

PACIFIC COUNTY COST ESTIMATES

| | | | |
|------------------------------------|---|---------------------------------------|------------------|
| Map Number: | B1 | Minimum Structure Height (ft) | 13 |
| Structure Type: | Berm | Structure Capacity: | 480 |
| Location: | Long Beach, WA, N Place & 41st Place | Safe Haven Square Footage: | 4800 |
| Overall Site Square Footage | 8160 | Volume of Berm Materials (LCY) | 3994 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$227,220 |
| Concrete | | | \$144,336 |
| Landscaping | | | \$24,101 |
| Construction Totals | | | \$445,471 |
| Design Fees (8%) | | | \$35,638 |
| General Conditions (10%) | | | \$44,547 |
| Contractor Fees, O&P (15%) | | | \$66,821 |
| Construction Contingency (5%) | | | \$22,274 |
| Estimate/Design Contingency (10%) | | | \$44,547 |
| Project Total | | | \$659,297 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|-------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6' Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |

| | | | | | | | | |
|--|----|-----|------------|------------|---------|---------|--------------------|---|
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|-----------------------|------------------------|---------------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 3994 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$108,858.79 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 3994 | LCY | | \$7.64 | \$14.10 | 108.20% | \$93,949.58 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 3698 | ECY | | \$0.63 | \$1.81 | 108.20% | \$9,763.41 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 4622 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$8,001.99 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$227,219.73 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|------------------|------------------------|-------------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inundation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 1247 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$7,151.49 | Based on square root of the berm safe haven area times three walls RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 208 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$26,263.28 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 208 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$1,199.13 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | |
| 5' high wall, pumped, 8" thick | 675 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$74,287.92 | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 675 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$4,246.48 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 2702 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$14,193.52 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 4800 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$11,893.34 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |

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|--|----|----|--|--------|---------|---------|---------------------|---|
| Haul of Material, 40 MPH, cycle 40 MPH | 89 | CY | | \$7.64 | \$14.10 | 108.20% | \$2,090.90 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$144,336.06 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|----------|------|----------------|--------------------|-----------------|-----------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 151 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$9,319.63 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 907 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$353.16 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 50 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$3,085.98 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 208 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$4,455.47 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 8160 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$6,886.71 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$24,100.96 | |

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|------------------------------------|--|---------------------------------------|------------------|
| Map Number: | B2 | Minimum Structure Height (ft) | 10 |
| Structure Type: | Berm | Structure Capacity: | 800 |
| Location: | Long Beach, WA, 5th Street S & Washington | Safe Haven Square Footage: | 8000 |
| Overall Site Square Footage | 10598 | Volume of Berm Materials (LCY) | 4281 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$244,752 |
| Concrete | | | \$163,089 |
| Landscaping | | | \$30,324 |
| Construction Totals | | | \$487,978 |
| Design Fees (8%) | | | \$39,038 |
| General Conditions (10%) | | | \$48,798 |
| Contractor Fees, O&P (15%) | | | \$73,197 |
| Construction Contingency (5%) | | | \$24,399 |
| Estimate/Design Contingency (10%) | | | \$48,798 |
| Project Total | | | \$722,208 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |

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|---|-----|-----|------------|------------|---------|---------|--------------------|---|
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | |
| Assuming 6' Area Drains/Catch Basins on Site | | | | | | | | |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | |
| Assuming 100' distance from service at street | | | | | | | | |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|-------|---------------|-------------------|----------------|-----------------|---------------------|--|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 4281 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$116,681.14 | RSMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 4281 | LCY | | \$7.64 | \$14.10 | 108.20% | \$100,700.59 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 3964 | ECY | | \$0.63 | \$1.81 | 108.20% | \$10,464.98 | RSMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 5926 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$10,258.96 | RSMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$244,751.64 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|-----------|-----------------|------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inundation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 1610 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$9,232.53 | Based on square root of the berm safe haven area times three walls RSMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |

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|--|------|----|---------|---------|---------|---------|---------------------|---|
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 268 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$33,905.74 | RSMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 268 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$1,548.07 | RSMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | |
| 5' high wall, pumped, 8" thick | 671 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$73,773.31 | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. RSMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 671 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$4,217.06 | RSMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment Concrete or Gravel Platform | 2683 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$14,095.20 | RSMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 8000 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$19,822.24 | RSMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 148 | CY | | \$7.64 | \$14.10 | 108.20% | \$3,484.84 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$163,088.99 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|----------|------|----------------|--------------------|-----------------|-----------------|--------------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 196 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$12,104.09 | RSMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 1178 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$458.68 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 50 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$3,064.61 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 268 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$5,751.98 | RSMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 10598 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$8,944.29 | RSMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$30,323.65 | |

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|------------------------------------|--|---------------------------------------|-------------|
| Map Number: | B3 | Minimum Structure Height (ft) | 13 |
| Structure Type: | Berm | Structure Capacity: | 320 |
| Location: | Long Beach, WA, NE 2nd & Washington | Safe Haven Square Footage: | 3200 |
| Overall Site Square Footage | 6560 | Volume of Berm Materials (LCY) | 3008 |
| Scope | | Cost | |
| Site Utilities | | \$49,814 | |
| Excavation-Backfill | | \$172,075 | |
| Concrete | | \$116,307 | |
| Landscaping | | \$19,470 | |
| Construction Totals | | \$357,666 | |
| Design Fees (8%) | | \$28,613 | |
| General Conditions (10%) | | \$35,767 | |
| Contractor Fees, O&P (15%) | | \$53,650 | |
| Construction Contingency (5%) | | \$17,883 | |
| Estimate/Design Contingency (10%) | | \$35,767 | |
| Project Total | | \$529,345 | |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|--------------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6' Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---------------------------|----------|-------|---------------|-------------------|----------------|-----------------|------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |

| | | | | | | | | |
|--|------|-----|---------|--------|---------|---------|---------------------|---|
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 3008 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$81,984.78 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 3008 | LCY | | \$7.64 | \$14.10 | 108.20% | \$70,756.22 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 2785 | ECY | | \$0.63 | \$1.81 | 108.20% | \$7,353.11 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 3081 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$5,334.66 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$172,074.74 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|------------------|------------------------|---------------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inundation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 1018 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$5,839.16 | Based on square root of the berm safe haven area times three walls RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 170 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$21,443.88 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 170 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$979.09 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | |
| 5' high wall, pumped, 8" thick | 552 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$60,655.84 | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 552 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$3,467.23 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 2206 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$11,588.96 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 3200 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$7,928.90 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 59 | CY | | \$7.64 | \$14.10 | 108.20% | \$1,393.94 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$116,306.99 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|-----------------------|---------------------------|------------------------|------------------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 121 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$7,492.25 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 729 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$283.92 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 41 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$2,519.69 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 170 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$3,637.87 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 6560 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$5,536.38 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$19,470.11 | |

| | | | |
|------------------------------------|---|---------------------------------------|------------------|
| Map Number: | B4 | Minimum Structure Height (ft) | 10 |
| Structure Type: | Berm | Structure Capacity: | 560 |
| Location: | Long Beach, WA, NE 13th & Washington | Safe Haven Square Footage: | 5600 |
| Overall Site Square Footage | 8120 | Volume of Berm Materials (LCY) | 3171 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$182,597 |
| Concrete | | | \$133,757 |
| Landscaping | | | \$23,855 |
| Construction Totals | | | \$390,022 |
| Design Fees (8%) | | | \$31,202 |
| General Conditions (10%) | | | \$39,002 |
| Contractor Fees, O&P (15%) | | | \$58,503 |
| Construction Contingency (5%) | | | \$19,501 |
| Estimate/Design Contingency (10%) | | | \$39,002 |
| Project Total | | | \$577,233 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|-------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6 Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |

| | | | | | | | | |
|--|----|-----|------------|------------|--------|---------|--------------------|--|
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|-------|---------------|-------------------|----------------|-----------------|---------------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 3171 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$86,427.44 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 3171 | LCY | | \$7.64 | \$14.10 | 108.20% | \$74,590.42 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 2936 | ECY | | \$0.63 | \$1.81 | 108.20% | \$7,751.57 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 4148 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$7,181.27 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$182,596.67 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|-----------|-----------------|---------------------|--|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inundation Concrete Wall | 224 | LF | | | | | | Based on square root of the berm safe haven area times three walls |
| Excavation, 6' deep | 1347 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$7,724.49 | RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 224 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$28,367.58 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 224 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$1,295.21 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. |
| 5' high wall, pumped, 8" thick | 561 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$61,723.18 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 561 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$3,528.24 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 2245 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$11,792.89 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 5600 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$13,875.57 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 104 | CY | | \$7.64 | \$14.10 | 108.20% | \$2,439.39 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$133,756.54 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|----------|------|----------------|--------------------|-----------------|-----------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 150 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$9,273.94 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 902 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$351.43 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 42 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$2,564.03 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 224 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$4,812.46 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 8120 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$6,852.96 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$23,854.82 | |

| | | | |
|------------------------------------|---|---------------------------------------|------------------|
| Map Number: | B5 | Minimum Structure Height (ft) | 10 |
| Structure Type: | Berm | Structure Capacity: | 400 |
| Location: | Long Beach, WA, NE 26th & Washington | Safe Haven Square Footage: | 4000 |
| Overall Site Square Footage | 6520 | Volume of Berm Materials (LCY) | 2432 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$141,213 |
| Concrete | | | \$111,376 |
| Landscaping | | | \$19,466 |
| Construction Totals | | | \$321,869 |
| Design Fees (8%) | | | \$25,749 |
| General Conditions (10%) | | | \$32,187 |
| Contractor Fees, O&P (15%) | | | \$48,280 |
| Construction Contingency (5%) | | | \$16,093 |
| Estimate/Design Contingency (10%) | | | \$32,187 |
| Project Total | | | \$476,366 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |

| | | | | | | | | |
|---|-----|-----|------------|------------|---------|---------|--------------------|--|
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | Assuming 6 Area Drains/Catch Basins on Site RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|-------|---------------|-------------------|----------------|-----------------|---------------------|--|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 2432 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$66,285.57 | RSMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 2432 | LCY | | \$7.64 | \$14.10 | 108.20% | \$57,207.16 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6"to 12" lifts, vibrating roller | 2252 | ECY | | \$0.63 | \$1.81 | 108.20% | \$5,945.07 | RSMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 2963 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$5,129.48 | RSMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$141,213.24 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|-----------|-----------------|-------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inudation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 1138 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$6,528.38 | Based on square root of the berm safe haven area times three walls RSMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 190 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$23,974.98 | RSMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |

| | | | | | | | | |
|--|------|----|---------|---------|---------|---------|---------------------|--|
| Subdrainage Piping, 4" diameter, PVC, perforated | 190 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$1,094.65 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. |
| 5' high wall, pumped, 8" thick | 474 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$52,165.60 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 474 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$2,981.91 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment Concrete or Gravel Platform | 1897 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$9,966.81 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 4000 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$9,911.12 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 74 | CY | | \$7.64 | \$14.10 | 108.20% | \$1,742.42 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$111,375.88 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|----------|------|----------------|--------------------|-----------------|-----------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 121 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$7,446.56 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 724 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$282.19 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 35 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$2,167.00 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 190 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$4,067.27 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 6520 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$5,502.62 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$19,465.64 | |

| | | | |
|------------------------------------|---|---------------------------------------|------------------|
| Map Number: | B6 | Minimum Structure Height (ft) | 10 |
| Structure Type: | Berm | Structure Capacity: | 480 |
| Location: | Ocean Park, WA, 227th and U Street | Safe Haven Square Footage: | 4800 |
| Overall Site Square Footage | 7320 | Volume of Berm Materials (LCY) | 2801 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$161,878 |
| Concrete | | | \$122,937 |
| Landscaping | | | \$21,684 |
| Construction Totals | | | \$356,314 |
| Design Fees (8%) | | | \$28,505 |
| General Conditions (10%) | | | \$35,631 |
| Contractor Fees, O&P (15%) | | | \$53,447 |
| Construction Contingency (5%) | | | \$17,816 |
| Estimate/Design Contingency (10%) | | | \$35,631 |
| Project Total | | | \$527,344 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|--------------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6' Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---------------------------|----------|-------|---------------|-------------------|----------------|-----------------|------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |

| | | | | | | | | |
|--|------|-----|---------|--------|---------|---------|---------------------|---|
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 2801 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$76,342.88 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 2801 | LCY | | \$7.64 | \$14.10 | 108.20% | \$65,887.03 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 2594 | ECY | | \$0.63 | \$1.81 | 108.20% | \$6,847.10 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 3556 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$6,155.38 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$161,878.35 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|------------------|------------------------|---------------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inudation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 1247 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$7,151.49 | Based on square root of the berm safe haven area times three walls RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 208 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$26,263.28 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 208 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$1,199.13 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | |
| 5' high wall, pumped, 8" thick | 520 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$57,144.56 | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 520 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$3,266.52 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 2078 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$10,918.09 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 4800 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$11,893.34 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 89 | CY | | \$7.64 | \$14.10 | 108.20% | \$2,090.90 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$122,937.31 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|-----------------------|---------------------------|------------------------|------------------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 136 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$8,360.25 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 813 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$316.81 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 38 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$2,373.83 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 208 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$4,455.47 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 7320 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$6,177.79 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$21,684.15 | |

| | | | |
|------------------------------------|---------------------------------------|---------------------------------------|-------------|
| Map Number: | B7 | Minimum Structure Height (ft) | 13 |
| Structure Type: | Berm | Structure Capacity: | 160 |
| Location: | Ocean Park, 210th & SR 103 | Safe Haven Square Footage: | 1600 |
| Overall Site Square Footage | 4960 | Volume of Berm Materials (LCY) | 2022 |

| Scope | Cost |
|-----------------------------------|------------------|
| Site Utilities | \$49,814 |
| Excavation-Backfill | \$116,930 |
| Concrete | \$81,192 |
| Landscaping | \$14,420 |
| Construction Totals | \$262,356 |
| Design Fees (8%) | \$20,988 |
| General Conditions (10%) | \$26,236 |
| Contractor Fees, O&P (15%) | \$39,353 |
| Construction Contingency (5%) | \$13,118 |
| Estimate/Design Contingency (10%) | \$26,236 |
| Project Total | \$388,286 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6' Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |

| | | | | | | | | |
|--|----|-----|------------|------------|--------|---------|--------------------|--|
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|-------|---------------|-------------------|----------------|-----------------|---------------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 2022 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$55,110.78 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 2022 | LCY | | \$7.64 | \$14.10 | 108.20% | \$47,562.86 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 1872 | ECY | | \$0.63 | \$1.81 | 108.20% | \$4,942.82 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 1541 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$2,667.33 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$116,929.75 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|-----------|-----------------|--------------------|--|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inundation Concrete Wall | 120 | LF | | | | | | Based on square root of the berm safe haven area times three walls |
| Excavation, 6' deep | 720 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$4,128.91 | RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 120 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$15,163.11 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 120 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$692.32 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. |
| 5' high wall, pumped, 8" thick | 390 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$42,890.15 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 390 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$2,451.70 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 1560 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$8,194.63 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 1600 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$3,964.45 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 30 | CY | | \$7.64 | \$14.10 | 108.20% | \$696.97 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$81,192.25 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|----------|------|----------------|--------------------|-----------------|-----------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 92 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$5,664.87 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 551 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$214.67 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 29 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$1,781.69 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 120 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$2,572.37 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 4960 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$4,186.04 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$14,419.64 | |

| | | | |
|------------------------------------|---------------------------------------|---------------------------------------|------------------|
| Map Number: | B8 | Minimum Structure Height (ft) | 17 |
| Structure Type: | Berm | Structure Capacity: | 160 |
| Location: | Ocean Park, 188th & SR 103 | Safe Haven Square Footage: | 1600 |
| Overall Site Square Footage | 6080 | Volume of Berm Materials (LCY) | 3156 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$178,105 |
| Concrete | | | \$97,665 |
| Landscaping | | | \$17,241 |
| Construction Totals | | | \$342,825 |
| Design Fees (8%) | | | \$27,426 |
| General Conditions (10%) | | | \$34,282 |
| Contractor Fees, O&P (15%) | | | \$51,424 |
| Construction Contingency (5%) | | | \$17,141 |
| Estimate/Design Contingency (10%) | | | \$34,282 |
| Project Total | | | \$507,381 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |

| | | | | | | | | |
|---|-----|-----|------------|------------|---------|---------|--------------------|---|
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6' Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|-----------------------|------------------------|---------------------|--|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 3156 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$86,018.61 | RSMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 3156 | LCY | | \$7.64 | \$14.10 | 108.20% | \$74,237.58 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6"to 12" lifts, vibrating roller | 2922 | ECY | | \$0.63 | \$1.81 | 108.20% | \$7,714.90 | RSMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 2015 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$3,488.05 | RSMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$178,105.10 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|------------------|------------------------|-------------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inudation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 720 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$4,128.91 | RSMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 120 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$15,163.11 | RSMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |

| | | | | | | | | |
|--|------|----|---------|---------|---------|---------|--------------------|--|
| Subdrainage Piping, 4" diameter, PVC, perforated | 120 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$692.32 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. |
| 5' high wall, pumped, 8" thick | 510 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$56,087.12 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 510 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$3,206.07 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment Concrete or Gravel Platform | 2040 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$10,716.06 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 1600 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$3,964.45 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 30 | CY | | \$7.64 | \$14.10 | 108.20% | \$696.97 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$97,665.01 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|----------|------|----------------|--------------------|-----------------|-----------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 113 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$6,944.04 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 676 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$263.14 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 38 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$2,329.91 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 120 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$2,572.37 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 6080 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$5,131.28 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$17,240.73 | |

| | | | |
|------------------------------------|--|---------------------------------------|------------------|
| Map Number: | B9 | Minimum Structure Height (ft) | 26 |
| Structure Type: | Berm | Structure Capacity: | 120 |
| Location: | Ocean Park, 162nd Ln & SR 103 | Safe Haven Square Footage: | 1200 |
| Overall Site Square Footage | 8200 | Volume of Berm Materials (LCY) | 6035 |
| Scope | | | |
| Site Utilities | | | Cost \$49,814 |
| Excavation-Backfill | | | \$331,846 |
| Concrete | | | \$116,541 |
| Landscaping | | | \$21,954 |
| Construction Totals | | | \$520,156 |
| Design Fees (8%) | | | \$41,612 |
| General Conditions (10%) | | | \$52,016 |
| Contractor Fees, O&P (15%) | | | \$78,023 |
| Construction Contingency (5%) | | | \$26,008 |
| Estimate/Design Contingency (10%) | | | \$52,016 |
| Project Total | | | \$769,830 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|--------------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6' Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---------------------------|----------|-------|---------------|-------------------|----------------|-----------------|------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |

| | | | | | | | | |
|--|------|-----|---------|--------|---------|---------|---------------------|---|
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 6035 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$164,487.43 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 6035 | LCY | | \$7.64 | \$14.10 | 108.20% | \$141,959.37 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 5588 | ECY | | \$0.63 | \$1.81 | 108.20% | \$14,752.67 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 2311 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$4,001.00 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$331,846.43 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|------------------|------------------------|---------------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inudation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 624 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$3,575.74 | Based on square root of the berm safe haven area times three walls RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 104 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$13,131.64 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 104 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$599.57 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | |
| 5' high wall, pumped, 8" thick | 675 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$74,287.92 | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 675 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$4,246.48 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 2702 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$14,193.52 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 1200 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$2,973.34 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 22 | CY | | \$7.64 | \$14.10 | 108.20% | \$522.73 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$116,540.93 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|-----------------------|---------------------------|------------------------|------------------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 152 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$9,365.31 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 911 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$354.90 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 50 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$3,085.98 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 104 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$2,227.73 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 8200 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$6,920.47 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$21,954.40 | |

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|------------------------------------|---|---------------------------------------|------------------|
| Map Number: | B10 | Minimum Structure Height (ft) | 10 |
| Structure Type: | Berm | Structure Capacity: | 320 |
| Location: | Ocean Park, Cranberry & SR 103 | Safe Haven Square Footage: | 3200 |
| Overall Site Square Footage | 5720 | Volume of Berm Materials (LCY) | 2062 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$120,495 |
| Concrete | | | \$98,835 |
| Landscaping | | | \$17,184 |
| Construction Totals | | | \$286,328 |
| Design Fees (8%) | | | \$22,906 |
| General Conditions (10%) | | | \$28,633 |
| Contractor Fees, O&P (15%) | | | \$42,949 |
| Construction Contingency (5%) | | | \$14,316 |
| Estimate/Design Contingency (10%) | | | \$28,633 |
| Project Total | | | \$423,765 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|-------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone converstaion on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone converstaion on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6 Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone converstaion on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |

| | | | | | | | | |
|--|----|-----|------------|------------|--------|---------|--------------------|--|
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|-------|---------------|-------------------|----------------|-----------------|---------------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 2062 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$56,201.01 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 2062 | LCY | | \$7.64 | \$14.10 | 108.20% | \$48,503.77 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 1909 | ECY | | \$0.63 | \$1.81 | 108.20% | \$5,040.60 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 2370 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$4,103.59 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$120,494.92 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|-----------|-----------------|--------------------|--|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inundation Concrete Wall | 170 | LF | | | | | | Based on square root of the berm safe haven area times three walls |
| Excavation, 6' deep | 1018 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$5,839.16 | RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 170 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$21,443.88 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 170 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$979.09 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. |
| 5' high wall, pumped, 8" thick | 424 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$46,658.33 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 424 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$2,667.10 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 1697 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$8,914.59 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 3200 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$7,928.90 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 59 | CY | | \$7.64 | \$14.10 | 108.20% | \$1,393.94 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$98,834.98 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|----------|------|----------------|--------------------|-----------------|-----------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 106 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$6,532.88 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 636 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$247.56 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 31 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$1,938.23 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 170 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$3,637.87 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 5720 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$4,827.45 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$17,183.99 | |

| | | | |
|------------------------------------|--|---------------------------------------|------------------|
| Map Number: | B11 | Minimum Structure Height (ft) | 17 |
| Structure Type: | Berm | Structure Capacity: | 320 |
| Location: | Ocean Park, U Street & 260th Street | Safe Haven Square Footage: | 3200 |
| Overall Site Square Footage | 8800 | Volume of Berm Materials (LCY) | 6164 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$341,687 |
| Concrete | | | \$139,603 |
| Landscaping | | | \$24,791 |
| Construction Totals | | | \$555,895 |
| Design Fees (8%) | | | \$44,472 |
| General Conditions (10%) | | | \$55,590 |
| Contractor Fees, O&P (15%) | | | \$83,384 |
| Construction Contingency (5%) | | | \$27,795 |
| Estimate/Design Contingency (10%) | | | \$55,590 |
| Project Total | | | \$822,725 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |

| | | | | | | | | |
|---|-----|-----|------------|------------|---------|---------|--------------------|---|
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6' Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|-----------------------|------------------------|---------------------|--|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 6164 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$168,003.40 | RSMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 6164 | LCY | | \$7.64 | \$14.10 | 108.20% | \$144,993.80 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6"to 12" lifts, vibrating roller | 5707 | ECY | | \$0.63 | \$1.81 | 108.20% | \$15,068.01 | RSMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 4030 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$6,976.09 | RSMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$341,687.27 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|--------------------------|------------------|------------------------|-------------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inudation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 1018 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$5,839.16 | RSMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 170 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$21,443.88 | RSMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |

| | | | | | | | | |
|--|------|----|---------|---------|---------|---------|---------------------|--|
| Subdrainage Piping, 4" diameter, PVC, perforated | 170 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$979.09 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. |
| 5' high wall, pumped, 8" thick | 721 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$79,319.17 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 721 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$4,534.07 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment Concrete or Gravel Platform | 2885 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$15,154.80 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 3200 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$7,928.90 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 59 | CY | | \$7.64 | \$14.10 | 108.20% | \$1,393.94 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$139,603.00 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|----------|------|----------------|--------------------|-----------------|-----------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 163 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$10,050.58 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 978 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$380.86 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 53 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$3,294.99 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 170 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$3,637.87 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 8800 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$7,426.85 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$24,791.15 | |

| | | | |
|------------------------------------|---|---------------------------------------|------------------|
| Map Number: | B12 | Minimum Structure Height (ft) | 13 |
| Structure Type: | Berm | Structure Capacity: | 320 |
| Location: | Illwaco, WA, Fire Dept. (N Street & 37th St) | Safe Haven Square Footage: | 3200 |
| Overall Site Square Footage | 6560 | Volume of Berm Materials (LCY) | 3008 |
| Scope | | | |
| Site Utilities | | | Cost \$49,814 |
| Excavation-Backfill | | | \$172,075 |
| Concrete | | | \$116,307 |
| Landscaping | | | \$19,470 |
| Construction Totals | | | \$357,666 |
| Design Fees (8%) | | | \$28,613 |
| General Conditions (10%) | | | \$35,767 |
| Contractor Fees, O&P (15%) | | | \$53,650 |
| Construction Contingency (5%) | | | \$17,883 |
| Estimate/Design Contingency (10%) | | | \$35,767 |
| Project Total | | | \$529,345 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|--------------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6' Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---------------------------|----------|-------|---------------|-------------------|----------------|-----------------|------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |

| | | | | | | | | |
|--|------|-----|---------|--------|---------|---------|---------------------|---|
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 3008 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$81,984.78 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 3008 | LCY | | \$7.64 | \$14.10 | 108.20% | \$70,756.22 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6"to 12" lifts, vibrating roller | 2785 | ECY | | \$0.63 | \$1.81 | 108.20% | \$7,353.11 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 3081 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$5,334.66 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$172,074.74 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|----------------------|--------------------------|------------------|------------------------|---------------------|---|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inudation Concrete Wall | | | | | | | | |
| Excavation, 6' deep | 1018 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$5,839.16 | Based on square root of the berm safe haven area times three walls RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88 ' long | 170 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$21,443.88 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 170 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$979.09 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | |
| 5' high wall, pumped, 8" thick | 552 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$60,655.84 | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 552 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$3,467.23 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 2206 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$11,588.96 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone bse, 2" binder course, 1" topping | 3200 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$7,928.90 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 59 | CY | | \$7.64 | \$14.10 | 108.20% | \$1,393.94 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$116,306.99 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|-----------------------|---------------------------|------------------------|------------------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 121 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$7,492.25 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 729 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$283.92 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 41 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$2,519.69 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 170 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$3,637.87 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 6560 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$5,536.38 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$19,470.11 | |

| | | | |
|------------------------------------|--|---------------------------------------|------------------|
| Map Number: | B13 | Minimum Structure Height (ft) | 17 |
| Structure Type: | Berm | Structure Capacity: | 240 |
| Location: | Illwaco, WA, Vandalia (Ortelius Dr. & | Safe Haven Square Footage: | 2400 |
| Overall Site Square Footage | 6880 | Volume of Berm Materials (LCY) | 3813 |
| Scope | | | Cost |
| Site Utilities | | | \$49,814 |
| Excavation-Backfill | | | \$214,816 |
| Concrete | | | \$120,221 |
| Landscaping | | | \$19,966 |
| Construction Totals | | | \$404,818 |
| Design Fees (8%) | | | \$32,385 |
| General Conditions (10%) | | | \$40,482 |
| Contractor Fees, O&P (15%) | | | \$60,723 |
| Construction Contingency (5%) | | | \$20,241 |
| Estimate/Design Contingency (10%) | | | \$40,482 |
| Project Total | | | \$599,130 |

| Site Utilities | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|----------------|-----------------|-------------|---|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Domestic Water, Ductile Iron Class 250, MJ, 6" diameter | 100 | LF | | | | 108.20% | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 6" Ductile Iron Piping, MJ | 100 | LF | \$14.60 | \$10.70 | \$2.72 | 108.20% | \$3,031.76 | RSMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone converstaion on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 75 | LCY | | \$0.50 | \$1.05 | 108.20% | \$125.78 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Drainage | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating, Trench |
| Install & Test, 12" Bituminous Coated | 100 | LF | \$11.50 | \$8.30 | \$1.53 | 108.20% | \$2,307.91 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 12 | LCY | \$20.00 | | | 108.20% | \$259.68 | Quote per Quigg Bros, Aberdeen, WA, phone converstaion on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 12 | LCY | | \$7.64 | \$14.10 | 108.20% | \$282.27 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 10 | ECY | | \$3.05 | \$0.34 | 108.20% | \$36.68 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 60 | LCY | | \$0.50 | \$1.05 | 108.20% | \$100.63 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Area Drains/Catch Basins | | | | | | | | Assuming 6 Area Drains/Catch Basins on Site |
| Concrete, Precast, 4' ID riser, 4' deep | 6 | EA | \$1,425.00 | \$1,200.00 | \$0.00 | 108.20% | \$17,041.50 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins (Equipment Cost included in Installation Cost) |
| Electrical | | | | | | | | Assuming 100' distance from service at street |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 70 | BCY | | \$2.16 | \$2.13 | 108.20% | \$324.92 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 100 | LF | \$2.00 | \$8.05 | | 108.20% | \$1,087.41 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 40 | LCY | \$20.00 | \$0.00 | \$0.00 | 108.20% | \$865.60 | Quote per Quigg Bros, Aberdeen, WA, phone converstaion on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 40 | LCY | | \$7.64 | \$14.10 | 108.20% | \$940.91 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |

| | | | | | | | | |
|--|----|-----|------------|------------|--------|---------|--------------------|--|
| Compacting Bedding In Trench | 35 | ECY | | \$3.05 | \$0.34 | 108.20% | \$128.38 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 44 | LCY | | \$0.50 | \$1.05 | 108.20% | \$73.79 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Light Pole, Aluminum, 20' high, 1 arm bracket | 8 | EA | \$1,250.00 | \$1,075.00 | \$0.00 | 108.20% | \$20,125.20 | RSMMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | \$49,813.97 | |

| Excavation-Backfill | Quantity | Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|----------|-------|---------------|-------------------|----------------|-----------------|---------------------|---|
| Site Preparation | | | | | | | | |
| Clear & Grub | 3 | acres | | \$320.00 | \$525.00 | 108.20% | \$2,742.87 | RSMMeans Building Construction Cost Data, 2011, 31 13 13, Selective Clearing |
| Survey Site | 3 | acres | \$32.50 | \$565.00 | \$35.00 | 108.20% | \$2,053.10 | RSMMeans Building Construction Cost Data, 2011, 02 21 13 Site Surveys |
| Mobilization of Equipment | 10 | EA | | \$69.00 | \$116.00 | 100.00% | \$1,850.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Material Costs | | | | | | | | |
| Fill Material, Select Structural Fill, 1 1/2" minus aggregate | 3813 | LCY | \$20.00 | \$1.75 | \$3.44 | 108.20% | \$103,925.53 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, Aggregates for Earthwork, Select Structural Fill & Material Cost from Quigg Bros., Aberdeen, WA |
| Haul of Material, 40 MPH, cycle 40 MPH | 3813 | LCY | | \$7.64 | \$14.10 | 108.20% | \$89,691.98 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Placement of Material | | | | | | | | |
| Compacting Backfill, 6" to 12" lifts, vibrating roller | 3531 | ECY | | \$0.63 | \$1.81 | 108.20% | \$9,320.95 | RSMMeans Building Construction Data, 2011, 31 23 23.13 Backfill |
| Stabilization Fabric, Polypropylene, 6oz/SY, 18" lifts, 5082 SF per lift | 3022 | SY | \$1.48 | \$0.09 | \$0.03 | 108.20% | \$5,232.07 | RSMMeans Building Construction Cost Data, 2011, 32 11 23 Aggregate Base Courses |
| | | | | | | | \$214,816.49 | |

| Concrete | Quantity | Unit | Material Cost | Installation Cost | Equipment | Location Factor | Total Cost | Comments |
|--|----------|------|---------------|-------------------|-----------|-----------------|---------------------|--|
| Mobilization of Equipment | 10 | EA | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Tsunami Wave Inundation Concrete Wall | 147 | LF | | | | | | Based on square root of the berm safe haven area times three walls |
| Excavation, 6' deep | 882 | SF | \$0.00 | \$5.30 | \$0.00 | 108.20% | \$5,056.86 | RSMMeans Assemblies Cost Data, 2011, A2010 110 building Excavation & Backfill, 6' deep, sand, gravel, or common earth. (Equipment Cost included in Installation) |
| Walls, Cast in place, 6' deep, pumped, 12" thick, 88' long | 147 | LF | \$46.25 | \$81.00 | \$0.00 | 99.30% | \$18,570.94 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 10' pumped, 12" thick (Equipment Cost included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 147 | LF | \$2.04 | \$3.77 | \$0.00 | 99.30% | \$847.91 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Stepped Concrete Wall 4' high | | | | | | | | 88', 86', 82', 72', 60' length walls, 12" thick, 5' high. |
| 5' high wall, pumped, 8" thick | 625 | LF | \$33.75 | \$77.00 | \$0.00 | 99.30% | \$68,692.42 | RSMMeans Assemblies Cost Data, 2011, A2020 110, Walls, Cast In Place, 6' pumped, 8" thick. Material costs have been increased 25% for additional reinforcing required for seismic event and tsunami. (Equipment Cost Included in Installation) |
| Subdrainage Piping, 4" diameter, PVC, perforated | 625 | LF | \$2.04 | \$3.77 | \$0.00 | 108.20% | \$3,926.62 | RSMMeans Assemblies Cost Data, 2011, A 2020 220, Subdrainage Piping (Equipment Cost included in Installation) |
| Sandblast Concrete Heavy Treatment | 2498 | SF | \$1.46 | \$3.31 | \$0.52 | 99.30% | \$13,124.44 | RSMMeans Building Construction Cost Data, 2011, 03 35 29.60 |
| Concrete or Gravel Platform | | | | | | | | |
| Asphaltic Concrete Paving, 6" stone base, 2" binder course, 1" topping | 2400 | SF | \$1.85 | \$0.20 | \$0.24 | 108.20% | \$5,946.67 | RSMMeans Building Construction Cost Data, 2011, 32 12 16.14 Asphaltic Concrete Paving |
| Haul of Material, 40 MPH, cycle 40 MPH | 44 | CY | | \$7.64 | \$14.10 | 108.20% | \$1,045.45 | RSMMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | \$120,221.32 | |

| Landscaping | Quantity | Unit | Material Costs | Installation Costs | Equipment Costs | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|-----------------------|---------------------------|------------------------|------------------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Berm Landscaping | | | | | | | | |
| Top Soil | 127 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$7,857.72 | RSMMeans Building Construction Cost Data, 2011, 32 91 19.13 Top Dress by hand, 1 CY for 600 SF |
| Hydro-Seed | 764 | SY | \$0.20 | \$0.10 | \$0.06 | 108.20% | \$297.77 | Mechanical Seeding, 44lb/sy |
| Top Soil at Stepped Concrete Walls | 46 | LCY | \$33.00 | \$24.00 | \$0.00 | 108.20% | \$2,853.54 | |
| Fencing at Top of Berm, chain link, 2" post, 1 5/8" rail, 9 ga. Galv. Wire 5' high | 147 | LF | \$17.65 | \$4.82 | \$0.00 | 95.40% | \$3,150.49 | RSMMeans Assemblies Cost Data, 2011, G2040 105 Fence & Guardrails (Equipment Costs are included in Installation) |
| Irrigation System | 6880 | SF | \$0.32 | \$0.46 | \$0.00 | 108.20% | \$5,806.44 | RSMMeans Building Construction Costs, 2011, 32 84 23.10, sprinkler irrigation system |
| | | | | | | | \$19,965.97 | |

| | | | |
|---|------------------------------|-----------------------------------|--------------------|
| Map Number: | PK 1 | Minimum Structure Height: | 26 |
| Structure Type: | Parking Garage | Structure Capacity: | 800 |
| Location: | Shoalwater Bay Casino | Safe Haven Square Footage: | 8000 |
| Levels | 4 | Total Square Foot | 32000 |
| Cost per Square Foot* | \$37.43 | Perimeter (LF) | 358 |
| * Based on RSMMeans Square Foot Costs 2011, 85,000 SF, LF Perimeter 529 (Subtract \$1.45 per 100 LF less), does not include Contractor Fees & Architect Fees * | | | |
| Scope | | | Cost |
| Square Foot Cost | | | \$1,197,760 |
| Total | | | \$1,197,760 |
| Design Fees (8%) | | | \$95,821 |
| General Conditions (10%) | | | \$119,776 |
| Contractor Fees, O&P (15%) | | | \$179,664 |
| Construction Contingency (5%) | | | \$59,888 |
| Estimate/Design Contingency (10%) | | | \$119,776 |
| Project Total | | | \$1,772,685 |

| | | | |
|---|------------------------------|-----------------------------------|------------------|
| Map Number: | PK 1 | Minimum Structure Height: | 20 |
| Structure Type: | Parking Garage | Structure Capacity: | 400 |
| Location: | Shoalwater Bay Casino | Safe Haven Square Footage: | 4000 |
| Levels | 3 | Total Square Foot | 12000 |
| Cost per Square Foot* | \$36.43 | Perimeter (LF) | 253 |
| * Based on RSMMeans Square Foot Costs 2011, 85,000 SF, LF Perimeter 529 (Subtract \$1.45 per 100 LF less), does not include Contractor Fees & Architect Fees * | | | |
| Scope | | | Cost |
| Square Foot Cost | | | \$437,160 |
| Total | | | \$437,160 |
| Design Fees (8%) | | | \$34,973 |
| General Conditions (10%) | | | \$43,716 |
| Contractor Fees, O&P (15%) | | | \$65,574 |
| Construction Contingency (5%) | | | \$21,858 |
| Estimate/Design Contingency (10%) | | | \$43,716 |
| Project Total | | | \$646,997 |

| | | | |
|-----------------------------------|--|-----------------------------------|------------------|
| Map Number: | T1 | Minimum Structure Height: | 20 |
| Structure Type: | Tower | Structure Capacity: | 80 |
| Location: | Tokeland, WA, 3088 Kindred Ave. | Safe Haven Square Footage: | 800 |
| Levels | 2 | Columns Required | 4 |
| | | Piles per Column | 2 |
| Scope | | | Cost |
| Site Utilities | | | \$15,257 |
| Excavation-Backfill | | | \$9,423 |
| Foundation | | | \$66,161 |
| Structure | | | \$70,429 |
| Roofing | | | \$18,391 |
| Stairs/Ramps/Guardrails | | | \$53,102 |
| Fire Protection | | | \$9,144 |
| Total | | | \$241,907 |
| Design Fees (8%) | | | \$19,353 |
| General Conditions (10%) | | | \$24,191 |
| Contractor Fees, O&P (15%) | | | \$36,286 |
| Construction Contingency (5%) | | | \$12,095 |
| Estimate/Design Contingency (10%) | | | \$24,191 |
| Project Total | | | \$358,023 |

| Site Utilities | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|--|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Fire Water, Ductile Iron Class 250, MJ, 4" diameter | 50 | LF | | \$16.05 | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 4" Ductile Iron Piping, MJ | 50 | LF | | \$12.50 | \$8.55 | \$2.17 | 108.20% | \$1,256.20 | RSMeans, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Service | | | | | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test, 8" Bituminous Coated | 50 | LF | | \$10.70 | \$5.25 | \$0.97 | 108.20% | \$915.37 | RSMeans, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |

| | | | | | | | | | |
|---|----|-----|--|------------|------------|---------|---------|--------------------|---|
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Site Drainage/Area Drains/Catch Basins | | | | | | | | | Assume 1 area drain for structure |
| Concrete, Precast, 4' ID riser, 4' deep | 1 | EA | | \$1,425.00 | \$1,200.00 | 0.00% | 108.20% | \$2,840.25 | RSMeans Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins |
| Electrical | 50 | LF | | | | | | | Assuming 50' distance from service at street |
| Electrical Service, includes service installation, breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 volts, 60 A | 1 | EA | | \$960.00 | \$920.00 | | 100.50% | \$1,889.40 | RSMeans Assemblies Cost Data, 2011, D 5010 120, Electric Service, 3 Phase - 4 Wire, equipment included in installation cost |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RSMeans, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 50 | LF | | \$2.00 | \$8.05 | | 108.20% | \$543.71 | RSMeans, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Wire, 600 volt, copper type THW, solid, #12 | 50 | CLF | | \$11.95 | \$36.50 | 0 | 100.50% | \$2,434.61 | RSMeans, Building Construction Cost Data, 2011, 26 05 19.90 Wire |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 19 | LCY | | \$20.00 | | | 108.20% | \$411.16 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 19 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$446.93 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 19 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$69.69 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 22 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$36.90 | RSMeans, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | | \$15,257.23 | |

| Excavation-Backfill | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|--|
| Mobilization | 8 | EA | \$0.00 | \$0.00 | \$69.00 | \$116.00 | 100.00% | \$1,480.00 | RSMeans Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| Clear and Grub Site | 0.25 | ACRE | \$0.00 | \$0.00 | \$1,750.00 | \$1,300.00 | 108.20% | \$825.03 | Is clear and grub needed for structure in urban setting? RSMeans Building Construction Cost Data, 2011, 31 11 10.10 Clear and Grub Site |
| Excavation for Grade Beams | 20 | BCY | \$0.00 | \$0.00 | \$0.00 | \$0.00 | 108.20% | \$0.00 | Grade Beams, 3' wide, 3' deep, 568 lf. RSMeans Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket, (Price Included in grade beam foundation price) |
| Excavation for slab, subgrade and capillary break | 59 | BCY | \$0.00 | \$0.00 | \$7.20 | \$7.17 | 108.20% | \$921.38 | 1225 SF mat, 2' deep. RSMeans Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket |
| Removal of Foundation Spoils, Haul of Material, 40 MPH, cycle 40 MPH | 99 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$2,330.49 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Backfill Slab, subgrade, capillary break | 86 | ECY | | \$20.00 | | | 108.20% | \$1,852.38 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 86 | ECY | | | \$7.64 | \$14.10 | 108.20% | \$2,013.54 | RSMeans Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | | \$9,422.82 | |

| Foundation | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---|----------|------|---------------|---------------|-------------------|----------------|-----------------|--------------------|--|
| Piling | | | | | | | | | Piling needs to 2x the height of the structure which is 23-35'? |
| Mobilization for piling | 1 | EA | \$12,000.00 | \$0.00 | \$0.00 | \$0.00 | 100.00% | \$12,000.00 | Per phone conversation with Quigg Bros, Aberdeen, WA on June 29th, 2011 |
| Battered Piles, 18" Diameter, 30'-40' Deep | 8 | EA | \$0.00 | \$3,500.00 | \$1,200.00 | \$0.00 | 100.00% | \$37,600.00 | Driven pipe piles 40' long, 18"x.5", per phone conversation with Quigg Bros, Aberdeen, WA on June 29th,2011. Equipment Included in Material/Labor Cost |
| Pile Caps, Cap Size 6'-6" x 3'-6" x 37" | 4 | EA | \$0.00 | \$370.00 | \$540.00 | | 99.30% | \$3,614.52 | RSMeans Assemblies Cost Data 2011, A1010 250 Pile Caps (Equipment Costs are included in Installation Cost) |
| Foundation Cast-In-Place/Tower | | | | | | | | | |
| Grade Beams 30' span, 28" deep, 14" wide, 2 KLF load | 113 | LF | | \$34.50 | \$53.00 | | 99.30% | \$9,830.20 | RSMeans Assemblies Cost Data 2011, A 1020 210 Grade Beams (Equipment Cost is included in Installation Cost) |
| Foundation Cast-In-Place/ Footings for Ramp | | | | | | | | | Piling needs to 2x the height of the structure which is 23-35'? |
| Spread Footings, load 75K, soil capacity 6 KSF, 4'-0" sq x 12" deep | 12 | EA | \$0.00 | \$94.50 | \$167.00 | \$0.00 | 99.30% | \$3,116.03 | RSMeans Assemblies Cost Data, 2011, A1010 210, Spread Footings (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$66,160.75 | |

| Structure | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Costs | Location Factor | Total Cost | Comments |
|---|----------|------|---------------|---------------|-------------------|-----------------|-----------------|-------------|--|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RSMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Concrete Structure | | | | | | | | \$0.00 | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |
| Concrete Columns, rated for 1000 K load, 20' high, 26" round, concrete strength, 6000 PSI | 80 | VLF | | \$158.00 | \$7.85 | \$0.00 | 99.30% | \$13,175.12 | RSMeans Assemblies Cost Data, 2011, B1010 201, CIP Column, Round Tied (Equipment Cost included in Installation Cost) |
| Slab-On-Grade, 6" thick, non-industrial, reinforced, Ground Floor | 800 | SF | | \$3.01 | \$2.97 | | 99.30% | \$4,750.51 | RSMeans Assemblies Cost Data, 2011, A1030 120, Slab on Grade, Plain & Reinforced |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 170 PSF, 9" thick slab, 1st Floor | 800 | LF | | \$6.95 | \$11.55 | | 99.30% | \$14,696.40 | RSMeans Assemblies Cost Data, 2011, B1010 213 Rectangular Precast Beams (Equipment Cost included in Installation Cost) |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 351 PSF, 9" thick slab, 2nd Floor (evacuation level) | 800 | SF | | \$8.95 | \$13.60 | | 99.30% | \$17,913.72 | RSMeans Assemblies Cost Data, 2011, B1010 229 Precast Plank with No Topping (Equipment Cost included in Installation Cost) |
| Wood Structure | | | | | | | | | Wood structure, hip roof to support galvanized steel panels |
| Wood Columns 12"x12", 10' High, Select Structural | 40 | VLF | | \$9.85 | \$2.62 | | 97.30% | \$485.33 | Supply quote from Levee Lumber, Hoquiam, WA, RSMeans Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |

| | | | | | | | | | |
|---|-------------|----|--------|--------|--------|---------|--------|--------------------|--|
| Perimeter Joists, 3 1/8"x12", GLM 30' span | 113 | LF | | \$4.85 | \$1.95 | \$22.00 | 97.30% | \$3,170.37 | Supply quote from Levee Lumber, Hoquiam, WA, RSMMeans Building Construction Cost Data 2011, Glued-Laminated Beams 06 18 13.20 |
| 2x10 Wood Joist w/ 1/2" CDX, 12" OC | 800 | SF | | \$2.02 | \$2.05 | | 97.30% | \$3,168.09 | RSMMeans Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Roof, wood/pitched, 3"x12" 12" OC w/ sheathing plywood on roof, 5/16" CDX | 1120 | SF | | \$4.59 | \$2.62 | | 97.30% | \$7,857.17 | RSMMeans Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Weather Proofing/Coatings add 15% (Premium for PTS Wood) | \$14,680.96 | % | 15.00% | | | | | \$2,202.14 | Assumed that PTS wood is 15% more compared on price difference shown in means |
| | | | | | | | | \$70,428.86 | |

| Roofing | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Fact | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|----------------------|--------------------|--|
| Mobilization of Equipment | 4 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,204.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Roofing/Hip and Ridge Roof Steel Panels | | | | | | | | | Hip and ridge style roof, peak of roof 15'. (Equipment Cost is included in Installation Cost) |
| Flat Roof Steel Panels, Flat Seam, Copper, 1/4" min. slope, 20 oz, 1.2 PSF | 1120 | SF | | \$9.50 | \$5.80 | | 100.30% | \$17,187.41 | RSMMeans Assemblies Cost Data, 2011, B3010 135, Formed Metal (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$18,391.41 | |

| Stairs/Ramps/Guardrails | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Fact | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|----------------------|-------------------|--|
| Mobilization of Equipment | 6 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RSMMeans, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Exterior Ramp, Rises 20', 5' wide | | | | | | | | | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |
| Steel Columns, 20' high, Wide Flanged, 6", 12 locations | 240 | VLF | | \$26.50 | \$7.85 | \$0.00 | 95.40% | \$7,864.78 | RSMMeans Assemblies Cost Data, 2011, B1010, 208 Steel Columns (Equipment Cost is included in Installation Cost) |
| W Shape Beams and Girders, bay size 15X20,, Total Load 263 PSF. | 800 | SF | | \$11.70 | \$3.82 | \$1.50 | 95.40% | \$12,989.66 | RSMMeans Building Construction Cost Data, 2011, Structural Steel Framing, 05 12 23.17 |
| Floor Construction, Metal Deck/Concrete Fill, Deck Span 6 ft, 150 PSF Superimposed Load | 800 | SF | | \$2.38 | \$2.38 | | 95.40% | \$3,632.83 | RSMMeans Assemblies Cost Data, 2011, B1010 258, Metal Deck/Concrete Fill (Equipment Cost is included in Installation Cost) |
| Weather Proofing/Coatings (Galvanized) | 7.5 | Tons | \$400.00 | \$0.00 | 0 | 0 | 95.40% | \$2,862.00 | RSMMeans Building Construction Cost Data, 2011, 05 05 13.50, Paints and Protective Coatings |
| Hand Rail/Guard Rail | 270 | LF | | \$32.50 | \$9.80 | | 95.40% | \$10,895.63 | Galvanized, 2 Rail, 1 1/2" diameter, RSMMeans Building Construction Cost Date 2011, 05 52 Metal Railings |
| Ladders/Stairs | | | | | | | | | |
| Steel ladder to attic space 20" wide bolted to concrete without cage | 10 | VLF | | \$65.00 | \$31.50 | \$2.18 | 95.40% | \$920.61 | RSMMeans Building Construction Cost Data 2011, 05 51 33 - Vertical Metal Ladders |
| Accordion Ladder for Escape after Tsunami, Disappearing Stairs, Heavy duty, 16'-0" ceiling | 2 | ea | | \$1,400.00 | \$172.00 | | 95.40% | \$2,999.38 | RSMMeans Building Construction Cost Data 2011, 11 33 10.10, Disappearing Stairway |
| Platform Perimeters Railing (120 LF for each platform, 2 locations) | | | | | | | | | |
| Hand Rail/Guard Rail | 226 | LF | | \$32.50 | \$9.80 | | 95.40% | \$9,131.11 | Galvanized, 2 Rail, 1 1/2" diameter, RSMMeans Building Construction Cost Date 2011, 05 52 Metal Railings |

\$53,102.01

| Fire Protection | Quantity | Unit | Cost per Unit | Material Cost | Installation Costs | Equipment Cost | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|---------------------------|-----------------------|------------------------|-------------------|---|
| Fire Protection, Wet Pipe System | | | | | | | | | |
| Mobilization | 4 | EA | | \$69.00 | \$116.00 | | 100.00% | \$740.00 | RSMeans Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| First Floor, 2000 SF, Light Hazard | 800 | SF | | \$4.50 | \$3.04 | | 97.00% | \$5,851.04 | RSMeans Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| Second Floor, 2000 SF, Light Hazard | 800 | SF | | \$1.21 | \$2.08 | | 97.00% | \$2,553.04 | RSMeans Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| | | | | | | | | \$9,144.08 | |

| | | | |
|-----------------------------------|--|-----------------------------------|------------------|
| Map Number: | T2 | Minimum Structure Height: | 20 |
| Structure Type: | Tower | Structure Capacity: | 120 |
| Location: | Tokeland, WA, Tokeland Rd & Evergreen St. | Safe Haven Square Footage: | 1200 |
| Levels | 2 | Columns Required | 4 |
| | | Piles per Column | 2 |
| Scope | | | Cost |
| Site Utilities | | | \$15,257 |
| Excavation-Backfill | | | \$12,200 |
| Foundation | | | \$68,370 |
| Structure | | | \$96,268 |
| Roofing | | | \$26,985 |
| Stairs/Ramps/Guardrails | | | \$55,154 |
| Fire Protection | | | \$13,346 |
| Total | | | \$287,581 |
| Design Fees (8%) | | | \$23,006 |
| General Conditions (10%) | | | \$28,758 |
| Contractor Fees, O&P (15%) | | | \$43,137 |
| Construction Contingency (5%) | | | \$14,379 |
| Estimate/Design Contingency (10%) | | | \$28,758 |
| Project Total | | | \$425,619 |

| Site Utilities | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|---|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Fire Water, Ductile Iron Class 250, MJ, 4" diameter | 50 | LF | | \$16.05 | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |

| | | | | | | | | | |
|---|----|-----|--|------------|------------|---------|---------|--------------------|--|
| Install & Test, 4" Ductile Iron Piping, MJ | 50 | LF | | \$12.50 | \$8.55 | \$2.17 | 108.20% | \$1,256.20 | RS Means, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Service | | | | | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RS Means, Building Construction Cost Data, 201, 31 23 16.13 Excavating Trench |
| Install & Test, 8" Bituminous Coated | 50 | LF | | \$10.70 | \$5.25 | \$0.97 | 108.20% | \$915.37 | RS Means, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Site Drainage/Area Drains/Catch Basins | | | | | | | | | Assume 1 area drain for structure |
| Concrete, Precast, 4' ID riser, 4' deep | 1 | EA | | \$1,425.00 | \$1,200.00 | 0.00% | 108.20% | \$2,840.25 | RS Means Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins |
| Electrical | 50 | LF | | | | | | | Assuming 50' distance from service at street |
| Electrical Service, includes service installation, breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 volts, 60 A | 1 | EA | | \$960.00 | \$920.00 | | 100.50% | \$1,889.40 | RS Means Assemblies Cost Data, 2011, D 5010 120, Electric Service, 3 Phase - 4 Wire, equipment included in installation cost |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 50 | LF | | \$2.00 | \$8.05 | | 108.20% | \$543.71 | RS Means, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Wire, 600 volt, copper type THW, solid, #12 | 50 | CLF | | \$11.95 | \$36.50 | 0 | 100.50% | \$2,434.61 | RS Means, Building Construction Cost Data, 2011, 26 05 19.90 Wire |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 19 | LCY | | \$20.00 | | | 108.20% | \$411.16 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 19 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$446.93 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 19 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$69.69 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 22 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$36.90 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | | \$15,257.23 | |

| Excavation-Backfill | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|----------------------------|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|---|
| Mobilization | 8 | EA | \$0.00 | \$0.00 | \$69.00 | \$116.00 | 100.00% | \$1,480.00 | RS Means Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |

| | | | | | | | | | |
|--|------|------|--------|---------|------------|------------|---------|--------------------|---|
| Clear and Grub Site | 0.25 | ACRE | \$0.00 | \$0.00 | \$1,750.00 | \$1,300.00 | 108.20% | \$825.03 | Is clear and grub needed for structure in urban setting? RS Means Building Construction Cost Data, 2011, 31 11 10.10 Clear and Grub Site |
| Excavation for Grade Beams | 20 | BCY | \$0.00 | \$0.00 | \$0.00 | \$0.00 | 108.20% | \$0.00 | Grade Beams, 3' wide, 3' deep, 568 lf. RS Means Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket, (Price Included in grade beam foundation price) |
| Excavation for slab, subgrade and capillary break | 89 | BCY | \$0.00 | \$0.00 | \$7.20 | \$7.17 | 108.20% | \$1,382.07 | 1225 SF mat, 2' deep. RS Means Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket |
| Removal of Foundation Spoils, Haul of Material, 40 MPH, cycle 40 MPH | 136 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$3,201.70 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Backfill Slab, subgrade, capillary break | 118 | ECY | | \$20.00 | | | 108.20% | \$2,544.86 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 118 | ECY | | | \$7.64 | \$14.10 | 108.20% | \$2,766.27 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | | \$12,199.93 | |

| Foundation | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|--------------------|--|
| Piling | | | | | | | | | Piling needs to 2x the height of the structure which is 23-35'? |
| Mobilization for piling | 1 | EA | \$12,000.00 | \$0.00 | \$0.00 | \$0.00 | 100.00% | \$12,000.00 | Per phone conversation with Quigg Bros, Aberdeen, WA on June 29th, 2011 |
| Battered Piles, 18" Diameter, 30'-40' Deep | 8 | EA | \$0.00 | \$3,500.00 | \$1,200.00 | \$0.00 | 100.00% | \$37,600.00 | Driven pipe piles 40' long, 18"x.5", per phone conversation with Quigg Bros, Aberdeen, WA on June 29th,2011. Equipment Included in Material/Labor Cost |
| Pile Caps, Cap Size 6'-6" x 3'-6" x 37" | 4 | EA | \$0.00 | \$370.00 | \$540.00 | | 99.30% | \$3,614.52 | RS Means Assemblies Cost Data 2011, A1010 250 Pile Caps (Equipment Costs are included in Installation Cost) |
| Foundation Cast-In-Place/Tower | | | | | | | | | |
| Grade Beams 30' span, 28" deep, 14" wide, 2 KLF load | 139 | LF | | \$34.50 | \$53.00 | | 99.30% | \$12,039.49 | RS Means Assemblies Cost Data 2011, A 1020 210 Grade Beams (Equipment Cost is included in Installation Cost) |
| Foundation Cast-In-Place/ Footings for Ramp | | | | | | | | | |
| Spread Footings, load 75K, soil capacity 6 KSF, 4'-0" sq x 12" deep | 12 | EA | \$0.00 | \$94.50 | \$167.00 | \$0.00 | 99.30% | \$3,116.03 | Piling needs to 2x the height of the structure which is 23-35'? |
| | | | | | | | | \$68,370.04 | |

| Structure | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Costs | Location Factor | Total Cost | Comments |
|---------------------------|-----------------|-------------|----------------------|----------------------|--------------------------|------------------------|------------------------|-------------------|---|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Concrete Structure | | | | | | | | \$0.00 | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |

| | | | | | | | | | |
|---|-------------|-----|--------|----------|---------|---------|--------|--------------------|---|
| Concrete Columns, rated for 1000 K load, 20' high, 26" round, concrete strength, 6000 PSI | 80 | VLF | | \$158.00 | \$7.85 | \$0.00 | 99.30% | \$13,175.12 | RS Means Assemblies Cost Data, 2011, B1010 201, CIP Column, Round Tied (Equipment Cost included in Installation Cost) |
| Slab-On-Grade, 6" thick, non-industrial, reinforced, Ground Floor | 1200 | SF | | \$3.01 | \$2.97 | | 99.30% | \$7,125.77 | RS Means Assemblies Cost Data, 2011, A1030 120, Slab on Grade, Plain & Reinforced |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 170 PSF, 9" thick slab, 1st Floor | 1200 | LF | | \$6.95 | \$11.55 | | 99.30% | \$22,044.60 | RS Means Assemblies Cost Data, 2011, B1010 213 Rectangular Precast Beams (Equipment Cost included in Installation Cost) |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 351 PSF, 9" thick slab, 2nd Floor (evacuation level) | 1200 | SF | | \$8.95 | \$13.60 | | 99.30% | \$26,870.58 | RS Means Assemblies Cost Data, 2011, B1010 229 Precast Plank with No Topping (Equipment Cost included in Installation Cost) |
| Wood Structure | | | | | | | | | Wood structure, hip roof to support galvanized steel panels |
| Wood Columns 12"x12", 10' High, Select Structural | 40 | VLF | | \$9.85 | \$2.62 | | 97.30% | \$485.33 | Supply quote from Levee Lumber, Hoquiam, WA, RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Perimeter Joists, 3 1/8"x12", GLM 30' span | 139 | LF | | \$4.85 | \$1.95 | \$22.00 | 97.30% | \$3,882.90 | Supply quote from Levee Lumber, Hoquiam, WA, RS Means Building Construction Cost Data 2011, Glued-Laminated Beams 06 18 13.20 |
| 2x10 Wood Joist w/ 1/2" CDX, 12" OC | 1200 | SF | | \$2.02 | \$2.05 | | 97.30% | \$4,752.13 | RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Roof, wood/pitched, 3"x12" 12" OC w/ sheathing plywood on roof, 5/16" CDX | 1680 | SF | | \$4.59 | \$2.62 | | 97.30% | \$11,785.75 | RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Weather Proofing/Coatings add 15% (Premium for PTS Wood) | \$20,906.12 | % | 15.00% | | | | | \$3,135.92 | Assumed that PTS wood is 15% more compared on price difference shown in means |
| | | | | | | | | \$96,268.11 | |

| Roofing | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Fact | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|----------------------|--------------------|--|
| Mobilization of Equipment | 4 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,204.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Roofing/Hip and Ridge Roof Steel Panels | | | | | | | | | Hip and ridge style roof, peak of roof 15'. (Equipment Cost is included in Installation Cost) |
| Flat Roof Steel Panels, Flat Seam, Copper, 1/4" min. slope, 20 oz, 1.2 PSF | 1680 | SF | | \$9.50 | \$5.80 | | 100.30% | \$25,781.11 | RS Means Assemblies Cost Data, 2011, B3010 135, Formed Metal (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$26,985.11 | |

| Stairs/Ramps/Guardrails | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Fact | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|----------------------|-------------------|---|
| Mobilization of Equipment | 6 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Exterior Ramp, Rises 20', 5' wide | | | | | | | | | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |
| Steel Columns, 20' high, Wide Flanged, 6", 12 locations | 240 | VLF | | \$26.50 | \$7.85 | \$0.00 | 95.40% | \$7,864.78 | RS Means Assemblies Cost Data, 2011, B1010, 208 Steel Columns (Equipment Cost is included in Installation Cost) |

| | | | | | | | | | |
|--|-----|------|----------|------------|----------|--------|--------|--------------------|--|
| W Shape Beams and Girders, bay size 15X20,, Total Load 263 PSF. | 800 | SF | | \$11.70 | \$3.82 | \$1.50 | 95.40% | \$12,989.66 | RS Means Building Construction Cost Data, 2011, Structural Steel Framing, 05 12 23.17 |
| Floor Construction, Metal Deck/Concrete Fill, Deck Span 6 ft, 150 PSF Superimposed Load | 800 | SF | | \$2.38 | \$2.38 | | 95.40% | \$3,632.83 | RS Means Assemblies Cost Data, 2011, B1010 258, Metal Deck/Concrete Fill (Equipment Cost is included in Installation Cost) |
| Weather Proofing/Coatings (Galvanized) | 7.5 | Tons | \$400.00 | \$0.00 | 0 | 0 | 95.40% | \$2,862.00 | RS Means Building Construction Cost Data, 2011, 05 05 13.50, Paints and Protective Coatings |
| Hand Rail/Guard Rail | 270 | LF | | \$32.50 | \$9.80 | | 95.40% | \$10,895.63 | Galvanized, 2 Rail, 1 1/2" diameter, RS Means Building Construction Cost Date 2011, 05 52 Metal Railings |
| Ladders/Stairs | | | | | | | | | |
| Steel ladder to attic space 20" wide bolted to concrete without cage | 10 | VLF | | \$65.00 | \$31.50 | \$2.18 | 95.40% | \$920.61 | RS Means Building Construction Cost Data 2011, 05 51 33 - Vertical Metal Ladders |
| Accordion Ladder for Escape after Tsunami, Disappearing Stairs, Heavy duty, 16'-0" ceiling | 2 | ea | | \$1,400.00 | \$172.00 | | 95.40% | \$2,999.38 | RS Means Building Construction Cost Data 2011, 11 33 10.10, Disappearing Stairway |
| Platform Perimeters Railing (120 LF for each platform, 2 locations) | | | | | | | | | |
| Hand Rail/Guard Rail | 277 | LF | | \$32.50 | \$9.80 | | 95.40% | \$11,183.28 | Galvanized, 2 Rail, 1 1/2" diameter, RS Means Building Construction Cost Date 2011, 05 52 Metal Railings |
| | | | | | | | | \$55,154.18 | |

| Fire Protection | Quantity | Unit | Cost per Unit | Material Cost | Installation Costs | Equipment Cost | Location Factor | Total Cost | Comments |
|---|----------|------|---------------|---------------|--------------------|----------------|-----------------|--------------------|--|
| Fire Protection, Wet Pipe System | | | | | | | | | |
| Mobilization | 4 | EA | | \$69.00 | \$116.00 | | 100.00% | \$740.00 | RS Means Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| First Floor, 2000 SF, Light Hazard | 1200 | SF | | \$4.50 | \$3.04 | | 97.00% | \$8,776.56 | RS Means Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| Second Floor, 2000 SF, Light Hazard | 1200 | SF | | \$1.21 | \$2.08 | | 97.00% | \$3,829.56 | RS Means Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| | | | | | | | | \$13,346.12 | |

| | | | |
|------------------------|--|-----------------------------------|-------------|
| Map Number: | T3 | Minimum Structure Height: | 20 |
| Structure Type: | Tower | Structure Capacity: | 60 |
| Location: | Tokeland, WA, Tokeland Rd & Pine Ln | Safe Haven Square Footage: | 600 |
| Levels | 2 | Columns Required | 4 |
| | | Piles per Column | 2 |
| Scope | | | Cost |
| Site Utilities | | | \$15,257 |
| Excavation-Backfill | | | \$8,034 |
| Foundation | | | \$64,844 |

| | |
|-----------------------------------|------------------|
| Structure | \$57,430 |
| Roofing | \$14,095 |
| Stairs/Ramps/Guardrails | \$51,879 |
| Fire Protection | \$7,043 |
| Total | \$218,582 |
| Design Fees (8%) | \$17,487 |
| General Conditions (10%) | \$21,858 |
| Contractor Fees, O&P (15%) | \$32,787 |
| Construction Contingency (5%) | \$10,929 |
| Estimate/Design Contingency (10%) | \$21,858 |
| Project Total | \$323,501 |

| Site Utilities | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---|----------|------|---------------|---------------|-------------------|----------------|-----------------|------------|--|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Fire Water, Ductile Iron Class 250, MJ, 4" diameter | 50 | LF | | \$16.05 | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 4" Ductile Iron Piping, MJ | 50 | LF | | \$12.50 | \$8.55 | \$2.17 | 108.20% | \$1,256.20 | RS Means, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Service | | | | | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test, 8" Bituminous Coated | 50 | LF | | \$10.70 | \$5.25 | \$0.97 | 108.20% | \$915.37 | RS Means, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Site Drainage/Area Drains/Catch Basins | | | | | | | | | Assume 1 area drain for structure |
| Concrete, Precast, 4' ID riser, 4' deep | 1 | EA | | \$1,425.00 | \$1,200.00 | 0.00% | 108.20% | \$2,840.25 | RS Means Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins |
| Electrical | 50 | LF | | | | | | | Assuming 50' distance from service at street |
| Electrical Service, includes service installation, breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 volts, 60 A | 1 | EA | | \$960.00 | \$920.00 | | 100.50% | \$1,889.40 | RS Means Assemblies Cost Data, 2011, D 5010 120, Electric Service, 3 Phase - 4 Wire, equipment included in installation cost |

| | | | | | | | | | |
|---|----|-----|--|---------|---------|---------|---------|--------------------|---|
| Excavate, 3/4 CY Excavator, 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 50 | LF | | \$2.00 | \$8.05 | | 108.20% | \$543.71 | RS Means, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Wire, 600 volt, copper type THW, solid, #12 | 50 | CLF | | \$11.95 | \$36.50 | 0 | 100.50% | \$2,434.61 | RS Means, Building Construction Cost Data, 2011, 26 05 19.90 Wire |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 19 | LCY | | \$20.00 | | | 108.20% | \$411.16 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 19 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$446.93 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 19 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$69.69 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 22 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$36.90 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | | \$15,257.23 | |

| Excavation-Backfill | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|---|
| Mobilization | 8 | EA | \$0.00 | \$0.00 | \$69.00 | \$116.00 | 100.00% | \$1,480.00 | RS Means Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| Clear and Grub Site | 0.25 | ACRE | \$0.00 | \$0.00 | \$1,750.00 | \$1,300.00 | 108.20% | \$825.03 | Is clear and grub needed for structure in urban setting? RS Means Building Construction Cost Data, 2011, 31 11 10.10 Clear and Grub Site |
| Excavation for Grade Beams | 20 | BCY | \$0.00 | \$0.00 | \$0.00 | \$0.00 | 108.20% | \$0.00 | Grade Beams, 3' wide, 3' deep, 568 lf. RS Means Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket, (Price Included in grade beam foundation price) |
| Excavation for slab, subgrade and capillary break | 44 | BCY | \$0.00 | \$0.00 | \$7.20 | \$7.17 | 108.20% | \$691.04 | 1225 SF mat, 2' deep. RS Means Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket |
| Removal of Foundation Spoils, Haul of Material, 40 MPH, cycle 40 MPH | 81 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$1,894.88 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Backfill Slab, subgrade, capillary break | 70 | ECY | | \$20.00 | | | 108.20% | \$1,506.14 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 70 | ECY | | | \$7.64 | \$14.10 | 108.20% | \$1,637.18 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | | \$8,034.27 | |

| Foundation | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|---|
| Piling | | | | | | | | | Piling needs to 2x the height of the structure which is 23-35'? |
| Mobilization for piling | 1 | EA | \$12,000.00 | \$0.00 | \$0.00 | \$0.00 | 100.00% | \$12,000.00 | Per phone conversation with Quigg Bros, Aberdeen, WA on June 29th, 2011 |
| Battered Piles, 18" Diameter, 30'-40' Deep | 8 | EA | \$0.00 | \$3,500.00 | \$1,200.00 | \$0.00 | 100.00% | \$37,600.00 | Driven pipe piles 40' long, 18"x.5", per phone conversation with Quigg Bros, Aberdeen, WA on June 29th, 2011. Equipment Included in Material/Labor Cost |

| | | | | | | | | | |
|---|----|----|--------|----------|----------|--------|--------|--------------------|--|
| Pile Caps, Cap Size, 6'-6" x 3'-6" x 37" | 4 | EA | \$0.00 | \$370.00 | \$540.00 | | 99.30% | \$3,614.52 | RS Means Assemblies Cost Data 2011, A1010 250 Pile Caps (Equipment Costs are included in Installation Cost) |
| Foundation Cast-In-Place/Tower | | | | | | | | | |
| Grade Beams 30' span, 28" deep, 14" wide, 2 KLF load | 98 | LF | | \$34.50 | \$53.00 | | 99.30% | \$8,513.20 | RS Means Assemblies Cost Data 2011, A 1020 210 Grade Beams (Equipment Cost is included in Installation Cost) |
| Foundation Cast-In-Place/ Footings for Ramp | | | | | | | | | |
| Spread Footings, load 75K, soil capacity 6 KSF, 4'-0" sq x 12" deep | 12 | EA | \$0.00 | \$94.50 | \$167.00 | \$0.00 | 99.30% | \$3,116.03 | Piling needs to 2x the height of the structure which is 23-35'? RS Means Assemblies Cost Data, 2011, A1010 210, Spread Footings (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$64,843.76 | |

| Structure | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Costs | Location Factor | Total Cost | Comments |
|---|-------------|------|---------------|---------------|-------------------|-----------------|-----------------|--------------------|---|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Concrete Structure | | | | | | | | \$0.00 | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |
| Concrete Columns, rated for 1000 K load, 20' high, 26" round, concrete strength, 6000 PSI | 80 | VLF | | \$158.00 | \$7.85 | \$0.00 | 99.30% | \$13,175.12 | RS Means Assemblies Cost Data, 2011, B1010 201, CIP Column, Round Tied (Equipment Cost included in Installation Cost) |
| Slab-On-Grade, 6" thick, non-industrial, reinforced, Ground Floor | 600 | SF | | \$3.01 | \$2.97 | | 99.30% | \$3,562.88 | RS Means Assemblies Cost Data, 2011, A1030 120, Slab on Grade, Plain & Reinforced |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 170 PSF, 9" thick slab, 1st Floor | 600 | LF | | \$6.95 | \$11.55 | | 99.30% | \$11,022.30 | RS Means Assemblies Cost Data, 2011, B1010 213 Rectangular Precast Beams (Equipment Cost included in Installation Cost) |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 351 PSF, 9" thick slab, 2nd Floor (evacuation level) | 600 | SF | | \$8.95 | \$13.60 | | 99.30% | \$13,435.29 | RS Means Assemblies Cost Data, 2011, B1010 229 Precast Plank with No Topping (Equipment Cost included in Installation Cost) |
| Wood Structure | | | | | | | | | Wood structure, hip roof to support galvanized steel panels |
| Wood Columns 12"x12", 10' High, Select Structural | 40 | VLF | | \$9.85 | \$2.62 | | 97.30% | \$485.33 | Supply quote from Levee Lumber, Hoquiam, WA, RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Perimeter Joists, 3 1/8"x12", GLM 30' span | 98 | LF | | \$4.85 | \$1.95 | \$22.00 | 97.30% | \$2,745.62 | Supply quote from Levee Lumber, Hoquiam, WA, RS Means Building Construction Cost Data 2011, Glued-Laminated Beams 06 18 13.20 |
| 2x10 Wood Joist w/ 1/2" CDX, 12" OC | 600 | SF | | \$2.02 | \$2.05 | | 97.30% | \$2,376.07 | RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Roof, wood/pitched, 3"x12" 12" OC w/ sheathing plywood on roof, 5/16" CDX | 840 | SF | | \$4.59 | \$2.62 | | 97.30% | \$5,892.88 | RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Weather Proofing/Coatings add 15% (Premium for PTS Wood) | \$11,499.90 | % | 15.00% | | | | | \$1,724.98 | Assumed that PTS wood is 15% more compared on price difference shown in means |
| | | | | | | | | \$57,430.48 | |

| Roofing | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|--------------------|--|
| Mobilization of Equipment | 4 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,204.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Roofing/Hip and Ridge Roof Steel Panels | | | | | | | | | Hip and ridge style roof, peak of roof 15'. (Equipment Cost is included in Installation Cost) |
| Flat Roof Steel Panels, Flat Seam, Copper, 1/4" min. slope, 20 oz, 1.2 PSF | 840 | SF | | \$9.50 | \$5.80 | | 100.30% | \$12,890.56 | RS Means Assemblies Cost Data, 2011, B3010 135, Formed Metal (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$14,094.56 | |

| Stairs/Ramps/Guardrails | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Exterior Ramp, Rises 20', 5' wide | | | | | | | | | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |
| Steel Columns, 20' high, Wide Flanged, 6", 12 locations | 240 | VLF | | \$26.50 | \$7.85 | \$0.00 | 95.40% | \$7,864.78 | RS Means Assemblies Cost Data, 2011, B1010, 208 Steel Columns (Equipment Cost is included in Installation Cost) |
| W Shape Beams and Girders, bay size 15X20,, Total Load 263 PSF. | 800 | SF | | \$11.70 | \$3.82 | \$1.50 | 95.40% | \$12,989.66 | RS Means Building Construction Cost Data, 2011, Structural Steel Framing, 05 12 23.17 |
| Floor Construction, Metal Deck/Concrete Fill, Deck Span 6 ft, 150 PSF Superimposed Load | 800 | SF | | \$2.38 | \$2.38 | | 95.40% | \$3,632.83 | RS Means Assemblies Cost Data, 2011, B1010 258, Metal Deck/Concrete Fill (Equipment Cost is included in Installation Cost) |
| Weather Proofing/Coatings (Galvanized) | 7.5 | Tons | \$400.00 | \$0.00 | 0 | 0 | 95.40% | \$2,862.00 | RS Means Building Construction Cost Data, 2011, 05 05 13.50, Paints and Protective Coatings |
| Hand Rail/Guard Rail | 270 | LF | | \$32.50 | \$9.80 | | 95.40% | \$10,895.63 | Galvanized, 2 Rail, 1 1/2" diameter, RS Means Building Construction Cost Date 2011, 05 52 Metal Railings |
| Ladders/Stairs | | | | | | | | | |
| Steel ladder to attic space 20" wide bolted to concrete without cage | 10 | VLF | | \$65.00 | \$31.50 | \$2.18 | 95.40% | \$920.61 | RS Means Building Construction Cost Data 2011, 05 51 33 - Vertical Metal Ladders |
| Accordion Ladder for Escape after Tsunami, Disappearing Stairs, Heavy duty, 16'-0" ceiling | 2 | ea | | \$1,400.00 | \$172.00 | | 95.40% | \$2,999.38 | RS Means Building Construction Cost Data 2011, 11 33 10.10, Disappearing Stairway |
| Platform Perimeters Railing (120 LF for each platform, 2 locations) | | | | | | | | | |
| Hand Rail/Guard Rail | 196 | LF | | \$32.50 | \$9.80 | | 95.40% | \$7,907.78 | Galvanized, 2 Rail, 1 1/2" diameter, RS Means Building Construction Cost Date 2011, 05 52 Metal Railings |
| | | | | | | | | \$51,878.67 | |

| Fire Protection | Quantity | Unit | Cost per Unit | Material Cost | Installation Costs | Equipment Cost | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|---------------------------|-----------------------|------------------------|-------------------|--|
| Fire Protection, Wet Pipe System | | | | | | | | | |
| Mobilization | 4 | EA | | \$69.00 | \$116.00 | | 100.00% | \$740.00 | RS Means Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| First Floor, 2000 SF, Light Hazard | 600 | SF | | \$4.50 | \$3.04 | | 97.00% | \$4,388.28 | RS Means Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |

| | | | | | | | | | |
|-------------------------------------|-----|----|--|--------|--------|--|--------|-------------------|--|
| Second Floor, 2000 SF, Light Hazard | 600 | SF | | \$1.21 | \$2.08 | | 97.00% | \$1,914.78 | RS Means Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| | | | | | | | | \$7,043.06 | |

| | | | |
|-----------------------------------|--|-----------------------------------|------------------|
| Map Number: | T4 | Minimum Structure Height: | 22 |
| Structure Type: | Tower | Structure Capacity: | 80 |
| Location: | Tokeland, WA, Wipple Ave & SR 105 | Safe Haven Square Footage: | 800 |
| Levels | 2 | Columns Required | 4 |
| | | Piles per Column | 2 |
| Scope | | | Cost |
| Site Utilities | | | \$15,257 |
| Excavation-Backfill | | | \$9,423 |
| Foundation | | | \$66,161 |
| Structure | | | \$70,429 |
| Roofing | | | \$18,391 |
| Stairs/Ramps/Guardrails | | | \$53,888 |
| Fire Protection | | | \$9,144 |
| Total | | | \$242,694 |
| Design Fees (8%) | | | \$19,415 |
| General Conditions (10%) | | | \$24,269 |
| Contractor Fees, O&P (15%) | | | \$36,404 |
| Construction Contingency (5%) | | | \$12,135 |
| Estimate/Design Contingency (10%) | | | \$24,269 |
| Project Total | | | \$359,187 |

| Site Utilities | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|---|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Fire Water, Ductile Iron Class 250, MJ, 4" diameter | 50 | LF | | \$16.05 | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 4" Ductile Iron Piping, MJ | 50 | LF | | \$12.50 | \$8.55 | \$2.17 | 108.20% | \$1,256.20 | RS Means, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |

| | | | | | | | | | |
|---|----|-----|------------|------------|--------|---------|---------|--------------------|--|
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Service | | | | | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RS Means, Building Construction Cost Data, 201, 31 23 16.13 Excavating Trench |
| Install & Test, 8" Bituminous Coated | 50 | LF | \$10.70 | \$5.25 | \$0.97 | | 108.20% | \$915.37 | RS Means, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | \$20.00 | | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Site Drainage/Area Drains/Catch Basins | | | | | | | | | Assume 1 area drain for structure |
| Concrete, Precast, 4' ID riser, 4' deep | 1 | EA | \$1,425.00 | \$1,200.00 | 0.00% | | 108.20% | \$2,840.25 | RS Means Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins |
| Electrical | 50 | LF | | | | | | | Assuming 50' distance from service at street |
| Electrical Service, includes service installation, breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 volts, 60 A | 1 | EA | \$960.00 | \$920.00 | | | 100.50% | \$1,889.40 | RS Means Assemblies Cost Data, 2011, D 5010 120, Electric Service, 3 Phase - 4 Wire, equipment included in installation cost |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 50 | LF | \$2.00 | \$8.05 | | | 108.20% | \$543.71 | RS Means, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |
| Wire, 600 volt, copper type THW, solid, #12 | 50 | CLF | \$11.95 | \$36.50 | 0 | | 100.50% | \$2,434.61 | RS Means, Building Construction Cost Data, 2011, 26 05 19.90 Wire |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 19 | LCY | \$20.00 | | | | 108.20% | \$411.16 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 19 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$446.93 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 19 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$69.69 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 22 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$36.90 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | | \$15,257.23 | |

| Excavation-Backfill | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|----------------------------|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|---|
| Mobilization | 8 | EA | \$0.00 | \$0.00 | \$69.00 | \$116.00 | 100.00% | \$1,480.00 | RS Means Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| Clear and Grub Site | 0.25 | ACRE | \$0.00 | \$0.00 | \$1,750.00 | \$1,300.00 | 108.20% | \$825.03 | Is clear and grub needed for structure in urban setting? RS Means Building Construction Cost Data, 2011, 31 11 10.10 Clear and Grub Site |
| Excavation for Grade Beams | 20 | BCY | \$0.00 | \$0.00 | \$0.00 | \$0.00 | 108.20% | \$0.00 | Grade Beams, 3' wide, 3' deep, 568 lf. RS Means Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket, (Price Included in grade beam foundation price) |

| | | | | | | | | | |
|--|----|-----|--------|---------|--------|---------|---------|-------------------|---|
| Excavation for slab, subgrade and capillary break | 59 | BCY | \$0.00 | \$0.00 | \$7.20 | \$7.17 | 108.20% | \$921.38 | 1225 SF mat, 2' deep. RS Means Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket |
| Removal of Foundation Spoils, Haul of Material, 40 MPH, cycle 40 MPH | 99 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$2,330.49 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Backfill Slab, subgrade, capillary break | 86 | ECY | | \$20.00 | | | 108.20% | \$1,852.38 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 86 | ECY | | | \$7.64 | \$14.10 | 108.20% | \$2,013.54 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | | \$9,422.82 | |

| Foundation | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|--------------------|--|
| Piling | | | | | | | | | Piling needs to 2x the height of the structure which is 23-35'? |
| Mobilization for piling | 1 | EA | \$12,000.00 | \$0.00 | \$0.00 | \$0.00 | 100.00% | \$12,000.00 | Per phone conversation with Quigg Bros, Aberdeen, WA on June 29th, 2011 |
| Battered Piles, 18" Diameter, 30'-40' Deep | 8 | EA | \$0.00 | \$3,500.00 | \$1,200.00 | \$0.00 | 100.00% | \$37,600.00 | Driven pipe piles 40' long, 18"x.5", per phone conversation with Quigg Bros, Aberdeen, WA on June 29th,2011. Equipment Included in Material/Labor Cost |
| Pile Caps, Cap Size 6'-6" x 3'-6" x 37" | 4 | EA | \$0.00 | \$370.00 | \$540.00 | | 99.30% | \$3,614.52 | RS Means Assemblies Cost Data 2011, A1010 250 Pile Caps (Equipment Costs are included in Installation Cost) |
| Foundation Cast-In-Place/Tower | | | | | | | | | |
| Grade Beams 30' span, 28" deep, 14" wide, 2 KLF load | 113 | LF | | \$34.50 | \$53.00 | | 99.30% | \$9,830.20 | RS Means Assemblies Cost Data 2011, A 1020 210 Grade Beams (Equipment Cost is included in Installation Cost) |
| Foundation Cast-In-Place/ Footings for Ramp | | | | | | | | | |
| Spread Footings, load 75K, soil capacity 6 KSF, 4'-0" sq x 12" deep | 12 | EA | \$0.00 | \$94.50 | \$167.00 | \$0.00 | 99.30% | \$3,116.03 | Piling needs to 2x the height of the structure which is 23-35'? RS Means Assemblies Cost Data, 2011, A1010 210, Spread Footings (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$66,160.75 | |

| Structure | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Costs | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|--------------------------|------------------------|------------------------|-------------------|---|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Concrete Structure | | | | | | | | | \$0.00 |
| Concrete Columns, rated for 1000 K load, 20' high, 26" round, concrete strength, 6000 PSI | 80 | VLF | | \$158.00 | \$7.85 | \$0.00 | 99.30% | \$13,175.12 | RS Means Assemblies Cost Data, 2011, B1010 201, CIP Column, Round Tied (Equipment Cost included in Installation Cost) |
| Slab-On-Grade, 6" thick, non-industrial, reinforced, Ground Floor | 800 | SF | | \$3.01 | \$2.97 | | 99.30% | \$4,750.51 | RS Means Assemblies Cost Data, 2011, A1030 120, Slab on Grade, Plain & Reinforced |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 170 PSF, 9" thick slab, 1st Floor | 800 | LF | | \$6.95 | \$11.55 | | 99.30% | \$14,696.40 | RS Means Assemblies Cost Data, 2011, B1010 213 Rectangular Precast Beams (Equipment Cost included in Installation Cost) |

| | | | | | | | | | |
|---|-------------|-----|--------|--------|---------|---------|--------|--------------------|---|
| Cast-In-Place Beam and Slab, Two Way, 30x30, 351 PSF, 9" thick slab, 2nd Floor (evacuation level) | 800 | SF | | \$8.95 | \$13.60 | | 99.30% | \$17,913.72 | RS Means Assemblies Cost Data, 2011, B1010 229 Precast Plank with No Topping (Equipment Cost included in Installation Cost) |
| Wood Structure | | | | | | | | | Wood structure, hip roof to support galvanized steel panels |
| Wood Columns 12"x12", 10' High, Select Structural | 40 | VLF | | \$9.85 | \$2.62 | | 97.30% | \$485.33 | Supply quote from Levee Lumber, Hoquiam, WA, RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Perimeter Joists, 3 1/8"x12", GLM 30' span | 113 | LF | | \$4.85 | \$1.95 | \$22.00 | 97.30% | \$3,170.37 | Supply quote from Levee Lumber, Hoquiam, WA, RS Means Building Construction Cost Data 2011, Glued-Laminated Beams 06 18 13.20 |
| 2x10 Wood Joist w/ 1/2" CDX, 12" OC | 800 | SF | | \$2.02 | \$2.05 | | 97.30% | \$3,168.09 | RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Roof, wood/pitched, 3"x12" 12" OC w/ sheathing plywood on roof, 5/16" CDX | 1120 | SF | | \$4.59 | \$2.62 | | 97.30% | \$7,857.17 | RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Weather Proofing/Coatings add 15% (Premium for PTS Wood) | \$14,680.96 | % | 15.00% | | | | | \$2,202.14 | Assumed that PTS wood is 15% more compared on price difference shown in means |
| | | | | | | | | \$70,428.86 | |

| Roofing | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Fact | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|----------------------|--------------------|--|
| Mobilization of Equipment | 4 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,204.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Roofing/Hip and Ridge Roof Steel Panels | | | | | | | | | Hip and ridge style roof, peak of roof 15'. (Equipment Cost is included in Installation Cost) |
| Flat Roof Steel Panels, Flat Seam, Copper, 1/4" min. slope, 20 oz, 1.2 PSF | 1120 | SF | | \$9.50 | \$5.80 | | 100.30% | \$17,187.41 | RS Means Assemblies Cost Data, 2011, B3010 135, Formed Metal (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$18,391.41 | |

| Stairs/Ramps/Guardrails | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Fact | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|----------------------|-------------------|--|
| Mobilization of Equipment | 6 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Exterior Ramp, Rises 20', 5' wide | | | | | | | | | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |
| Steel Columns, 20' high, Wide Flanged, 6", 12 locations | 264 | VLF | | \$26.50 | \$7.85 | \$0.00 | 95.40% | \$8,651.25 | RS Means Assemblies Cost Data, 2011, B1010, 208 Steel Columns (Equipment Cost is included in Installation Cost) |
| W Shape Beams and Girders, bay size 15X20,, Total Load 263 PSF. | 800 | SF | | \$11.70 | \$3.82 | \$1.50 | 95.40% | \$12,989.66 | RS Means Building Construction Cost Data, 2011, Structural Steel Framing, 05 12 23.17 |
| Floor Construction, Metal Deck/Concrete Fill, Deck Span 6 ft, 150 PSF Superimposed Load | 800 | SF | | \$2.38 | \$2.38 | | 95.40% | \$3,632.83 | RS Means Assemblies Cost Data, 2011, B1010 258, Metal Deck/Concrete Fill (Equipment Cost is included in Installation Cost) |
| Weather Proofing/Coatings (Galvanized) | 7.5 | Tons | \$400.00 | \$0.00 | 0 | 0 | 95.40% | \$2,862.00 | RS Means Building Construction Cost Data, 2011, 05 05 13.50, Paints and Protective Coatings |

| | | | | | | | | | |
|--|-----|-----|--|------------|----------|--------|--------|--------------------|--|
| Hand Rail/Guard Rail | 270 | LF | | \$32.50 | \$9.80 | | 95.40% | \$10,895.63 | Galvanized, 2 Rail, 1 1/2" diameter, RS Means Building Construction Cost Date 2011, 05 52 Metal Railings |
| Ladders/Stairs | | | | | | | | | |
| Steel ladder to attic space 20" wide bolted to concrete without cage | 10 | VLF | | \$65.00 | \$31.50 | \$2.18 | 95.40% | \$920.61 | RS Means Building Construction Cost Data 2011, 05 51 33 - Vertical Metal Ladders |
| Accordion Ladder for Escape after Tsunami, Disappearing Stairs, Heavy duty, 16'-0" ceiling | 2 | ea | | \$1,400.00 | \$172.00 | | 95.40% | \$2,999.38 | RS Means Building Construction Cost Data 2011, 11 33 10.10, Disappearing Stairway |
| Platform Perimeters Railing (120 LF for each platform, 2 locations) | | | | | | | | | |
| Hand Rail/Guard Rail | 226 | LF | | \$32.50 | \$9.80 | | 95.40% | \$9,131.11 | Galvanized, 2 Rail, 1 1/2" diameter, RS Means Building Construction Cost Date 2011, 05 52 Metal Railings |
| | | | | | | | | \$53,888.48 | |

| Fire Protection | Quantity | Unit | Cost per Unit | Material Cost | Installation Costs | Equipment Cost | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|---------------------------|-----------------------|------------------------|-------------------|--|
| Fire Protection, Wet Pipe System | | | | | | | | | |
| Mobilization | 4 | EA | | \$69.00 | \$116.00 | | 100.00% | \$740.00 | RS Means Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| First Floor, 2000 SF, Light Hazard | 800 | SF | | \$4.50 | \$3.04 | | 97.00% | \$5,851.04 | RS Means Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| Second Floor, 2000 SF, Light Hazard | 800 | SF | | \$1.21 | \$2.08 | | 97.00% | \$2,553.04 | RS Means Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| | | | | | | | | \$9,144.08 | |

| | | | |
|-------------------------|--|-----------------------------------|------------------|
| Map Number: | T5 | Minimum Structure Height: | 24 |
| Structure Type: | Tower | Structure Capacity: | 80 |
| Location: | Tokeland, WA, Warrenton Cannery Rd & SR | Safe Haven Square Footage: | 800 |
| Levels | 2 | Columns Required | 4 |
| | | Piles per Column | 2 |
| Scope | | | Cost |
| Site Utilities | | | \$15,257 |
| Excavation-Backfill | | | \$9,423 |
| Foundation | | | \$66,161 |
| Structure | | | \$70,429 |
| Roofing | | | \$18,391 |
| Stairs/Ramps/Guardrails | | | \$54,675 |
| Fire Protection | | | \$9,144 |
| Total | | | \$243,480 |

| | |
|-----------------------------------|------------------|
| Design Fees (8%) | \$19,478 |
| General Conditions (10%) | \$24,348 |
| Contractor Fees, O&P (15%) | \$36,522 |
| Construction Contingency (5%) | \$12,174 |
| Estimate/Design Contingency (10%) | \$24,348 |
| Project Total | \$360,351 |

| Site Utilities | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---|----------|------|---------------|---------------|-------------------|----------------|-----------------|------------|--|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Fire Water, Ductile Iron Class 250, MJ, 4" diameter | 50 | LF | | \$16.05 | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13, Excavating Trench |
| Install & Test, 4" Ductile Iron Piping, MJ | 50 | LF | | \$12.50 | \$8.55 | \$2.17 | 108.20% | \$1,256.20 | RS Means, Building Construction Cost Data, 2011, 33 11 Water Utility Distribution Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Storm Service | | | | | | | | | Assuming 50' distance from service at street |
| Excavate, 3/4 CY Excavator, 6'-10' deep | 60 | BCY | | | \$2.88 | \$2.85 | 108.20% | \$371.99 | RS Means, Building Construction Cost Data, 201, 31 23 16.13 Excavating Trench |
| Install & Test, 8" Bituminous Coated | 50 | LF | | \$10.70 | \$5.25 | \$0.97 | 108.20% | \$915.37 | RS Means, Building Construction Cost Data, 2011, 33 41 Storm Utility Drainage Piping |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 6 | LCY | | \$20.00 | | | 108.20% | \$129.84 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 6 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$141.14 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 5 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$18.34 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 38 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$63.73 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| Site Drainage/Area Drains/Catch Basins | | | | | | | | | Assume 1 area drain for structure |
| Concrete, Precast, 4' ID riser, 4' deep | 1 | EA | | \$1,425.00 | \$1,200.00 | 0.00% | 108.20% | \$2,840.25 | RS Means Assemblies Cost Data, 2011, G3030 210, Manholes & Catch Basins |
| Electrical | 50 | LF | | | | | | | Assuming 50' distance from service at street |
| Electrical Service, includes service installation, breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 volts, 60 A | 1 | EA | | \$960.00 | \$920.00 | | 100.50% | \$1,889.40 | RS Means Assemblies Cost Data, 2011, D 5010 120, Electric Service, 3 Phase - 4 Wire, equipment included in installation cost |
| Excavate, 3/4 CY Excavator, 4'-6' deep | 35 | BCY | | | \$2.16 | \$2.13 | 108.20% | \$162.46 | RS Means, Building Construction Cost Data, 2011, 31 23 16.13 Excavating Trench |
| Install & Test PVC, type EB 4 @ 3" diameter | 50 | LF | | \$2.00 | \$8.05 | | 108.20% | \$543.71 | RS Means, Building Construction Cost Data, 2011, 33 71 19 Electrical Underground Ducts and Manholes |

| | | | | | | | | | |
|---|----|-----|--|---------|---------|---------|---------|--------------------|---|
| Wire, 600 volt, copper type THW, solid, #12 | 50 | CLF | | \$11.95 | \$36.50 | 0 | 100.50% | \$2,434.61 | RS Means, Building Construction Cost Data, 2011, 26 05 19.90 Wire |
| Utility Bedding, For Pipe & Conduit, Not Incl. Compaction | 19 | LCY | | \$20.00 | | | 108.20% | \$411.16 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 19 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$446.93 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Compacting Bedding In Trench | 19 | ECY | | | \$3.05 | \$0.34 | 108.20% | \$69.69 | RS Means, Building Construction Cost Data, 2011, 31 23 23.16 Fill By Borrow & Utility Bedding |
| Backfill, General Fill By Dozer, No Compaction | 22 | LCY | | | \$0.50 | \$1.05 | 108.20% | \$36.90 | RS Means, Building Construction Cost Data, 2011, 31 23 23.17 General Fill |
| | | | | | | | | \$15,257.23 | |

| Excavation-Backfill | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|---|
| Mobilization | 8 | EA | \$0.00 | \$0.00 | \$69.00 | \$116.00 | 100.00% | \$1,480.00 | RS Means Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| Clear and Grub Site | 0.25 | ACRE | \$0.00 | \$0.00 | \$1,750.00 | \$1,300.00 | 108.20% | \$825.03 | Is clear and grub needed for structure in urban setting? RS Means Building Construction Cost Data, 2011, 31 11 10.10 Clear and Grub Site |
| Excavation for Grade Beams | 20 | BCY | \$0.00 | \$0.00 | \$0.00 | \$0.00 | 108.20% | \$0.00 | Grade Beams, 3' wide, 3' deep, 568 lf. RS Means Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket, (Price Included in grade beam foundation price) |
| Excavation for slab, subgrade and capillary break | 59 | BCY | \$0.00 | \$0.00 | \$7.20 | \$7.17 | 108.20% | \$921.38 | 1225 SF mat, 2' deep. RS Means Building Construction Cost Data, 2011, 31 23 16.16 3/4 CY bucket |
| Removal of Foundation Spoils, Haul of Material, 40 MPH, cycle 40 MPH | 99 | LCY | | | \$7.64 | \$14.10 | 108.20% | \$2,330.49 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| Backfill Slab, subgrade, capillary break | 86 | ECY | | \$20.00 | | | 108.20% | \$1,852.38 | Quote per Quigg Bros, Aberdeen, WA, phone conversation on June 29th, 2011 |
| Haul of Material, 40 MPH, cycle 40 MPH | 86 | ECY | | | \$7.64 | \$14.10 | 108.20% | \$2,013.54 | RS Means Building Construction Cost Data, 2011, 31 05 16, 31 23 23.20 Hauling |
| | | | | | | | | \$9,422.82 | |

| Foundation | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|-------------------|--|
| Piling | | | | | | | | | Piling needs to 2x the height of the structure which is 23-35'? |
| Mobilization for piling | 1 | EA | \$12,000.00 | \$0.00 | \$0.00 | \$0.00 | 100.00% | \$12,000.00 | Per phone conversation with Quigg Bros, Aberdeen, WA on June 29th, 2011 |
| Battered Piles, 18" Diameter, 30'-40' Deep | 8 | EA | \$0.00 | \$3,500.00 | \$1,200.00 | \$0.00 | 100.00% | \$37,600.00 | Driven pipe piles 40' long, 18"x.5", per phone conversation with Quigg Bros, Aberdeen, WA on June 29th,2011. Equipment Included in Material/Labor Cost |
| Pile Caps, Cap Size 6'-6" x 3'-6" x 37" | 4 | EA | \$0.00 | \$370.00 | \$540.00 | | 99.30% | \$3,614.52 | RS Means Assemblies Cost Data 2011, A1010 250 Pile Caps (Equipment Costs are included in Installation Cost) |
| Foundation Cast-In-Place/Tower | | | | | | | | | |

| | | | | | | | | | |
|---|-----|----|--------|---------|----------|--------|--------|--------------------|---|
| Grade Beams 30' span, 28" deep, 14" wide, 2 KLF load | 113 | LF | | \$34.50 | \$53.00 | | 99.30% | \$9,830.20 | RS Means Assemblies Cost Data 2011, A 1020 210 Grade Beams (Equipment Cost is included in Installation Cost) |
| Foundation Cast-In-Place/ Footings for Ramp | | | | | | | | | Piling needs to 2x the height of the structure which is 23-35'? |
| Spread Footings, load 75K, soil capacity 6 KSF, 4'-0" sq x 12" deep | 12 | EA | \$0.00 | \$94.50 | \$167.00 | \$0.00 | 99.30% | \$3,116.03 | RS Means Assemblies Cost Data, 2011, A1010 210, Spread Footings (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$66,160.75 | |

| Structure | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Costs | Location Factor | Total Cost | Comments |
|---|-------------|------|---------------|---------------|-------------------|-----------------|-----------------|--------------------|---|
| Mobilization of Equipment | 10 | EA | | | \$116.00 | \$185.00 | 100.00% | \$3,010.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Concrete Structure | | | | | | | | \$0.00 | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |
| Concrete Columns, rated for 1000 K load, 20' high, 26" round, concrete strength, 6000 PSI | 80 | VLF | | \$158.00 | \$7.85 | \$0.00 | 99.30% | \$13,175.12 | RS Means Assemblies Cost Data, 2011, B1010 201, CIP Column, Round Tied (Equipment Cost included in Installation Cost) |
| Slab-On-Grade, 6" thick, non-industrial, reinforced, Ground Floor | 800 | SF | | \$3.01 | \$2.97 | | 99.30% | \$4,750.51 | RS Means Assemblies Cost Data, 2011, A1030 120, Slab on Grade, Plain & Reinforced |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 170 PSF, 9" thick slab, 1st Floor | 800 | LF | | \$6.95 | \$11.55 | | 99.30% | \$14,696.40 | RS Means Assemblies Cost Data, 2011, B1010 213 Rectangular Precast Beams (Equipment Cost included in Installation Cost) |
| Cast-In-Place Beam and Slab, Two Way, 30x30, 351 PSF, 9" thick slab, 2nd Floor (evacuation level) | 800 | SF | | \$8.95 | \$13.60 | | 99.30% | \$17,913.72 | RS Means Assemblies Cost Data, 2011, B1010 229 Precast Plank with No Topping (Equipment Cost included in Installation Cost) |
| Wood Structure | | | | | | | | | Wood structure, hip roof to support galvanized steel panels |
| Wood Columns 12"x12", 10' High, Select Structural | 40 | VLF | | \$9.85 | \$2.62 | | 97.30% | \$485.33 | Supply quote from Levee Lumber, Hoquiam, WA, RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Perimeter Joists, 3 1/8"x12", GLM 30' span | 113 | LF | | \$4.85 | \$1.95 | \$22.00 | 97.30% | \$3,170.37 | Supply quote from Levee Lumber, Hoquiam, WA, RS Means Building Construction Cost Data 2011, Glued-Laminated Beams 06 18 13.20 |
| 2x10 Wood Joist w/ 1/2" CDX, 12" OC | 800 | SF | | \$2.02 | \$2.05 | | 97.30% | \$3,168.09 | RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Roof, wood/pitched, 3"x12" 12" OC w/ sheathing plywood on roof, 5/16" CDX | 1120 | SF | | \$4.59 | \$2.62 | | 97.30% | \$7,857.17 | RS Means Assemblies Cost Data, 2011, B1020 102, Roof Construction, Wood/Flat or Pitched (Equipment Cost included in Installation Cost) |
| Weather Proofing/Coatings add 15% (Premium for PTS Wood) | \$14,680.96 | % | 15.00% | | | | | \$2,202.14 | Assumed that PTS wood is 15% more compared on price difference shown in means |
| | | | | | | | | \$70,428.86 | |

| Roofing | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|---------------------------|----------|------|---------------|---------------|-------------------|----------------|-----------------|------------|---|
| Mobilization of Equipment | 4 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,204.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |

| | | | | | | | | | |
|--|------|----|--|--------|--------|--|---------|--------------------|--|
| Roofing/Hip and Ridge Roof Steel Panels | | | | | | | | | Hip and ridge style roof, peak of roof 15'. (Equipment Cost is included in Installation Cost) |
| Flat Roof Steel Panels, Flat Seam, Copper, 1/4" min. slope, 20 oz, 1.2 PSF | 1120 | SF | | \$9.50 | \$5.80 | | 100.30% | \$17,187.41 | RS Means Assemblies Cost Data, 2011, B3010 135, Formed Metal (Equipment Cost is included in Installation Cost) |
| | | | | | | | | \$18,391.41 | |

| Stairs/Ramps/Guardrails | Quantity | Unit | Cost per Unit | Material Cost | Installation Cost | Equipment Cost | Location Factor | Total Cost | Comments |
|--|-----------------|-------------|----------------------|----------------------|--------------------------|-----------------------|------------------------|--------------------|--|
| Mobilization of Equipment | 6 | EA | | | \$116.00 | \$185.00 | 100.00% | \$1,806.00 | RS Means, Building Construction Cost Data, 2011, 01 54 36.50 Mobilization |
| Exterior Ramp, Rises 20', 5' wide | | | | | | | | | Beam and Column sizes are not determined and estimate takes in "best guess" to assume sizes for this project. |
| Steel Columns, 20' high, Wide Flanged, 6", 12 locations | 288 | VLF | | \$26.50 | \$7.85 | \$0.00 | 95.40% | \$9,437.73 | RS Means Assemblies Cost Data, 2011, B1010, 208 Steel Columns (Equipment Cost is included in Installation Cost) |
| W Shape Beams and Girders, bay size 15X20,, Total Load 263 PSF. | 800 | SF | | \$11.70 | \$3.82 | \$1.50 | 95.40% | \$12,989.66 | RS Means Building Construction Cost Data, 2011, Structural Steel Framing, 05 12 23.17 |
| Floor Construction, Metal Deck/Concrete Fill, Deck Span 6 ft, 150 PSF Superimposed Load | 800 | SF | | \$2.38 | \$2.38 | | 95.40% | \$3,632.83 | RS Means Assemblies Cost Data, 2011, B1010 258, Metal Deck/Concrete Fill (Equipment Cost is included in Installation Cost) |
| Weather Proofing/Coatings (Galvanized) | 7.5 | Tons | \$400.00 | \$0.00 | 0 | 0 | 95.40% | \$2,862.00 | RS Means Building Construction Cost Data, 2011, 05 05 13.50, Paints and Protective Coatings |
| Hand Rail/Guard Rail | 270 | LF | | \$32.50 | \$9.80 | | 95.40% | \$10,895.63 | Galvanized, 2 Rail, 1 1/2" diameter, RS Means Building Construction Cost Date 2011, 05 52 Metal Railings |
| Ladders/Stairs | | | | | | | | | |
| Steel ladder to attic space 20" wide bolted to concrete without cage | 10 | VLF | | \$65.00 | \$31.50 | \$2.18 | 95.40% | \$920.61 | RS Means Building Construction Cost Data 2011, 05 51 33 - Vertical Metal Ladders |
| Accordion Ladder for Escape after Tsunami, Disappearing Stairs, Heavy duty, 16'-0" ceiling | 2 | ea | | \$1,400.00 | \$172.00 | | 95.40% | \$2,999.38 | RS Means Building Construction Cost Data 2011, 11 33 10.10, Disappearing Stairway |
| Platform Perimeters Railing (120 LF for each platform, 2 locations) | | | | | | | | | |
| Hand Rail/Guard Rail | 226 | LF | | \$32.50 | \$9.80 | | 95.40% | \$9,131.11 | Galvanized, 2 Rail, 1 1/2" diameter, RS Means Building Construction Cost Date 2011, 05 52 Metal Railings |
| | | | | | | | | \$54,674.96 | |

| Fire Protection | Quantity | Unit | Cost per Unit | Material Cost | Installation Costs | Equipment Cost | Location Factor | Total Cost | Comments |
|---|-----------------|-------------|----------------------|----------------------|---------------------------|-----------------------|------------------------|-------------------|--|
| Fire Protection, Wet Pipe System | | | | | | | | | |
| Mobilization | 4 | EA | | \$69.00 | \$116.00 | | 100.00% | \$740.00 | RS Means Building Construction Cost Data, 2011, 01 54 36 - Equipment Mobilization |
| First Floor, 2000 SF, Light Hazard | 800 | SF | | \$4.50 | \$3.04 | | 97.00% | \$5,851.04 | RS Means Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| Second Floor, 2000 SF, Light Hazard | 800 | SF | | \$1.21 | \$2.08 | | 97.00% | \$2,553.04 | RS Means Square Foot Costs, 2011, D4010 410, Wet Pipe Sprinkler Systems (Equipment Cost included in Installation Cost) |
| | | | | | | | | \$9,144.08 | |