Northeastern Pennsylvania Office Building

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Construction Management

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Executive Summary

This technical report is intended to help understand the building systems, costs, and schedule of the Northeastern Pennsylvania Office Building. The building is Phase 1 of a multi-phase project in Northeastern Pennsylvania that is being built for an owner that has requested to remain anonymous. Phase 1 is comprised of a shop building and an office building that will be inhabited by a subsidiary company of the owner. The project site will also include an 18 acre gravel laydown yard that will be surrounded by a security fence.

The office and shop buildings are scheduled to start construction on June 14, 2011 and be substantially completed by March 20, 2012. The nine month schedule is effectively concise and encompasses the Site Work, Foundation/Superstructure, Building Enclosure, and Finishes stages of construction for both buildings. Although the site work appears to last the majority of the project length (five of nine months), this is because of the large size of the project site compared to the relatively small size of the actual building footprints.

The electrical system that services both buildings seems to be sufficient for the requirements of each space. However, the mechanical system for the shop building seems to be insufficient. Thirteen gas-fired heaters are used to heat the space because the overhead doors in the shop building will be constantly opening and closing as trucks enter and exit the building. Although the space heaters may be effective to warm the space while the doors are closed, the heat will escape when the doors are open. A heated floor system may help keep the space at a more constant temperature when the doors are open. This will also reduce the load on the space heaters that are used in this project.

The building system chosen for this project is a pre-engineered metal building enclosed with metal wall and roof panels. This is adequate for a building such as this because it exudes an industrial look, which is fitting for the shop building due to its functionality and rural location. Since the shop building and the office building are connected, the architect used the same building system for office building to give the project a uniform appearance. This type of building is effective because it is an extremely efficient system to design and construct. With the expedited construction schedule for this project, a pre-engineered metal building was the most logical choice for the architect.

The construction estimates that were performed were 52% of the actual construction costs for this project. This difference could be the result of the electrical wiring, piping, and ductwork that were not accounted for in the assemblies estimate.

This building project could have been delivered as a design-build project to expedite the construction schedule. This would be effective for this project because the work is not extensive and the structural fabrication could be concurrent with the site work. This means the work would be bid while the structure is being designed.

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Project Schedule Summary

Project Schedule

The project schedule is available in Appendix A: Project Schedule.

Site work

The site work involved with the Northeastern Pennsylvania Office Building is scheduled to start on June 14, 2011 and last until approximately November 3, 2011. Since the job site is located on an open field that was once used as a small aircraft landing zone, there isn't an extensive amount of large vegetation to be cleared. However, since the majority of the nearly 19 acres jobsite will be a gravel pad for material laydown, there will be a good amount of time delegated to clearing and grading the site. The site work includes both the laying of the gravel and the asphalt work associated with completing the parking lot and site entrance areas. Finally, the site work includes the site utilities. Since this building is Phase 1 of a multi-phase project, the site utilities locations have been established in a specific orientation so that they may branch off of larger lines that will eventually service the other phases of this extensive project. There will be a utility easement on the North side of the site that will be constructed by others, and it will provide this building's utilities.

Foundation/ Superstructure

Both the shop building and the office building that make up Phase 1 of this project will be using a pre-engineered metal building system as its structural system. This will require the pier foundations, spread footing, and grade beams to be placed well before the steel is placed. The foundations will be formed, reinforced, placed, and be in the process of curing while the steel structure is in fabrication. Then, after the slab on grade is placed, the steel will be erected by a telehandlers on site. The structure, from the forming of foundation elements to the end of the erection of the steel, is expected to last approximately 70 working days, from August 9, 2011 until November 14, 2011.

Building Enclosure

After a section of structural steel has been erected, plumbed, and fastened into place, metal roof panels and wall panels can be attached to the exterior to enclose the building. Windows and overhead doors can also be installed as the building structure is being constructed. The process of fully enclosing both buildings is expected to span about four weeks, from November 15, 2011 to December 12, 2011. After the building has been enclosed from the elements of nature, the finishes can be installed within the buildings.

Finishes

The finishes for both buildings are expected to take about 102 working days to complete, approximately from October 28, 2011 to March 19, 2012. Both buildings will have MEP systems rough-ins and fit-outs within this span of time. Along with MEP systems, the office building will also be receiving metal stud walls, insulation, drywall, paint, carpet tiles, doors, and casework. The shop building will be receiving CMU walls, insulation, paint, doors, and equipment cranes before the finishes are complete. If the work for this project stays on track, the work will be complete and the building will be ready for substantial completion on March 20, 2012.

Building Systems Summary

Demolition

The Northeastern Pennsylvania Office Building is being constructed on an open grass lot that was once a landing area for small aircraft. Since there are no buildings on or around the construction site, there will be no demolition required for this project. Also, there are no existing utilities under this site that need to be considered for demolition.

Structural Steel Frame

The structural steel frame for this project is a pre-engineered metal frame. A pre-engineered metal building was chosen for this project because these buildings are very quick to erect and fit-out while under a short schedule. The industrial look of these buildings is also very common for commercial projects such as Phase 1 of this project. The Building Innovation Group, Inc. will be responsible for fabrication and delivery of the steel members that will create the skeletal frame of both the office building and the shop building. The main structural elements of the pre-engineered metal building (PEMB) are pieces of rolled steel that may or may not taper from a wide end to a narrow end. Due to the larger loads on the shop building structure (wind, snow load, etc.), the steel members for this section of the building will be larger and heavier.

Figure 1 shows the different configurations of pieces of steel that will create each type if structural frame for this project. Pieces are denoted with different colors on the figure to represent the pieces of steel that will be delivered to the site. Each piece has a welded plate on each end that will allow it to be bolted to another piece or the foundation. Once lifted into place by telehandlers, two pieces will be plumbed and aligned before being bolted together. W10x33beams will then be placed perpendicular to the structural frames over door openings to laterally brace the frames. These beams will also be placed by telehandlers and will be bolted to the frame. On sections that do not contain a doorway, lateral bracing members will commonly be 12” purlins set every 2’-10” from the slab elevation upwards. Vertical metal panels will then be fastened to the horizontal purlins to enclose the building façade.

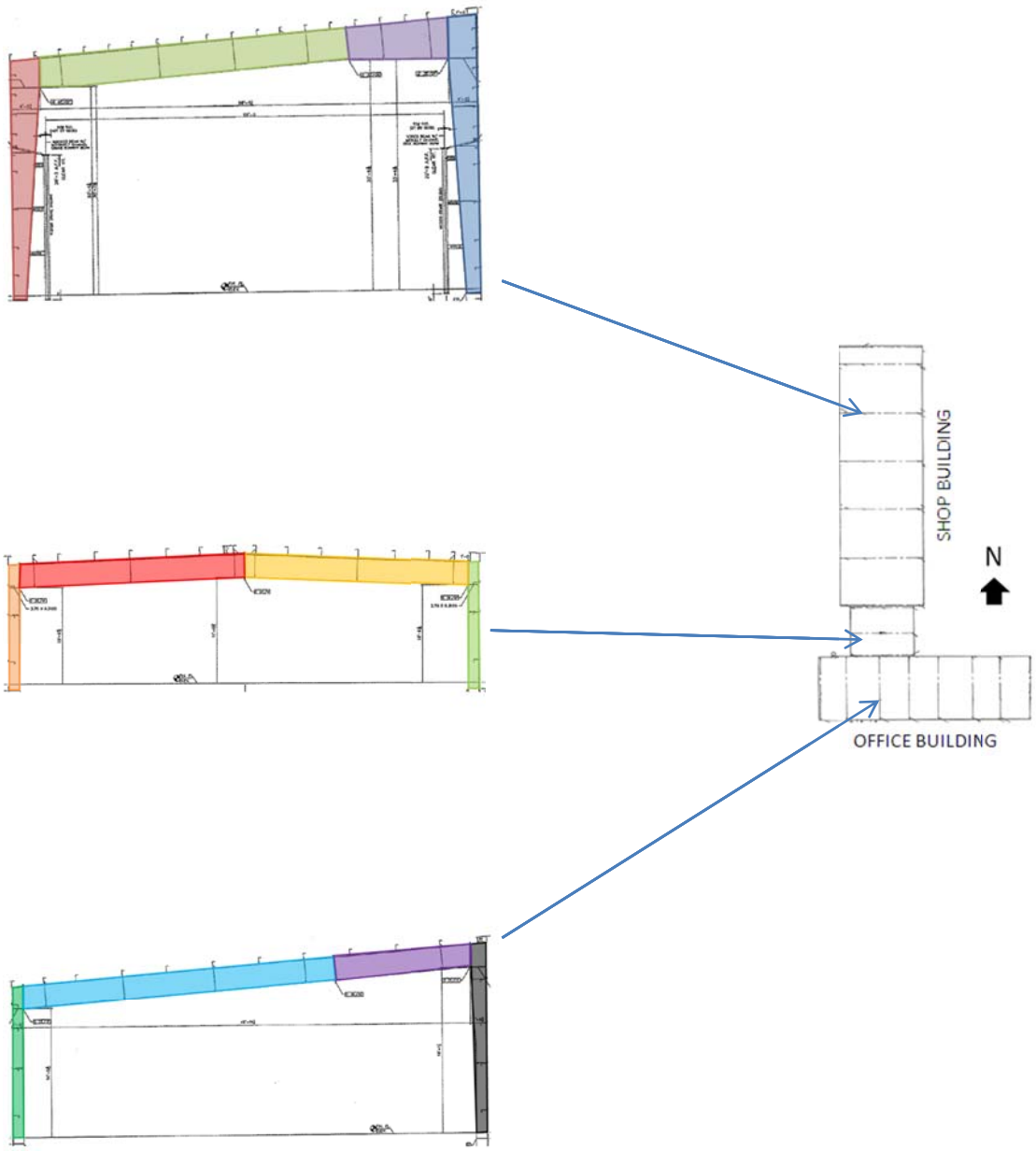


Figure 1. Pre-Engineered Metal Building Frames and Locations

Cast in Place Concrete

Footings, foundation walls, and slabs-on-grade will be cast-in-place concrete for this project. In order to ensure the concrete elements are the correct size and shape, the contractor will use a combination of plywood formwork, metal formwork, and insulating concrete forms (ICFs). ICFs will be used for the foundation walls, which in this project are grade beams. Foundation walls that are formed using ICFs are constructed by rigid insulation blocks that hold the reinforcing steel and concrete while it cures. After the concrete is stable enough, most formwork would be removed. ICF formwork does not need to be removed, and it adds insulating properties to the foundation wall. The column footings and the slabs-on-grade on this project will be formed with metal formwork. Inside the building, there will be a safe room that will consist of 8" thick concrete walls and ceilings. These elements will be formed using plywood forms. All concrete for this project will be placed directly from concrete trucks. No pumping will be required because all of the concrete work on this project is at ground level. Also, since the building is on an open site, concrete trucks have the ability to delivery concrete from anywhere around the perimeter of the structure.

Precast Concrete

The Northeastern Pennsylvania Office Building does not utilize any form of precast concrete anywhere on the project. Cast-in-place concrete will be the only form of concrete that is used. Also, any other elements that may commonly be precast concrete on other projects, such as lintels over openings in concrete or masonry structures, will either be steel or cast-in-place concrete.

Mechanical System

The mechanical rooms for this building are all located in the office building portion of the project, as shown in Figure 2. The three separate mechanical rooms are all located within the core of the building between the two corridors. The largest of the three rooms is located in the densest area of the building, while the two smaller rooms are located farther down both the North and East wings of the office building.

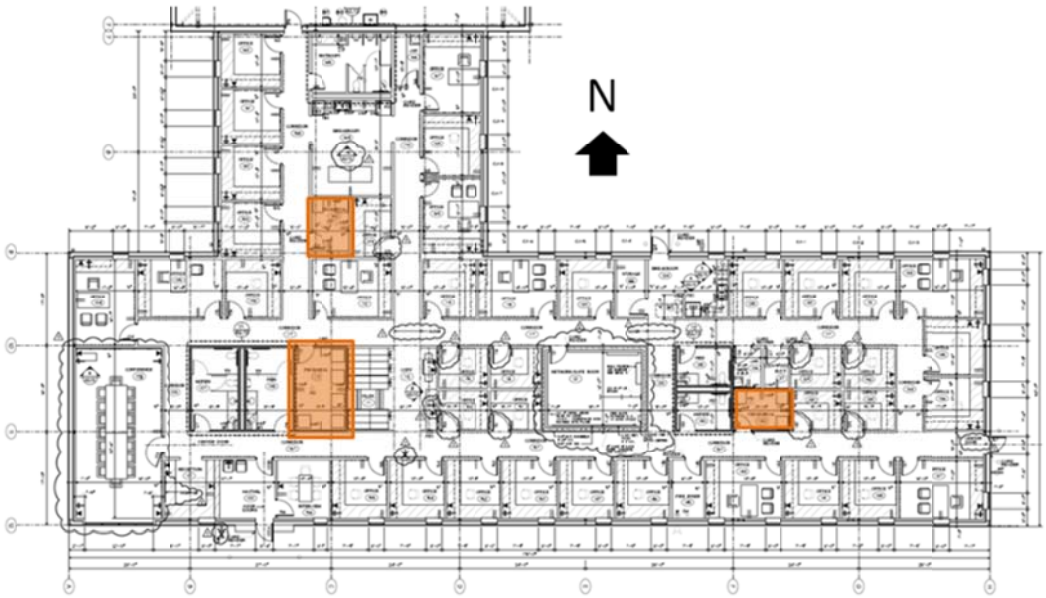


Figure 2. Locations of Mechanical Rooms in Office Building

The shop building contains thirteen gas fired infrared heaters that are to be hung from the above structure to keep the shop warm for workers in the colder months. These heaters will be controlled by programmable wall-mounted thermostats. These thermostats will be set to maintain a space temperature of approximately 50°F. Three large ceiling-mounted fans above the three main work bays will provide circulation throughout the shop building.

The office building will be conditioned using ten furnaces located throughout the building's three mechanical rooms. The furnaces will be fueled by natural gas and will be controlled by wall mounted thermostats that will be located in the space that the furnace is responsible for conditioning. The conditioned air will be distributed throughout the office building by a system of metal duct work located above the acoustical ceiling tile grid.

The entire Northeastern Pennsylvania Office Building will be sprinkled with a wet-pipe sprinkler system and is to meet the requirements of the NFPA codes, the Fire Marshal's office, and owner's approving insurance company. The sprinkler contractor is to coordinate the location of all sprinkler heads to avoid conflict with any light fixtures, ducts, diffusers, grilles, or the ceiling grid.

Electrical System

The electrical system is a fully redundant system for the Northeastern Pennsylvania Office Building. The electricity from the local township's utility transformer will be 800A at 480V. This line will run through an Automatic Transfer Switch (ATS) before entering the building. The ATS automatically switches from the utility transformer to a generator that is located on the North side of the building if the utility power is interrupted. This system ensures that the building will not lose power for an extended period of time unless the generator malfunctions.

As the power supply enters the building, it will enter the Main Distribution Panel (MDP). From here, two lines will run to panelboards PP1 and PP2 at 480V. Lines will also run from the MDP to two step-down transformers. These transformers will reduce the voltage from 480V to 120V, and will then run to five different Lighting Panels (LPs) that will distribute power throughout the building.

Panelboards PP1, PP2, LP3, LP4, and LP5 will be located in the North end of the shop building, while panelboards LP1 and LP2 are located within the East side of the office building. The electric utility meter will be located on the exterior of the North side of the shop building for easy access and readability.

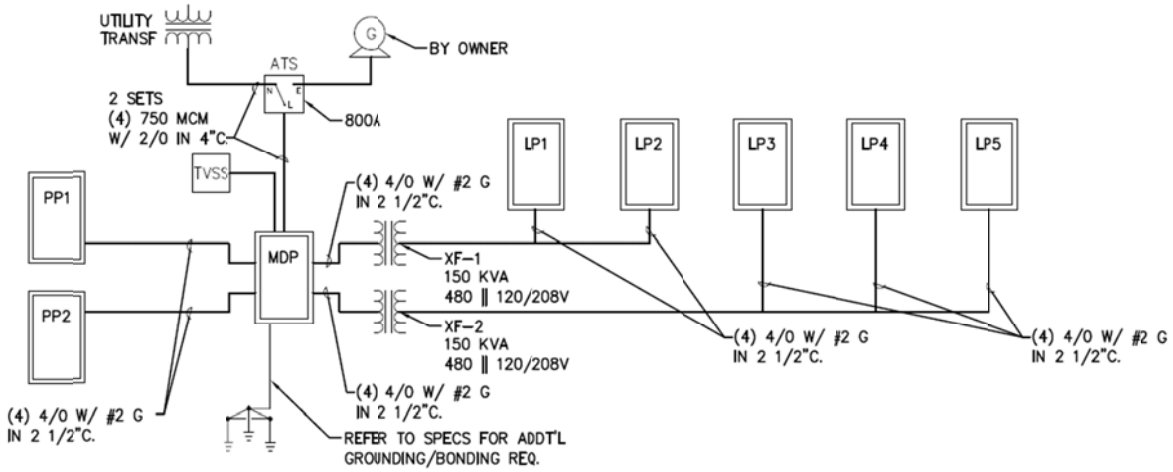


Figure 3. One-Line Diagram

Masonry

The only masonry work that this project has involves an 8” CMU wall that divides the wash bay from the work bays in the shop building. The wall is 43’ long and will be built 12’ high. The main purpose of this wall is to prevent wash spray from entering the work bay areas and the wall will not be load bearing. Steel anchors will be set in the concrete footing below the wall that will tie the masonry wall to the foundation. The CMU blocks will be set so the steel anchors will be set within the core of the blocks, which will then be filled with masonry grout. While constructing this masonry wall, the workers will be using scaffolding when their work is too high for them to safely reach.

Curtain Wall System

The office building and the shop building will both be utilizing an exterior wall panel system. The metal wall panel system will be 26 gauge corrugated Galvalume panels that will be fastened to the structural system’s horizontal purlins. The metal panels will be fastened to the purlins by using self-drilling screws and a pneumatic drill. The same metal panels that are used on the exterior walls will also be used for the roofing system of these buildings. The owner chose this style of exterior cladding for its industrial look. The phases of the project that contain shop buildings will be presented with an industrial look, while the phases that feature corporate office buildings will be presented with a more architecturally modern appearance. Workers will use telescoping boom lifts to install the metal wall panels and metal roof panels on both the office building and the shop building. Since the windows for this project are all located on the ground floor, no special equipment should be necessary for installation of glazing components.

Project Cost Evaluation

Total Building Construction Cost

Total Building Construction Cost (TC) = $5,400,000

Gross Building SF = 26,000 SF

TC/SF = $207.69/SF

Assume: Actual Building Cost includes costs from Division 3 to Division 28.

Actual Building Construction Cost

Total Building Construction Cost (CC) = $5,250,000

Gross Building SF = 26,000 SF

CC/SF = $201.92/SF

Assume: Total Building Construction Costs include all costs to construct the project.

RS Means Square Foot Estimate

RS Means Cost/SF for the Office Building = $123.72/SF

RS Means Cost/SF for the Shop Building = $89.25/SF

Assume: Since the Office Building contains 11,300 SF and the Shop Building contains 14,700 SF, the Project Cost/SF is adjusted to account for the correct proportions of the building SF per building.

Office Building - 11,300 SF / 26,000 SF = 0.4346 0.4346 x $123.72/SF = $53.77/SF

Shop Building - 14,700 SF / 26,000 SF = 0.5654 0.5654 x $89.25/SF = $50.46/SF

RS Means Project Cost/SF = $53.77/SF + $50.46/SF = $104.23/SF

The RS Means Project Cost/SF is only 52% of the Actual Building Construction Cost because the RS Means Data used for this estimate did not include any MEP or Fire Sprinkler cost data for this project.

RS Means MEP Assemblies Cost Estimate

Plumbing	Number	Units	Cost/Unit	Description	Total Cost
Toilet	5	Each	$2,420	Water Closet, Bowl only, Wall Hung	$12,100
Sink	12	Each	$1,620	Lavatory w/ trim, Wall Hung	$19,440
Urinal	4	Each	$700	Wall Hung, Vitreous China	$2,800
Water Heater	2	Each	$5,275	Electrical, Commercial, 50 Gal Tank	$10,550

Sprinklers	Number	Units	Cost/Unit	Description	Total Cost
Wet-Pipe	26,000	SF	$4.31	Ord. Hazard, One Floor, 10,000 SF	$112,060

Electrical	Number	Units	Cost/Unit	Description	Total Cost
Service	5	Each	$15,300	3 Phase, 4 Wire, 120V, 800A	$15,300
Switchgear	1	Each	$24,600	800 A	$24,660
Receptacle	26,000	SF	$3.71	20 per 1,000 SF	$96,460
Lighting	26,000	SF	$2.38	10 per 1,000 SF	$61,880

HVAC	Number	Units	Cost/Unit	Description	Total Cost
Heat/Cool	9	Each	$10,975	Gas Fired, 2,000 SF	$98,775

Total MEP Cost
$454,025

The combination of the RS Means SF Cost Estimate and the RS Means MEP Assemblies Cost Estimate results in a total estimate of about $3,164,000. This is approximately 59% of the actual total building cost for this project. The large discrepancy could be attributed to the wiring and conduit for the electrical system, the pipes and hangers for the piping system, and the ductwork for the HVAC system that were not included in the assemblies estimate.

Site Plan Summaries

Existing Conditions / General Conditions Site Plan

This project site is on an open grass lot that is a significantly large site for a building of this size. Because of this factor, the Existing Conditions and General Conditions Site Plans have quite a lot of flexibility for setting up the logistical layout of the site. The only existing utilities include an electrical line that transitions from underground to overhead on the South side of the project site, and a water main that runs under State Road. The jobsite trailers, temporary toilets, worker parking area, and dumpster are all located on the West side of the site because this will be the first area to be cleared and graded during the excavation stage of construction. By placing the jobsite trailers between the two West entrances, deliveries and site visitors can be monitored by personnel in the trailers.

Excavation Site Plan

The majority of excavation work for the Northeastern Pennsylvania Office Building will include clearing and grubbing the site, grading the site, and stoning the laydown yard. When this work first begins, workers will be allowed to park on the adjacent lot to the East of Phase 1. This lot will eventually be Phase 2 of this multi-phase project. It is owned by the same owner and is an open field that will for workers to temporarily park until parking is available on the Phase 1 lot.

Excavation work for this site will flow from the West to the East. This will allow for space for rock construction entrances, jobsite trailers, and parking for workers available as early as possible on the West side of the site. Once this side is sufficiently cleared, graded, and stoned, workers will access the site by travelling North on Township Road and entering the site using the lower West entrance. Parking will be available to the immediate North of this entrance. The upper West entrance will be used for mobilization of equipment, removal of dumpsters, and material deliveries. Jobsite trailers will be located directly between the lower West entrance and the upper West entrance so deliveries and visitors can be easily monitored.

Due to the amount of open space on this project, subcontractors will not be issues specific areas to store their equipment during non-work hours. However, since this project will not be implementing a temporary construction fence during the excavation stage, it is suggested that subcontractors protect their equipment as they see fit to prevent vandalism.

Superstructure Site Plan

Once the superstructure of the Northeastern Pennsylvania Office Building is fabricated and delivered to the jobsite, the erection should be relatively quick compare to the other building systems. This is because the superstructure is a pre-engineered steel structure. This type of structure will require multiple telehandlers to efficiently erect the steel skeleton of the building. In order to ensure a timely erection of the structure, the telehandlers will be permitted to access the building from any direction that they require. Steel deliveries will be placed around the perimeter of the building in order to be accessed by the telehandlers.

When the first delivery of structural members is received on site, the telehandlers will be ready to erect the East side of the office building. The structure will be erected in this area and will move from East to West across the office building. When that portion of work is completed, the telehandlers will then begin erecting the shop building from the South side and move towards the North side. All material deliveries will enter the site from the upper entrance on the West side of the site. By working from the South end of the site to the North end, material deliveries will be able to drop off sequential deliveries without maneuvering around previous deliveries. This will help increase productivity and should help reduce wasted time and possible injuries.

Finishes Site Plan

By the time the finishes phase begins, the permanent site fence will be installed around the perimeter of the project. Since the site will then require permission to grant access, an employee will be in charge of monitoring the two West fence gates. Workers will still need to access the lower entrance, and material deliveries will still be directed to enter through the upper entrance. Since the vast majority of the site will be graded and/or stoned, material deliveries will be permitted to deliver goods to either the West, North, or East sides of the shop building and the North or East sides of the office building as needed. Before a delivery is placed on site, the location must be verified and approved by the on-site project superintendent to avoid logistical problems between different trades.

Local Conditions

Soils and Subsurface Conditions

According to the geotechnical report performed by CME Associates, Inc. for the Northeastern Pennsylvania Office Building, the site has an existing grade that generally slopes downward in the easterly direction with approximately one foot of elevation change across the shop building footprint and approximately six feet of elevation change across the office building footprint. The borings showed the entire site contained two to six inched of topsoil at grade. The topsoil tested was underlain by organic-rich soils. Below these layers of surfacing, the boring tests identified a silty sand stratum, underlain by a silty sand and gravel stratum. The silty sand stratum consists of predominately silt, mixed with lesser amounts of sand, gravel, and clay. This stratum was discovered to exist from approximately two to four feet below grade and is considered medium-stiff to stiff in consistency. The silty sand and gravel stratum consists of silty sand and gravel and silty gravel and sand. This stratum was penetrated to the boring termination depth (10 to 25 feet) and has a relative density ranging from loose to very compact. No potentially expansive soils were identified within the boring depths on the jobsite. Soils are considered conductive to infiltration of stormwater.

Site Groundwater

The groundwater level throughout the site was observed and measured by CME Associates, Inc. by performing boring tests at thirteen different locations throughout the site. The depth of the water ranged from 7 feet to 13.5 feet beneath the soil surface. The average depth of the groundwater table was approximately 9.5 feet beneath the soil surface.

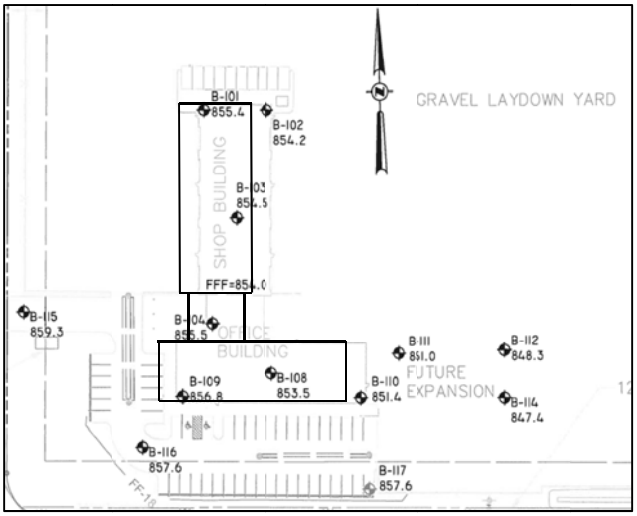


Table 1: Groundwater Observations – Phase 1

Boring I.D.	Elevation at Grade (ft.)	First Encounter of Groundwater or Wet/Saturated Soil while Drilling	
		Depth (ft.)	Elevation (ft.)
B-101	855.4	9.0	846.4
B-102	854.2	8.0	846.2
B-103	854.5	13.5	841.0
B-104	855.5	13.5	842.0
B-108	853.5	8.0	845.5
B-109	856.8	7.0	849.8
B-110	851.4	7.0	844.4
B-111	851.0	8.0	843.0
B-112	848.3	13.5	834.8
B-114	847.4	8.3	839.1
B-115	859.3	9.5	849.8
B-116	857.6	9.5	848.1
B-117	857.6	8.5	849.1

Figure 4. Boring Test Locations

Parking Situation

Due to the extensive size of the building lot, construction parking will not be a large intrusion on the construction project. After the northwestern corner of the lot has been cleared, grubbed, graded, and stoned per the construction documents, workers will be able to enter the site from the northwest entrance and park along the northern edge of the site. According to the construction schedule, this area of the project should become available for construction parking around August 12, 2011. Until this area is available for parking, workers can use the neighboring site to the East to park. This site will be the location of Phase 2 of the Northeastern Pennsylvania Office Complex project. Since Phase 2 will not be starting until November 2011, parking on this lot will not be an issue.

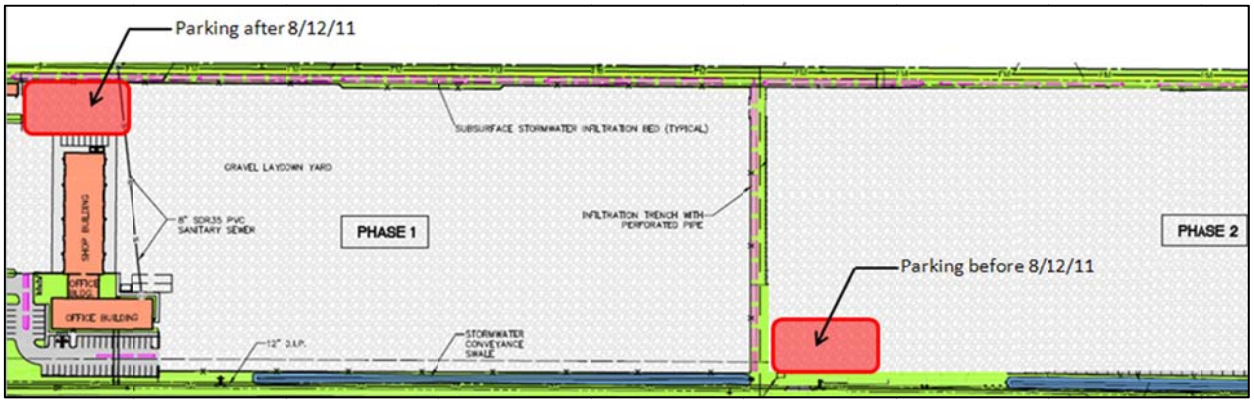


Figure 5. Construction Parking Lot Locations

Recycling and Tipping Fees

Since this project is not striving for LEED certification and there is no major demolition at the jobsite, the amount of recycled materials and waste materials will be significantly low compared to other construction projects. Materials that will be recycled on this project include excess concrete that would normally be waste. The excess concrete on this project will be crushed and be mixed with the underlayment material for the gravel laydown areas for later phases of this multi-phase office complex.

Any construction waste will be transported from the jobsite approximately 25 miles to the county's solid waste authority. Upon arrival, trucks will pay a $45 tipping fee per ton of waste. The $45 per ton rate includes all state assessed fees according to Act 101, Act 90, and Pennsylvania Department of Environmental Protection Regulations. Also, any brush that is accumulated from clearing the site will not be shipped as construction waste as it would in other construction projects. Due to the local township's allowance to permit controlled brush burning, all accumulated brush will be burned onsite at a designated time and will be monitored by the township's volunteer fire company.

Local Concerns and Permitting

Since the five phases of the project, including the Northeastern Pennsylvania Office Building, will be replacing a 56 acre grass airport runway with buildings and gravel laydown areas, the local township is concerned with the project will create a localized "heat island" effect because there will be no vegetation on the entire 56 acre site. To help prevent this, the later phases of the project that are currently in the design phase are having more trees and other vegetation included in the site design.

Another concern that the local township authority has involves the permeability of the gravel laydown areas for stormwater drainage to the soils beneath. They are concerned that if the proper aggregate sizes and gradation is not placed on site, water will not be able to properly permeate and will cause pooling of water.

The project team for this project has put forth an extensive effort to avoid requiring a Highway Occupancy Permit (HOP) from PennDOT. This is because an HOP would take time and money to be processed and approved. The owner and design team were also hoping to continue with the project without concerning themselves with the proper flagging and other requirements mandated by an HOP.

Client Information

Client

The owner of the Northeastern Pennsylvania Office Building has requested to remain anonymous throughout the duration of this thesis project. They are a southern corporation that is expanding to the Northeast region of the United States. The expansion of their company into Northeastern Pennsylvania also prompted the expansion of their subsidiary companies to this area. My thesis is focused around Phase 1 of a 5 phase project that will provide shop buildings and office buildings for 5 of the owner's subsidiary companies.

Cost, Quality, Schedule, and Safety Expectations

Due to the size of the owner, cost on this project is not necessarily a driving factor. The most influential factor to this project is the project schedule. The owner is relying on the construction team to have this building ready to be turned over in a timely fashion so the subsidiary company can begin work. Although quality is expected to be sufficient, the building type that was chosen for this project (pre-engineered metal building) does not necessarily create an opportunity for excessively high quality on this project. Safety is always a high priority for not only the owner, but all parties in involved with the project. Delays caused by OSHA violations or worker injuries will try to be avoided at all costs.

Sequencing Concerns and Phasing of Turnover

Phase 1 of the Northeastern Pennsylvania Office Building is expected to be turned over to the owner by March 20, 2012. The entire project (all five phases) is expected to be turned over by the end of the year 2014. Since the later phases of the project are still in the design phase, extensive coordination will be needed once these projects begin construction to ensure that they are turned over to the owner in a timely manner.

Meeting Owner's Expectations

The owner's expectation for this phase of the project includes a quality constructed project turned over by late March. Since the project is not an overly complex form of construction, the owner is also anticipating a minimal amount of change requests from the contractors on this building.

Project Delivery System

Due to a request from the project owner to have this project remain anonymous, I will be keeping the owner, design architect, architect of record, mechanical contractor, and electrical contractor anonymous and will refer to them by their role on this project. The only key players that I will provide company names for include the engineering team, Larson Design Group, LLC, the CM/GC, LeChase Construction Services, LLC, and the structural contractor, Building Innovation Group, Inc.

The contract for the Northeastern Pennsylvania Office Building is a Lump-Sum, AIA Owner/Contractor Agreement. The project was delivered under a Design-Bid-Build method where LeChase was chosen based on a low-bid selection method. The Design Architect for this project was chosen because they have a long-term working relationship with the Owner. Also, the Design Architect and the Architect of Record are both firms that are owned by the entity. Because of this, the two firms work together on a vast majority of their projects. Larson Design Group, LLC, Building Innovation Group, the Mechanical Contractor, and the Electrical Contractor were all chosen because they are "local firms" that won the project based on a low bid selection method.

Since this project is Phase 1 of a multi-phase project, it should be noted that the Owner, Design Architect, Architect of Record, and Larson Design Group have been contracted on the other prospective phases. The CM/GC and all Subcontractors for later phases will be chosen on a low-bid selection scheme.

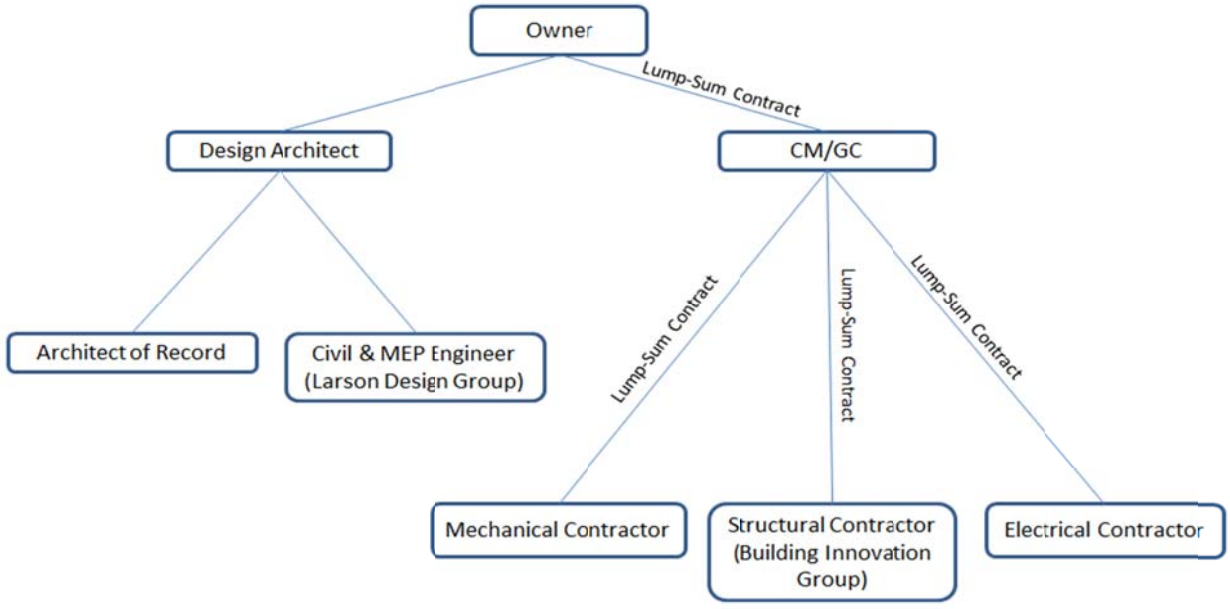


Figure 6. Project Delivery System

Staffing Plan

CM/GC Staffing Plan

The CM/GC on the Northeastern Pennsylvania Office Building is LeChase Construction Services, LLC. The flow diagram that represents their company's staffing plan for this project includes nine key players, along with several subcontractors. The employees that have the most control over this project are the company's President & CEO, Executive Vice President, and Senior Vice President. Since they are responsible for company-based decisions, monitoring this particular project may not be atop their daily tasks, and therefore they have a Senior Operations Manager and Field Operations Manager that report to them. These managers oversee all company projects and monitor the work of all Project Managers.

The Project Manager for this project is responsible for properly managing, budgeting, and providing direction for the work that is to occur. They manage submittals and coordinate between field personnel and the architect/owner's representative. The Project Manager receives assistance with many of their daily tasks from the Project Engineer. The Project Engineer on this particular job is responsible for managing paperwork that is essential for a timely and effective project completion. This work may include change requests, RFIs, submittal processing, and other related tasks. Although the Safety & Quality Engineer does not report directly to the Project Manager, they instill a vital role in a successful project. The Safety & Quality Engineer for this project was responsible for creating a site-specific safety plan, as well as ensuring that all field personnel for the CM/GC had a valid OSHA certification.

In the field, subcontractors must be monitored and directed by a representative of the CM/GC company. For this project, that person is the Project Superintendent. The Superintendent's main responsibilities include communicating with the subcontractors, giving direction as to what work is to be completed, monitoring quality of work in place, and ensuring that the project is remaining on schedule. The Project Superintendent reports directly to the Project Manager with issues and project updates.

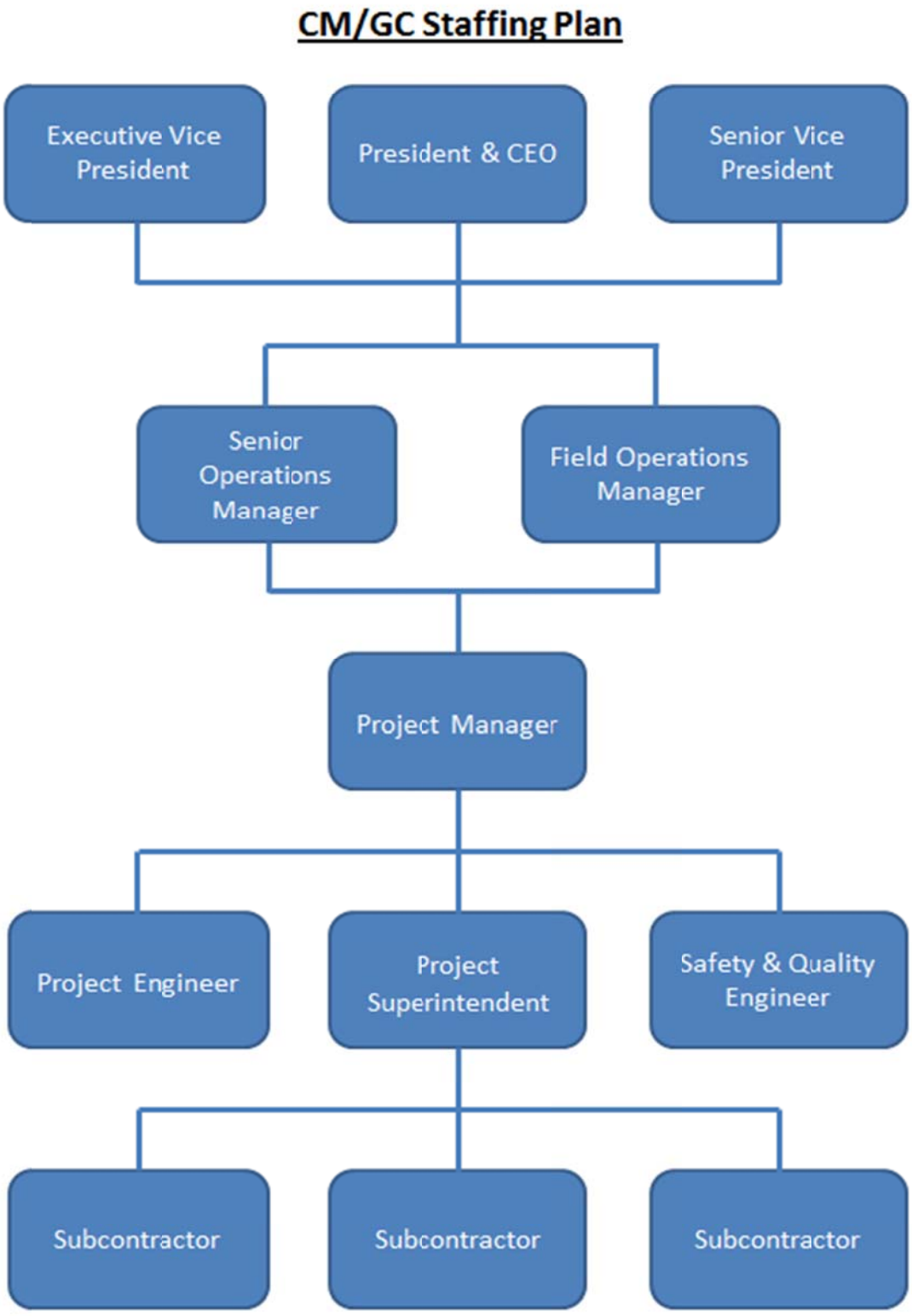
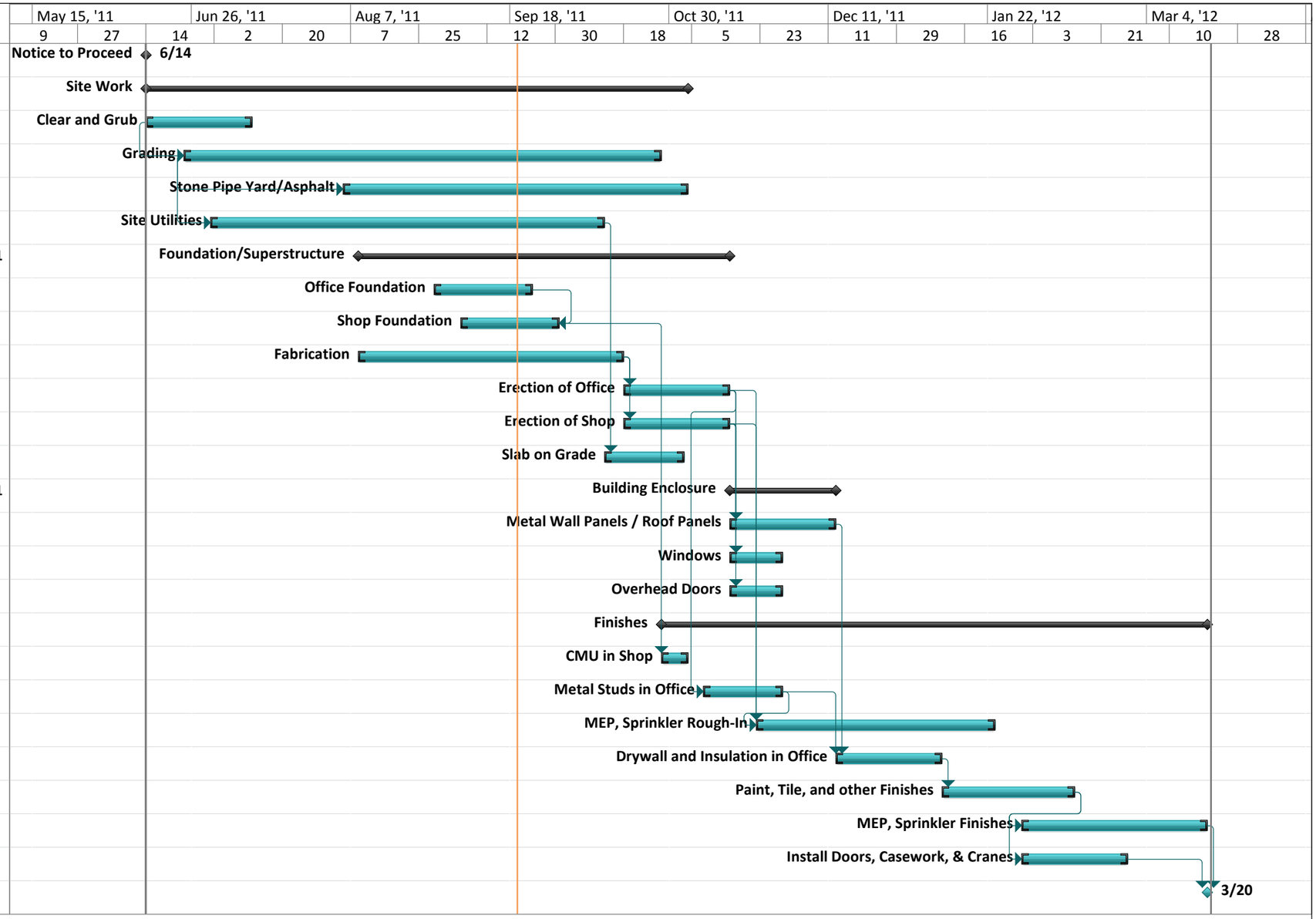


Figure 7. LeChase Construction Services, LLC Staffing Plan

Appendix A: Project Schedule

ID	Task Name	Duration	Start	Finish
1	**Notice to Proceed**	**0 days**	**Tue 6/14/11**	**Tue 6/14/11**
2	**Site Work**	**103 days**	**Tue 6/14/11**	**Thu 11/3/11**
3	Clear and Grub	20 days	Tue 6/14/11	Mon 7/11/11
4	Grading	90 days	Fri 6/24/11	Thu 10/27/11
5	Stone Pipe Yard/Asphalt	65 days	Fri 8/5/11	Thu 11/3/11
6	Site Utilities	74 days	Fri 7/1/11	Wed 10/12/11
7	**Foundation/Superstructure**	**70 days**	**Tue 8/9/11**	**Mon 11/14/11**
8	Office Foundation	20 days	Mon 8/29/11	Fri 9/23/11
9	Shop Foundation	20 days	Mon 9/5/11	Fri 9/30/11
10	Fabrication	50 days	Tue 8/9/11	Mon 10/17/11
11	Erection of Office	20 days	Tue 10/18/11	Mon 11/14/11
12	Erection of Shop	20 days	Tue 10/18/11	Mon 11/14/11
13	Slab on Grade	15 days	Thu 10/13/11	Wed 11/2/11
14	**Building Enclosure**	**20 days**	**Tue 11/15/11**	**Mon 12/12/11**
15	Metal Wall Panels / Roof Panels	20 days	Tue 11/15/11	Mon 12/12/11
16	Windows	10 days	Tue 11/15/11	Mon 11/28/11
17	Overhead Doors	10 days	Tue 11/15/11	Mon 11/28/11
18	**Finishes**	**102 days**	**Fri 10/28/11**	**Mon 3/19/12**
19	CMU in Shop	5 days	Fri 10/28/11	Thu 11/3/11
20	Metal Studs in Office	15 days	Tue 11/8/11	Mon 11/28/11
21	MEP, Sprinkler Rough-In	45 days	Tue 11/22/11	Mon 1/23/12
22	Drywall and Insulation in Office	20 days	Tue 12/13/11	Mon 1/9/12
23	Paint, Tile, and other Finishes	25 days	Tue 1/10/12	Mon 2/13/12
24	MEP, Sprinkler Finishes	35 days	Tue 1/31/12	Mon 3/19/12
25	Install Doors, Casework, & Cranes	20 days	Tue 1/31/12	Mon 2/27/12
26	**Substantial Completion**	**0 days**	**Tue 3/20/12**	**Tue 3/20/12**



Project: A. Project Schedule Summ
Date: Tue 9/20/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

Appendix B: RS Means Data

Office Building

CostWorks® RSMeans

Square Foot Cost Estimate Report

Back Print Export

Estimate Name:	**Untitled**
Building Type:	**Office, 2-4 Story with Face Brick with Concrete Block Back-up / Steel Joists**
Location:	**WELLSBORO, PA**
Stories:	**1**
Story Height (L.F.):	**20**
Floor Area (S.F.):	**11300**
Labor Type:	**Union**
Basement Included:	**No**
Data Release:	**Year 2011**
Cost Per Square Foot:	**$123.72**
Building Cost:	**$1,398,000**

Costs are derived from a building model with basic components. Scope differences and market conditions can cause costs to vary significantly. **Parameters are not within the ranges recommended by RSMeans.**

		% of Total	Cost Per S.F.	Cost
A Substructure		**7.6%**	**$9.34**	**$105,500**
A1010	**Standard Foundations**		**$2.48**	**$28,000**
	Strip footing, concrete, reinforced, load 11.1 KLF, soil bearing capacity 6 KSF, 12" deep x 24" wide			
	Spread footings, 3000 PSI concrete, load 200K, soil bearing capacity 6 KSF, 6' - 0" square x 20" deep			
	Spread footings, 3000 PSI concrete, load 300K, soil bearing capacity 6 KSF, 7' - 6" square x 25" deep			
A1030	**Slab on Grade**		**$4.56**	**$51,500**
	Slab on grade, 4" thick, non industrial, reinforced			
A2010	**Basement Excavation**		**$0.18**	**$2,000**
	Excavate and fill, 30,000 SF, 4' deep, sand, gravel, or common earth, on site storage			
A2020	**Basement Walls**		**$2.12**	**$24,000**
	Foundation wall, CIP, 4' wall height, direct chute, .099 CY/LF, 4.8 PLF, 8" thick			
	Foundation wall, CIP, 4' wall height, direct chute, .148 CY/LF, 7.2 PLF, 12" thick			
B Shell		**25.4%**	**$31.37**	**$354,500**
B1010	**Floor Construction**		**$2.65**	**$30,000**
	Floor, concrete, slab form, open web bar joist @ 2' OC, on W beam and wall, 25'x25' bay, 26" deep, 75 PSF superimposed load, 120 PSF total load			
	Floor, concrete, slab form, open web bar joist @ 2' OC, on W beam and wall, 25'x25' bay, 26" deep, 75 PSF superimposed load, 120 PSF total load, for columns add			
	Fireproofing, gypsum board, fre rated, 2 layer, 1" thick, 14" steel column, 3 hour rating, 22 PLF			
B1020	**Roof Construction**		**$5.97**	**$67,500**

	Floor, steel joists, beams, 1.5" 22 ga metal deck, on columns and bearing wall, 25'x25' bay, 20" deep, 40 PSF superimposed load, 60 PSF total load			
	Floor, steel joists, beams, 1.5" 22 ga metal deck, on columns and bearing wall, 25'x25' bay, 20" deep, 40 PSF superimposed load, 60 PSF total load, add for column			
B2010	**Exterior Walls**		**$12.88**	**$145,500**
	Brick wall, composite double wythe, standard face/CMU back-up, 8" thick, perlite core fill			
B2020	**Exterior Windows**		**$3.50**	**$39,500**
	Windows, aluminum, awning, insulated glass, 4'-5" x 5'-3"			
B2030	**Exterior Doors**		**$1.02**	**$11,500**
	Door, aluminum & glass, with transom, narrow stile, double door, hardware, 6'-0" x 10'-0" opening			
	Door, aluminum & glass, with transom, bronze finish, hardware, 3'-0" x 10'-0" opening			
	Door, steel 18 gauge, hollow metal, 1 door with frame, no label, 3'-0" x 7'-0" opening			
B3010	**Roof Coverings**		**$5.35**	**$60,500**
	Roofing, asphalt flood coat, gravel, base sheet, 3 plies 15# asphalt felt, mopped			
	Insulation, rigid, roof deck, composite with 2" EPS, 1" perlite			
	Roof edges, aluminum, duranodic, .050" thick, 6" face			
	Flashing, aluminum, no backing sides, .019"			
	Gravel stop, aluminum, extruded, 4", duranodic, .050" thick			
C Interiors		**21.7%**	**$26.81**	**$303,000**
C1010	**Partitions**		**$2.96**	**$33,500**
	Metal partition, 5/8" water resistant gypsum board face, no base layer, 3-5/8" @ 24" OC framing ,same opposite face, no insulation			
	1/2" fire ratedgypsum board, taped & finished, painted on metal furring			
C1020	**Interior Doors**		**$4.82**	**$54,500**
	Door, single leaf, kd steel frame, hollow metal, commercial quality, flush, 3'-0" x 7'-0" x 1-3/8"			
C1030	**Fittings**		**$0.97**	**$11,000**
	Toilet partitions, cubicles, ceiling hung, plastic laminate			
C2010	**Stair Construction**		**$4.03**	**$45,500**
	Stairs, steel, cement filled metal pan & picket rail, 16 risers, with landing			
C3010	**Wall Finishes**		**$0.97**	**$11,000**
	Painting, interior on plaster and drywall, walls & ceilings, roller work, primer & 2 coats			
	Vinyl wall covering, fabric back, medium weight			
C3020	**Floor Finishes**		**$7.35**	**$83,000**
	Carpet, tufted, nylon, roll goods, 12' wide, 36 oz			
	Carpet, padding, add to above, minimum			
	Vinyl, composition tile, maximum			
	Tile, ceramic natural clay			
C3030	**Ceiling Finishes**		**$5.71**	**$64,500**
	Acoustic ceilings, 3/4"mineral fiber, 12" x 12" tile, concealed 2" bar & channel grid, suspended support			
D Services		**45.4%**	**$56.19**	**$635,000**
D1010	**Elevators and Lifts**		**$11.28**	**$127,500**
	Hydraulic passenger elevator, 3000 lb, 3 floors,12' story height, 2 car group,125 FPM			
D2010	**Plumbing Fixtures**		**$3.14**	**$35,500**

	Water closet, vitreous china, bowl only with flush valve, wall hung		
	Urinal, vitreous china, wall hung		
	Lavatory w/trim, vanity top, PE on CI, 20" x 18"		
	Service sink w/trim, PE on CI,wall hung w/rim guard, 24" x 20"		
	Water cooler, electric, wall hung, 8.2 GPH		
	Water cooler, electric, wall hung, wheelchair type, 7.5 GPH		
D2020	**Domestic Water Distribution**	**$0.40**	**$4,500**
	Gas fired water heater, commercial, 100< F rise, 100 MBH input, 91 GPH		
D2040	**Rain Water Drainage**	**$0.58**	**$6,500**
	Roof drain, CI, soil,single hub, 4' diam, 10' high		
	Roof drain, CI, soil,single hub, 4' diam, for each additional foot add		
D3050	**Terminal & Package Units**	**$14.87**	**$168,000**
	Rooftop, multizone, air conditioner, offices, 25,000 SF, 79.16 ton		
D4010	**Sprinklers**	**$3.19**	**$36,000**
	Wet pipe sprinkler systems, steel, light hazard, 1 floor, 5000 SF		
	Wet pipe sprinkler systems, steel, light hazard, each additional floor, 5000 SF		
	Standard High Rise Accessory Package 3 story		
D4020	**Standpipes**	**$0.75**	**$8,500**
	Wet standpipe risers, class III, steel, black, sch 40, 4" diam pipe, 1 floor		
	Wet standpipe risers, class III, steel, black, sch 40, 4" diam pipe, additional floors		
D5010	**Electrical Service/Distribution**	**$6.99**	**$79,000**
	Service installation, includes breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 V, 1000 A		
	Feeder installation 600 V, including RGS conduit and XHHW wire, 1000 A		
	Switchgear installation, incl switchboard, panels & circuit breaker, 1200 A		
D5020	**Lighting and Branch Wiring**	**$9.87**	**$111,500**
	Receptacles incl plate, box, conduit, wire, 16.5 per 1000 SF, 2.0 W per SF, with transformer		
	Miscellaneous power, 1.2 watts		
	Central air conditioning power, 4 watts		
	Motor installation, three phase, 460 V, 15 HP motor size		
	Fluorescent fixtures recess mounted in ceiling, 1.6 watt per SF, 40 FC, 10 fixtures @32watt per 1000 SF		
D5030	**Communications and Security**	**$4.91**	**$55,500**
	Telephone wiring for offices & laboratories, 8 jacks/MSF		
	Communication and alarm systems, fire detection, addressable, 50 detectors, includes outlets, boxes, conduit and wire		
	Fire alarm command center, addressable with voice, excl. wire & conduit		
	Internet wiring, 8 data/voice outlets per 1000 S.F.		
D5090	**Other Electrical Systems**	**$0.22**	**$2,500**
	Generator sets, w/battery, charger, muffler and transfer switch, gas/gasoline operated, 3 phase, 4 wire, 277/480 V, 7.5 kW		
	Uninterruptible power supply with standard battery pack, 15 kVA/12.75 kW		
E Equipment & Furnishings		**0.0%**	**$0.00**	**$0**
E1090	**Other Equipment**	**$0.00**	**$0**

F Special Construction	0.0%	$0.00	$0
G Building Sitework	0.0%	$0.00	$0

SubTotal	100%	$123.72	$1,398,000
Contractor Fees (GC,Overhead,Profit)	0.0%	$0.00	$0
Architectural Fees	0.0%	$0.00	$0
User Fees	0.0%	$0.00	$0
Total Building Cost		$123.72	$1,398,000

Shop Building

CostWorks® RSMeans

Square Foot Cost Estimate Report

Back Print Export

Estimate Name:	**Untitled**
Building Type:	**Garage, Repair with Insulated Metal Panels / Steel Frame**
Location:	**WELLSBORO, PA**
Stories:	**1**
Story Height (L.F.):	**40**
Floor Area (S.F.):	**14700**
Labor Type:	**Union**
Basement Included:	**No**
Data Release:	**Year 2011**
Cost Per Square Foot:	**$89.25**
Building Cost:	**$1,312,000**

Costs are derived from a building model with basic components. Scope differences and market conditions can cause costs to vary significantly. **Parameters are not within the ranges recommended by RSMeans.**

		% of Total	Cost Per S.F.	Cost
A Substructure		**13.0%**	**$11.56**	**$170,000**
A1010	**Standard Foundations**		**$1.60**	**$23,500**
	Strip footing, concrete, reinforced, load 11.1 KLF, soil bearing capacity 6 KSF, 12" deep x 24" wide			
A1030	**Slab on Grade**		**$6.84**	**$100,500**
	Slab on grade, 6" thick, light industrial, reinforced			
A2010	**Basement Excavation**		**$0.27**	**$4,000**
	Excavate and fill, 10,000 SF, 4' deep, sand gravel, or common earth, on site storage			
A2020	**Basement Walls**		**$2.86**	**$42,000**
	Foundation wall, CIP, 4' wall height, direct chute, .148 CY/LF, 7.2 PLF, 12" thick			
B Shell		**33.8%**	**$30.20**	**$444,000**
B1020	**Roof Construction**		**$7.18**	**$105,500**
	Roof, steel joists, joist girder, 1.5" 22 ga metal deck, on columns, 35'x40' bay, 20 PSF superimposed load, 36.5" deep, 40 PSF total load			
	Roof, steel joists, joist girder, 1.5" 22 ga metal deck, on columns, 35'x40' bay, 20 PSF superimposed load, 36.5" deep, 40 PSF total load, add for columns			
B2020	**Exterior Windows**		**$13.13**	**$193,000**
	Windows, aluminum, sliding, standard glass, 5' x 3'			
	Facing panel, textured aluminum, 4' x 8' x 5/16" plywood backing, single face			
B2030	**Exterior Doors**		**$4.18**	**$61,500**
	Door, steel 18 gauge, hollow metal, 1 door with frame, no label, 3'-0" x 7'-0" opening			
	Door, steel 24 gauge, overhead, sectional, manual operation, 12'-0" x 12'-0" opening			

B3010	**Roof Coverings**		**$5.71**	**$84,000**
	Roofing, asphalt flood coat, gravel, base sheet, 3 plies 15# asphalt felt, mopped			
	Insulation, rigid, roof deck, composite with 2" EPS, 1" perlite			
	Roof edges, aluminum, duranodic, .050" thick, 6" face			
	Gravel stop, aluminum, extruded, 4", mill finish, .050" thick			
B3020	**Roof Openings**		**$0.00**	**$0**
	Skylight, plastic domes, insulated curbs, 10 SF to 20 SF, single glazing			
C Interiors		**7.2%**	**$6.43**	**$94,500**
C1010	**Partitions**		**$3.67**	**$54,000**
	Lightweight block 4" thick			
	5/8" gypsum board, taped & finished, painted on 2 x 4 studs 16" O.C.			
C1020	**Interior Doors**		**$0.31**	**$4,500**
	Door, single leaf, kd steel frame, hollow metal, commercial quality, flush, 3'-0" x 7'-0" x 1-3/8"			
C1030	**Fittings**		**$0.07**	**$1,000**
	Toilet partitions, cubicles, ceiling hung, stainless steel			
C3010	**Wall Finishes**		**$1.02**	**$15,000**
	Painting, masonry or concrete, latex, brushwork, primer & 2 coats			
	Painting, masonry or concrete, latex, brushwork, addition for block filler			
C3020	**Floor Finishes**		**$1.05**	**$15,500**
	Concrete topping, hardeners, metallic additive, minimum			
	Vinyl, composition tile, minimum			
C3030	**Ceiling Finishes**		**$0.31**	**$4,500**
	Acoustic ceilings, 5/8" fiberglass board, 24" x 48" tile, tee grid, suspended support			
D Services		**31.6%**	**$28.16**	**$414,000**
D2010	**Plumbing Fixtures**		**$2.65**	**$39,000**
	Water closet, vitreous china, bowl only with flush valve, wall hung			
	Urinal, vitreous china, wall hung			
	Lavatory w/trim, wall hung, PE on CI, 19" x 17"			
	Service sink w/trim, PE on CI,wall hung w/rim guard, 24" x 20"			
	Shower, stall, baked enamel, molded stone receptor, 30" square			
	Water cooler, electric, wall hung, wheelchair type, 7.5 GPH			
D2020	**Domestic Water Distribution**		**$0.48**	**$7,000**
	Gas fired water heater, residential, 100< F rise, 30 gal tank, 32 GPH			
D2040	**Rain Water Drainage**		**$2.07**	**$30,500**
	Roof drain, steel galv sch 40 threaded, 4" diam piping, 10' high			
	Roof drain, steel galv sch 40 threaded, 4" diam piping, for each additional foot add			
D3050	**Terminal & Package Units**		**$7.82**	**$115,000**
	Rooftop, single zone, air conditioner, factories, 10,000 SF, 33.33 ton			
D3090	**Other HVAC Systems/Equip**		**$0.54**	**$8,000**
	Garage, single exhaust, 3" outlet, cars & light trucks, 1 bay			

	Garage, single exhaust, 3" outlet, additional bays up to seven bays			
D4010	**Sprinklers**		**$3.95**	**$58,000**
	Wet pipe sprinkler systems, steel, ordinary hazard, 1 floor, 10,000 SF			
D4020	**Standpipes**		**$0.75**	**$11,000**
	Wet standpipe risers, class III, steel, black, sch 40, 4" diam pipe, 1 floor			
	Wet standpipe risers, class III, steel, black, sch 40, 4" diam pipe, additional floors			
D5010	**Electrical Service/Distribution**		**$0.31**	**$4,500**
	Service installation, includes breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 V, 200 A			
	Feeder installation 600 V, including RGS conduit and XHHW wire, 200 A			
	Switchgear installation, incl switchboard, panels & circuit breaker, 400 A			
D5020	**Lighting and Branch Wiring**		**$6.56**	**$96,500**
	Receptacles incl plate, box, conduit, wire, 4 per 1000 SF, .5 watts per SF			
	Miscellaneous power, 1 watt			
	Central air conditioning power, 3 watts			
	Fluorescent fixtures recess mounted in ceiling, 1.6 watt per SF, 40 FC, 10 fixtures @32watt per 1000 SF			
D5030	**Communications and Security**		**$2.96**	**$43,500**
	Communication and alarm systems, fire detection, addressable, 25 detectors, includes outlets, boxes, conduit and wire			
	Fire alarm command center, addressable with voice, excl. wire & conduit			
	Internet wiring, 4 data/voice outlets per 1000 S.F.			
D5090	**Other Electrical Systems**		**$0.07**	**$1,000**
	Generator sets, w/battery, charger, muffler and transfer switch, gas/gasoline operated, 3 phase, 4 wire, 277/480 V, 15 kW			
E Equipment & Furnishings		**14.4%**	**$12.89**	**$189,500**
E1030	**Vehicular Equipment**		**$12.89**	**$189,500**
	Architectural equipment, auto equipment hoists, single post, 4 ton capacity, swivel arms			
E1090	**Other Equipment**		**$0.00**	**$0**
F Special Construction		**0.0%**	**$0.00**	**$0**
G Building Sitework		**0.0%**	**$0.00**	**$0**

SubTotal	**100%**	**$89.25**	**$1,312,000**
Contractor Fees (GC,Overhead,Profit)	**0.0%**	**$0.00**	**$0**
Architectural Fees	**0.0%**	**$0.00**	**$0**
User Fees	**0.0%**	**$0.00**	**$0**
Total Building Cost		**$89.25**	**$1,312,000**

Appendix C: RS Means Assemblies Data

Toilets

D20 Plumbing

D2010 Plumbing Fixtures

Systems are complete with trim seat and rough-in (supply, waste and vent) for connection to supply branches and waste mains.

One Piece Wall Hung

Supply

Waste/Vent

Floor Mount

System Components	QUANTITY	UNIT	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
SYSTEM D2010 110 1880					
WATER CLOSET, VITREOUS CHINA, ELONGATED					
TANK TYPE, WALL HUNG, TWO PIECE					
Water closet, tank type vit china wall hung 2 pc. w/seat supply & stop	1.000	Ea.	650	217	867
Pipe Steel galvanized, schedule 40, threaded, 2" dim.	4.000	L.F.	68.60	72	140.60
Pipe, CI soil, no hub, cplg 10' OC, hanger 5' OC, 4" diam.	2.000	L.F.	34.70	39.70	74.40
Pipe, coupling, standard coupling, CI soil, no hub, 4" diam.	2.000	Ea.	40	70	110
Copper tubing type L solder joint, hangar 10' O.C., 1/2" diam.	6.000	L.F.	26.22	47.40	73.62
Wrought copper 90° elbow for solder joints 1/2" diam.	2.000	Ea.	4.46	64	68.46
Wrought copper Tee for solder joints 1/2" diam.	1.000	Ea.	3.82	49	52.82
Supports/carrier, water closet, siphon jet, horiz, single, 4" waste	1.000	Ea.	830	120	950
TOTAL			1,657.80	679.10	2,336.90

D2010 110	Water Closet Systems		COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
1800	Water closet, vitreous china, elongated				
1840	Tank type, wall hung				
1880	Close coupled two piece	RD2010 -400	1,650	680	2,330
1920	Floor mount, one piece		1,450	720	2,170
1960	One piece low profile		995	720	1,715
2000	Two piece close coupled		635	720	1,355
2040	Bowl only with flush valve				
2080	Wall hung		1,650	770	2,420
2120	Floor mount		785	735	1,520
2160	Floor mount, ADA compliant with 18" high bowl		780	755	1,535

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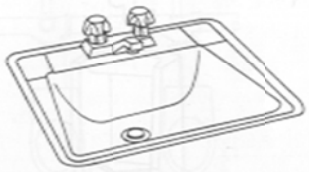
Sinks

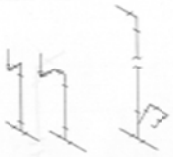
D20 Plumbing

D2010 Plumbing Fixtures

Systems are complete with trim and rough-in (supply, waste and vent) to connect to supply branches and waste mains.



Vanity Top



Supply Waste/Vent

Wall Hung

System Components	QUANTITY	UNIT	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
SYSTEM D2010 310 1560					
LAVATORY W/TRIM, VANITY TOP, P.E. ON C.I., 20" X 18"					
Lavatory w/trim, PE on CI, white, vanity top, 20" x 18" oval	1.000	Ea.	325	180	505
Pipe, steel, galvanized, schedule 40, threaded, 1-1/4" diam.	4.000	L.F.	44.60	51.80	96.40
Copper tubing type DWV, solder joint, hanger 10' OC 1-1/4" diam.	4.000	L.F.	48.60	42.60	91.20
Wrought copper DWV, Tee, sanitary, 1-1/4" diam.	1.000	Ea.	42.50	71	113.50
P trap w/cleanout, 20 ga., 1-1/4" diam.	1.000	Ea.	143	35.50	178.50
Copper tubing type L, solder joint, hanger 10' OC 1/2" diam.	10.000	L.F.	43.70	79	122.70
Wrought copper 90° elbow for solder joints 1/2" diam.	2.000	Ea.	4.46	64	68.46
Wrought copper Tee for solder joints, 1/2" diam.	2.000	Ea.	7.64	98	105.64
Stop, chrome, angle supply, 1/2" diam.	2.000	Ea.	18.50	58	76.50
TOTAL			678	679.90	1,357.90

D2010 310	Lavatory Systems		COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
1560	Lavatory w/trim, vanity top, PE on CI, 20" x 18", Vanity top by others.		680	680	1,360
1600	19" x 16" oval		530	680	1,210
1640	18" round	RD2010 -400	605	680	1,285
1680	Cultured marble, 19" x 17"		585	680	1,265
1720	25" x 19"		620	680	1,300
1760	Stainless, self-rimming, 25" x 22"		750	680	1,430
1800	17" x 22"		740	680	1,420
1840	Steel enameled, 20" x 17"		560	700	1,260
1880	19" round		530	700	1,230
1920	Vitreous china, 20" x 16"		640	715	1,355
1960	19" x 16"		640	715	1,355
2000	22" x 13"		645	715	1,360
2040	Wall hung, PE on CI, 18" x 15"		870	750	1,620
2080	19" x 17"		870	750	1,620
2120	20" x 18"		840	750	1,590
2160	Vitreous china, 18" x 15"		715	770	1,485
2200	19" x 17"		660	770	1,430
2240	24" x 20"		935	770	1,705
2300	20" x 27", handicap		970	830	1,800

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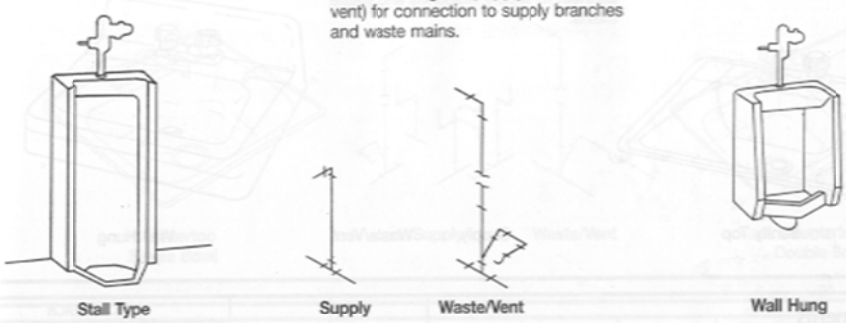
Urinals

D20 Plumbing

D2010 Plumbing Fixtures

Systems are complete with trim, flush valve and rough-in (supply, waste and vent) for connection to supply branches and waste mains.



Stall Type | Supply | Waste/Vent | Wall Hung

System Components	QUANTITY	UNIT	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
SYSTEM D2010 210 2000					
URINAL, VITREOUS CHINA, WALL HUNG					
Urinal, wall hung, vitreous china, incl. hanger	1.000	Ea.	315	385	700
Pipe, steel, galvanized, schedule 40, threaded, 1-1/2" diam.	5.000	L.F.	65	72	137
Copper tubing type DWV, solder joint, hangers 10' OC, 2" diam.	3.000	L.F.	60	43.65	103.65
Combination Y & 1/8 bend for CI soil pipe, no hub, 3" diam.	1.000	Ea.	16.50		16.50
Pipe, CI, no hub, cplg. 10' OC, hanger 5' OC, 3" dian.	4.000	L.F.	54.40	72	126.40
Pipe coupling standard, CI soil, no hub, 3" diam.	3.000	Ea.	34.20	61	95.20
Copper tubing type L, solder joint, hanger 10' OC 3/4" diam.	5.000	L.F.	32.75	42	74.75
Wrought copper 90° elbow for solder joints 3/4" dian.	1.000	Ea.	4.61	33.50	38.11
Wrought copper Tee for solder joints, 3/4" diam.	1.000	Ea.	8.80	53.50	62.30
TOTAL			591.26	762.65	1,353.91

D2010 210	Urinal Systems	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
2000	Urinal, vitreous china, wall hung	590	765	1,355
2040	Stall type	1,225	910	2,135

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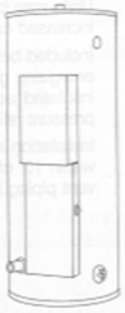
Water Heaters

D20 Plumbing

D2020 Domestic Water Distribution



Systems below include piping and fittings within 10' of heater. Electric water heaters do not require venting.

System Components	QUANTITY	UNIT	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
SYSTEM D2020 240 1820					
ELECTRIC WATER HEATER, COMMERCIAL, 100° F RISE					
50 GALLON TANK, 9 KW, 37 GPH					
Water heater, commercial, electric, 50 Gal, 9 KW, 37 GPH	1.000	Ea.	3,600	355	3,955
Copper tubing, type L, solder joint, hanger 10' OC, 3/4" diam	34.000	L.F.	222.70	285.60	508.30
Wrought copper 90° elbow for solder joints 3/4" diam	5.000	Ea.	23.05	167.50	190.55
Wrought copper Tee for solder joints, 3/4" diam	2.000	Ea.	17.60	107	124.60
Wrought copper union for soldered joints, 3/4" diam	2.000	Ea.	64	71	135
Valve, gate, bronze, 125 lb, NRS, soldered 3/4" diam	2.000	Ea.	89	64	153
Relief valve, bronze, press & temp, self-close, 3/4" IPS	1.000	Ea.	146	23	169
Wrought copper adapter, copper tubing to male, 3/4" IPS	1.000	Ea.	7.85	37.50	45.35
TOTAL			4,170.20	1,110.60	5,280.80

D2020 240	Electric Water Heaters - Commercial Systems	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
1800	Electric water heater, commercial, 100°F rise (RD2020 -100)			
1820	50 gallon tank, 9 KW 37 GPH	4,175	1,100	5,275
1860	80 gal, 12 KW 49 GPH	6,000	1,375	7,375
1900	36 KW 147 GPH	8,100	1,475	9,575
1940	120 gal, 36 KW 147 GPH	8,675	1,600	10,275
1980	150 gal, 120 KW 490 GPH	25,400	1,725	27,125
2020	200 gal, 120 KW 490 GPH	26,700	1,775	28,475
2060	250 gal, 150 KW 615 GPH	30,200	2,050	32,250
2100	300 gal, 180 KW 738 GPH	36,600	2,175	38,775
2140	350 gal, 30 KW 123 GPH	24,500	2,350	26,850
2180	180 KW 738 GPH	33,700	2,350	36,050
2220	500 gal, 30 KW 123 GPH	31,700	2,750	34,450
2260	240 KW 984 GPH	51,000	2,750	53,750
2300	700 gal, 30 KW 123 GPH	26,000	3,150	29,150
2340	300 KW 1230 GPH	37,900	3,150	41,050
2380	1000 gal, 60 KW 245 GPH	32,700	4,375	37,075
2420	480 KW 1970 GPH	51,000	4,375	55,375
2460	1500 gal, 60 KW 245 GPH	67,500	5,400	72,900
2500	480 KW 1970 GPH	91,500	5,400	96,900

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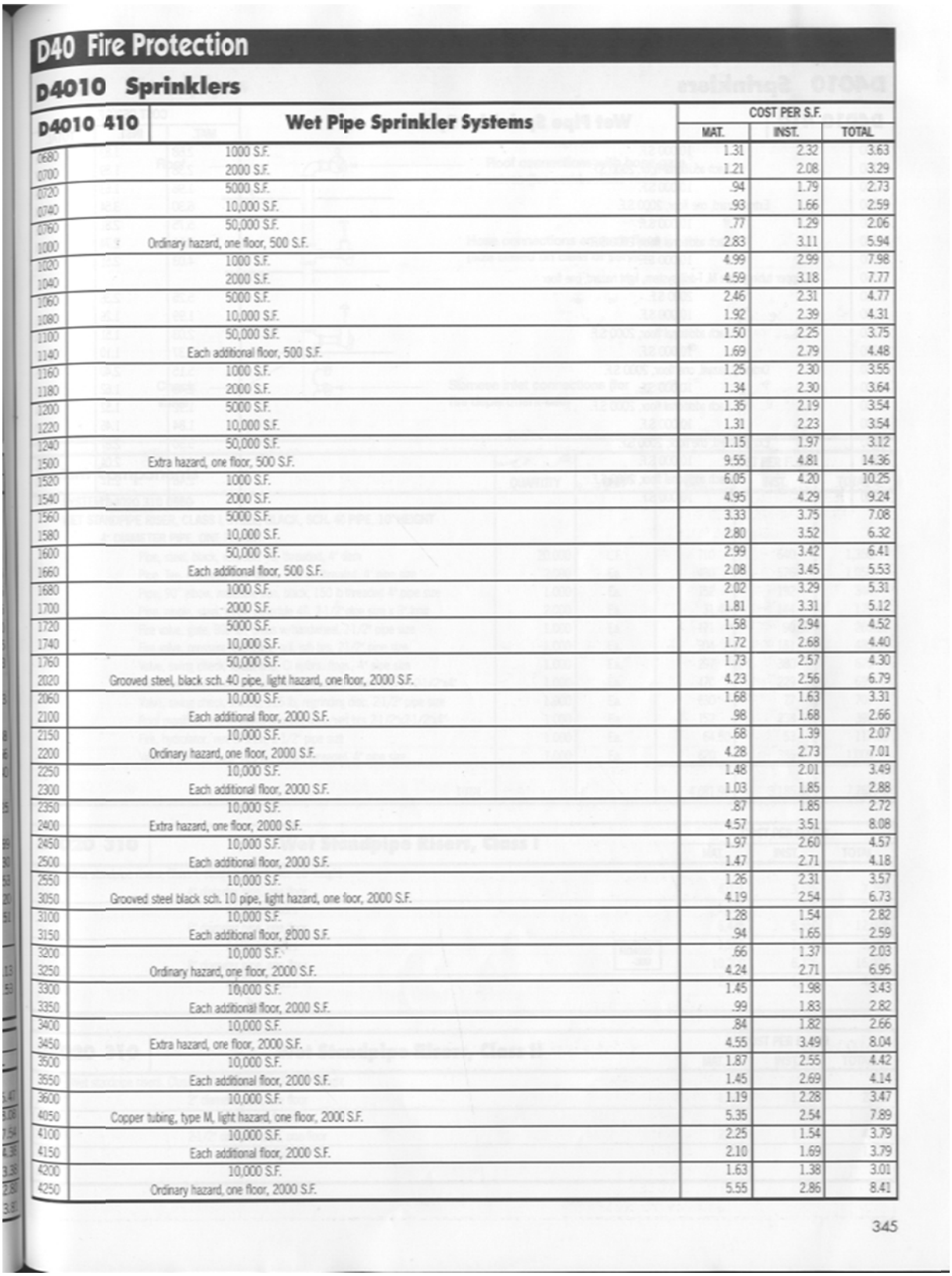
Sprinklers



D40 Fire Protection

D4010 Sprinklers

D4010 410	Wet Pipe Sprinkler Systems	COST PER S.F.		
		MAT.	INST.	TOTAL
0680	1000 S.F.	1.31	2.32	3.63
0700	2000 S.F.	1.21	2.08	3.29
0720	5000 S.F.	.94	1.79	2.73
0740	10,000 S.F.	.93	1.66	2.59
0760	50,000 S.F.	.77	1.29	2.06
1000	Ordinary hazard, one floor, 500 S.F.	2.83	3.11	5.94
1020	1000 S.F.	4.99	2.99	7.98
1040	2000 S.F.	4.59	3.18	7.77
1060	5000 S.F.	2.46	2.31	4.77
1080	10,000 S.F.	1.92	2.39	4.31
1100	50,000 S.F.	1.50	2.25	3.75
1140	Each additional floor, 500 S.F.	1.69	2.79	4.48
1160	1000 S.F.	1.25	2.30	3.55
1180	2000 S.F.	1.34	2.30	3.64
1200	5000 S.F.	1.35	2.19	3.54
1220	10,000 S.F.	1.31	2.23	3.54
1240	50,000 S.F.	1.15	1.97	3.12
1500	Extra hazard, one floor, 500 S.F.	9.55	4.81	14.36
1520	1000 S.F.	6.05	4.20	10.25
1540	2000 S.F.	4.95	4.29	9.24
1560	5000 S.F.	3.33	3.75	7.08
1580	10,000 S.F.	2.80	3.52	6.32
1600	50,000 S.F.	2.99	3.42	6.41
1660	Each additional floor, 500 S.F.	2.08	3.45	5.53
1680	1000 S.F.	2.02	3.29	5.31
1700	2000 S.F.	1.81	3.31	5.12
1720	5000 S.F.	1.58	2.94	4.52
1740	10,000 S.F.	1.72	2.68	4.40
1760	50,000 S.F.	1.73	2.57	4.30
2020	Grooved steel, black sch. 40 pipe, light hazard, one floor, 2000 S.F.	4.23	2.56	6.79
2060	10,000 S.F.	1.68	1.63	3.31
2100	Each additional floor, 2000 S.F.	.98	1.68	2.66
2150	10,000 S.F.	.68	1.39	2.07
2200	Ordinary hazard, one floor, 2000 S.F.	4.28	2.73	7.01
2250	10,000 S.F.	1.48	2.01	3.49
2300	Each additional floor, 2000 S.F.	1.03	1.85	2.88
2350	10,000 S.F.	.87	1.85	2.72
2400	Extra hazard, one floor, 2000 S.F.	4.57	3.51	8.08
2450	10,000 S.F.	1.97	2.60	4.57
2500	Each additional floor, 2000 S.F.	1.47	2.71	4.18
2550	10,000 S.F.	1.26	2.31	3.57
3050	Grooved steel black sch. 10 pipe, light hazard, one floor, 2000 S.F.	4.19	2.54	6.73
3100	10,000 S.F.	1.28	1.54	2.82
3150	Each additional floor, 2000 S.F.	.94	1.65	2.59
3200	10,000 S.F.	.66	1.37	2.03
3250	Ordinary hazard, one floor, 2000 S.F.	4.24	2.71	6.95
3300	10,000 S.F.	1.45	1.98	3.43
3350	Each additional floor, 2000 S.F.	.99	1.83	2.82
3400	10,000 S.F.	.84	1.82	2.66
3450	Extra hazard, one floor, 2000 S.F.	4.55	3.49	8.04
3500	10,000 S.F.	1.87	2.55	4.42
3550	Each additional floor, 2000 S.F.	1.45	2.69	4.14
3600	10,000 S.F.	1.19	2.28	3.47
4050	Copper tubing, type M, light hazard, one floor, 2000 S.F.	5.35	2.54	7.89
4100	10,000 S.F.	2.25	1.54	3.79
4150	Each additional floor, 2000 S.F.	2.10	1.69	3.79
4200	10,000 S.F.	1.63	1.38	3.01
4250	Ordinary hazard, one floor, 2000 S.F.	5.55	2.86	8.41

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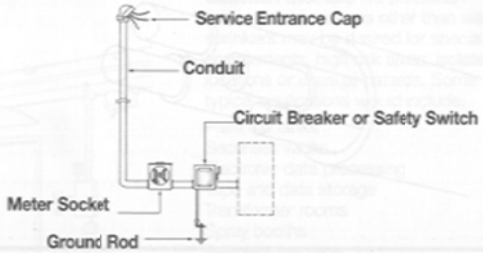
Electrical Service

D50 Electrical

D5010 Electrical Service/Distribution



System Components	QUANTITY	UNIT	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
SYSTEM D5010 120 0220					
SERVICE INSTALLATION, INCLUDES BREAKERS, METERING, 20' CONDUIT & WIRE					
3 PHASE, 4 WIRE, 60 A					
Circuit breaker, enclosed (NEMA 1), 600 volt, 3 pole, 60 A	1.000	Ea.	655	213	868
Meter socket, single position, 4 terminal, 100 A	1.000	Ea.	48.50	186	234.50
Rigid galvanized steel conduit, 3/4", including fittings	20.000	L.F.	59.40	149	208.40
Wire, 600V type XHHW, copper stranded #6	.900	C.L.F.	91.80	82.35	174.15
Service entrance cap 3/4" diameter	1.000	Ea.	12.25	46	58.25
Conduit LB fitting with cover, 3/4" diameter	1.000	Ea.	15.75	46	61.75
Ground rod, copper clad, 8' long, 3/4" diameter	1.000	Ea.	35.50	112	147.50
Ground rod clamp, bronze, 3/4" diameter	1.000	Ea.	8.35	18.65	27
Ground wire, bare armored, #6-1 conductor	.200	C.L.F.	31.60	66	97.60
TOTAL			958.15	919	1,877.15

D5010 120	Electric Service, 3 Phase - 4 Wire		COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
0200	Service installation, includes breakers, metering, 20' conduit & wire				
0220	3 phase, 4 wire, 120/208 volts, 60 A		960	920	1,880
0240	100 A		1,150	1,100	2,250
0280	200 A		1,875	1,700	3,575
0320	400 A	RD5010 -110	4,425	3,125	7,550
0360	600 A		8,275	4,225	12,500
0400	800 A		10,200	5,100	15,300
0440	1000 A		12,400	5,850	18,250
0480	1200 A		15,800	6,000	21,800
0520	1600 A		27,800	8,600	36,400
0560	2000 A		30,600	9,800	40,400
0570	Add 25% for 277/480 volt				
0580					
0610	1 phase, 3 wire, 120/240 volts, 100 A		535	1,000	1,535
0620	200 A		1,100	1,475	2,575

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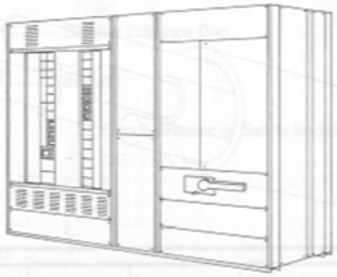
Switchgear

D50 Electrical

D5010 Electrical Service/Distribution



System Components	QUANTITY	UNIT	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
SYSTEM D5010 240 0240					
SWITCHGEAR INSTALLATION, INCL SWBD, PANELS & CIRC BREAKERS, 600 A					
Panelboard, NQOD 225A 4W 120/208V main CB, w/20A bkrs 42 circ	1.000	Ea.	2,475	2,125	4,600
Switchboard, alum. bus bars, 120/208V, 4 wire, 600V	1.000	Ea.	4,425	1,200	5,625
Distribution sect., alum. bus bar, 120/208 or 277/480 V, 4 wire, 600A	1.000	Ea.	2,525	1,200	3,725
Feeder section circuit breakers, KA frame, 70 to 225 A	3.000	Ea.	4,200	558	4,758
TOTAL			13,625	5,083	18,708

D5010 240	Switchgear		COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
0200	Switchgear inst., incl. swbd., panels & circ bkr, 400 A, 120/208volt		4,500	3,750	8,250
0240	600 A		13,600	5,075	18,675
0280	800 A	RD5010 -110	17,400	7,200	24,600
0320	1200 A		20,900	11,000	31,900
0360	1600 A		28,300	15,500	43,800
0400	2000 A		35,800	19,700	55,500
0410	Add 20% for 277/480 volt				

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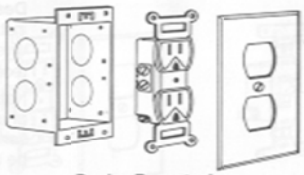
Receptacles

D50 Electrical

D5020 Lighting and Branch Wiring



Duplex Receptacle

System Components	QUANTITY	UNIT	COST PER S.F. MAT.	INST.	TOTAL
SYSTEM 05020 110 0200					
RECEPTACLES INCL. PLATE, BOX, CONDUIT, WIRE & TRANS. WHEN REQUIRED					
2.5 PER 1000 S.F., .3 WATTS PER S.F.					
Steel intermediate conduit, (IMC) 1/2" diam	167.000	L.F.	.32	.99	1.31
Wire 600V type THWN-THHN, copper solid #12	3.382	C.L.F.	.04	.18	.22
Wiring device, receptacle, duplex, 120V grounded, 15 amp	2.500	Ea.		.04	.04
Wall plate, 1 gang, brown plastic	2.500	Ea.		.02	.02
Steel outlet box 4" square	2.500	Ea.	.01	.08	.09
Steel outlet box 4" plaster rings	2.500	Ea.	.01	.02	.03
TOTAL			.38	1.33	1.71

D5020 110	Receptacle (by Wattage)		COST PER S.F. MAT.	INST.	TOTAL
0190	Receptacles include plate, box, conduit, wire & transformer when required				
0200	2.5 per 1000 S.F., .3 watts per S.F.		.38	1.33	1.71
0240	With transformer	RD5010 -110	.45	1.40	1.85
0280	4 per 1000 S.F., .5 watts per S.F.		.43	1.55	1.98
0320	With transformer		.53	1.65	2.18
0360	5 per 1000 S.F., .6 watts per S.F.		.51	1.83	2.34
0400	With transformer		.65	1.96	2.61
0440	8 per 1000 S.F., .9 watts per S.F.		.53	2.03	2.56
0480	With transformer		.72	2.21	2.93
0520	10 per 1000 S.F., 1.2 watts per S.F.		.58	2.20	2.78
0560	With transformer		.89	2.50	3.39
0600	16.5 per 1000 S.F., 2.0 watts per S.F.		.68	2.75	3.43
0640	With transformer		1.21	3.26	4.47
0680	20 per 1000 S.F., 2.4 watts per S.F.		.71	3	3.71
0720	With transformer		1.33	3.60	4.93

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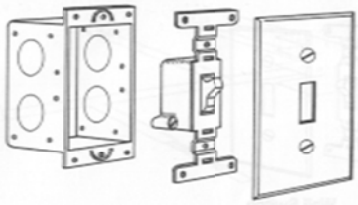
Light Switches

D50 Electrical

D5020 Lighting and Branch Wiring



Description: Table D5020 130 includes the cost for switch, plate, box, conduit in slab or EMT exposed and copper wire. Add 20% for exposed conduit.

No power required for switches.

Federal energy guidelines recommend the maximum lighting area controlled per switch shall not exceed 1000 S.F. and that areas over 500 S.F. shall be so controlled that total illumination can be reduced by at least 50%.

System Components	QUANTITY	UNIT	COST PER S.F. MAT.	INST.	TOTAL
SYSTEM D5020 130 0360					
WALL SWITCHES, 5.0 PER 1000 S.F.					
Steel, intermediate conduit (IMC), 1/2" diameter	88.000	L.F.	.17	.52	.69
Wire, 600V type THWN-THHN, copper solid #12	1.710	C.L.F.	.02	.09	.11
Toggle switch, single pole, 15 amp	5.000	Ea.	.03	.07	.10
Wall plate, 1 gang, brown plastic	5.000	Ea.		.04	.04
Steel outlet box 4" plaster rings	5.000	Ea.	.01	.15	.16
Plaster rings	5.000	Ea.	.02	.05	.07
TOTAL			.25	.92	1.17

D5020 130	Wall Switch by Sq. Ft.	COST PER S.F. MAT.	INST.	TOTAL
0200	Wall switches, 1.0 per 1000 S.F.	.06	.21	.27
0240	1.2 per 1000 S.F.	.06	.25	.31
0280	2.0 per 1000 S.F.	.10	.34	.44
0320	2.5 per 1000 S.F.	.11	.43	.54
0360	5.0 per 1000 S.F.	.25	.92	1.17
0400	10.0 per 1000 S.F.	.52	1.86	2.38

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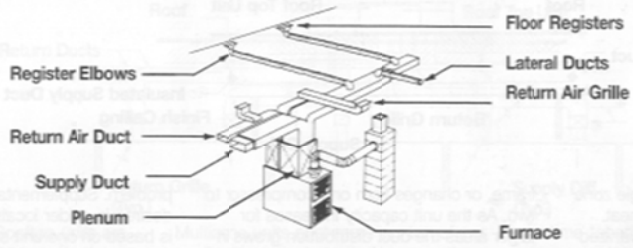
Heating/Cooling System

D30 HVAC

D3030 Cooling Generating Systems



System Components	QUANTITY	UNIT	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
SYSTEM D3030 214 1200					
HEATING/COOLING, GAS FIRED FORCED AIR,					
ONE ZONE, 1200 SF BLDG, SEER 14					
Thermostat manual	1.000	Ea.	49	81	130
Intermittent pilot	1.000	Ea.	165		165
Furnace, 3 Ton cooling, 115 MBH	1.000	Ea.	2,125	375	2,500
Cooling tubing 25 feet	1.000	Ea.	267		267
Ductwork	158.000	Lb.	115.34	1,177.10	1,292.44
Ductwork connection	12.000	Ea.	360	225	585
Supply ductwork	176.000	SF Surf	149.60	880	1,029.60
Supply grill	2.000	Ea.	52	57	109
Duct insulation	1.000	L.F.	377.28	623.52	1,000.80
Return register	1.000	Ea.	354	234.60	588.60
TOTAL			4,014.22	3,653.22	7,667.44

D3030 214	Heating/Cooling System	COST EACH MAT.	COST EACH INST.	COST EACH TOTAL
1200	Heating/Cooling system, gas fired, SEER 14, 1200 SF Bldg	4,025	3,650	7,675
1300	2000 SF Bldg	5,200	5,775	10,975
1400	Heating/Cooling system, heat pump 3 ton, SEER14, 1200 SF Bldg	6,650	4,725	11,375
1500	5 ton, SEER 14, 2000 SF Bldg	8,950	5,400	14,350

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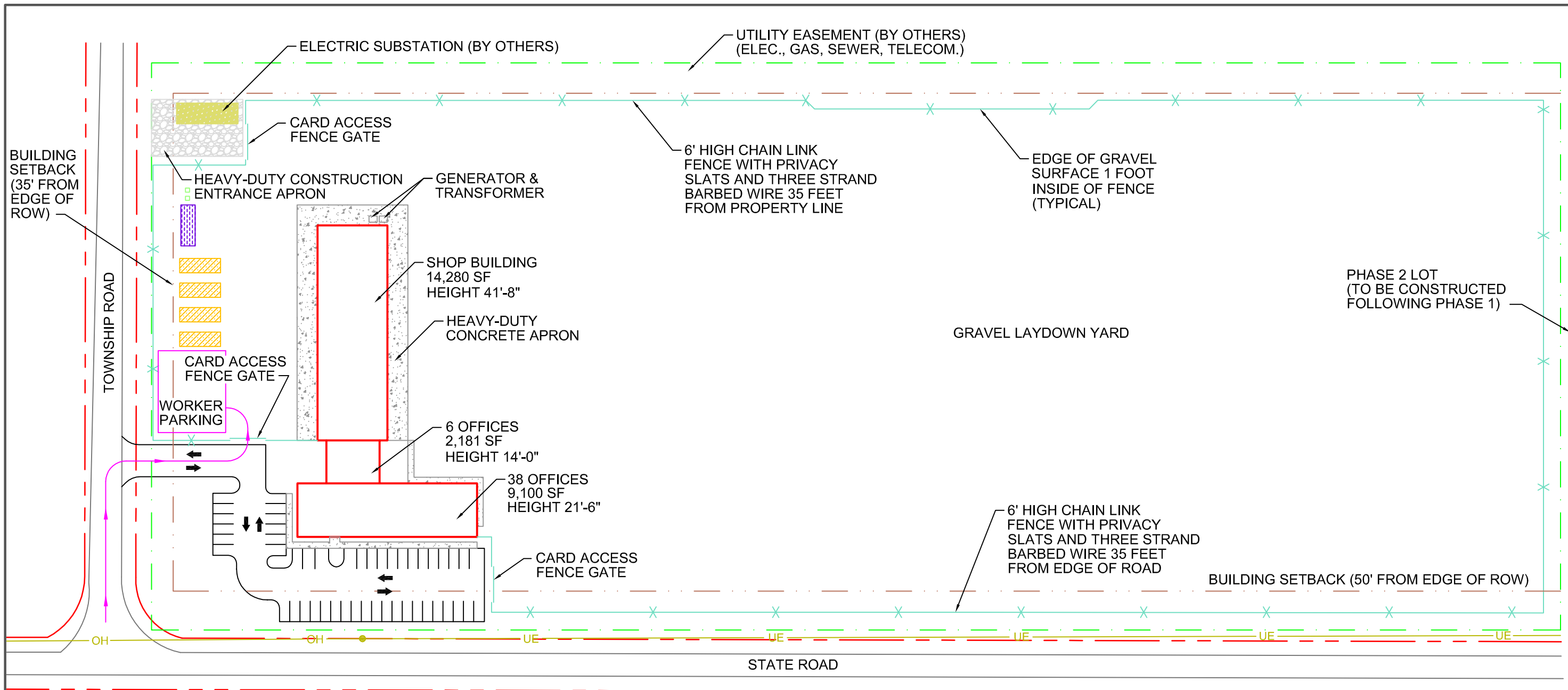
Appendix D: Site Plans



NOTES

- THERE ARE NO EXISTING FIRE HYDRANTS OR LIGHT POSTS ON THIS SITE
- THE PEDESTRIAN TRAFFIC AT THIS SITE IS VERY MINIMAL AS IT IS OVER ONE MILE FROM ANY RESIDENTIAL OR COMMERCIAL AREAS
- THE VEHICULAR TRAFFIC AT THIS SITE IS MINIMAL TO MODERATE ON THE STATE ROAD AND IS VERY MINIMAL ON THE TOWNSHIP ROAD
- THERE ARE NO NEIGHBORING BUILDINGS WITHIN 1500 FEET OF THIS SITE
- TEMPORARY SITE ELECTRIC WILL BE RUN OFF OF THE EXISTING OVERHEAD ELECTRIC LINE UNTIL THE SUBSTATION IN THE NORTHWESTERN CORNER OF THE SITE IS COMPLETED. THIS WORK WILL BE COMPLETED AS PART OF A SEPARATE PROJECT
- SITE WATER WILL BE TAPPED OFF OF THE EXISTING WATER MAIN UNDER STATE ROAD, WHICH WILL EVENTUALLY SUPPLY WATER FOR ALL PHASES OF THIS PROJECT

NOTES (CONT.)

- UTILITY EASEMENT ON NORTH SIDE OF SITE WILL BE CONSTRUCTED BY OWNER TO SERVICE PHASE 1 AND A HOUSING DEVELOPMENT THAT IS TO BE CONSTRUCTED ON THE WEST SIDE OF TOWNSHIP ROAD AT A LATER DATE WITH ELEC., GAS, SEWER, & TELECOM.
- WORKERS WILL ACCESS THE SITE BY TRAVELING NORTH ON TOWNSHIP ROAD AND TURNING RIGHT INTO THE WEST ENTRANCE. PARKING WILL BE AVAILABLE TO THE SOUTH OF THE JOBSITE TRAILERS

SCALE

100 0 100

1" = 100'

N

LEGEND

- BUILDING OUTLINE
- SITE FENCE
- SITE BOUNDARY
- EXISTING ROAD
- PARKING AREA
- BUILDING SETBACK
- RIGHT-OF-WAY
- JOBSITE TRAILER
- DUMPSTER
- UE — UNDERGROUND ELECTRIC
- OH — OVERHEAD ELECTRIC
- UTILITY POLE
- WORKER ACCESS
- TEMPORARY TOILETS

Drawn By: Christopher Havens

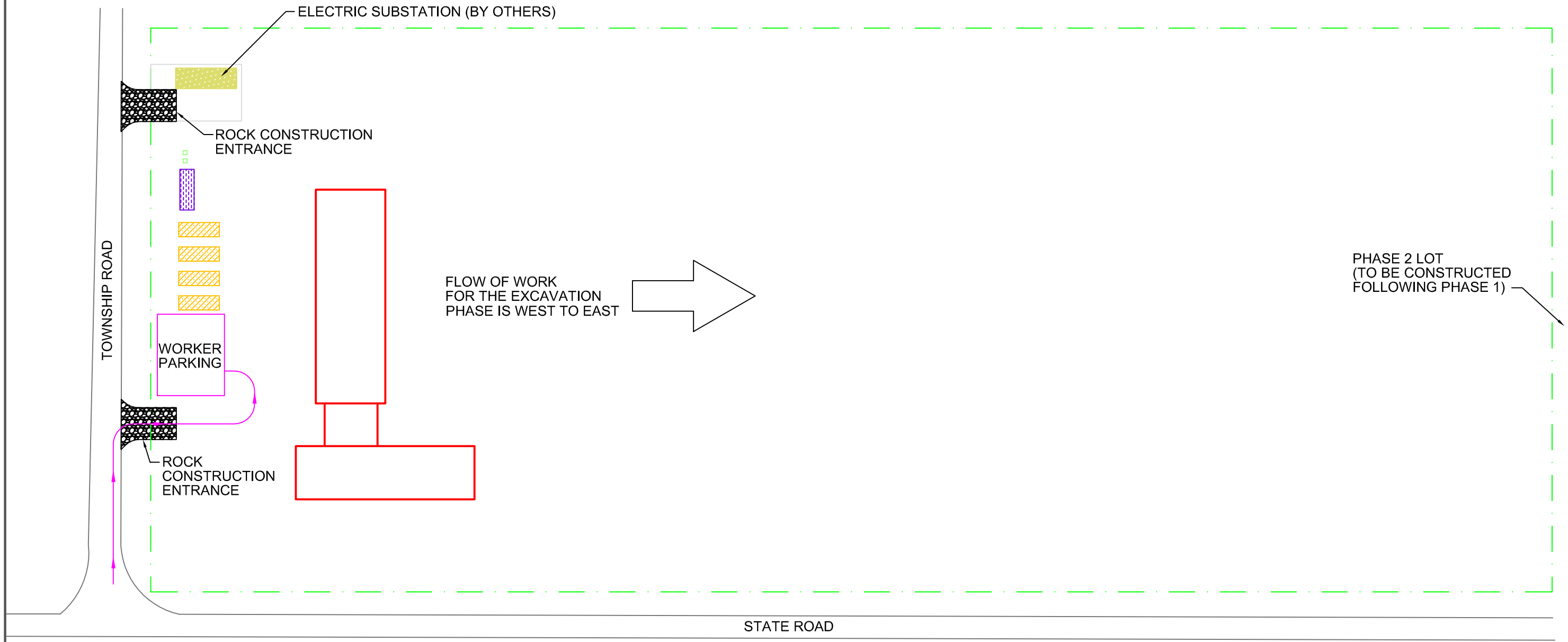
Scale: 1" = 100'

Date: 9/20/11

Project Name: Northeastern Pennsylvania Office Building

Drawing Name: Existing Conditions Site Plan

Drawing No.: C-100



NOTES

- THERE WILL BE NO TEMPORARY CONSTRUCTION FENCES FOR THE EXCAVATION PHASE OF THIS PROJECT
- FLOW OF WORK FOR SITE CLEARING AND GRUBBING, GRADING, AND STONING THE LAYDOWN YARD WILL BEGIN ON THE WEST SIDE OF THE SITE AND WORK TO THE EAST
- BOTH ROCK CONSTRUCTION ENTRANCES ARE TO BE CONSTRUCTED ONCE THE WEST SIDE OF THE SITE IS FULLY GRADED
- WORKERS WILL USE THE AVAILABLE SPACE ON TH WEST SIDE OF THE SITE FOR PARKING
- MOBILIZATION OF EQUIPMENT AND DUMPSTERS WILL OCCUR THROUGH THE NORTHERN ENTRANCE ON THE WEST SIDE OF THE SITE

NOTES (CONT.)

- WORKERS WILL ACCESS THE SITE BY TRAVELING NORTH ON TOWNSHIP ROAD AND TURNING RIGHT INTO THE WEST ENTRANCE. PARKING WILL BE AVAILABLE TO THE SOUTH OF THE JOBSITE TRAILERS

SCALE

100 0 100

1" = 100'

N

LEGEND

- BUILDING OUTLINE
- SITE BOUNDARY
- EXISTING ROAD
- JOBSITE TRAILER
- DUMPSTER
- WORKER ACCESS
- TEMPORARY TOILETS

Drawn By: Christopher Havens

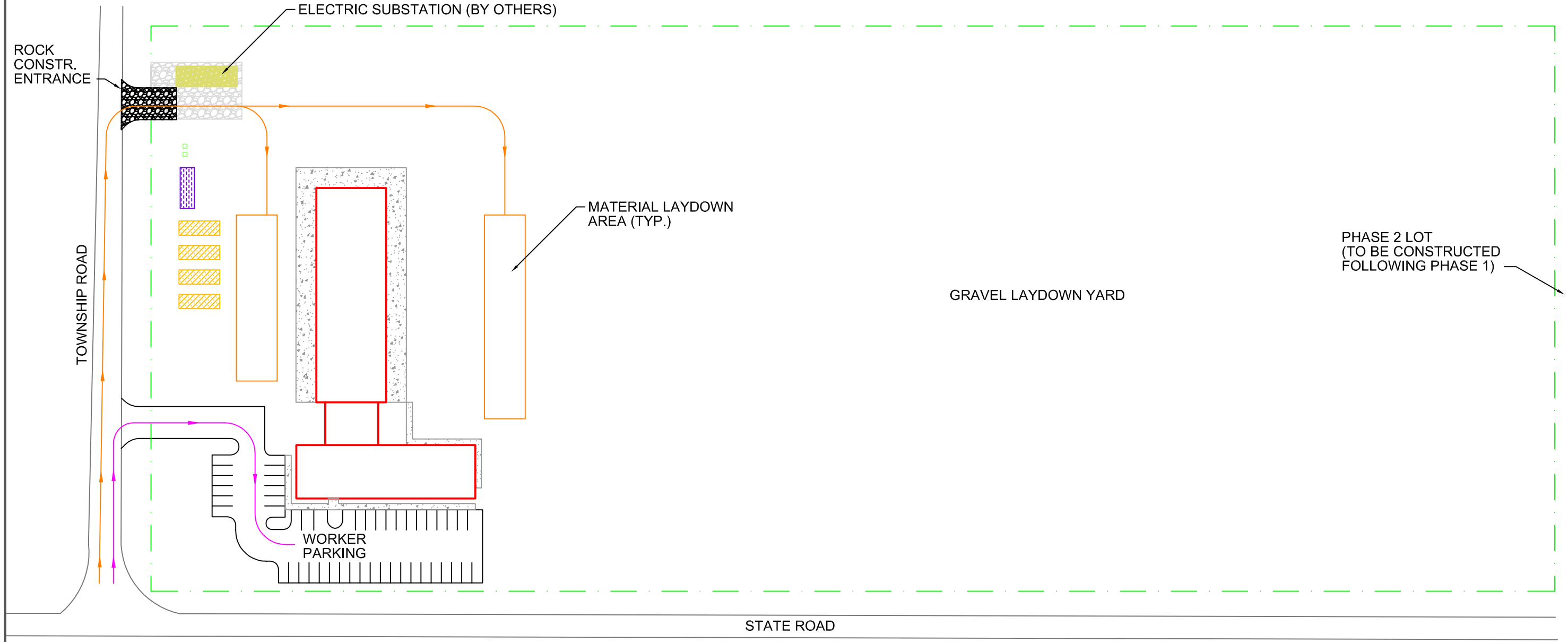
Scale: 1" = 100'

Date: 9/20/11

Project Name: Northeastern Pennsylvania Office Building

Drawing Name: Excavation Phase Site Plan

Drawing No.: C-101



NOTES

- MATERIAL DELIVERIES ARE TO ENTER THE SITE USING THE UPPER CONSTRUCTION ENTRANCE
- TWO PATHS WITH MATERIAL LAYDOWN AREAS WILL BE AVAILABLE ON BOTH THE EAST AND WEST SIDE OF THE SITE
- THE BUILDING STRUCTURE WILL BE SET USING MULTIPLE TELEHANDLERS THAT WILL HAVE ACCESS TO ALL SIDES OF THE BUILDING
- WORKERS ARE PERMITTED TO PARK ON THE ASPHALT PARKING LOT

SCALE

100 0 100

1" = 100'

N

LEGEND

- BUILDING OUTLINE
- SITE BOUNDARY
- EXISTING ROAD
- PARKING AREA
- JOBSITE TRAILER
- DUMPSTER
- WORKER ACCESS
- MATERIAL DELIVERY ROUTE
- TEMPORARY TOILETS

Drawn By: Christopher Havens

Scale: 1" = 100'

Date: 9/20/11

Project Name: Northeastern Pennsylvania Office Building

Drawing Name: Superstructure Phase Site Plan

Drawing No.: C-102

HEAVY-DUTY CONSTRUCTION ENTRANCE APRON

ELECTRIC SUBSTATION (BY OTHERS)

CARD ACCESS FENCE GATE

GENERATOR & TRANSFORMER

6' HIGH CHAIN LINK FENCE WITH PRIVACY SLATS AND THREE STRAND BARBED WIRE 35 FEET FROM PROPERTY LINE

TOWNSHIP ROAD

PHASE 2 LOT (TO BE CONSTRUCTED FOLLOWING PHASE 1)

AVAILABLE LAYDOWN AREA FOR MATERIALS

GRAVEL LAYDOWN YARD

CARD ACCESS FENCE GATE

6' HIGH CHAIN LINK FENCE WITH PRIVACY SLATS AND THREE STRAND BARBED WIRE 35 FEET FROM EDGE OF ROAD

CARD ACCESS FENCE GATE

WORKER PARKING

STATE ROAD

NOTES

- CARD ACCESS FENCE GATES WILL BE MONITORED TO ALLOW ACCESS TO AUTHORIZED PERSONNEL AS DIRECTED
- FINISHES MATERIALS WILL BE PERMITTED TO BE DELIVERED TO AREAS OF THE BUILDING AS NEEDED ONCE APPROVED BY THE ONSITE PROJECT SUPERINTENDENT

SCALE

100 0 100

1" = 100'

N

LEGEND

- BUILDING OUTLINE
- SITE FENCE
- SITE BOUNDARY
- EXISTING ROAD
- PARKING AREA
- JOBSITE TRAILER
- DUMPSTER
- WORKER ACCESS
- MATERIAL DELIVERY ROUTE
- TEMPORARY TOILETS

Drawn By: Christopher Havens

Scale: 1" = 100'

Date: 9/20/11

Project Name: Northeastern Pennsylvania Office Building

Drawing Name: Finishes Phase Site Plan

Drawing No.: C-103