADEMY OF OPPORTUNITY
8500 S. FIGUEROA ST.
LOS ANGELES, CA 90003

SHEET TITLE:
PARTIAL MECHANICAL PLAN - LEVEL 1 (SOUTH)

PROFESSIONAL OF RECORD

APPROVED
By MOD vict.
Department of Housing and Community Development approved
third party design
approval agency
MOD-1777
APPROVAL
DATE:
JUN 29 16
FILING DATE:
SEP 30 17
APPROVAL NO.: 589-1006

REVISIONS
DESCRIPTION
DATE

DRAWN BY: 
SCALE: 3/16 = 1'-0"
DATE: 6.27.16

SHEET NUMBER:
M-1.11
NOTES:
1. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT SCHEDULE
2. SEE SHEET M-0.00 FOR TYPICAL MECHANICAL EQUIPMENT DETAILS AND
   SUPPORT
3. SEE SHEET M-0.00 FOR TYPICAL REGISTER SUPPORT
4. SEE SCHEDULE FOR TYPICAL REGISTERS AND EQUIPMENT DETAILS
5. PROVIDE RUSKIN #FSD-35 FIRE SMOKE DAMPER AT 2nd & 3rd LEVEL
   FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE
   DETAIL 6/A-5.61.
6. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS THRU
   RATED WALLS, SEE DETAIL 1/A-5.61.
7. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRADDINGS PRIOR TO CONSTRUCTION.
8. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRADDINGS PRIOR TO CONSTRUCTION.
9. FIRE RATED WALL PER PLAN
10. NON-RATED WALL PER PLAN
11. SEE SCHEDULE ON SHEET M-0.00 FOR EQUIPMENT ANCHORAGE
12. PROVIDE RUSKIN #FSD-35OW FIRE SMOKE DAMPER AT 2nd & 3rd LEVEL FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE
   DETAIL 6/A-5.61.
13. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS THRU RATED WALLS, SEE DETAIL 1/A-5.61.
14. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRADDINGS PRIOR TO CONSTRUCTION.
15. FIRE RATED WALL PER PLAN
16. NON-RATED WALL PER PLAN
17. SEE SCHEDULE ON SHEET M-0.00 FOR EQUIPMENT ANCHORAGE
18. PROVIDE RUSKIN #FSD-35OW FIRE SMOKE DAMPER AT 2nd & 3rd LEVEL FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE
   DETAIL 6/A-5.61.
19. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS THRU RATED WALLS, SEE DETAIL 1/A-5.61.
20. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRADDINGS PRIOR TO CONSTRUCTION.
NOTES:
1. SEE SHEET M-00 FOR MECHANICAL EQUIPMENT SCHEDULE
2. SEE SHEET M-00 FOR TYPICAL MECHANICAL EQUIPMENT NOTES AND
   DETAILS
3. SEE PANEL LEGEND FOR TYPICAL DUCT SUPPORT
4. SEE SHEET M-00 FOR TYPICAL REGISTER SUPPORT
5. SEE SCHEDULE ON SHEET M-00 FOR EQUIPMENT ANCHORAGE
6. PROVIDE RUSKIN #FSD-350W FIRE SMOKE DAMPER AT 2nd & 3rd LEVEL
   FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE DETAIL
   6/A-5.61.
7. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS
   THRU RATED WALLS, SEE DETAIL 1/A-5.61.
8. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS
    PRIOR TO CONSTRUCTION.
9. VERIFY T-STAT AND SENSOR LOCATIONS WITH SHOP DRAWINGS PRIOR TO
    CONSTRUCTION.
EXHAUST HOOD WITH BACKDRAFT DAMPER, PAINT TO MATCH WALL. LOCATE 36" MIN. FROM ANY DOOR.

NOTES:
1. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT SCHEDULE
2. SEE SHEET M-0.00 FOR TYPICAL MECHANICAL EQUIPMENT NOTES AND DETAILS
3. SEE 6/A-2.90 FOR TYPICAL DUCT SUPPORT
4. SEE 14/A-2.90 FOR TYPICAL REGISTER SUPPORT
5. PROVIDE RUSKIN #FSD-35OW FIRE SMOKE DAMPER AT 2nd & 3rd LEVEL FLOOR PENETRATIONS FOR ALL DUCTWORK TO THE 1st LEVEL, SEE DETAIL 6/A-5.61.
6. PROVIDE RUSKIN #FSD-35 FIRE/SMOKE DAMPER AT DUCT PENETRATIONS THRU RATED WALLS, SEE DETAIL 1/A-5.61.
7. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS PRIOR TO CONSTRUCTION.

WALL LEGEND:
A.3.0 NON-RATED WALL PER PLAN
A.3.0.0 NON-RATED WALL PER PLAN

NOTES:
1. FIRE RATED WALL PER PLAN
2. FIRE RATED WALL PER PLAN
PLANT - LEVEL 3

RAW TEXT END
WALL LEGEND
- FIRE RATED WALL PER PLAN
- NON-RATED WALL PER PLAN

NOTES:
1. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT SCHEDULE
2. SEE SHEET M-0.00 FOR TYPICAL MECHANICAL EQUIPMENT NOTES AND DETAIL
3. SEE 6/A-2.90 FOR TYPICAL DUCT SUPPORT
4. SEE 14/A-2.90 FOR TYPICAL REGISTER SUPPORT
5. PROVIDE FLOWLINED DUCT TO PREVENT COMBUSTION AT DUCT PONTECTIONS WHERE AIR TEMPERATURES ARE BETWEEN 150°F AND 350°F.
6. PROVIDE REGISTER TO PREVENT COMBUSTION AT REGISTER PENETRATIONS THROUGH FIRE RATED WALLS, SEE DETAIL 1/A-5.61.
7. VERIFY DUCT AND REGISTER SIZES AND LOCATIONS WITH SHOP DRAWINGS PRIOR TO CONSTRUCTION.

PROFESSIONAL OF RECORD
SILVERCREEK INDUSTRIES, INC
8500 S. FIGUEROA ST. LOS ANGELES, CA 90003

MECHANICAL ROOF PLAN

SCALE: 3/16" = 1'-0"
WHERE A PIPE SIZE IS SHOWN THAT PIPE SIZE SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED.

INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

HOT WATER PIPING SHALL BE INSULATED WITH 1" MINIMUM THICKNESS WRAP.

NOTES:

1. WHEN A PIPE SIZE IS SHOWN THE PIPE SIZE SHALL BE CONSTRUCTED IN LINE WITH THE DIRECTION OF FLOW AND TO THE REQUIRED LENGTH.

2. INDIVIDUAL FIXTURE BRANCH PIPE SIZE SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

3. HOT WATER PIPING SHALL BE INSULATED WITH 1" MINIMUM WRAP.

PIPE MATERIAL + LEGEND

POTABLE WATER - TYPE L COPPER PIPE MATERIAL + LEGEND
1. WHERE A PIPE SIZE IS SHOWN THAT PIPE SIZE SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED.

2. INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

3. HOT WATER PIPING SHALL BE INSULATED WITH 1" MINIMUM THICKNESS WRAP.

NOTES:

POTABLE WATER - TYPE L COPPER PIPE MATERIAL + LEGEND

COLD WATER LINE
HOT WATER LINE

SCALE:
DATE:
DRAWN BY:
PROJECT NO:
SHEET NUMBER:

REVISIONS
PROJECT SPECIFIC STATE AGENCY APPROVAL
PROFESSIONAL OF RECORD
MODULAR BUILDING PROFESSIONAL OF RECORD

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ALL PATENTABLE MATERIAL CONTAINED HEREIN AND ORIGINATING WITH SCI Inc SHALL BE THE PROPERTY OF SCI Inc.
WHERE A PIPE SIZE IS SHOWN THAT PIPE SIZE SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED.

INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

CLEAN-OUT SIZES SHALL MATCH THE SIZE OF THE PIPE THE CLEAN-OUT IS LOCATED WITHIN.

CLEAN-OUTS SHALL BE PROVIDED AT INDIVIDUAL FIXTURES AS REQUIRED (NOT SHOWN FOR CLARITY)

NOTES:

PIPE MATERIAL + LEGEND

SEWER LINE + STORM DRAIN LINE

VENT LINE

SEWER

VENT

STORM DRAIN

- ABS SCHD 40

- ABS SCHD 40

- ABS SCHD 40
WHERE A PIPE SIZE IS SHOWN THAT PIPE SIZE SHALL BE CONTINUOUS, IN THE DIRECTION OF FLOW, UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED. INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE. CLEAN-OUT SIZES SHALL MATCH THE SIZE OF THE PIPE THE CLEAN-OUT IS LOCATED WITHIN. CLEAN-OUTS SHALL BE PROVIDED AT INDIVIDUAL FIXTURES AS REQUIRED (NOT SHOWN FOR CLARITY).
NOTES:

1. PIPE SIZE SHOWN ON IVORY PIPE SHOULDN'T BE CONTINUED IN THE DIRECTION OF FLOW UNTIL THE NEXT PIPE SIZE IS INDICATED OR UNTIL THE INDIVIDUAL BRANCH TO THE FIXTURE IS REACHED.

2. INDIVIDUAL FIXTURE BRANCH PIPE SIZES SHALL BE PER THE PLUMBING FIXTURE SCHEDULE.

3. CLEAN-OUT SIZES SHALL MATCH THE SIZE OF THE PIPE THE CLEAN-OUT IS LOCATED WITHIN.

4. CLEAN-OUTS SHALL BE PROVIDED AT INDIVIDUAL FIXTURES AS REQUIRED (NOT SHOWN FOR CLARITY).

PIPE MATERIAL + LEGEND

- SEVIER - ABS SCHD 40
- VENT - ABS SCHD 40
- STORM DRAIN - ABS SCHD 40
- SEVIER LINE + STORM DRAIN LINE
- ------- VENT LINE

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WWW.SILVERCREEK.NET

PROJECT NAME: KIPP: ACADEMY OF OPPORTUNITY
8500 S. FIGUEROA ST. LOS ANGELES, CA 90003

SHEET TITLE: PLUMBING ISOMETRIC - ROOF DRAINAGE

MODULAR BUILDING PROFESSIONAL OF RECORD

APPROVED
by NAACo + CA
Department of Housing and Community Development approved third party design approval agency
DM920272
APPROVAL DATED
JUN 29, 16
SEP 30, 17
APPROVAL NO
589-1006

PROJECT NO: 30486
DRAWN BY: Author
SCALE: As indicated
DATE: 6.27.16

SHEET NUMBER P-4.00
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<th>Location</th>
<th>Panel Type</th>
<th>Panel Size</th>
<th>Breaker Size</th>
<th>Power Rating</th>
<th>QTY</th>
<th>Notes</th>
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<tbody>
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<td>Location 1</td>
<td>Panel 1</td>
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<td>120/208, 3 Phase</td>
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<tr>
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<td>Panel 2</td>
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<td>Panel 4</td>
<td>100A</td>
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<td>35</td>
<td>5</td>
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</tr>
</tbody>
</table>

**TOTAL**

- Total 'A' Watts: 16920
- Total 'B' Watts: 2160
- Total 'C' Watts: 4670

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<table>
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<tr>
<th>Location 2</th>
<th>Panel 1</th>
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<td></td>
<td>Panel 3</td>
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<td>Panel 2</td>
<td>100A</td>
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<td>Panel 4</td>
<td>100A</td>
<td>120/208, 3 Phase</td>
<td>35</td>
<td>5</td>
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</tbody>
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**TOTAL**

- Total 'A' Watts: 16920
- Total 'B' Watts: 2160
- Total 'C' Watts: 4670

---

**Location 5**

- Panel Size: 100A
- Breaker Size: 120/208, 3 Phase
- Power Rating: 35 A
- QTY: 5
- Notes: 

---

**TOTAL**

- Total 'A' Watts: 16920
- Total 'B' Watts: 2160
- Total 'C' Watts: 4670
NOTES:
1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. ALL RECEPTACES SHOWN AT A COUNTER/CASEWORK SHALL BE INSTALLED AT A 0'-0" COUNTER TOP
3. SEE 5/E-2 FOR TRANSFORMER ANCHORAGE
4. SEE 10/E-2 FOR SURFACE MOUNTED PANEL ANCHORAGE
5. SEE 15/E-2 FOR SURFACE MOUNTED PANEL ANCHORAGE
6. CONDUIT PENETRATIONS THRU FIRE RATED WALL SHALL BE PER 16 OR 17/A-5.60
7. NOTE: ALL CIRCUITS ON THIS SHT. ARE ON PANEL R2 (U.O.)

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2830 Barrett Ave, Perris, CA 92571
Phone: 951-943-5393, Fax: 951-943-2211
www.silver-creek.net

Project Name: KIPP: Academy of Opportunity
8500 S. Figueroa St.
Los Angeles, CA 90003

Sheet Title: Partial Electrical Plan - Level 2 (North)

Level 1

Level 2

Level 3

Level 4

Level 5

Level 6

Level 7
NOTES:

1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. ALL RECEPTACLES SHOWN AT A COUNTER/CASEWORK SHALL BE INSTALLED AT +44" AFF (UNO)
3. SEE 5/S-2.94 FOR TRANSFORMER ANCHORAGE
4. SEE 10/S-2.94 FOR SWITCHBOARD AND RACK ANCHORAGE
5. SEE 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
6. SEE 1/S-2.94 FOR RECEIVED ANCHORAGE
7. CONDUIT PENETRATIONS THRU FIRE RATED WALL SHALL BE PER 16 OR 17/A-5.60

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL R2 (U.N.O.)
NOTES:
1. ONE SHEET IS CONSIDERED TYPICAL NOTES AND SYMBOLS LISTED
2. ALL RECEPTIBLES ShOWN AT LOCATION INDICATED SHALL BE INSTALLED 20'-0" MAX.
3. SEE APP. B FOR TRANSFORMER ANCHORAGE
4. SEE APP. B FOR EXHAUST OUTLET AND RACK ANCHORAGE
5. SEE APP. B FOR SURFACE MOUNTED PANEL ANCHORAGE
6. SEE APP. B FOR SURFACE MOUNTED P
7. CONDUIT PENETRATIONS THRU FIRE RATED WALL SHALL BE PER CODE.

NOTE: ALL CIRCUITS ON THIS SHEET ARE ON PANEL R3 (U.N.O.)
NOTES:

1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. ALL RECEPTACLES SHOWN AT COUNTER/CASEWORK SHALL BE INSTALLED AT +44" AFF (U.N.O.)
3. ALL SLEEVES SHOWN ARE TRANSFORMER-SIZE SLEEVES
4. ALL 100-CA F/F SWITCHEBOARD AND RACK-SIZE SLEEVES
5. SEE 2" CONDUIT SLEEVE, TYP. FOR SURFACE MOUNTED PANEL AND ENCLOSURE
6. CONDUIT PENETRATIONS THRU FIRE RATED WALL SHALL BE RATED 90 MIN.

NOTE:
ALL CIRCUITS ON THIS SHEET ARE ON PANEL R3 (U.N.O.)
NOTES:
1. See sheet E-0.00 for typical notes and panel legend.
2. See E-0.00 for typical light fixture anchorage.
3. See E-0.00 for recessed panel anchorage.
4. See E-0.00 for mechanical equipment anchorage.

NOTE:
All circuits on this SHT. ARE ON PANEL L1 (U.N.O.)
NOTES:
1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. SEE 9/A-2.90 FOR TYPICAL LIGHT FIXTURE ANCHORAGE
3. SEE 15/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
4. SEE 20/S-2.94 FOR RECESSED PANEL ANCHORAGE
5. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT ANCHORAGE

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL L1 (U.N.O.)
NOTES:

1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. SEE 10/S-2.94 FOR SURFACE MOUNTED PANEL ANCHORAGE
3. SEE 20/S-2.94 FOR RECESSED PANEL ANCHORAGE
4. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT ANCHORAGE

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL L2 (U.N.O.)
NOTES:

1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. SEE E-3.1.3 FOR SURFACE MOUNTED PANEL ANCHORAGE
3. SEE E-2.0.4 FOR RECESSED PANEL ANCHORAGE
4. SEE SHEET M-0.00 FOR MECHANICAL EQUIPMENT ANCHORAGE

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL L2 (U.N.O.)
NOTES:
1. USE SHEET E-85 FOR TYPICAL NOTES AND PANEL LEGEND
2. USE A4-LR FOR TYPICAL LIGHT FIXTURE ANCHORAGE
3. USE 1/2"-13 ANCHOR FOR MOUNTED PANEL ANCHORS
4. USE 3/8" J.N. FOR RECESSED PANEL ANCHORAGE
5. USE SHEET H-16 FOR MECHANICAL EQUIPMENT ANCHORAGE

NOTE:
ALL CIRCUITS ON THIS SHT. ARE ON PANEL L3 (U.N.O.)
SOLAR ZONE CALCULATION

2013 TITLE 24, PART 110.10

TOTAL ROOF AREA - 9,192 SF
MINIMUM SOLAR ZONE AREA (15%) - 1,378 SF
SOLAR ZONE #1 - 467 SF
SOLAR ZONE #2 - 983 SF
TOTAL SOLAR ZONE PROVIDED - 1,450 SF

NOTES:
1. SEE SHEET E-0.00 FOR TYPICAL NOTES AND SYMBOL LEGEND
2. PROVIDE A 480V 3P NON-FUSED DISCONNECT AT EACH HVAC UNIT (U.N.O.)
3. A COPY OF THE CONSTRUCTION DOCUMENTS INDICATING THE INFORMATION FROM ENERGY CODE SECTIONS 110.10(b) THRU 110.10(c) SHALL BE PROVIDED TO THE OCCUPANT.

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KIPP: Academy of Opportunity
Modular Fire Sprinkler Plans

Fire Protection Scope of Work
Work to be performed by C-16 contractor
Fire Sprinkler System in Classrooms to be installed off site in Modular Factory
Final connection to fire service underground to be performed on building site.
NFPA testing of Sprinkler System to be performed on building site.
Fire Service Main, FDC and Back Flow preventer provided by others
Fire Alarm System provided by others

Project Design Data:

Three Story Classroom
Occupancy Type: E
Hazard: Light
Building Height: 25'-0"
Building Area: 27,000 SQ. FT.

Sheet Index:

<table>
<thead>
<tr>
<th>SHEET</th>
<th>DESCRIPTION</th>
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<tr>
<td>FS 1</td>
<td>Cover Sheet/Project Data</td>
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<tr>
<td>FS 2</td>
<td>First Floor Fire Sprinkler Plans</td>
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<tr>
<td>FS 3</td>
<td>Second Floor Fire Sprinkler Plans</td>
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<td>FS 4</td>
<td>Third Floor Fire Sprinkler Plans</td>
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<td>FS 5</td>
<td>Sectional</td>
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<tr>
<td>FS 6</td>
<td>Details</td>
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Fire Service Main Construction Notes

1. Install new 4" Groove Valve
2. Install new 4" C-800 Class 150
3. Install new 4" Detector Check Assembly and FDC
4. Install new 4" Ductile Iron Class 52 under Foundation
5. Install new 4" Ductile Iron Riser
6. Install 1 truss block per level
7. All work to be installed per NFPA 14

Forecasted Flow Characteristics

- Model 354/4XD
- Double Check Valve Assembly
- City of Los Angeles
- Los Angeles Division of Water Works - Main System
- For Service Prepared 5/11/11
- Complying with State Water Code, Title 22

Site Area: 23,472 SF

85th Street

S. Figueroa

Sidewalk

FDC

Tamper Switches Tamper Switches Tamper Switches Tamper Switches Tamper Switches Tamper Switches Tamper Switches Tamper Switches

Wiring by Others

811 DIG A HOLE

Know what's below. Call 811 before you dig.
### Fire-Lite Control Panel
- Remote Booster Power Supply
- Fire-Lite 800 Series
- Fire-Lite ECC-50/100
- Fire-Lite IPGSM-4G
- Fire-Lite IMA Series
- Fire-Lite BG-12LXSP
- Fire-Lite IFLOW Switch
- Fire-Lite HEAT DETECTOR
- Fire-Lite HD-355
- Fire-Lite DUCT DETECTOR
- Fire-Lite HD-355
- Fire-Lite SHOE LOCK 24MCC-FW
- Fire-Lite RSS-24MCC-FW
- Monitor Module Fire-Lite MMF-301

### Wire Legend
- 14/2-FPL for Audio/Visual Appliances
- 18/2-FPL for Audio Appliances
- 14/2-FPL for Initiating Circuits

### Fire Alarm System Layout
- 2nd Floor - New Fire Alarm System - KIPP Academy of Opportunity

**Scale:** 1/8" = 1'-0"
## PC-02-114000 MODULAR ELEVATOR HOISTWAY WITH MODULAR MACHINE ROOM

### "A.D.A. COMPLIANT"
**DESIGNED FOR HYDRAULIC ELEVATOR SYSTEM**

### BUILDING DATA

<table>
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<tr>
<th>Use or Occupancy Classification per CBC, Part 2, Chapter 3: Group F</th>
<th>Number of Stories:</th>
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<td>*HOSPITAL CAN SERVE BUILDING WITH MAXIMUM OF THREE STORIES INCLUDING BASEMENT</td>
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**MODULE SIZE:**
10'-0" x 7'-11" (AMBULANCE STRETCHER COMPLAINT)

**THIRD FLOOR IS NOT APPROVED FOR LOADING IN ANY FIRE 1-FIRED SECURITY ZONE AS SPECIFIED IN CBC, CHAPTER 7A.**

### STRUCTURAL DESIGN NOTES

Please choose select the valid floor reaction design options. Mark out the unacceptable group of numbers. Note: on select F project exceeds maximum tower height in feet + 2.7 and project site is +.2 or +500 choose appropriate structural changes. See steel E20 V.2 and E23.1.1 for tower height maximum and elavator floor levels.

### PC TESTS & INSPECTIONS GUIDELINE

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<tr>
<td>S</td>
<td>SECTION (A) ON SHEET (B3)</td>
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<tr>
<td>R</td>
<td>REVISION / CHANGE ON SHEET (EV3)</td>
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**ABBREVIATIONS**

- B.-O. BY OTHERS
- BNT BENT
- C.P. COMPLETE PENETRATION
- DIA. DIAMETER
- DSG. DESIGN
- EA. EACH
- ELEV. ELEVATION
- EX 第二层
- F S. FIRST STORY
- FEET FEET
- GA. GAUGE
- GAUDE
- M.K. MACHINE ROOM
- MAU. MAXIMUM
- M.S. MAIN SUPPORT STRUCTURE
- N.B. NEAR SIDE
- N.B.S. NEAR SIDE
- N.T.B. NOT TO SCALE
- N.A. NOT APPLICABLE
- O.C. ON CENTER
- P.L.T. PLATE
- PQR PROCEDURE QUALIFICATION RECORD
- R.O. ROUND OPENING
- #. REQUIRED
- W. TUBE STEEL
- TYP. TYPICAL
- WPS WELDING PROCEDURE SPECIFICATION
- W. WITH
- " " DIAMETER
- " " ROUND
- " " CENTERLINE

### BUILDING CODES & STANDARDS

- 2010 CALIFORNIA ADMINISTRATIVE CODE (CAG) — (PART 1, TITLE 24, GCD)
- 2010 CALIFORNIA BUILDING CODE (CBC), VOLUMES 1 AND 3 — (PART 2, TITLE 24, COR) (2009 INTERNATIONAL BUILDING CODE WITH CALIFORNIA AMENDMENTS)
- 2010 CALIFORNIA ELECETRIC CODE (CER) — (PART 5, TITLE 24, CER) (2011 NATIONAL ELECTRICAL CODE WITH CALIFORNIA AMENDMENTS)
- 2010 CALIFORNIA MECHANICAL CODE (CMC) — (PART 4, TITLE 24, CMC)
- 2010 CALIFORNIA PLUMBING CODE (CPD) — (PART 6, TITLE 24, CPD) (2009 UNIFIED PLUMBING CODE WITH CALIFORNIA AMENDMENTS)
- 2010 CALIFORNIA FIRE CODE (CFC) — (PART 8, TITLE 24, CFC) (2010 INTERNATIONAL FIRE CODE WITH CALIFORNIA AMENDMENTS)
- 2010 CALIFORNIA REFERENCE CODES (CMC) — (PART 12, TITLE 24, CMC)

- NFPA 13, INSTALLATION OF SPRINKLER SYSTEMS — 2012 EDITION
- NFPA 72, NATIONAL FIRE ALARM CODE — 2014 EDITION

### REFERENCE CODE SECTIONS FOR APPLICABLE STANDARDS

- 2010 CBC, CHAPTER 35
- 2013 CBC, CHAPTER 45
ARCHITECTS, ENGINEERS, OR LUNHAUERS - Select the appropriate configuration for your project and mark the box.

PLAN VIEW - FRONT / REAR EXIT

ARCHITECTS, ENGINEERS, OR LUNHAUERS - Select the appropriate configuration for your project and mark the box.

PLAN VIEW - FRONT EXIT

EV1.0

20000W
One of 5/8" type X fire rated gypsum board on the interior and exterior of hoistway.

The drawings are for a typical hoistway arrangement where the floor opening is 1'-0" wide and the wall opening is 1'-0" wide. The drawings show the connections between the floor and wall assemblies, including the use of C-8TUDS and C-STUDS for the connections. The drawings also show the use of BAR2x1/4" and BAR2x1/2" for the horizontal and vertical connections, respectively.

The calculations for the deflection of the tower only are as follows:

\[ \text{deflection} = \frac{1}{48} \times \frac{P}{E} \]

where \( P \) is the load on the tower and \( E \) is the modulus of elasticity of the steel.

The drawings also show the use of a 3/4" plate for the roof assembly and the use of a 1/2" plate for the column plates. The drawings show the use of HSS4x4x3/8" and HSS4x4x1/4" for the horizontal and vertical connections, respectively.

The drawings also show the use of bolts for the connections, with a specified minimum tensile strength of 130 ksi for the bolts. The drawings also show the use of welding for the connections, with specified minimum requirements for the welds.

The drawings also show the use of anchor bolts for the connections, with specified minimum requirements for the anchor bolts.

The drawings also show the use of a 3/4" plate for the roof assembly and the use of a 1/2" plate for the column plates. The drawings also show the use of HSS4x4x3/8" and HSS4x4x1/4" for the horizontal and vertical connections, respectively.

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The drawings also show the use of anchor bolts for the connections, with specified minimum requirements for the anchor bolts.
FRAMING DETAIL

BASE PLATE DETAIL

FRAMING DETAIL

BASE PLATE DETAIL

FRAMING DETAIL

FRAMING DETAIL

FRAMING SECTION

FRAMING SECTION

ROOF FRAMING SECTION

ROOF FRAMING SECTION

LIFTING LUG DETAIL

TYPICAL SPlice DETAIL

TYPICAL BUILDING CONNECTION DETAIL

WALL FRAMING DETAILS - ALTERNATE C-STUD CONNECTION METHODS

RAIL BRACKET DETAIL

RAIL BRACKET DETAIL - TOP VIEW

NOTE: Material and dimensions of framing are specified in Exhibit 1 or 2. All dimensions are in ".

Steel connections by others. Fire-rated penetrations of walls for this connection are by others.

As per A71.1 Stud/clip brackets shall be secured to their supporting structure by one of the following methods:
(a) by bolts or nails
(b) by using clip fastenings to mount brackets to the building structure
(c) by welding.

METHOD #1

METHOD #2

METHOD #3

Note: 1/8" x 3 FLAT BAR WELD REQUIRED AT ALL CLIP TO C-STUD OR MEMBER CONNECTIONS.

METHOD #1

METHOD #2

METHOD #3

Note: 1/8" x 3 FLAT BAR WELD REQUIRED AT ALL CLIP TO C-STUD OR MEMBER CONNECTIONS.

METHOD #1

METHOD #2

METHOD #3

Note: 1/8" x 3 FLAT BAR WELD REQUIRED AT ALL CLIP TO C-STUD OR MEMBER CONNECTIONS.

A36 STEEL REQUIRED AT ALL CONNECTIONS

A36 STEEL REQUIRED AT ALL CONNECTIONS

A36 STEEL REQUIRED AT ALL CONNECTIONS

1/8" x 3 FLAT BAR WELD REQUIRED AT ALL CLIP TO C-STUD OR MEMBER CONNECTIONS.
Appendix B
# Hydraulic Overview

## Job Information

- **Job Number**: 30486
- **Design Engineer**: Kris Michel
- **Job Name**: KIPP Academy of Opportunity
- **Address 1**: 8500 South Figueroa Street, Los Angeles, CA 90003
- **Address 2**: DSA

## System

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<td>Coverage Per Sprinkler</td>
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## System Pressure Demand

- **System Pressure Demand**: 58.130
- **System Flow Demand**: 150.41
- **Total Demand**: 250.41 @ 58.130

## Supplies

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<th>Hose Flow(gpm)</th>
<th>Static(psi)</th>
<th>Residual(psi)</th>
<th>Identifier</th>
<th>Pressure(psi)</th>
<th>K-Factor(K)</th>
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## Graphs

- **System demand curve**:
  - Static Pressure 79.000
  - 1620.00 @ 71.000
  - 150.41 @ 58.130
  - 250.41 with hose streams

---

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AutoSPRINK 2018 v14.3.10.0 11:03:00AM

3/31/2019 11:03:00AM Page 1
Water Supply at Node 1

Static Pressure: 79.000

Residual Pressure: 71.000 @ 1620.00

Available Pressure at Time of Test: 78.747 @ 250.41

System Demand: 58.130 @ 150.41

System Demand (Including Hose Allowance at Source): 58.130 @ 250.41
### Node Analysis

**Report Description:** Light Hazard  
**Job Number:** 30486  

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**Route 2 ******

| DR 1.0800 | 106 8'-0½ | 15.59 | 5.46 | 120 | 0.071232 | 5'-9¾ | 5'-9¾ | 5'-9¾ | 11'-0 | 0.228 |
| 15 10'-0 | 15.59 | 5.6 | 7.751 | 7.878 | 0.071232 | 8'-0¾ | 8'-0¾ | 8'-0¾ | 11'-0 | 0.228 |

---

**Route 3 ******

| DR 1.0800 | 109 8'-0½ | 16.09 | 5.64 | 120 | 0.075552 | 5'-9¾ | 5'-9¾ | 5'-9¾ | 11'-0 | 0.228 |
| 18 10'-0 | 16.09 | 5.6 | 8.260 | 8.196 | 0.075552 | 8'-0¾ | 8'-0¾ | 8'-0¾ | 11'-0 | 0.228 |
| BL 1.4080 | 16.09 | 3.32 | 120 | 0.020765 | 11'-0 | 11'-0 | 11'-0 | 11'-0 | 11'-0 | 0.833 |
| 16 10'-0 | 16.40 | 8.424 | 9.257 | 9.257 | 0.020765 | 11'-0 | 11'-0 | 11'-0 | 11'-0 | 0.833 |
| 14 10'-0 | 16.30 | 8.424 | 9.257 | 9.257 | 0.020765 | 11'-0 | 11'-0 | 11'-0 | 11'-0 | 0.833 |

---

**Route 4 ******

| DR 1.0800 | 104 8'-0½ | 16.27 | 5.70 | 120 | 0.077033 | 5'-9¾ | 5'-9¾ | 5'-9¾ | 11'-0 | 0.228 |
| 13 10'-0 | 16.27 | 5.6 | 8.438 | 8.646 | 0.077033 | 8'-0¾ | 8'-0¾ | 8'-0¾ | 11'-0 | 0.228 |
| DR 1.0800 | 107 8'-0½ | 16.30 | 5.71 | 120 | 0.077326 | 5'-9¾ | 5'-9¾ | 5'-9¾ | 11'-0 | 0.228 |
| 16 10'-0 | 16.30 | 5.6 | 8.470 | 8.424 | 0.077326 | 8'-0¾ | 8'-0¾ | 8'-0¾ | 11'-0 | 0.228 |

---

**Route 5 ******

<p>| DR 1.0800 | 107 8'-0½ | 16.30 | 5.71 | 120 | 0.077326 | 5'-9¾ | 5'-9¾ | 5'-9¾ | 11'-0 | 0.228 |
| 16 10'-0 | 16.30 | 5.6 | 8.470 | 8.424 | 0.077326 | 8'-0¾ | 8'-0¾ | 8'-0¾ | 11'-0 | 0.228 |</p>
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<th>Pipe Type</th>
<th>Diameter</th>
<th>Flow</th>
<th>Velocity</th>
<th>HWC</th>
<th>Friction Loss</th>
<th>Length</th>
<th>Pressure</th>
<th>Summary</th>
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<td>Discharge</td>
<td>K-Factor</td>
<td>Pt</td>
<td>Pn</td>
<td>Fittings</td>
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**Equivalent Pipe Lengths of Valves and Fittings (C=120 only)**

\[
\text{Actual Inside Diameter} \div \text{Schedule 40 Steel Pipe Inside Diameter} = \text{Factor}
\]

C Value Multiplier

- Value Of C: 100, 130, 140, 150
- Multiplying Factor: 0.713, 1.16, 1.33, 1.51
<table>
<thead>
<tr>
<th>Pipe Type</th>
<th>Diameter</th>
<th>Flow</th>
<th>Velocity</th>
<th>HWC</th>
<th>Friction Loss</th>
<th>Length</th>
<th>Eq. Length</th>
<th>Total Length</th>
<th>Pressure Summary</th>
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<td>Discharge</td>
<td>K-Factor</td>
<td>Pt</td>
<td>Pn</td>
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### Pipe Type Legend
- **AO**: Arm-Over
- **BL**: Branch Line
- **CM**: Cross Main
- **DN**: Drain
- **DR**: Drop
- **DY**: Dynamic
- **FM**: Feed Main
- **FR**: Feed Riser
- **MS**: Miscellaneous
- **OR**: Outrigger
- **RN**: Riser Nipple
- **SP**: Sprig
- **ST**: Stand Pipe
- **UG**: Underground

### Units Legend
- **Diameter**: Inch
- **Elevation**: Foot
- **Flow**: gpm
- **Discharge**: gpm
- **Velocity**: fps
- **Pressure**: psi
- **Length**: Foot
- **Friction Loss**: psi/Foot
- **HWC**: Hazen-Williams Constant
- **Pt**: Total pressure at a point in a pipe
- **Pn**: Normal pressure at a point in a pipe
- **Pf**: Pressure loss due to friction between points
- **Pe**: Pressure due to elevation difference between indicated points
- **Pv**: Velocity pressure at a point in a pipe

### Fittings Legend
- **ALV**: Alarm Valve
- **AngV**: Angle Valve
- **b**: Bushing
- **BalV**: Ball Valve
- **BFP**: Backflow Preventer
- **BV**: Butterfly Valve
- **C**: Cross Flow Turn 90°
- **Cplg**: Coupling
- **Cr**: Cross Run
- **CV**: Check Valve
- **DelV**: Deluge Valve
- **DPV**: Dry Pipe Valve
- **E**: 90° Elbow
- **EE**: 45° Elbow
- **Ee1**: 11¼° Elbow
- **Ee2**: 22½° Elbow
- **f**: Flow Device
- **fd**: Flex Drop
- **FDC**: Fire Department Connection
- **fE**: 90° FireLock(TM) Elbow
- **fEE**: 45° FireLock(TM) Elbow
- **fEng**: Flange
- **FN**: Floating Node
- **fT**: FireLock(TM) Tee
- **g**: Gauge
- **GloV**: Globe Valve
- **GV**: Gate Valve
- **Ho**: Hose
- **Hose**: Hose
- **HV**: Hose Valve
- **Hyd**: Hydrant
- **LiE**: Long Turn Elbow
- **mect**: Mechanical Tee
- **Noz**: Nozzle
- **P1**: Pump In
- **P2**: Pump Out
- **PIV**: Post Indicating Valve
- **PO**: Pipe Outlet
- **PRV**: Pressure Reducing Valve
- **PrV**: Pressure Relief Valve
- **red**: Reducer/Adapter
- **S**: Supply
- **scV**: Swing Check Valve
- **Spr**: Sprinkler
- **St**: Strainer
- **T**: Tee Flow Turn 90°
- **Tr**: Tee Run
- **U**: Union
- **WinF**: Wirsbo
- **WMV**: Water Meter Valve
- **Z**: Cap