

## Significant \$\$ can be Saved in SITEWORK!



**L**ocation, location, location. When buying or selling a house, those are the three most important words. The same can be said when choosing property for development. And for development of property, it is not only important to have the right location to meet your needs, it is just as important to locate the facilities on the property to minimize sitework costs and impacts. Sitework issues are one of the largest sources of cost overruns and construction related claims in building construction. Depending on the location, size and shape, contours and elevations and the facility orientation on the site, sitework will either directly dictate or influence every aspect of the facility. Impacts from sitework conditions range from and include site preparation, location of buildings, foundations, structure, utilities, excavation, flooring systems, types of materials, parking surfaces, HVAC systems and landscaping. Sitework related costs can account for up to 20% and sometimes more of the total construction cost.

At American Constructors we have saved owners millions of dollars by addressing sitework issues early on in the design and preconstruction phases of projects. We have been most effective when we can work in a team environment with the owner, architect and consultants to analyze various sitework options that will impact the entire scope of the project. We have found that the more communication that occurs in the early stages of the project between the team members, the

greater the benefits achieved for owners in terms of quality, schedule and first time and life cycle costs.

At American Constructors we take the design and preconstruction phase of projects very seriously. We actively engage the architect and consultants to understand all of the issues concerning the project, including sitework, from a design

and constructability standpoint. The results have been significant savings in upfront, remedial and life cycle, operating and maintenance costs by identifying and recommending optimum solutions. This issue of *Projections* highlights three examples of where American Constructors' involvement played a key role in achieving significant savings in sitework related issues.



*In order to complete a parking lot similar to the above photo, extensive excavation, hauling and compaction is required (see photo below).*



### DELETING PIERS SAVES TIME AND MONEY

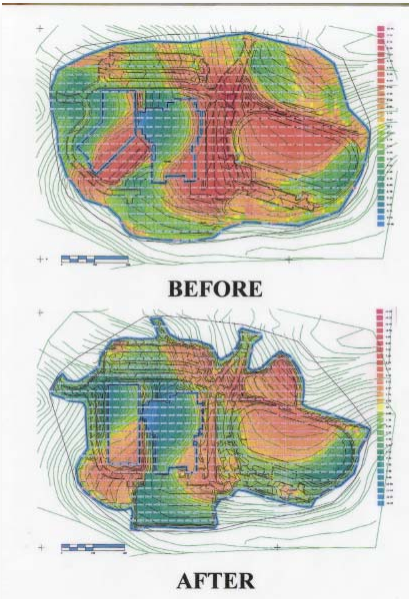
**T**his project involved analyzing the soils conditions once the physical work was started. The specifications required drilled piers to penetrate the stratum III level (this is a category of soil). This design was based on the soils report for the project. American Constructors became involved with this project after this decision was made. As part of our constructability review process, we met with the Owner, Architect and consultants to discuss the foundation design.



Based on our experience, we recommended the pier requirement be reviewed due to the stratum III being closer to the surface than anticipated. To support our recommendation, we mobilized a drilling rig at the site and drilled demonstration holes confirming the actual soil conditions to the engineering consultant. This demonstration resulted in the foundation design being changed from a drilled pier concept to a revised footing design that deleted the necessity for piers. This change saved the owner in both costs and schedule. In this case, the savings could have been even greater had we been involved early on in the project.

# Relocating building on the site saves \$1.5 Million

On a recent project a new 261,000 square foot building was planned for development on a 60+ acre piece of property. This property varied in elevation by 70 feet over the entire site. One of the main costs in sitework can be the amount of excavation and related effort to haul off unusable materials (soils) and replace with selected materials from offsite - or in other cases the cost to dispose of excess material (either useable or not) by hauling it offsite. On this particular project, extensive material handling would have been required due to the proposed location of the new building. In addition, the placement of two of the six major structures would have necessitated the use of suspended foundations to properly address the expansive soils located on only a portion of the site.

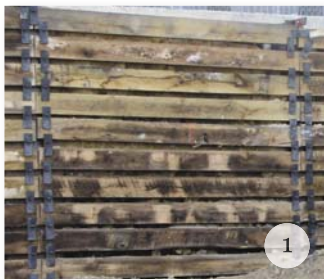


From a constructability cost viewpoint, American Constructors recommended the building be positioned further up the slope of the property to minimize the amount of excavation work required. The picture at the left shows the before and after effects of this recommendation. The red areas require significant excavation work (excavating, hauling, replacing, compacting, etc). The blue areas on the lower half of the picture show the final location of the building and the minimal amount of excavation that was required. This

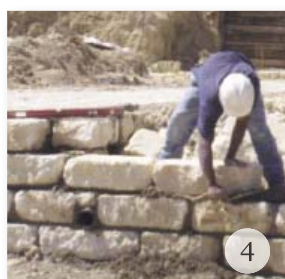
change did not affect the look or function of the building and saved the owner over \$1.5 million dollars.

## Retaining Walls Come in all Sizes

A retaining wall is a method of supporting soil to allow for the use of an area for many applications including buildings, roadways, bridges, walkways, play areas and erosion control. Geotechnical reports and site investigations are used to design the proper retaining wall system if and when required. American Constructors is currently working on a site that has incorporated retaining walls on four separate areas for different requirements. The first application consists of steel I beams with wood lagging. This system (photo 1) was used to support and protect existing foundations when excavation for new facilities exposed these foundations. This retaining wall system



was engineered by the subcontractor and approved by the structural design engineer of record. This retaining wall system will be buried and remain in place hidden from view. By using this method new facilities were constructed immediately adjacent to the existing building and maximized the use of very limited area. The second application is a retaining wall system to support an area for new playfields. This system uses the same philosophy as the first where the wall will hold back the soil so the area can be used for its intended purpose. For this application the retaining wall is both structural and aesthetic since it will remain exposed (photo 2). The third application is a head wall for soil erosion protection (photo 3). This wall will provide



water runoff control as well as soil support. In this case the wall has been cast in place with a smooth finish since it will remain exposed as well. Finally, the fourth (photo 4) is MSE (mechanically stabilized earth) walls. This is an exposed retaining wall system where a mesh wire fabric is anchored to the stone blocks and then laid back and covered with fill and compacted. This is done every couple of courses providing the mechanical stabilization. The picture at left is an example of this system.

## Tech Tips

### Site Conditions

The following bullets are things to consider when dealing with site conditions on your project in order to save money and have a more successful project.

- Include the Construction Manager in the early phases of the project and set a sitework planning meeting early on in the process.
- Let the Construction Manager provide input on the soils report before it is formally submitted.
- Insure core drill tests are where the building foot print is planned and not just in the general area. Soil conditions can change dramatically in short distances on various sites.
- Verify that the structural and exterior skin systems maximize the benefits of the foundation design.
- Design the concrete mixes for prevention of moisture penetration through slabs and walls.
- Confirm if existing excavated materials (soils) can be used in some capacity onsite versus the haul off and import of other select material.



## AMERICAN CONSTRUCTORS

### PROJECTIONS

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