ASSOCIATED SCHOOLS OF CONSTRUCTION
ROCKY MOUNTAIN REGION
REGION VI
AK, AZ, CO, ID, MT, NV, NM, UT, WY
FAR WEST REGION
REGION VII
CA, HI, OR, WA

National Preconstruction Problem
February 12-14, 2009

Problem Statement
Phase II: Request for Proposals

New Office Building Project
Los Angeles, CA

Problem Sponsor:

PCL Construction Services, Inc.
700 N. Central Avenue, Suite 700
Glendale, CA 91203

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Associated Schools of Construction Competition
National Preconstruction Services Problem
February 12-14, 2009

I. PRECONSTRUCTION PROBLEM TIME TABLE

CENTRAL PACIFIC ABC ROOM

THURSDAY, FEBRUARY 12 TH

Turn in Phase I RFQ ……..6:00 AM
Phase II Pre-Proposal Conf……..6:00 AM
Written Questions (RFI's) Due……..10:00AM
First Progress Meeting ……....11:00 AM
Visits to Student Rooms ……..1:00 PM to 3:00 PM
Visits to Student Rooms ……..6:00 PM to 8:00 PM
Phase II Proposals Due ……10:00 PM

FRIDAY, FEBRUARY 13TH

Interview Start Times Posted ……7:30 AM
Interview Materials Due (All Teams) ……7:30 AM
Interviews Start ……8:00 AM
Project Debriefing ……6:45 PM
Reception ……8 PM – 10 PM

SATURDAY, FEBRUARY 14TH

Career Fair ……8:00 AM – 12:00PM
Awards Banquet / Luncheon ……12:00 PM

II. PREFACE

Welcome to the 2009 ASC Student Competition. PCL Construction Services, Inc. is proud to be the sponsor of the Preconstruction Services National Problem at the 2009 Competition in Sparks, NV.

We believe this problem will enhance each student's experience to the everyday occurrence of preconstruction services in today's construction environment. Clients require varying levels of preconstruction services including design coordination, budget development and construction planning.

The problem proposed will be typical to the services provided to a client including the proper selection of your construction team, and in some cases, consultants and subcontractor team. Other services include risk analysis, contracts, design creation, estimating, constructability review, resource requirements, budgeting, scheduling, purchasing, safety and contracting.

This competition is an invaluable tool for your career development. It is designed to enhance and expose each team member in different facets of the construction industry. Each team members' technical knowledge of estimating, scheduling, planning, leadership, and communication skills will be put to the test during the next two days.

PCL hopes every team benefits from this 'real-life' experience. We are here to support the ASC and its members, so please ask questions after the competition is complete or any time throughout the school year.

Understand there are many dynamic elements to every project whether in design or under construction, including this actual project constructed by PCL. Please keep an open mind to the challenges that are presented during this event. Learn from our own project experience, as well!

At the end of the day, only three teams are awarded a placement and these teams will be recognized at the ASC Awards Ceremony on Saturday. Regardless of your final overall placement, each competitor is truly a winner when you combine the experience of the competition, coupled with the industry exposure you have gained throughout the event.

We look forward to great thinking, fellowship and sportsmanship throughout the week. We are proud to serve our great industry with this problem and advancing construction education to all the member schools, faculty and students of the Associated Schools of Construction! Good luck!

III. PROBLEM SCENARIO

Congratulations. The development team of PRIHD Development Partnership has short listed your firm based upon your response to the Phase I RFP. Your team is now invited to continue on to the next stage of the Contractor selection process. You and several other competing teams will now be responding to the Phase II Request for Proposal.

Your team will develop the Phase II RFP Response based upon the design drawings and specification documents prepared by the Owners' design consultants.

Your team will be asked to establish a project budget, prepare a preconstruction schedule and provide various other deliverables as defined in the succeeding portions of this Problem Statement. You must submit your documentation to the development team by 10:00 PM on February 12, 2009 and be prepared to present your findings to the developer's panel in a presentation to them on February 13, 2009. Interim progress meetings are scheduled for 11:00AM and 2:00 PM on February 12th. Any questions should be delivered, in writing on the Request for Information (RFI) form to the management team up until 10:00 AM. Response to these RFI's will be provided at or before the 11:00 AM meeting. The RFI form is provided in Section X - Supplemental Information.

For the oral presentation on Friday, all teams shall include students representing at a minimum your project executive, preconstruction manager, project manager, sr. estimator, project superintendent and project engineer. You will be allowed 20 minutes for the team presentation and 10 minutes for questions and answers from PRIHD management.

At a minimum, your presentation should cover the following areas:

- Budget
- Schedule
- Safety
- Site Utilization
- Team Differentiators

PROJECT INFORMATION

The Fox Entertainment Group Office Building is located on one of the most prestigious and busiest studio lots in the world. The building consists of a 4 level subterranean parking structure and a 5 level office building. The parking structure is cast-in-place, post-tension concrete, 325,000 SF, 890 parking spaces. The office building is structural steel with slab on metal decks and 200,000 SF of space. The exterior is a composite of plaster, curtain wall and punched windows. This active studio lot is home to various productions including American Idol, The Simpsons, Bones, and Family Guy television shows.

The geotechnical report indicates the site has methane gas present in the soils. A methane mitigation system will need to be designed and approved prior to final building department approval.

It is anticipated the project will break ground in September 2009. The intent is to begin preconstruction in February 2009 for a six month duration. The construction schedule is expected to be 19 months.

Langdon Wilson, the design firm has progressed the design to the 75 % construction document design stage, and the developer now wishes to engage the contractor to provide preconstruction services including design coordination, constructability review, budget development and construction planning prior to moving into 100% construction document phase. The developer has a history of teaming with contractors and design consultants who understand the studio and filming environment.

Your firm has an extensive office portfolio of both mid-rise and high-rise product. You recently completed an office building with Langdon Wilson in Pasadena less than two years ago.

The developer has decided that the form of contract will be AIA102-2007 with A201 General Conditions.

Any information concerning the size and scope and timelines provided in previous correspondence has been superseded by the information provided in this written problem statement.

IV. PROBLEM OUTLINE

Organize and tab your documentation submittal according to the following outline. Include only the information requested in Section VI, Submission Requirements. Remember to be as brief as necessary to convey your points.

1. Cover Letter
2. Executive Summary
3. Project Budget
    a. Preconstruction and Construction Services Agreement
    b. Conceptual Estimate Summary
    c. Preconstruction Services Fee
    d. General Conditions
    e. Concrete Estimate
    f. Steel Estimate
    g. Subcontractor Recap
4. Project Schedule
5. Site Logistics
6. Cash Flow Analysis
7. Mechanical Load Analysis and Alternate Design Solution
8. BIM Analysis of shoring tiebacks and fiber optics
9. LEED Analysis
10. Bonus – “Red Light” procedure and impact analysis

V. SUBMISSION REQUIREMENTS:

The appearance and organization of proposals is important in our industry, as it is often our first opportunity to interact with a new client and/or impress the upper management in your company. We want them to see the professional image we are trying to portray and be able to find and understand the information we are presenting. Points will be awarded in this section based upon appearance and organization, as well as the clear and concise responses the following requirements. Six copies on your Phase II response are to be submitted.

If you utilize a new company logo for your submission, include it on the cover of the proposal book. Also, include the school logo in the lower left hand corner of the proposal cover.

A disc has been included with some of the forms referenced so you do not have to recreate them. *Always, check formulas to ensure that proper extensions are made.*

1. Cover Letter

Provide a brief cover letter. At a minimum, you must acknowledge all addenda, provide a company logo and sign the letter.

2. Executive Summary

An Executive Summary is an important part of your proposal. It identifies, in a summary fashion, the key benefits and features you want an Owner to know about your Company, and why they should choose your team over others for their project. It is an important sales tool. It let's you be creative and points out your most important differentiators from your competition. It should key in on what you have learned from your research of the Owner's "hot buttons" (most important factors of the project) and should address how you will make sure those "hot buttons" are addressed. Your response to a Request for Proposal should always include a Cover Letter and an Executive Summary. See the Supplemental Information section for the Cover Letter and Executive Summary exercises.

Deliverables:

1. *Cover Letter*
2. *Executive Summary*

3. Project Budget

A. Preconstruction and Construction Services Agreement

Should your firm be selected, you will be expected to execute a Preconstruction and Construction Services Agreement. It will serve as an interim agreement to authorize the start of preconstruction services and memorialize agreed business deal points (commercial terms) until superseded by an executed contract.

The Preconstruction and Construction Services Agreement should cover the services you anticipate providing in your preconstruction and construction budgets.

Deliverable:

1. *Signed and Completed Preconstruction and Construction Services Agreement*

B. Conceptual Estimate Summary

You will be finalizing the estimate to determine the budget price that you will submit to the developer. The estimate will be prepared on the 75% Construction Document Pricing set of documents that have been provided. The Conceptual Estimate Summary form has been filled out with the values for the items that have already been analyzed, priced and summarized, but you will be taking proposals on a few remaining trades, preparing a detailed concrete and structural steel estimate, estimating your General Conditions and determining your required fee for the Project. See Supplemental Information section for forms. You will also prepare an estimate of the costs anticipated to be incurred during the preconstruction period of the project. You must plug the values of these items into the Conceptual Estimate Summary Form, apply your required fee for the project, and determine what the overall budget for the project should be.

Deliverable:

1. *Completed Conceptual Estimate Summary*

C. Preconstruction Costs

In an ever increasingly competitive industry and the requirement of many of our clients to operate in a collaborative environment with design professionals, the scope of preconstruction services to continues to grow. Preconstruction services can tie up significant amount of personnel resources who are not engaged in our core business of building actual projects. What was once considered as a loss leader and relatively inexpensive cost of project pursuit, preconstruction costs often represent a significant cost that need to be reimbursed by our clients as a professional service, much like that of our design consultants.

As part of your overall budget for the project you will need to prepare an estimate of preconstruction services. A preconstruction personnel billing rate worksheet and estimate form has been included in Supplemental Information section for your use in developing the estimate. A description of required services for preconstruction services to be included in your estimate has also been included. Preconstruction costs shall be calculated to include personnel directly working on the project. Preconstruction personnel generally work on multiple projects at one time and are generally not charged full time against any given project. Home office overhead is not to be included in preconstruction costs.

Deliverable:

1. *Preconstruction Services Estimate*

D. General Conditions

General Conditions are defined as the on-site project management and supervision costs incurred throughout the duration of the project to support and supervise subcontracted and self performed work. General condition costs are to be categorized by Project Staff for jobsite personnel costs only, and Project Overhead and Equipment related to rental equipment, and the balance of general conditions costs not included as Project Staff.

Prepare a detailed breakout of General Conditions that your team anticipates for the project. Use the forms provided for each of the two categories of General Conditions costs as included in the Supplemental Information Section. One excel file has both worksheets, tabbed at the bottom of the spreadsheet. Personnel rates and equipment rental are included for your use. You may also use R.S. Means manuals for any information required to complete your estimate, but not provided on the rate sheets. Home office overhead is not included in the General Conditions for the project. You do not have to include costs for the Owner and subcontractors.

Supervisory staff positions are to be provided as deemed necessary by your team. The staff worksheet lists suggested positions as a starting point, but add or subtract as your team deems necessary. Remember there are 2080 work hours in a year.

Supervision costs for self performed work do not need to be included.

Prepare a Staffing Matrix/Schedule showing the duration and period for each member to be assigned to the project.

Deliverables:

2. *Completed General Conditions Estimate Forms and Staffing Matrix/Schedule*

E. Concrete Estimate

Your company prides themselves on being a builder, not a broker, and has a long history of self-performing many scopes of work, including concrete work. Your team has completed the subterranean and parking structure concrete takeoffs and pricing, but must still analyze the slab-on-metal-deck (SOMD). Using the plans and specifications you've been furnished, as well as pricing guidelines and forms furnished with the Supplemental Information, complete the quantity and pricing analysis of the SOMD and incorporate that budget into the Conceptual Estimate Summary.

Deliverable:

1. *Completed Concrete Estimate Form*

F. Steel Estimate

The structural engineer is still completing the detailed design for the office structural steel frame. In order to complete the budget analysis, as well as to help select the steel subcontractor, the engineer has provided a note on the drawings which gives a parameter to be used for budget analysis and comparison. Using the plans and specifications you've been furnished, as well as pricing guidelines and forms furnished with the Supplemental Information, complete the quantity and pricing analysis of the structural steel frame and incorporate that budget into the Conceptual Estimate Summary.

Deliverable:

1. *Completed Steel Estimate Form*

G. Subcontractor Bid Recaps

You have received proposals from three electrical firms. You are assigned the task of "recapping" the bids to determine the lowest responsible proposal. In order to arrive at the value of work to be loaded into the Conceptual Estimate Summary you must recap the quotes to determine the most advantageous value to use. The Recap sheet has been created and "check questions" written on them to determine if the subcontractors have the correct scope per the plans and outline specifications. You may find that additional check questions are necessary to define the complete scope or differentiate between the proposals. Feel free to add to the check questions as you deem necessary. Choose your subcontractors carefully to ensure that they will perform the correct scope, staff the project adequately, and that they are financially stable.

Once you have arrived at a recapped total for each firm, take the lowest responsive and responsible bid and load that number in the electrical line of the Conceptual Estimate Summary.

What risks do you see in the electrical quotes? Provide a brief narrative of any concerns.

Deliverables:

1. *Completed Subcontractor Recap Form and Narrative*

4. Schedule

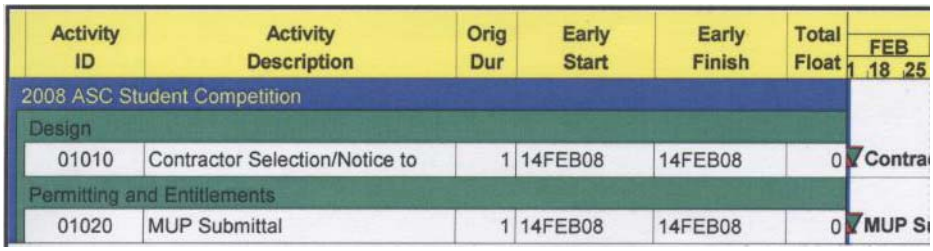
As part of your review with management, you will be required to present a complete, workable Critical Path Schedule (CPM) to plan the work within the guidelines prescribed below. As this is a preconstruction services problem, PRIHD management is equally interested in the activities and

your thought processes in the preconstruction phase as in the construction phase. The schedule is to convey your teams plan to fully execute the project from cradle to grave.

The following criteria explain the background information and requirements of the CPM schedule your team will present.

1. General Schedule Criteria:
    a. Presentation Criteria:
        i. Format:
            1. At minimum, show Activity ID, Activity Description, Original Duration (OD), Early Start (ES), Early Finish (EF), and Total Float (TF), per activity (see Figure "A" below)
            2. Organize and sort Preconstruction activities grouped together with construction activities following.

Figure A: Schedule Activity Example



Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	FEB 1 18 25
2008 ASC Student Competition						
Design						
01010	Contractor Selection/Notice to	1	14FEB08	14FEB08	0	Contra
Permitting and Entitlements						
01020	MUP Submittal	1	14FEB08	14FEB08	0	MUP S

        ii. Activity Count: 150- 200 activities
        iii. Provide a sufficient amount of preconstruction and construction activities. Include design, permitting and entitlements, easement negotiations, long lead and construction activities
        iv. Show the logic between activities
        v. Clearly show the critical path of the schedule
        vi. Organize activities so they are easy to read, activities are grouped intuitively and the schedule flows well.

    b. Contractual Criteria
        1. Project Start Date for Preconstruction (Notice to Proceed): February 12, 2009
        2. Preconstruction Period: 7 Months
        3. Project Duration: 19 Months
        4. Minimum Milestones to be presented on CPM Schedule:

Contract Award	Permit Submittal (S)
Design Complete	GMP Estimate
Begin Demolition	Parking Structure Complete
Completion of Shoring and Excavation	C of O Inspections

Final Completion	Structural Steel and Metal Decks Complete

5. Assume the following calendar holidays: May 26, 2009, July 4, 2009, September 1, 2009, November 26-27, 2009, December 25, 2009, January 21, 2010, May 31, 2010, July 5, 2010, September 6, 2010, November 25-26, 2010, December 24, 2010, December 31, 2010, May 30, 2011, July 4, 2011, September 5, 2011.

2. Preconstruction Phase Criteria:
   a) The Architect and consultants will be 75% complete with the construction documents on February 12, 2009.
   b) The permitting agency will allow phased permitting for demolition, excavation and shoring, structure and finishes.
   c) Estimates will be required at the completion of each design phase
   d) The project may be contracted under a phased GMP contract.

3. All other work criteria:
   a) Original durations for the demolition, excavation, shoring, concrete structure, steel, etc. shall be derived on a (rough) quantitative basis per the "Typical Construction Activity" worksheet and explanation included in the scheduling section of the Supplemental Information. Use the worksheets to calculate durations based upon (rough) quantities that you survey, then divide by a productivity rate that you derive. You may use RS Means or other productivity data resources to help if needed.
   b) The remainder of the work will be handled by subcontractors your team will manage.
   c) Scheduling of all work should support the assumptions made by the Site Utilization Plans drafted in Section 5 below
   d) Review the plans thoroughly. Ensure that your schedule encompasses as much of the work possible in the limited number of activities you are required to provide.
   e) Your team may begin construction anytime, provided you have your first permit in hand. You may lag activities as you see fit and this should be based on reasonable, logical assumptions.
   f) The last activity in your schedule should be Contract Completion.

General comments:

1. Do not resource load or cost load your schedule
2. Remember preconstruction period encompasses all project activities prior to the actual commencement of work in the field and may overlap the initial construction phases of the project.

3. When it comes to scheduling, there are no right or wrong answers. Ensure that you team can substantiate and explain all of the assumptions and decisions made in the process of developing your schedule.

Deliverables:

1. *Preconstruction Schedule & Preliminary Project Schedule*

5. Site Logistics

The Fox Studios 103 Project is located on the corner of Pico and Ave of the Stars, bordered by the main entrance to Fox Studios and an existing office building. There are currently no nearby parking lots, no parking on Ave. of the Stars and Pico. The PCL trailer will be 60' X 24'; the Plumbers and Electricians trailers will be 30' X 12' each. Assume at least 1 storage container for the Plumbers, Electricians, Mechanical sub and Rebar sub.

Site Plan

Use the full size drawing to create your site logistics plan. Other drawings may be used if you determine them necessary to fully explain your plan. Your plan can add or omit items from the basic list below, as long as a valid reason is present and that your logic does not violate code requirements or jurisdictional limits. Ensure that the locations of all items listed below are coordinated with future work activities, so they do not impede construction progress. In addition, if your site utilization changes/evolves throughout the project, describe any such changes. Include the following without limiting to:

- Project Office location
- Parking
- Location of subcontractor offices, dryshacks, etc.
- Locations for temporary fences
- Location of access roads and gates (union and non-union)
- Project and required signage (location and what signs are needed)
- Location of temp services; Water, Power, Trash, etc
- Temporary Toilet Locations for 100 workers
- Laydown areas
- Personnel/material hoist location (at different times in the project if needed)
- Concrete Pumping locations
- Delivery locations for staging and unloading
- Stair towers, if used.
- Emergency evacuation location
- Any SWPPP necessary
- North Arrow
- Any other items that your team thinks should be on the plan

In addition to a graphical plan provide written narrative to further explain the site utilization plan prepared by your team. When site work is to take place, briefly explain any conflicts that might occur with locations of trailers, etc. and completing all of the landscaping and site work. Provide a brief explanation of how these conflicts will be coordinated and resolved. If there are no foreseen conflicts, briefly explain how the site utilization plan was coordinated with the final site work.

Deliverable:

1. *Site Logistics Plan and Narrative*

6. Cash Flow Analysis

As part of its financial analysis, PRIHD Development Partnership needs to understand its cash flow requirements. As part of your submittal, prepare separate cash flow analyses for the Preconstruction and for the Construction phases of this project using the following assumptions:

- Use the Contractual Criteria for durations of each phase.
- Assume no retention for the Preconstruction phase.
- Assume 10% retention for the Construction phase to be paid 60 days after completion.
- Assume payments will be on the last day of each month.
- Assume a tolerance of Zero.

Deliverables:

1. *Preconstruction and Construction phase cash flow analysis*

7. Mechanical Load Analysis and Alternate Design Solution

Due to the current economic downturn, the Fox management has decided to shelve the $35 million central plant expansion project. This creates a major problem of how to provide chilled water for the air conditioning of the new office building, which has been contracted and been released for construction about 2 months ago. For this exercise you will need to calculate total capacity of chilled water needed for the Office Building, size the chillers and pumps and provide a rough order of magnitude (ROM) budget to add a chilled water plant to your building.

Deliverables:

1. *ROM Budget, Cooling Load Analysis and Equipment Size required*

8. Building Information Modeling

The new Fox Office Building is just south of an existing office building (FNC Operations Building) with similar 4 stories of underground parking, see sheet A-1.02A. There is a bundle of fiber optic cables running underground between the two buildings, see sheet C-1.02. These fiber optic cables transmit the entirety of Fox's programming to the outside world. The cost of damaging these

cables is $5 Million a minute of interrupted service. All necessary precautions need to be taken to avoid damaging these cables when drilling shoring tie-backs for the new building.

The shoring engineer designed the tiebacks for the north underground wall to enter the ground per the SH- series drawings, but he did not have all of the as-built information of the existing conditions.

Determine if the tiebacks, 2 of them at soldier piles #34 and #1 violate this safety zone and if they conflict with any other existing conditions.

There is a 7'-0" "safety zone" that the tieback can not violate surrounding the 11"x11" conduit bank. See C-1.20.

If the tiebacks conflict with the safety zone or any other existing conditions, determine the most efficient tie-back angle to resolve the conflict using the angle to length chart.

Deliverables:

1. *A narrative describing any changes required to the shoring system to avoid conflicts with existing infrastructure. A 3D Model or sufficient 2D sketches of the proposed modifications to the shoring system to graphically demonstrate that the proposed changes avoid conflicts with existing infrastructure and conform to the desired factor of safety of the Owner*

9. LEED ™ Analysis

The developer has questioned the team about possibly marketing a LEED™ for Core and Shell project.

Certifying a LEED™ project requires the combined effort of the entire project team. The owners, architect, consultants, and the construction team must all contribute in order to successfully certify a LEED™ building. After initial meetings conducted between the owner and the design team, 22 points have already been determined to be achievable. It is time for the construction team to provide their input on the amount of additional LEED™ points that they consider feasibly attainable.

Make a recommendation stating the number of LEED™ points attainable as follows:

1) Determine which additional points can be achieved at no additional cost to the owner to reach LEED Certified. Fill out a scorecard for LEED Certified and provide a narrative on the reasoning behind the selection of the points your team used to achieve LEED Certified.
2) Determine which additional points can be achieved at the lowest cost to the owner to reach LEED Silver. Fill out a scorecard for LEED Silver and provide a narrative on the reasoning behind the selection of the points your team used to achieve LEED Silver and an estimate of the additional costs.
3) Determine which additional points can be achieved and the cost to the owner to reach LEED Gold. Fill out a scorecard for LEED Gold and provide a narrative on the reasoning

behind the selection of the points your team used to achieve LEED Gold and an estimate of the additional costs.

The following is a list of points that have been predetermined by the owner and design team. This information is also reflected in the LEED™ CS score card provided. Your Team only needs to evaluate the credits in the "?" column of the scorecard provided. Do Not change any previously predetermined credits by the owner and A/E Team.

Sustainable Sites

Credit 1 – Site Selection – 1pt
Credit 2 - Development Density and Community Connectivity – Unattainable
Credit 3 – Brownfield Redevelopment – Unattainable
Credit 4.1 – Alternative Transportation, Public Transportation – 1pt
Credit 4.4 – Alternative Transportation, Parking Capacity – Unattainable
Credit 5.1 – Site Development, Protect or Restore Habitat - Unattainable
Credit 5.2 – Site Development, Maximize Open Space – Unattainable
Credit 8 – Light Pollution Reduction – 1 pt
Credit 9 – Tenant Design & Construction Guidelines – 1pt

Water Efficiency

Credit 1.1 Water Efficient Landscaping, Reduce by 50% – Unattainable
Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation – Unattainable
Credit 3.2 Water Use Reduction, 30% Reduction - Unattainable

Energy and Atmosphere

Credit 1.5 – Optimize Energy Performance – 24.5% New Buildings – 5pts
Credit 2 – On Site Renewable Energy – Unattainable
Credit 3 – Enhanced Commissioning – 1pt
Credit 4 – Enhanced Refrigerant Management – Unattainable
Credit 5.2 - Measurement and Verification: Tenant Sub-Metering – *1pt*
Credit 6 – Green Power – 1 pt

Materials and Resources

Credit 1.1 Building Reuse, Maintain 25% of Existing Walls, Floors & Roof – 1 pt
Credit 1.2 Building Reuse, Maintain 50% of Existing Walls, Floors & Roof – Unattainable
Credit 1.3 – Building Reuse, Maintain 75% of Interior Non-Structural Elements - Unattainable
Credit 3 - Materials Reuse, 1% - 1 pt
Credit 4.1 – Recycled Content, 10% (Post Consumer + ½ Pre-Consumer) – 1 pt
Credit 4.2 – Recycled Content, 20% (Post Consumer + ½ Pre-Consumer) – 1 pt
Credit 5.1 – Regional Materials, 10% Extracted, Processed and Manufactured – 1pt.
Credit 5.2 – Regional Materials, 20% Extracted, Processed and Manufactured – Unattainable
Credit 6 – Certified Wood – Unattainable

Indoor Environmental Quality

Credit 1 – Outdoor Air delivery Monitoring – 1 pt

Credit 2 - Increased Ventilation – Unattainable
Credit 4.1 – Low- Emitting Materials, Adhesives & Sealants – 1 pt
Credit 4.2 – Low- Emitting Materials, Paints and Coatings – 1 pt
Credit 4.3 – Low-Emitting Materials, Carpet Systems – Unattainable
Credit 4.4 – Low Emitting Materials, Composite Wood & Agrifiber Products – Unattainable
Credit 5 – Indoor Chemical & Pollutant Source Control – 1 pt
Credit 6 – Controllability of Systems, Thermal Comfort – 1 pt
Credit 7 – Thermal Comfort, Design – 1 pt
Credit 8.1 – Daylight & Views, Daylight 75% of Spaces – Unattainable
Credit 8.2 – Daylight & Views, Daylight 90% of Spaces – Unattainable

Innovation & Design Process
Credit 1.1, 1.2, 1.3, 1.4 – Innovation in Design - Unattainable

Deliverables:

1. *Completed LEED™ Scorecard and Narrative for each of 3 levels of LEED (Certified, Silver & Gold)*

10. Bonus – "Red Light Procedure"

A very unique aspect of this project is that it is being built on a working TV & Movie production lot. While most TV and Movie filming is done inside of sound controlled buildings, the Fox lot has an outdoor filming area, which replicates a New York City street, hence the name NY Street. Film for TV and Movies is extremely sensitive to sound and vibration and must be carefully controlled, especially when filming occurs in an outdoor environment. An actual tripod with a flashing red strobe light is used to signal when the cameras are rolling, hence the name "Red Light" and that all noise and vibration which may impact the filming must be ceased immediately.

Some other interesting information is that a normal 8 hour filming day, which begins at 10:00 AM, breaks for lunch from 2:00 PM to 3:00 PM and is finished by 7:00 PM. During the 8 hour day, much of the time, 90%, is spent setting up a scene and rehearsing. Only about 10% of the time are the cameras and sound equipment actually recording. Although the overall 8 hour +1 hour for lunch day is known, the actual time when the filming and sound recording occurs happens when everything is ready and rehearsal is done, so it is not possible to know in advance when the actual "Red Light" will be turned on.

For the purpose of this problem, please assume that shooting on NY Street will occur a maximum of 2 days Monday through Friday per week, the TV & Movie Industry is on hiatus all of the Month of December and from June through August each year.

For this problem please develop a one page procedure of how your project team will successfully manage "Red Lights" Include contact information, how communications will flow and how you will track "Red Light" impacts against the Contract Allowance of 10 days. Describe in a narrative of steps your team will take to minimize the cost & schedule impacts from "Red Lights" and ensure

the allowance is not exceeded during the course of the project. Provide an analysis, based upon your team's procedure and efforts to minimize the cost & schedule impacts, of the anticipated cost and schedule impact to the project due to "Red Lights".

Deliverable:

1. *"Red Light" Management Plan, Narrative and Projected Cost & Schedule Impact to the project*

VI. COMPETITION SCORING SYSTEM:

Item	Description	Points
	Phase 1 RFP Phase I	20
	Phase 2 RFP Phase II	50
	Phase 3 Interview	30

Note: Late Submittal Point Deduction

Time Adherence Scoring

It is critical to submit proposals on time. For those who do not adhere to the published times, points will be deducted according to the following schedule:

- Phase I Submittal
  - (on time = 0, up to 1 min late = -1, up to 10 min late = -2, later = -4)
- Phase II Submittal
  - (on time = 0, up to 1 min late = -2, up to 10 min late = -3, later = -6)
- Phase III Presentation
  - (on time = 0, up to 1 min late = -1; up to 2 min = -2; 3 = -3; 4 = -4; later = -5)

VII. LIST OF JUDGES:

Jeff Miller, Construction Manager (818) 246-3481 *Acting as President, PRIHD*	Los Angeles District 700 N. Central Avenue, Suite 700 Glendale, CA, USA 91203
Wil Painter, Regional Manager, Preconstruction (818) 246-3481 *Acting as Project Director, PRIHD*	Los Angeles District 700 N. Central Avenue, Suite 700 Glendale, CA, USA 91203
Craig Warner, Operations Manager (808) 541-9101 *Acting as Operations Manager, PRIHD*	Hawaii District 1099 Alakea Street, Suite 1560 Honolulu, HI, USA 96813
Michael Koury, Project Manager (818) 246-3481 *Acting as VP, Finance, PRIHD*	Los Angeles District 700 N. Central Avenue, Suite 700 Glendale, CA, USA 91203
Scott Viola, Project Manager (808) 541-9101 *Acting as Facilities Manager, PRIHD*	Hawaii District 1099 Alakea Street, Suite 1560 Honolulu, HI, USA 96813
Bruce Winer, Business Development Manager (858) 657-3400 *Acting as Facilities Safety & Risk Manager, PRIHD*	San Diego District 4690 Executive Drive, Suite 100 San Diego, CA, USA 92121

Alternates:

Kurt Boyd, Manager Business Development (425) 454-8020	Seattle District 15405 SE 37th St, Su 200 Bellevue, WA 98006
Dale Kain, Director of Corp. Development (303)365-6500	Denver Head Office 2000 South Colorado Blvd Tower Two Suite 2-500 Denver, CO 80222
Dave Yount, Operations Manager (818) 246-3481	Los Angeles District 700 N. Central Avenue, Suite 700 Glendale, CA, USA 91203

VIII. COMPETITION RULES:

The rules for the competition are designed to provide each team with an equal opportunity to apply their knowledge in developing their respective solutions and an equal opportunity to present their problem solutions to the judges. The following rules apply to the National Preconstruction Services Problem and supplement the ASC Competition Rules:

1. While the competition is in progress, only the six students identified as being team members shall be present in the teams' room. Faculty advisors may not interface with their team once the competition has begun.
2. Six (6) copies of the proposal must be turned in at the prescribed time. Proposals will not be returned to the teams. If you require some of the material in your proposal for your oral presentation, please make the appropriate copies prior to your submission of the written problem for your use.
3. The number of computers per team and use of the internet is to be as outlined in the ASC Competition Rules.
4. Once the presentations begin, only the teams who have presented their solutions may be present at the presentations of subsequent teams. This will mean that the first team up gets to see them all, while the last team does not get to see any of the others. The purpose of this rule is to prevent those participating in later sessions from gaining an advantage as to the contents of previous sessions.
5. Presentation materials for all teams are to be turned in to the judges prior to the first interview, by 7:30 AM on Friday, February 13th. No other presentation material will be allowed into the presentation that is not turned into the judges by this time. NO EXCEPTIONS.
6. All decisions of the judges are final.
7. The problem presented is an actual project completed by PCL. To avoid any conflict of interest or unfair advantage, any student who may have potentially worked on the project in any way shall identify themselves to PCL immediately. This issue will be reviewed, and if appropriate we may request that an alternate be assigned to the project. PCL shall make the final decision as to equity in such a case.
8. Points will be deducted if proposals are submitted late per the Scoring System noted in Section VI. Written proposals will be due as indicted in Section I. The submission location will be announced at the commencement of the competition. Other deliverables will be as noted elsewhere in the Problem Statement.
9. No phone calls, emails, or communication of any kind shall be made to the Owner, Architect, Engineer or design consultants that may be listed in the documents provided for this competition. They are aware that no team is to contact them and have been notified to contact the judges if any contact occurs. Contact with the any of the above shall disqualify team from the competition.
10. Do not submit any extraneous materials with your written proposal, including company profiles, marketing materials etc. Please limit your response to the information requested. Be brief, clear and concise.
11. Any information concerning the size and scope and timelines provided in previous correspondence has been superseded by the information provided in the written problem statement and is not to be used in response to Phase 2.

12. The last and most important rule: Have fun, learn, and develop new relationships.

Violation of any of these rules will be grounds for disqualification from the competition

IX. COMPETITION EVALUATION FORM:

Please complete the evaluation form included in the Supplemental Information section. Your feedback is important to our team as we strive to continually improve the problem in years to come. Please be honest and forthright with your responses.

Please complete one questionnaire per team and turn it in at the problem debrief. This form will be your admission ticket to the Debrief and Answer Session.

X. SUPPLEMENTAL INFORMATION

	Description	Electronic Form on Disk
0.0	RFI Form	X
1.0	Cover Letter Exercise	
2.0	Executive Summary Exercise	
3.0a	Preconstruction and Construction Services Agreement	X
3.0b	Conceptual Estimate Summary Worksheet	X
3.0c	Preconstruction Staff Worksheet	X
	Preconstruction Billing Rates	
3.0d	Construction Staff Worksheet	X
	Project Overhead & Equipment Estimate Form	
	Staff and Equipment Billing Rate Schedules	
3.0e	Concrete Pricing Form	X
	Concrete Work Productivities	X
	Other Pricing Data	X
	Metal Deck Cut Sheets	X
	Drawings with Tables	X
3.0f	Steel Pricing Form	X
3.0g	Electrical Recap Card	X
	Subcontractor Bid Quotes	X
5.0	Site Logistics Exercise	
	Full Size Drawing Sheet	X
4.0	Project Schedule Information	
	Common Construction Activity Durations	X
6.0	Cash Flow Exercise Instructions	
	Electronic Cash Flow Worksheet	X
7.0	Mechanical Exercise Narrative	X
	Mechanical Charts	X
	Table of Equivalents	X

8.0	Building Information Modeling Narrative	
	Drawing Sheets	X
	Electronic Files	X
9.0	LEED Narrative	
	LEED Predetermined Scorecard	X
	LEED Core and Shell Guide	X
	LEED Blank Scorecards (3)	X
10.0	Red Light Procedure	

IX. Evaluation Form

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TAB 0

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School Name:_____

REQUEST FOR INFORMATION				RFI #:	
New Office Building Project				Subcontractor RFI#:	
				Number of Pages (Including Attachments):	
To:		Company:		Date Issued:	
Initiated by:		Company:		Respond by:	
Drawing/Sheet:		Spec Section:			

Subject:

Request:

Proposed Solution:

All impacts pending response.

Cost Impact: Yes ☐ No ☐ Schedule Impact: Yes ☐ No ☐ Signed: Ckd:

Response:

Approved for construction: No Yes Responding Party: Date:

Subcontractors affected by this Request for Information must notify PCL in writing within five (5) days of receipt identifying any cost and/or schedule impact. Otherwise they shall not be considered.

Copies to:					
					Field (**1**) copies
					Plan Room

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TAB 1

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1.) Cover Letter Exercise

Exercise Narrative:

A Cover Letter is an important component to a submission. It compliments the Executive Summary by reinforcing your key messages to the Client. It also serves to fulfill mandatory requirements to acknowledge addendum issued during the proposal process.

Acknowledgement of addenda (i.e.: more than one addendum) issued assures the Client your proposal is compliant with the latest information and can be adequately analyzed. Lack of compliance to this request by your team can cause your submission to be deemed non-responsive and could lead up to disqualification. Your response to a Request for Proposal should always include a Cover Letter.

• *Cover Letter Exercise*

Exercise Process:

Based on the information given in this handout, create a Cover Letter for your proposal. Insert the Cover Letter in Section 2 of the Phase II proposal book in front of the Executive Summary and include the following:

- Limit to two (2) pages
- Acknowledge addendum received (ie: Our team acknowledges receipt of Addenda 1, 2, and 3.)
- Reinforce key messages
- Include company logo
- Sign the letter

• Cover Letter Components

Your Logo

Owner Address

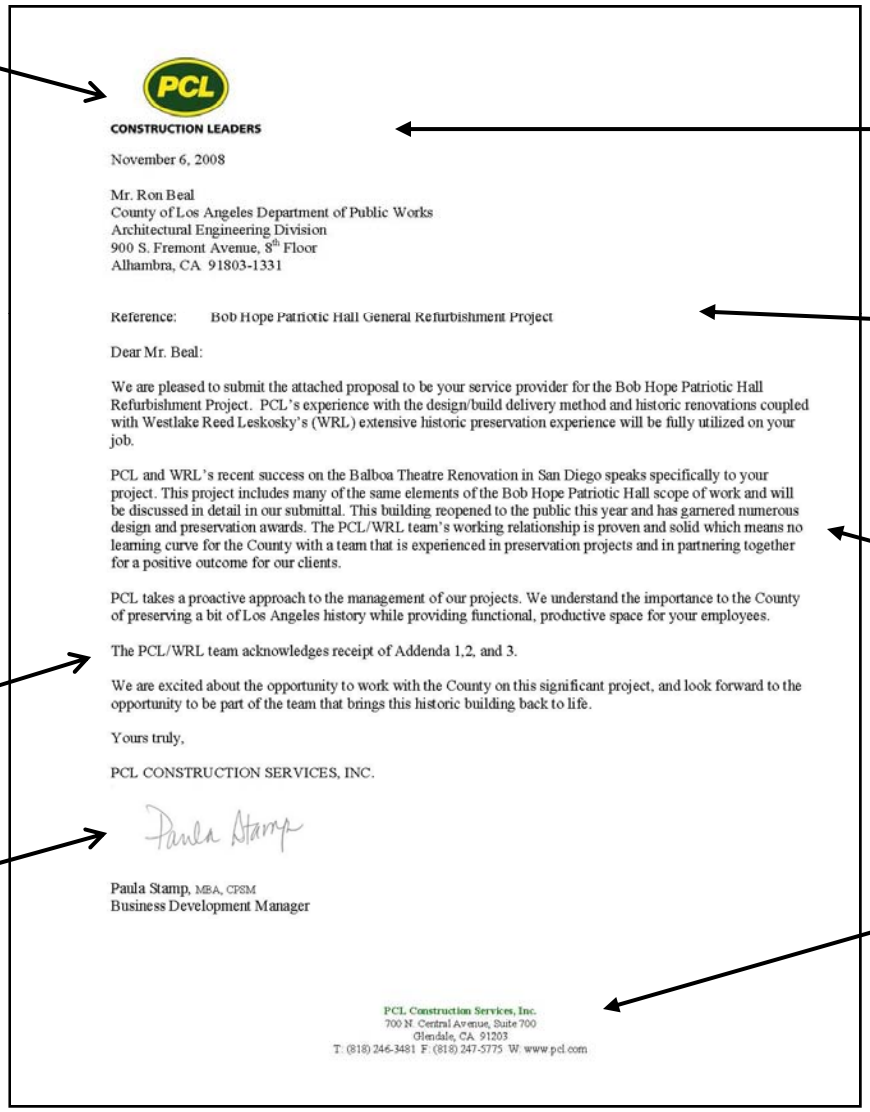
Project Name

Key Message

Acknowledge Addenda

Signature

Team Address



PCL
CONSTRUCTION LEADERS

November 6, 2008

Mr. Ron Beal
County of Los Angeles Department of Public Works
Architectural Engineering Division
900 S. Fremont Avenue, 8th Floor
Alhambra, CA 91803-1331

Reference: Bob Hope Patriotic Hall General Refurbishment Project

Dear Mr. Beal:

We are pleased to submit the attached proposal to be your service provider for the Bob Hope Patriotic Hall Refurbishment Project. PCL's experience with the design/build delivery method and historic renovations coupled with Westlake Reed Leskosky's (WRL) extensive historic preservation experience will be fully utilized on your job.

PCL and WRL's recent success on the Balboa Theatre Renovation in San Diego speaks specifically to your project. This project includes many of the same elements of the Bob Hope Patriotic Hall scope of work and will be discussed in detail in our submittal. This building reopened to the public this year and has garnered numerous design and preservation awards. The PCL/WRL team's working relationship is proven and solid which means no learning curve for the County with a team that is experienced in preservation projects and in partnering together for a positive outcome for our clients.

PCL takes a proactive approach to the management of our projects. We understand the importance to the County of preserving a bit of Los Angeles history while providing functional, productive space for your employees.

The PCL/WRL team acknowledges receipt of Addenda 1,2, and 3.

We are excited about the opportunity to work with the County on this significant project, and look forward to the opportunity to be part of the team that brings this historic building back to life.

Yours truly,

PCL CONSTRUCTION SERVICES, INC.

Paula Stamp

Paula Stamp, MBA, CPSM
Business Development Manager

PCL Construction Services, Inc.
700 N. Central Avenue, Suite 700
Glendale, CA 91203
T: (818) 246-3481 F: (818) 247-5775 W: www.pcl.com

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TAB 2

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2.) Executive Summary Exercise

Exercise Narrative:

An Executive Summary is an important part of your proposal. It identifies, in a summary fashion, the key benefits and features you want an Owner to know about your Company and why they should choose you over others for their project. It is an important sales and communication tool. It let's you be creative and points out your most important differentiators from your competition. It should key in on what you have learned from your research of the Owner's "hot buttons" (most important factors of the project) and should address how you will make sure those "hot buttons" are addressed. Your response to a Request for Proposal should always include an Executive Summary.

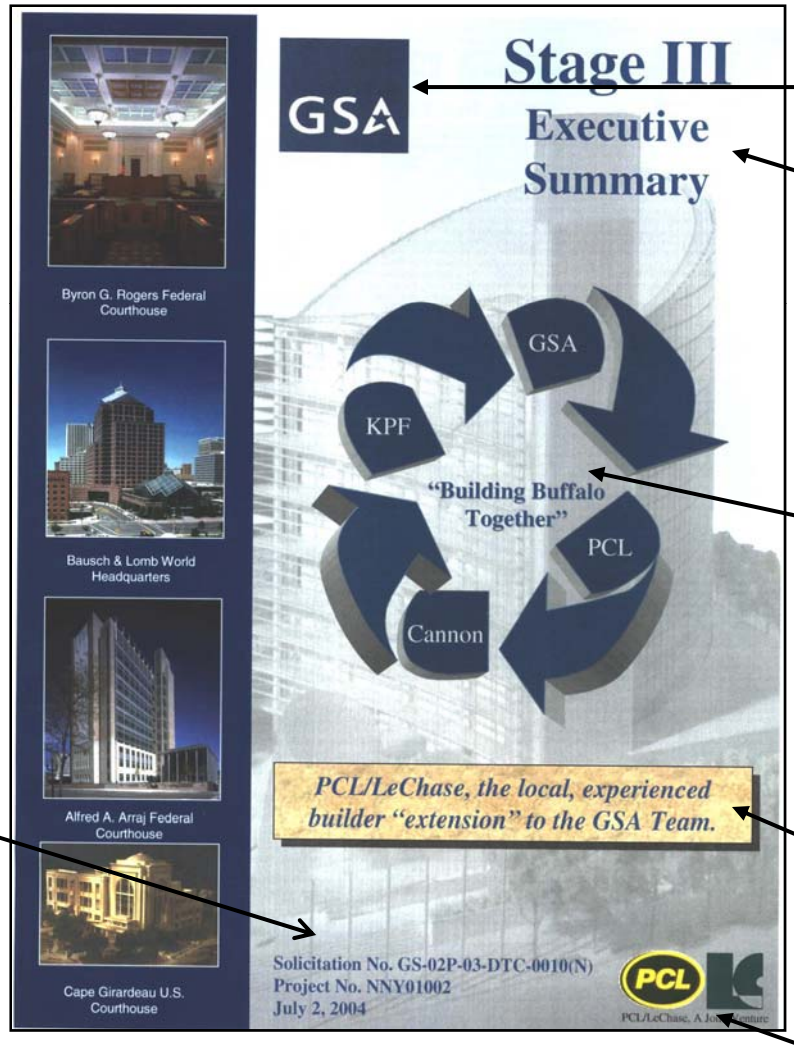
Executive Summary Exercise

Exercise Process:

Based on the information given in this handout, create an Executive Summary for your proposal. Insert the Summary in Section 2 of the Phase II proposal book and include the following:

- 1st Page – Include a key message and a simple theme statement
- 2nd Page – Include a theme statement and the key reasons PRIHD should choose you, and not your competition
- Be creative.

Executive Summary Components (1st Page)



Owner Logo

Executive Summary Title

Key Message

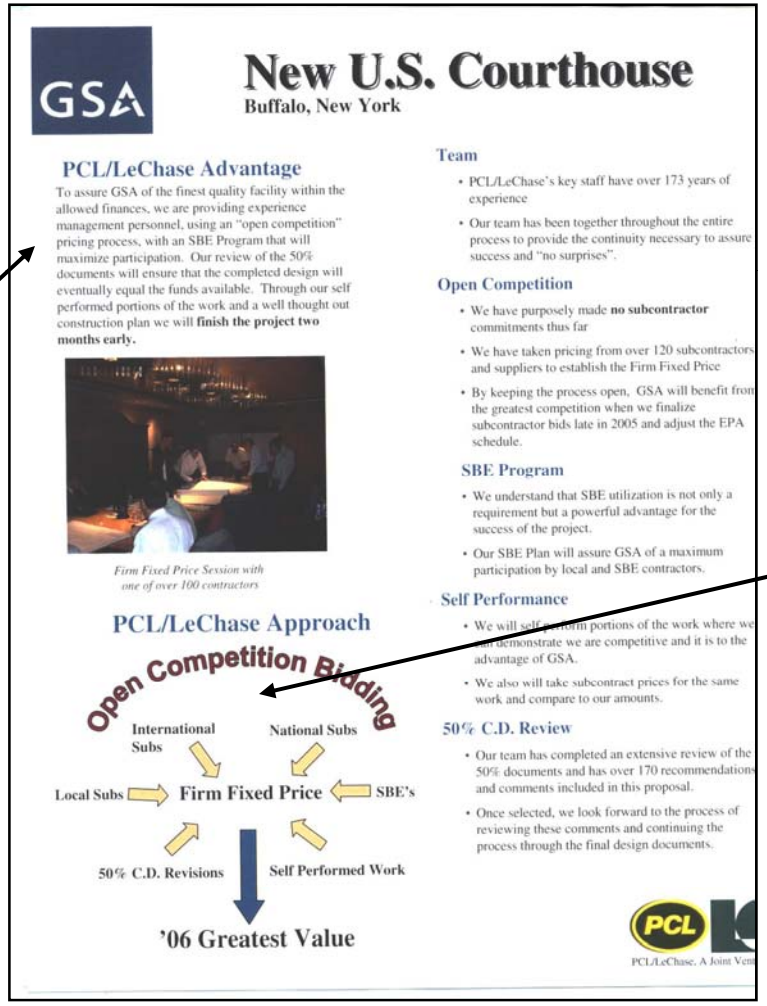
Project Name

Simple Theme Statement

Your Logo

Executive Summary Components (2nd Page)

Theme Statement



GSA

New U.S. Courthouse

Buffalo, New York

PCL/LeChase Advantage

To assure GSA of the finest quality facility within the allowed finances, we are providing experience management personnel, using an "open competition" pricing process, with an SBE Program that will maximize participation. Our review of the 50% documents will ensure that the completed design will eventually equal the funds available. Through our self performed portions of the work and a well thought out construction plan we will **finish the project two months early.**

Firm Fixed Price Session with one of over 100 contractors

PCL/LeChase Approach

Open Competition Bidding

International Subs | National Subs

Local Subs → Firm Fixed Price ← SBE's

50% C.D. Revisions | Self Performed Work

'06 Greatest Value

Team

- PCL/LeChase's key staff have over 173 years of experience
- Our team has been together throughout the entire process to provide the continuity necessary to assure success and "no surprises".

Open Competition

- We have purposely made **no subcontractor** commitments thus far
- We have taken pricing from over 120 subcontractors and suppliers to establish the Firm Fixed Price
- By keeping the process open, GSA will benefit from the greatest competition when we finalize subcontractor bids late in 2005 and adjust the EPA schedule.

SBE Program

- We understand that SBE utilization is not only a requirement but a powerful advantage for the success of the project.
- Our SBE Plan will assure GSA of a maximum participation by local and SBE contractors.

Self Performance

- We will self perform portions of the work where we can demonstrate we are competitive and it is to the advantage of GSA.
- We also will take subcontract prices for the same work and compare to our amounts.

50% C.D. Review

- Our team has completed an extensive review of the 50% documents and has over 170 recommendations and comments included in this proposal.
- Once selected, we look forward to the process of reviewing these comments and continuing the process through the final design documents.

PCL

PCL/LeChase, A Joint Ven

"Why You?",

"Why Not Them?"

(The Key Differentiators)

TAB 3

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3a.) Budget-Preconstruction and Construction Services Agreement

Should your firm be selected, you will be expected to execute the attached Preconstruction and Construction Services Agreement. It will serve as an interim agreement to authorize the start of preconstruction services and memorialize agreed business deal points (commercial terms) until superseded by an executed contract.

Use the services contemplated in this Preconstruction and Construction Services Agreement as your guide in preparing your preconstruction budget in exercise 3c.

After you have completed all the budget exercises in section 3, complete the Preconstruction and Construction Services Agreement provided herein, with your proposed business terms.

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Preconstruction & Construction Services Agreement

This Preconstruction and Construction Services Agreement (Agreement) is made and entered into this 14th day of February, 2009, between *PRIHD Development Partnership* (Owner) and _____ (Contractor), with reference to the following facts:

I. Owner is defined herein as *PRIHD Development Partnership* but will include any successors or assigns of *PRIHD Development Partnership* including any LLC or other entity to whom the property or the project is transferred.
II. Owner owns a parcel of real property in California (Property)
III. Owner contemplates developing *The Fox Office Building Project* on the Property (Project) and desires to employ Contractor to provide preconstruction and construction services.

Now therefore in consideration of the mutual covenants and agreements set forth herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Owner and Contractor agree as follows:

A. Preconstruction Services: Preconstruction services to be provided by Contractor include, but are not limited to, cost estimating, value engineering, scheduling, construction phasing, constructibility review, weekly design review meetings with the Owner, input from key subcontractors as to building systems, and means & methods of construction. Preconstruction is expected to last six months. More specifically, Contractor will:

1. Provide scheduling and estimating services:

    a. Building on budget submitted with the RFP, update conceptual estimate from preliminary plans based on historical costs adjusted to location and time as a control budget. This control budget will be reviewed by the project team, modified as required, and developed into a mutually agreeable budget itemized into cost systems for each component.

    b. Prepare preliminary estimates for each phase of the work as information becomes available (once at completion of DDs, once at 50% CDs). The control budget will be revised and updated accordingly.

    c. Provide value engineering input by reviewing conceptual and working drawings during their preparation focusing on construction methods and details. Cost analyses of design options will be carried out and recommendations made for alternatives to be included in the bid packages.

    d. Evaluate market conditions and schedule bid calls to obtain the most competitive prices commensurate with overall project scheduling.

    e. Prepare cash flow projections and update regularly.

    f. Prepare a preliminary schedule following initial review of the project. This schedule will contain activities integrating the whole team to include entitlements, permits, approvals, design development, bid packages and

construction. Schedule will be provided for Owner's approval in conjunction with the preliminary drawings and conceptual estimate.

g. Update and revise the approved master schedule as necessary to coordinate the ongoing activities of all members of the project team, with major updates/increase in detail in conjunction with the DD and 50%CD budget updates.

h. Monitor progress on both design and other preconstruction activities with regular reports indicating the responsibility for any corrective action.

i. Provide input as required to Owner's entitlement process which is anticipated to conclude in July 2009.

2. Provide constructibility review of the bid documents. This review will verify and help identify any problems in the following areas:

   a. Reasonableness of work sequence, interface relationships, and periods of performance.

   b. Adequacy of lead times for material and equipment procurement.

   c. Accuracy of job-site description and depiction of conditions.

   d. Degree of site restrictions and adequacy of access, work areas and disposal sites.

   e. Availability of utility connections for construction.

   f. Consideration of the impact of adverse weather on the CPM schedule and milestone operations.

   g. Impact upon and plans for pedestrian and vehicular traffic and ongoing operations.

3. Work with Owner to update the preliminary (RFP) Site Plan that will provide additional logistics guidelines and detail. The Site Plan will include:

   a. Location of temporary buildings, lunchrooms, etc.

   b. Location of temporary gas lines and power services.

   c. Assist entitlement team in utility company negotiations with respect to permanent utility relocations.

   d. Material storage areas.

   e. Access roads and gates.

   f. Temporary fencing and gates.

   g. Location and boom radius of crane, personnel, personnel/material hoist, saws, concrete pumps, and all other construction equipment.

   h. Delivery and unloading areas (concrete, precast, rebar, structural steel, etc.) including traffic flow.

   i. Prefab and precasting areas (if required).

j. Subcontractors' offices and storage areas.

k. Consultant's office, testing labs, etc.

l. Footprint of the building, existing street, overhead lines, fire hydrant, vaults, traffic signals, bus stops, other buildings, utilities (e.g. gas, water, sewer) and items to be protected (e.g. trees).

m. Worker access gates.

n. Worker parking during construction.

o. Safety/first aid locations including emergency meeting place and safety bulletin board.

p. Hazardous Storage i.e. gasoline, oxygen, acetylene, PCB's, paint, etc.

q. Outline of excavation/shoring.

r. Property lines.

s. Special Conditions (phased areas, prohibited areas, environmental issues, dewatering, etc).

t. Emergency shutoffs.

u. Public protection, safety, and, if impacted, flow (pedestrian/vehicle) around project.

4. Compensation: Owner shall pay Contractor for Preconstruction Services as follows:

   Preconstruction budget is as itemized in Exhibit A.

B. Construction Services: The parties to this agreement will enter into a Contract for Construction Services which will incorporate and supercede this Agreement. This Contract will be based on the following terms:

1.	Form of Contract:	AIA _____ Standard Form of Agreement Between Owner and Contractor, modified as mutually agreed.
2.	Documents used to establish final price:	Building Department submittal.
3.	General Conditions Expense:	As itemized in project budget Exhibits B, and as further mutually agreed; included in GMP.
4.	Contractor Fee	____ %, included in GMP.
5.	Project Contingency - Share of Savings:	Split ___% / ___% Owner-Contractor

6. Payment & Performance Bond: Excluded, but can be furnished.
7. Preconstruction Services: As detailed in paragraph 4 above.
8. Payment: Progress billings submitted by the 25th of the month will be paid by the 20th following.
9. Retention: Ten percent (10%), with early release for mutually agreed sub-trades.
10. Owner's representative: Jeff Miller
11. Contractor's representative: _____

C. Construction Management Services: Prior to Owner's issuance of a Notice to Proceed with Construction, it may elect to engage Contractor to provide Construction Management Services for hazardous material mitigation & removal, building demolition, and site clearing. Costs for these services are not included in the scope of this Preconstruction & Construction Services Agreement.

D. No Partnership: This Agreement shall not be construed as creating a partnership or joint venture between Owner and Contractor, or between them and any third party, nor cause either of them to be responsible in any manner for the other's or any third party's debts or obligations.

E. Assignment: Neither this Agreement nor any interest herein may be assigned by either party without the prior written consent of the other. Should Property be sold, this Agreement shall survive and be assigned to buyer as a condition of the sale.

IN WITNESS WHEREOF, the parties have executed this Preconstruction Services Agreement to be effective as of the Day and year first above written.

Owner	Contractor
PRIHD Development Partnership	_____
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____

3b.) Budget-Conceptual Estimate Summary

The Owner has requested a budget submittal as part of your proposal. A budget summary worksheet is attached, with several missing line items. Work from subsequent section of section 3 budget exercises will need to be completed and the information transferred to this Conceptual Estimate Summary. You will also need information from your proposed construction schedule in section 4 to complete many of these exercises.

- Complete exercise 3c, to determine the input value for the Preconstruction Services line item in the Conceptual Estimate Summary (CES).
- Complete exercise 3d, to determine the input values for the Construction General Expense (both staff and Overhead/Equipment) line items in the Conceptual Estimate Summary (CES).
- Complete exercise 3e, to determine the input value for the Concrete Slab on Metal Deck line item in the Conceptual Estimate Summary (CES).
- Complete exercise 3f, to determine the input value for the Structural Steel line item in the Conceptual Estimate Summary (CES).
- Complete exercise 3g, to determine the input value for the Bldg Electrical line item in the Conceptual Estimate Summary (CES).
- Calculate the Total Cost line item with the above inputs.
- Insert your Firm's proposed Fee % and amount.
- Calculate the Total Bid.

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YOUR FIRM'S NAME
LOCATION

CONCEPTUAL ESTIMATE SUMMARY

Owner: Fox Studios
Project: Office Building 103
Location: Los Angeles, CA

Designer: Langdon Wilson
Area: ###,### SF

Description	Quantity	UoM	Unit Price	Cost	Remarks
DIRECT COSTS					
PRECONSTRUCTION SERVICES	1.0	LS			Provide per precon estimate exercise
SITEWORK	1.0	LS		5,998,256	
SHOTCRETE WALLS	1.0	LS		666,541	
CONCRETE	1.0	LS		7,899,237	
CONCRETE SLAB ON METAL DECK	1.0	LS			Provide per concrete estimate exercise
CONCRETE REINFORCING	1.0	LS		2,861,568	
MASONRY	1.0	LS		280,356	
STRUCTURAL STEEL	1.0	LS			Provide per steel budget exercise
METAL DECK & MISC METALS	1.0	LS		1,778,223	
WOOD & PLASTIC	1.0	LS		104,462	
THERMAL/MOISTURE PROTECTION	1.0	LS		998,261	
DOORS & WINDOWS	1.0	LS		3,606,336	
FINISHES	1.0	LS		3,872,241	
SPECIALTIES	1.0	LS		206,182	
BUILDING EQUIPMENT	1.0	LS		110,837	
CONVEYING SYSTEMS	1.0	LS		1,504,314	
BLDG MECHANICAL	1.0	LS		4,839,189	
BLDG ELECTRICAL	1.0	LS			Provide per electrical recap sheet
SUBCONTRACTOR BONDS	1.0	LS		564,864	
STREET USE IMPACTS	1.0	LS		50,000	
DIRECT COSTS				35,340,867	**Calculate Direct Costs**
GENERAL EXPENSE COSTS					
PROJECT STAFF	1.0	LS			Provide per staff estimate exercise
PROJECT OVERHEAD & EQUIP	1.0	LS			Provide per equip/overhead exercise
INSURANCE/BONDS/TAXES	1.0	LS		667,481	
GENERAL EXPENSE COSTS				667,481	**Calculate General Expense Cost**
TOTAL COST				36,008,348	**Calculate Total Cost**
Fee	0.00%	%		-	**Input Fee % and Amount**
CONTRACTOR'S CONTINGENCY	0.75%	%		270,063	Calculate Contingency on Total Cost Only
TOTAL BID				36,278,411	**Calculate Total Bid Amount**

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3c.) Budget-Preconstruction Services

- Review the Preconstruction and Construction Services Agreement in section 3a and prepare an appropriate preconstruction staff budget for inclusion in the Conceptual Estimate Summary where noted.
- Use your preconstruction schedule to determine the timeframes and duration each proposed preconstruction team member will be needed during this phase of the project.
- Remember, preconstruction personnel generally work on multiple projects at one time and generally not charged full time against any given project. Not all personnel are needed for the full duration of the preconstruction schedule.
- Staff billing rates are provided below for your use.

Billing Rates	Per Hour
Preconstruction Manager	110.00
Construction Manager	110.00
Chief Estimator	110.00
Senior Estimator	80.00
Estimator	60.00
Project Superintendent	83.49
Assistant Superintendent	82.15
Project Manager	93.34
Project Engineer	58.91
Office Admin/Accountant	45.00
Safety Coordinator	50.00
QC Supervisor	55.00
Secretary	28.57
Scheduler	60.00

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FOX OFFICE BUILDING
Los Angeles, CA

EXHIBIT - ?

PRECONSTRUCTION STAFF BUDGET

ITEM	QTY		RATE	MH	LABOR	UNIT	MATERIAL	UNIT	EQUIP/SUB	TOTAL
PRECONSTRUCTION STAFFING		MO								
PROJECT EXECUTIVE		MO	(Home Office Overhead)				0		0	0
PRECONSTRUCTION MANAGER		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
OTHER STAFF AS REQ'D		MO		-	0		0		0	0
(Add to and Expand this Spread Sheet as Necessary)										
TOTAL BUDGET - PRECONSTRUCTION					**0**		**0**		**0**	**0**

EXTENDED BY ________

CHECKED BY ________

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3d.) Budget-General Condition

- Prepare an appropriate construction general conditions budget for inclusion in the Conceptual Estimate Summary where noted.
- There are 2 parts for this exercise, part 1 is a budget for staff during the construction phase. Part 2 is a budget for overhead and equipment during the construction phase.
- Use your preliminary construction schedule to determine the timeframes and duration, each proposed construction staff team member and overhead/equipment items, will be needed during this phase of the project.
- Staff billing rates are provided below for your use.

Billing Rates	Per Hour
Preconstruction Manager	110.00
Construction Manager	110.00
Chief Estimator	110.00
Senior Estimator	80.00
Estimator	60.00
Project Superintendent	83.49
Assistant Superintendent	82.15
Project Manager	93.34
Project Engineer	58.91
Office Admin/Accountant	45.00
Safety Coordinator	50.00
QC Supervisor	55.00
Secretary	28.57
Scheduler	60.00

- Overhead and equipment rates are provided on the next page for your use.

ITEM		MATERIAL	SUBCONTRACT	REMARKS
GENERAL EXPENSE EQUIPMENT/OVERHEAD				
MAN/MATERIAL HOIST	MO		21,000.00	Includes install and dismantling costs
FINAL CLEANUP	SF		0.06	
FINAL CLEANUP -SITE	LS		7,500.00	
PICKUP	MO		750.00	Rental
PICKUP	MO	250.00		Fuel & maintenance
FORKLIFT - SMALL	MO		960.00	
MISC EQUIP RENTALS	MO		900.00	
TEMP BLDGS	MO		1,350.00	
TOOL CRIBS	MO		200.00	
TEMP TOILETS/WASH STATIONS	MO		135.00	Assume one per ten workers per month
MOVE IN & OUT	LS	500.00	11,000.00	Includes contractor's labor force
TEMP CONSTRUCTION WATER	MO	450.00		
TEMP WATER - DRINKING	MO	50.00		
PARKING - PCL STAFF ($8/DAY/PERSON)	MO	168.00		Assume each jobsite staff for their duration
PROJECT SIGNS	EA	1,300.00	1,300.00	Includes contractor's labor force
COURIER/EXPRESS SERVICE	MO	500.00		
TELEPHONE INSTALL	LS	2,000.00		
TELEPHONE USAGE	MO	600.00		
COMPUTER LINE CHARGES	MO	150.00		
SITE RADIOS	MO	350.00		
CELL PHONES	MO	150.00		
FAX MACHINE	MO	65.00		
COMPUTER STATIONS	MO	130.00		
OFFICE SUPPLIES	MO	800.00		
OFFICE FURN/EQUIP	LS	7,500.00		
COPIER	MO	650.00		
PHOTOS	MO	125.00		
SAFETY MEETINGS	MO	250.00		
MEDICAL EQUIP/SUPPLIES	LS	125.00		
SAFETY/WEATHER WEAR	LS	2,500.00		
TEMP FIRE PROTECTION	MO	150.00		
WARNING/SAFETY SIGNS	LS	2,000.00		
LOSSES - UNINSURED	LS	5,000.00		
SECURITY - ALARM SYSTEM	MO	95.00		
STAIRS & LADDERS	VLF	20.00	15.00	Includes contractor's labor force
TEMP FENCES	LF		4.19	
HOUSEKEEPING	WK		600.00	Includes contractor's labor force
TRASH REMOVAL	WK	400.00		
OPERATING MANUALS	LS	2,500.00		
AS-BUILT DRAWINGS	LS	2,500.00		
DRAWING REPRODUCTION	LS	10,000.00		
CONSTRUCTION DRAWINGS	EA	350.00		
CASUAL MEALS	MO	400.00		
TO/FROM EXPENSE	MI	0.48		Business mileage expense reimbursement

FOX OFFICE BUILDING | **CONSTRUCTION STAFF BUDGET**

Los Angeles, CA

EXHIBIT - ?

ITEM	QTY		RATE	MH	LABOR	UNIT	MATERIAL	UNIT	EQUIP/SUB	TOTAL
GENERAL EXPENSE STAFFING										
PROJECT EXECUTIVE		MO	(Home Office Overhead)				0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
OTHER STAFF AS REQ'D		MO			0		0		0	0
(Add to and Expand this Spread Sheet as Necessary)										
TOTAL BUDGET - PROJECT STAFF					-		-		-	-

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FOX OFFICE BUILDING **EQUIPMENT & OVERHEAD BUDGET**
Los Angeles, CA EXHIBIT - ?

ITEM	QTY		RATE	MH	LABOR	UNIT	MATERIAL	UNIT	EQUIP/SUB	TOTAL
GENERAL EXPENSE EQUIPMENT/OVERHEAD										
MAN/MATERIAL HOIST	-	MO			0		0		-	0
FINAL CLEANUP		SF			0		0		-	0
FINAL CLEANUP -SITE		LS			0		0		-	0
PICKUP		MO			0		0		-	0
FORKLIFT - SMALL		MO			0		0		-	0
MISC EQUIP RENTALS		MO			0		0		-	0
TEMP BLDGS		MO			0		0		-	0
TOOL CRIBS		MO			0		0		-	0
TEMP TOILETS/WASH STATIONS		MO			0		0		-	0
MOVE IN & OUT		LS	55.36	200	11,072		0		-	0
TEMP CONSTRUCTION WATER		MO			0		0		-	0
TEMP WATER - DRINKING		MO			0		0		-	0
PARKING - PCL STAFF ($8/DAY)		MO			0		0		-	0
PROJECT SIGNS		EA	55.36	24	1,329		0		-	0
COURIER/EXPRESS SERVICE		MO			0		0		-	0
TEMP POWER INSTALL	W/ELECTRICAL SUB				0		0		-	0
TEMP POWER CONSUMPTION	BY OWNER				0		0		-	0
TELEPHONE INSTALL		LS			0		0		-	0
TELEPHONE USAGE		MO			0		0		-	0
COMPUTER LINE CHARGES		MO			0		0		-	0
SITE RADIOS		MO			0		0		-	0
CELL PHONES		MO			0		0		-	0
FAX MACHINE		MO			0		0		-	0
COMPUTER STATIONS		MO			0		0		-	0
OFFICE SUPPLIES		MO			0		0		-	0
OFFICE FURN/EQUIP		LS			0		0		-	0
COPIER		MO			0		0		-	0
PHOTOS		MO			0		0		-	0
SAFETY MEETINGS		MO			0		0		-	0
MEDICAL EQUIP/SUPPLIES		LS			0		0		-	0
SAFETY/WEATHER WEAR		LS			0		0		-	0
TEMP FIRE PROTECTION		MO			0		0		-	0
WARNING/SAFETY SIGNS		LS			0		0		-	0
LOSSES - UNINSURED		LS			0		0		-	0
SECURITY - ALARM SYSTEM		MO			0		0		-	0
STAIRS & LADDERS		VLF	59.23	-	0		0		-	0

ITEM	QTY		RATE	MH	LABOR	UNIT	MATERIAL	UNIT	EQUIP/SUB	TOTAL
TEMP FENCES		LF			0		0		-	0
HOUSEKEEPING		WK	50.73	-	0		0		-	0
TRASH REMOVAL		WK			0		0		-	0
OPERATING MANUALS		LS			0		0		-	0
AS-BUILT DRAWINGS		LS			0		0		-	0
DRAWING REPRODUCTION		LS			0		0		-	0
CONSTRUCTION DRAWINGS		EA			0		0		-	0
CASUAL MEALS		MO			0		0		-	0
TO/FROM EXPENSE	13,000	MI			0		0		-	0
(Add to and Expand this Spread Sheet as Necessary)										
TOTAL BUDGET - EQUIPMENT/OVERHEAD					**12,401**		**-**		**-**	**-**

EXTENDED BY _____

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3e.) Budget-Concrete Slab on Metal Deck

- In this exercise your Team will complete the Concrete Slab on Metal Deck estimate for inclusion in the Conceptual Estimate Summary where noted.
- Some information in the Concrete SOMD worksheet has been provided and you may assume this information is correct.
- Using the drawings and other supplemental information provided, obtain quantities for the various line items of work in the SOMD worksheet.
- Apply the appropriate unit rates for labor, material and equipment/subcontract to complete the estimate for this phase of work.
- Drawing References
    - S1.21-TYPICAL STEEL METAL DECK DETAILS
    - S2.06-2ND LEVEL FRAMING PLAN
    - S2.07-3RD LEVEL FRAMING PLAN
    - S2.08-4TH LEVEL FRAMING PLAN
    - S2.09-5TH LEVEL FRAMING PLAN
    - S2.10-ROOF PENTHOUSE FRAMING PLAN
    - S2.11-MECHANICAL PENTHOUSE ROOF FRAMING PLAN

- Other Information
    - Use D-1 steel decking mark everywhere deck is required on typical floors
    - Use D-1 and/or D-4 steel decking mark on the roof as indicated on the drawings
    - Effective SOMD place/finish ranges from 10,000sf to 16,000sf per day.
    - Budget 3000 psi hardrock concrete delivered at $90/cy
    - Budget 3000 psi lightweight concrete delivered at $110/cy
    - Concrete pump is $220/hr + $3.00/cy + $100/day move in/out
    - Assume concrete pump averages 50cy/hr production
    - Based upon your pour cycle, figure the average cost/cy for pumping and use this average rate in the SOMD worksheet for concrete pumping
    - Concrete placing labor crew rate is $52.00/mh, fully burdened
    - Assume a Laborer places 1.67cy of concrete per hour
    - Cement finishing labor crew rate is $55.78/mh, fully burdened
    - Assume a Finisher trowel finishes 1000 sf of slab per day
    - Assume a Finisher broom finishes 1333 sf of slab per day

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Fox Office Building 103
Los Angeles, CA

CONCRETE SOMD ESTIMATE

ITEM	QTY		CREW RATE	PROD RATE	LABOR MH	LABOR COST	MATERIAL UNIT	MATERIAL COST	EQUIP/SUBCONTRACT UNIT	EQUIP/SUBCONTRACT COST	TOTAL COST
SLAB ON METAL DECK (SOMD)											
FORMING											
Form Bulkheads (pour stops)	2,249	LF	54.68	0.300	675	36,893	1.00	2,249	-	-	39,142
Hung edge form (recess at terrace)	540	LF	54.68	0.350	189	10,335	1.00	540	-	-	10,875
Perimeter edge form by metal deck sub	-		-	-	-	-	-	-	-	-	0
PLACING (w/Pump)											
Place lightweight SOMD		CY			-	0	-	-		-	0
Place lightweight SOMD - Roof		CY			-	0	-	-		-	0
Place hardrock SOMD - Roof		CY			-	0	-	-		-	0
Concrete supply 3000 psi LtWt +5%		CY	-	-	-	-		0	-	-	0
Concrete supply 3000 psi HR +5%		CY	-	-	-	-		0	-	-	0
CEMENT FINISHING											
Trowel Finish SOMD		SF			-	0	-	-	-	-	0
Broom Finish SOMD - Roof		SF			-	0	-	-	-	-	0
CURE & PROTECT											
SOMD (incl roof)		SF	48.41	0.002	-	0	0.01	0	-	-	0
REINFORCING STEEL											
Rebar & wire mesh, furnish & install, included in concrete reinforcing budget	-		-	-	-	-	-	-	-	-	0
(Add to and Expand this Spread Sheet as Necessary)											
SUBTOTAL DIRECT COSTS - SOMD						47,227		2,789		0	50,016
EQUIP & OVERHEAD (SOMD)		%				0	17%	8,503		--	8,503
TOTAL COSTS - SOMD											58,519
FEE (on Self Performed Work)		%				0	10%	5,852		0	5,852
TOTAL BID - SOMD											**64,371**

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CHECKED BY _____

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3f.) Budget-Structural Steel

- In this exercise your Team will complete the Structural Steel estimate for inclusion in the Conceptual Estimate Summary where noted.
- Some information in the Structural Steel worksheet has been provided and you may assume this information is correct.
- Using the drawings and other supplemental information provided, obtain quantities for the various line items of work in the Structural Steel worksheet.
- Apply the appropriate unit rates to complete the estimate for this phase of work.
- Drawing References
    - S2.05B-GROUND LEVEL SLAB DEPRESSION PLAN
    - S2.06-2ND LEVEL FRAMING PLAN
    - S2.07-3RD LEVEL FRAMING PLAN
    - S2.08-4TH LEVEL FRAMING PLAN
    - S2.09-5TH LEVEL FRAMING PLAN
    - S2.10-ROOF PENTHOUSE FRAMING PLAN
    - S2.11-MECHANICAL PENTHOUSE ROOF FRAMING PLAN

- Other Information
    - The Structural Engineer has not completed the steel design and has indicated an allowance to be utilized in the development of the budget estimate which is based upon the building area.
    - The unit price market for a structural steel frame of this design is $2,800 per ton.

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Fox Office Building 103
Los Angeles, CA

STRUCTURAL STEEL ESTIMATE

ITEM	QTY		CREW RATE	PROD RATE	LABOR MH	LABOR COST	MATERIAL UNIT	MATERIAL COST	EQUIP/SUBCONTRACT UNIT	EQUIP/SUBCONTRACT COST	TOTAL COST
STRUCTURAL STEEL											
Total Building Area =		sf									
Engr's Steel Allowance =		#/sf									
Estimated Pounds of Steel =	-	#									
Estimated Tonnes of Steel =	-	TN									
Unit Price per Ton =		$/TN									
Structural Steel	-	TN	-		-	0	-	0	-	-	0
SUBTOTAL DIRECT COSTS - SOMD						0		0		0	0
EQUIP & OVERHEAD (SOMD)		%				0	0%	0		--	0
TOTAL COSTS - SOMD											0
FEE (on Self Performed Work)		%				0	0%	-		0	0
TOTAL BID - STRUCTURAL STEEL											**0**

STRUCTURAL STEEL ESTIMATE

EXTENDED BY _____
CHECKED BY _____

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3g.) Budget-Electrical Recap

- In this exercise your Team will review 3 actual Electrical bids and complete the Electrical Recap Worksheet.
- Determine the lowest responsive bidder and include Electrical budget total from the recap worksheet in the Conceptual Estimate Summary where noted.
- Some information in the Electrical Recap worksheet has been provided and you may assume this information is correct
- Information in one or more of the electrical bids maybe incomplete, your team may make reasonable assumptions that are based upon a fictitious telephone call to the respective electrical bidder, to determine incomplete information. Note any assumptions on the bottom of the electrical recap card.

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	Description		PCL Budget	Dynalectric	Morrow-Meadows	Rosendin	
	Electrical						
	Base Bid		2,287,800				
	Design Fee	**By Owner**	excl				
	Fire Alarm System	**Owner's S**	incl				
	Temp Power		incl				
	Utility Company Charges	**By Owner**	excl				
	Electrical Permit		incl				
	Warranty Costs		incl				
	Parking- Offsite + Shuttle		incl				
	Bid RFI Deducts/adds		incl				
	Site Lighting Allowance		80,500		incl	incl	
	Lobby Lighting Allowance		25,000		incl	incl	
	Temp Power Install		92,000		incl	incl	
	Temp Power Maintain		26,894		incl	incl	
	M/E Coordinator 1/2 Time		37,977	37,977	37,977	37,977	
	Sales Tax	**$$ Include**					
	BONDABLE	**$$ Not Inc**		Y	Y	Y	
	PER PLANS AND SPECS			Y	Y	Y	
	ADDENDUM 1 & 2			Y	Y	Y	
	UNION /NON UNION			Union	Union	Union	
	ELECTRICAL		**2,550,171**	**37,977**	**37,977**	**37,977**	

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Dynalectric
Los Angeles
An EMCOR Company

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Jeff Miller	Doug Spencer
COMPANY:	DATE:
PCL Construction	02/25/2005
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
(310) 203-9483	4
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
(310) 203-3163	05-008
RE:	YOUR REFERENCE NUMBER:
Fox Studio A – Proposal	

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY

NOTES/COMMENTS:

Attached is our proposal for the above-mentioned project.

I have been favored with a fire-alarm sub-contractor, alternate, if you are interested.

Please call with any questions or comments.

Thanks,

4462 CORPORATE CENTER DRIVE
LOS ALAMITOS, CA 90720

(714) 828-7000 PH.
(714) 484-2393 FAX

Dynalectric
Los Angeles
An EMCOR Company

February 25, 2005

PCL Construction Services
200 Burchett Street
Glendale, CA 91203

Attn: Mr. Jeff Miller

Re: Fox Studios – Lot B Office Building
Electrical Proposal

Dear Mr. Miller:

Dynalectric is pleased to offer our proposal for the electrical construction of the above referenced project. Our bid is based on plan sheets FE0.1 through FE3.1, (Qty. 13), E0.1 through E4.1, (Qty. 13), SE2.01 through SE3.01, (Qty. 11) and GP-1 through GP-15, (Qty. 15) all dated 01/14/2005. Specification section 16100, 16135 and 16720 from project manual dated 1/14/05, (1995 CSI Masterformat) is included. Addenda 1 and 2 are noted. Please see the bid form for breakouts and additional information.

Base Bid: (Parking Structure and site)	$	898,800.00	
Base Bid: (Core and shell office and temporary power)	$	1,446,800.00	
Alternate #1 <deductive>: Delete parking costs included for non-company vehicles, parked off-site	$	< $ 8,500.00 >	[Deduct]
Bond Fee (0.69%) (if required)	$	As applicable	

Exclusions:

1. Utility company service charges, fees and usage.
2. Formed and/or finished concrete.
3. Off-site work.
4. Temporary Generator(s).
5. Site work except incoming utilities.
6. Fire rated fixture enclosures.
7. Fixture hanger / safety wires.
8. Access doors.
9. VFD; Furnish and install. We will wire and termination line voltage.
10. Controls conduit, wiring and devices
11. Security system, camera poles, wiring and devices
12. Telecommunications system, wiring and devices.
13. Parking costs. (See alternate)

14. Tenant area development.
15. Smoke control (by Mechanical).
16. Plywood backboards.
17. Excavation, removal or other mitigation of contaminated soil or debris.
18. Sawcutting, breakout, haul-away of asphalt, concrete, slabs, etc.
19. Traffic control, barricades
20. Line voltage thermostats. None shown; only a detail.
21. Patching, painting.
22. Soundproofing materials.
23. Demolition.
24. Scaffolding (We are taking the assumption, that we will be able to utilize other sub-trades)
25. Any work in the existing FNC building.
26. Working with or near hazardous materials.
27. Surveying
28. Liability for damage and/or delays, or responsibility for any other costs associated with sub-surface conditions, pipes, objects, etc., that are not specifically shown on the drawings at their true locations.

Clarifications:

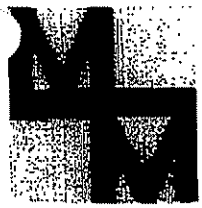
1. Pricing is based on construction time of 17 months beginning 5/15/05, on an 8 hour per day, 5 day per week schedule.
2. Unless noted otherwise, this proposal is valid for 60 days only.
3. Our price assumes contract terms that are no less favorable than those of the general contract.
4. During the bid process we concentrate on accurate take-off and pricing of the designed and engineered documents. While we always try to be alert to obvious errors and omissions during this process and call attention to any questionable items using the RFI process, we cannot accept the risk of guaranteeing the completeness, adequacy and accuracy of all of the underlying work of the professional designers, engineers and architects that have been commissioned to produce the bid documents.
5. Temporary power "panels", as described in section 01000-30, are included as "spider boxes" with cords, per OSHA requirements. Relocation of temporary power during construction, is included however, quantity of relocations is limited and T.B.D.
6. We have included parking costs included for non-company vehicles. (See deductive alternate).
7. Sheet E2.5: Each "L2" fixture is included as (1) fixture per symbol location.
8. PCL RFI # 75B: Any conduit or wiring between the division 15 furnished and installed relay panels and our lighting power panels is by others. None is shown.
9. PCL RFI # 59B: Single line diagrams between the electrical plan sets still do not agree. We have included the items shown in bold on each respective plan set, regardless of the difference between the (2) plan sets. I.e., E0.3 and FE0.3 are not the same in specific content

10. All wire and pull rope, that we are furnishing and installing, to the outside of the existing FNC building is included at a maximum of 10' within conduit stubs 10' outside the existing FNC building. These conduit stubs and wire/rope are to be picked up by others, (the FNC contractor).
11. Dyna RFI DSBID006 was not answered before bid time regarding the pull boxes at the exterior of the existing FNC building
12. PCL RFI #46B-R1: This RFI was not answered regarding the 5" –vs.- 4" Telco conduits, we have included 4" as shown on (2) of the (3) plan sheets noted.
13. PCL RFI #45B-R1: The BMS equipment specification and sizes were not clarified before bid time. Per the portion of the answer, that stated the equipment is to be mounted outside of the power panel now, we have included 1-hour labor each, maximum, to mount (1) BMS junction box next to each power panel. Any conduit or wire not shown, is by others.
14. Dyna RFI # DSBID007: This RFI was not answered before bid time. For this distribution board "DBPH", we have included a 600amp circuit breaker in lieu of the 1200a circuit breaker as this is shown as a 600amp board.
15. We included conduit grounding per code compliance. Spec 16100/2.01;BB note #2, calls out for "grounding bushings on conduits that are grounded". Which is not a common practice, in most applications.
16. We are assuming that security cameras shown at or near fence locations, will be on poles, furnished and installed by others.
17. The fixture/tax cost for "F1" is not included as the type is listed as "T.B.D." in the light fixture schedule.

If you have any questions, please feel free to call the undersigned at **(714) 236-2298.**

Sincerely,
DYNALECTRIC

Doug Spencer
Senior Estimator



MORROW-MEADOWS CORP.

ELECTRICAL CONTRACTORS AND ENGINEERS
231 Benton Court
City of Industry, CA 91789
Telephone: (909) 598-7700
Fax: (909) 598-3907
License No. 230813-C10

FAX LEAD SHEET

FAX #: (909) 839-8186
VERIFYING #: (909) 598-7700

TO: **JEFF MILLER**

FROM: **DENNIS MATHIS**

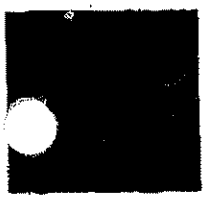
RE: **FOX AREA ONE OFFICE CORE & SHELL**

NUMBER OF PAGES TO FOLLOW THIS SHEET: **8**

DATE: **2/25/05** HARD COPY TO FOLLOW **x** YES NO ____

MESSAGE:

PROPOSAL



MORROW-MEADOWS CORP.

ELECTRICAL/DATACOM CONTRACTORS AND ENGINEERS
231 Benton Court
City of Industry, CA 91789
Telephone: (909) 598-7700
Fax: (909) 598-3907
License No. 290813-C10

Date February 25, 2005

Proposal No. 05N-025

TO: PCL CONSTRUCTION SERVICES, INC.
200 Burchett Street
Glendale, CA 91203-1222
ATTN: Mr. Jeff Miller

JOB: Fox Area One
New Office Building
Bid Package No. 3
Los Angeles, CA

WE ARE PLEASED TO QUOTE AS FOLLOWS:

ELECTRICAL BID CATEGORY 30:

Furnished and installed, taxes included, per the following documents:

- PCL Construction Services, Inc. Contract Documents Log dated February 16, 2005.
- Addenda No. 1 and No. 2.

TOTAL BID PRICE .....

See Attached Bid Form

Thank you,

Quotations terminate thirty (30) calendar days after date of issuance. All orders are subject to acceptance by an officer of our company.

MORROW-MEADOWS CORP.

By _____
Dennis Mathis
Senior Estimator

Exclusions:

1.) Formed and finished concrete (pole bases complete, barrier posts, housekeeping pads, etc.).

2.) Engineering and plan check fees.

3.) Fire-rated enclosures for fixtures, panels or boxes over 4" square.

4.) Mechanical control wiring and conduit (except as shown on the electrical drawings).

5.) Louvers and lenses for architectural light coves.

6.) Performance and payment bond cost.

7.) Plywood backboards.

8.) All offsite work (street lighting, traffic signal, street crossing, etc.).

9.) Installation of duct smoke detectors.

10.) Concrete encasement of site lighting conduits.

Clarifications:

1.) We have based our bid price on the utilization of the construction site for the storage of materials and the placement of a job trailer.

2.) The bid price applies to the award of the complete project; breakdown is provided for proposal evaluation purposes only.

3.) We respectfully request an opportunity to modify certain provisions of the subcontract agreement before executing it.

4.) General contractor shall provide access to the site for deliveries.

5.) Bid price includes $7,500.00 lobby lighting allowance per plan sheet E3.1.

6.) Temporary power system is based on using existing 225 KVA transformer and 600 AMP distribution panel..

7.) Bid price includes $102,000.00 for temporary power and lighting.

FOX STUDIOS OFFICE BUILDING
BID PACKAGE #3

BID FORM

Firm Name MORROW-MEADOWS CORPORATION

Affiliations: UNION X LOCAL # 40 NON-UNION ____ (Applies to field labor only)

PROJECT: Fox Studios Office Building

TO: PCL Construction Services, Inc.
200 Burchett Street
Glendale, CA 91203
Phone: (818) 246-3481
Fax: (818) 247-5775 (Faxed Bids are acceptable. Original to be sent via mail)

ATTN: JEFF MILLER

Gentlemen:

In compliance with the Instructions to Bidders, the undersigned proposes to furnish all materials, labor, equipment, services and supervision and pay all applicable taxes necessary to perform the work for **BID CATEGORY 30-ELECTRICAL** in accordance with the Contract Documents prepared by the Design Team and PCL.

The undersigned acknowledges receipt of the following Addenda:

Addendum No.	1	Dated	2/1/05	Addendum No.		Dated	
Addendum No.	2	Dated	2/7/05	Addendum No.		Dated	
Addendum No.	2	Dated	2/16/05	Addendum No.		Dated	

The delivery schedule and time required for on-site work as defined in Section 1600 – Schedule is as follows:

Shop Drawing Duration:	2-8	weeks
Delivery of materials/equipment to site. After approved Shop Drawings:	2-12	weeks
Completion of on-site work:	64	weeks
Comply with proposed schedule:	Yes	Yes/No

The undersigned agrees that the quoted prices are firm and not subject to escalation and will not be withdrawn or canceled within Seventy-Five (75) days after the time fixed for receipt of Bids.

Each Bidder, by making this Bid, represents that:

1. They have read and understand the Project Manual and this Bid is made in accordance therewith.
2. If successful, they agree to execute PCL's Standard Subcontract form with its Uniform Special Conditions to Subcontract included in the Project Manual.

February 25, 2005

BASE BID – FOR CONTRACT: The Bidder agrees to perform all Work for the Bid Category as described in the Contract Documents for the Lump Sum cost of: DEDUCT (24,500) FOR RFI's CHANGES

Bid Category		Price (in words)		Dollar Value ($)
30-Electrical		TWO MILLION THREE HUNDRED NINETY-TWO THOUSAND, TWO HUNDRED DOLLARS		$2,392,200.00 Lump Sum

1. A separate Bid Form is required for each Bid Category for which Bidder is submitting a Bid. Each Bid must be a stand alone price. The Bidder may utilize the Voluntary Alternate section of this Bid form to offer a cost savings alternate for the award of any combination of Bid Categories under a single subcontract or purchase order.

2. By submitting a Bid, Bidder will be deemed to have warranted and represented the (i) it had ample opportunity to carefully study and estimate the Contract Documents and is satisfied that the Work Scope can be constructed to meet the requirements of the Contract Documents without exceeding the Bid price, save and except only for adjustments thereto permitted by the Contract Documents; and (ii) it has satisfied itself regarding completeness, adequacy and accuracy of the information contained in the Contract Documents and assumes all risk associated with conditions in or among the various parts of the Contract Documents that constitute errors, omissions, conflicts, ambiguities, or violation of Applicable Laws that, prior to bidding, were either discovered by Bidder or it Bidders of any Tier, or were discoverable by Bidder of its Bidders of any Tier in the exercise of care and diligence.

3. Bidder's price is a Lump Sum Price, including all necessary work to provide a complete system as described in the Contract Documents. Bids and subcontracts will be based on the issued for Bid Drawings. These drawings are intended to show the entire scope of the project but not all the details or all items required to make a complete system. Bids are to include all items required to provide a complete system. Refinement of details and the scope of the project will not be a basis for additional compensation. Successful bidders will be expected to provide preconstruction services. These services will include as a minimum reviewing of documents as they are being developed for constructability and scope confirmation. Attendance at meetings may also be required during this preconstruction period. Final 100% for construction drawings will be issued in conjunction with a no cost/time subcontract revision, incorporating the 100% Construction Documents into the Subcontract Agreement.

UNIT PRICES: The Unit Prices are offered by the Bidder as requested in section 01000 Work Scope and in accordance with section 01070 Unit Prices and shall remain in effect until execution of the Subcontract. If the Unit Prices are accepted, they will be included in the Subcontract and remain in effect for the duration of the Subcontract. Unit prices include all overhead, insurance, profit and applicable taxes.

Item		Description		Unit Price
		None Scheduled.	(Add or Deduct)	

ALTERNATES: The alternate prices are offered by the Bidder and shall remain in effect until execution of the Subcontract. The Bidder agrees that amounts indicated below shall be added to or deducted from the base Bid, for each requested alternate which is accepted. The alternates include all overhead, insurance, profit and applicable taxes.

Alternate		Description		Alternate Price
Alt-3.1		PCL provided parking and jobsite shuttle. Number of spaces 12 From 6/6/05 to 8/29/06	(~~Add or~~ Deduct)	<$38,800.00>

February 25, 2005

FOX STUDIOS OFFICE BUILDING
BID PACKAGE #3

VOLUNTARY ALTERNATE(S): The voluntary alternate prices are offered by the Bidder and shall remain in effect until execution of the Subcontract. The Bidder agrees that amounts indicated below shall be added to or deducted from the base Bid, for each voluntary alternate which is accepted. The voluntary alternates include all overhead, insurance, profit and applicable taxes.

Voluntary Alternate		Description (attach additional description as needed)		Unit Price
1		MC cable in lieu of EMT conduit/wire	~~(Add or~~ Deduct)	<$30,400.00>
2		Owner Red Light Allowance	(~~Add or~~ Deduct)	<$10,000.00>
3		Square D Switchgear	(Add ~~or Deduct~~)	$32,000.00
			(Add or Deduct)	

PAYMENT & PERFORMANCE BOND: Not included in the base Bid price but if required by PCL, a 100% Performance & 100% labor and material bond, can be added for the additional price of $18,000.00.

Submitted by:

FIRM NAME: MORROW-MEADOWS CORPORATION

BUSINESS ADDRESS: 231 Benton Court

City of Industry, CA 91789

TELEPHONE: (909) 598-7700 FAX: (909) 839-8186

EMAIL ADDRESS dmathis@morrow-meadows.com

AUTHORIZED SIGNATORY: [signature] DATE: February 25, 2005

PRINTED NAME/TITLE: Dennis H. Mathis, Senior Estimator

The person or persons signing this Bid Form on behalf of Bidder hereby represent and warrant to PCL that this Bid is duly authorized, signed and delivered by Bidder.

Remember to enclosed Exhibit A, B, C and the Subcontractor Qualification Form as an attachment to the bid form.

February 25, 2005

END OF SECTION

EXHIBIT A
BASE BID PRICING SUMMARY

Bidder: MORROW-MEADOWS CORPORATION

Bid Category: 30-ELECTRICAL

Item Description		Breakdown of Bid by Project Component			TOTAL
		PARKING STRUCTURE	OFFICE BUILDING		
I.	**COSTS:**				
A.	Material & Equipment (including shop labor and freight)	$422,400.00	$359,000.00		$781,400.00
B.	Field Erection/Installation Labor	$451,100.00	$435,100.00		$886,200.00
C.	Supervision/General Conditions/Overhead	$274,600.00	$256,000.00		$530,600.00
D.	Sub-Subcontracts (including material and labor)	$80,200.00	$113,800.00		$194,000.00
	TOTAL	$1,228,300.00	$1,163,900.00		$2,392,200.00
II.	**INSTALLATION WORK HOURS (On-Site)**				
A.	Direct or Self Performed Work Hours	7742 man hrs	8108 man hrs		15,850 man hrs
B.	Subcontractor Work Hours	640 man hrs	406 man hrs		1046 man hrs
	TOTAL WORK HOURS	8382 man hrs	8514 man hrs		16,896 man hrs

EXHIBIT B
HOURLY LABOR RATES
(For changes in the Work only)

Bidder: MORROW-MEADOWS CORPORATION

Bid Category: 30-ELECTRICAL

Labor Classification	Base Hourly Rate* ($)	Premium Time Hourly Rate* (Do not use 1.5x Base)	Double Time Hourly Rate* (Do not use 2.0x Base)
EXAMPLE	27.85	37.59	45.95
General Foreman	96.85	131.77	167.47
Foreman	89.50	121.93	154.36
Journeyman Electrician	73.16	101.44	129.72

***Includes: All jobsite and home office Overhead and Profit, Fringe benefits, Payroll Taxes, Workers Compensation and Employers Liability Insurance, Travel allowance, small tools (less than $500 value)**

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FOX STUDIOS OFFICE BUILDING
BID PACKAGE #3

ROSENDIN ELECTRIC, INC.

SECTION 00060-30
BID FORM
Page 1 of 4

BID FORM

Firm Name ROSENDIN ELECTRIC, INC.

Affiliations: UNION IBEW LOCAL # 11 NON-UNION____ (Applies to field labor only)

PROJECT: **Fox Studios Office Building**

TO: **PCL Construction Services, Inc.**
200 Burchett Street
Glendale, CA 91203
Phone: (818) 246-3481
Fax: (818) 247-5775 (Faxed Bids are acceptable. Original to be sent via mail)

ATTN: **JEFF MILLER**

Gentlemen:

In compliance with the Instructions to Bidders, the undersigned proposes to furnish all materials, labor, equipment, services and supervision and pay all applicable taxes necessary to perform the work for BID CATEGORY 30-ELECTRICAL in accordance with the Contract Documents prepared by the Design Team and PCL.

The undersigned acknowledges receipt of the following Addenda:

Addendum No. 1	Dated _____	Addendum No. _____	Dated _____
Addendum No. 2	Dated _____	Addendum No. _____	Dated _____
Addendum No. _____	Dated _____	Addendum No. _____	Dated _____

The delivery schedule and time required for on-site work as defined in Section 1600 – Schedule, is as follows:

Shop Drawing Duration:	4 weeks
Delivery of materials/equipment to site, After approved Shop Drawings:	12 - 16 Weeks
Completion of on-site work:	60 weeks
Comply with proposed schedule:	YES Yes/No

The undersigned agrees that the quoted prices are firm and not subject to escalation and will not be withdrawn or canceled within Seventy-Five (75) days after the time fixed for receipt of Bids.

Each Bidder, by making this Bid, represents that:

1. They have read and understand the Project Manual and this Bid is made in accordance therewith.
2. If successful, they agree to execute PCL's Standard Subcontract form with its Uniform Special Conditions to Subcontract included in the Project Manual.

January 20, 2005

ROSENDIN ELECTRIC, INC.

FOX STUDIOS OFFICE BUILDING
BID PACKAGE #3

SECTION 00060-30
BID FORM
Page 2 of 4

BASE BID - FOR CONTRACT: The Bidder agrees to perform all Work for the Bid Category as described in the Contract Documents for the Lump Sum cost of:

Bid Category	Price (in words)	Dollar Value ($)
30-Electrical		$2,160,000.00 Lump Sum

1. A separate Bid Form is required for each Bid Category for which Bidder is submitting a Bid. Each Bid must be a stand alone price. The Bidder may utilize the Voluntary Alternate section of this Bid Form to offer a cost savings alternate for the award of any combination of Bid Categories under a single subcontract or purchase order.
2. By submitting a Bid, Bidder will be deemed to have warranted and represented the (i) it had ample opportunity to carefully study and estimate the Contract Documents and is satisfied that the Work Scope can be constructed to meet the requirements of the Contract Documents without exceeding the Bid price, save and except only for adjustments thereto permitted by the Contract Documents; and (ii) it has satisfied itself regarding completeness, adequacy and accuracy of the information contained in the Contract Documents and assumes all risk associated with conditions in or among the various parts of the Contract Documents that constitute errors, omissions, conflicts, ambiguities, or violation of Applicable Laws that, prior to bidding, were either discovered by Bidder or it Bidders of any Tier, or were discoverable by Bidder of its Bidders of any Tier in the exercise of care and diligence.
3. Bidder's price is a Lump Sum Price, including all necessary work to provide a complete system as described in the Contract Documents. Bids and subcontracts will be based on the issued for Bid Drawings. These drawings are intended to show the entire scope of the project but not all the details or all items required to make a complete system. Bids are to include all items required to provide a complete system. Refinement of details and the scope of the project will not be a basis for additional compensation. Successful bidders will be expected to provide preconstruction services. These services will include as a minimum reviewing of documents as they are being developed for constructability and scope confirmation. Attendance at meetings may also be required during this preconstruction period. Final 100% for construction drawings will be issued in conjunction with a no cost/time subcontract revision, incorporating the 100% Construction Documents into the Subcontract Agreement.

UNIT PRICES: The Unit Prices are offered by the Bidder as requested in section 01000 Work Scope and in accordance with section 01070 Unit Prices and shall remain in effect until execution of the Subcontract. If the Unit Prices are accepted, they will be included in the Subcontract and remain in affect for the duration of the Subcontract. Unit prices include all overhead, insurance, profit and applicable taxes.

Item	Description	(Add or Deduct)	Unit Price
	None Scheduled.		

ALTERNATES: The alternate prices are offered by the Bidder and shall remain in effect until execution of the Subcontract. The Bidder agrees that amounts indicated below shall be added to or deducted from the base Bid, for each requested alternate which is accepted. The alternates include all overhead, insurance, profit and applicable taxes.

Alternate	Description	(~~Add or~~ Deduct)	Alternate Price
Alt-3.1	PCL provided parking and jobsite shuttle, Number of spaces 2 - 6 From 5/05 (date) to 11/05 (date)		32,000.00

January 20, 2005

ROSENDIN ELECTRIC, INC.

FOX STUDIOS OFFICE BUILDING
BID PACKAGE #3

SECTION 00060-30
BID FORM
Page 3 of 4

VOLUNTARY ALTERNATE(S): The voluntary alternate prices are offered by the Bidder and shall remain in effect until execution of the Subcontract. The Bidder agrees that amounts indicated below shall be added to or deducted from the base Bid, for each voluntary alternate which is accepted. The voluntary alternates include all overhead, insurance, profit and applicable taxes.

Voluntary Alternate		Description (attach additional description as needed)		Unit Price
		MC Cable Branch Power & Lighting	(Add or Deduct)	10,000.00
		Simplex Fire Alarm	(Add or Deduct)	20,000.00
			(Add or Deduct)	
			(Add or Deduct)	

PAYMENT & PERFORMANCE BOND: Not included in the base Bid price but if required by PCL, a 100% Performance & 100% labor and material bond, can be added for the additional price of $ 15,200.00

Submitted by:

FIRM NAME: Rosendin Electric, Inc.

BUSINESS ADDRESS: 880 N. Mabury Road
San Jose, CA 95133

TELEPHONE: (408) 286-2800 FAX: (408) 297-4644

EMAIL ADDRESS: jbrown@rosendin.com

AUTHORIZED SIGNATORY: John L Brown DATE: February 25, 2005

PRINTED NAME/TITLE: John L. Brown, Vice President Estimating

The person or persons signing this Bid Form on behalf of Bidder hereby represent and warrant to PCL that this Bid is duly authorized, signed and delivered by Bidder.

Remember to enclose Exhibit A, B, C and the Subcontractor Qualification Form as an attachment to the bid form.

January 20, 2005

FOX STUDIOS OFFICE BUILDING
BID PACKAGE #3

END OF SECTION

ROSENDIN ELECTRIC, INC.

January 20, 2005

FOX STUDIOS OFFICE BUILDING
BID PACKAGE #3

SECTION 00060A-30
BASE BID PRICING SUMMARY
Page 1 of 1

Bidder: Rosendin Electric, Inc.

EXHIBIT A
BASE BID PRICING SUMMARY

Bid Category: 30-ELECTRICAL

Item Description	Breakdown of Bid by Project Component			
	PARKING STRUCTURE	OFFICE BUILDING		TOTAL
I. COSTS:				
A. Material & Equipment (including shop labor and freight)	$ 136,000.00	$ 541,000.00		$ 677,000.00
B. Field Erection/Installation Labor	$ 330,000.00	$ 522,000.00		$ 837,000.00
C. Supervision/General Conditions/Overhead	$ 186,000.00	$ 318,000.00		$ 504,000.00
D. Sub-Subcontracts (including material and labor)	$ 42,000.00	$ 100,000.00		$ 142,000.00
TOTAL	$ 679,000.00	$ 1,481,000.00		$ 2,160,000.00
II. INSTALLATION WORK HOURS (On-Site)				
A. Direct or Self Performed Work Hours	5,250 man hrs	8,700 man hrs		13,950 man hrs
B. Subcontractor Work Hours	160 man hrs	100 man hrs		260 man hrs
TOTAL WORK HOURS	5,410 man hrs	8,800 man hrs		14,210 man hrs

January 20, 2005

ROSENDIN ELECTRIC, INC.

EXHIBIT B
HOURLY LABOR RATES
(For changes in the Work only)

BIDDER: ROSENDIN ELECTRIC, INC.

BID CATEGORY: 30-ELECTRICAL

Labor Classification	Base Hourly Rate* ($)	Premium Time Hourly Rate* (Do not use 1.5x Base)	Double Time Hourly Rate* (Do not use 2.0x Base)
~~EXAMPLE~~	~~27.85~~	~~37.50~~	~~45.95~~
APPRENTICE	54.35	72.85	90.88
JOURNEYMAN	70.16	94.83	119.00
FOREMAN	76.49	104.00	131.00

* Includes: All jobsite and home office Overhead and Profit, Fringe benefits, Payroll Taxes, Workers Compensation and Employers Liability Insurance, Travel allowance, small tools (less than $500 value)

Rosendin Electric, Inc.

February 25, 2005

FOX STUDIOS OFFICE BUILDING
CLARIFICATIONS

A. GENERAL CLARIFICATIONS:

Add $15,000

1. Cost breakdown on bid form is for accounting purposes.
2. We are including costs for remote off-site parking, lost time and transportation to and from job site from 04/05 – 12/05 when the garage is complete. We will use the garage for employee parking and material storage from 12/05 through completion.

Material Storage ok
but NO PARKING

3. 600V feeder cables are copper conductors with THWN insulation.
4. Conduits from out door transformer to main switchboard may have to be concrete encased. Form work, reinforcement, engineering and concrete, if required, are by others (suspended from ground floor slab).
5. Concrete light pole bases in dirt are by REI. Pole bases on structural concrete are by others.
6. CAD files for coordination and as-built drawings to be provided free of charge to our engineering department.
7. All work is on straight time. We have reviewed the construction schedule dated 1/17/05 and will comply.

REI's Add $18,200

B. ITEMS EXCLUDED FROM PROPOSAL

1. Utility connection and usage fees.
2. All formed concrete including but not limited to housekeeping and equipment pads.
3. Field painting.
4. Earthquake wires for recessed light fixtures (by ceiling contractor).
5. Sample light fixtures, if required.
6. Drug and alcohol tests except after accidents.
7. Fire rated enclosures at recessed electrical fixtures, if required.

880 N. Mabury Road, San Jose, CA 95133
Phone: (408) 286-2800 Fax: (408) 297-4644

8. Extending conduits, cables and furnishing and installing new circuit breakers in existing FNC building (by Morrow Meadows per Addendum 1 Note, Drawing FEO.6).
9. Furnishing and installing VFD's (by Div. 15).
10. Furnishing automatic transfer switch (by FNC contractor per Drawing EO.4, Addendum Note).
11. Electric door hardware and magnetic door holders.
12. Plywood backboards.
13. Costs for light fixture types F1, F2 & N (to be selected by lighting designer).

ROSENDIN ELECTRIC, INC.

SUBCONTRACTOR QUALIFICATION

Project: Fox Studios Office Building

Subcontractor: Rosendin Electric, Inc. **Definition of Work:** Electrical - 16000

CA Contractor's state license #: 142881
Phone#: (408) 286-2800

A.1 Project Experience:

Name the two largest projects currently under construction:

1) Project: Intel - D1D, Phase 2, Tool Install
Subcontract value: $20,300,000
Contractor: Direct to Owner - Intel
Contractor reference: Matthew Jackson Phone No. (503) 613-2976
Comments: (Adherence to schedule, manpower planning, payment history, etc.)

2) Project: Letterman Digital Arts Center
Subcontract value: $19,400,000
Contractor: Webcor Builders
Contractor reference: Todd Mercer Phone No. (650) 349-2727
Comments: (Adherence to schedule, manpower planning, payment history, etc.)

Name the two largest projects completed by subcontractor within last year:

1) Project: UCSC - Engineering Building
Subcontract value: $ 4,400,000
Contractor: DPR Construction
Contractor reference: Tyler Cox Phone No. (408) 370-2922
Comments: (Adherence to schedule, manpower planning, payment history, etc.)

2) Project: Bremerton Server Farm
Subcontract value: $ 3,400,000
Contractor: Austin Commercial
Contractor reference: Steve Penson Phone No. (214) 443-5764
Comments: (Adherence to schedule, manpower planning, payment history, etc.)

ROSENDIN ELECTRIC, INC.

SUBCONTRACTOR QUALIFICATION

Name largest project ever undertaken by subcontractor:

1) Project: Pac Bell Ballpark
Subcontractors on-site period: July 1999 to August 2001
Subcontract value: $24,200,000
Contractor: Hunt Construction
Contractor reference: Ray Zunino Phone No. (602) 225-9500
Comments: (Adherence to schedule, manpower planning, payment history, etc.)
Duration: Start July 1999 (Forecasted) Completion: August 2001

A.2 Bonding and Insurance:

Name of broker: Arthur J. Gallagher & Co. Phone# (925) 460-9900
Could subcontractor provide a performance bond for this project if required ?
Yes XXX If "Yes" Bond Rate $ .72 /1000 No
Current Workers Comp EMR Rate 60%
Three year OSHA Citation History (1) Serious citation received in 2002 for having an employee working in a bucket truck without fall protection connected to an anchor point.

A.3 Union Affiliation:

Carpenters X Laborers X Cement Masons ___ Iron Workers ___
Others
IBEW, Operating Engineers

A.4 Corporate Structure:

Subcontractor is a X private ___ public company.
Parent company: N/A
Subsidiary companies: N/A

A.5 Parental Guarantee:

Will parent company provide guarantee ?
Yes N/A No N/A

A.6 Financial Information:

Information obtained from:
- Audited financial statements XXX
- Published financial statements
- Dun & Bradstreet reports
- Other (specify)

Financial reports for period ending: December 31, 2003
Working capital: Financial Statement to be provided upon further request.
Equity: Financial Statement to be provided upon further request.

ROSENDIN ELECTRIC, INC.

SUBCONTRACTOR QUALIFICATION

Banking reference:

Institution Name Harris Nesbitt Investment & Corporate Banking Phone # (312) 461-4605 Fax #

Address 111 W. Monroe Street, Chicago, IL Contact/Manager William Veal

Account# 109-535-5

Comments:

Supplier Reference:

Supplier: Independent Electric Supply, Rich Butler

Address/Phone/**Fax**: 755 Evelyn Ave., Sunnyvale, CA

(408) 534-2894 - Phone (408) 295-9530 - Fax

Supplier: All-Phase, Troy Nunes

Address/Phone/**Fax**: 351 E. 9th Street, Gilroy, CA

(408) 848-5225 - Phone (831) 336-8069 - Fax

Supplier: GE Supply, Dave Singh

Address/Phone/**Fax**: 31285 San Clemente Street, Hayward, CA

(510) 476-3434 - Phone (510) 476-3460 - Fax

Date

Subcontractor Signature

Rosendin Electric, Inc.

March 4, 2005

Michael Khouri
PCL Construction Services
200 Burchett Street
Glendale, CA 91203

Via Fax (310) 203-9483

Project: Fox Studios Office Building

Gentlemen:

We are pleased to submit the following post bit information as requested.

1. PCO # 84 – Add (1) 4" conduit between telephone rooms on 5th floor .....ADD $ 7,000.00

2. Add cost of laborer for site clean up crew to be directed by PCL. Man hours based on 8 MH laborer for every 400 MH electricians.
   14,000 MH ÷ 400 = 35 x 8 hrs = 280 hrs at $40.00/hr ADD $ 11,200.00

3. Add costs for off-site parking and transportation throughout project duration.
   (No parking permitted in garage).....ADD $ 156,000.00
   * Includes Labor per Union Agreements

Thank you for the opportunity to work with PCL on this project. Please contact the undersigned if you should have any questions.

Very Truly Yours,

Rosendin Electric Inc.
John L. Brown
Vice President Estimating

880 N. Mabury Road, San Jose, CA 95133
Phone: (408) 286-2800 Fax: (408) 297-4644

TAB 4

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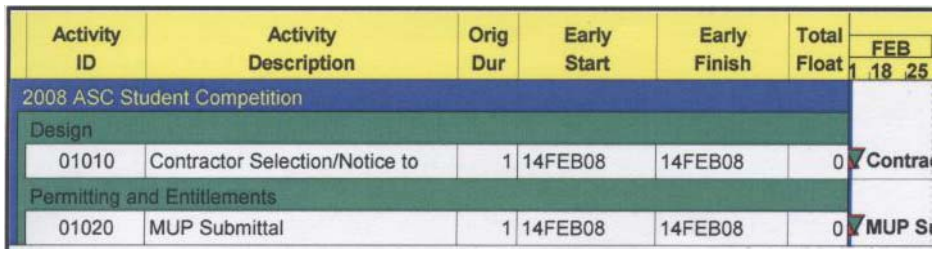
4. Schedule

As part of your review with management, you will be required to present a complete, workable Critical Path Schedule (CPM) to plan the work within the guidelines prescribed below. As this is a preconstruction services problem, upper management is equally interested in the activities and your thought processes in the preconstruction phase as in the construction phase. The schedule is to convey your teams plan to fully execute the project from cradle to grave.

The following criteria explain the background information and requirements of the CPM schedule you team will present.

1. General Schedule Criteria:
    a. Presentation Criteria:
        i. Format:
            1. At minimum, show Activity ID, Activity Description, Original Duration (OD), Early Start (ES), Early Finish (EF), and Total Float (TF), per activity (see Figure "A" below)
            2. Organize and sort Preconstruction activities grouped together with construction activities following.

Figure A: Schedule Activity Example



Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	FEB 1 18 25
2008 ASC Student Competition						
Design						
01010	Contractor Selection/Notice to	1	14FEB08	14FEB08	0	Contra
Permitting and Entitlements						
01020	MUP Submittal	1	14FEB08	14FEB08	0	MUP S

        ii. Activity Count: 150- 200 activities
        iii. Provide a sufficient amount of preconstruction and construction activities. Include design, permitting and entitlements, easement negotiations, long lead and construction activities
        iv. Show the logic between activities
        v. Clearly show the critical path of the schedule
        vi. Organize activities so they are easy to read, activities are grouped intuitively and the schedule flows well.

    b. Contractual Criteria
        1. Project Start Date for Preconstruction (Notice to Proceed): February 14, 2009
        2. Preconstruction Period: 7 Months
        3. Project Duration: 19 Months

4. Minimum Milestones to be presented on CPM Schedule:

Contract Award	Permit Submittal (S)
Design Complete	GMP Estimate
Begin Demolition	Parking Structure Complete
Completion of Shoring and Excavation	Structural Steel & Mtl Decks Complete
C of O Inspections	Substantial Completion
Building Enclosure Milestone	Final Completion

5. Assume the following calendar holidays: May 26, 2009, July 04, 2009, September 01, 2009, November 26- 27, 2009, December 25, 2009, January 21, 2010, *June 01, 2010*, *July 05, 2010*, September 01, 2010, November 25-26, 2010, December 25, 2010, January 01, 2011.

2. Preconstruction Phase Criteria:
   a) The Architect and consultants will be 75% complete with the Construction Document phase on February 14, 2009.
   b) The permitting agency will allow phased permitting for shoring and excavation, foundation only, and remaining structure.
   c) Estimates will be required at the completion of each design phase

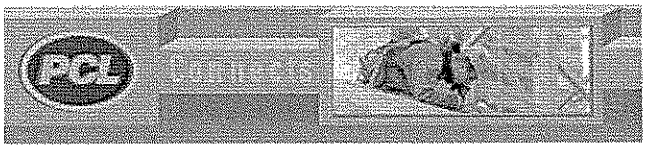
3. All other work criteria:
   a) Original durations for the demolition, excavation, shoring, concrete structure, steel and etc. shall be derived on a (rough) quantitative basis per the "Typical Construction Activity" worksheet and explanation included in the scheduling section of the Supplemental Information. Use the worksheets to calculate durations based upon (rough) quantities that you survey, then divide by a productivity rates that you derive. You may use RS Means or other productivity data resources to help if needed.
   b) Scheduling of all work should support the assumption made by the Site Logistics Plans drafted in Section 5 below
   c) Review the plans thoroughly. Ensure that your schedule encompasses as much of the work possible in the limited number of activities you are required to provide.
   d) Your team may begin construction anytime, provided you have your first permit in hand. You may lag activities as you see fit and are reasonable logic assumptions.
   e) The last activity in your schedule should be Final Completion.

General comments:

1. Do not resource load or cost load your schedule
2. Preconstruction may overlap construction.
3. When it comes to scheduling, there are not right or wrong answers. Ensure that your team can substantiate and explain all of the assumptions and decisions made in the process of developing your schedule.

Deliverable:

1. *Preconstruction Schedule*



Common Construction Activity Durations

These common construction activities and duration "rules of thumb" can help you build your baseline project schedule. All durations are estimates and may vary from one project to another.

CSI Division 01: General

- Overall schedule duration estimate: 1 month per underground level of excavation, 2 weeks in the bottom of the hole, 1 month per underground level to come out of the hole, 1 month per level above ground, 2 months from structure completion to building watertight, 4 months from building watertight to substantial completion.
- Cranes: 1 month allowance after structure top off before taking down crane, 12,000 SF floor plate is the upper limit for one tower crane
- Critical schedule milestones: Design, Pemits, Mobilization, First Work Items, Temporary power, Tower Crane Set Up, Start of Structure, Completion of Structure, Building Water Tight, Permanent Power, Commissioning, Occupancy - Inspections, Owner Specific Move-In.

CSI Division 02: Site construction

- Demolition: 28 M3 (1000 CF)/day, 8 person crew
- Excavation: 500 M3 (18000 CF) to 1000 M3 (35000 CF) /day
- Fine Grading: small areas 300-500 sy/hr, large areas 500-800 sy/hr
- Asphalt Paving: small areas 500-1000 tons/day, large areas 1500-2000 tons/day
- Concrete Paving: Small Areas 30 sy/hr Large areas 50 sy/hr
- Caissons: 2100mm bell X 5500mm deep = 4 piles / day using a 3 man crew
- Auger cast piles: 6 auger cast piles per day 18 inch diameter, 4' to 6' diameter caisson 50 feet deep in one day, 15-20 vertical feet/hr (holes up to 48" diamemter)
- Driven piles: 7 piles/day, 18 M (60 FT) long, typical 4 man crew
- Shoring: 8 to 12 H piles per day drilled or pounded, 4 tie backs per day
- Storm sewer: RCP > 24 inches = 45 to 61 LM (150 to 200 FT) /day, RCP < 24 inches = 31 to 45 LM/day, 5 man crew
- Water distribution: 31 LM (100 FT) /day typical 5 man crew
- Landscaping

CSI Division 03: Concrete

- Tying Rebar: 100 to 250 lbs/manhour
- Concrete Placing: 10000 - 8000 SF / week / tower crane for a typical

floor, 8000 - 6000 SF / week / tower crane if fly forms cannot be used, 4000 - 6000 SF / week / tower crane if heavily gridded with beams. 2.5 to 5 cy/mhr Large slab on grade or slab on metal deck concrete pours
- Formwork Erection and Stripping: 5 sf/mhr to 10 sf/mhr (this would be for handset type formwork not large gang forms that are crane set. Built in place formwork would be in the low end of this range.)
- Lagging for Shored Excavations: 1 sy/mhr
- Footings (pad): 1.564 M2 (17 SF)/man/hr to 4.283 M2 (150 SF)/man/hr, typical 5 man crew
- Footings (continuous): 1.86 M2 (20 SF)/Man/hr, typical 5 man crew
- Grade beams: 1 LM (3.3 FT)/manhour
- Foundation walls: 2.1 M2 (22 SF)/man/hr
- Foundation wall rebar: 7 to 10 manhours/tonne
- Concrete finishing: 1200 - 1500 SF / DAY / cement finisher
- Concrete Wall Cycle: 20 linear feet per day
- Suspended slab rebar: 7 manhours/tonne
- Slab On Metal Deck
- Precast structural panels: 20 panels/day, 6 man crew
- Precast spandrel panels: 30 to 40 panels/day, 6 man crew

CSI Division 04: Masnory

- Masonry block: 160 blocks/mason/day
- Masonry block (warehouse): 350 to 400 blocks/mason/day
- Masonry block (high storage): 500 blocks/mason/day
- Brick: 700 to 800 bricks/mason/day

CSI Division 05: Metals

- Structural steel erection: 35 tons/day or 35 pieces/day/hook, 5 man crew
- Metal Deck: 30000 SF/month
- Misc Metals
- Ornamental Metals & Handrails
- Expansion Joints
- Aluminum Ceiling & Assemblies

CSI Division 06: Wood & plastics

- Rough carpentry (backing and blocking)
- Finish carpentry: use 27% of contract value, typical crew size 5 to 10 men
- Architectural woodwork: use 27% of contract value, typical crew size 5 to 10 men

CSI Division 07: Thermal & moisture protection

- Waterproofing
- Water Repellant Coatings
- Exterior Insulation Finish System (EIFS): 100 SF/day/installer
- Exterior wall assemblies: 185 M2 (2000 SF)/day typical
- Metal Wall & Roof Panels
- Roofing: EPDM ballasted: 1000 M2 (10,000 SF)/day typical 8 man crew. Built up roof: 175 M2 (1900 SF)/day typical 6 man crew. Standing seam roof: 50 M2/day typical 15 man crew

- Spray Fireproofing: 3000 to 5000 SF/day
- Caulking & Sealants

CSI Division 08: Doors & windows

- Windows: 1200 SF/day
- Curtainwall: Panelized system: 2500 SF/day, typical crew size 7 men. Stick built: 750 to 1250 SF/day, typical crew size 7 men
- Hollow metal door frames: 2 manhours/frame, 8 frames installed per day, 2 man crew
- Hollow metal door and hardware: 4 manhours/door, 1 man crew
- Overhead doors: 1 door/day, 2 man crew
- Door hardware

CSI Division 09: Finishes

Interior finishes follows structure 6 to 8 floors behind, due to need for reshoring, eye brow of fly forms preventing drifting of loads underneath, and the need for a rain barrier between the top concrete deck and finishing floors. The status of elevators will dictate the completion of interior finishes. One month after elevators are complete is usually enough time to complete interior finishes.

- Metal Studs: 45 M2 (500 SF)/day, 1 man crew
- Drywall hang, tape, finish: 140 M2 (1500 SF)/day, 5 man crew, 5/8" drywall
- Drywall ceilings: 900 SF/day
- Tape and Finish Gypsum Board
- Ceramic and Quarry Tile: 250-300 SF/day/2 man crew
- Grouting tile: 500-600 SF/day/2 man crew
- Terrazzo: 130 SF/day/2 man crew
- Acoustical Ceiling Grid: 2000 SF/day
- Acoustical Ceiling Tile: 2000 SF/day
- Carpet: 1500 SF/day
- Resilient Flooring, Rubber Base
- Painting, Vinyl Wall Coverings
- Special Flooring

CSI Division 10: Specialties

- Toilet Partitions: 5 to 10 stalls/day/installer
- Toilet Accessories
- Louvers and Vents

CSI Division 11: Equipment

- Audio/Video equipment
- Security equipment
- Maintenance equipment
- Parking Control Equipment
- Detention Equipment
- Water Softening Equipment
- Building Maintenenance Fall Arrest Equipment

CSI Division 12: Furnishings

- Artwork
- Casework
- Furnishings

CSI Division 13: Special construction

- Swimming pools
- Security cameras
- Solar panels

CSI Division 14: Conveying systems

- Elevators: Hydro: 4 weeks/elevator, 2 man crew, Traction: 18 weeks/elevator, 2 man crew. 4 to 5 months to build elevators after dry in of machine room, 2 months before the first car becomes available after dry in of machine room, 1 month to refurbish the car used during construction and put it in control group.
- Hoists: Hoists will be needed for structures with a roof height 65 feet or more above ground,
  Hoists will be needed until the first elevator can be used during construction, 2 months to close in hoist bay after removal.
- Escalators: 6 weeks/escalator, 3 man crew

CSI Division 15: Mechanical

Use 45% of contract value for labor divided by $65/hour to calculate total manhours

- Underground Storm pipe
- Sanitary sewer pipe: 50 LF / day
- Pipe laying: 2 to 3 joints per hour (storm drain pipe up to 48" diameter with excavation less than 10' deep and open cut)
- Rough in Fire Protection Lines
- Fire Protection Trim
- Rough in Plumbing
- Plumbing Fixtures
- Rough in Mech Piping
- Mech Equipment
- Rough in Ductwork & Equipment
- HVAC Trim
- Mech Start-up & Commissioning
- Air Handling Units
- Heat Exchangers
- Pumps
- Cooling Towers
- Centrifugal Chillers
- Steam Boilers
- Supply and return fans
- Variable Frequency Drives
- Terminal Units VAV boxes

CSI Division 16: Electrical

Use 45% of contract value for labor divided by $65/hour to calculate total manhours

- Underground Electrical Rough-In
- Rough-In Elect Conduit & Panel Boards
- Electrical Pull Wire & Terminate
- Electrical Switchgear & UPS Equip
- Electrical Light Fixtures
- Electrical Trim & Test
- Rough-In Elect Fire Alarm
- Temperature Controls Wire & Trim
- Security System Wire & Trim
- Switchgear
- Transformers
- Generators
- Distribution Panels
- UPS System
- Fire Alarm Panels

CSI Division 17: Close out

- First Cleaning
- Contract Work Completed
- Trade Damage Repair
- Final Painting and Touch Up
- PCL Punchlist and Correction
- Second Cleaning
- Owner Punch List identification
- Owner Punch List Correction
- Final Cleaning
- Owner Acceptence
- Owner Install Fixtures, furnishings, and equipment

Send questions or comments to: Mike Haponiuk **Target Audience:** PCL family of companies

Publication Date: 10/04/2004 **Publisher:** Mike Haponiuk

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TAB 5

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5. Site Logistics

The Fox Studios 103 Project is located on the corner of Pico and Ave of the Stars, bordered by the main entrance to Fox Studios and an existing office building. There are currently no nearby parking lots, no parking on Ave. of the Stars and very limited parking on Pico. The PCL trailer will be 60' X 30', the Plumber's, Concrete subcontractor's and Electrician's trailers will be 30' X 12'.

Site Plan

Use the full size drawing (C-1.01) to create your site logistics plan. Other drawings may be used if you determine them necessary to fully explain your plan. Your plan can add or omit items from the basic list below, as long as a valid reason is present and that your logic does not violate code requirements or jurisdictional limits. Ensure that the locations of all items listed below are coordinated with future work activities, so they do not impede construction progress. In addition, if your site utilization changes/evolves throughout the project, describe any such changes. Include the following without limiting to:

- Project Office location
- Parking
- Location of subcontractor offices
- Locations for temporary fences
- Location of access roads and gates (union and non-union)
- Project and required signage (location and what signs are needed)
- Location of temp services; Power, Trash, etc
- Temporary Toilet Locations for 200 workers
- Laydown areas
- Location and boom radius of crane(s)
- Personnel/material hoist location (at different times in the project if needed)
- Concrete Pumping locations
- Delivery locations for staging and unloading
- Stair towers, if used.
- Emergency evacuation location
- Any SWPPP (erosion control) necessary
- North Arrow
- Any other items that your team things should be on the plan

In addition to a graphical plan provide written narrative to further explain the site utilization plan prepared by your team. When site work is to take place, briefly explain any conflicts that might occur with locations of trailers, etc. and completing all of the landscaping and site work. Provide a brief explanation of how these conflicts will be coordinated and resolved. If there are no foreseen conflicts, briefly explain how the site utilization plan was coordinated with the final site work.

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6.) Cash Flow Analysis

As part of its financial analysis, the Owner needs to understand its cash flow requirements. As part of your submittal, prepare separate cash flow analyses for the Preconstruction and for the Construction phases of this project.

- Use the excel spreadsheet cash flow program to derive applicable cash flow projections.
- Completion of this exercise will require information from the budget exercises in section 3 and the schedule exercises in section 4.
- Use the Contractual Criteria for durations of each phase.
- Assume 10% retention for the each phase to be paid 60 days after completion.
- Assume billing on the 25th of the month and payments will be on the 25th of the following month.
- Assume a tolerance of Zero.

Deliverables for this exercise include;

- Cash Flow Worksheet
- Summary Cash Flow Graph
- Cash Flow Graph for each Project Phase

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CASH FLOW WORKSHEET V3.4

Release Notes Downlaod Current Version Need Help?

Title 1	**Project Name Here**
Title 2	**Prepared by ??**
Title 3	**Cash Flow Report**

Show Details: Graph: ☑ **TRUE** Actuals Data: ☑ **TRUE** Curve Data: ☑ **TRUE**

Number of Phases

Retention %

Monthly Billing Day
i.e. 25th of the month

Payment Due (Days)
Amount of days after the Billing Date.

Tolerance (20 is recommended)

HB Release (e.g. 45 days)
HB Released by Phase (If HB Released by Phase is left blank, default is No)

Notes:
The more phases you add, the longer the program takes to produce the chart. For 10 phases, it should take approximately 90 seconds to finish.

Using 0 in monthly billing day will give you the last day of each month.

Use a new (clean) template for each new project or "what-if" analysis.

To add actual billings go to relevant phase and key in billings manually. Then click the

Phase	1	2	3	4	5	6	7	8	9	10
Contract (Phase) Value										
Start Date (MM/DD/YYYY)										
Completion Date										
Initial Billing per S-Curve										
Initial Billing Override										
HB Release Date	1/31/1900									

(days after project completion and adjusted to the next billing day)

Program Modifications
Version V2.01 Release Notes
Version V2.10 Release Notes
Version V2.11 Release Notes
Version V2.12 Release Notes
Version V2.13 Release Notes
Version V3.0 Release Notes
Version V3.1 Release Notes
Version V3.2 Release Notes
Version V3.3 Release Notes
Version V3.4 Release Notes

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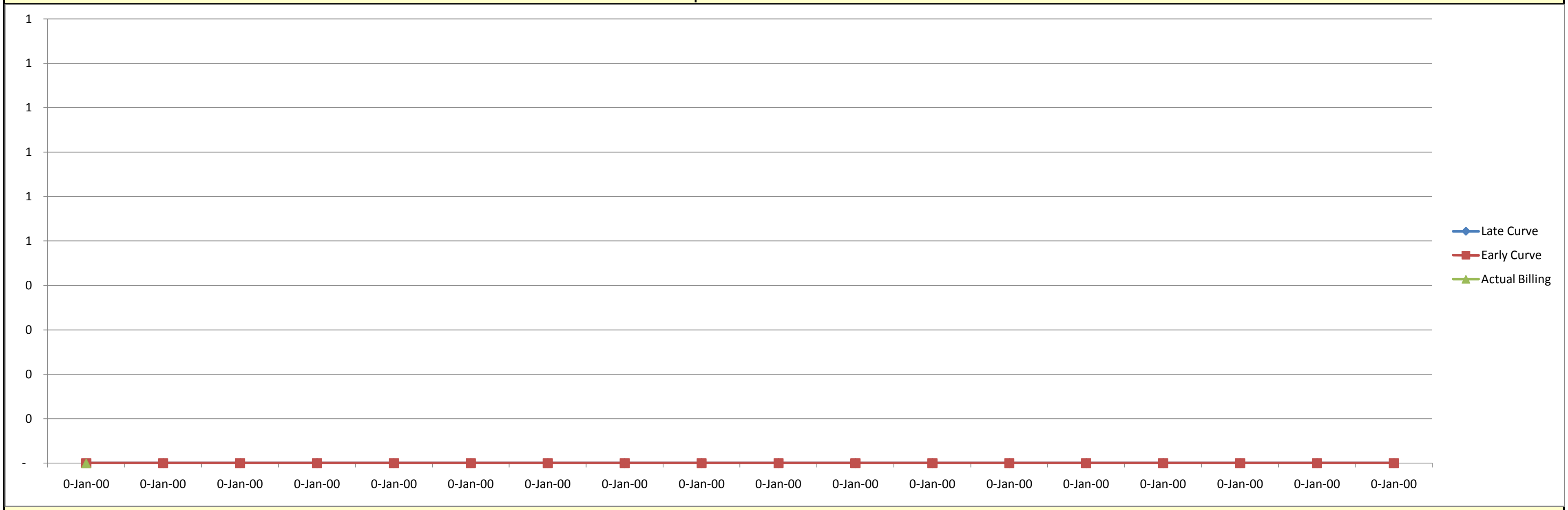
Project Name Here - Summary

Prepared by ??

Cash Flow Report



Total Project Period: January 0, 1900 To January 0, 1900

Total Project Value: $00

		This Period			Cumulative				Late Curve		Early Curve		Actual Billing		Expected Payment		
Draw Date	**Duration%**	**Gross Billing**	**Retention**	**Net Billing**	**Gross Billing**	**Retention**	**Net Billing**	**SpreadFactor**	**Monthly**	**Cumulative**	**Monthly**	**Cumulative**	**Monthly**	**Cumulative**	**Date**	**Monthly**	**Cummalative**
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Highlights of the new S-Curve Projected Cash flow Worksheet

- The S-Curve builds a table for and graph depicting projected cash requirements.
- Allows you to define up to 10 phases.
- Allows you to input Actuals for the first month of each phase adjusting projected curve.
- Allows you to Adjust Gross Billing, by putting values into the Adjusted Gross Column for each phase.
- Allows retention to be release at the end of each phase or at the end of the project.

Setting up the Worksheet

Row 4 — Input the Project Name.

Row 8 — Show Details: Choose one of three options to define the specific data you want to print; there are three different selections that produce different report formats depending uponthe stakeholders requirements.

Row 10 — Numbers of Phases: To get a better cash flow projection on the project, the use of multiple phases is recommended. Distinct phases of one project that could be incorporated into the cash flow projections could include:

- Parkade
- Hotel
- Common Retail Area
- Water park

Row 12 — Retention %: Holdback from owner.

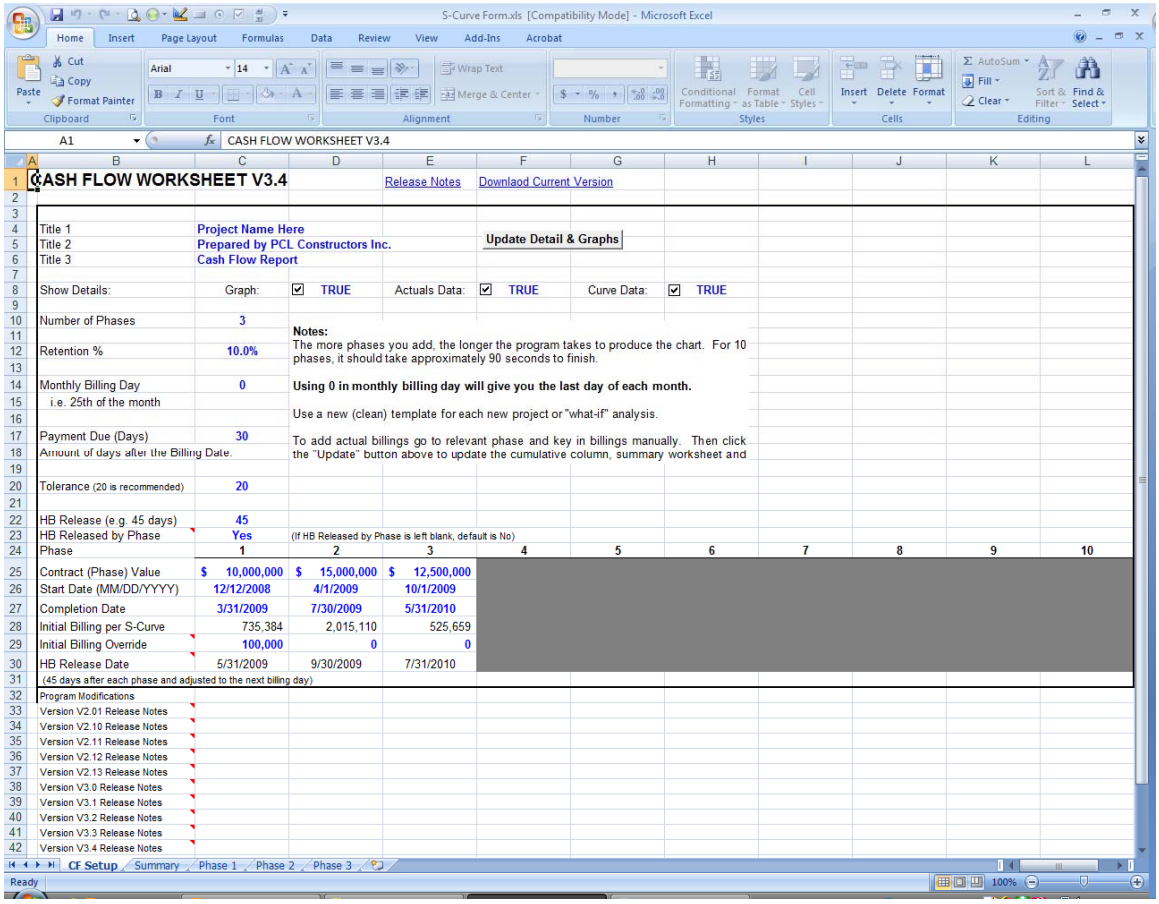
Row 14 — Monthly billing days: The date of the month when the billing is initiated. Use 0 for the last day of each month.

Row 17 — Payment Due: You can set the number of days to offset from the billing day for the expected payment date.

Row 20 — Tolerance: A tolerance of 20 is recommended for use at PCL.

Row 22 HB Release: The number of days after each phase is complete when holdback is released (adjusted to the next billing day).

Row 23 HB Released by Phase: If yes, then all phases will be released. If no, all holdbacks are released at the end of the project.



Row 25 For each phase that you have requested, define the contract value for each phase.

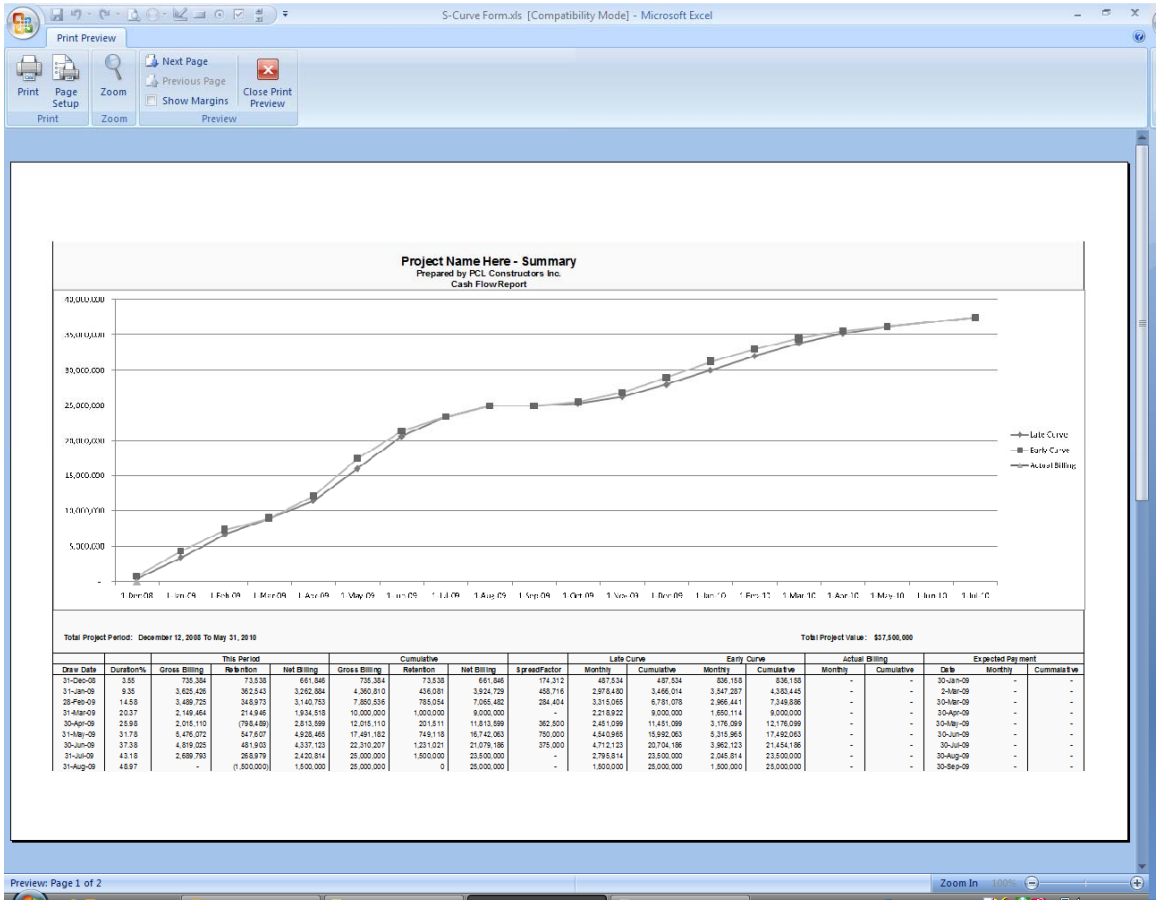
Rows 26 -27 Define the Start / Completion date for each phase.

Row 28 The spreadsheet will approximate the initial billing based on the S-Curve.

Row 29 Override only the first months billing numbers as required updating the curve of projected cash flow analysis. The spreadsheet only allows the first month to be overridden.

Graphical Output and Numerical Projections

Row 5 Press the “Update Details and Graphs” to update your graph and projected cash flows.



You can view the summary tab or the detail by each phase by selecting one of the tabs at the bottom of the worksheet.

Print the graphical report or numerical projection as required.

Press the “Close” button on the top middle of the screen to close the graph and return to the spreadsheet.

As you need to make adjustments to Gross Billing and Actual billing for the phases the values entered into the different phases will update the Summary sheet and Graphs.

		Cumulative				Late Curve		Early Curve		Actual Billing	
Calculated Gross	Adjusted Gross	Gross Billing	Retention	Net Billing	SpreadFactor	Monthly	Cumulative	Monthly	Cumulative	Monthly	Cumulative
1,142,34		1,142,341	114,234	1,028,107	245,902	782,206	782,206	1,274,009	1,274,009		-
5,298,54		5,298,543	529,854	4,768,689	563,525	3,422,959	4,205,164	4,058,204	5,332,213		-
9,553,19		9,553,198	955,320	8,597,878	379,098	4,013,615	8,218,780	3,644,763	8,976,976		-
12,179,77		12,179,773	1,217,977	10,961,796	61,475	2,681,541	10,900,321	2,046,295	11,023,271		-

New columns have been added to allow the user to see when the payments should come in. You can set the Payment offset in the CF Setup.

Expected Payment		
Date	Monthly	Cummalative
30-Jan-09	-	-
2-Mar-09	-	-
30-Mar-09	-	-
30-Apr-09	-	-
30-May-09	-	-
30-Jun-09	-	-
30-Jul-09	-	-
30-Aug-09	-	-
30-Sep-09	-	-
30-Oct-09	-	-
30-Nov-09	-	-
30-Dec-09	-	-
30-Jan-10	-	-
2-Mar-10	-	-
30-Mar-10	-	-
30-Apr-10	-	-
30-May-10	-	-
30-Jun-10	-	-
30-Aug-10		-

TAB 7

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7. Mechanical Problem for ASC Competition

The new Fox Office Building was intended to be served by the campus chilled water plant. The existing central plant currently serves about 50% of the campus buildings and is running at full capacity. An expansion of the existing central plant is in design. This plant expansion would not only serve the new office building, but other campus buildings that are not currently connected to the plant. Construction completion was planned to coincide with the completion of the new office building.

Due to the current economic downturn, the Fox management has is considering cancelling the $35 million central plant expansion project. This creates a major problem of how to provide chilled water for the air conditioning of the new office building.

At the P4 level of the building there is currently a storage area that just happens to be large enough to house the chillers and their associated pumps and the roof has an area that can accommodate the cooling towers. A route will need to be established for the condenser water piping from the P4 level mechanical central plant to the roof.

As the general contractor, the owner (Fox) has requested that you provide a rough order of magnitude (ROM) budget to add a chilled water plant to your building. Do not incorporate this exercise into your answers for any other section of the Preconstruction problem. This is just one of several potential solution being considered by the Owner.

In order to establish your ROM budget here are the parameters:

- Total capacity of the chilled water plant needs to be calculated. The coil data for the built-up air handling units and the fan coil units have the total cooling capacities specified on the mechanical schedule. To these loads add 10 tons per office level for miscellaneous tenant cooling loads.

  MBH = 1000 BTU/Hr

  1 ton = 12,000 BTU
  rule-of-thumb check approximately 400 cfm / ton
- There will be 2 chillers, each sized at 60% of the system total load. Note that chillers are up-sized so that should a chiller be down for service, the capacity of one chiller could maintain air conditioning during normal outdoor conditions. The budgetary installed cost of a chiller is $280 per ton.
- Each chiller will have a chilled water pump and a condenser water pump. Capacities of the pumps are determined by the following equation:

  BTU = GPM x 500 x differential temperature

  chilled water system 16°F temperature differential (44°F > 60°F)
  condenser water system 10°F temperature differential (95°F > 85°F)

  The budgetary installed cost of a pump is $9.00 per gpm.

- Cooling towers have a budgetary installed cost of $126 per ton.

- Budgetary piping costs for the chilled water plant are $326 per ton. This is based upon a close-coupled plant; meaning that the cooling towers are located adjacent to the chillers. Since the cooling towers are located on the roof, condenser water piping costs (supply and return) from the P4 level central plant to the roof will need to be added.

6" dia pipe	220>700 gpm	$82 per LF
8" dia pipe	700>1,200 gpm	$108 per LF
10" dia pipe	1,200>2,000 gpm	$146 per LF

  In addition the chilled water piping will have to be extended from the P1 level to the P4 level central plant.

- The other sub trades have provided the following budgets for the plant addition:

Electrical	$220,000
Architectural / Structural	$85,000
Temperature Controls / BAS	$125,000
Crane & Rigging	$35,000
Fire Protection	$15,000

- The scheduled completion of the project will have to be extended by 4 months due to the addition of the chilled water plant (design and permitting). General Condition's costs are at $110,000 per month.
- Fee on top of all costs for this potential has been negotiated with the owner at 5%.
- You will probably want to look at sheets M-.02, M-1.04, A2.10, A-2.11, A-3.01

<u>Deliverables;</u>

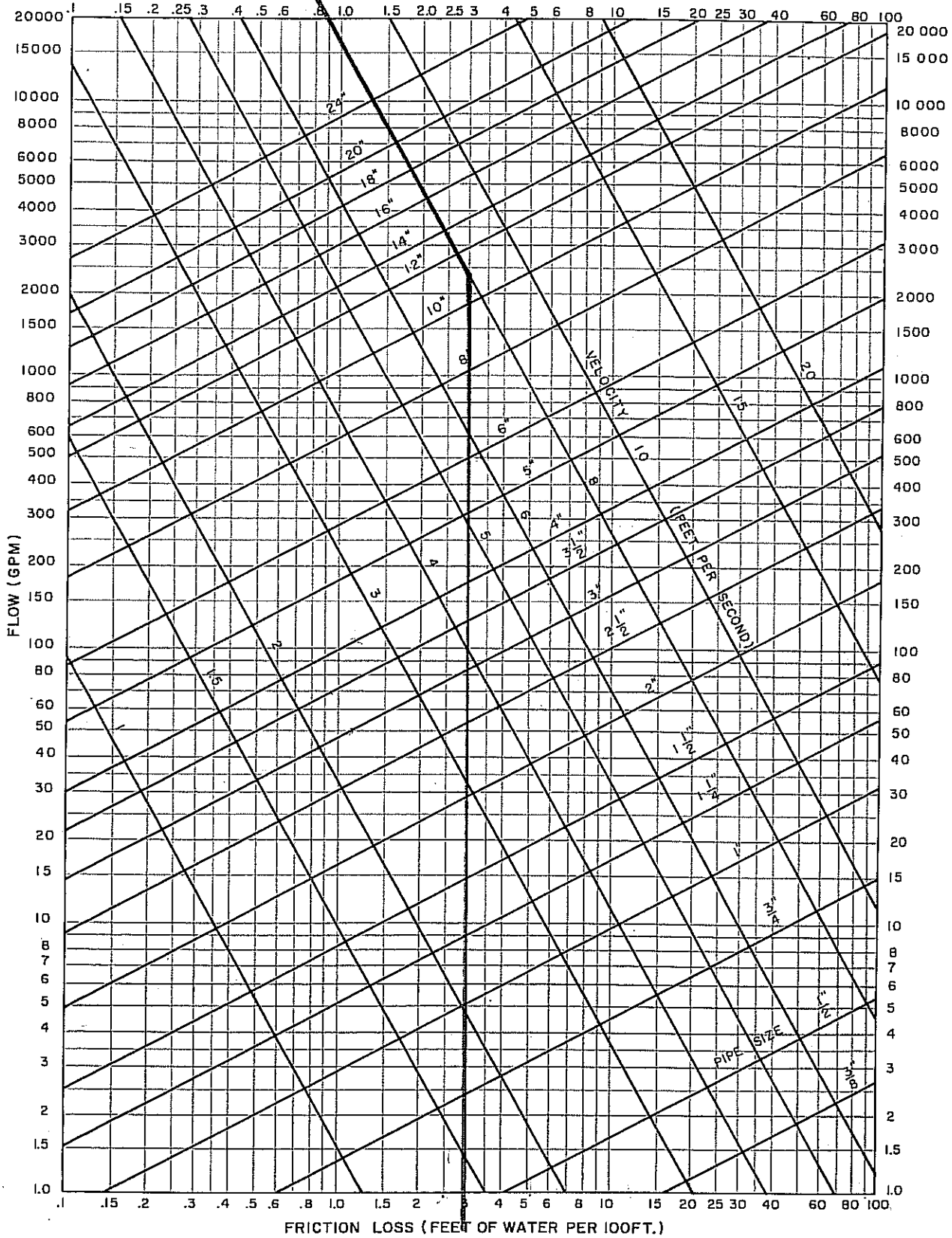
- Calculations for cooling loads, equipment selection, pipe sizing/quantities
- ROM budget estimate for this potential change
- Sketch of proposed roof top equipment and piping
- Sketch of proposed P4 chiller plant equipment and piping risers
- Sketch of proposed roof top equipment in building elevation

REFERENCE

ACCEPTABLE LIMITS

CHART 4—FRICTION LOSS FOR OPEN PIPING SYSTEMS

Schedule 40 Pipe



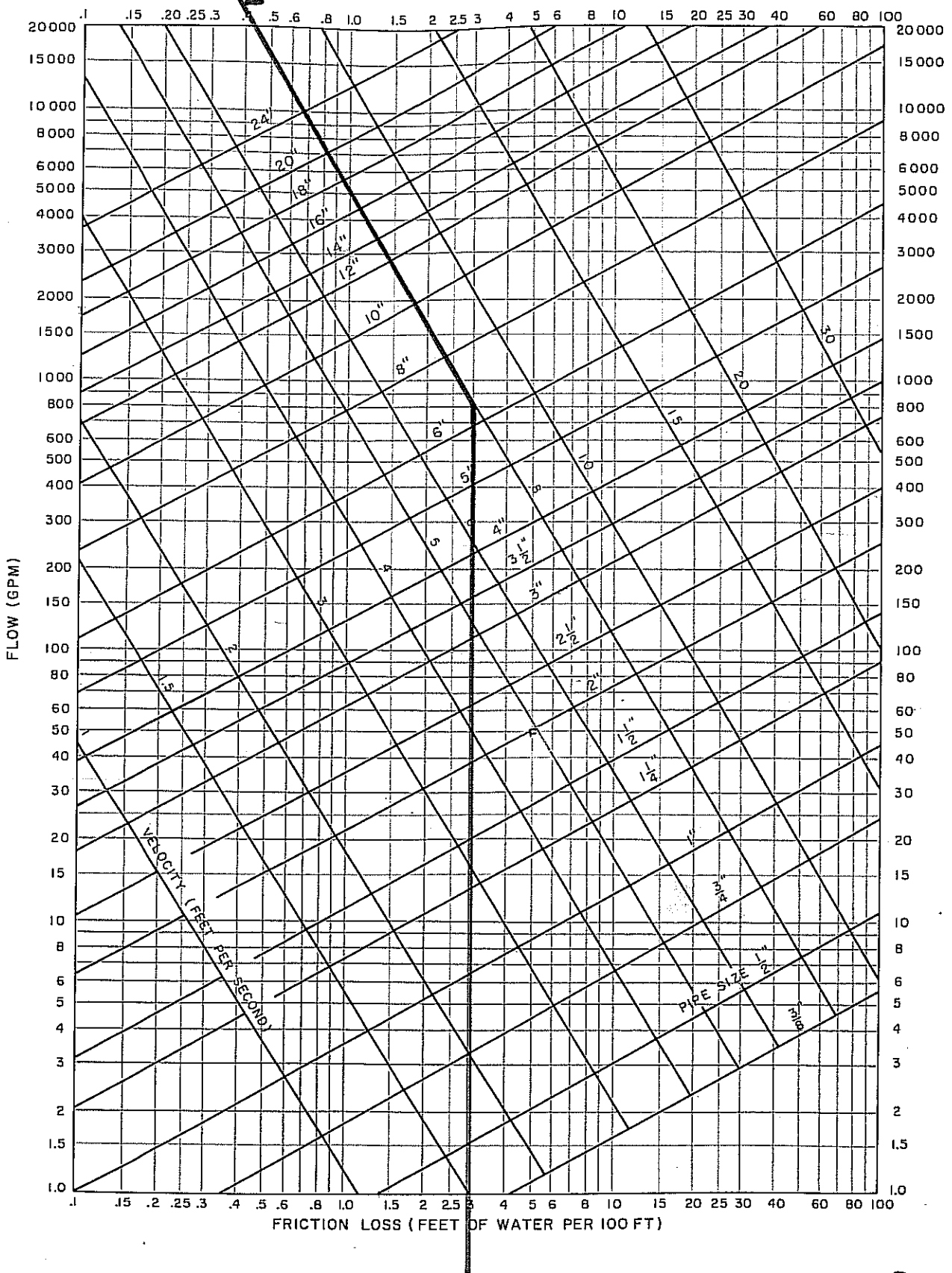
PAGE 3

REFERENCE

ACCEPTABLE LIMITS

CHART 3—FRICTION LOSS FOR CLOSED PIPING SYSTEMS

Schedule 40 Pipe



PAGE 4

TABLE OF EQUIVALENTS

Lengths

1 foot = 0.3048 meters
1 kilometer = 0.621 miles

Capacities & Volumes

1 cubic foot = 7.481 gallons of water
1 cubic yard = 0.765 cubic meters
1 gallon of water = 8.33 pounds
1 gallon of water = 3.785 liters

Weights & Mass

1 kilogram = 2.205 pounds
1 ton = 2000 pounds
1 metric ton = 1.102 tons

Electrical

1 HP = 748 watts
1 KW = volts x amps (x 1.73 for 3Ø only)

Pressure

1 psi = 2.31 feet of water
1 psi = 2.036 inches of mercury

Temperature

°C = [°F - 32] x 5/9
°F = [°C x 9/5] + 32

Energy

1 cubic foot (natural gas) = 1100 BTU (with specific gravity of 0.65)
1 therm = 100,000 BTU
1 gallon (fuel oil) = 140,000 BTU (approximately)
1 ton (coal) = 27,000 MBTU (average)
1 ton of refrigeration = 12,000 BTU per hour
1 watt = 3.42 BTU per hour
1 HP = 2545 BTU per hour
1 boiler HP = 33,479 BTU per hour output
1 boiler HP = 30 pounds steam per hour (w/feedwater temp of 100 °F. & 70 lb. press.)

Miscellaneous

BTU = gpm x 500 x temp. Δ
pump HP = [gpm x feet of head] / 3960
sensible heat (Q_s) = 1.1 x cfm x temp. Δ
latent heat (Q_l) = 0.69 x cfm x grain Δ
Total heat (Q_t) = 4.5 x cfm x enthalpy Δ

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TAB 8

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8. ASC 2009 PCL BIM Problem Statement

The new Fox Office Building is just south of an existing office building (FNC Operations Building) with 3 stories of underground parking, see sheet A-1.02A. There is a bundle of fiber optic cables running underground between the two buildings, see sheet C-1.02. These fiber optic cables transmit the entirety of Fox's programming to the outside world. The cost of damaging these cables is 5 Million Dollars a minute of interrupted service. All necessary precautions need to be taken to avoid damaging these cables when drilling shoring tie-backs for the new building.

The shoring engineer designed the tiebacks for the north underground wall to enter the ground per the SH- series drawings, but he did not have all of the as-built information of the existing conditions.

We have established a 7'-0" "safety zone" from all sides of the 11"x11" conduit bank that the tieback can not violate. See C-1.20. Determine if the tiebacks at soldier pile #36 and #1 (4 total, 2 at each soldier pile) violate the safety zone and or conflict with any other existing conditions. (You may assume sections 1 and 4 on C-1.02 are cut at the tiebacks at soldier piles #36 and #1)

If the tiebacks conflict with the safety zone or any other existing conditions determine the most efficient tie-back angle to resolve the conflict. Tieback length increases 2'-0" for every 5° see Tieback Angle Variance Chart. Maintain 5'-0" clear between Tiebacks. The longer the tieback the more it cost to install.

The solution for this problem may be determined and presented with 3D software, 2D software or by hand sketches and manual calculations.

Electronic .dwg files have been provided for your solution development utilizing software. Your team may choose to develop a manual solution.

<u>Deliverables;</u>

- Narrative indicating revisions, if any, to the 4 tiebacks.
- Sketches/cross sections to visually demonstrate location of tiebacks in relation to the existing conditions.
- Optional-Prints of any 3D images to visually demonstrate problem solutions.

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(E) FNC OPERATIONS BUILDING

AVENUE OF THE PALMS

(E) LANDSCAPED AREA

NEW CONCRETE CURB

ASSUMED PROPERTY LINE

30'-0" (TYP.)

1:20 MAX

1:20 SLOPE MAX.

NEW BOLLARDS
DETAIL 14/A-1.20

PARKING SUMMARY

CARS	LOCATION					
	P-1	P-2	P-3	P-4	DECK	FIRE LANE
STANDARD	124	159	160	37	35	37
COMPACT	46	108	116	41	8	–
ACCESSIBLE	17*	–	–	–	2*	–
TOTAL-890 SPACES PROVIDED	187	267	276	78	45	37

*2.1% OF 890 SPACES

MOTORCYCLE -TOTAL 20 SPACES AT P-1

LIMITS OF FIRE DEPT. ACCESS

FIRE DEPT. ACCESS DELINEATORS

OFFICE BUILDING ROOF-
FOR DETAILS & INFORMATION
SEE A-2.10 & A-2.11

BARRIER BAR @ 8'-2" A.F.F.

SITE LIGHTING
2 HEADS (TYP.)

LANDSCAPE AREA

PUBLIC PHONE W/ ROOF

CONC. PAVING

BOLLARDS (TYP.)

ACCESS CONTROL DEVICE (TYP.)

TRENCH DRAIN

RAMP

COORDINATE DEVICE W/ ACCESS CONTROL DEVICES AT GUARD STATION PROVDE KNOX BOX FOR FIRE DEPT. USE

(E) ACCESS GATE MIN. 20'-0" WIDE
14'-0" CLEAR HEIGHT W/ FRE DEPT. OVERRIDE

TRENCH DRAIN

COORDINATE DEVICE W/ ACCESS CONTROL DEVICES AT GUARD STATION PROVDE KNOX BOX FOR FIRE DEPT. USE

FOUNTAIN

(E) CHAIN LINK FENCE-
PROTECT IN PLACE

N 55°21'33" E 1429.73'

8'-0" HIGH CHAIN LINK FENCE

NEW BOLLARDS W/ GALV. CHAIN

ACCESS CONTROL DEVICE (TYP.)

DRAINAGE CATCH BASIN W/ GRATE (TYP.)

50'-0" (TYP.)

SITE LIGHTING
1 HEAD (TYP.)

TRENCH DRAIN

MANUAL CABLE BEAM VEHICLE BARRIER
SEE 3/A-1.14
(PROVIDE FIRE DEPT. KNOX BOX)

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
DISABLED ACCESS SECTION

This set of plans and specifications has been reviewed and is approved for compliance with state and local laws and ordinances related to accessibility to public accommodations and housing.

The stamping of this set of plans and specifications shall not be held to permit or to be an approval of the violation of any provisions of federal, state, and local laws and ordinances related to accessibility to public accommodations and housing.

By: _____ Total of _____ Sheets

Date: _____

NOTE: PARKING IS UNDER SEPARATE PERMIT

LANGDON WILSON
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PLANNING
INTERIORS

1055 WILSHIRE BOULEVARD, SUITE 1500, LOS ANGELES
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IRVINE, CALIFORNIA 92612-1577
949 833-9193

455 NORTH THIRD STREET, SUITE 333
PHOENIX, ARIZONA 85004-3940
602 252-2555

SITE/ BLDG LIGHTING LEGEND

- L-1 – UP-LIGHTING, ELLIPTPAR M151-150G-V-02-B-VH-0-AXF
- L-2 – UP-LIGHTING, LUMIERE 730-MH70PAR30-VOLTAGE-WR-BKLSL30-DIF30-FH30
- L-3 – PLAZA, ECLARTEC 1-0B150MH277TSP15 (SINGLE)
- L-4 – DOWN LIGHT, INDY 481R-150-SSCC-SSB-FL-L
- L-5 – WALL MOUNTED, HYDREL "EDGE WEDGE", G2EW-DW-VOLTAGE-WFL-ES4-IBS-DBLB
- L-6 – PLAZA, ECLARTEC 1-0B150MH277TSP15 (DOUBLE)
- L-7 – WALL MOUNTED, MCPHILBEN
- POLE LIGHT 1 1 HEAD – SEE ELECT.
- POLE LIGHT 2 2 HEADS – SEE ELECT.
- FLUSH IN WALL, HYDREL 9600B-MH100-277-HW-E-BZ

LICENSED ARCHITECT
PATRICK ALLEN
NO. C7181
REN. 03-31-07
STATE OF CALIFORNIA

FOX

AREA ONE
NEW OFFICE BUILDING
FOX ENTERTAINMENT GROUP
10201 WEST PICO BLVD., LOS ANGELES, CA 90035

CONSTRUCTION PHASE			PRE-CONSTRUCTION PHASE	
REV.	BULLETIN	DATE	DATE	ISSUED FOR
1	ADDENDUM 1	2/14/05	5/19/04	SCHEMATIC DESIGN
2	STEEL PACKAGE	3/11/05	8/10/04	DESIGN DEVELOPMENT
3	CMP #3 SUBMITTAL	4/18/05	11/04/04	SHORING PERMIT
4	BUILDING PERMIT	7/01/05	11/30/04	FOUNDATION ONLY PLAN CHECK
			1/14/05	PLAN CHECK SUBMITTAL & CMPR
			1/19/05	FOUNDATION PERMIT

CHECKED BY _____ DATE APRIL 18, 2005

SCALE 1/16" = 1'-0" JOB NUMBER L472-000

APPROVED/ARCHITECT

SHEET TITLE
SITE PARKING PLAN

SHEET NUMBER CAD I.D.

A-1.02A

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PARKING LAYOUT GENERAL NOTES
(UNLESS NOTED OTHERWISE)

1. ALL COMPACT PARKING SPACES (C) ARE 7'-10" WIDE
2. ALL PARKING SPACES WITHIN A COLUMN BAY ARE CENTERED WITHIN THAT BAY
3. ALL STANDARD PARKING SPACES ARE 9'-4" WIDE
4. ALL MOTORCYCLE PARKING SPACES ARE 4'-0" WIDE
5. THE CLEAR SPACE BETWEEN A PARKING SPACE AND A WALL OR COLUMN IS 10" MIN.
6. EACH PARKING SPACE IS MARKED BY A SINGLE LINE, SEE 1&2/A-1.20 FOR ACTUAL, TYPICAL STRIFING

PARKING SUMMARY

CARS	LOCATION					
	P-1	P-2	P-3	P-4	DECK	FIRE LANE
STANDARD	124	159	160	37	35	37
COMPACT	46	108	116	41	8	–
ACCESSIBLE	17*	–	–	–	2*	–
TOTAL–890 SPACES PROVIDED	187	267	276	78	45	37

*2.1% OF 890 SPACES

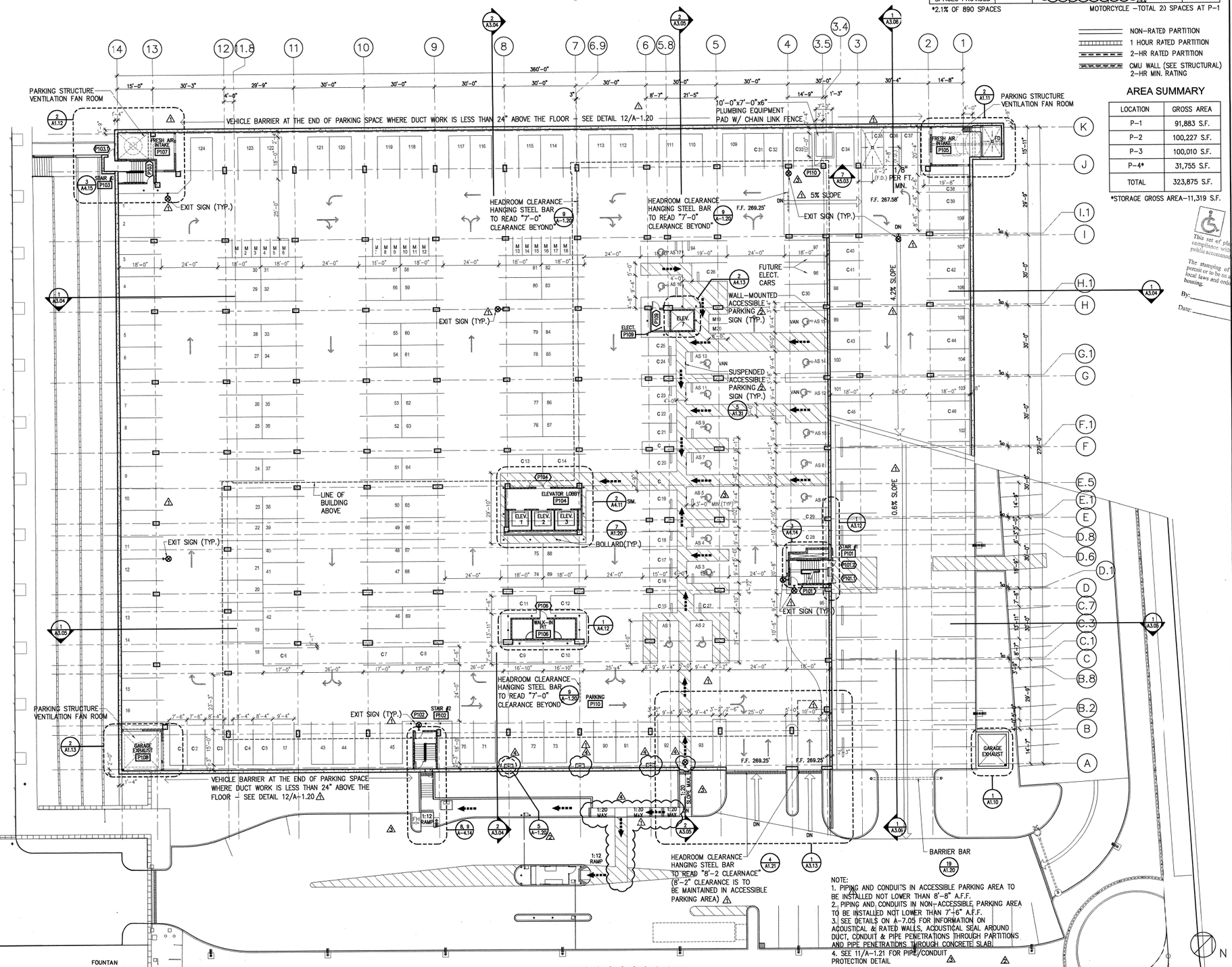
MOTORCYCLE –TOTAL 20 SPACES AT P-1

NON-RATED PARTITION
1 HOUR RATED PARTITION
2-HR RATED PARTITION
CMU WALL (SEE STRUCTURAL) 2-HR MIN. RATING

AREA SUMMARY

LOCATION	GROSS AREA
P-1	91,883 S.F.
P-2	100,227 S.F.
P-3	100,010 S.F.
P-4*	31,755 S.F.
TOTAL	323,875 S.F.

*STORAGE GROSS AREA–11,319 S.F.



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949 833-9783

455 NORTH THIRD STREET, SUITE 333
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602 252-2555

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
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By: _____

Date: _____ Total of _____ Sheets

LICENSED ARCHITECT
IAN PATRICK ALLEN
NO. C7181
REN. 03-31-07
STATE OF CALIFORNIA

FOX

AREA ONE
NEW OFFICE BUILDING
FOX ENTERTAINMENT GROUP
10201 WEST PICO BLVD., LOS ANGELES, CA. 90035

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4	BUILDING PERMIT	7/01/05	11/30/04	FOUNDATION ONLY PLAN CHECK
			2/14/05	PLAN CHECK SUBMITTAL & GMP#2
			3/19/05	FOUNDATION PERMIT

CHECKED BY — DATE APRIL 18, 2005

SCALE 1/16" = 1'-0" — JOB NUMBER L412-000

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SHEET TITLE
P-1 LEVEL FLOOR PLAN

SHEET NUMBER — CAD ID.
A-2.04

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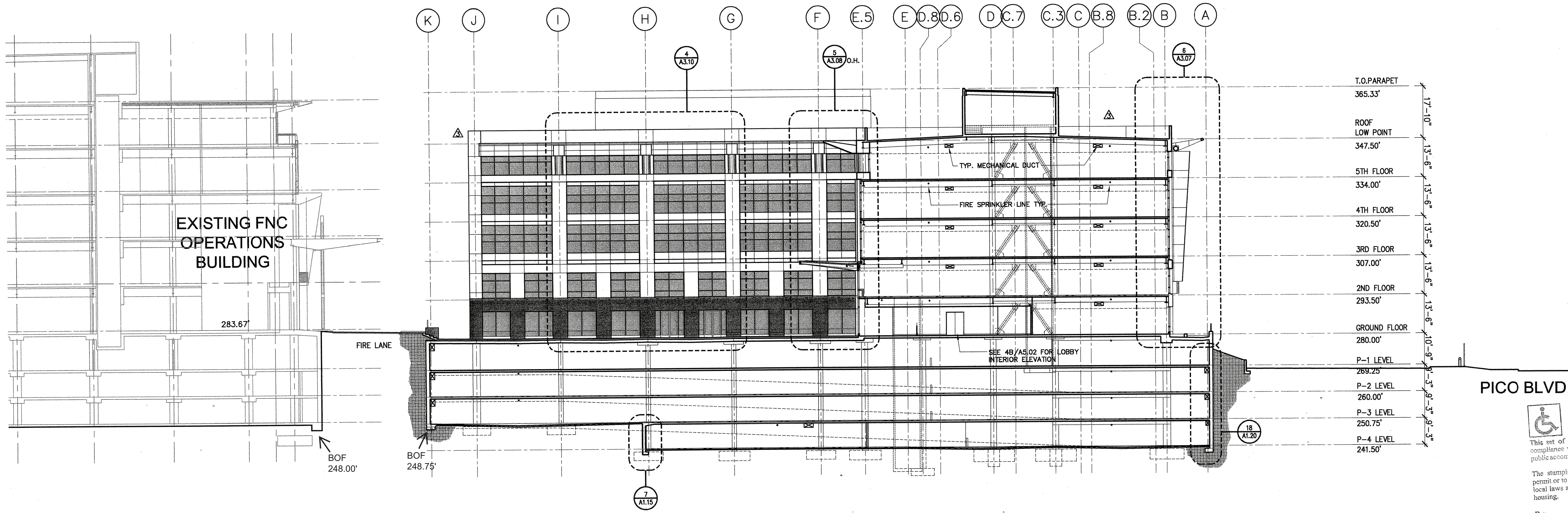

NORTH-SOUTH SECTION

SCALE : 1/16" = 1'-0" | 2

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
DISABLED ACCESS SECTION

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Total of ________ Sheets

By: ________

Date: ________

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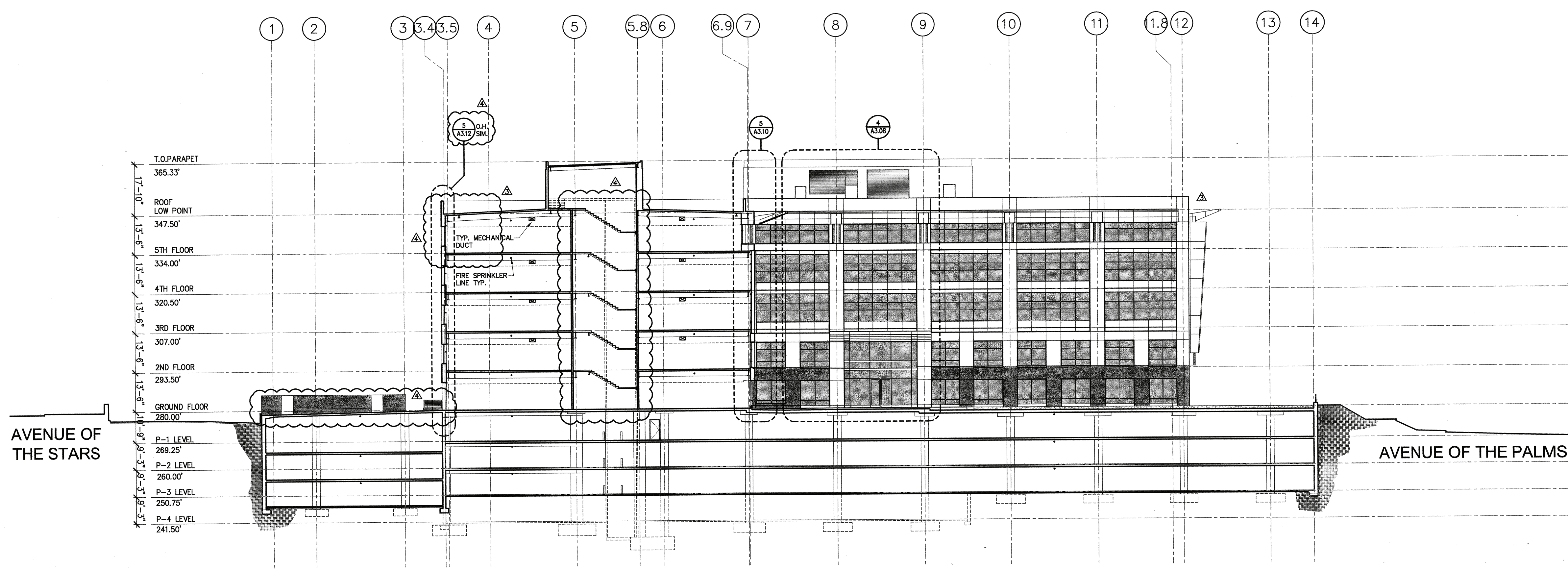
NO. C7181
REN. 03-31-07
STATE OF CALIFORNIA



EAST-WEST SECTION

SCALE : 1/16" = 1'-0" | 1

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FOX ENTERTAINMENT GROUP
10201 WEST PICO BLVD., LOS ANGELES, CA 90035

CONSTRUCTION PHASE			PRE-CONSTRUCTION PHASE	
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4	BUILDING PERMIT	7/01/05	11/30/04	FOUNDATION ONLY PLAN CHECK
			1/14/05	PLAN CHECK SUBMITTAL & GMP#2
			1/19/05	FOUNDATION PERMIT

CHECKED BY — DATE: APRIL 18, 2005

SCALE: 1/16" = 1'-0" — JOB NUMBER: L412-000

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SHEET TITLE: BUILDING SECTIONS

SHEET NUMBER: A-3.04 — CAD I.D.

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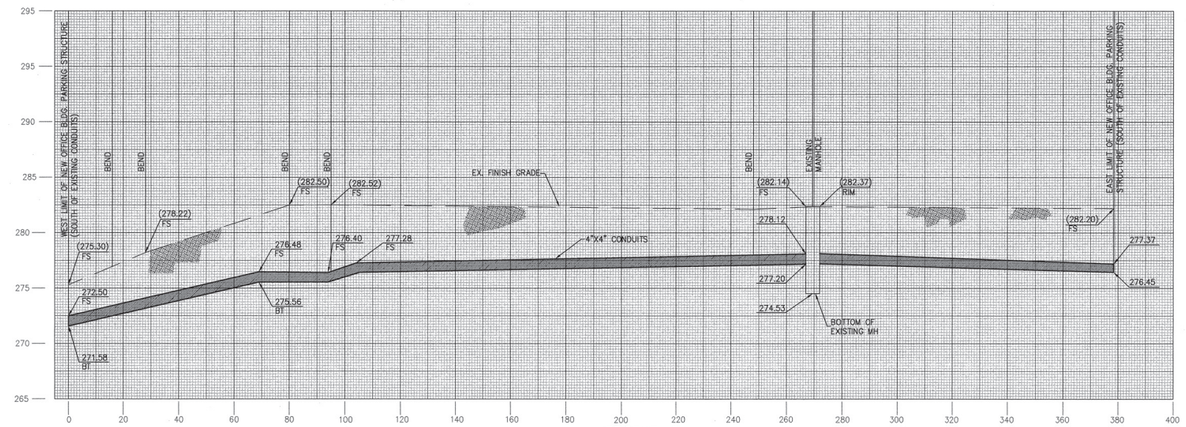

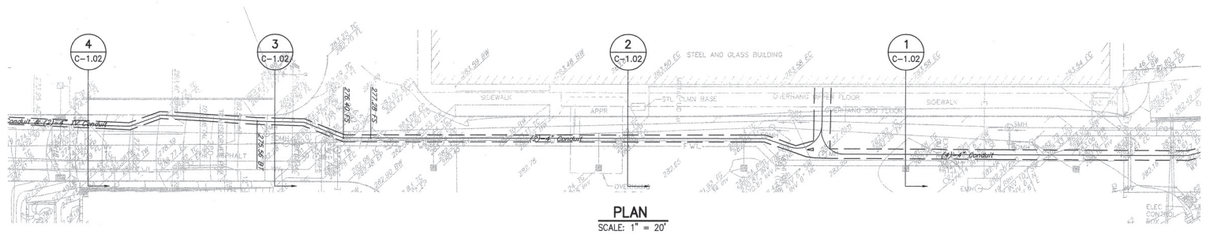

PROFILE
SCALE H: 1" = 20'
V: 1" = 5'

NOTES:

① ELEVATIONS OF EXISTING FIBER OPTIC CONDUITS ARE BASED ON THE INFORMATION PROVIDED TO KPFF.

② KPFF IS ASSUMING THAT THE ABBREVIATION "FS" MEANS TOP OF EXISTING FIBER OPTIC CONDUITS AND "BT" MEANS BOTTOM OF EXISTING FIBER OPTIC CONDUITS AS SHOWN ON THE PLAN VIEW.

③ ELEVATION OF EXISTING FIBER OPTIC CONDUITS AT EXISTING MANHOLE WERE PROVIDED TO KPFF BY FOX FACILITIES AT MEETING ON NOVEMBER 5, 2004. KPFF IS ASSUMING THAT ELEVATIONS PROVIDED IS FROM RIM ELEVATION TO TOP OF 1ST ROW OF FIBER OPTIC CONDUITS AND TO THE TOP OF 2ND ROW OF FIBER OPTIC CONDUITS. KPFF IS ASSUMING BOTTOM ROW OF FIBER OPTIC CONDUITS TO BE 4" BELOW ELEVATIONS PROVIDED.

④ KPFF IS ASSUMING THAT THE FIBER OPTIC CONDUITS SLOPE AT A CONSTANT RATE BETWEEN ELEVATIONS PROVIDED.

⑤ KPFF HAS NOT VERIFIED NOR ASSUMES ANY RESPONSIBILITY FOR INFORMATION PROVIDED RELATED TO THE EXISTING UTILITIES.

⑥ KPFF HIGHLY RECOMMENDS THAT CONTRACTOR TO FIELD VERIFY EXACT HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FIBER OPTIC CONDUITS AND ALL OTHER UTILITIES PRIOR TO START OF ANY CONSTRUCTION WORKS.

⑦ CONTRACTOR IS RESPONSIBLE TO DO THEIR OWN RESEARCH TO LOCATE, VERIFY AND COORDINATE THEIR CONSTRUCTION WORKS WITH EXISTING UTILITIES SUCH AS WATER, SANITARY SEWER, STORM DRAIN, ELECTRICAL, ETC. THAT ARE LOCATED IN THE VICINITY OF THEIR CONSTRUCTION ACTIVITIES.

PLAN
SCALE: 1" = 20'

CONDUITS SECTION
N.T.S.

SECTION 1
SCALE H&V: 1" = 10'

SECTION 2
SCALE H&V: 1" = 10'

SECTION 3
SCALE H&V: 1" = 10'

SECTION 4
SCALE H&V: 1" = 10'

NOT FOR CONSTRUCTION.
INFORMATION PROVIDED BY OWNER DEEMED
ACCURATE BUT NOT VERIFIED BY KPFF.

PLAN
SCALE: 1" = 20'

GRAPHIC SCALE

LANGDON
WILSON
ARCHITECTURE
PLANNING
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kpff Consulting Engineers
18400 Von Karman Ave. Suite 100
Irvine, California 92612
(949) 252-1022 Fax (949) 252-8082

FOX

AREA ONE
NEW OFFICE BUILDING
FOX ENTERTAINMENT GROUP

CONSTRUCTION PHASE			PRE-CONSTRUCTION PHASE	
REV.	BULLETIN	DATE	DATE	ISSUED FOR
			5/19/04	SCHEMATIC DESIGN
			8/10/04	DESIGN DEVELOPMENT
			11/04/04	SHORING PERMIT
			11/30/04	FOUNDATION ONLY PLAN CHECK
			12/07/04	PROGRESS SET
			12/15/04	REVISED SITE PLAN
			01/14/05	PLAN CHECK SUBMITTAL & GMP #2

CHECKED BY
DATE NOVEMBER 4TH, 2004
SCALE
JOB NUMBER L412-000
APPROVED/ARCHITECT

SHEET TITLE
EXISTING FIBER OPTIC
CONDUITS PLAN & PROFILE

SHEET NUMBER
CAD I.D.
C-1.02

P:\2003\103810 - Fox Entertainment Group\Cdraft\CADD\C1.02.dwg, 1/14/2005 11:42:43 AM, marrua, OCE-CIVIL-PLOT.pc3, kpff (30.00 x 42.00 Inches), 1:1

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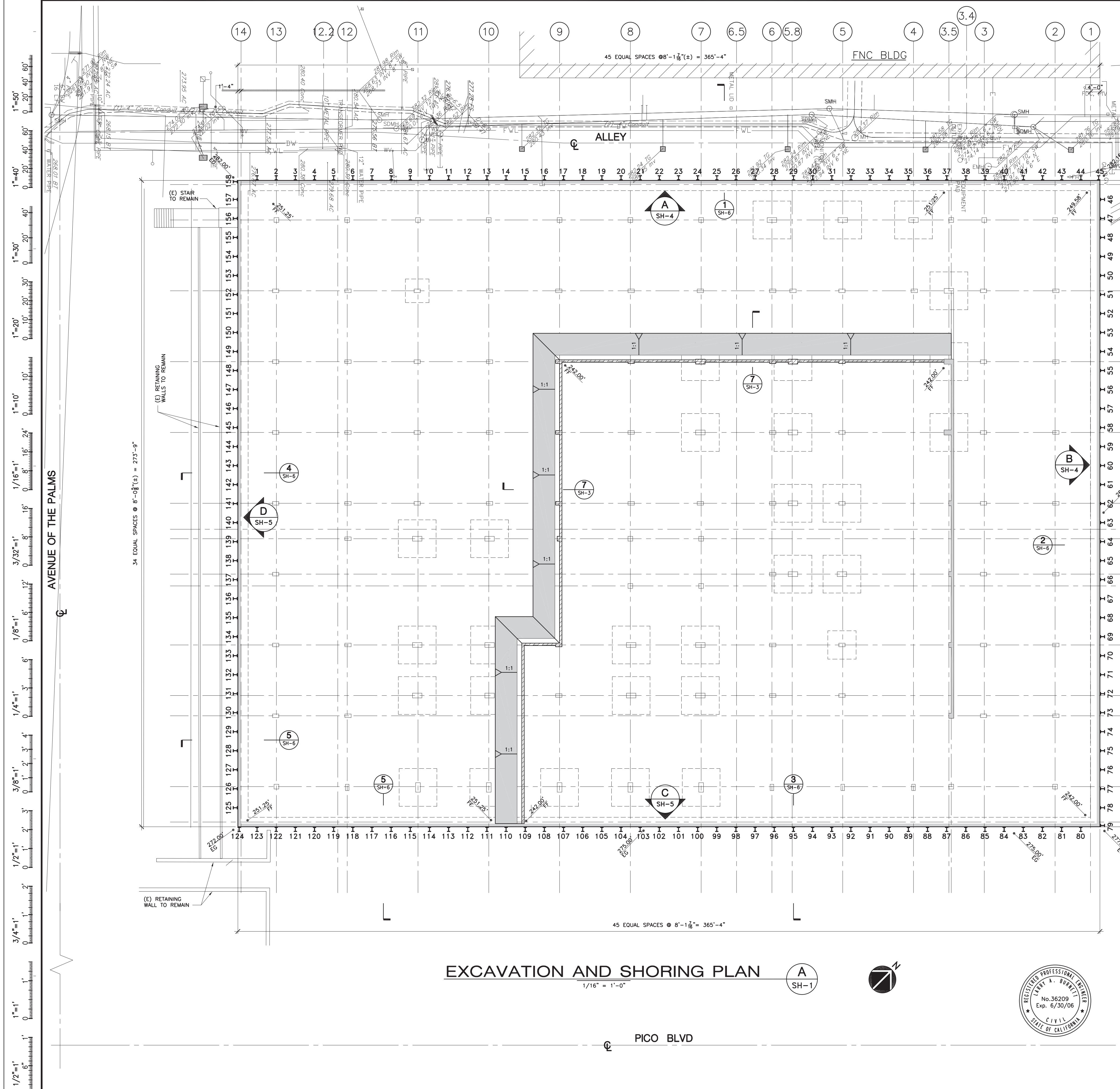


EXCAVATION AND SHORING PLAN (A / SH-1)

1/16" = 1'-0"

ABBREVIATIONS

- EG = EXISTING GRADE
- FF = FINISH FLOOR
- FOW = FACE OF WALL
- BOF = BOTTOM OF FOOTING
- TOF = TOP OF FOOTING
- TOW = TOP OF WALL
- FL = FLOW LINE
- (E) = EXISTING
- (N) = NEW
- SB = SOLDIER BEAM
- PL = PROPERTY LINE
- SPS = SPACING

LEGAL DESCRIPTION
IN THE CITY OF LOS ANGELES,
STATE OF CALIFORNIA,
LOT 1, TRACT 51502.

OWNER
TWENTIETH CENTURY FOX FILM CORP.
10201 PICO BLVD.
LOS ANGELES, CA. 90064
PHONE:
FAX:
E-MAIL:
CONTACT:

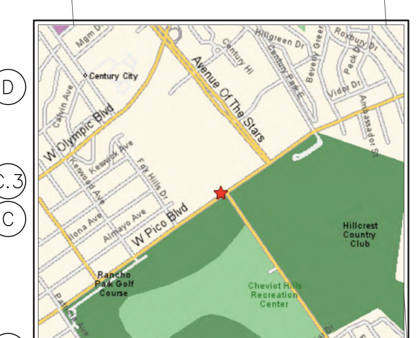
OWNER AGENT
INVESTMENT DEVELOPMENT SERVICES, INC.
515 S. FIGUEROA STREET, SUITE 1600
LOS ANGELES, CA. 90071
PHONE: (213) 362-9309
FAX: (213) 627-2138
E-MAIL: BREGE@INVESDEV.COM
CONTACT: MR. BROOKE REGE

GEOTECHNICAL
GEOTECHNOLOGIES, INC.
439 WESTERN AVE.
GLENDALE, CA. 91201-2837
PHONE: (818) 240-9600
FAX: (818) 240-9675
CONTACT: STANLEY TANG

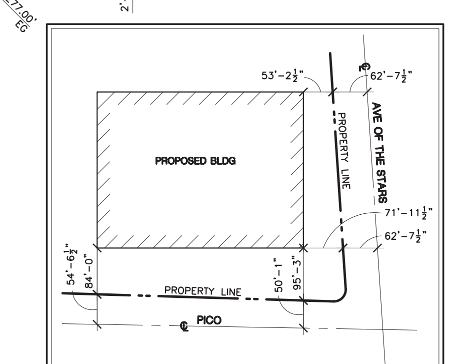
EARTHWORK QUANTITIES

CUT	FILL
142,000 CY.	0.0 CY.

AVENUE OF THE STARS



VICINITY MAP
N.T.S.



SITE PLAN
N.T.S.

REGISTERED PROFESSIONAL ENGINEER LARRY A. BURNETT No.36209 Exp. 6/30/06 CIVIL STATE OF CALIFORNIA

REVISIONS	BY
△	
△	
△	
△	
△	
△	

BURNETT & YOUNG, Inc.
CONSULTANTS • ENGINEERS
650 Sierra Madre Villa Ave., Suite 102
Pasadena, CA 91107
Phone: (626) 351-3367 • Fax: (626) 351-3247

FOX ENTERTAINMENT GROUP
LOS ANGELES, CA.
10201 WEST PICO BLVD

EXCAVATION AND SHORING PLAN

Date 08/26/04
Scale 1/16" = 1'-0"
Drawn JT
Checked LAB
Job No. 04-0430
Sheet SH-1
Of 6 Sheets

Printed : Nov 08, 2004 - 10:35pm

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SCHEDULE																	
SOLDIER BEAMS					ANCHORS												
					'A'							'B'					
SOLDIER BEAM NUMBER & SIZE	SECT.	MAX. VERT. HT. ABOVE BOTT OF FTG. 'H'	EMBED. BELOW BOTT OF FTG. 'D'	SHAFT DIA. 'd'	DESIGN LOAD (KIPS)	150% TEST LOAD (KIPS)	200% TEST LOAD (KIPS)	NUMBER OF 0.6" DIA STRANDS	ANCHOR ANGLE (DEGREES)	MIN. BOND LENGTH (FEET)	TOTAL SHAFT LENGTH (FEET)	DESIGN LOAD (KIPS)	150% TEST LOAD (KIPS)	200% TEST LOAD (KIPS)	NUMBER OF 0.6" DIA STRANDS	ANCHOR ANGLE (DEGREES)	MIN. BOND LENGTH (FEET)	TOTAL SHAFT LENGTH (FEET)
#1 THRU #45 W14x43	1/SH-6	36'	8'	24"	100	150	200	4	20	32	48	105	158	210	4	20	33	48
#46 THRU #51 W14x43	2/SH-6	36'	8'	24"	100	150	200	4	20	32	48	100	150	200	4	20	32	48
#52 THRU #56 W16x50	2/SH-6	37'	8'	24"	105	158	210	4	20	34	50	105	158	210	4	20	34	50
#57 THRU #59 W18x55	2/SH-6	38'	8'	24"	120	180	240	5	20	38	54	105	158	210	4	20	34	50
#60 THRU #64 W18x55	2/SH-6	38'	8'	24"	120	180	240	5	20	38	54	105	158	210	4	20	34	50
#65 THRU #70 W21x73	2/SH-6	41'	8'	30"	140	210	280	5	20	45	62	120	180	240	5	20	38	53
#71 THRU #73 W21x73	2/SH-6	41'	8'	30"	140	210	280	5	20	45	62	120	180	240	5	20	38	53
#74 THRU #79 W21x73	2/SH-6	41'	8'	30"	140	210	280	5	20	45	62	120	180	240	5	20	38	53
#80 THRU #86 W18x55	3/SH-6	38'	8'	24"	120	180	240	5	20	38	54	105	158	210	4	20	34	50
#87 THRU #110 W14x43	3/SH-6	36'	8'	24"	100	150	200	4	20	32	48	100	150	200	4	20	32	48
#111 THRU #115 W14x48	5/SH-6	28'	8'	24"	125	188	250	5	20	40	55	–	–	–	–	–	–	–
#116 THRU #124 W14x30	5/SH-6	26'	8'	24"	100	180	200	4	20	32	48	–	–	–	–	–	–	–
#125 THRU#127 W14x48	5/SH-6	28'	8'	24"	125	188	250	5	20	40	55	–	–	–	–	–	–	–
#128 THRU #133 W14x48	5/SH-6	30'	8'	24"	135	203	270	5	20	43	58	–	–	–	–	–	–	–
#134 THRU #158 W14x34	4/SH-6	33'	8'	24"	75	113	150	3	20	25	40	85	128	170	4	20	27	42

-AN EXTRA STRAND, THE NEXT LARGER ROD OR TWO RODS SHALL BE ADDED/USED, AS REQUIRED, TO TEST THE ANCHORS.

Tieback Angle Variance to Length Chart	
Variance	Additional Length Required
0° to 5°	+2'–0"
>5° to 10°	+4'–0"
>10° to 15°	+6'–0"
>15° to 20°	+8'–0"
>20°	Consult Shoring Engineer

WHEN SPECIFIED TIEBACK LENGTH CANNOT BE ACHIEVED INCREASE BOND LENGTH ACCORDINGLY

INSPECTION BY SHORING ENGINEER

1. A pre-construction meeting between the Shoring Engineer, Soils Engineer, Shoring Sub-Contractor, General Contractor and Inspectors from the City of Los Angeles Department of Building and Safety and Bureau of Public Works shall take place prior to start of shoring for the purpose of procedural review and utility identification/location.
2. The Shoring Engineer shall make periodic inspections to the job site for the purpose of observing the installation of the shoring system.
3. Observation shall include but not be limited to the following:
   a. Observe the installation of at least two soldier beams and tie-back anchors;
   b. Observe the soldier beam survey monitoring.

MATERIAL SPECIFICATION

CAISSONS:

1. Caissons are to be machine drilled. Caissons are to be drilled straight, true and plumb.
2. Provide protection against sloughing or caving as required.
3. Drilled holes to be left open more than 12 hours shall be covered with steel plates or plywood.

TIMBER:

1. Wood lagging shall be rough sawn Douglas-Fir No. 2 (f_b= 900 psi). See TYPICAL PLAN SECTION DETAIL on SH-3.
2. Wood lagging shall be ACQ or CCA pressure treated with a minimum retention of preservative of 0.4 pcf and approved for use in ground contact by the City of Los Angeles.

STRUCTURAL STEEL:

1. Structural steel shapes shall conform to ASTM A572, Grade 50 or ASTM A992.
2. Miscellaneous steel and plates shall conform to ASTM A36, A572, Grade 50 or A992.
3. All pipes and pipe sleeves shall conform to ASTM A53, Grade B.

ANCHOR RODS:

1. Design loads on anchor rods per SCHEDULE on SH-2.
2. Diameter of anchor rods and size of concrete anchor shafts shall be logged and certified by the Soils Engineer.
3. Anchor rods shall not be welded or used for grounding welding equipment.
4. Anchor rods shall conform to ASTM A722, high-strength with a guaranteed ultimate minimum strength of 150,000 psi.
5. Anchor rods shall conform to the City of Los Angeles Research Report No. 23835.

ANCHOR TENDONS:

1. Design loads on stranded cables per SCHEDULE on sheet SH-2.
2. Tie-back strands shall be fabricated from seven-wire strands conforming to ASTM A416.
3. Strands shall be 0.6-inch diameter.
4. Strands shall be high-strength with a guaranteed ultimate minimum strength of 270 ksi.
5. Strands shall conform to the City of Los Angeles Research Report No. 25053.
6. Strands shall not be welded or used for grounding welding equipment.
7. Diameter of strands, number of strands per anchor and size of concrete anchor shafts shall be logged and checked by the Geotechnical Engineer.

WELDING:

1. All welds shall be electric arc using E70XX electrodes.
2. All structural steel welding shall conform to the ANSI/AWS D1.1.
3. All welders shall be certified by the City of Los Angeles.
4. Provide continuous inspection by a City of Los Angeles approved Deputy Inspector for all field welds.

SLURRY FOR SOLDIER PILES:

1. Slurry shall contain 1½ sacks (141 lbs) of Portland cement per cubic yard of sand.
2. Cement shall be ASTM C150 Type II/V.
3. Aggregates shall be natural sand conforming to ASTM C33.

CONCRETE FOR SOLDIER PILES:

1. Minimum compressive strength of concrete shall be 2500 psi at 28 days.
2. Cement shall be ASTM C150 Type II/V.
3. Aggregates shall be natural sand and rock conforming to ASTM C33.
4. No calcium chloride or other additive shall be used unless specifically approved by the Shoring Engineer.

CONCRETE FOR ANCHORS:

1. Concrete for earth anchors shall be high early-strength and shall reach its design strength of 3000 psi in 72 hours.
2. Provide continuous inspection by a Los Angeles City approved Deputy Inspector.
3. Cement shall be ASTM C150 Type II/V.
4. No calcium chloride or other additive shall be used unless specifically approved by the Shoring Engineer.
5. The concrete mix design shall be reviewed and approved by the Shoring Engineer prior to use.
6. The concrete mix design shall be prepared, stamped and signed by a Civil or Structural Engineer registered in the State of California.

GROUT FOR TIE-BACK ANCHORS:

1. Grout shall be a neat cement mixture containing 4½ to 5 gallons of water per cubic foot (94 lbs) of Portland cement.
2. Cement shall conform to ASTM C150, Type II/V.
3. Water reducing add mixtures may be add if approved by the City and the Shoring Engineer.
4. Accelerators shall not be used.
5. Fine aggregates, if used, shall conform to ASTM C33.

INSTALLATION PROCEDURE (GENERAL)

1. Drill shafts;
   a. Shafts are not allowed to be left open over-night.
   b. Provide protection against sloughing or caving as required. See Soils Report Boring Logs.
   c. Shafts are to be accurately located. Do not exceed the minimum or maximum allowable spacing.
2. Place soldier beams in shaft. See DETAIL 1/SH-3 for location tolerances.
3. Fill shaft with 2500 psi concrete to bottom of footing excavation as shown on ELEVATIONS. Fill balance of caisson with lean sand-cement mixture.
4. Take all initial monitoring readings. See SOLDIER BEAM SURVEY MONITORING for requirements.
5. Start excavation only after concrete in bottom of shaft has cured a minimum of 7 days. Excavation of 6 feet maximum is permissible after slurry has cured a minimum of 24 hours.
6. Lagging will be required between the soldier beams.
7. Timber lagging shall be treated. See the Material Specification, TIMBER for requirements.
8. Careful installation of the lagging will be necessary to achieve full bearing against the retained earth. Fill voids behind lagging with slurry or granular material to insure bearing of soil along the full length of lagging. Lagging lifts are not to exceed 5 feet.
9. Drill earth anchor shafts. Place tie-back anchor rods or strands as soon as the shafts are completely drilled and inspected by the Soils Engineer. See TYPICAL DRILL BENCH STAGES FOR REQUIRED EXCAVATION DETAIL 2/SH-3.
10. Anchor shafts shall be free of loose material. Concrete or grout shall be placed immediately after placing anchor rods or strands in shaft.
11. Anchor rods or strands shall be tensioned straight and true. Kinking or sharp curvature in anchor rods or strands shall not be permitted.
12. All water should be removed from the tie-back anchor shafts prior to the filling of grout. If all of the water cannot be removed anchors must be post grouted at least once. Concrete shall be placed through a rigid tremie.
13. Do not continue with the excavation before anchors are tested and certified.
14. See INSTALLATION OF PRESSURE GROUTED ANCHORS for addition requirements.

SOLDIER PILE SURVEY MONITORING

1. Soldier pile survey monitoring shall be conducted on a periodic basis until the permanent structure is capable of supporting the imposed lateral loads.
2. Control points, initial soldier pile offsets and weekly monitoring shall be performed by a California State licensed surveyor.
3. Prior to any excavation, survey monitoring control points and initial soldier pile offsets shall be established to monitor the horizontal and vertical movement of the soldier piles.
4. Initial reading and periodic reading shall be submitted to the Shoring Engineer and General Contractor.
5. Monitoring reading shall be submitted within 3 working days after they are conducted.
6. Additional reading shall be obtained when requested by the Shoring Engineer or General Contractor.
7. Control points shall be established outside the area of influence of the shoring system to ensure the accuracy of the monitoring readings.
8. If any horizontal or vertical movement of the soldier piles reaches one inch the Shoring Engineer shall evaluate such movement and recommend corrective measures, if necessary, before excavation continues.
9. If the magnitude of any horizontal or vertical movement of soldier piles reaches two inches supplemental shoring shall be installed to eliminate all further movement.

TESTING OF TIE-BACK ANCHORS

1. The Soils Engineer shall keep a record at the job site of all test loads and total anchor movements and shall certify their accuracy.
2. All of the anchors shall be tested to 150% of their design loads; the total deflection during the test shall not exceed 12 inches. The rate of creep under the 150% test shall not exceed 0.1 inch over a 15 minute period in order for the anchor to be approved for the design loading.
3. Three of the initial anchors, as selected by the Soils Engineer, shall be tested to 200% of design load for a 24 hour period. The total deflection during the 24-hour 200% test load shall not exceed 12 inches; the anchor deflection shall not exceed 0.75 inch measured after the 200% test load is applied. If the anchor movement after the 200% load has been applied for 12 hours is less than 0.5 inch, and the movement over the previous 4 hours has been less than 0.1 inch, the 24 hour test may be terminated.
4. At least 10% of the anchors shall be "quick" tested at 200% of design load and this test load maintained for 30 minutes. The total deflection shall not exceed 12 inches; the anchor movement shall not exceed 0.25 inch during the 30 minute period, measured after the 200% test load is applied.
5. In the event that the stated limits in deflection are exceeded, the Soils Engineer shall submit recommended reduced loading values and supplementary anchors may be required.
6. After a satisfactory test, each anchor shall be locked-off at the design load. The locked-off load shall be verified by rechecking the load in the anchor. If the locked-off load varies by more than 10% from the design load, the load shall be locked-off to the design load.
7. Certification from an approved testing laboratory is required for the calibration of the hydraulic rams to tension anchors prior to the start of testing and monthly thereafter.
8. The location of the 200% test shall be predetermined by the Soils Engineer. An extra strand, the next higher rod diameter or two rods shall be added, as required, to test the soils anchors.
9. If excessive twisting of the soldier beams occurs during testing, a 3"x 3/8" flat bar strap shall be installed between adjacent soldier beams, above and below the anchor pocket.

PRESSURE GROUTING PROCEDURE:

1. Grout shall conform to the Post Tension Institute Manual, 4th Edition.
2. Grout shall have a water to cement ratio of 0.4 to 0.45 and achieve a minimum compressive strength of 3000 psi at time of stressing.
3. Grout is to be batched on site, discharged into a holding tank or directly into the grout pump. The grout will be pumped by piston pump with pressures monitored by a pressure gauge at the outlet of the pump.
4. Batching Procedure:
   a. Fill mixing unit with 4½ to 5 gallons of potable water.
   b. Add one sack, 94 lbs, of cement to mixer.
   c. Agitate thoroughly until a homogenous mix is achieved.
   d. Discharge grout into tank or directly into shaft, agitate slowly to prevent segregation in pumped into tank, pump grout into shafts as noted above.

INSTALLATION OF PRESSURE GROUTED ANCHORS:

1. Machine drill the tieback shaft with temporary casing as required to prevent sloughing or caving of material.
2. Inject air and/or water under pressure through the drill stem to remove the drill cuttings from the drill shaft.
3. Install the tieback anchor rod with attached centralizing devices into the shaft or install rod through the drill casing without centralizers.
4. Fill the shaft with neat cement grout. A 3/8"ø grout tube may be used to fill shaft or grout may be tremied into the shaft through a rigid pipe from the tip out. Ensure the tremie is always in fresh grout.
5. The grout tube may remain in the shaft or be removed after initial grouting. If left in place, the grout tube must be full of grout.
6. Terminate grouting when the shaft is completely filled to the back flange of the soldier beam.
7. After the initial grout has attained its set, perform post grouting of the anchor bond zone through the attached post grout line and valves.
8. The post grout line shall be a 1/2"ø, Schedule 40, PVC pipe with rubber valves at 5 feet on center in the post grout zone, max.
9. Fracture the initially set in the bond zone with water and repeat grouting until a confinement back-pressure of approximately 300 psi is recorded. Actual injection pressures and grout volumes will vary depending on soil conditions and holding capacities of the anchor.
10. Flush post grout line with water for reuse.
11. The anchor rods shall remain undisturbed until the grout has cured a minimum of 3 days.
12. Test anchors in accordance with the procedures described in "Testing of Tie-Back Anchors".
13. Should the anchor fail the acceptance criteria, unload the rods and perform additional post grouting and retest anchor until it passes the prescribed test.
14. After a successful load test, the rods shall be locked off to within 10% of their design load.
15. Repeat the above procedure for all tiebacks.

GENERAL NOTES

1. All construction shall conform to the 2001 California Building Code and all other known applicable regulating requirements.
2. All work shall be performed in accordance with the latest edition of the California Construction Safety Orders (CAL-OSHA).
3. The design of the earth embankment shoring system is based upon soils data and recommendations contained in the Geotechnical Engineering Investigation, Proposed Office Building and Parking Structure, Fox Studio Lot, 10201 West Pico Blvd., Lot B, Los Angeles, California prepared by Geotechnologies, Inc. dated November 10, 2003 and Addendum Letter II, Update of Geotechnical Engineering Investigation dated June 10, 2004. (Geotechnologies File No. 18484-S).
4. The City of Los Angeles Department of Grading approval letter dated _________ and the above referenced Report(s) are a part of these plans.
5. The shoring contractor shall familiarize himself with all data therein and keep a copy of the soils report(s) at the job site at all times.
6. The locations of existing underground utilities are shown in an approximate way only based on the project civil drawings. The contractor shall determine the exact location of all existing utilities before commencing work. The contractor shall be fully responsible for any and all damages which might be caused by their failure to exactly locate, protect and preserve any and all underground utilities.
7. The shoring contractor shall contact Underground Service Alert at 1-800-227-2600 two working days before commencing any excavation.
8. Heavy vehicular traffic, such as cranes, concrete trucks, material trucks or material storage, (with a uniform pressure greater than 300 psf) shall be prohibited within 10 feet of the soil side of the shoring bulkhead or top of sloped embankments except for temporary construction ramps at the front side of the shoring bulkhead.
9. Dust shall be controlled at all times during construction of the retaining system and the associated shoring installation, excavation, grading and back-filling.
10. Provide sandbags, soil berm or other means to prevent surface water from entering excavation over top of shoring and cut slopes.
11. Temporary cuts shall not exceed slopes recommended in the project specifications nor those shown on these drawings.
12. Coordinate these drawings with the Architectural, Structural, Civil and Site Survey drawings.
13. Installation of shoring and excavation shall be performed under the continuous observation and approval of the Soils Engineer's Representative.
14. Installation and testing of shoring system shall comply with the Los Angeles City's "Requirements for temporary tie-back earth anchors", the Testing of Tie-Back Anchors Specification on this sheet and the above referenced Soils Reports and shall be performed under the continuous inspection and approval of the Soils Engineer and the Deputy Inspector for welding, concrete and grading.
15. A City of Los Angeles Registered Grading Deputy Inspector, approved by and responsible to the geotechnical engineer, shall be required to provide continuous inspection for the proposed shoring.
16. A City of Los Angeles Registered Deputy Grading Inspector is required on grading and foundation earthwork where the site exceeds 60,000 square feet, cut and fill slopes exceed 2:1 or foundation excavation are below a 1:1 plane from the property line.
17. Existing grades are estimates only based on the site survey and may not reflect the final site conditions after grubbing and rough grading.
18. No excavation or grading shall commence until 10 days after the notice required by Section 91.0303(1) of the City of Los Angeles Building Code has been posted on the site.
19. After the permanent subterranean portion of structure is complete, a portion of the tops of soldier beams and lagging on private property shall be removed for landscaping purposes. Consult with the Owner's Representative, General Contractor and/or Landscape Architect for requirements.
20. After the permanent basement structure is complete, all soldier beams and lagging placed in the public way wither under the sidewalk or in the roadway shall be removed to a minimum of 8-feet below gutter grade. All soldier beams and lagging placed in an alley shall be removed to a minimum of 4-feet below grade. All tieback anchor rods in the public way including alleys that are located within 20-feet of surface shall be removed. All other tiebacks in the public way shall be de-tensioned and shall be verified by the Public Works Inspector.
21. No trenches or excavations 5 feet or greater in depth into which a person is required to descend shall be constructed before obtaining the necessary permits from the State of California Division of Industrial Safety and prior to the issuance of a building or grading permit.
22. The shoring system has been designed in accordance with known applicable codes, the project soils report and an assumed drained soils condition.

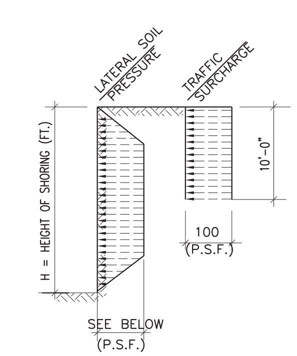
CITY OF LOS ANGELES GRADING NOTES:

1. "General Specifications for all Grading Plans" – Department of Building and Safety form B-164 is a part of these plans.
2. No fill is to be placed until the City Grading Inspector has inspected and approved the bottom of excavation.
3. Man-made fill shall be compacted to a minimum relative compaction of 90%. Cohesionless soils with less than 15% finer than 0.005 mm requires 95% relative compaction. See Section 91.7011.3.
4. Temporary erosion control is to be installed between November 1 and April 15. Obtain Grading Inspector's and the Department of Public Works approval for all proposed procedures. See Section 91.7007.1.

DESIGN CRITERIA

1. Building Code: .... 2002 City of Los Angeles Building Code
2. Concrete: ACI-318-99
3. Steel: .... AISC Ninth Edition (ASD)
4. Soils: .... Geotechnical Engineering Investigation, Proposed Office Building and Parking Structure, Fox Studio Lot, 10201 West Pico Blvd., Lot B, Los Angeles, California prepared by Geotechnologies, Inc. dated November 10, 2003 and Addendum Letter II, Update of Geotechnical Engineering Investigation dated June 10, 2004. (Geotechnologies File No. 18484-S).

BRACED OR TIED BACK SHORING



EARTH PRESSURE DISTRIBUTION
H<15' = 20H
H<35' = 24H
H<45' = 25H
MAX. LAGGING PRESSURE = 400 PSF
TRAFFIC SURCHARGE = 100 PSF
PASSIVE BEARING PRESSURE = 600 PCF
MAXIMUM PASSIVE PRESSURE = 6000 PSF
AVERAGE FRICTION VALUE
PASSIVE ANCHORS = 450 PSF
PRESSURE GROUTED ANCHORS = 2000 PSF
MINIMUM ANCHOR LENGTH = 20 FEET BEYOND FAILURE WEDGE

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LOS ANGELES, CA.
10201 WEST PICO BLVD

GENERAL NOTES

Date	11-08-04
Scale	AS NOTED
Drawn	JT
Checked	LAB
Job No.	04-0430
Sheet	SH-2
Of	6 Sheets

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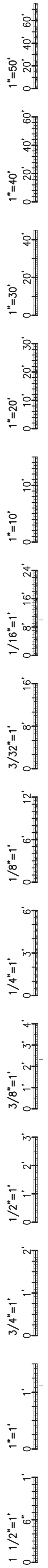
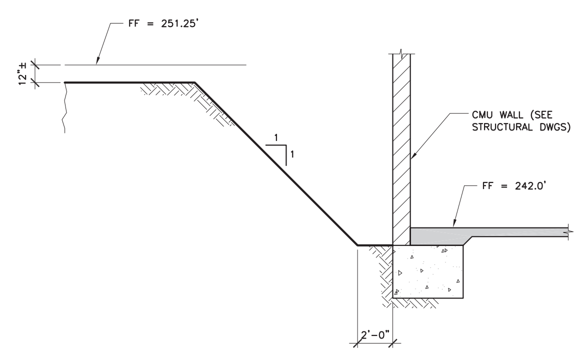


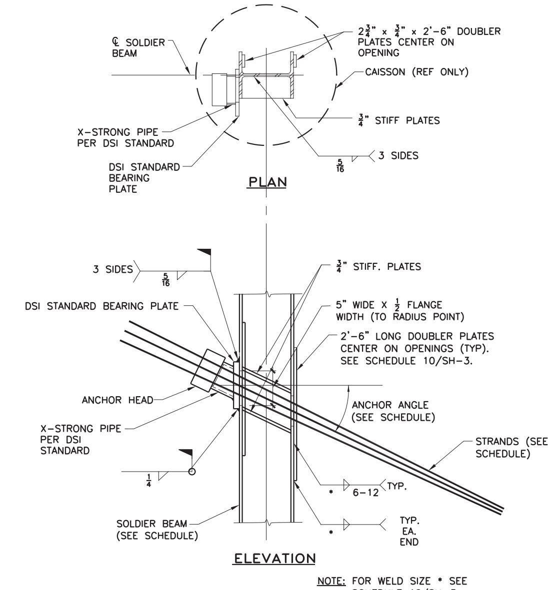
DOUBLER PLATE SCHEDULE			
BEAM SIZE	DOUBLER PLATES		WELD SIZE
	WIDTH	THICKNESS	
W14x30	2 1/2"	5/8"	3/16"
W14x34	2 1/2"	5/8"	3/16"
W14x38	2 1/2"	5/8"	3/16"
W14x43	2 3/4"	3/4"	3/16"
W14x48	3"	3/4"	3/16"
W16X50	3"	3/4"	3/16"
W18X55	3"	3/4"	3/16"
W21X73	$3\frac{1}{2}$	3/4"	3/16"

DOUBLER PLATE SCHEDULE (10 / SH-3)



$\frac{1}{4}$" = 1'-0"

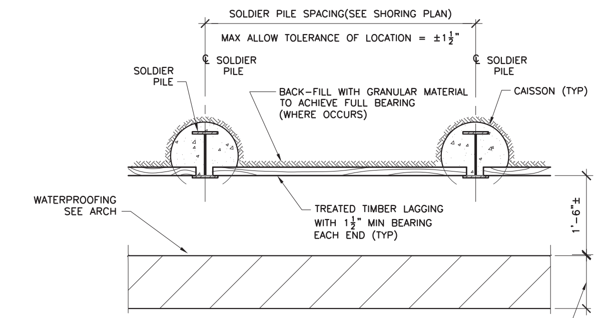
SECTION (7 / SH-3)



NOTE: FOR WELD SIZE * SEE SCHEDULE 10/SH-3.

NTS

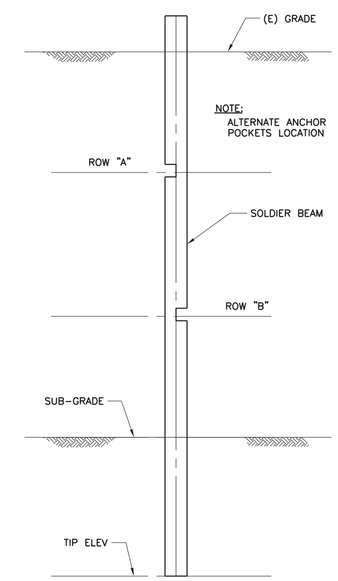
TYPICAL ANCHOR POCKET FOR STRANDS (4 / SH-3)



LAGGING SCHEDULE	
SPAN	LAGGING SIZE
5' < 8.33'	3x12
8.5' < 10.0'	4x12
10' < 12'	6x12 / 2-3x12
12' < 14'	8x12 / 2-4x12

NTS

TYPICAL PLAN SECTION (1 / SH-3)



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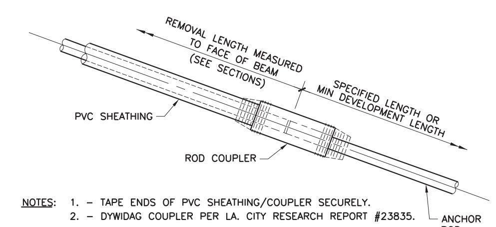
DETAIL (8 / SH-3)



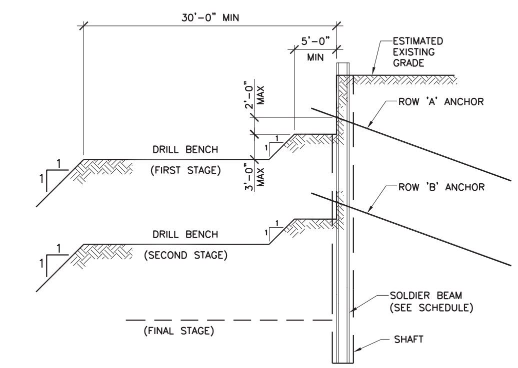
NOTES: 1. – TAPE ENDS OF PVC SHEATHING/COUPLER SECURELY.
2. – DYWIDAG COUPLER PER LA. CITY RESEARCH REPORT #23835.

PARTIAL ROD REMOVAL

ROD ø	MINIMUM DEVELOPMENT LENGTH
1"ø	12'
$1\frac{1}{4}$"ø	15'
$1\frac{3}{8}$"ø	16'
$1\frac{3}{4}$"ø	21'

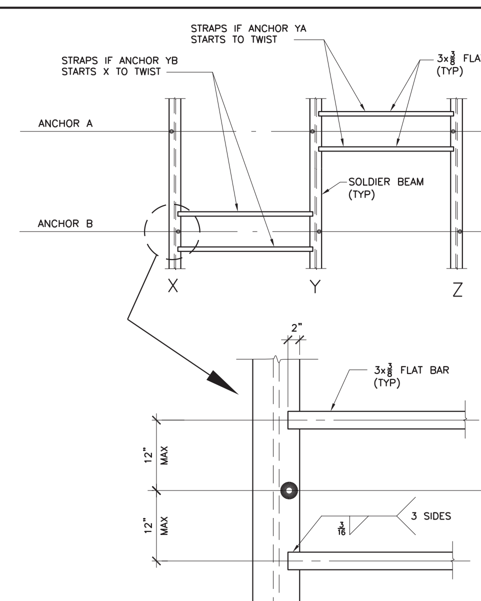
NTS

DETAIL (5 / SH-3)



NTS

TYPICAL DRILL BENCH STAGE FOR REQUIRED EXCAVATION (2 / SH-3)



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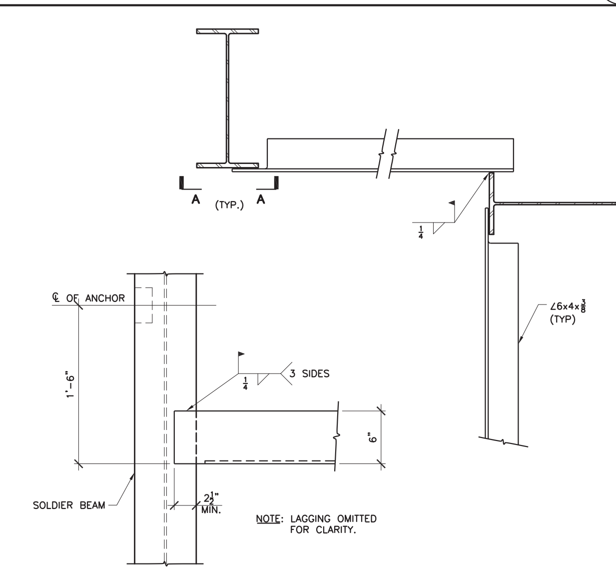
ANCHOR POCKET STRAP DETAIL (9 / SH-3)



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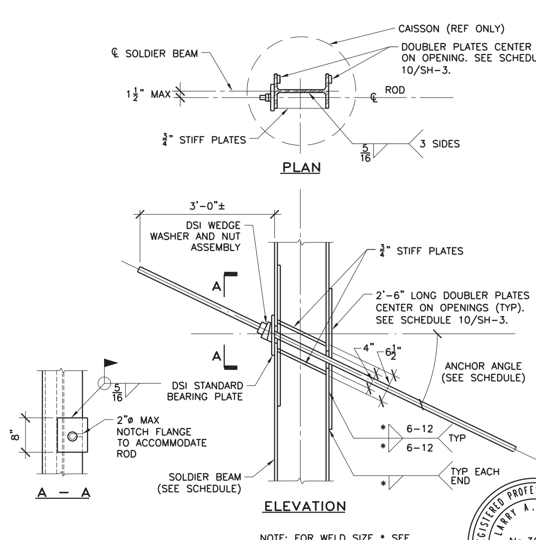
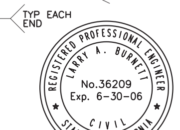
DETAIL (6 / SH-3)



NOTE: FOR WELD SIZE * SEE SCHEDULE 10/SH-3.



NTS

TYPICAL SOLDIER BEAM POCKET FOR ANCHOR RODS (UP TO 25°) (3 / SH-3)

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LOS ANGELES, CA.

TYPICAL DETAILS

Date	08-26-04
Scale	AS NOTED
Drawn	JT
Checked	LAB
Job No.	04-0430
Sheet	SH-3
Of 6 Sheets	

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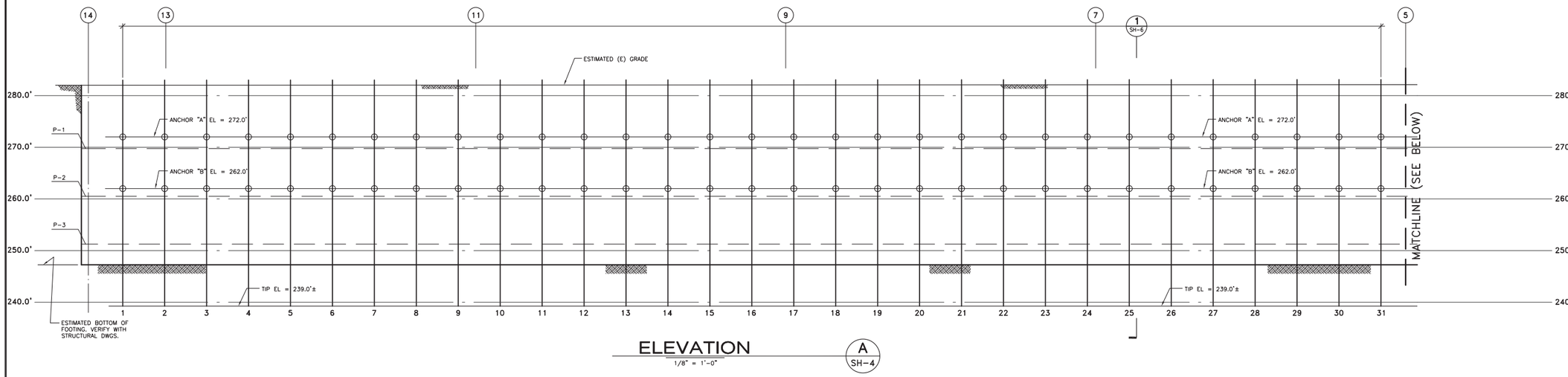
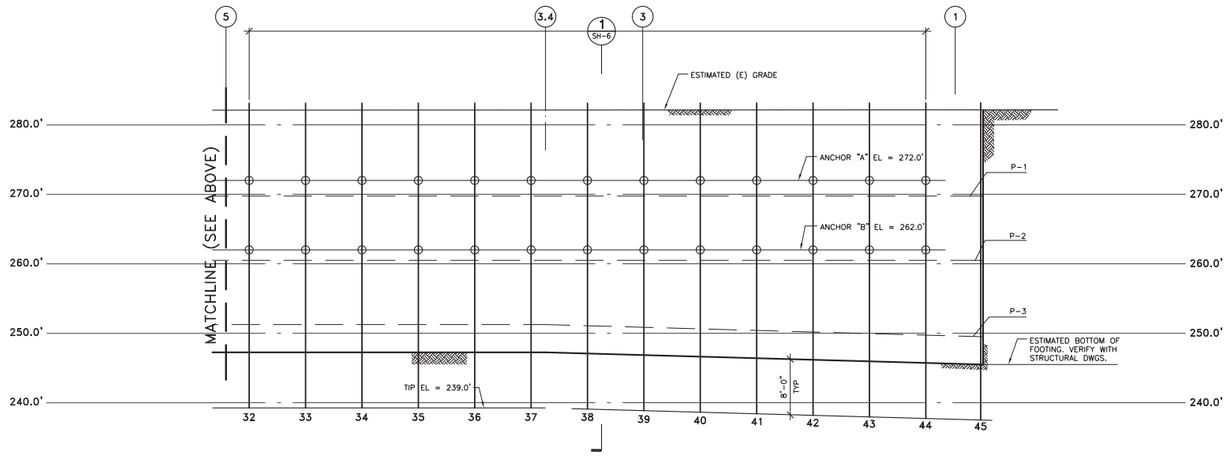


ELEVATION
1/8" = 1'-0"
A / SH-4



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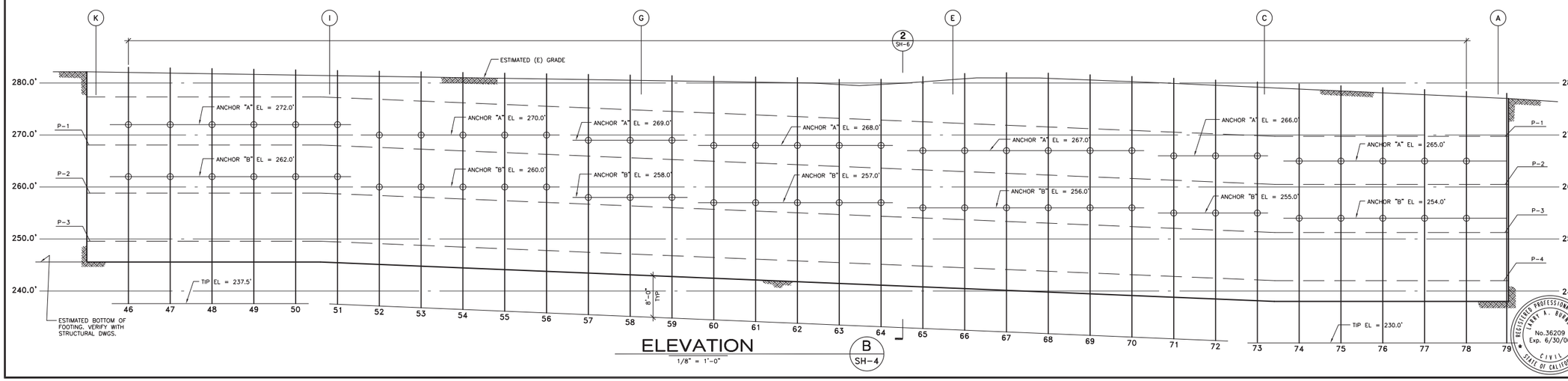

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B / SH-4

NOTES:

1. ⊕ – DENOTES TIE-BACK ANCHORS.
2. ⊠ – DENOTES A PARTIALLY OR COMPLETELY REMOVED ANCHOR.

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BURNETT & YOUNG, Inc.
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10201 WEST PICO BLVD

LOS ANGELES, CA.

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ELEVATIONS

Date	08/26/04
Scale	1/8" = 1'-0"
Drawn	JT
Checked	LAB
Job No.	04-0430
Sheet	SH-4
Of	6 Sheets

REGISTERED PROFESSIONAL ENGINEER
LARRY A. BURNETT
No. 36209
Exp. 6/30/06
CIVIL
STATE OF CALIFORNIA

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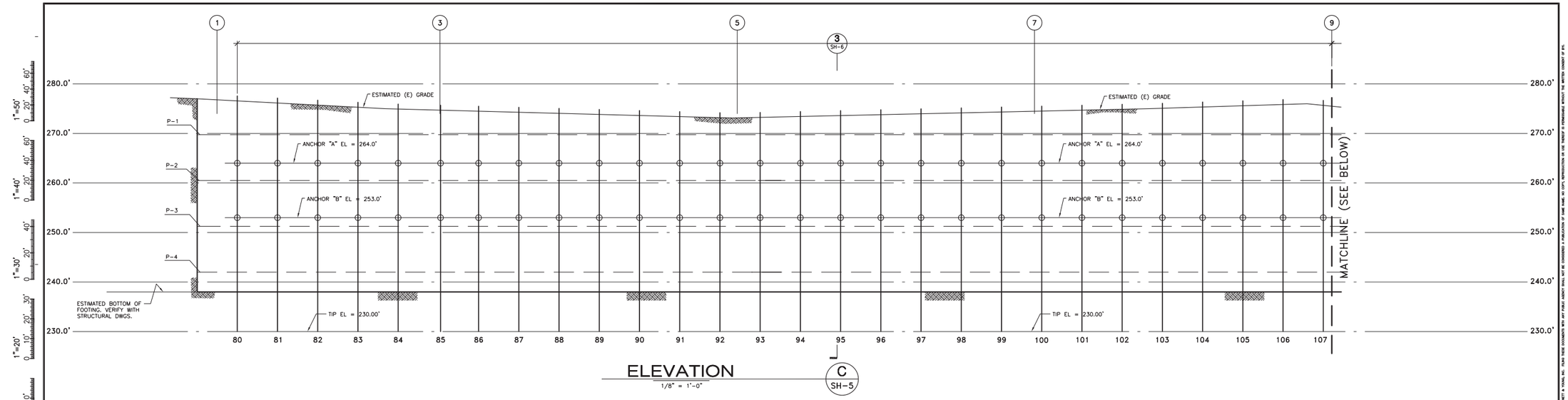

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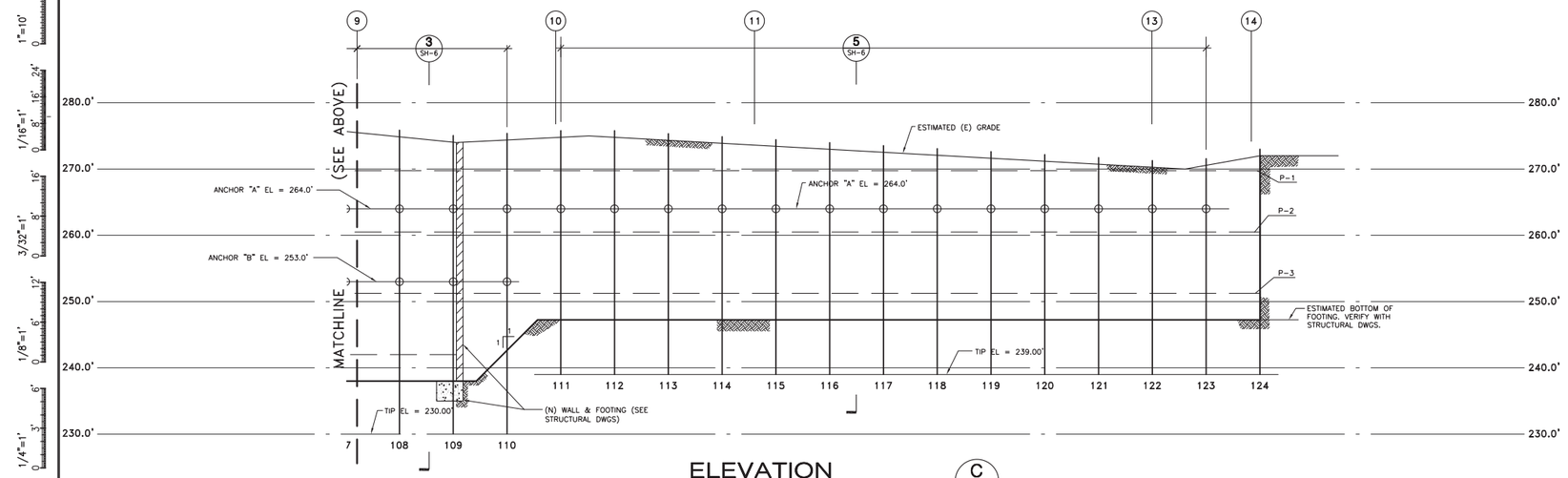

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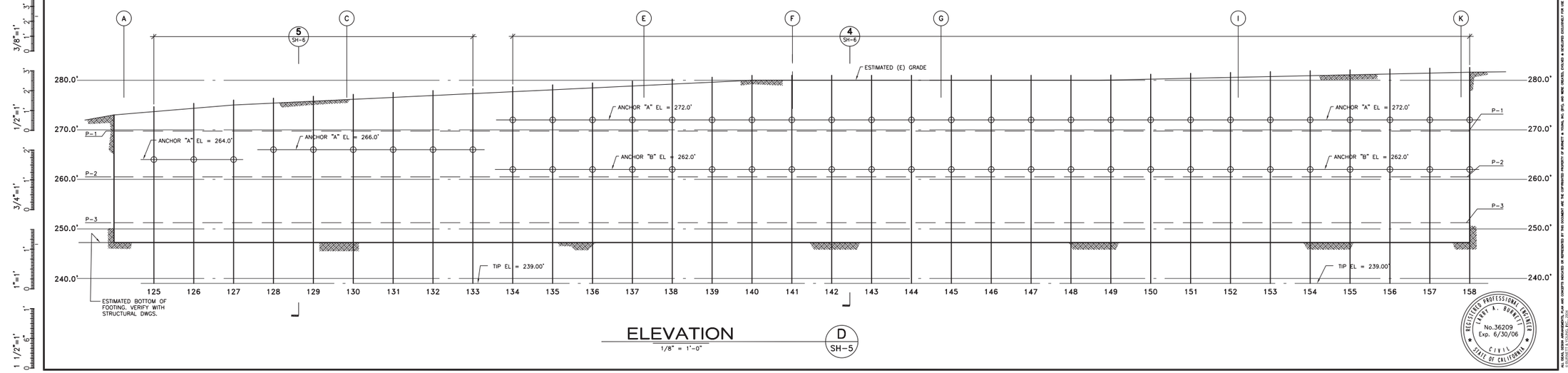

ELEVATION
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SH-5

NOTES:

1. ⊕ – DENOTES TIE-BACK ANCHORS.
2. ⊠ – DENOTES A PARTIALLY OR COMPLETELY REMOVED ANCHOR.

REGISTERED PROFESSIONAL ENGINEER
LARRY A. BURNETT
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Exp. 6/30/06
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ELEVATIONS

Date	08/26/04
Scale	1/8" = 1'-0"
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Job No.	04-0430
Sheet	SH-5
Of	6 Sheets

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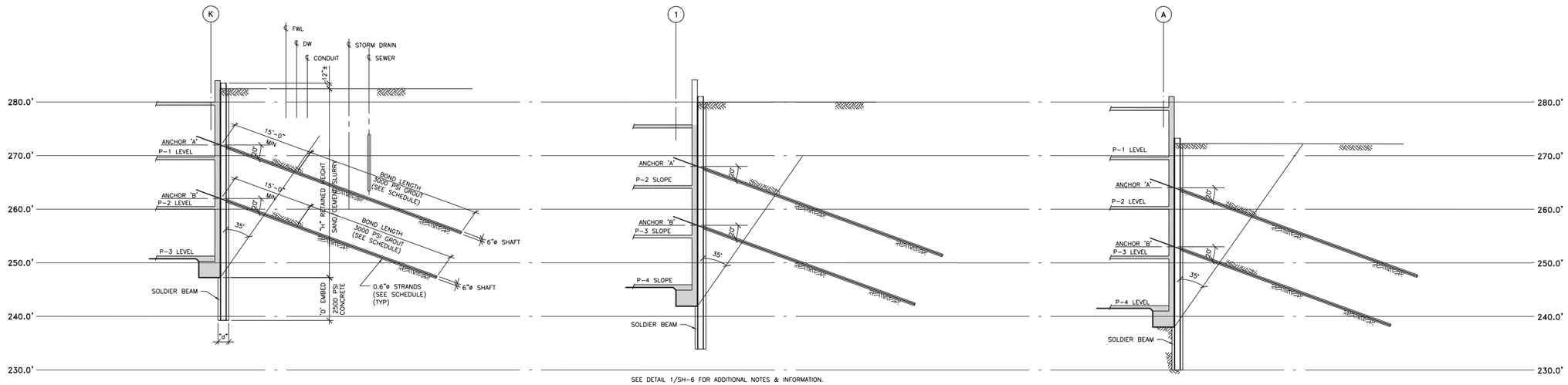


SEE DETAIL 1/SH-6 FOR ADDITIONAL NOTES & INFORMATION.

SECTION 1 — 1/8" = 1'-0" — SH-6

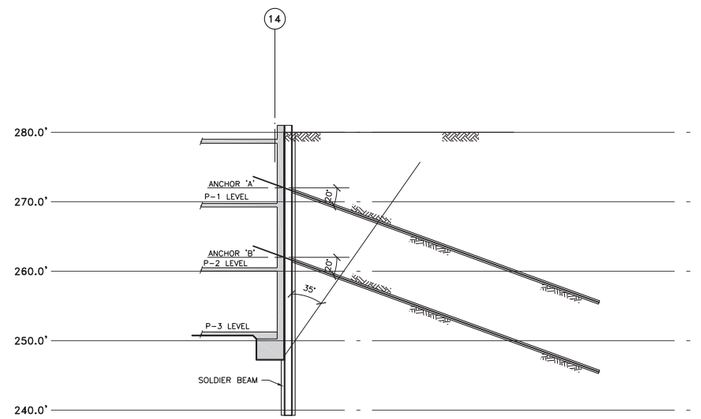
SEE DETAIL 1/SH-6 FOR ADDITIONAL NOTES & INFORMATION.

SECTION 2 — 1/8" = 1'-0" — SH-6

SEE DETAIL 1/SH-6 FOR ADDITIONAL NOTES & INFORMATION.

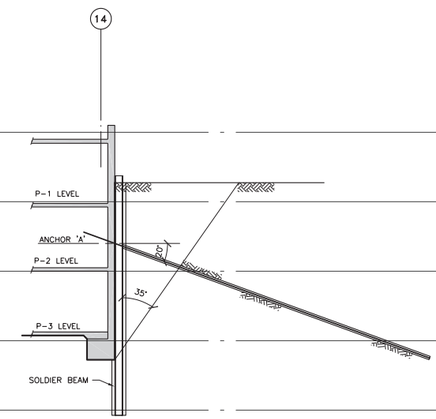
SECTION 3 — 1/8" = 1'-0" — SH-6

NOTE: SEE SCHEDULE ON SH-2 FOR "D", "H", "d" AND BOND LENGTH.



SEE DETAIL 1/SH-6 FOR ADDITIONAL NOTES & INFORMATION.

SECTION 4 — 1/8" = 1'-0" — SH-6



SEE DETAIL 1/SH-6 FOR ADDITIONAL NOTES & INFORMATION.

SECTION 5 — 1/8" = 1'-0" — SH-6

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SECTIONS

Date	08/26/04
Scale	1/8" = 1'-0"
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Checked	LAB
Job No.	04-0430
Sheet	SH-6
Of	6 Sheets

REGISTERED PROFESSIONAL ENGINEER — JAMES A. BURNETT — No. 36209 Exp. 6-30-06 — CIVIL — STATE OF CALIFORNIA

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TAB 9

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9. LEED ™ Analysis

The developer has questioned the team about possibly marketing a LEED™ for Core and Shell project.

Certifying a LEED™ project requires the combined effort of the entire project team. The owners, architect, consultants, and the construction team must all contribute in order to successfully certify a LEED™ building. After initial meetings conducted between the owner and the design team, 22 points have already been determined to be achievable. It is time for the construction team to provide their input on the amount of additional LEED™ points that they consider feasibly attainable.

Make a recommendation stating the number of LEED™ points attainable as follows:

1) Determine which additional points can be achieved at no additional cost to the owner to reach LEED Certified. Fill out a scorecard for LEED Certified and provide a narrative on the reasoning behind the selection of the points your team used to achieve LEED Certified.
2) Determine which additional points can be achieved at the lowest cost to the owner to reach LEED Silver. Fill out a scorecard for LEED Silver and provide a narrative on the reasoning behind the selection of the points your team used to achieve LEED Silver and an estimate of the additional costs.
3) Determine which additional points can be achieved and the cost to the owner to reach LEED Gold. Fill out a scorecard for LEED Gold and provide a narrative on the reasoning behind the selection of the points your team used to achieve LEED Gold and an estimate of the additional costs.

The following is a list of points that have been predetermined by the owner and design team. This information is also reflected in the LEED™ CS score card provided. Your Team only needs to evaluate the credits in the "?" column of the scorecard provided. Do Not change any previously predetermined credits by the owner and A/E Team.

Sustainable Sites

Credit 1 – Site Selection – 1pt
Credit 2 - Development Density and Community Connectivity – Unattainable
Credit 3 – Brownfield Redevelopment – Unattainable
Credit 4.1 – Alternative Transportation, Public Transportation – 1pt
Credit 4.4 – Alternative Transportation, Parking Capacity – Unattainable
Credit 5.1 – Site Development, Protect or Restore Habitat - Unattainable
Credit 5.2 – Site Development, Maximize Open Space – Unattainable
Credit 8 – Light Pollution Reduction – 1 pt
Credit 9 – Tenant Design & Construction Guidelines – 1pt

Water Efficiency

Credit 1.1 Water Efficient Landscaping, Reduce by 50% – Unattainable
Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation – Unattainable
Credit 3.2 Water Use Reduction, 30% Reduction - Unattainable

Energy and Atmosphere
Credit 1.5 – Optimize Energy Performance – 24.5% New Buildings – 5pts
Credit 2 – On Site Renewable Energy – Unattainable
Credit 3 – Enhanced Commissioning – 1pt
Credit 4 – Enhanced Refrigerant Management – Unattainable
Credit 5.2 - Measurement and Verification: Tenant Sub-Metering – *1pt*
Credit 6 – Green Power – 1 pt

Materials and Resources
Credit 1.1 Building Reuse, Maintain 25% of Existing Walls, Floors & Roof – 1 pt
Credit 1.2 Building Reuse, Maintain 50% of Existing Walls, Floors & Roof – Unattainable
Credit 1.3 – Building Reuse, Maintain 75% of Interior Non-Structural Elements - Unattainable
Credit 3 - Materials Reuse, 1% - 1 pt
Credit 4.1 – Recycled Content, 10% (Post Consumer + ½ Pre-Consumer) – 1 pt
Credit 4.2 – Recycled Content, 20% (Post Consumer + ½ Pre-Consumer) – 1 pt
Credit 5.1 – Regional Materials, 10% Extracted, Processed and Manufactured – 1pt.
Credit 5.2 – Regional Materials, 20% Extracted, Processed and Manufactured – Unattainable
Credit 6 – Certified Wood – Unattainable

Indoor Environmental Quality
Credit 1 – Outdoor Air delivery Monitoring – 1 pt
Credit 2 - Increased Ventilation – Unattainable
Credit 4.1 – Low- Emitting Materials, Adhesives & Sealants – 1 pt
Credit 4.2 – Low- Emitting Materials, Paints and Coatings – 1 pt
Credit 4.3 – Low-Emitting Materials, Carpet Systems – Unattainable
Credit 4.4 – Low Emitting Materials, Composite Wood & Agrifiber Products – Unattainable
Credit 5 – Indoor Chemical & Pollutant Source Control – 1 pt
Credit 6 – Controllability of Systems, Thermal Comfort – 1 pt
Credit 7 – Thermal Comfort, Design – 1 pt
Credit 8.1 – Daylight & Views, Daylight 75% of Spaces – Unattainable
Credit 8.2 – Daylight & Views, Daylight 90% of Spaces – Unattainable

Innovation & Design Process
Credit 1.1, 1.2, 1.3, 1.4 – Innovation in Design - Unattainable

Deliverable:

1. *Completed LEED™ Scorecard and Narrative for each of 3 levels of LEED (Certified, Silver & Gold)*

LEED for Core and Shell v2.0
Registered Project Checklist

Predetermined LEED Points by Owner & A/E Team

Project Name: Fox Office Building #103

Project Address: 10201 W. Pico Blvd, Los Angeles, CA 90035

Yes	?	No		
22	13	20	**Project Totals** (Pre-Certification Estimates)	69 Points
			Certified: 23-27 points **Silver**: 28-33 points **Gold**: 34-44 points **Platinum**: 45-61 points	

Yes	?	No			
4	6	5	**Sustainable Sites**		15 Points
Yes			Prereq 1	**Construction Activity Pollution Prevention**	Required
1			Credit 1	**Site Selection**	1
		1	Credit 2	**Development Density & Community Connectivity**	1
		1	Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation**, Public Transportation	1
	1		Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
	1		Credit 4.3	**Alternative Transportation**, Low-Emitting & Fuel Efficient Vehicles	1
		1	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
		1	Credit 5.1	**Site Development**, Protect or Restore Habitat	1
		1	Credit 5.2	**Site Development**, Maximize Open Space	1
	1		Credit 6.1	**Stormwater Design**, Quantity Control	1
	1		Credit 6.2	**Stormwater Design**, Quality Control	1
	1		Credit 7.1	**Heat Island Effect**, Non-Roof	1
	1		Credit 7.2	**Heat Island Effect**, Roof	1
1			Credit 8	**Light Pollution Reduction**	1
1			Credit 9	**Tenant Design & Construction Guidelines**	1

Yes	?	No			
	2	3	**Water Efficiency**		5 Points
		1	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
		1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	1		Credit 2	**Innovative Wastewater Technologies**	1
	1		Credit 3.1	**Water Use Reduction**, 20% Reduction	1
		1	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No		
8	1	1	Energy & Atmosphere	14 Points

Yes		Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Yes		Prereq 2	**Minimum Energy Performance**	Required
Yes		Prereq 3	**Fundamental Refrigerant Management**	Required

***Note for EAc1:** All LEED for Core and Shell projects registered after June 26, 2007 are required to achieve at least two (2) points.

5			Credit 1	**Optimize Energy Performance**	1 to 8
			Credit 1.1	10.5% New Buildings / 3.5% Existing Building Renovations	1
			Credit 1.2	14% New Buildings / 7% Existing Building Renovations	2
			Credit 1.3	17.5% New Buildings / 10.5% Existing Building Renovations	3
			Credit 1.4	21% New Buildings / 14% Existing Building Renovations	4
			--> Credit 1.5	24.5% New Buildings / 17.5% Existing Building Renovations	5
			Credit 1.6	28% New Buildings / 21% Existing Building Renovations	6
			Credit 1.7	31.5% New Buildings / 24.5% Existing Building Renovations	7
			Credit 1.8	35% New Buildings / 28% Existing Building Renovations	8
		1	Credit 2	**On-Site Renewable Energy**	1
1			Credit 3	**Enhanced Commissioning**	1
		1	Credit 4	**Enhanced Refrigerant Management**	1
	1		Credit 5.1	**Measurement & Verification -** Base Building	1
1			Credit 5.2	**Measurement & Verification -** Tenant Sub-metering	1
1			Credit 6	**Green Power**	1

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
5	2	4	Materials & Resources		11 Points

Yes					
1			Prereq 1	**Storage & Collection of Recyclables**	Required
		1	Credit 1.1	**Building Reuse,** Maintain 25% of Existing Walls, Floors & Roof	1
		1	Credit 1.2	**Building Reuse,** Maintain 50% of Existing Walls, Floors & Roof	1
	1		Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1
	1		Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1
1			Credit 3	**Materials Reuse**, 1%	1
1			Credit 4.1	**Recycled Content**, 10% (post-consumer + 1/2 pre-consumer)	1
1			Credit 4.2	**Recycled Content**, 20% (post-consumer + 1/2 pre-consumer)	1
1			Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured	1
		1	Credit 5.2	**Regional Materials**, 20% Extracted, Processed & Manufactured	1
		1	Credit 6	**Certified Wood**	1

Yes	?	No			
5	1	3	Indoor Environmental Quality		11 Points

Yes					
Yes			Prereq 1	**Minimum IAQ Performance**	Required
Yes			Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required
1			Credit 1	**Outdoor Air Delivery Monitoring**	1
		1	Credit 2	**Increased Ventilation**	1
	1		Credit 3	**Construction IAQ Management Plan,** During Construction	1
Y			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
Y			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1
		N	Credit 4.3	**Low-Emitting Materials**, Carpet Systems	1
		N	Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1			Credit 6	**Controllability of Systems**, Thermal Comfort	1
1			Credit 7	**Thermal Comfort,** Design	1
		1	Credit 8.1	**Daylight & Views,** Daylight 75% of Spaces	1
		1	Credit 8.2	**Daylight & Views,** Views for 90% of Spaces	1

***Note for EQc4.1-4.4:** Project teams will receive 1 point for achievement of 2 credits, 2 points for achievement of 3 credits, or 3 points for achievement of 4 credits among EQc4.1, EQc4.2, EQc4.3 and EQc4.4.

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
	1	4	**Innovation & Design Process**		**5 Points**
		1	Credit 1.1	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.2	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.3	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.4	**Innovation in Design:** Provide Specific Title	1
	1		Credit 2	**LEED® Accredited Professional**	1

LEED® Green Building Rating System™
For Core & Shell Development
Version 2.0

July 2006*

For Public Use and Display

*Revised EA section for projects registered after June 26, 2007.

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Table of Contents

Introduction

The Leadership in Energy and Environmental Design (LEED®) Green Building Rating System for Core & Shell Development (LEED for Core & Shell) is a set of performance criteria for certifying the sustainable design and construction of speculative and core and shell buildings. It has been developed as part of the U.S. Green Building Council's ongoing effort to provide a national standard for what constitutes a "green building." The intent of which is to assist in the creation of high performance, healthful, durable, affordable and environmentally sound buildings.

The LEED for Core & Shell Rating System is a market specific application, which recognizes the unique nature of core and shell development. The Rating System acknowledges the limited sphere of influence over which a developer can exert control in a speculatively developed building and encourages the implementation of green design and construction practices in areas where the developer has control. LEED for Core & Shell works to set up a synergistic relationship, which allows future tenants to capitalize on green strategies implemented by the developer. Some key building areas, interior space layout, interior finishes, lighting, mechanical distribution, and other tenant related systems are often outside the direct control of the developer. Thus, the scope of a LEED for Core & Shell project is limited to those aspects of the project over which the developer has direct control. It is the responsibility of the developer/owner to properly identify which LEED rating system to use for the LEED building certification as further described herein.

LEED for Core & Shell is designed to be complementary to the LEED for Commercial Interiors Green Building Rating System (LEED-CI). The LEED-CI and LEED for Core & Shell rating systems establish green building criteria for both developer/owners and tenants.

LEED for Core & Shell addresses:

- Site selection;
- Water efficiency in core and shell building systems;
- Energy optimization of the core and shell systems and provisions for fit out of tenant spaces to optimize operational building energy use;
- Materials and resource guidelines for construction of building core and shell;
- Indoor Environmental Quality planning of the building core and shell to ensure tenant fit out is able to make optimal use of Indoor Environmental Quality attributes including thermal comfort, daylight, and views as well as prevention of contamination from indoor pollutants.

DEFINING THE CORE & SHELL BUILDING

The LEED for Core & Shell Rating System provides the building design and construction industry with a LEED rating system that serves the speculatively driven development market where project teams routinely do not control all aspects of a building's design and construction. The scope of LEED for Core & Shell is limited to those elements of the project under the direct control of the developer/owner. Depending on how the project is structured, this scope can range greatly from project to project. The LEED for Core & Shell Rating System has been developed to address a variety of project types and a broad project scope range.

Scope of Construction

- LEED for Core & Shell can be used for projects where the developer controls the design and construction of the entire core and shell base building including MEP/FP systems, but have no control over the design and construction of the tenant fit-out. An example of this type of project is a commercial office building, medical office building, retail center, warehouse, or lab facility.

- LEED for Core & Shell can also be used for projects that have limited control of the building systems. This is often found in retail development. Projects with limited scope should review the specific credit requirements for guidance.

- In projects that are designed and constructed to be partially occupied by the owner/developer, there is clearly the ability of the owner/developer to directly influence the portion of the work that would typically be tenant interior construction. For projects of this type to utilize the LEED for Core & Shell Rating System, the owner/tenant must occupy 50% or less of the building's leasable space. Projects with greater than 50% of the building's tenant space occupied by a tenant/owner should utilize LEED-NC.

Core & Shell and Tenant Space Guidance

To assist project teams in defining the tenant/owner division in both the project design as well as certification review process, the Core & Shell / Tenant Interiors Checklist has been developed. This checklist is attached as Appendix 3.

LEED for Core & Shell Pre-certification

Overview
LEED for Core & Shell pre-certification is a unique aspect of the LEED for Core & Shell program. Pre-certification is formal recognition by USGBC given to a LEED for Core & Shell candidate project for which the developer/owner has established a goal to develop a LEED for Core & Shell building. LEED for Core & Shell pre-certification is granted to projects after USGBC has reviewed early design stage documentation. This documentation, which reflects a studied and realistic set of project goals and intentions, forms the basis for an award of pre-certification at the project's anticipated LEED for Core & Shell certification level. Pre-certification is not a documented and completed building and is not confirmation or a commitment to achieve LEED for Core & Shell certification. Pre-certification is not LEED Certification.

Value
Pre-certification provides the core & shell developer/owner with the ability to market to potential tenants and financiers the unique and valuable green features of a proposed building.

Submittal and Review
Once a project is registered as a LEED for Core & Shell project with USGBC, the project team may complete the LEED for Core & Shell pre-certification letter templates and submit the project for pre-certification. This is a voluntary submittal at the discretion of the project team.

Because much of the value of pre-certification occurs early in a project's development, the project team's documentation and USGBC's review is less comprehensive than the final LEED for Core & Shell certification application. Project teams are required to provide confirmation that the project intends to meet the requirements of a credit. This is provided using the LEED for Core & Shell pre-certification letter templates on the appropriate design team member's letterhead for each credit pursued, with a brief description of the strategy and/or technology that will be employed. The developer/owner is also required to provide a signed letter template declaring that they are in agreement with the intention and strategies as indicated on each credit specific letter template submitted.

The LEED for Core & Shell Project Scope checklist will also need to be submitted. This checklist is both a design team tool and provides USGBC with useful building information for the review. This includes information about building use, LEED for Core & Shell occupancy numbers and core and shell scope.

The project is reviewed and a LEED for Core & Shell pre-certification level (certified, silver, gold or platinum) is granted. A certificate and letter are provided to the project. The review will allow the developer to market the project's intention to achieve a particular LEED for Core & Shell certification level. This pre-certification process is not intended to be a supplementary comprehensive review of a project's submittal and the

anticipated LEED for Core & Shell certification level. LEED for Core & Shell certification review will still occur with USGBC's established two-phase application (Design and Construction). Because of the many factors inherent in project design, construction and project documentation and review, it is possible that the final certification review will not correspond exactly to the pre-certification review. Project team members should be aware that it is incumbent upon the team to demonstrate that the credit requirements have been met at the design and construction certification reviews.

Credit Compliance

Overview

The LEED for Core & Shell Rating System is written for core and shell development and is intentionally neutral regarding requirements for tenant build-out. A LEED for Core & Shell rating can be attained without making any requirements of a tenant. A tenant can choose to pursue or not to pursue a LEED for Commercial Interiors (LEED-CI) rating with no impact on the building's LEED for Core & Shell rating. However, if a developer chooses to make specific lease requirements part of their tenant negotiation, and these requirements meet the criteria of a particular credit in the LEED for Core & Shell Rating System, the LEED for Core & Shell project may be able to receive a point for this credit even if the work is not part of the core and shell design and construction.

The following describes this approach to credit compliance and may be used, as applicable, throughout the rating system.

Requirements

Meet LEED for Core & Shell Credit requirements through either;

- Design and construction of the building core and shell,

OR

- Establishment of tenant requirements that meet the LEED for Core & Shell credit requirements, but will be implemented as part of the tenant controlled build-out.

Submittals

- Provide the LEED letter template, signed by the building developer/owner for the credit being pursued, based on the core and shell design and construction.

OR

- The LEED letter template for the credit pursued indicating that:
  - 100% of leased square footage complies with credit requirements. Lease or sales agreements may be requested.
  AND
  - That 100% of the unleased square footage shall comply with the credit requirements when leased. A statement signed by the developer/owner that all leases and/or sales agreements will comply may be requested.

USGBC recognizes the realities and complexity of tenant fit out and the difficulties associated with the enforcement of a 100% compliance path requirement. As result, in certain instances, a minor portion of the final fully occupied tenant spaces may not meet the 100% requirement. Under such a situation, the committee acknowledges the 100% assurance as being met. Minor portion is defined as a 10% variance.

Project Checklist

Sustainable Sites 15 Possible Points

Prereq 1	**Construction Activity Pollution Prevention**	Required
Credit 1	**Site Selection**	1
Credit 2	**Development Density & Community Connectivity**	1
Credit 3	**Brownfield Redevelopment**	1
Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
Credit 4.3	**Alternative Transportation**, Low Emitting & Fuel Efficient Vehicles	1
Credit 4.4	**Alternative Transportation**, Parking Capacity	1
Credit 5.1	**Site Development**, Protect or Restore Habitat	1
Credit 5.2	**Site Development**, Maximize Open Space	1
Credit 6.1	**Stormwater Design**, Quantity Control	1
Credit 6.2	**Stormwater Design**, Quality Control	1
Credit 7.1	**Heat Island Effect**, Non-Roof	1
Credit 7.2	**Heat Island Effect**, Roof	1
Credit 8	**Light Pollution Reduction**	1
Credit 9	**Tenant Design and Construction Guidelines**	1

Water Efficiency 5 Possible Points

Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
Credit 2	**Innovative Wastewater Technologies**	1
Credit 3.1	**Water Use Reduction**, 20% Reduction	1
Credit 3.2	**Water Use Reduction**, 30% Reduction	1

Energy & Atmosphere 14 Possible Points

Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Prereq 2	**Minimum Energy Performance**	Required
Prereq 3	**Fundamental Refrigerant Management**	Required
Credit 1	**Optimize Energy Performance** (2 points mandatory for LEED for Core and Shell projects registered after June 26, 2007)	1–8
Credit 2	**On-Site Renewable Energy**	1
Credit 3	**Enhanced Commissioning**	1
Credit 4	**Enhanced Refrigerant Management**	1
Credit 5.1	**Measurement & Verification-** Base Building	1
Credit 5.2	**Measurement & Verification –** Tenant Sub-metering	1
Credit 6	**Green Power**	1

Materials & Resources 11 Possible Points

Prereq 1	**Storage & Collection of Recyclables**	Required
Credit 1.1	**Building Reuse**, Maintain 25% of Existing Walls, Floors & Roof	1
Credit 1.2	**Building Reuse**, Maintain 50% of Existing Walls, Floors & Roof	1
Credit 1.3	**Building Reuse**, Maintain 75% of Existing Walls, Floors & Roof	1
Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1
Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1
Credit 3	**Materials Reuse**, 1%	1
Credit 4.1	**Recycled Content**, 10% (post-consumer + 1/2 pre-consumer)	1
Credit 4.2	**Recycled Content**, 20% (post-consumer + 1/2 pre-consumer)	1
Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured Regionally	1
Credit 5.2	**Regional Materials,** 20% Extracted, Processed & Manufactured Regionally	1
Credit 6	**Certified Wood**	1

Indoor Environmental Quality 11 Possible Points

Prereq 1	**Minimum IAQ Performance**	Required
Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required
Credit 1	**Outdoor Air Delivery Monitoring**	1
Credit 2	**Increased Ventilation**	1
Credit 3	**Construction IAQ Management Plan**, During Construction	1
Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1 point for 2
Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	2 points for 3
Credit 4.3	**Low-Emitting Materials**, Carpet Systems	3 points for 4
Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	
Credit 5	**Indoor Chemical & Pollutant Source Control**	1
Credit 6	**Controllability of Systems**, Thermal Comfort	1
Credit 7	**Thermal Comfort**, Design	1
Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Innovation & Design Process 5 Possible Points

Credit 1.1	**Innovation in Design**	1
Credit 1.2	**Innovation in Design**	1
Credit 1.3	**Innovation in Design**	1
Credit 1.4	**Innovation in Design**	1
Credit 2	**LEED Accredited Professional**	1

Project Totals 61 Possible Points

Certified 23–27 points Silver 28–33 points Gold 34–44 points Platinum 45–61 points

Sustainable Sites

SS Prerequisite 1: Construction Activity Pollution Prevention Required

Intent

Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

Requirements

Create and implement an Erosion and Sedimentation Control (ESC) Plan for all construction activities associated with the project. The ESC Plan shall conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit OR local erosion and sedimentation control standards and codes, whichever is more stringent. The Plan shall describe the measures implemented to accomplish the following objectives:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams.
- Prevent polluting the air with dust and particulate matter.

The Construction General Permit (CGP) outlines the provisions necessary to comply with Phase I and Phase II of the National Pollutant Discharge Elimination System (NPDES) program. While the CGP only applies to construction sites greater than 1 acre, the requirements are applied to all projects for the purposes of this prerequisite. Information on the EPA CGP is available at: http://cfpub.epa.gov/npdes/stormwater/cgp.cfm.

Potential Technologies & Strategies

Create an Erosion and Sedimentation Control Plan during the design phase of the project. Consider employing strategies such as temporary and permanent seeding, mulching, earth dikes, silt fencing, sediment traps and sediment basins.

SS Credit 1: Site Selection
1 Point

Intent

Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

Requirements

Do not develop buildings, hardscape, roads or parking areas on portions of sites that meet any one of the following criteria:

- Prime farmland as defined by the United States Department of Agriculture in the United States Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5 (citation 7CFR657.5)
- Previously undeveloped land whose elevation is lower than 5 feet above the elevation of the 100-year flood as defined by FEMA (Federal Emergency Management Agency)
- Land that is specifically identified as habitat for any species on Federal or State threatened or endangered lists
- Within 100 feet of any wetlands as defined by United States Code of Federal Regulations 40 CFR, Parts 230-233 and Part 22, and isolated wetlands or areas of special concern identified by state or local rule, OR within setback distances from wetlands prescribed in state or local regulations, as defined by local or state rule or law, whichever is more stringent
- Previously undeveloped land that is within 50 feet of a water body, defined as seas, lakes, rivers, streams and tributaries which support or could support fish, recreation or industrial use, consistent with the terminology of the Clean Water Act
- Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (Park Authority projects are exempt)

Potential Technologies & Strategies

During the site selection process, give preference to those sites that do not include sensitive site elements and restrictive land types. Select a suitable building location and design the building with the minimal footprint to minimize site disruption of those environmentally sensitive areas identified above.

SS Credit 2: Development Density & Community Connectivity
1 Point

Intent

Channel development to urban areas with existing infrastructure, protect greenfields and preserve habitat and natural resources.

Requirements

OPTION 1 — DEVELOPMENT DENSITY

Construct or renovate building on a previously developed site AND in a community with a minimum density of 60,000 square feet per acre net (Note: density calculation must include the area of the project being built and is based on a typical two-story downtown development).

OR

OPTION 2 — COMMUNITY CONNECTIVITY

Construct or renovate building on a previously developed site AND within 1/2 mile of a residential zone or neighborhood with an average density of 10 units per acre net AND within 1/2 mile of at least 10 Basic Services AND with pedestrian access between the building and the services.

Basic Services include, but are not limited to:

1) Bank; 2) Place of Worship; 3) Convenience Grocery; 4) Day Care; 5) Cleaners; 6) Fire Station; 7) Beauty; 8) Hardware; 9) Laundry; 10) Library; 11) Medical/Dental; 12) Senior Care Facility; 13) Park; 14) Pharmacy; 15) Post Office; 16) Restaurant; 17) School; 18) Supermarket; 19) Theater; 20) Community Center; 21) Fitness Center; 22) Museum.

Proximity is determined by drawing a 1/2 mile radius around the main building entrance on a site map and counting the services within that radius.

Potential Technologies & Strategies

During the site selection process, give preference to urban sites with pedestrian access to a variety of services.

SS Credit 3: Brownfield Redevelopment
1 Point

Intent

Rehabilitate damaged sites where development is complicated by environmental contamination, reducing pressure on undeveloped land.

Requirements

Develop on a site documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment or a local Voluntary Cleanup Program) OR on a site defined as a brownfield by a local, state or federal government agency.

Potential Technologies & Strategies

During the site selection process, give preference to brownfield sites. Identify tax incentives and property cost savings. Coordinate site development plans with remediation activity, as appropriate.

SS Credit 4.1: Alternative Transportation: Public Transportation Access

1 Point

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

Locate project within 1/2 mile of an existing, or planned and funded, commuter rail, light rail or subway station.

OR

Locate project within 1/4 mile of one or more stops for two or more public or campus bus lines usable by building occupants.

Potential Technologies & Strategies

Perform a transportation survey of future building occupants to identify transportation needs. Site the building near mass transit.

SS Credit 4.2: Alternative Transportation: Bicycle Storage & Changing Rooms

1 Point

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

CASE 1

For commercial or institutional buildings with a total gross square footage of less than 300,000 sq. feet, provide secure bicycle racks and/or storage (within 200 yards of a building entrance) for 3% or more of all building users (calculated on average for the year), AND, provide shower and changing facilities in the building, or within 200 yards of a building entrance, for 0.5% of Full-Time Equivalent (FTE) occupants.

CASE 2

For projects with a total gross square footage greater than 300,000 sq feet, provide secure bicycle storage for 3% of the occupants for up to 300,000 sf, then an additional 0. 5% for the occupants for the space over 300,000 sf. Mixed-use buildings with a total gross square footage greater than 300,000 sq feet must apply this calculation for each use in the building. AND, provide shower and changing facilities in the building, or within 200 yards of a building entrance, for 0.5% of Full-Time Equivalent (FTE) occupants.

CASE 3

For residential buildings or the residential portion of a mixed-use building, provide covered storage facilities for securing bicycles for 15% or more of building occupants in lieu of changing/shower facilities.

See Appendix 1 – Default Occupancy Counts for occupancy count requirements and guidance.

Potential Technologies & Strategies

Design the building with transportation amenities such as bicycle racks and showering/changing facilities.

SS Credit 4.3: Alternative Transportation: Low Emitting & Fuel Efficient Vehicles

1 Point

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

OPTION 1

Provide preferred parking for low-emitting and fuel-efficient vehicles for 5% of the total vehicle parking capacity of the site.

OR

OPTION 2

Install alternative-fuel refueling stations for 3% of the total vehicle parking capacity of the site (liquid or gaseous fueling facilities must be separately ventilated or located outdoors).

For the purposes of this credit, low-emitting and fuel-efficient vehicles are defined as vehicles that are either classified as Zero Emission Vehicles (ZEV) by the California Air Resources Board or have achieved a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide.

"Preferred parking" generally refers to the parking spots that are closest to the main entrance of the project (exclusive of spaces designated for handicapped) or parking passes provided at a discounted price.

For project types that demonstrate market barriers to the definition of "preferred parking closest to the main entrance", alternatives to may be considered on a case-by-case basis.

See Appendix 1 – Default Occupancy Counts for occupancy count requirements and guidance.

Potential Technologies & Strategies

Provide transportation amenities such as alternative fuel refueling stations. Consider sharing the costs and benefits of refueling stations with neighbors.

SS Credit 4.4: Alternative Transportation: Parking Capacity
1 Point

Intent

Reduce pollution and land development impacts from single occupancy vehicle use.

Requirements

OPTION 1 — NON-RESIDENTIAL

- Size parking capacity to not exceed, minimum local zoning requirements.

OR

OPTION 2 — NON-RESIDENTIAL

For projects that provide parking for less than 3% of FTE building occupants:

- Provide preferred parking for carpools or vanpools, marked as such, for 3% of total provided parking spaces. OR

OPTION 2 — RESIDENTIAL

- Size parking capacity to not exceed minimum local zoning requirements, AND, provide infrastructure and support programs to facilitate shared vehicle usage such as carpool drop-off areas, designated parking for vanpools, or car-share services, ride boards, and shuttle services to mass transit.

OR

OPTION 3 — ALL

Provide no new parking.

See Appendix 1 – Default Occupancy Counts for occupancy count requirements and guidance.

Potential Technologies & Strategies

Minimize parking lot/garage size. Consider sharing parking facilities with adjacent buildings. Consider alternatives that will limit the use of single occupancy vehicles.

SS Credit 5.1: Site Development: Protect or Restore Habitat
1 Point

Intent

Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirements

On greenfield sites, limit all site disturbance to 40 feet beyond the building perimeter; 10 feet beyond surface walkways, patios, surface parking and utilities less than 12 inches in diameter; 15 feet beyond primary roadway curbs and main utility branch trenches; and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities and playing fields) that require additional staging areas in order to limit compaction in the constructed area.

OR

On previously developed or graded sites, restore or protect a minimum of 50% of the site area (excluding the building footprint) with native or adapted vegetation. Native/adapted plants are plants indigenous to a locality or cultivars of native plants that are adapted to the local climate and are not considered invasive species or noxious weeds. Projects earning SS Credit 2 and using vegetated roof surfaces may apply the vegetated roof surface to this calculation if the plants meet the definition of native/adapted.

Greenfield sites are those that are not previously developed or graded and remain in a natural state. Previously developed sites are those that previously contained buildings, roadways, parking lots, or were graded or altered by direct human activities.

Potential Technologies & Strategies

On greenfield sites, perform a site survey to identify site elements and adopt a master plan for development of the project site. Carefully site the building to minimize disruption to existing ecosystems and design the building to minimize its footprint. Strategies include stacking the building program, tuck-under parking and sharing facilities with neighbors. Establish clearly marked construction boundaries to minimize disturbance of the existing site and restore previously degraded areas to their natural state. For previously developed sites, utilize local and regional governmental agencies, consultants, educational facilities, and native plant societies as resources for the selection of appropriate native or adapted plant materials. Prohibit plant materials listed as invasive or noxious weed species. Native/adapted plants require minimal or no irrigation following establishment, do not require active maintenance such as mowing or chemical inputs such as fertilizers, pesticides or herbicides, and provide habitat value and promote biodiversity through avoidance of monoculture plantings.

SS Credit 5.2: Site Development: Maximize Open Space
1 Point

Intent

Provide a high ratio of open space to development footprint to promote biodiversity.

Requirements

OPTION 1

Reduce the development footprint (defined as the total area of the building footprint, hardscape, access roads and parking) and/or provide vegetated open space within the project boundary to exceed the local zoning's open space requirement for the site by 25%.

OR

OPTION 2

For areas with no local zoning requirements (e.g., some university campuses, military bases), provide vegetated open space area adjacent to the building that is equal to the building footprint.

OR

OPTION 3

Where a zoning ordinance exists, but there is no requirement for open space (zero), provide vegetated open space equal to 20% of the project's site area.

ALL OPTIONS:

- For projects located in urban areas that earn SS Credit 2, vegetated roof areas can contribute to credit compliance.
- For projects located in urban areas that earn SS Credit 2, pedestrian oriented hardscape areas can contribute to credit compliance. For such projects, a minimum of 25% of the open space counted must be vegetated.
- Wetlands or naturally designed ponds may count as open space if the side slope gradients average 1:4 (vertical: horizontal) or less and are vegetated.

Potential Technologies & Strategies

Perform a site survey to identify site elements and adopt a master plan for development of the project site. Select a suitable building location and design the building with a minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck-under parking and sharing facilities with neighbors to maximize open space on the site.

SS Credit 6.1: Stormwater Design: Quantity Control
1 Point

Intent

Limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and managing stormwater runoff.

Requirements

CASE 1 — EXISTING IMPERVIOUSNESS IS LESS THAN OR EQUAL TO 50%

Implement a stormwater management plan that prevents the post-development peak discharge rate and quantity from exceeding the pre-development peak discharge rate and quantity for the one- and two-year 24-hour design storms.

OR

Implement a stormwater management plan that protects receiving stream channels from excessive erosion by implementing a stream channel protection strategy and quantity control strategies.

OR

CASE 2 — EXISTING IMPERVIOUSNESS IS GREATER THAN 50%

Implement a stormwater management plan that results in a 25% decrease in the volume of stormwater runoff from the two-year 24-hour design storm.

Potential Technologies & Strategies

Design the project site to maintain natural stormwater flows by promoting infiltration. Specify vegetated roofs, pervious paving, and other measures to minimize impervious surfaces. Reuse stormwater volumes generated for non-potable uses such as landscape irrigation, toilet and urinal flushing and custodial uses.

SS Credit 6.2: Stormwater Design: Quality Control
1 Point

Intent

Limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and managing stormwater runoff.

Requirements

Implement a stormwater management plan that reduces impervious cover, promotes infiltration, and captures and treats the stormwater runoff from 90% of the average annual rainfall[1] using acceptable best management practices (BMPs).

BMPs used to treat runoff must be capable of removing 80% of the average annual post development total suspended solids (TSS) load based on existing monitoring reports. BMPs are considered to meet these criteria if (1) they are designed in accordance with standards and specifications from a state or local program that has adopted these performance standards, or (2) there exists in-field performance monitoring data demonstrating compliance with the criteria. Data must conform to accepted protocol (e.g., Technology Acceptance Reciprocity Partnership [TARP], Washington State Department of Ecology) for BMP monitoring.

Potential Technologies & Strategies

Use alternative surfaces (e.g., vegetated roofs, pervious pavement or grid pavers) and nonstructural techniques (e.g., rain gardens, vegetated swales, disconnection of imperviousness, rainwater recycling) to reduce imperviousness and promote infiltration thereby reducing pollutant loadings.

Use sustainable design strategies (e.g., Low Impact Development, Environmentally Sensitive Design) to design integrated natural and mechanical treatment systems such as constructed wetlands, vegetated filters, and open channels to treat stormwater runoff.

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[1] In the United States, there are three distinct climates that influence the nature and amount of rainfall occurring on an annual basis. Humid watersheds are defined as those that receive at least 40 inches of rainfall each year, Semi-arid watersheds receive between 20 and 40 inches of rainfall per year, and Arid watersheds receive less than 20 inches of rainfall per year. For this credit, 90% of the average annual rainfall is equivalent to treating the runoff from:

(a) Humid Watersheds – 1 inch of rainfall;
(b) Semi-arid Watersheds – 0.75 inches of rainfall; and
(c) Arid Watersheds – 0.5 inches of rainfall.

SS Credit 7.1: Heat Island Effect: Non-Roof
1 Point

Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements

OPTION 1

Provide any combination of the following strategies for 50% of the site hardscape (including roads, sidewalks, courtyards and parking lots):

- Shade (within 5 years of occupancy)
- Paving materials with a Solar Reflectance Index (SRI)[2] of at least 29
- Open grid pavement system

OR

OPTION 2

Place a minimum of 50% of parking spaces under cover (defined as under ground, under deck, under roof, or under a building). Any roof used to shade or cover parking must have an SRI of at least 29.

Potential Technologies & Strategies

Shade constructed surfaces on the site with landscape features and utilize high-reflectance materials for hardscape. Consider replacing constructed surfaces (i.e. roof, roads, sidewalks, etc.) with vegetated surfaces such as vegetated roofs and open grid paving or specify high-albedo materials to reduce the heat absorption.

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[2] The Solar Reflectance Index (SRI) is a measure of the constructed surface's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. To calculate the SRI for a given material, obtain the reflectance value and emittance value for the material. SRI is calculated according to ASTM E 1980-01. Reflectance is measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371. Default values for some materials will be available in the LEED-CS Reference Guide.

SS Credit 7.2: Heat Island Effect: Roof
1 Point

Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements

OPTION 1

Use roofing materials having a Solar Reflectance Index (SRI)[3] equal to or greater than the values in the table below for a minimum of 75% of the roof surface.
OR

OPTION 2

Install a vegetated roof for at least 50% of the roof area.

OR

OPTION 3

Install high albedo and vegetated roof surfaces that, in combination, meet the following criteria:

(Area of SRI Roof / 0.75) + (Area of vegetated roof / 0.5) >= Total Roof Area

Roof Type	Slope	SRI
Low-Sloped Roof	**≤ 2:12**	**78**
Steep-Sloped Roof	**> 2:12**	**29**

Potential Technologies & Strategies

Consider installing high-albedo and vegetated roofs to reduce heat absorption. SRI is calculated according to ASTM E 1980. Reflectance is measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371. Default values will be available in the LEED for Core & Shell Reference Guide. Product information is available from the Cool Roof Rating Council website, at www.coolroofs.org.

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[3] The Solar Reflectance Index (SRI) is a measure of the constructed surface's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. To calculate the SRI for a given material, obtain the reflectance value and emittance value for the material. SRI is calculated according to ASTM E 1980. Reflectance is measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371.

SS Credit 8: Light Pollution Reduction
1 Point

Intent

Minimize light trespass from the building and site, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction, and reduce development impact on nocturnal environments.

Requirements

FOR INTERIOR LIGHTING
All non-emergency interior lighting, with a direct line of sight to any openings in the envelope (translucent or transparent), shall have its input power reduced (by automatic device) by at least 50% between the hours of 11 PM and 5 AM. After hours override may be provided by a manual or occupant sensing device provided that the override last no more than 30 minutes.

OR

All openings in the envelope (translucent or transparent) with a direct line of sight to any non-emergency lighting shall have shielding (for a resultant transmittance of less than 10%) that will be controlled/closed by automatic device between the hours of 11 PM and 5 AM.

AND

FOR EXTERIOR LIGHTING
Only light areas as required for safety and comfort. Do not exceed 80% of the lighting power densities for exterior areas and 50% for building facades and landscape features as defined in ASHRAE/IESNA Standard 90.1-2004, Exterior Lighting Section, without amendments.

All projects shall be classified under one of the following zones, as defined in IESNA RP-33, and shall follow all of the requirements for that specific zone:

LZ1 — Dark (Park and Rural Settings)
Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.01 horizontal and vertical footcandles at the site boundary and beyond. Document that 0% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down).

LZ2 — Low (Residential areas)
Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.10 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 10 feet beyond the site boundary. Document that no more than 2% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

LZ3 — Medium (Commercial/Industrial, High-Density Residential)

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.20 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 15 feet beyond the site. Document that no more than 5% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

LZ4 — High (Major City Centers, Entertainment Districts)
Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.60 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 15 feet beyond the site. Document that no more than 10% of the total initial designed site lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

Potential Technologies & Strategies

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible and model the site lighting using a computer model. Technologies to reduce light pollution include full cutoff luminaires, low-reflectance surfaces and low-angle spotlights.

SS Credit 9: Tenant Design & Construction Guidelines
1 Point

Intent

Provide tenants with a descriptive tool that both educates and helps them implement sustainable design and constructions features in their tenant improvement build-out.

Tenant Design and Construction Guidelines benefit the Core & Shell certified project for two important reasons: First, the Guidelines will help tenants design and build sustainable interiors and adopt green building practices; second, the Guidelines will help in coordinating LEED-CI and LEED for Core & Shell certifications.

Requirements

Publish an illustrated document that provides tenants with design and construction information that:

Provides a description of the sustainable design and construction features incorporated in the Core & Shell project and delineates the project intent with respect to sustainability goals and objectives including those for tenant spaces.

- Provides information that enables a tenant to coordinate their space design and construction with the core and shell's building systems. Specific building LEED for Core & Shell credits to be addressed when applicable include;
    - Water Use Reduction
    - Optimize Energy Performance, Lighting Power
    - Optimize Energy Performance, Lighting Controls
    - Optimize Energy Performance, HVAC
    - Energy use and metering
    - Measurement and Verification
    - Ventilation and Outdoor Air Delivery
    - Construction IAQ Management
    - Indoor Chemical and Pollutant Source Control
    - Controllability of Systems
    - Thermal comfort
    - Daylighting and views
    - Commissioning
    - The elimination or control of environmental tobacco smoke.
    - Provides recommendations, including examples, of sustainable strategies, products, materials, and service suggestion;

Provides information LEED Green Building Rating System for Commercial Interiors (LEED-CI) and how the core and shell building contributes to achieving these credits.

Potential Technologies & Strategies

Provide a copy of the Tenant Design and Construction Guideline to tenants.

Water Efficiency

WE Credit 1.1: Water Efficient Landscaping: Reduce by 50%
1 Point

Intent

Limit or eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

Requirements

Reduce potable water consumption for irrigation by 50% from a calculated mid-summer baseline case.

Reductions shall be attributed to any combination of the following items:

- Plant species factor
- Irrigation efficiency
- Use of captured rainwater
- Use of recycled wastewater
- Use of water treated and conveyed by a public agency specifically for non-potable uses

Potential Technologies & Strategies

Perform a soil/climate analysis to determine appropriate plant material and design the landscape with native or adapted plants to reduce or eliminate irrigation requirements. Where irrigation is required, use high-efficiency equipment and/or climate-based controllers.

WE Credit 1.2: Water Efficient Landscaping: No Potable Water Use or No Irrigation

1 Point in addition to WE Credit 1.1

Intent

Eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

Requirements

Achieve WE Credit 1.1.and:

Use only captured rainwater, recycled wastewater, recycled greywater, or water treated and conveyed by a public agency specifically for non-potable uses for irrigation.

OR

Install landscaping that does not require permanent irrigation systems. Temporary irrigation systems used for plant establishment are allowed only if removed within one year of installation.

Potential Technologies & Strategies

Perform a soil/climate analysis to determine appropriate landscape types and design the landscape with indigenous plants to reduce or eliminate irrigation requirements. Consider using stormwater, greywater, and/or condensate water for irrigation.

WE Credit 2: Innovative Wastewater Technologies
1 Point

Intent

Reduce generation of wastewater and potable water demand, while increasing the local aquifer recharge.

Requirements

OPTION 1

Reduce potable water use for building sewage conveyance by 50% through the use of water-conserving fixtures (water closets, urinals) or non-potable water (captured rainwater, recycled greywater, and on-site or municipally treated wastewater).

OR

OPTION 2

Treat 50% of wastewater on-site to tertiary standards. Treated water must be infiltrated or used on-site.

Potential Technologies & Strategies

Specify high-efficiency fixtures and dry fixtures such as composting toilet systems and non-water using urinals to reduce wastewater volumes. Consider reusing stormwater or greywater for sewage conveyance or on-site wastewater treatment systems (mechanical and/or natural). Options for on-site wastewater treatment include packaged biological nutrient removal systems, constructed wetlands, and high-efficiency filtration systems.

WE Credit 3.1: Water Use Reduction: 20% Reduction
1 Point

Intent

Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirements

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 (and as amended) fixture performance requirements. Calculations are based on estimated occupant usage and shall include only the following fixtures (as applicable to the building): water closets, urinals, lavatory faucets, showers and kitchen sinks.

Potential Technologies & Strategies

Use high-efficiency fixtures, including dry fixtures such as composting toilet systems and non-water using urinals, to reduce the potable water demand. Consider reuse of stormwater and treated greywater for non-potable applications such as toilet and urinal flushing, landscape irrigation, clothes washing, and custodial uses.

WE Credit 3.2: Water Use Reduction: 30% Reduction
1 Point in addition to WE Credit 3.1

Intent

Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirements

Employ strategies that in aggregate use 30% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 (and as amended) fixture performance requirements. Calculations are based on estimated occupant usage and shall include only the following fixtures (as applicable to the building): water closets, urinals, lavatory faucets, showers and kitchen sinks.

Potential Technologies & Strategies

Use high-efficiency fixtures, including dry fixtures such as composting toilets and waterless urinals, to reduce the potable water demand. Consider reuse of stormwater and treated greywater for non-potable applications such as toilet and urinal flushing, landscape irrigation, clothes washing, mechanical systems and custodial uses.

Energy & Atmosphere

EA Prerequisite 1: Fundamental Commissioning of the Building Energy Systems

Required

Intent

Verify that the building's energy related systems are installed, calibrated and perform according to the owner's project requirements, basis of design, and construction documents.

Benefits of Commissioning

Benefits of commissioning include reduced energy use, lower operating costs, reduced contractor callbacks, better building documentation, improved occupant productivity, and verification that the systems perform in accordance with the owner's project requirements.

Requirements

The following commissioning process activities shall be completed by the commissioning team, in accordance with the LEED for Core & Shell Reference Guide.

1) Designate an individual as the Commissioning Authority (CxA) to lead, review and oversee the completion of the commissioning process activities.
   a) The CxA shall have documented commissioning authority experience in at least two building projects.
   b) The individual serving as the CxA shall be independent of the project's design and construction management, though they may be employees of the firms providing those services. The CxA may be a qualified employee or consultant of the Owner.
   c) The CxA shall report results, findings and recommendations directly to the Owner.
   d) For projects smaller than 50,000 gross square feet, the CxA may include qualified persons on the design or construction teams who have the required experience.
2) The Owner shall document the Owner's Project Requirements (OPR). The design team shall develop the Basis of Design (BOD). The CxA shall review these documents for clarity and completeness. The Owner and design team shall be responsible for updates to their respective documents.
3) Develop and incorporate commissioning requirements into the construction documents.
4) Develop and implement a commissioning plan.
5) Verify the installation and performance of the systems to be commissioned.
6) Complete a summary commissioning report.

Commissioned Systems

Commissioning process activities shall be completed, at a minimum, for the following energy-related systems, if they are installed as part of the core and shell project:

- Heating, ventilating, air conditioning, and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls
- Lighting and daylighting controls
- Domestic hot water systems
- Renewable energy systems (wind, solar etc.)

Potential Technologies & Strategies

Owners are encouraged to seek out qualified individuals to lead the commissioning process. Qualified individuals are identified as those who possess a high level of experience in the following areas:

- Energy systems design, installation and operation
- Commissioning planning and process management
- Hands-on field experience with energy systems performance, interaction, start-up, balancing, testing, troubleshooting, operation, and maintenance procedures
- Energy systems automation control knowledge

Owners are encouraged to consider including water-using systems, building envelope systems, and other systems in the scope of the commissioning plan as appropriate. The building envelope is an important component of a facility which impacts energy consumption, occupant comfort and indoor air quality. While it is not required to be commissioned by LEED, an owner can receive significant financial savings and reduced risk of poor indoor air quality by including building envelope commissioning.

The LEED for Core & Shell Reference Guide provides guidance on the rigor expected for this prerequisite for the following:

- Owner's project requirements
- Basis of design
- Commissioning plan
- Commissioning specification
- Performance verification documentation
- Commissioning report

EA Prerequisite 2: Minimum Energy Performance Required

Intent

Establish the minimum level of energy efficiency for the proposed building and systems.

Requirements

Design the building project to comply with both—

- the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) of ASHRAE/IESNA Standard 90.1-2004 (without addenda); and
- the prescriptive requirements (Sections 5.5, 6.5, 7.5 and 9.5) or performance requirements (Section 11) of ASHRAE/IESNA Standard 90.1-2004 (without addenda).
- NOTE: LEED for Core and Shell projects registered after June 26, 2007 must exceed the minimum energy performance requirements of ASHRAE/IESNA Standard 90.1-2004. See EAc1 for the new requirements.

Potential Technologies & Strategies

Design the building envelope, HVAC, lighting, and other systems to maximize energy performance. The ASHRAE 90.1-2004 User's Manual contains worksheets that can be used to document compliance with this prerequisite. For projects pursuing points under EA Credit 1, the computer simulation model may be used to confirm satisfaction of this prerequisite.

If a local code has demonstrated quantitative and textual equivalence following, at a minimum, the U.S. Department of Energy standard process for commercial energy code determination, then it may be used to satisfy this prerequisite in lieu of ASHRAE 90.1-2004. Details on the DOE process for commercial energy code determination can be found at www.energycodes.gov/implement/determinations_com.stm.

EA Prerequisite 3: Fundamental Refrigerant Management Required

Intent

Reduce ozone depletion.

Requirements

Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion prior to project completion. Phase-out plans extending beyond the project completion date will be considered on their merits.

Potential Technologies & Strategies

When reusing existing HVAC systems, conduct an inventory to identify equipment that uses CFC refrigerants and provide a replacement schedule for these refrigerants. For new buildings, specify new HVAC equipment in the base building that uses no CFC refrigerants.

EA Credit 1: Optimize Energy Performance

1–8 Points (2 Points mandatory for LEED for Core and Shell projects registered after June 26, 2007)

Intent

Achieve increasing levels of energy performance above the baseline in the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

Requirements

Select one of the three compliance path options described below. Project teams documenting achievement using any of the three options are assumed to be in compliance with EA Prerequisite 2.

NOTE: LEED for Core and Shell projects registered after June 26th, 2007 are required to achieve at least two (2) points under EAc1.

OPTION 1 — WHOLE BUILDING ENERGY SIMULATION (1–8 Points)

Demonstrate a percentage improvement in the proposed building performance rating compared to the baseline building performance rating per ASHRAE/IESNA Standard 90.1-2004 (without amendments) by a whole building project simulation using the Building Performance Rating Method in Appendix G of the Standard. The minimum energy cost savings percentage for each point threshold is as follows:

New Buildings	Existing Building Renovations	Points
10.5%*	3.5%	1
14%	7%	2
17.5%	10.5%	3
21%	14%	4
24.5%	17.5%	5
28%	21%	6
31.5%	24.5%	7
35%	28%	8

* Note: Only projects registered prior to June 26, 2007 may pursue 1 point under EAc1.

Appendix G of Standard 90.1-2004 requires that the energy analysis done for the Building Performance Rating Method include ALL of the energy costs within and associated with the building project. To achieve points using this credit, the proposed design—

- must comply with the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2004 (without addenda);
- must include all the energy costs within and associated with the building project; and
- must be compared against a baseline building that complies with Appendix G to Standard 90.1-2004 (without addenda). The default process energy cost is 25% of the total energy

cost for the baseline building. For buildings where the process energy cost is less than 25% of the baseline building energy cost, the LEED submittal must include supporting documentation substantiating that process energy inputs are appropriate.

For the purpose of this analysis, process energy is considered to include, but is not limited to, office and general miscellaneous equipment, computers, elevators and escalators, kitchen cooking and refrigeration, laundry washing and drying, lighting exempt from the lighting power allowance (e.g. lighting integral to medical equipment) and other (e.g. waterfall pumps). Regulated (non-process) energy includes lighting (such as for the interior, parking garage, surface parking, façade, or building grounds, except as noted above), HVAC (such as for space heating, space cooling, fans, pumps, toilet exhaust, parking garage ventilation, kitchen hood exhaust, etc.), and service water heating for domestic or space heating purposes.

For EA Credit 1, process loads shall be identical for both the baseline building performance rating and for the proposed building performance rating. However, project teams may follow the Exceptional Calculation Method (ASHRAE 90.1-2004 G2.5) to document measures that reduce process loads. Documentation of process load energy savings shall include a list of the assumptions made for both the base and proposed design, and theoretical or empirical information supporting these assumptions.

OR

** OPTION 2 — PRESCRIPTIVE COMPLIANCE PATH (3 Points possible)

Comply with the ASHRAE Advanced Energy Design Guide for Small Office Buildings recommendations.
Project teams must fully comply with all applicable criteria as established in the ASHRAE Advanced Energy Design Guide for Small Office Buildings for the climate zone in which the building is located. It should be noted that this compliance path may only be used for office buildings up to 20,000 ft2.

(Note: the envelope, lighting and HVAC & SWH requirements vary by climate. For each climate there is a table that lists recommended levels for each “system”.)

**LEED for Core and Shell projects registered after June 26th, 2007 are required to achieve at least two (2) points under EAc1

Envelope Performance: (1 point possible)

Install envelope systems which comply with all the envelope recommendations in the ASHRAE Advanced Energy Design Guide for Small Office Buildings table for the climate zone in which the building is located.

Lighting Systems: (1 additional point possible)

Install lighting systems which comply with all the lighting recommendations in the ASHRAE Advanced Energy Design Guide for Small Office Buildings table for the climate zone in which the building is located.

All such systems shall be included in systems commissioned under EA P1, Fundamental Building Systems Commissioning.

HVAC and Service Water Heater Systems: (1 additional point possible)

Install HVAC and Service Water Heating (SWH) systems which comply with all the HVAC & SWH recommendations in the ASHRAE Advanced Energy Design Guide for Small Office Buildings table for the climate zone in which the building is located.

All such systems shall be included in systems commissioned under EA P1, Fundamental Building Systems Commissioning.

OR

*** OPTION 3 — PRESCRIPTIVE COMPLIANCE PATH (1 Point)

Comply with the Basic Criteria and Prescriptive Measures of the NBI Advanced Buildings Benchmark™ Version 1.1 with the exception of the following sections: 1.1 Design Certification, 1.2 Construction Certification, 1.3 Operations Certification, 1.4 Energy Code Compliance, 1.7 Monitoring and Trend-logging, 1.11 Indoor Air Quality, 1.13 Refrigeration Equipment Efficiency Requirements, 1.14 Networked Computer Monitor Control, and 2.3 Cool Roofs and EcoRoofs (Zones 1 through 5). The following restrictions apply:

- Project teams must fully comply with all applicable criteria as established in Advanced Buildings Benchmark for the climate zone in which the building is located.
- Project teams must show compliance with all applicable criteria for all systems that are part of the core and shell work.

*** ADVANCED BUILDINGS™ CORE PERFORMANCE™

Note: Option 3 is currently under revision to provide a prescriptive path for projects registered after June 26, 2007 to meet the new 2 point Optimize Energy Performance mandate. Option 3 will be updated to provide guidance for projects when this new path is available. Please check the CIR page on the USGBC Web site for updates.

Potential Technologies & Strategies

Design the building envelope and systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost-effective energy efficiency measures. Quantify energy performance as compared to a baseline building.

If a local code has demonstrated quantitative and textual equivalence following, at a minimum, the U.S. Department of Energy standard process for commercial energy code determination, then the results of that analysis may be used to correlate local code performance with ASHRAE 90.1-2004. Details on the DOE process for commercial energy code determination can be found at www.energycodes.gov/implement/determinations_com.stm.

EA Credit 2: On-Site Renewable Energy
1 Point

Intent

Encourage and recognize increasing levels of on-site renewable energy self-supply in order to reduce environmental and economic impacts associated with fossil fuel energy use.

Requirements

Use on-site renewable energy systems to offset building energy cost. Calculate project performance by expressing the energy produced by the renewable systems as a percentage of the building annual energy cost and using the table below to determine the number of points achieved.

Use the building annual energy cost calculated in EA Credit 1 or use the Department of Energy (DOE) Commercial Buildings Energy Consumption Survey (CBECS) database to determine the estimated electricity use. (Table of use for different building types is provided in the Reference Guide.)

% Renewable Energy	Points
1%	1

Potential Technologies & Strategies

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

EA Credit 3: Enhanced Commissioning
1 Point

Intent

Begin the commissioning process early during the design process and execute additional activities after systems performance verification is completed.

Requirements

Implement, or have a contract in place to implement, the following additional commissioning process activities in addition to the requirements of EA Prerequisite 1 and in accordance with the LEED for Core & Shell Reference Guide:

1. Prior to the start of the construction documents phase, designate an independent Commissioning Authority (CxA) to lead, review, and oversee the completion of all commissioning process activities. The CxA shall, at a minimum, perform Tasks 2, 3 and 6. Other team members may perform Tasks 4 and 5.
    a. The CxA shall have documented commissioning authority experience in at least two building projects.
    b. The individual serving as the CxA shall be—
        i. independent of the work of design and construction;
        ii. not an employee of the design firm, though they may be contracted through them;
        iii. not an employee of, or contracted through, a contractor or construction manager holding construction contracts; and
        iv. (can be) a qualified employee or consultant of the Owner.
    c. The CxA shall report results, findings and recommendations directly to the Owner.
    d. This requirement has no deviation for project size.
2. The CxA shall conduct, at a minimum, one commissioning design review of the Owner's Project Requirements (OPR), Basis of Design (BOD), and design documents prior to mid-construction documents phase and back-check the review comments in the subsequent design submission.
3. The CxA shall review contractor submittals applicable to systems being commissioned for compliance with the OPR and BOD. This review shall be concurrent with A/E reviews and submitted to the design team and the Owner.
4. Develop a systems manual that provides future operating staff the information needed to understand and optimally operate the commissioned systems.
5. Verify that the requirements for training operating personnel and building occupants are completed.
6. Assure the involvement by the CxA in reviewing building operation within 10 months after substantial completion with O&M staff and occupants. Include a plan for resolution of outstanding commissioning-related issues.

Potential Technologies & Strategies

Although it is preferable that the CxA be contracted by the Owner, for the enhanced commissioning credit, the CxA may also be contracted through the design firms or construction management firms not holding construction contracts.

The LEED for Core & Shell Reference Guide provides detailed guidance on the rigor expected for following process activities:

- Commissioning design review
- Commissioning submittal review
- Systems manual

EA Credit 4: Enhanced Refrigerant Management
1 Point

Intent

Reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to global warming.

Requirements

OPTION 1

Do not use refrigerants.

OR

OPTION 2

Select refrigerants and HVAC&R that minimize or eliminate the emission of compounds that contribute to ozone depletion and global warming. The base building HVAC&R equipment shall comply with the following formula, which sets a maximum threshold for the combined contributions to ozone depletion and global warming potential:

$$LCGWP + LCODP \times 105 \leq 100$$

Where:

LCODP = $[ODP_r \times (Lr \times Life + Mr) \times Rc]/Life$
LCGWP = $[GWPr \times (Lr \times Life + Mr) \times Rc]/Life$
LCODP: Lifecycle Ozone Depletion Potential (lbCFC11/Ton-Year)
LCGWP: Lifecycle Direct Global Warming Potential ($lbCO_2$/Ton-Year)
GWPr: Global Warming Potential of Refrigerant (0 to 12,000 $lbCO_2$/lbr)
ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 lbCFC11/lbr)
Lr: Refrigerant Leakage Rate (0.5% to 2.0%; default of 2% unless otherwise demonstrated)
Mr: End-of-life Refrigerant Loss (2% to 10%; default of 10% unless otherwise demonstrated)
Rc: Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of cooling capacity)
Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)

For multiple types of equipment, a weighted average of all base building level HVAC&R equipment shall be applied using the following formula:

$$[\sum (LCGWP + LCODP \times 105) \times Qunit] / Qtotal \leq 100$$

Where:

Qunit = Cooling capacity of an individual HVAC or refrigeration unit (Tons)
Qtotal = Total cooling capacity of all HVAC or refrigeration

Small HVAC units (defined as containing less than 0.5 lbs of refrigerant), and other equipment such as standard refrigerators, small water coolers, and any other cooling equipment that contains less than 0.5 lbs of refrigerant, are not considered part of the "base building" system and are not subject to the requirements of this credit.

AND

Do not install fire suppression systems that contain ozone-depleting substances (CFCs, HCFCs or Halons).

Potential Technologies & Strategies

Design and operate the facility without mechanical cooling and refrigeration equipment. Where mechanical cooling is used, utilize base building HVAC and refrigeration systems for the refrigeration cycle that minimize direct impact on ozone depletion and global warming. Select HVAC&R equipment with reduced refrigerant charge and increased equipment life. Maintain equipment to prevent leakage of refrigerant to the atmosphere. Utilize fire suppression systems that do not contain HCFCs or Halons.

EA Credit 5.1: Measurement & Verification- Base Building
1 Point

Intent

Provide for the ongoing accountability of building energy consumption over time.

Requirements

- Provide the necessary infrastructure within the base building design to facilitate metering building electricity and tenant electrical end-uses as appropriate.
- Develop a building M&V Plan consistent with Option D: Calibrated Simulation (Savings Estimation Method that documents for future tenants the means to measure and minimize energy consumption.. The documentation is to include 1) a description of the infrastructure design, 2) existing meter locations, 3) existing meter specifications, 4) 1-line electrical schematics identifying end-use circuits, 5) guidelines for carrying out tenant sub-metering.

Potential Technologies & Strategies

Develop an M&V Plan to evaluate building and/or energy system performance. Characterize the building and/or energy systems through energy simulation or engineering analysis. Install the necessary metering equipment to measure energy use. Track performance by comparing predicted performance to actual performance, broken down by component or system as appropriate. Evaluate energy efficiency by comparing actual performance to baseline performance.

While the IPMVP describes specific actions for verifying savings associated with energy conservation measures (ECMs) and strategies, this LEED credit expands upon typical IPMVP M&V objectives. M&V activities should not necessarily be confined to energy systems where ECMs or energy conservation strategies have been implemented. The IPMVP provides guidance on M&V strategies and their appropriate applications for various situations. These strategies should be used in conjunction with monitoring and trend logging of significant energy systems to provide for the ongoing accountability of building energy performance.

EA Credit 5.2 Measurement and Verification – Tenant Sub-metering

1 Point

Intent

Provide for ongoing accountability of building electricity consumption performance over time.

Requirements

- Include a centrally monitored electronic metering network in the base building design that is capable of being expanded to accommodate the future tenant sub-metering as required by LEED for Commercial Interiors Rating System Credit EA3.

- Develop a tenant M&V Plan that documents and advises future tenants of this opportunity and the means of their achievement.

Potential Technologies & Strategies

Install the necessary metering and sub-metering equipment to measure energy use. Develop and implement a Measurement & Verification Plan able to be utilized and expanded by the tenant, which compares predicted savings to actual energy performance.

EA Credit 6: Green Power
1 Point

Intent

Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

Requirements

Provide at least 35% of the core & shell building's electricity from renewable sources by engaging in at least a two-year renewable energy contract. The core and shell building's electricity is defined as the electricity usage of the core and shell square footage as defined by BOMA Standards, but not less than 15% of the building total gross square footage. Renewable sources are as defined by the Center for Resource Solutions (CRS) Green-e products certification requirements.

DETERMINE THE BASELINE ELECTRICITY USE

Use the annual electricity consumption from the results of EA Credit 1.

OR

Use the Department of Energy (DOE) Commercial Buildings Energy Consumption Survey (CBECS) database to determine the estimated electricity use.

Potential Technologies & Strategies

Determine the energy needs of the building and investigate opportunities to engage in a green power contract. Green power is derived from solar, wind, geothermal, biomass or low-impact hydro sources. Visit www.green-e.org for details about the Green-e program. The power product purchased to comply with credit requirements need not be Green-e certified. Other sources of green power are eligible if they satisfy the Green-e program's technical requirements. Renewable energy certificates (RECs), tradable renewable certificates (TRCs), green tags and other forms of green power that comply with Green-e's technical requirements can be used to document compliance with EA Credit 6 requirements.

Materials & Resources

MR Prerequisite 1: Storage & Collection of Recyclables

Required

Intent

Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

Requirements

Provide an easily accessible area that serves the entire building and is dedicated to the collection and storage of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.

Potential Technologies & Strategies

Coordinate the size and functionality of the recycling areas with the anticipated collection services for glass, plastic, office paper, newspaper, cardboard and organic wastes to maximize the effectiveness of the dedicated areas. Consider employing cardboard balers, aluminum can crushers, recycling chutes and collection bins at individual workstations to further enhance the recycling program.

MR Credit 1.1: Building Reuse: Maintain 25%, of Existing Walls, Floors & Roof

1 Point

Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirements

Maintain at least 25% (based on surface area) of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and non-structural roofing material). Hazardous materials that are remediated as a part of the project scope shall be excluded from the calculation of the percentage maintained. If the project includes an addition to an existing building, this credit is not applicable if the square footage of the addition is more than 6 times the square footage of the pre-existing building.

Potential Technologies & Strategies

Consider reuse of existing, previously occupied buildings, including structure, envelope and elements. Remove elements that pose contamination risk to building occupants and upgrade components that would improve energy and water efficiency such as windows, mechanical systems and plumbing fixtures.

MR Credit 1.2: Building Reuse: Maintain 50%, of Existing Walls, Floors & Roof

1 Point

Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirements

Maintain at least 50% (based on surface area) of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and non-structural roofing material). Hazardous materials that are remediated as a part of the project scope shall be excluded from the calculation of the percentage maintained. If the project includes an addition to an existing building, this credit is not applicable if the square footage of the addition is more than 6 times the square footage of the pre-existing building.

Potential Technologies & Strategies

Consider reuse of existing, previously occupied buildings, including structure, envelope and elements. Remove elements that pose contamination risk to building occupants and upgrade components that would improve energy and water efficiency such as windows, mechanical systems and plumbing fixtures.

MR Credit 1.3: Building Reuse: Maintain 75%, of Existing Walls, Floors & Roof

1 Point

Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirements

Maintain at least 75% (based on surface area) of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and non-structural roofing material). Hazardous materials that are remediated as a part of the project scope shall be excluded from the calculation of the percentage maintained. If the project includes an addition to an existing building, this credit is not applicable if the square footage of the addition is more than 6 times the square footage of the pre-existing building.

Potential Technologies & Strategies

Consider reuse of existing, previously occupied buildings, including structure, envelope and elements. Remove elements that pose contamination risk to building occupants and upgrade components that would improve energy and water efficiency such as windows, mechanical systems and plumbing fixtures.

MR Credit 2.1: Construction Waste Management: Divert 50% From Disposal

1 Point

Intent

Divert construction and demolition debris from disposal in landfills and incinerators. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

Requirements

Recycle and/or salvage at least 50% of non-hazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled. Excavated soil and land-clearing debris do not contribute to this credit. Calculations can be done by weight or volume, but must be consistent throughout.

Potential Technologies & Strategies

Establish goals for diversion from disposal in landfills and incinerators and adopt a construction waste management plan to achieve these goals. Consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable materials, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that diversion may include donation of materials to charitable organizations and salvage of materials on-site.

MR Credit 2.2: Construction Waste Management: Divert 75% From Disposal

1 Point in addition to MR Credit 2.1

Intent

Divert construction and demolition debris from disposal in landfills and incinerators. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

Requirements

Recycle and/or salvage an additional 25% beyond MR Credit 2.1 (75% total) of non-hazardous construction and demolition debris. Excavated soil and land-clearing debris do not contribute to this credit. Calculations can be done by weight or volume, but must be consistent throughout.

Potential Technologies & Strategies

Establish goals for diversion from disposal in landfills and incinerators and adopt a construction waste management plan to achieve these goals. Consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable materials, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that diversion may include donation of materials to charitable organizations and salvage of materials on-site.

MR Credit 3: Materials Reuse: 1%
1 Point

Intent

Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

Requirements

Use salvaged, refurbished or reused materials such that the sum of these materials constitutes at least 1%, based on cost, of the total value of materials on the project.

Mechanical, electrical and plumbing components and specialty items such as elevators and equipment shall not be included in this calculation. Only include materials permanently installed in the project. Furniture may be included, providing it is included consistently in MR Credits 3–7.

Potential Technologies & Strategies

Identify opportunities to incorporate salvaged materials into building design and research potential material suppliers. Consider salvaged materials such as beams and posts, flooring, paneling, doors and frames, cabinetry and furniture, brick and decorative items.

MR Credit 4.1: Recycled Content: 10% (post-consumer + 1/2 pre-consumer)

1 Point

Intent

Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Requirements

Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.

The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

Mechanical, electrical and plumbing components and specialty items such as elevators shall not be included in this calculation. Only include materials permanently installed in the project. Furniture may be included, providing it is included consistently in MR Credits 3–7.

Recycled content shall be defined in accordance with the International Organization of Standards document, *ISO 14021—Environmental labels and declarations—Self-declared environmental claims (Type II environmental labeling).*

Post-consumer material is defined as waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose.

Pre-consumer material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

Potential Technologies & Strategies

Establish a project goal for recycled content materials and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

MR Credit 4.2: Recycled Content: 20% (post-consumer + 1/2 pre-consumer)

1 Point in addition to MR Credit 4.1

Intent

Increase demand for building products that incorporate recycled content materials, thereby reducing the impacts resulting from extraction and processing of virgin materials.

Requirements

Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes an additional 10% beyond MR Credit 4.1 (total of 20%, based on cost) of the total value of the materials in the project.

The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

Mechanical, electrical and plumbing components and specialty items such as elevators shall not be included in this calculation. Only include materials permanently installed in the project. Furniture may be included, providing it is included consistently in MR Credits 3–7.

Recycled content shall be defined in accordance with the International Organization of Standards document, *ISO 14021—Environmental labels and declarations—Self-declared environmental claims (Type II environmental labeling).*

Post-consumer material is defined as waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose.

Pre-consumer material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

Potential Technologies & Strategies

Establish a project goal for recycled content materials and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

MR Credit 5.1: Regional Materials: 10% Extracted, Processed & Manufactured Regionally

1 Point

Intent

Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

Requirements

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% (based on cost) of the total materials value. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

Mechanical, electrical and plumbing components and specialty items such as elevators and equipment shall not be included in this calculation. Only include materials permanently installed in the project. Furniture may be included, providing it is included consistently in MR Credits 3–7.

Potential Technologies & Strategies

Establish a project goal for locally sourced materials, and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified local materials are installed and quantify the total percentage of local materials installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

MR Credit 5.2: Regional Materials: 20% Extracted, Processed & Manufactured Regionally

1 Point in addition to MR Credit 5.1

Intent

Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

Requirements

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for an additional 10% beyond MR Credit 5.1 (total of 20%, based on cost) of the total materials value. If only a fraction of the material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

Potential Technologies & Strategies

Establish a project goal for locally sourced materials and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified local materials are installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

MR Credit 6: Certified Wood
1 Point

Intent

Encourage environmentally responsible forest management.

Requirements

Use a minimum of 50% of wood-based materials and products, which are certified in accordance with the Forest Stewardship Council's (FSC) Principles and Criteria, for wood building components. These components include, but are not limited to, structural framing and general dimensional framing, flooring, sub-flooring, wood doors, and finishes.

Include materials permanently installed in the project. Furniture may be included, providing it is included consistently in MR Credits 3–7. At the projects discretion, calculation may include temporary wood materials purchased for the project. If any such materials are included, all such materials must be included in the calculation.

Potential Technologies & Strategies

Establish a project goal for FSC-certified wood products and identify suppliers that can achieve this goal. During construction, ensure that the FSC-certified wood products are installed and quantify the total percentage of FSC-certified wood products installed.

Indoor Environmental Quality

EQ Prerequisite 1: Minimum IAQ Performance
Required

Intent

Establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in buildings, thus contributing to the comfort and well-being of the occupants.

Requirements

Meet the minimum requirements of Sections 4 through 7 of ASHRAE 62.1-2004, Ventilation for Acceptable Indoor Air Quality. Mechanical ventilation systems shall be designed using the Ventilation Rate Procedure or the applicable local code, whichever is more stringent.

Naturally ventilated buildings shall comply with ASHRAE 62.1-2004, paragraph 5.1.

Mechanical ventilation systems installed during core and shell construction shall be capable of meeting projected ventilation levels based on anticipated future tenant requirements.

Potential Technologies & Strategies

Design ventilation systems to meet or exceed the minimum outdoor air ventilation rates as described in the ASHRAE standard. Balance the impacts of ventilation rates on energy use and indoor air quality to optimize for energy efficiency and occupant health. Use the ASHRAE 62 Users Manual for detailed guidance on meeting the referenced requirements.

EQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control Required

Intent

Minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to Environmental Tobacco Smoke (ETS).

Requirements

OPTION 1

- Prohibit smoking in the building.
- Locate any exterior designated smoking areas at least 25 feet away from entries, outdoor air intakes and operable windows.

OR

OPTION 2

- Prohibit smoking in the public areas of the building except in designated smoking areas. Public areas include all common areas that are part of the core and shell that are not tenant spaces. Prohibit smoking in the building except in designated smoking areas
- Locate any exterior designated smoking areas at least 25 feet away from entries, outdoor air intakes and operable windows.
- Locate designated smoking areas to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room must be directly exhausted to the outdoors with no re-circulation of ETS-containing air to the non-smoking area of the building, and enclosed with impermeable deck-to-deck partitions. With the doors to the smoking room closed, operate exhaust sufficient to create a negative pressure with respect to the adjacent spaces of at least an average of 5 Pa (0.02 inches of water gauge) and with a minimum of 1 Pa (0.004 inches of water gauge).
- Performance of the smoking room differential air pressures shall be verified by conducting 15 minutes of measurement, with a minimum of one measurement every 10 seconds, of the differential pressure in the smoking room with respect to each adjacent area and in each adjacent vertical chase with the doors to the smoking room closed. The testing will be conducted with each space configured for worst case conditions of transport of air from the smoking rooms to adjacent spaces with the smoking rooms' doors closed to the adjacent spaces.

OR

OPTION 3 (For residential buildings only)

- Prohibit smoking in all common areas of the building.
- Locate any exterior designated smoking areas at least 25 feet away from entries, outdoor air intakes and operable windows opening to common areas.

- Minimize uncontrolled pathways for ETS transfer between individual residential units by sealing penetrations in walls, ceilings and floors in the residential units, and by sealing vertical chases adjacent to the units.
- All doors in the residential units leading to common hallways shall be weather-stripped to minimize air leakage into the hallway.
- If the common hallways are pressurized with respect to the residential units then doors in the residential units leading to the common hallways need not be weather-stripped provided that the positive differential pressure is demonstrated as in Option 2 above, considering the residential unit as the smoking room. Acceptable sealing of residential units shall be demonstrated by a blower door test conducted in accordance with ANSI/ASTM-E779-03, Standard Test Method for Determining Air Leakage Rate By Fan Pressurization, AND use the progressive sampling methodology defined in Chapter 4 (Compliance Through Quality Construction) of the Residential Manual for Compliance with California's 2001 Energy Efficiency Standards (www.energy.ca.gov/title24/residential_manual). Residential units must demonstrate less than 1.25 square inches leakage area per 100 square feet of enclosure area (i.e. sum of all wall, ceiling and floor areas).

Potential Technologies & Strategies

Prohibit smoking in commercial buildings or effectively control the ventilation air in smoking rooms. For residential buildings, prohibit smoking in common areas, design building envelope and systems to minimize ETS transfer among dwelling units.

EQ Credit 1: Outdoor Air Delivery Monitoring
1 Point

Intent

Provide capacity for ventilation system monitoring to help sustain occupant comfort and well-being.

Requirements

Install permanent monitoring systems that provide feedback on ventilation system performance to ensure that ventilation systems maintain design minimum ventilation requirements. Configure all monitoring equipment to generate an alarm when the conditions vary by 10% or more from setpoint, via either a building automation system alarm to the building operator or via a visual or audible alert to the building occupants.

FOR MECHANICALLY VENTILATED SPACES

- For each mechanical ventilation system, provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor airflow rate with an accuracy of plus or minus 15% of the design minimum outdoor air rate, as defined by ASHRAE 62.1-2004.

FOR NATURALLY VENTILATED SPACES

Monitor CO_2 concentrations within all naturally ventilated spaces. CO_2 monitoring shall be located within the room between 3 feet and 6 feet above the floor. One CO_2 sensor may be used to represent multiple spaces if the natural ventilation design uses passive stack(s) or other means to induce airflow through those spaces equally and simultaneously without intervention by building occupants.

Potential Technologies & Strategies

Install carbon dioxide and airflow measurement equipment and feed the information to the HVAC system and/or Building Automation System (BAS) to trigger corrective action, if applicable. If such automatic controls are not feasible with the building systems, use the measurement equipment to trigger alarms that inform building operators or occupants of a possible deficiency in outdoor air delivery.

Installation of CO2 sensors in tenant spaces is not required during core and shell construction and tenants are not required to install CO2 monitors, however they should be made aware of the capability of the core and shell system to monitor CO2. The core and shell systems must be designed with the capacity for CO2 monitoring. This entails a building automation system that can be expanded to include future tenant CO2 points.

EQ Credit 2: Increased Ventilation
1 Point

Intent

Provide additional outdoor air ventilation to improve indoor air quality for improved occupant comfort, well-being and productivity.

Requirements

FOR MECHANICALLY VENTILATED SPACES

- Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates required by ASHRAE Standard 62.1-2004 as determined by EQ Prerequisite 1.

FOR NATURALLY VENTILATED SPACES

Design natural ventilation systems for occupied spaces to meet the recommendations set forth in the Carbon Trust "Good Practice Guide 237" [1998]. Determine that natural ventilation is an effective strategy for the project by following the flow diagram process shown in Figure 1.18 of the Chartered Institution of Building Services Engineers (CIBSE) Applications Manual 10: 2005, Natural ventilation in non-domestic buildings.

AND

- Use diagrams and calculations to show that the design of the natural ventilation systems meets the recommendations set forth in the CIBSE Applications Manual 10: 2005, Natural ventilation in non-domestic buildings.

OR

- Use a macroscopic, multi-zone, analytic model to predict that room-by-room airflows will effectively naturally ventilate, defined as providing the minimum ventilation rates required by ASHRAE 62.1-2004 Chapter 6, for at least 90% of occupied spaces.
- The core and shell buildings that are designed to be naturally ventilated must provide the capability for the tenant build-out to meet the requirements of this credit.

Potential Technologies & Strategies

For Mechanically ventilated Spaces: Use heat recovery, where appropriate, to minimize the additional energy consumption associated with higher ventilation rates.

For Naturally ventilated Spaces: Follow the eight design steps described in the Carbon Trust Good Practice Guide 237 – 1) Develop design requirements, 2) Plan airflow paths, 3) Identify building uses and features that might require special attention, 4) Determine ventilation requirements, 5) Estimate external driving pressures, 6) Select types of ventilation devices, 7) Size ventilation devices, 8) Analyze the design. Use public domain software such as NIST's CONTAM, Multizone Modeling Software, along with LoopDA, Natural Ventilation Sizing Tool, to analytically predict room-by-room airflows.

EQ Credit 3: Construction IAQ Management Plan: During Construction

1 Point

Intent

Reduce indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- During construction meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 1995, Chapter 3.
- Protect stored on-site or installed absorptive materials from moisture damage.
- If permanently installed air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille, as determined by ASHRAE 52.2-1999. Replace all filtration media immediately prior to occupancy.

Potential Technologies & Strategies

Adopt an IAQ management plan to protect the HVAC system during construction, control pollutant sources and interrupt contamination pathways. Sequence the installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile and gypsum wallboard. Coordinate with Indoor Environmental Quality Credit 5 to determine the appropriate specifications and schedules for filtration media.

If possible, avoid using permanently installed air handlers for temporary heating/cooling during construction. Consult the LEED for Core & Shell Reference Guide for more detailed information on how to ensure the well-being of construction workers and building occupants if permanently installed air handlers must be used during construction.

EQ Credit 4.1: Low-Emitting Materials: Adhesives & Sealants

1 Point for Achievement of 2 (4.1, 4.2, 4.3 or 4.4)

2 Points for Achievement of 3 (4.1, 4.2, 4.3 or 4.4)

3 Points for Achievement of 4 (4.1, 4.2, 4.3 or 4.4)

Intent

Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements

All adhesives and sealants used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the requirements of the following reference standards:

- Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management District (SCAQMD) Rule #1168. VOC limits are listed in the table below and correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.

Architectural Applications	VOC Limit [g/L less water]	Specialty Applications	VOC Limit [g/L less water]
Indoor Carpet Adhesives	50	PVC Welding	510
Carpet Pad Adhesives	50	CPVC Welding	490
Wood Flooring Adhesives	100	ABS Welding	325
Rubber Floor Adhesives	60	Plastic Cement Welding	250
Subfloor Adhesives	50	Adhesive Primer for Plastic	550
Ceramic Tile Adhesives	65	Contact Adhesive	80
VCT & Asphalt Adhesives	50	Special Purpose Contact Adhesive	250
Drywall & Panel Adhesives	50	Structural Wood Member Adhesive	140
Cove Base Adhesives	50	Sheet Applied Rubber Lining Operations	850
Multipurpose Construction Adhesives	70	Top & Trim Adhesive	250
Structural Glazing Adhesives	100		

Substrate Specific Applications	VOC Limit [g/L less water]	Sealants	VOC Limit [g/L less water]
Metal to Metal	30	Architectural	250
Plastic Foams	50	Nonmembrane Roof	300
Porous Material (except wood)	50	Roadway	250
Wood	30	Single-Ply Roof Membrane	450
Fiberglass	80	Other	420

Sealant Primers	VOC Limit [g/L less water]
Architectural Non Porous	250
Architectural Porous	775
Other	750

- Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36 requirements in effect on October 19, 2000.

Aerosol Adhesives:	VOC weight [g/L minus water]
General purpose mist spray	65% VOCs by weight
General purpose web spray	55% VOCs by weight
Special purpose aerosol adhesives (all types)	70% VOCs by weight

Potential Technologies & Strategies

Specify low-VOC materials in construction documents. Ensure that VOC limits are clearly stated in each section of the specifications where adhesives and sealants are addressed. Common products to evaluate include: general construction adhesives, flooring adhesives, fire-stopping sealants, caulking, duct sealants, plumbing adhesives, and cove base adhesives.

EQ Credit 4.2: Low-Emitting Materials: Paints & Coatings

1 Point for Achievement of 2 (4.1, 4.2, 4.3 or 4.4)

2 Points for Achievement of 3 (4.1, 4.2, 4.3 or 4.4)

3 Points for Achievement of 4 (4.1, 4.2, 4.3 or 4.4)

Intent

Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements

Paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the following criteria:

- Architectural paints, coatings and primers applied to interior walls and ceilings: Do not exceed the VOC content limits established in Green Seal Standard GS-11, Paints, First Edition, May 20, 1993.
    - Flats: 50 g/L
    - Non-Flats: 150 g/L
- Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates: Do not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03, Anti-Corrosive Paints, Second Edition, January 7, 1997.
- Clear wood finishes, floor coatings, stains, and shellacs applied to interior elements: Do not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
    - Clear wood finishes: varnish 350 g/L; lacquer 550 g/L
    - Floor coatings: 100 g/L
    - Sealers: waterproofing sealers 250 g/L; sanding sealers 275 g/L; all other sealers 200 g/L
    - Shellacs: Clear 730 g/L; pigmented 550 g/L
    - Stains: 250 g/L

Potential Technologies & Strategies

Specify low-VOC paints and coatings in construction documents. Ensure that VOC limits are clearly stated in each section of the specifications where paints and coatings are addressed. Track the VOC content of all interior paints and coatings during construction.

EQ Credit 4.3: Low-Emitting Materials: Carpet Systems

1 Point for Achievement of 2 (4.1, 4.2, 4.3 or 4.4)

2 Points for Achievement of 3 (4.1, 4.2, 4.3 or 4.4)

3 Points for Achievement of 4 (4.1, 4.2, 4.3 or 4.4)

Intent

Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements

All carpet installed in the building interior shall meet the testing and product requirements of the Carpet and Rug Institute's Green Label Plus program.

All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.

All carpet adhesive shall meet the requirements of EQ Credit 4.1: VOC limit of 50 g/L.

Potential Technologies & Strategies

Clearly specify requirements for product testing and/or certification in the construction documents. Select products that are either certified under the Green Label Plus program or for which testing has been done by qualified independent laboratories in accordance with the appropriate requirements.

The Green Label Plus program for carpets and its associated VOC emission criteria in micrograms per square meter per hour, along with information on testing method and sample collection developed by the Carpet & Rug Institute (CRI) in coordination with California's Sustainable Building Task Force and the California Department of Health Services (DHS), are described in Section 9, Acceptable Emissions Testing for Carpet, DHS Standard Practice CA/DHS/EHLB/R-174, dated 07/15/04. This document is available at: www.dhs.ca.gov/ps/deodc/ehlb/iaq/VOCS/Section01350_7_15_2004_FINAL_PLUS_ADDENDUM-2004-01.pdf (also published as Section 01350 Section 9 [dated 2004] by the Collaborative for High Performance Schools [www.chps.net]).

EQ Credit 4.4: Low-Emitting Materials: Composite Wood & Agrifiber Products

1 Point for Achievement of 2 (4.1, 4.2, 4.3 or 4.4)

2 Points for Achievement of 3 (4.1, 4.2, 4.3 or 4.4)

3 Points for Achievement of 4 (4.1, 4.2, 4.3 or 4.4)

Intent

Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements

Composite wood and agrifiber products used on the interior of the building (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins.

Composite wood and agrifiber products are defined as: particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates and door cores. Materials considered fit-out are not considered base building elements and are not included.

Potential Technologies & Strategies

Specify wood and agrifiber products that contain no added urea-formaldehyde resins. Specify laminating adhesives for field and shop applied assemblies that contain no added urea-formaldehyde resins.

EQ Credit 5: Indoor Chemical & Pollutant Source Control
1 Point

Intent

Minimize exposure of building occupants to potentially hazardous particulates and chemical pollutants.

Requirements

Design to minimize and control pollutant entry into buildings and later cross-contamination of regularly occupied areas:

- Employ permanent entryway systems at least six feet long in the primary direction of travel to capture dirt and particulates from entering the building at all entryways that are directly connected to the outdoors. Acceptable entryway systems include permanently installed grates, grilles, or slotted systems that allow for cleaning underneath. Roll-out mats are only acceptable when maintained on a weekly basis by a contracted service organization. Qualifying entryways are those that serve as regular entry points into the core and shell of the building by building users. Projects that do not have entryway systems cannot achieve this credit.
- Where hazardous gases or chemicals may be present or used (including garages, housekeeping/laundry areas and copying/printing rooms), exhaust each space sufficiently to create negative pressure with respect to adjacent spaces with the doors to the room closed. For each of these spaces, provide self-closing doors and deck to deck partitions or a hard lid ceiling. The exhaust rate shall be at least 0.50 cfm/sq.ft., with no air re-circulation. The pressure differential with the surrounding spaces shall be at least 5 Pa (0.02 inches of water gauge) on average and 1 Pa (0.004 inches of water) at a minimum when the doors to the rooms are closed.
- In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media prior to occupancy that provides a Minimum Efficiency Reporting Value (MERV) of 13 or better. Filtration should be applied to process both return and outside air that is to be delivered as supply air.

Potential Technologies & Strategies

Design facility cleaning and maintenance areas with isolated exhaust systems for contaminants. Maintain physical isolation from the rest of the regularly occupied areas of the building. Install permanent architectural entryway systems such as grills or grates to prevent occupant-borne contaminants from entering the building. Install high-level filtration systems in air handling units processing both return air and outside supply air. Ensure that air handling units can accommodate required filter sizes and pressure drops.

EQ Credit 6: Controllability of Systems: Thermal Comfort
1 Point

Intent

Provide a high level of thermal comfort system control by individual occupants or by specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the productivity, comfort and well-being of building occupants.

Requirements

Provide individual comfort controls for 50% (minimum) of the building occupants to enable adjustments to suit individual task needs and preferences. Operable windows can be used in lieu of comfort controls for occupants of areas that are 20 feet inside of and 10 feet to either side of the operable part of the window. The areas of operable window must meet the requirements of ASHRAE 62.1-2004 paragraph 5.1 Natural Ventilation.

AND

Provide comfort system controls for all shared multi-occupant spaces to enable adjustments to suit group needs and preferences.

Conditions for thermal comfort are described in ASHRAE Standard 55-2004 to include the primary factors of air temperature, radiant temperature, air speed and humidity. Comfort system control for the purposes of this credit is defined as the provision of control over at least one of these primary factors in the occupant's local environment.

Core & Shell buildings that do not purchase and/or install the mechanical system or operable windows (or a combination of both) have not met the intent of this credit.

See Appendix 1 – Default Occupancy Counts for occupancy count requirements and guidance.

Potential Technologies & Strategies

Design the building and systems with comfort controls to allow adjustments to suit individual needs or those of groups in shared spaces. ASHRAE Standard 55-2004 identifies the factors of thermal comfort and a process for developing comfort criteria for building spaces that suit the needs of the occupants involved in their daily activities. Control strategies can be developed to expand on the comfort criteria to allow adjustments to suit individual needs and preferences. These may involve system designs incorporating operable windows, hybrid systems integrating operable windows and mechanical systems, or mechanical systems alone. Individual adjustments may involve individual thermostat controls, local diffusers at floor, desk or overhead levels, or control of individual radiant panels, or other means integrated into the overall building, thermal comfort systems, and energy systems design. In addition, designers should evaluate the closely tied interactions between thermal comfort (as required by ASHRAE Standard 55-2004) and acceptable indoor air quality (as required by ASHRAE Standard 62.1-2004, whether natural or mechanical ventilation).

EQ Credit 7: Thermal Comfort: Design
1 Point

Intent

Provide a comfortable thermal environment that supports the productivity and well-being of building occupants.

Requirements

Design HVAC systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy. Demonstrate design compliance in accordance with the Section 6.1.1 Documentation.

See Appendix 1 – Default Occupancy Counts for occupancy count requirements and guidance.

The core and shell base building mechanical system must provide the capability for the tenant build-out to meet the requirements of this credit.

Core & Shell buildings designed for mechanical ventilation that do not purchase and/or install the mechanical system can not achieve this credit.

Potential Technologies & Strategies

Establish comfort criteria per ASHRAE Standard 55-2004 that support the desired quality and occupant satisfaction with building performance. Design building envelope and systems with the capability to deliver performance to the comfort criteria under expected environmental and use conditions. Evaluate air temperature, radiant temperature, air speed, and relative humidity in an integrated fashion and coordinate these criteria with EQ Prerequisite 1, EQ Credit 1, and EQ Credit 2.

EQ Credit 8.1: Daylight & Views: Daylight 75% of Spaces
1 Point

Intent

Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Requirements

OPTION 1 — CALCULATION

Achieve a minimum glazing factor of 2% in a minimum of 75% of all regularly occupied areas. The glazing factor is calculated as follows:

$$\text{Glazing Factor} = \frac{\text{Window Area [SF]}}{\text{Floor Area [SF]}} \times \text{Window Geometry Factor} \times \frac{\text{Actual } T_{vis}}{\text{Minimum } T_{vis}} \times \text{Window Height Factor}$$

OR

OPTION 2 — SIMULATION

Demonstrate, through computer simulation, that a minimum daylight illumination level of 25 footcandles has been achieved in a minimum of 75% of all regularly occupied areas. Modeling must demonstrate 25 horizontal footcandles under clear sky conditions, at noon, on the equinox, at 30 inches above the floor.

OR

OPTION 3 — MEASUREMENT

Demonstrate, through records of indoor light measurements, that a minimum daylight illumination level of 25 footcandles has been achieved in at least 75% of all regularly occupied areas. Measurements must be taken on a 10-foot grid for all occupied spaces and must be recorded on building floor plans.

OR

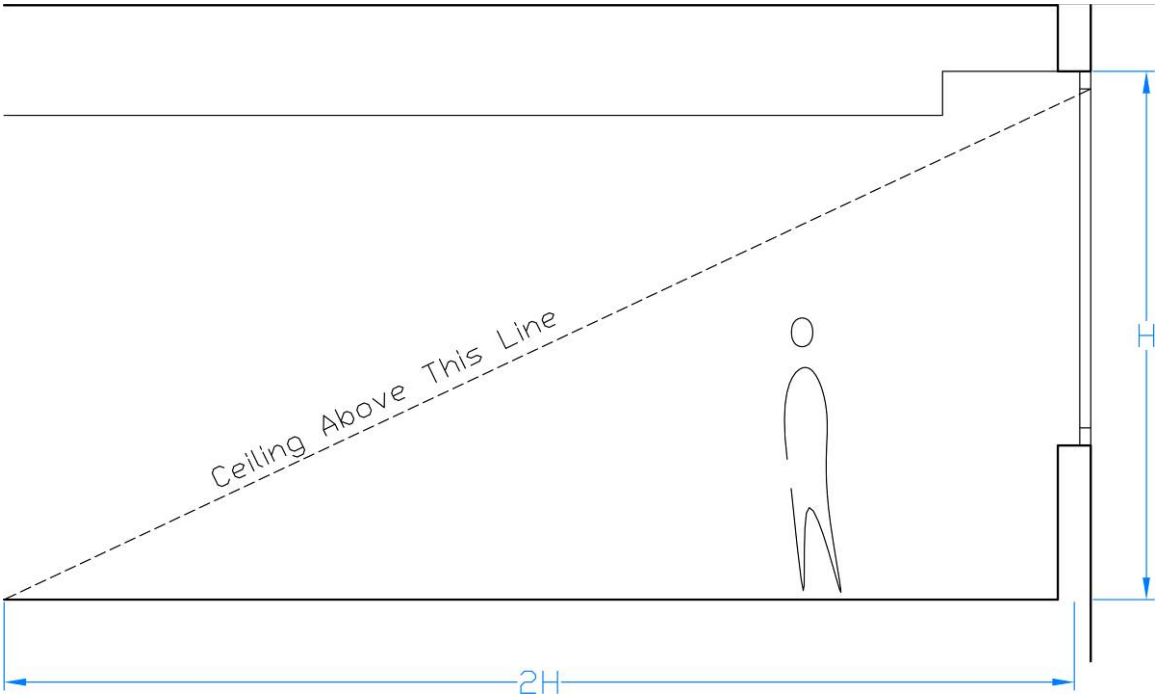
OPTION 4 – PRESCRIPTIVE

Use a combination of side-lighting and top-lighting to achieve a total Daylighting Zone (that floor area meeting the following requirements) that is at least 75% of all the regularly occupied spaces.

Sidelighting Daylight Zone:

- Achieve a product of the visible light transmittance (VLT) and window to floor area ratio (WFR) of daylight zone between the values of 0.150 and 0.180. Window area included in the calculation must be of the portion of the window at least 2'-6" above the floor.
- $0.150 < \text{VLT} \times \text{WFR} < 0.180$
- Ceiling should not obstruct a line in section that joins the window-head to a line on the floor that is parallel to the plane of the window and is, in distance from the plane of the glass as measured perpendicular to the plane of the glass, two times the height of the window head above the floor. See diagram below.

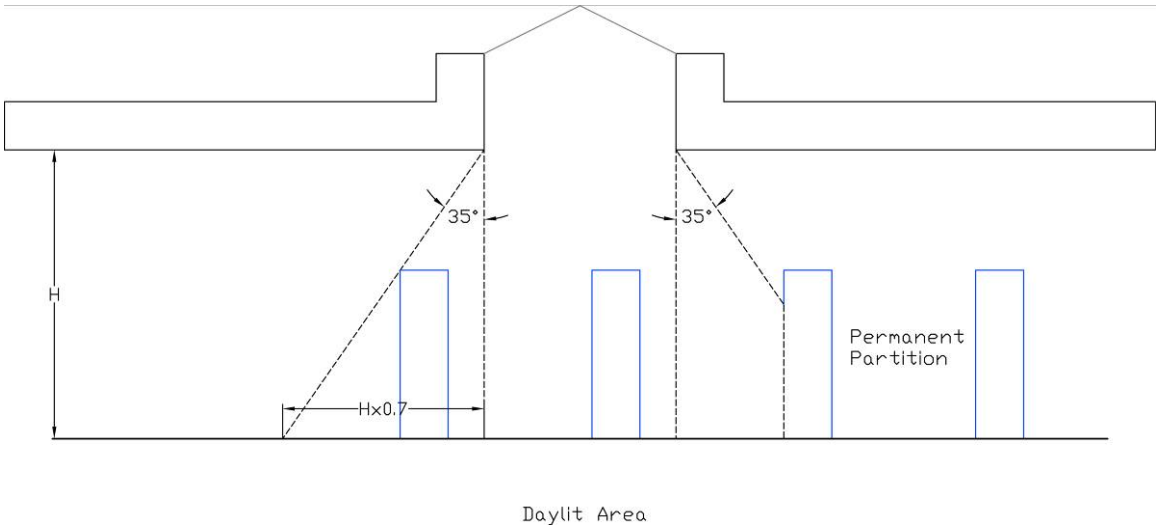
- Provide sunlight redirection and/or glare control devices to ensure daylight effectiveness.



Toplighting Daylight Zone:

- The daylit zone under a skylight is the outline of the opening beneath the skylight, plus in each direction the lesser of: 70% of the ceiling height, one half of the distance to the edge of the nearest skylight, or the distance to any permanent opaque partition (if transparent show VLT) which is farther away than 70% of the distance between the top of the partition and the ceiling. See diagram below.
- Achieve a skylight roof coverage that is between 3% and 6% of the roof area with a minimum 0.5 visible light transmittance (VLT) for the skylights.
- The distance between the skylights shall not be more than 1.4 times the ceiling height
- Skylight diffuser with a measured haze value of greater than 90% when tested according to ASTM D1003. Avoid direct line of sight to skylight diffuser.

Exceptions for areas where tasks would be hindered by the use of daylight will be considered on their merits.



In all cases, only the square footage associated with the portions of rooms or spaces meeting the minimum illumination requirements can be applied towards the 75% of total area calculation required to qualify for this credit.

In all cases, provide daylight redirection and/or glare control devices to avoid high-contrast situations that could impede visual tasks. Exceptions for areas where tasks would be hindered by the use of daylight will be considered on their merits.

Potential Technologies & Strategies

Design the building to maximize interior daylighting. Strategies to consider include building orientation, shallow floor plates, increased building perimeter, exterior and interior permanent shading devices, high performance glazing and automatic photocell-based controls. Predict daylight factors via manual calculations or model daylighting strategies with a physical or computer model to assess foot-candle levels and daylight factors achieved.

EQ Credit 8.2: Daylight & Views: Views for 90% of Spaces
1 Point

Intent

Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Requirements

Achieve direct line of sight to the outdoor environment via vision glazing between 2'6" and 7'6" above finish floor for building occupants in 90% of all regularly occupied areas. Determine the area with direct line of sight by totaling the regularly occupied square footage that meets the following criteria:

- In plan view, the area is within sight lines drawn from perimeter vision glazing.
- In section view, a direct sight line can be drawn from the area to perimeter vision glazing.

Line of sight may be drawn through interior glazing. For private offices, the entire square footage of the office can be counted if 75% or more of the area has direct line of sight to perimeter vision glazing. For multi-occupant spaces, the actual square footage with direct line of sight to perimeter vision glazing is counted.

The core and shell design needs to develop a feasible tenant layout(s) per the default occupancy counts (or some other justifiable occupancy count) that can be used in the analysis of this credit.

Potential Technologies & Strategies

Design the space to maximize daylighting and view opportunities. Strategies to consider include lower partition heights, interior shading devices, interior glazing, and automatic photocell-based controls.

Allow the tenant to design the space to maximize daylighting and view opportunities. Strategies to consider include lower partition heights, interior shading devices, interior glazing, and photo integrated light sensors.

This credit requires consideration of tenant design for views that can be implemented during future tenant build-out. Core and shell design documents should include drawings or specifications that detail the design assumptions and information on how the tenant can use this capability. If Tenant Design and Construction Guidelines are created, this information should also be included in the guidelines.

Innovation & Design Process

ID Credit 1-1.4: Innovation in Design
1-4 Points

Intent

To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED for Core & Shell Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED for Core & Shell Green Building Rating System.

Requirements

Credit 1.1 (1 point) In writing, identify the intent of the proposed innovation credit, the proposed requirement for compliance, the proposed submittals to demonstrate compliance, and the design approach (strategies) that might be used to meet the requirements.

Credit 1.2 (1 point) Same as Credit 1.1

Credit 1.3 (1 point) Same as Credit 1.1

Credit 1.4 (1 point) Same as Credit 1.1

Potential Technologies & Strategies

Substantially exceed a LEED for Core & Shell performance credit such as energy performance or water efficiency. Apply strategies or measures that demonstrate a comprehensive approach and quantifiable environment and/or health benefits.

ID Credit 2: LEED Accredited Professional
1 Point

Intent

To support and encourage the design integration required by a LEED for Core & Shell green building project and to streamline the application and certification process.

Requirements

At least one principal participant of the project team shall be a LEED Accredited Professional (AP).

Potential Technologies & Strategies

Educate the project team members about green building design & construction and application of the LEED Rating System early in the life of the project. Consider assigning the LEED AP as a facilitator of an integrated design & construction process.

Appendix 1 – Default Occupancy Counts

Due to the particular nature of LEED for Core & Shell projects, the project team may not know the occupant count. Because of this, compliance with some of the credits becomes complicated. For projects that do not know the final occupant count, a draft default table has been developed.

The issue of occupant counts is important for a number of credits. There are three general areas where this is important:

1) The requirements for Alternative Transportation including bike racks, and parking requirements.
2) Default numbers needed to determine water use reduction
3) Default numbers needed to determine occupant density for mechanical system design and Energy Modeling.

For projects where the tenant and occupancy counts are known, the actual occupant numbers must be used. In the absence of this, the default table below can be used for determining occupancy counts. However, in no circumstances, can the gross square foot per employee be greater than those in the default table. The table establishes maximum square foot per employee. If code requirements are less that those in the table, this is acceptable. Default occupancy counts are provided for typical core and shell project types.

		Gross sf per employee			
		General Office	Retail	Medical Office bldg	R&D - Lab Bldg
SS 4.2	For bike racks	250	550	225	400
SS 4.3	For parking requirement	250	550	225	400
SS 4.4	For car pool requirement	250	550	225	400
WE 3.1	For water use	(1)	(1)	(1)	(1)
WE3.2	For water use	(1)	(1)	(1)	(1)
EA C1	For energy model	250	550	225	400
EQ P1	For ventilation requirements	250	550	225	400
EQ C1	For ventilation requirements	250	550	225	400
EQ C2	For ventilation Requirements	250	550	225	400
EQ C6	For individual controls	250	550	225	400
EQ 7	Human contribution to humidity	250	550	225	400

(1) Code or actual, whichever is less

NOTE TO REVIEWERS: The information is drawn from a City of Boulder study that in turn used Building Owners and Managers Association (BOMA), Institute for Transportation Engineers (ITE), the Urban Land Institute, the San Diego Association of Governments (SDAG) and Portland Oregon Metro Employment Density Study (POMEDS) studies as its basis. The link to this study is:
http://www.ci.boulder.co.us/buildingservices/jobs_to_pop/documents/attachment_squarefootage.pdf

Appendix 2 – Core & Shell Energy Modeling Guidelines

These guidelines are intended to ensure that projects in different markets with different project teams are approaching the energy modeling requirements in a similar manner and that a minimum benchmark for energy optimization is established.

1. Create the ASHRAE 90.1-2004 baseline building model and proposed building model

1.1 Follow the ASHRAE 90.1-2004 Building Performance Rating Method. This is a whole building model inclusive of both shell and core, and tenant space scope. The following describes the prescriptive requirements for developing the whole building modeling of both the known shell and core work and unknown tenant space development.

1.2 Tenant spaces are defined as meeting all the following conditions:

1.2.1 Components exclusively serve the tenant space;

1.2.2 Components specifically designed for the tenant space;

1.2.3 Energy using components are metered and apportioned and/or billed to the tenant;

1.2.4 The tenant will pay for the components.

1.3 The core and shell building is all parts of the building that is not a tenant space.

2 Proposed Building Model

2.1 Core and Shell Building

2.1.1 HVAC Systems

2.1.1.1 Model the building system as described in the design documents.

- If the HVAC system is not yet designed, use the same HVAC system as the baseline model.

2.1.2 Building Envelope

2.1.2.1 Model the building envelope as shown on the architectural drawings.

2.1.3 Lighting

2.1.3.1 Model the lighting power as shown in the design documents for the core and shell spaces.

2.2 Tenant Spaces

2.2.1 Lighting

2.2.1.1 Model separate electric meters for the lighting in the core building and the tenant spaces.

2.2.1.2 Choose a space type classification for the building spaces. Use lighting levels shown in chart 9.3.1.2 of ASHRAE 90.1-2004 for the space type use classification.

- If the tenant lighting is designed and installed as part of the core and shell work, the project team may model the designed or installed lighting systems.

2.2.2 Receptacle and Other Loads

2.2.2.1 Model separate meters for tenant plug loads and process loads.

2.2.2.2 Use the following values to model tenant plug loads or provide documentation for the modeled loads (See the Process energy section on page 44 of this section):

2.2.2.3 Computer intensive offices

- 2.0 W/sq. ft.

2.2.2.4 General office areas

- 1.5 W/sq. ft.

2.2.2.5 Large conference areas

- 1.0 W/sq. ft.

2.2.2.6 Corridors

- 0 W/sq. ft.

2.2.2.7 Server/computer rooms

- 50 W/sq. ft.

2.2.2.8 Other uses

- Use diversity in calculations

3 Baseline Building Model

3.1 Core and Shell Building

3.1.1 HVAC system

3.1.1.1 Model the baseline building HVAC system determined from Table G3.1.1A in ASHRAE 90.1-2004.

3.1.2 Building Envelope

3.1.2.1 Comply with the prescriptive requirements of ASHRAE 90.1-2004.

3.1.3 Lighting

3.1.3.1 Model the lighting power in the core and shell areas as determined by the space type classification in chart 9.6.1 of ASHRAE 90.1-2004.

3.2 Tenant Spaces

3.2.1 Lighting

3.2.1.1 Model separate electric meters for the lighting in the core building and the tenant spaces.

3.2.1.2 Use the same lighting power as modeled in the proposed building.

3.2.2 Receptacle and other Loads

3.2.2.1 Model separate meters for tenant receptacle loads and process loads.

3.2.2.2 Use the same values for receptacle loads as used in the proposed building.

4 Perform Energy Simulation of Baseline Building and Proposed Building

4.1 Simulate building performance for an entire year.

5 Compare Annual Energy Costs of Baseline Building and Proposed Building

5.1 From the simulation, determine the annual energy costs of the budget building and design building.

5.2 Verify that 25% of the overall energy cost is process load.

5.3 Determine the percentage savings for annual energy costs

Appendix 3 – LEED for Core & Shell Project Scope Checklist

The LEED for Core & Shell Project Scope Checklist is intended to be a tool for projects to identify and document Core & Shell project scope. This document will need to be submitted with the project certification submittal.

Project Name _____

Project Size (Gross sf) _____

Use type	Occupancy (Gross sf per employee)	Percentage of total Bldg.
General Office		
Retail		
Medical Office bldg.		
R & D – Lab bldg.		

Building Space	Building System	Core & Shell Scope
Main Lobby	Floor finishes	
	Wall finishes	
	Ceiling finishes	
	Air terminal equipment	
	Air inlets and outlets	
	Light fixtures	
	Lighting Controls	
Secondary Lobby	Floor finishes	
	Wall finishes	
	Ceiling finishes	
	Air terminal equipment	
	Air inlets and outlets	
	Light fixtures	
	Lighting Controls	
Main Corridor	Floor finishes	
	Wall finishes	
	Ceiling finishes	
	Air terminal equipment	
	Air inlets and outlets	
	Light fixtures	
	Lighting Controls	
Elevator Lobbies	Floor finishes	
	Wall finishes	
	Ceiling finishes	
	Air terminal equipment	

	Air inlets and outlets	
	Light fixtures	
	Lighting Controls	
Secondary Corridors	Floor finishes	
	Wall finishes	
	Ceiling finishes	
	Air terminal equipment	
	Air inlets and outlets	
	Light fixtures	
	Lighting Controls	
Interior Buildouts	Floor finishes	
	Wall finishes	
	Ceiling finishes	
	Air terminal equipment	
	Air inlets and outlets	
	Light fixtures	
	Lighting Controls	
HVAC	AHUs/RTUs/Air supply equipment	
	Chillers	
	Cooling Tower	
	Boilers	
	Primary Ductwork	
Electrical	Electrical Panels	
	Switchgear	
	Busduct	
	Tenant meters	

LEED for Core and Shell v2.0
Registered Project Checklist

Blank Part 1-LEED Certified w/Predetermined LEED Points

Project Name: Fox Office Building 103

Project Address: 10201 W. Pico Blvd, Los Angeles, CA

Yes	?	No		
22	0	20	Project Totals (Pre-Certification Estimates)	69 Points
			Certified: 23-27 points **Silver**: 28-33 points **Gold**: 34-44 points **Platinum**: 45-61 points	

Yes	?	No			
4		5	Sustainable Sites		15 Points
Yes			Prereq 1	**Construction Activity Pollution Prevention**	Required
1			Credit 1	**Site Selection**	1
		1	Credit 2	**Development Density & Community Connectivity**	1
		1	Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation**, Public Transportation	1
			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
			Credit 4.3	**Alternative Transportation**, Low-Emitting & Fuel Efficient Vehicles	1
		1	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
		1	Credit 5.1	**Site Development**, Protect or Restore Habitat	1
		1	Credit 5.2	**Site Development**, Maximize Open Space	1
			Credit 6.1	**Stormwater Design**, Quantity Control	1
			Credit 6.2	**Stormwater Design**, Quality Control	1
			Credit 7.1	**Heat Island Effect**, Non-Roof	1
			Credit 7.2	**Heat Island Effect**, Roof	1
1			Credit 8	**Light Pollution Reduction**	1
1			Credit 9	**Tenant Design & Construction Guidelines**	1

Yes	?	No			
		3	Water Efficiency		5 Points
		1	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
		1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
			Credit 2	**Innovative Wastewater Technologies**	1
			Credit 3.1	**Water Use Reduction**, 20% Reduction	1
		1	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
8		1	**Energy & Atmosphere**		14 Points
Yes			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Yes			Prereq 2	**Minimum Energy Performance**	Required
Yes			Prereq 3	**Fundamental Refrigerant Management**	Required

***Note for EAc1:** All LEED for Core and Shell projects registered after June 26, 2007 are required to achieve at least two (2) points.

5			Credit 1	**Optimize Energy Performance**	1 to 8
			Credit 1.1	10.5% New Buildings / 3.5% Existing Building Renovations	1
			Credit 1.2	14% New Buildings / 7% Existing Building Renovations	2
			Credit 1.3	17.5% New Buildings / 10.5% Existing Building Renovations	3
			Credit 1.4	21% New Buildings / 14% Existing Building Renovations	4
			--> Credit 1.5	24.5% New Buildings / 17.5% Existing Building Renovations	5
			Credit 1.6	28% New Buildings / 21% Existing Building Renovations	6
			Credit 1.7	31.5% New Buildings / 24.5% Existing Building Renovations	7
			Credit 1.8	35% New Buildings / 28% Existing Building Renovations	8
		1	Credit 2	**On-Site Renewable Energy**	1
1			Credit 3	**Enhanced Commissioning**	1
		1	Credit 4	**Enhanced Refrigerant Management**	1
			Credit 5.1	**Measurement & Verification -** Base Building	1
1			Credit 5.2	**Measurement & Verification -** Tenant Sub-metering	1
1			Credit 6	**Green Power**	1

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
5		4	Materials & Resources		11 Points

Yes					
1			Prereq 1	**Storage & Collection of Recyclables**	Required
		1	Credit 1.1	**Building Reuse,** Maintain 25% of Existing Walls, Floors & Roof	1
		1	Credit 1.2	**Building Reuse,** Maintain 50% of Existing Walls, Floors & Roof	1
			Credit 1.3	**Building Reuse,** Maintain 75% of Interior Non-Structural Elements	1
			Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1
1			Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1
1			Credit 3	**Materials Reuse**, 1%	1
1			Credit 4.1	**Recycled Content**, 10% (post-consumer + 1/2 pre-consumer)	1
1			Credit 4.2	**Recycled Content**, 20% (post-consumer + 1/2 pre-consumer)	1
		1	Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured	1
		1	Credit 5.2	**Regional Materials**, 20% Extracted, Processed & Manufactured	1
1			Credit 6	**Certified Wood**	1

Yes	?	No			
5	0	3	Indoor Environmental Quality		11 Points

Yes					
Yes			Prereq 1	**Minimum IAQ Performance**	Required
Yes			Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required
1			Credit 1	**Outdoor Air Delivery Monitoring**	1
		1	Credit 2	**Increased Ventilation**	1
			Credit 3	**Construction IAQ Management Plan,** During Construction	1
Y			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
Y			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1
		N	Credit 4.3	**Low-Emitting Materials**, Carpet Systems	1
		N	Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1			Credit 6	**Controllability of Systems**, Thermal Comfort	1
1			Credit 7	**Thermal Comfort,** Design	1
		1	Credit 8.1	**Daylight & Views,** Daylight 75% of Spaces	1
		1	Credit 8.2	**Daylight & Views,** Views for 90% of Spaces	1

***Note for EQc4.1-4.4:** Project teams will receive 1 point for achievement of 2 credits, 2 points for achievement of 3 credits, or 3 points for achievement of 4 credits among EQc4.1, EQc4.2, EQc4.3 and EQc4.4.

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
		4	**Innovation & Design Process**		**5 Points**
		1	Credit 1.1	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.2	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.3	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.4	**Innovation in Design:** Provide Specific Title	1
			Credit 2	**LEED® Accredited Professional**	1

LEED for Core and Shell v2.0
Registered Project Checklist

Blank Part 2-LEED Silver w/Predetermined LEED Points

Project Name: Fox Office Building 103

Project Address: 10201 W. Pico Blvd, Los Angeles, CA

Yes	?	No		
22	0	20	**Project Totals** (Pre-Certification Estimates)	69 Points
			Certified: 23-27 points **Silver**: 28-33 points **Gold**: 34-44 points **Platinum**: 45-61 points	

Yes	?	No		
4		5	**Sustainable Sites**	15 Points

Yes	?	No			
			Prereq 1	**Construction Activity Pollution Prevention**	Required
1			Credit 1	**Site Selection**	1
		1	Credit 2	**Development Density & Community Connectivity**	1
		1	Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation**, Public Transportation	1
			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
			Credit 4.3	**Alternative Transportation**, Low-Emitting & Fuel Efficient Vehicles	1
		1	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
		1	Credit 5.1	**Site Development**, Protect or Restore Habitat	1
		1	Credit 5.2	**Site Development**, Maximize Open Space	1
			Credit 6.1	**Stormwater Design**, Quantity Control	1
			Credit 6.2	**Stormwater Design**, Quality Control	1
			Credit 7.1	**Heat Island Effect**, Non-Roof	1
			Credit 7.2	**Heat Island Effect**, Roof	1
1			Credit 8	**Light Pollution Reduction**	1
1			Credit 9	**Tenant Design & Construction Guidelines**	1

Yes	?	No		
		3	**Water Efficiency**	5 Points

		1	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
		1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
			Credit 2	**Innovative Wastewater Technologies**	1
			Credit 3.1	**Water Use Reduction**, 20% Reduction	1
		1	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
8		1	**Energy & Atmosphere**		14 Points
Yes			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Yes			Prereq 2	**Minimum Energy Performance**	Required
Yes			Prereq 3	**Fundamental Refrigerant Management**	Required

***Note for EAc1:** All LEED for Core and Shell projects registered after June 26, 2007 are required to achieve at least two (2) points.

5			Credit 1	**Optimize Energy Performance**	1 to 8
			Credit 1.1	10.5% New Buildings / 3.5% Existing Building Renovations	1
			Credit 1.2	14% New Buildings / 7% Existing Building Renovations	2
			Credit 1.3	17.5% New Buildings / 10.5% Existing Building Renovations	3
			Credit 1.4	21% New Buildings / 14% Existing Building Renovations	4
			--> Credit 1.5	24.5% New Buildings / 17.5% Existing Building Renovations	5
			Credit 1.6	28% New Buildings / 21% Existing Building Renovations	6
			Credit 1.7	31.5% New Buildings / 24.5% Existing Building Renovations	7
			Credit 1.8	35% New Buildings / 28% Existing Building Renovations	8
		1	Credit 2	**On-Site Renewable Energy**	1
1			Credit 3	**Enhanced Commissioning**	1
		1	Credit 4	**Enhanced Refrigerant Management**	1
			Credit 5.1	**Measurement & Verification -** Base Building	1
1			Credit 5.2	**Measurement & Verification -** Tenant Sub-metering	1
1			Credit 6	**Green Power**	1

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
5		4	Materials & Resources		11 Points

Yes					
1			Prereq 1	**Storage & Collection of Recyclables**	Required
		1	Credit 1.1	**Building Reuse,** Maintain 25% of Existing Walls, Floors & Roof	1
		1	Credit 1.2	**Building Reuse,** Maintain 50% of Existing Walls, Floors & Roof	1
			Credit 1.3	**Building Reuse,** Maintain 75% of Interior Non-Structural Elements	1
			Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1
1			Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1
1			Credit 3	**Materials Reuse**, 1%	1
1			Credit 4.1	**Recycled Content**, 10% (post-consumer + 1/2 pre-consumer)	1
1			Credit 4.2	**Recycled Content**, 20% (post-consumer + 1/2 pre-consumer)	1
		1	Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured	1
		1	Credit 5.2	**Regional Materials**, 20% Extracted, Processed & Manufactured	1
1			Credit 6	**Certified Wood**	1

Yes	?	No			
5	0	3	Indoor Environmental Quality		11 Points

Yes					
Yes			Prereq 1	**Minimum IAQ Performance**	Required
Yes			Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required
1			Credit 1	**Outdoor Air Delivery Monitoring**	1
		1	Credit 2	**Increased Ventilation**	1
			Credit 3	**Construction IAQ Management Plan,** During Construction	1
Y			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
Y			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1
		N	Credit 4.3	**Low-Emitting Materials**, Carpet Systems	1
		N	Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1			Credit 6	**Controllability of Systems**, Thermal Comfort	1
1			Credit 7	**Thermal Comfort,** Design	1
		1	Credit 8.1	**Daylight & Views,** Daylight 75% of Spaces	1
		1	Credit 8.2	**Daylight & Views,** Views for 90% of Spaces	1

***Note for EQc4.1-4.4:** Project teams will receive 1 point for achievement of 2 credits, 2 points for achievement of 3 credits, or 3 points for achievement of 4 credits among EQc4.1, EQc4.2, EQc4.3 and EQc4.4.

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
		4	**Innovation & Design Process**		**5 Points**
		1	Credit 1.1	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.2	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.3	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.4	**Innovation in Design:** Provide Specific Title	1
			Credit 2	**LEED® Accredited Professional**	1

LEED for Core and Shell v2.0
Registered Project Checklist

Blank Part 2-LEED Gold w/Predetermined LEED Points

Project Name: Fox Office Building 103

Project Address: 10201 W. Pico Blvd, Los Angeles, CA

Yes	?	No		
22	0	20	**Project Totals** (Pre-Certification Estimates)	69 Points
			Certified: 23-27 points **Silver**: 28-33 points **Gold**: 34-44 points **Platinum**: 45-61 points	

Yes	?	No		
4		5	**Sustainable Sites**	15 Points

Yes					
1			Prereq 1	**Construction Activity Pollution Prevention**	Required
		1	Credit 1	**Site Selection**	1
		1	Credit 2	**Development Density & Community Connectivity**	1
1			Credit 4.1	**Alternative Transportation**, Public Transportation	1
			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
			Credit 4.3	**Alternative Transportation**, Low-Emitting & Fuel Efficient Vehicles	1
		1	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
		1	Credit 5.1	**Site Development**, Protect or Restore Habitat	1
		1	Credit 5.2	**Site Development**, Maximize Open Space	1
			Credit 6.1	**Stormwater Design**, Quantity Control	1
			Credit 6.2	**Stormwater Design**, Quality Control	1
			Credit 7.1	**Heat Island Effect**, Non-Roof	1
			Credit 7.2	**Heat Island Effect**, Roof	1
1			Credit 8	**Light Pollution Reduction**	1
1			Credit 9	**Tenant Design & Construction Guidelines**	1

Yes	?	No		
		3	**Water Efficiency**	5 Points

		1	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
		1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
			Credit 2	**Innovative Wastewater Technologies**	1
			Credit 3.1	**Water Use Reduction**, 20% Reduction	1
		1	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
8		1	**Energy & Atmosphere**		14 Points
Yes			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Yes			Prereq 2	**Minimum Energy Performance**	Required
Yes			Prereq 3	**Fundamental Refrigerant Management**	Required

***Note for EAc1:** All LEED for Core and Shell projects registered after June 26, 2007 are required to achieve at least two (2) points.

5			Credit 1	**Optimize Energy Performance**	1 to 8
			Credit 1.1	10.5% New Buildings / 3.5% Existing Building Renovations	1
			Credit 1.2	14% New Buildings / 7% Existing Building Renovations	2
			Credit 1.3	17.5% New Buildings / 10.5% Existing Building Renovations	3
			Credit 1.4	21% New Buildings / 14% Existing Building Renovations	4
			--> Credit 1.5	24.5% New Buildings / 17.5% Existing Building Renovations	5
			Credit 1.6	28% New Buildings / 21% Existing Building Renovations	6
			Credit 1.7	31.5% New Buildings / 24.5% Existing Building Renovations	7
			Credit 1.8	35% New Buildings / 28% Existing Building Renovations	8
		1	Credit 2	**On-Site Renewable Energy**	1
1			Credit 3	**Enhanced Commissioning**	1
		1	Credit 4	**Enhanced Refrigerant Management**	1
			Credit 5.1	**Measurement & Verification -** Base Building	1
1			Credit 5.2	**Measurement & Verification -** Tenant Sub-metering	1
1			Credit 6	**Green Power**	1

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
5		4	Materials & Resources		11 Points

Yes					
1			Prereq 1	**Storage & Collection of Recyclables**	Required
		1	Credit 1.1	**Building Reuse,** Maintain 25% of Existing Walls, Floors & Roof	1
		1	Credit 1.2	**Building Reuse,** Maintain 50% of Existing Walls, Floors & Roof	1
			Credit 1.3	**Building Reuse,** Maintain 75% of Interior Non-Structural Elements	1
			Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1
1			Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1
1			Credit 3	**Materials Reuse**, 1%	1
1			Credit 4.1	**Recycled Content**, 10% (post-consumer + 1/2 pre-consumer)	1
1			Credit 4.2	**Recycled Content**, 20% (post-consumer + 1/2 pre-consumer)	1
		1	Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured	1
		1	Credit 5.2	**Regional Materials**, 20% Extracted, Processed & Manufactured	1
1			Credit 6	**Certified Wood**	1

Yes	?	No			
5	0	3	Indoor Environmental Quality		11 Points

Yes					
Yes			Prereq 1	**Minimum IAQ Performance**	Required
Yes			Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required
1			Credit 1	**Outdoor Air Delivery Monitoring**	1
		1	Credit 2	**Increased Ventilation**	1
			Credit 3	**Construction IAQ Management Plan,** During Construction	1
Y			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
Y			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1
		N	Credit 4.3	**Low-Emitting Materials**, Carpet Systems	1
		N	Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1			Credit 6	**Controllability of Systems**, Thermal Comfort	1
1			Credit 7	**Thermal Comfort,** Design	1
		1	Credit 8.1	**Daylight & Views,** Daylight 75% of Spaces	1
		1	Credit 8.2	**Daylight & Views,** Views for 90% of Spaces	1

***Note for EQc4.1-4.4:** Project teams will receive 1 point for achievement of 2 credits, 2 points for achievement of 3 credits, or 3 points for achievement of 4 credits among EQc4.1, EQc4.2, EQc4.3 and EQc4.4.

LEED for Core and Shell v2.0
Registered Project Checklist

Yes	?	No			
		4	**Innovation & Design Process**		**5 Points**
		1	Credit 1.1	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.2	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.3	**Innovation in Design:** Provide Specific Title	1
		1	Credit 1.4	**Innovation in Design:** Provide Specific Title	1
			Credit 2	**LEED® Accredited Professional**	1

TAB 10

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10.) Bonus – "Red Light Procedure"

A very unique aspect of this project is that it is being built on a working TV & Movie production lot. While most TV and Movie filming is done inside of sound controlled buildings, the Fox lot has an outdoor filming area, which replicates a New York City street, hence the name NY Street. Film for TV and Movies is extremely sensitive to sound and vibration and must be carefully controlled, especially when filming occurs in an outdoor environment. An actual tripod with a flashing red strobe light is used to signal when the cameras are rolling, hence the name "Red Light" and that all noise and vibration which may impact the filming must be ceased immediately.

Some other interesting information is that a normal 8 hour filming day, which begins at 10:00 AM, breaks for lunch from 2:00 PM to 3:00 PM and is finished by 7:00 PM. During the 8 hour day, much of the time, 90%, is spent setting up a scene and rehearsing. Only about 10% of the time, are the cameras and sound equipment actually recording. Although the overall 8 hour +1 hour for lunch day is known, the actual time when the filming and sound recording occurs, happens when everything is ready and rehearsal is done, so it is not possible to know in advance when the actual "Red Light" will be turned on.

For the purpose of this problem, please assume that shooting on NY Street will occur a maximum of 2 days, Monday through Friday, per week, the TV & Movie Industry is on hiatus all of the Month of December and from June through August each year.

For this problem please develop a one page procedure of how your project team will successfully manage "Red Lights" Include contact information, how communications will flow and how you will track "Red Light" impacts against the Contract Allowance of 10 days. Describe in a narrative of steps your team will take to minimize the cost & schedule impacts from "Red Lights" and ensure the allowance is not exceeded during the course of the project. Provide an analysis, based upon your team's procedure and efforts to minimize the cost & schedule impacts, of the anticipated cost and schedule impact to the project due to "Red Lights".

Deliverable:

1. *"Red Light" Management Plan, Narrative and Projected Cost & Schedule Impact to the project*

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TAB IX

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2009 ASC Student Competition
National Preconstruction Services Problem
Evaluation Form

Dear ASC Preconstruction Services Problem Teams/Team Leaders:

Please have each team leader complete this evaluation form and return it with the Team Leader to the Debrief and Answer Session on Friday, February 13, 2009 at 6:45 PM. ***The provided evaluation form is your admission ticket*** for your team to the Debrief and Answer Session.

Your feedback is important to our team as we improve the quality of this problem in the years to come. Be honest and forthright with your answers. If you need additional space, please use the back of this form for your comments. Please label the question number to which you are responding.

Thank you for your time and consideration.

---

1. **Why did you choose this particular problem?**

2. **What was the most challenging component of the problem statement?**

3. **What time on Thursday did your team complete the written Phase II portion of the problem?**

4. **How well does your class work prepare you for this problem?**

5. **How much time (in total hours) did your team exercise the industry at large in preparing for this problem?**

PCL CONSTRUCTION SERVICES, INC.
700 N. CENTRAL AVE, SUITE 700, GLENDALE, CA 91203
TELEPHONE (818)246-3481 ◆ FAX (818)247-5775

6. How satisfied are you with the time allotment to respond to each section of the problem?

a. Phase I - Prequalification

☐ Very Dissatisfied ☐ Dissatisfied ☐ Neither Dissatisfied or Satisfied ☐ Satisfied ☐ Very Satisfied

b. Phase II – Proposal

☐ Very Dissatisfied ☐ Dissatisfied ☐ Neither Dissatisfied or Satisfied ☐ Satisfied ☐ Very Satisfied

c. Presentation

☐ Very Dissatisfied ☐ Dissatisfied ☐ Neither Dissatisfied or Satisfied ☐ Satisfied ☐ Very Satisfied

7. List any recommended changes to the competition rules. Include how to implement your recommendation.

8. Overall, how satisfied were you with the Preconstruction Services Problem?

☐ Very Dissatisfied ☐ Dissatisfied ☐ Neither Dissatisfied or Satisfied ☐ Satisfied ☐ Very Satisfied

9. Overall, how satisfied were you with the Preconstruction Services Problem as a learning tool?

☐ Very Dissatisfied ☐ Dissatisfied ☐ Neither Dissatisfied or Satisfied ☐ Satisfied ☐ Very Satisfied

10. Overall, how satisfied were you as to the professionalism of the PCL Problem team members?

☐ Very Dissatisfied ☐ Dissatisfied ☐ Neither Dissatisfied or Satisfied ☐ Satisfied ☐ Very Satisfied

11. List three positive things about this years' competition. Does not have to be Preconstruction Services Problem specific.

12. List three negative things about this years' competition. Does not have to be Preconstruction Services Problem specific.

13. On a scale of 1-10, (ten being the best) how would you rate this year's competition?

14. Rate each category using the following evaluation scoring system:

1 = Poor 2 = Needs Improvement 3 = Average 4 = Good 5 = Excellent

a. _____ Location of facilities
b. _____ Quality of the presentation room & equipment
c. _____ Applicability to school course work
d. _____ Availability of support from the Architect/Contracting/Engineering community
e. _____ Format of the problem statement
f. _____ Amount of work to the problem statement
g. _____ Quality of the problem statement
h. _____ Clarity of the Addendum
i. _____ Amount of presentation time

15. How much of the financial burden of this trip was paid by the students (not including entertainment and gambling) as a percentage of total costs?

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