Overwater Facility Upgrades
Concept Design Report

Produced By:

ART ANDERSON

830 PACIFIC AVE., BREMERTON, WA, 98337

July 31, 2020

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Introduction

The objective of this project is to implement the overwater design elements identified in the 2019 Port of Silverdale Comprehensive Plan. The Silverdale waterfront provides a very attractive and suitable location for nonmotorized boating, including sailboats, rowing, kayaking, and paddle boarding. Dyes Inlet is isolated from commercial vessel traffic, is perfectly suited for regional sailing competitions, has relatively low currents, and has ample space for many to use. This project seeks to enhance and enrich the nonmotorized boating experience, while maintaining the same experience motorized boat users enjoy.

The goal of this concept report is to define the approximate size, locations, configuration and type of construction of project components to aid the Port in grant and permit applications. This report contains a discussion of each project element, a set of concept design drawings and renderings, and a ROM cost estimate of planned work.

Project Elements

New Nonmotorized Craft Float

A new float for nonmotorized craft use will be installed on the north side of the existing moorage float. The new float will be accessed directly from the fixed pier with a separate gangway. The float is space constrained by the existing moorage float on the south side, and the dredged bathymetry on the north side. A 100'x40' float has been preliminarily chosen. Some of the primary objectives of the new float are listed below:

- Overwater storage for sailboats for quick access and launch. It is assumed that the typical sailboat is 15 feet long, with a maximum length of 19 feet for some boats.
- Overwater storage racks for crew shells to eliminate the need to carry shells from land at each use. A typical 8-person shell is 58-60 feet long.
- Low-freeboard long-edge section of dock for launching crew shells
- Water level access for commercial kayak and paddle board rental, storage, and launching.

The preliminary concept has the new float divided into two sections: a 100'x28' section for sailboat storage, and a 100'x12' section for low freeboard crew shell storage and launching. The low freeboard section will have a freeboard of approximately 6 inches. Typical low freeboard rowing docks on the market consist of PVC or other composite type decking. The two sections would be separated by a walkway, potentially with a pad for landing the gangway. Since the two sections would have different freeboards, a guardrail and stairway or ramp would be

planned between the two sections. It is assumed that four new steel piles will be planned for the new nonmotorized float. This would allow it to be permanently kept in place.

Finger Pier Extension on Existing Floats

A 100-foot long by 17-foot wide extension is planned on the last finger section of the existing mooring float. This will replace any motorized craft transient mooring that would be displaced by the nonmotorized float. Also, the longer finger float would provide some extra wave attenuation for the inside of the marina. The dock profile is not a breakwater and will have minimal effect on higher height and period storm waves. However, the docks will help some to dampen smaller waves and chop that are expected during summer months when the nonmotorized float will see the most use. The new finger extension will be designed to mimic the design of the existing mooring floats, which consist of timber framing and decking, foam filled floatation tubs, and interstitial pile hoops. It is anticipated that about three new steel pilings will be needed along the new 100-foot long finger float.

New Accessible Gangways

The new non-motorized craft float will have access from the fixed pier separate from the access to the existing floats. There are several advantages to having separate access, including the ability to control access to the non-motorized float separate from the main public float. The separate access feature was determined during the development of the Comprehensive Plan.

Existing access to the floats is via an aluminum gangway. This project plans to replace the existing gangway with a longer, more accessible gangway, and provide a second new gangway for the non-motorized float. Tidal data at this location is summarized below.

- Highest predicted tide, 2019 = 13.9 ft
- Mean Higher High Water = 11.74 ft
- Mean Tide Level = 6.85 ft
- Mean Lower Low Water = 0.00
- Lowest predicted tide, 2019 = -3.2 ft

According to the United States Access Board guidelines for accessible boating facilities, a maximum 80-foot long gangway is required for an accessible route to a floating boating facility. An 80-foot long gangway will provide a 1:12 slope for tides approximately 10 feet MLLW and higher. For tides below that, the slope will be greater than 1:12. Even with new 80-foot long gangways, the slope of the ramps at low tides will still be very steep, and grip strips like the current gangway has may still be needed to prevent slipping. For the current concept design, two new 80-foot long gangways will be estimated. However, during the detailed design phase,

further investigation and discussion with the Port may be needed to come up with the most effective way to upgrade the accessibility of the boating facilities.

Electrical

The electrical scope of work includes upgrading the distribution system and installing twenty 50 ampere, 240 volt receptacles. The scope provided did not mention pier lighting, but costs will be provided.

Existing Electrical System

The existing distribution system is supplied by a 300 KVA Puget Sound Energy pad mounted transformer, three phase, 480/277 volts. The service is routed through a disconnect switch and meter to a 480/277 volt, 225 amp panelboard. This panelboard then supplies power to two transformers and panelboards on the pier. Pictures of the existing gear show significant degradation.

Proposed Electrical System

Installing twenty 50 amp receptacles will require a larger electrical service. The National Electric Code (NEC) Table 555.12 specifies demand factors for the service based on the number of receptacles installed. Twenty receptacles have a demand factor of 70% from Table 555.12. This results in a demand total of 50 amps x 20 = 700 amps.

The existing distribution system has a 480/277 volt panelboard supplied directly from the PSE service disconnect and meter. This panelboard serves to supply the two existing transformers and nothing else. We are proposing that the new service use two 200 amp, 480 volt three phase fused switches that would directly supply each new transformer and float circuit. These would be located near the existing meter base at the head of the pier and would be in NEMA 4X enclosures.

The existing service disconnect switch and meter base would also be replaced. We have added costs for these items but sizing for these items will be determined by PSE. The demand factors from NEC Table 555.12 dictate a larger service than the actual loads represent in most cases. The PSE equipment will be based on their load projections for the service.

In order to keep the new equipment and float conductors from being extremely large and unwieldy we are proposing that two 400 amp enclosed circuit breakers each supplying a float circuit be provided for the receptacles with 10 receptacles supplied from each circuit. These new enclosed circuit breakers would have NEMA 4X enclosures suitable for the marine environment and would also include ground fault protection.

Each enclosed circuit breaker would be supplied from a 150 KVA transformer rated 480 volts on the primary and 120/208 volts on the secondary. These two transformers would be dry type with a NEMA 4X enclosure suitable for the marine environment and supplied from the two new fused disconnect switches at the head of the pier.

The NEC now requires that all marina docking facilities be protected by ground fault devices not exceeding 30 milliamps. The best way to accomplish this is to include ground fault circuit breakers in the pedestals. The enclosed circuit breakers supplying the pedestal circuits are required to have a 100 milliampere setting. These ground fault devices protect swimmers and other personnel that may be in the water in the vicinity of the floats.

Power pedestals on the floats would contain the ground fault circuit breakers and 50 amp receptacles and can provide water service and lighting if so desired. Metering is not included in the scope of work but could also be provided at the pedestals.

The existing lighting can be resupplied from a small fused switch tapped from one of the float circuits. Once more is known about the lighting requirements a circuit can be provided. We added a lump sum for this item until more detail is available.

Fire Protection

Fire protection requirements applicable to the Port of Silverdale facility are contained in NFPA 303, Fire Protection Standard for Marinas and Boatyards. The pertinent requirements for this project are:

- Fire extinguishers are required at the pier/land intersection and additionally such that the max travel distance does not exceed 75' (essentially a fire extinguisher every 150' max).
- A Class I standpipe system (2.5" hose connections) is required with piping sized for 300 gpm and 150' max distance from any point on the pier to a hose connection.
- Piers over 5000 square feet total or over 25 feet in width may be required to have under pier sprinklers. This pier is below the 5000 square foot threshold and well under 25 feet wide for most of its length, however the end of the pier widens out to approximately 37 feet. The NFPA allows the Authority Having Jurisdiction (typically the fire marshal) to ultimately decide if sprinklers are required and for the purposes of this report we are assuming the requirement would not be enforced.

There is an existing standpipe system that consists of a 3" diameter HDPE pipe running the length of the pier and along the length of the floating portion of the marina, with hose connections spaced periodically along the length. The hose connections are smaller than required by the NFPA and many appeared to be broken or non-operational. The hydraulic capacity of the 3" HDPE pipe was not calculated for this concept design but based on anecdotal

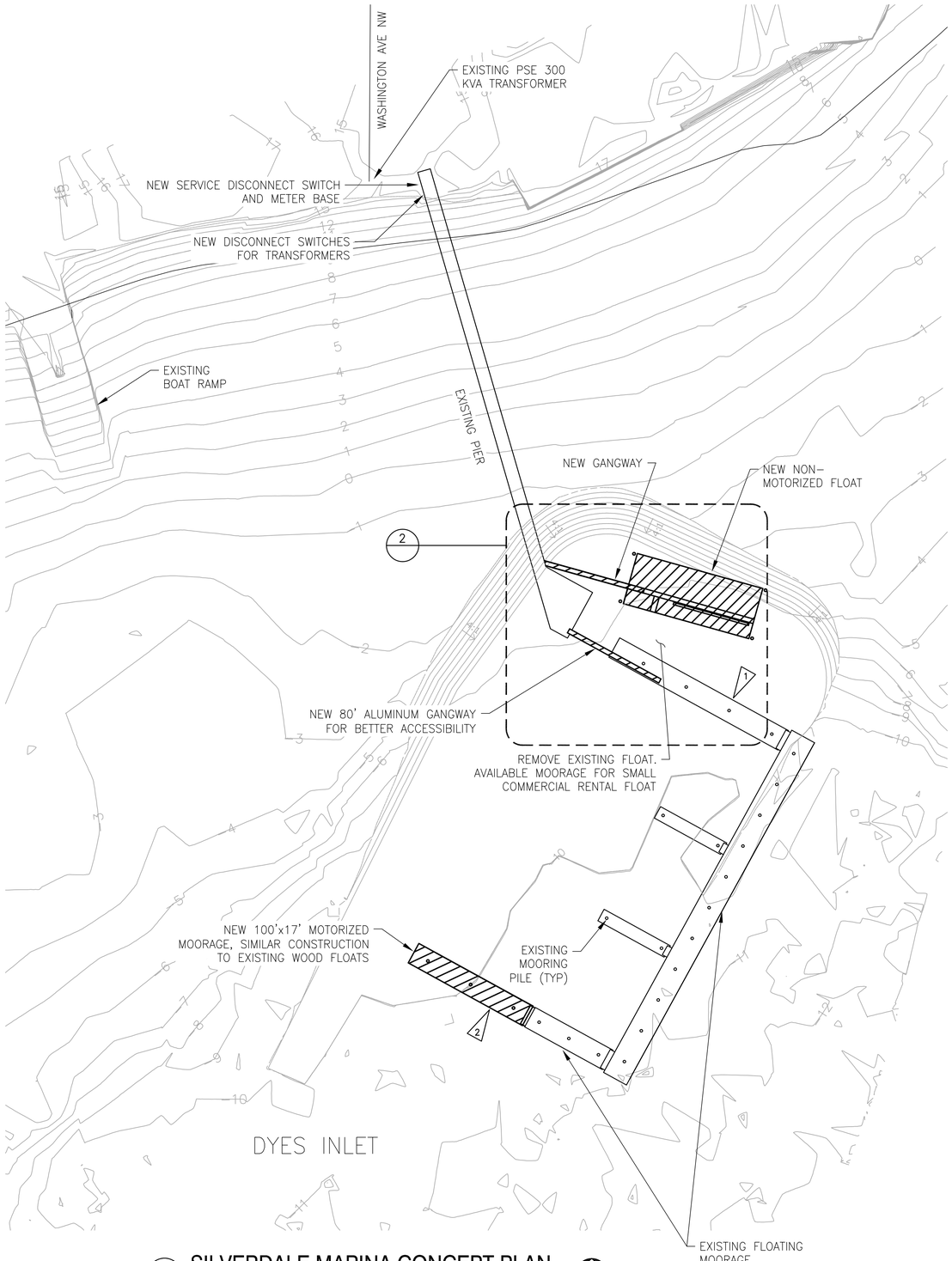
information provided by the Port it is assumed to be under-sized and full replacement with all new material is assumed for this project.

Appendices

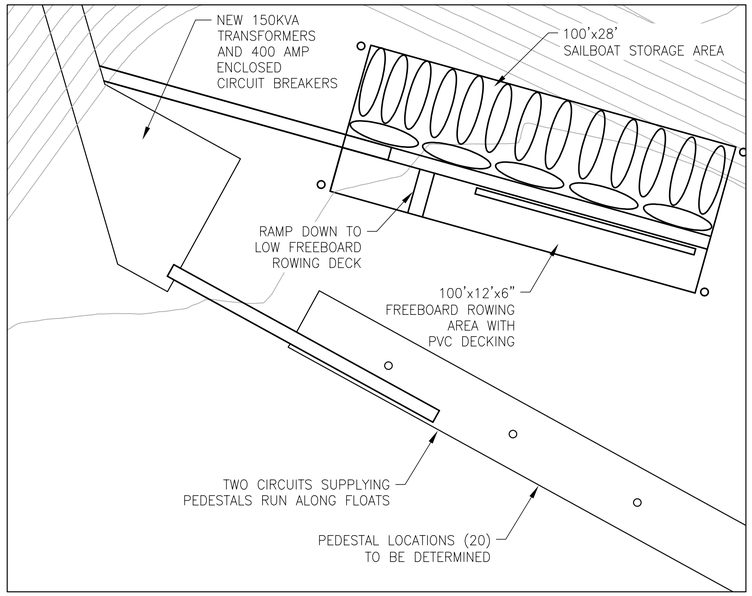
Appendix A – Concept Design Drawings

Appendix B – ROM Cost Estimate

Appendix A - Concept Design Drawings



1 SILVERDALE MARINA CONCEPT PLAN
1"=50'



2 ENLARGED NON-MOTORIZED FLOAT PLAN
1" = 20'-0"

FLAG NOTES

1 ~170 LF ON NORTH SIDE OF EXISTING FLOATS.

2 ~200 LF TOTAL BETWEEN TWO SIDES OF NEW MOTORIZED MOORAGE. THIS MOORAGE CAN BE LENGTHENED IF NEEDED.

KEY PLAN SCALE: 1"=1000'

0 5' 10' 15' 20' 30' 40' 60'
SCALE: 1" = 20'

0 10' 20' 30' 40' 50' 75' 100' 150
SCALE: 1" = 50'

SHEET IS 22x34 ANSI D
IF PRINTING 11x17 USE
50% SCALE FACTOR

ART ANDERSON
202 PACIFIC AVE. BREMERTON, WA 98337
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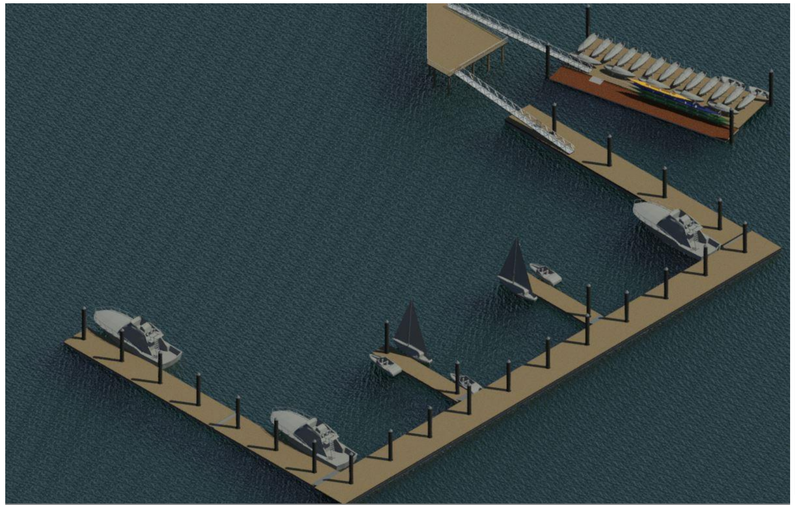
CONCEPT DESIGN
NOT FOR
CONSTRUCTION

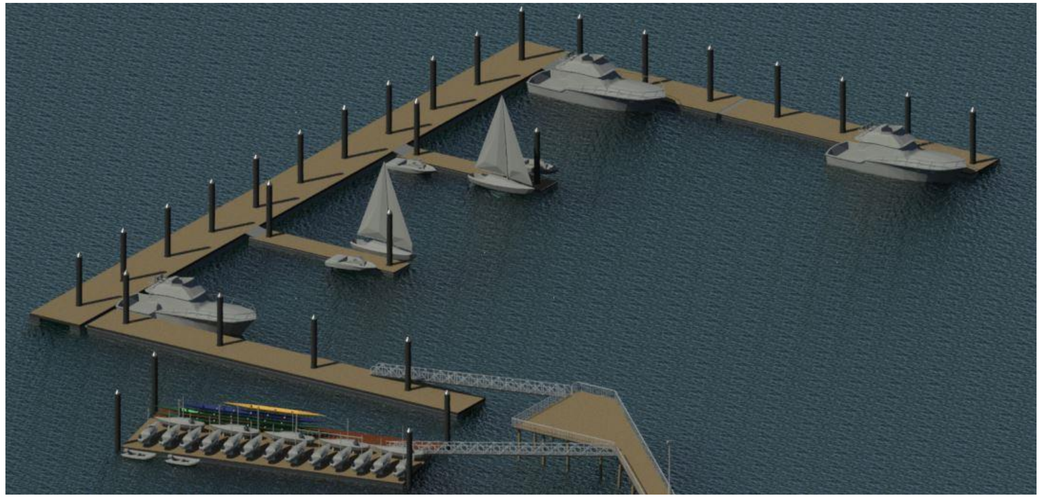
PORT OF SILVERDALE
CONCEPT OVERWATER FACILITY UPGRADES
3550 NW BYRON ST
SILVERDALE, WA 98383

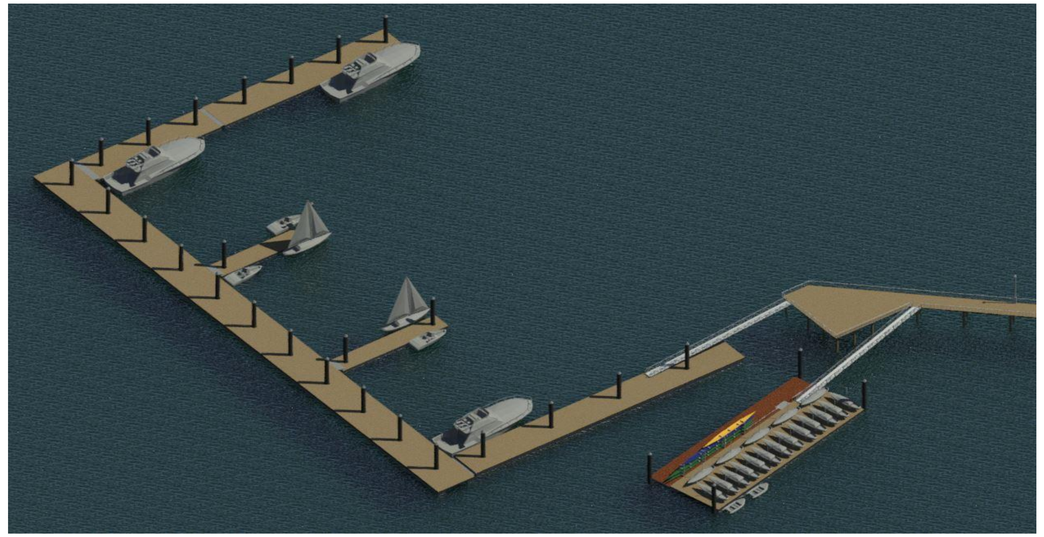
DRAWN:	JHL
DESIGNED:	ADT
CHECKED:	RBG
ISSUE DATE	31 JUL 2020
REVISIONS	
JOB NO	FWPSI001
SHT TITLE	SILVERDALE MARINA CONCEPT PLANS
SHT NO	1 OF 2

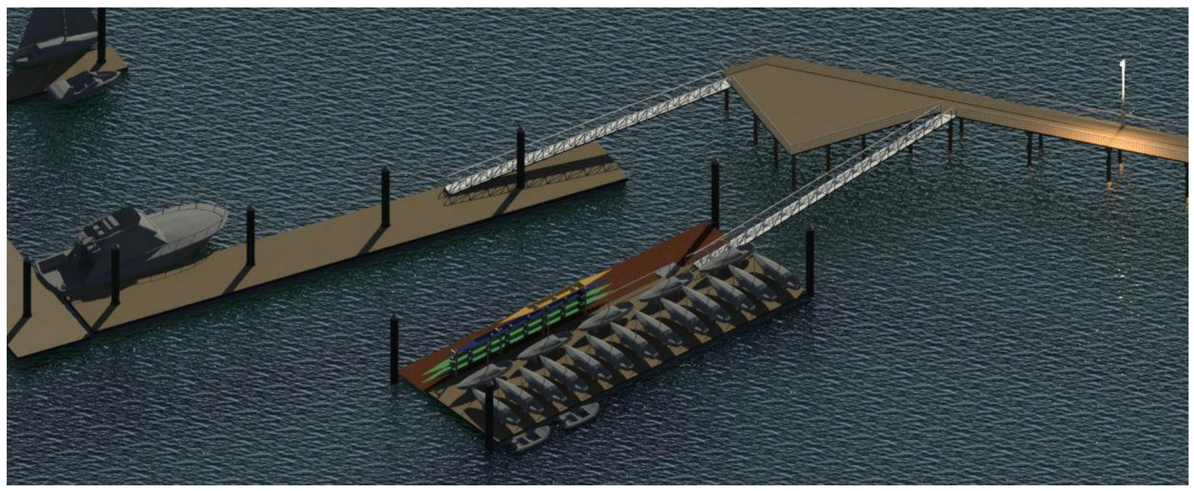
CS-1

Port of Silverdale









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SHT NO	2 OF 2

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Appendix B - ROM Cost Estimate

ART ANDERSON

PORT OF SILVERDALE OVERWATER FACILITY UPGRADES ROM ESTIMATE

ESTIMATED BY: Andrew Thorsen	AA PROJECT No.	**FWPSI001.001**
PROJECT & CITY: Port of Silverdale Waterfront, Silverdale, WA	DATE	7/31/2020

LS = Lump Sum Allowance value used

LINE ITEMS	**QUANTITY**		**LINE ITEM COST**			**TOTALS**
DESCRIPTION OF WORK	#	UNIT	UNIT($)	SUM TOT ($)		SUM TOTS ($)
Mobilization (boat/barge/drill rig)	1	LS	$30,000.00	$30,000		$30,000
Install new steel piles	7	EA	$10,000.00	$70,000		$70,000
Nonmotorized float - storage area, 28'x100'	2800	SF	$28.00	$78,400		$78,400
Nonmotorized float - 6" freeboard, 12'x100	1200	SF	$48.00	$57,600		$57,600
Nonmotorized float assembly and installation	4000	SF	$17.64	$70,560		$70,560
Wood mooring float finger extension	1700	SF	$38.53	$65,501		$65,501
Aluminum Gangway (2) 80'	160	LF	$364.55	$58,328		$58,328
Electrical Upgrades	1	LS	$148,020.00	$148,020		$148,020
Fire Protection Upgrades	1	LS	$20,000.00	$20,000		$20,000
Misc. Hardware (Cleats, railings, etc)	1	LS	$5,000.00	$5,000		$5,000
Demobilize	1	LS	$20,000.00	$20,000		$20,000
LINE ITEM SUBTOTAL						**$623,409**
GENERAL CONDITIONS ITEMS	**QUANTITY**			**COST**		
Description of Item	#	UNIT	UNIT($)	SUM TOT ($)		SUM TOTS ($)
Supervision (Full Time)	8	WK	$4,000.00	$32,000.00		$32,000
Project Manager (Quarter Time)	8	WK	$1,000.00	$8,000.00		$8,000
Permits, Plan Review (allow)	1	LS	$3,000.00	$3,000.00		$3,000
SUBTOTAL				$43,000.00	$0.00	$43,000
Job Phones, Truck, Fuels, Tools (% of subtotal)	8%				$3,440.00	$3,440
Temp job site maintenance/security(% of subtotal)	10%				$4,300.00	
Main Office Construction Expense (% of subtotal)	5%			$2,150.00		$2,150
SUBTOTAL				$45,150.00	$7,740.00	$48,590
CONTRACTOR'S OVERHEAD	15%					$100,800
CONTRACTOR'S PROFIT	10%					$77,280
Sales Tax (on above subtotals+OH/P)	9%					$76,507
CONTRACTOR'S BONDS & INSURANCE	5%					$40,074
SUBTOTAL						**$226,670**
CONTINGENCY						
DESIGN + CONSTRUCTION CONTINGENCY	20%	0	$0.00	$0.00	$0.00	$170,016
CONSTRUCTION COST TOTAL						**$1,020,094**
DESIGN & ENGINEERING (Permit/ Permit Docs)	8%					$81,608
SUBTOTAL						**$1,101,702**
GRAND TOTAL						**$1,101,702**