
# California Highway Patrol, Grass Valley Lessons Learned

## AIA AAJ National Conference – Portland Oregon
## The Future Is Now:
## Alternative Project Delivery

**September 19, 2013**

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# INTRODUCTIONS

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# THE PROGRAM

- The California Highway Patrol has launched a program for replacing their aging Area Office Infrastructure.
- Many of these facilities will be delivered using the Design / Build / Finance / model of project delivery.
- The Grass Valley Facility is the first of these projects to be successfully delivered using the D/B/F/ model.

# PROJECT DETAILS

- Property optioned by State for purchase by Developer
- States performed preliminary Due Diligence.
- State provided schematic design with room by room and system descriptions.
- State requested Team Qualifications, and a Lease price proposal for 25 years with options to buy at set periods.

# BRIDGING DOCUMENTS

## How Much is enough?

After working with these documents we recommend the following revisions:

**Provide Adjacency Diagrams for site and building relationships.**

The Bridging Architect and Engineers don't typically have enough time with the project to see all of the constraints and opportunities inherent in the project.

Team reconfigured the site plan to address grading, and utility issues effecting constructability, that were unknown to the Bridging Team.

# IDENTIFYING THE RISKS AND MITIGATING THEM

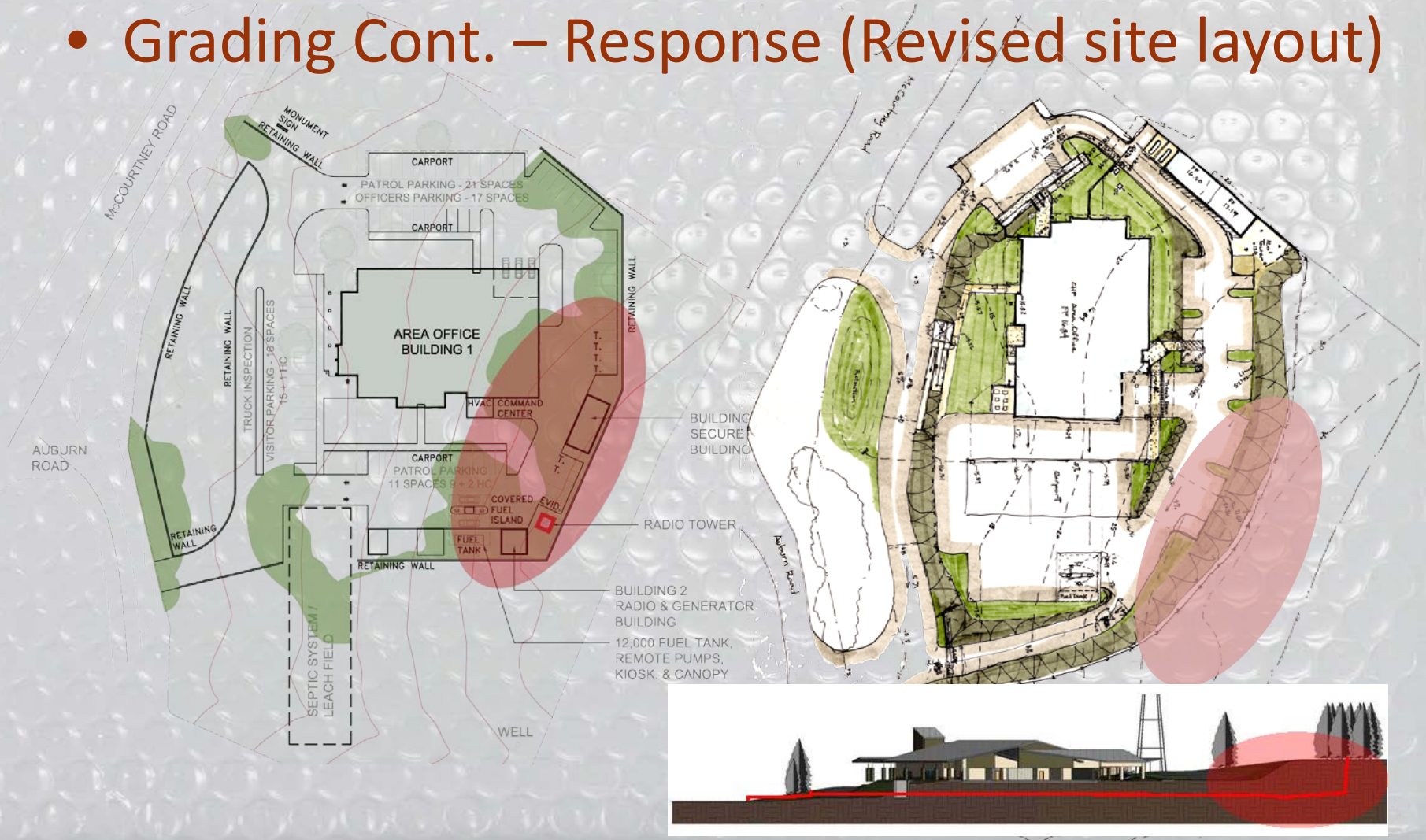
- Unresolved Due Diligence
  - The State's Geotech did not complete the follow-up on a set of comments sent by the State Department of Conservation. Potential on site mines and fault lines were not ruled out. A possible disqualifier of the site.
    - The team discovered the issue by discussing the project with the Department of Conservation and the Geotech of Record prior to bidding. We consulted a local Geotech who reviewed mining records and found mining unlikely, and recommended a trench across the site at the start of our pre design phase. No faults were found.

# IDENTIFYING THE RISKS AND MITIGATING THEM

- Grading Impacts – Schedule Risk
  - Site has a 30 foot fall across its width
  - Bridging Solution showed a nearly flat site development
  - Grading duration would make the 10 month construction schedule impossible
  - Bridging Document showed 20 feet of cut in areas of suspected mining activity

# IDENTIFYING THE RISKS AND MITIGATING THEM

- Grading Cont. – Response (Revised site layout)



# IDENTIFYING THE RISKS AND MITIGATING THEM

- Construction Type – Entitlements Risk
  - Original program asked for fiber cement lap siding with stone veneer base.  Interior studs and roof structure were allowed to be wood.
  - Team priced solid grouted cmu walls with special sloped face block, and metal stud walls and roof joists.
    - This provided a non combustible construction type which made an Alternate Means of Protection request possible to counteract the low water flow available on site.

# IDENTIFYING THE RISKS AND MITIGATING THEM

- Fencing – Entitlements Risk
  - Bridging Documents called for high security fencing at the frontage
  - Local Government was resistant to the forceful image.
  - Design team raised the building higher than drives and allowed for the use of alternate fencing

# IDENTIFYING THE RISKS AND MITIGATING THEM

- Maintenance Risks
  - More durable materials were selected
    - Specialty block instead of stained Fiber cement
    - Galvanized Metal vs. Painted Metal


Photo By: Ed Asmus

Exterior Architecture:

The building image must be compatible with its surroundings. The scale and massing should be minimized and varied, and in compliance with Concept Drawings. The building should be aesthetically pleasing and incorporate appropriate landscape screening to minimize impacts from neighboring developments.

All building and exterior materials must be of durable, easily maintained and cost effective materials. Walls to be stained fiber-cement horizontal siding boards with a synthetic stone wainscot. Roofing to be factory finish metal standing seam.

# IDENTIFYING THE RISKS AND MITIGATING THEM

- Parallel Review Paths - Schedule / Conflict Risk
  - Privately owned public facility required both State and Local review
  - Met with local Building Department and Fire Marshall in advance and discussed what parts of the State review the locals would rely on and what parts they wanted to review themselves.
  - State Comments , responses and approved set were distributed to the local authority.
  - State and Local Fire Marshall coordinated in plan check and in field.

# Aesthetic Challenges of D/B/F

- How do you quantify the unquantifiable?
  - The Bridging documents can only give subjective guidelines to aesthetic intent.
  - Clients generally look at the bottom line first, so the aesthetic elements must be economical.
  - An aesthetic of poetic pragmatism, where all of the aesthetic elements must be justified with a functional purpose needs to be embraced to compete.

# AESTHETIC CHALLENGES OF D/B/F

- Spending where it counts
  - The Building roof form was kept simple.
  - Because the building was significantly above the street level the lower edge of the roof was more important than the complexity of the roof form.
  - We introduced a trellis along the wet side which blocked the low west sun and provided cover at entrances.

# AESTHETIC CHALLENGES OF D/B/F

Photo By: Ed Asmus

# Construction Challenges and How They Were Addressed

- Production Rates using new materials
  - Lesson learned on the job
  - Shaped block proved to be a challenge for the sub contractor. The masons production time ran longer than estimated pushing the project into the rainy season while roofing.
  - New materials or process are a risk to schedule and should be reviewed prior to implementation.

# Construction Challenges and How They Were Addressed

- The Roof
  - The added volume of the pitched roof meant introducing an attic space.
  - Prefab light gauge metal trusses were ruled out because of the risk of justification of the structure to the State using proprietary software.
  - Several designs were analyzed through the start of construction.
  - A light gauge system suspended from the roof was selected

# CONSTRUCTION CHALLENGES AND HOW THEY WERE ADDRESSED

- No Wall protection was specified at the Corridor
  - The team proposed substituting one layer of ¼" hard board for one layer of ½" gypsum board at the corridor.
  - The density of the board allowed us to meet the required sound rating and add resilience to the wall finish. No touch-up paint remarks were needed in the punch list.

# Construction Challenges and How They Were Addressed

- CHP Requested Polished Concrete after award
  - Requested specification would have added significant cost due to flat slab standards.
  - The team was concerned that results would be more inline with a remodel of an existing slab.
  - Examples were found and shown to the client to establish expectations. The State agreed to the remodel standard and the team provided the polished concrete at no additional cost.

# CONSTRUCTION CHALLENGES AND HOW THEY WERE ADDRESSED

Photo By: Ed Asmus

Corridor showing Wall protection and polished concrete flooring.

# LESSONS LEARNED

- Developer
  - Special Purpose Facilities require a strong, long term lease
  - Entitlements / Land-use Approvals / Permits tremendous impact on success/failure of the project
  - Split Accountability increases risk
    - Inspection contracts
    - Tenant IT / Systems Integration

# LESSONS LEARNED

- Contractor
  - **Successful Planning** – success of the project is driven by the ability of the team to communicate, negotiate, collaborate, commit, trust and be trusted.
  - **Target Value Design** – TVD offers designers an opportunity to engage in the design conversation with those people who will procure services and execute design.
  - **Transparency** – take advantage of tools to communicate the plan and share documents.

# LESSONS LEARNED

- A& E Team
  - It is important that all parties understand each other's roles and motivations. We all have valuable contributions to make based on our different perspectives. This can result in great synergy.
  - Trade partners can help in producing the documents to reduce redundancies in the process, but certain areas need to stay more firmly within the Architects control. Roofing / Waterproofing for example.
  - Trade partners are reluctant to use modeling early and must be coaxed into participation. Must make sure Trade partners are ready for the modeling effort. Participation of Fire suppression in modeling is a great benefit

# CHANGES RECOMMENDED FOR THE CHP D/B/F PROCESS

- Avoidance of Duplication
  - Keep Bridging Documents minimal
    - System Performance Requirements
    - Room by Room Descriptions
    - Adjacencies for site and building elements and spaces
    - Lease and Process requirements

# CHANGES RECOMMENDED FOR THE CHP D/B/F PROCESS

- Develop a Life Cycle Cost Comparison based on system goals and measurable criteria using a Choosing By Advantages process to evaluate alternate approaches.
  - We recommend that CHP / DGS develop these for each system using their base system as a standard measure.

# RESULTS

- Project started Construction on the day originally scheduled.
- Heavy rains / frost conditions pushed the construction completion one month beyond original schedule.
- Original Construct Cost $7,557,855
- State approved Change Orders $517,050  6.8% Nearly all in in Design Phase.  Included additional offsite improvements.

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