Yesler Terrace
Renovation Cost Analysis

January 28, 2011

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Executive Summary

Background and Purpose

The purpose of this report is to establish baseline costs to renovate the residential structures and make minor site improvements to achieve a forty-year life at Seattle Housing Authority's (SHA) Yesler Terrace Garden Community. New construction costs to replace the existing residential structures and make major site improvements are also established for comparison purposes.

Methodology

A team was assembled, led by CollinsWoerman, which included expertise in demolition and hazardous waste disposal, structural engineering, mechanical and plumbing systems and a general contractor. In conjunction, SvR Design Company was also tasked with analyzing site work costs to improve infrastructure, landscaping and other site related items. Background information was reviewed, interviews with SHA property management staff were conducted and individual buildings, units and the site were inspected. A determination of severe distress based on advanced age, construction type and construction techniques was signed by CollinsWoerman. A letter documenting infrastructure and sitework structural deficiencies was signed by SvR.

Renovation costs were developed to reflect two scenarios; Scenario 1 (repair option), includes costs associated with renovation of the existing buildings and minimal site work. Scenario 2 (replacement option), includes costs to completely demolish the existing buildings, reconstruct them in their current configurations and major site work. This scenario also adds 150 square feet to the 3 and 4 bedroom units and a ¾ bath (shower, sink and toilet). Both scenarios assume a renovation to extend the life span of the buildings by forty years. Specific assumptions related to the methodology and scenarios are included in the full report and appendices.

Findings

All cost studies were compiled into a Cost Summary by Lydig Construction and CollinsWoerman. The costs are supported by supplemental reports appended to the full report. Total costs include insurance, contingencies, sales tax, escalation and other items as noted in the detailed cost summaries.

Scenario 1: Summary and Cost

This option includes selective building demolition and disposal, replacing 25% of the structural framing due to decay and rot, seismic upgrades to framing and foundation, new roofs, new windows and doors, new siding, new flooring, new drywall and insulation, new kitchen cabinets, new appliances, new hot and cold water supply lines, new electrical distribution systems, new plumbing fixtures and hardware, new ventilation systems, new fire alarm and smoke detector systems, new energy efficient light fixtures, new baseboard heaters and controls and new interior and exterior paint.

Site work includes replacing 35% of public sidewalks, minimal exterior lighting upgrades, replacing 70% of access walks and pedestrian paths, overlay existing parking lots and restriping, repairing some concrete rubble retaining walls, replacing 30% of the site fencing, replacing 30% of the private water and storm drainage system, repair and relining private sewer system, removing lead containing soils from unit backyards, exterior unit improvements, general landscape improvements and play area improvements.

Total Cost of Scenario 1 (including site work and building renovation): $106,233,274.92

Cost per Unit: $189,364.13

Scenario 2: Summary and Cost

This replacement scenario includes new insulation, new drywall, new doors and windows, new siding, new roofs, new electrical, new flooring, new equipment and furnishings, new appliances, full demolition of buildings and foundations, new concrete foundations, new structural framing (roofs, walls and floors), new plumbing waste piping, all 3 and 4 bedroom units (105 total) increased in size by an additional 150 square feet and a ¾ bath (shower, sink and toilet), and 29 units will be constructed to meet Type A accessibility requirements (Seattle Building Code).

Site work includes replacing all public sidewalks and adding street trees, full replacement of private utilities (storm drainage, water, sewer) to meet City requirements, reconstruct parking lots and restriping, new electrical services to buildings, replacing all access walks and pedestrian paths, replacing concrete rubble retaining walls, replacing 50% of the site fences, removing lead containing soils from around buildings, replacing building footing drains, exterior unit improvements, general landscape improvements and play area improvements.

Total Cost of Scenario 2 (including site work and building replacement): $156,565,864.24

Cost per Unit: $279,083.54

Site Context

Built on the southern slope of Seattle's First Hill district in 1939, Yesler Terrace is the Seattle Housing Authority's oldest housing community and was the nation's first racially-integrated housing project. 69 low-rise buildings spread over 36 acres house approximately 1,200 residents in 561 units of apartment housing. The site is located directly southeast of downtown Seattle, on the opposite side of the I-5 freeway. Yesler Terrace is considered one of Seattle's downtown neighborhoods and borders the Central Area Neighborhood. Directly to the north of the site is Harborview Medical Center, a major regional trauma center serving Washington, Alaska, Montana and Idaho. The site is bordered on the south and southwest by Little Saigon and the International District, respectively. Directly to the east of the site is Bailey Gatzert Elementary School and the Squire Park neighborhood.

Site Layout

The Yesler Terrace housing development of 561 units is divided into groups of buildings by sector. The site still uses the original sector designations - R, S, T, U, W, Y & Z. An original sector Q was demolished for the construction of the I-5 freeway. Sector V includes the City of Seattle Community Center and old community center utilized by the community that are not included in this assessment (21 units in this sector were demolished to build the Yesler Community Center). Building 42 in Sector T is a former housing unit that is currently utilized as offices. A brief description of each cluster with building type is as follows:

Sector R – Thirteen (13) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding.

Sector S – Nine (9) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding. There is one (1) 1-story building that serves as a laundry facility and a central playground area. The original steam plant and an additional multi-story brick office building is located within this group, but not included in the scope of work.

Sector T – Eleven (11) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding. Building 42 is currently being used as SHA property management offices for the complex.

Sector U – Nine (9) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding. There is one (1) 1-story building that serves as a laundry facility.

Sector W – Eighteen (18) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding. There is one (1) 1-story building that serves as a laundry facility.

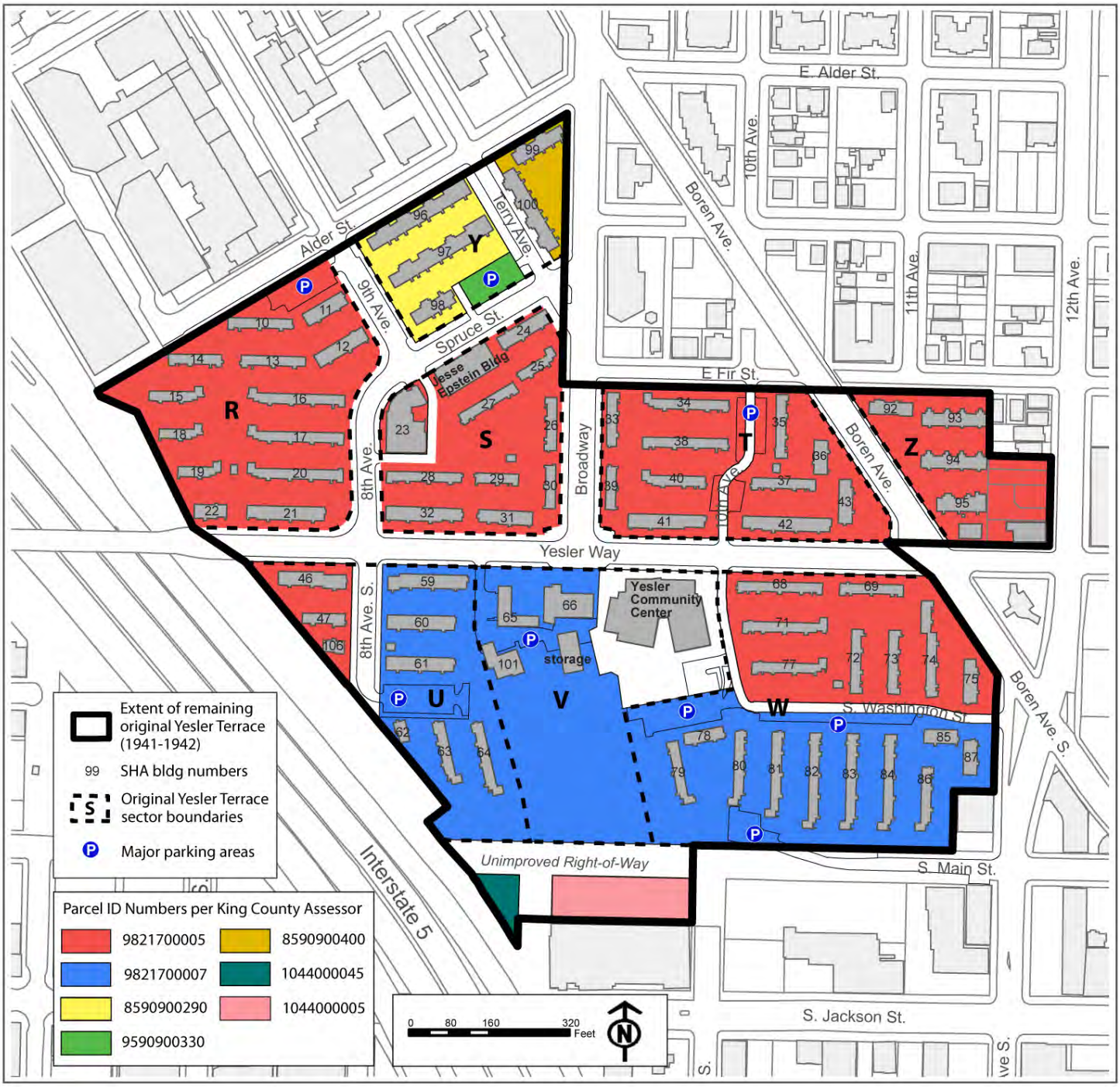
Sector Y – Five (5) 3-story buildings, CMU foundations, pitched roofs with composition asphalt, wood siding.

Sector Z – Four (4) 2-story buildings, CMU foundations, pitched roofs with composition asphalt, wood siding. There is one (1) 1-story building that was formerly a residence on the corner of Boren and Yesler.

Unit type	Studio	1 BR	2 BR	3 BR	4BR	Totals
# of units	35	192	229	86	19	561

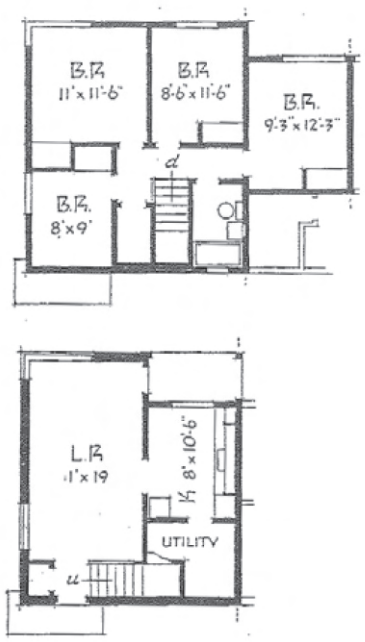
Site Layout

The Yesler Terrace site plan, with parcels, sectors, and buildings identified, is shown below.

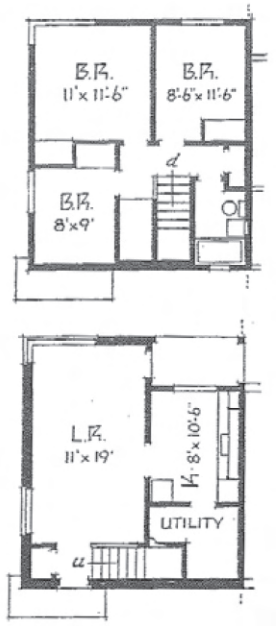


Unit Floor Plans

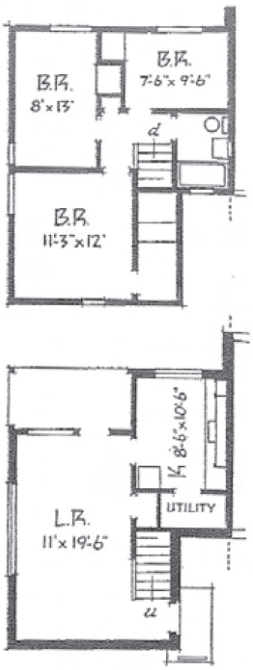
The housing at Yesler Terrace consists of studios, 1BR, 2 BR, 3BR, and 4BR units. These units are organized into various building types, including duplexes, rowhouses, and townhouses. The existing unit floor plans below, taken from a 1941 issue of ***Pencil Points***, are a representative sample of unit layouts at Yesler Terrace.



"A" units houses with kitchen, living room, and four bedrooms

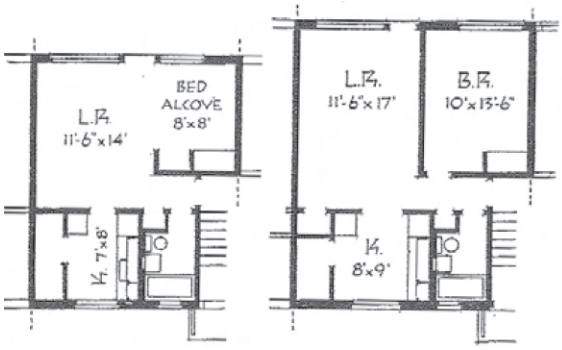


"B" units with kitchen, living room, and three second floor bedrooms



"C" units with kitchen, living room, and three second floor bedrooms

"D" (two-bedroom) and "E" (one-bedroom) units have the same first floor layout but a different second floor layout (Unit "E" second floor at upper right)



"F" studio (left) and "G" one-bedroom units (right) have three rooms, all on one floor; Unit "G" has a separate bedroom

General Description and Condition of Units

The housing units are predominantly composed of 2-story, wood framed structures with concrete or CMU foundations built in 1941 and 1942. Because the overall site is on a hill that descends from north to south, most of the foundations are stepped and many of the buildings have ground floors that are partially below grade. Given the hillside, there are numerous retaining walls constructed of recycled concrete or rockeries.

A number of upgrades to the units have been undertaken since their original construction. All roofs were replaced and poorly flashed vinyl siding was added to most of the residential buildings in the 1990's, most likely to mitigate lead paint issues. Most or all of the original, fixed wood windows were replaced with vinyl-framed operable windows. Interior doors were added at bedrooms – originally only bathrooms had doors.

Presently, almost all of the units exhibit significant deterioration of both interior and exterior elements. Vinyl siding and other exterior materials suffer from failures allowing vegetation to propagate on the buildings. On many north facing building elevations the siding and roof drains are covered with a blackish green growth which is clearly mold. The mold is also growing under the siding at those areas. Interior finishes show considerable wear and extensive damage to all surfaces. Interior wall finishes show rainwater damage from leaks around poorly flashed windows. Some rooms lack operable windows and thus have no ventilation. Although not required in 1980, there is no whole house ventilation system in the units, and windows lack vent ports. The lack of adequate exterior ventilation has also caused damage around the window sills. In many cases the rotted or damaged original wood trim and sills at windows has been replaced with a wood textured plastic laminate. However, the laminate installation is very poorly executed and has created additional maintenance to re-repair the problem. The underlying moisture damage still remains and can only be abated by removal and replacement of the windows, gypsum board and underlying framing. An interior ventilation system needs to be installed to reduce the moisture in the units.

The overall lateral force resisting systems for the units do not meet minimum seismic standards. It is likely that the structural studs inside building walls are decaying due to water intrusion and poor ventilation. There is no evidence to indicate that wood stud walls and wood sill plates are mechanically connected to the foundation system or interconnected between floors to allow for proper transfer of seismic forces through the floor and into the foundation. The floor framing does not meet the current minimum standards for deflection.

Some units do not meet minimum ventilation requirements as listed in the Seattle Mechanical Code. Hot and cold water supply piping may not meet minimum velocity requirements as permitted under the current plumbing code. Due to the age of the building upgrades, there is a high probability that lead-based solder was used in the copper piping.

The kitchen cabinets, last installed about the 1980's, are laminate faced particle board and clearly have passed their designed useful life. They show exhausted finishes and rusting and bent hardware. Water from leaky plumbing has damaged sink cabinets beyond repair and invites mold. The lack of ventilation in the units also causes the plumbing piping and fixtures to support condensation, which leaks into the flooring and wall framing, contributing to mold and dry rot damage. Units show water damage in kitchens and bathrooms at plumbing fixtures, some of which was likely caused by site-wide water and sewer infrastructure problems.

Asbestos containing sheet vinyl flooring (SVT) and vinyl asbestos tile (VAT) was identified in the units. It is anticipated that the old steam heating piping will contain asbestos insulation material. It is not anticipated that the lead based paint will be an "abatement" issue and will not exceed the 50 ppm threshold for waste to be considered "lead waste".

There is a significant amount of historical and architectural documentation on Yesler Terrace. A Landmark Nomination Report prepared by Bola Architecture and Planning, dated May 7, 2010 (available from the SHA), describes the original construction of the residential buildings at Yesler Terrace.

Cost Analysis Methodology

This report was commissioned by the Seattle Housing Authority as part of the process for the redevelopment of the Yesler Terrace neighborhood. The purpose of this study is to investigate the costs associated with rehabilitation or direct replacement of the 561 housing units and the site infrastructure that currently exists on the site.

The team assembled to prepare this report includes:

- Seattle Housing Authority – the owner
- CollinsWoerman – code analysis and architectural analysis
- Lydig Construction – construction estimating
- DCI Engineers – structural analysis
- CGI and Pacific Rim – environmental and hazardous materials analysis
- MacDonald-Miller – mechanical and plumbing analysis
- Tonkin-Hoyne – architectural renovation specialists
- SvR – site and infrastructure analysis

The two scenarios are described below with their global assumptions. Specific assumptions for each scenario are listed under the cost estimates:

1. Rehabilitate/renovate existing 561 units to achieve a new 40-year life.
2. Complete demolition and replacement of 561 units

Global Assumptions

1. Estimates of required rehabilitation and cost of rehabilitation work are based on observations in several units that were made available for inspection in the summer of 2010. The units inspected are assumed to be representative of the project as a whole.
2. All units will be rehabilitated in a sequence that facilitates efficient mobilization of construction trades, economies of scale for materials and labor, and standard demolition and construction timelines.
3. Movement of residents into and out of units during the construction process is assumed to be coordinated by SHA and is not considered in these scenarios.
4. All units will be rehabilitated to the same level of finish quality. All materials affected by a renovation scenario are assumed to be replaced or otherwise refinished according to the scenario description.
5. The scenarios and estimates are exclusive of the Jesse Epstein Building, Steam Plant, Old Community Center Buildings and the YWCA Childcare Building.
6. The concentration of lead in paints will not be high enough to trigger hazardous materials disposal requirements. The concentration of lead in soils adjacent to buildings will require removal and abatement.
7. Costs developed are based on current year (2010 and 2011).
8. Materials are assumed to be 50% of total building costs for calculating Washington State sales tax, as permitted under state law.
9. Materials are assumed to be 30% of total site work costs for calculating Washington State sales tax, as permitted under state law.

Scenario 1 Assumptions

Rehabilitate/renovate the existing 561 residential units and minor site work

Site Work

1. No improvements are assumed for the public roadways, public water lines, public sewer lines or public storm drainage lines.
2. Repair approximately 35% of the public sidewalks. An allowance for infill street trees is also included to restore the edge condition and streetscape environment.
3. Install minimal exterior energy efficient lighting from buildings to increase safety and visibility.
4. Provide excavation and backfilling services to replace gas service and communications lines installed by service providers.
5. Overlay parking lots with new asphalt and restripe to meet UFAS requirements.
6. Repair/replace approximately 70% of the site access pathways and walks. Pervious concrete will be used where appropriate to meet GSI MEF requirements. Replace stacked rubble concrete walls that are failing in several locations. Replace approximately 30% of the site fencing.
7. Replace 30% of the existing private water service system, including pipe, meters and building connections.
8. Replace failing sewer pipes and reline side sewer service lines to the main line at various locations.
9. Replace 30% of the existing storm drainage system.
10. Connect remaining building drainage systems to the side sewer system.
11. Remove and dispose of potential lead soil in back yards of units, up to 6 feet from building walls and 6 inches deep.
12. Replace partial fencing, patios and improve landscaping at units.
13. Enhance site landscaping and minor improvements to the ball field.
14. Repair site benches and tables at various site locations. Replace 6 play areas with new equipment and protective surfacing.

Building Renovation

1. Selective demolition includes removal of exterior and interior materials to expose the building systems and structural wall framing.
2. Existing foundations will remain.
3. Provide seismic upgrades, including tie-downs from roof trusses to exterior walls and floor framing to foundations and exterior plywood sheathing.
4. Replace 25% of the structural framing due to decay and rot.
5. Provide adequate attic, crawl space and basement venting.
6. Provide all new windows, exterior and interior doors and screen doors.
7. Construct new pitched roofs for 60 buildings (9 buildings currently have pitched roofs).
8. Replace all flooring and sub-flooring with new.
9. Replace all interior finishes (drywall, paint, trim) with new.
10. Replace all new exterior siding and insulation and paint.
11. Install all new kitchen and bath cabinets, vanities and hardware.
12. Install new blinds and shades for windows.
13. Install new hot and cold water piping.
14. Install washer and dryer hookup.
15. Replace plumbing fixtures and trim.
16. Install new appliances (refrigerator, range and dishwasher, hot water heater, washer and dryer).
17. Replace electrical service distribution wiring including GFI, fire alarms and smoke detectors, and energy efficient light fixtures.
18. Replace all electric baseboard heaters and provide remote thermostatic controls.
19. Install new kitchen, bathroom and dryer ventilation systems.
20. Provide minor accessibility upgrades (reinforced walls for grab bars, lowered lighting controls, etc.) to 29 units without changing room sizes or configurations.

Scenario 1 Itemized Costs

Scenario 1 Site Work

Site Preparation and Mobilization		
Mobilization / Demobilization / Record Drawings		
Remove Sidewalks and Retaining Walls		
Lead Soil Remediation		
Subtotal	**$**	**700,000.00**
Temporary Erosion and Sedimentation Controls		
Construction Fencing (6' chain link)		
Sile Fence and Catch Basin Protection		
TESC Allowance for Stormwater		
Subtotal	**$**	**35,000.00**
Utilities - Storm Drainage		
Cleanout		
Catch Basin Type 241		
Inlet Type 250		
8" Diameter PVC Service Drain Pipe		
Connect to Existing Storm Drain Line		
Connect to Existing Manhole		
Subtotal	**$**	**351,000.00**
Utilities - Sanitary Sewer		
Sanitary Sewer Manhole Type 200		
Cleanout		
8" Diameter PVC Side Sewer Pipe		
12" Diameter PVC Side Sewer Pipe		
Reline Existing Sanitary Sewer Lines		
Subtotal	**$**	**345,000.00**
Utilities - Water Distribution		
4" Water Service Line		
4" Domestic Service Line		
Connection to Existing System		
Subtotal	**$**	**152,000.00**
Utilities - Power / Franchise		
Lighting Allowance		
Electrical/Gas/Telephone/Cable Allowance		
Subtotal	**$**	**173,000.00**
Public Hardscape		
Cement Concrete Sidewalks		
Concrete Driveways		
Subtotal	**$**	**180,000.00**
Landscape		
ROW Planting Strips, Street Trees		
Subtotal	**$**	**35,000.00**

Scenario 1 Itemized Costs, cont.

Private Hardscape		
Pervious Concrete Sidewalks		
Asphalt Parking Lot Overlay and Striping		
Cement Concrete Sidewalks		
Concrete Driveways		
Concrete Stairs including Railing		
Retaining Walls		
ADA Accessibility Allowance		
Signage		
Subtotal	**$**	**1,630,000.00**
Site Landscaping		
Site Landscaping Improvements		
Play Structure Replacements		
Miscellaneous Landscaping		
Fencing		
Ball Field Improvements		
Subtotal	**$**	**3,509,000.00**
SUBTOTAL SITE WORK COST	**$**	**7,110,000.00**

Scenario 1 Itemized Costs

Scenario 1 Building Renovation	Units	Unit Cost	Total Cost
Hazardous Materials Abatement			
Good Faith Survey per AHERA Protocols	1	$ 20,000.00	$ 20,000.00
Notifications of Abatement	1	$ 10,000.00	$ 10,000.00
Abatement/Disposal of Sheet Vinyl Tile	1	$ 300,000.00	$ 300,000.00
Abatement/Disposal of Vinyl Asbestos Tile	1	$ 987,000.00	$ 987,000.00
Subtotal			**$ 1,317,000.00**
Selective Demolition			
Drywall	561	$ 4,400.00	$ 2,468,400.00
Insulation	561	$ 400.00	$ 224,400.00
Base and Trim	561	$ 150.00	$ 84,150.00
Doors	561	$ 110.00	$ 61,710.00
Windows	561	$ 700.00	$ 392,700.00
Vinyl and Wood Siding	69	$ 7,970.00	$ 549,930.00
Built-up Roofing	60	$ 7,350.00	$ 441,000.00
Composition Roofing	9	$ 10,500.00	$ 94,500.00
Subtotal			**$ 4,316,790.00**
Building Carpentry			
Base and Trim	561	$ 1,600.00	$ 897,600.00
Siding	69	$ 76,500.00	$ 5,278,500.00
Exterior Structural Plywood Sheathing	69	$ 10,700.00	$ 738,300.00
Structural Framing Replacement	69	$ 25,000.00	$ 1,725,000.00
Add Crawl Space Vents	69	$ 800.00	$ 55,200.00
Seismic Upgrades, Roof and Foundation Tie-Downs	69	$ 3,000.00	$ 207,000.00
Subtotal			**$ 8,901,600.00**
Roofing and Insulation			
Clean Attic Space	69	$ 6,400.00	$ 441,600.00
Insulation	69	$ 16,000.00	$ 1,104,000.00
Roofing	69	$ 61,000.00	$ 4,209,000.00
Subtotal			**$ 5,754,600.00**
Windows and Doors			
Doors	561	$ 5,250.00	$ 2,945,250.00
Windows	2,667	$ 720.00	$ 1,920,240.00
Subtotal			**$ 4,865,490.00**
Finishes			
Drywall	561	$ 3,136.00	$ 1,759,296.00
Insulation	561	$ 1,960.00	$ 1,099,560.00
Flooring	561	$ 4,704.00	$ 2,638,944.00
Interior Painting	561	$ 3,500.00	$ 1,963,500.00
Exterior Painting	69	$ 12,747.00	$ 879,543.00
Subtotal			**$ 8,340,843.00**

Scenario 1 Itemized Costs, cont.

Scenario 1 Building Renovation	Units	Unit Cost	Total Cost
Equipment and Furnishings			
Bath Equipment	561	$ 500.00	$ 280,500.00
New Kitchen Cabinets and Vanities	561	$ 3,000.00	$ 1,683,000.00
New Blinds and Shades	2,667	$ 100.00	$ 266,700.00
Refrigerator and Water Heater	561	$ 3,800.00	$ 2,131,800.00
Washer / Dryer	561	$ 1,000.00	$ 561,000.00
Subtotal			**$ 4,923,000.00**
Mechanical			
Replace Plumbing Piping (hot and cold water supply)	561	$ 3,920.00	$ 2,199,120.00
Replace Plumbing Fixtures and Trim	561	$ 8,000.00	$ 4,488,000.00
Replace Unit Ventilation Systems	561	$ 1,000.00	$ 561,000.00
Whole Building Attic Ventilation Fan and Controls	69	$ 1,500.00	$ 103,500.00
Subtotal			**$ 7,351,620.00**
Electrical			
Service and Distribution Upgrades	561	$ 10,975.00	$ 6,156,975.00
New Electric Resistance Heating and Line Thermostats	561	$ 1,975.00	$ 1,107,975.00
Subtotal			**$ 7,264,950.00**
SUBTOTAL BUILDING RENOVATION COST			**$ 53,035,893.00**

Scenario 1 Total Cost Summary		Total Cost
Subtotal Site Work		**$ 7,110,000.00**
Subtotal Building Renovation		**$ 53,035,893.00**
Subtotal Site Work and Building Renovation Costs		**$ 60,145,893.00**
General Requirements	6.00%	$ 3,608,753.58
Overhead	2.00%	$ 1,202,917.86
Profit	6.00%	$ 3,608,753.58
Insurance and Bonds	1.25%	$ 751,823.66
Sales Tax on Materials	9.50%	$ 2,721,839.92
Design Contingency	10.00%	$ 6,014,589.30
Construction Contingency	15.00%	$ 9,021,883.95
BID COST TODAY		**$ 87,076,454.85**
Construction Administration, Permit and Legal Fees	4.00%	$ 3,483,058.19
Design Fees	8.00%	$ 6,966,116.39
Escalation (2 years)	10.00%	$ 8,707,645.49
TOTAL CONSTRUCTION COST		**$ 106,233,274.92**
COST PER UNIT (561 UNITS)		**$ 189,364.13**

Scenario 2 Assumptions

Demolish and rebuild all 561 residential units.

Site Work

1. No improvements are assumed for the public roadways, public water lines, public sewer lines or public storm drainage lines.
2. Replace all public sidewalks, including upgraded planter areas per city requirements and UFAS.
3. Install new electrical services to the buildings. Install exterior lighting from buildings to increase safety and visibility.
4. Provide excavation and backfilling services to replace gas service and communications lines installed by service providers.
5. Excavate parking lots down to subgrade and rebuild parking lots with crushed base and asphalt. Restripe to meet ADA and UFAS requirements and upgrade storm drainage facilities to meet City flow control requirements.
6. Repair/replace all site access pathways and walks. Pervious concrete will be used where appropriate to meet GSI MEF requirements. Replace stacked rubble concrete walls that are failing. Replace approximately 50% of the site fencing.
7. Replace private water system with new water meters and water main connections.
8. Replace private sewer system with new.
9. Replace private storm drainage system with new facilities to meet City requirements, including GSI for flow control and water quality treatment.
10. Replace building footing drains and connect building drainage to the side sewer system.
11. Remove and dispose of potential lead soil around buildings, up to 6 feet from building walls and 6 inches deep.
12. Replace partial fencing, patios and improve landscaping at units.
13. Enhance site landscaping and major improvements to the ball field.
14. Repair site benches and tables at various site locations. Replace 6 play areas with new equipment and protective surfacing.

Building Replacement

1. Demolish and dispose of all foundations and buildings. Includes hazardous materials abatement and disposal.
2. Construct new foundations for 69 buildings.
3. Construct new structural framing, including floors, walls and roofs.
4. Add new insulation, new drywall, new doors and windows, new siding, new roofs, new electrical, new flooring, new equipment and furnishings, and new appliances.
5. Addition of 150 square feet to three and four bedroom units (105 units total) for bath addition and to increase living and dining room.
6. Addition of a ¾ bathroom (shower, sink and toilet) to three and four bedroom units.
7. Construct 29 units to full accessibility requirements including routes, kitchens and bathrooms (Type A Requirements, Seattle Building Code and and UFAS. (These may require additional square footage added).

Scenario 2 Site Work

Site Preparation and Mobilization		
Mobilization / Demobilization / Record Drawings		
Remove Sidewalks and Retaining Walls		
Lead Soil Remediation		
Subtotal	**$**	**1,860,000.00**
Temporary Erosion and Sedimentation Controls		
Construction Fencing (6' chain link)		
Sile Fence and Catch Basin Protection		
TESC Allowance for Stormwater		
Subtotal	**$**	**48,000.00**
Utilities - Storm Drainage		
Cleanout		
Catch Basin Type 241		
Inlet Type 250		
8" Diameter PVC Service Drain Pipe		
Connect to Existing Storm Drain Line		
Connect to Existing Manhole		
Stormwater Flow Control Allowance		
Building Footing Drain Allowance		
Subtotal	**$**	**3,665,000.00**
Utilities - Sanitary Sewer		
Sanitary Sewer Manhole Type 200		
Cleanout		
8" Diameter PVC Side Sewer Pipe		
12" Diameter PVC Side Sewer Pipe		
Reline Existing Sanitary Sewer Lines		
Subtotal	**$**	**934,000.00**
Utilities - Water Distribution		
4" Water Service Line		
Fire Service		
4" Fire Service by Seattle Public Utilities		
4" Domestic Service Line		
Connection to Existing System		
Subtotal	**$**	**1,076,000.00**
Utilities - Power / Franchise		
Lighting Allowance		
Electrical/Gas/Telephone/Cable Allowance		
Subtotal	**$**	**575,000.00**

Scenario 2 Site Work

Public Hardscape		
Cement Concrete Sidewalks		
Concrete Driveways		
Subtotal	**$**	**485,000.00**
Landscape		
ROW Planting Strips, Street Trees		
Subtotal	**$**	**100,000.00**
Private Hardscape		
Pervious Concrete Sidewalks		
Asphalt Parking Lot Replacement and Striping		
Cement Concrete Sidewalks		
Concrete Driveways		
Concrete Stairs including Railing		
Retaining Walls		
ADA Accessibility Allowance		
Signage		
Subtotal	**$**	**4,867,000.00**
Site Landscaping		
Site Landscaping Improvements		
Play Structure Replacements		
Miscellaneous Landscaping		
Fencing		
Ball Field Improvements		
Subtotal	**$**	**5,409,000.00**
SUBTOTAL SITE WORK COST	**$**	**19,019,000.00**

Scenario 2 Itemized Costs

Scenario 2 Building Replacement	Units	Unit Cost	Total Cost
Hazardous Materials Abatement			
Good Faith Survey per AHERA Protocols	1	$ 20,000.00	$ 20,000.00
Notifications of Abatement	1	$ 10,000.00	$ 10,000.00
Abatement/Disposal of Sheet Vinyl Tile	1	$ 300,000.00	$ 300,000.00
Abatement/Disposal of Vinyl Asbestos Tile	1	$ 987,000.00	$ 987,000.00
Subtotal			**$ 1,317,000.00**
Demolition			
Structural Demolition	69	$ 32,250.00	$ 2,225,250.00
Foundation Demolition	69	$ 30,000.00	$ 2,070,000.00
Subtotal			**$ 4,295,250.00**
Foundations			
Earthwork	69	$ 4,500.00	$ 310,500.00
Underground Utilities and Connections	69	$ 4,000.00	$ 276,000.00
New Footings and Foundations	69	$ 9,500.00	$ 655,500.00
New Flatwork and Finishing	69	$ 4,000.00	$ 276,000.00
Subtotal			**$ 1,518,000.00**
Building Carpentry			
Base and Trim	561	$ 1,600.00	$ 897,600.00
Siding	69	$ 76,500.00	$ 5,278,500.00
Exterior Structural Plywood Sheathing	69	$ 10,700.00	$ 738,300.00
Structural Framing (Floors, Walls and Roofs)	69	$ 286,800.00	$ 19,789,200.00
Addition to 3 and 4 Bedroom Units (150 sq. ft. total)	105	$ 16,500.00	$ 1,732,500.00
Subtotal			**$ 28,436,100.00**
Roofing and Insulation			
Insulation	69	$ 16,000.00	$ 1,104,000.00
Roofing	69	$ 61,000.00	$ 4,209,000.00
Subtotal			**$ 5,313,000.00**
Windows and Doors			
Doors	561	$ 5,250.00	$ 2,945,250.00
Windows	2,667	$ 720.00	$ 1,920,240.00
Subtotal			**$ 4,865,490.00**
Finishes			
Drywall	561	$ 3,136.00	$ 1,759,296.00
Insulation	561	$ 1,960.00	$ 1,099,560.00
Flooring	561	$ 4,704.00	$ 2,638,944.00
Interior Painting	561	$ 3,500.00	$ 1,963,500.00
Exterior Painting	69	$ 12,747.00	$ 879,543.00
Subtotal			**$ 8,340,843.00**

Scenario 2 Itemized Costs

Scenario 2 Building Replacement	Units	Unit Cost	Total Cost
Equipment and Furnishings			
Bath Equipment	561	$ 500.00	$ 280,500.00
3/4 Bath Addition to 3 and 4 Bedroom Units	105	$ 9,000.00	$ 945,000.00
Construct 29 units to UFAS Requirements	29	$ 12,000.00	$ 348,000.00
New Kitchen Cabinets and Vanities	561	$ 3,000.00	$ 1,683,000.00
New Blinds and Shades	2,667	$ 100.00	$ 266,700.00
Refrigerator and Water Heater	561	$ 3,800.00	$ 2,131,800.00
Washer / Dryer	561	$ 1,000.00	$ 561,000.00
Subtotal			**$ 6,216,000.00**
Mechanical			
Install Plumbing Piping (hot and cold water supply)	561	$ 3,920.00	$ 2,199,120.00
Plumbing Fixtures and Trim	561	$ 8,000.00	$ 4,488,000.00
Install Unit Ventilation Systems	561	$ 1,000.00	$ 561,000.00
Whole Building Attic Ventilation Fan and Controls	69	$ 1,500.00	$ 103,500.00
Subtotal			**$ 7,351,620.00**
Electrical			
New Service and Distribution Wiring	561	$ 10,975.00	$ 6,156,975.00
New Electric Resistance Heating and Line Thermostats	561	$ 1,975.00	$ 1,107,975.00
Subtotal			**$ 7,264,950.00**
SUBTOTAL BUILDING RENOVATION COST			**$ 74,918,253.00**

Scenario 2 Total Cost Summary		Total Cost
Subtotal Site Work		**$ 19,019,000.00**
Subtotal Building Replacement		**$ 74,918,253.00**
Subtotal Site Work and Building Replacement Costs		**$ 93,937,253.00**
General Requirements	6.00%	$ 5,636,235.18
Overhead	2.00%	$ 1,878,745.06
Profit	6.00%	$ 5,636,235.18
Insurance and Bonds	1.25%	$ 1,174,215.66
Sales Tax on Materials	9.50%	$ 4,100,658.52
Design Contingency	7.00%	$ 6,575,607.71
Construction Contingency	10.00%	$ 9,393,725.30
BID COST TODAY		**$ 128,332,675.61**
Construction Administration, Permit and Legal Fees	4.00%	$ 5,133,307.02
Design Fees	8.00%	$ 10,266,614.05
Escalation (2 years)	10.00%	$ 12,833,267.56
TOTAL CONSTRUCTION COST		**$ 156,565,864.24**
COST PER UNIT (561 UNITS)		**$ 279,083.54**

Ongoing Maintenance Costs (Both Scenarios)

The costs identified below are work that will be necessary over time to keep the building systems, equipment, furnishings and finishes functioning and efficient. Typical mechanical and plumbing equipment have a service life of between 10 and 15 years. In residential applications, the service life would be expected to be reduced due to increased usage. These costs are based on current day (2010/2011) costs and include materials and labor for installation. No sales tax, permit fees, design costs or other soft costs are included. The frequency of repair and/or replacement will be dependent on use, more or less frequent replacement may need to occur. Please note that the replacement frequency assumes that the project starts with all new equipment, fixtures and furnishings and the costs are projected to maintain the buildings to a forty year lifespan. For example, roofs typically last twenty years, we assume the buildings have a new roof which will last twenty years and only one replacement will be necessary to reach the forty year lifespan.

Building Maintenance / Replacement Schedule	Replacement Frequency	Units	Unit Cost	Total
Roofing and Insulation				
Roofing	1x	69	$ 61,000.00	$ 4,209,000.00
Subtotal				**$ 4,209,000.00**
Windows and Doors				
Doors	1x	561	$ 5,250.00	$ 2,945,250.00
Windows	1x	2,667	$ 720.00	$ 1,920,240.00
Subtotal				**$ 4,865,490.00**
Finishes				
Flooring	1x	561	$ 4,704.00	$ 2,638,944.00
Interior Painting	3x	561	$ 3,500.00	$ 5,890,500.00
Exterior Painting	3x	69	$ 12,747.00	$ 2,638,629.00
Subtotal				**$ 11,168,073.00**
Equipment and Furnishings				
New Kitchen Cabinets and Vanities	1x	561	$ 3,000.00	$ 1,683,000.00
New Blinds and Shades	3x	2,667	$ 100.00	$ 800,100.00
Refrigerator and Water Heater	1x	561	$ 3,800.00	$ 2,131,800.00
Washer / Dryer	2x	561	$ 1,000.00	$ 1,122,000.00
Subtotal				**$ 5,736,900.00**
Mechanical				
Replace Plumbing Fixtures and Trim	2x	561	$ 8,000.00	$ 8,976,000.00
Replace Unit Ventilation Systems	2x	561	$ 1,000.00	$ 1,122,000.00
Whole Building Attic Ventilation Fan and Controls	1x	69	$ 1,500.00	$ 103,500.00
Subtotal				**$ 10,201,500.00**
Electrical				
New Electric Resistance Heating and Line Thermostats	2x	561	$ 1,975.00	$ 2,215,950.00
Subtotal				**$ 2,215,950.00**
MAINTENANCE COSTS TO ACHIEVE A 40 YEAR BUILDING LIFE				**$ 38,396,913.00**

Appendices Index

ASBESTOS EXECUTIVE SUMMARY REPORT FOR

YESLER TERRACE

SEATTLE HOUSING AUTHORITY

PERFORMED BY

PACIFIC RIM ENVIRONMENTAL, INC
6510 SOUTHCENTER BLVD, SUITE 4
TUKWILA, WA 98188

PRE#14239
JULY 2010

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Introduction

Yesler Terrace is a Seattle Housing Authority (SHA) family housing development located on first hill in Seattle. The site, constructed in 1939 is the oldest public housing community in Seattle. The development consists of residential units divided into five sectors described as;

R Sector	13 Buildings	95 Units
U Sector	9 Buildings	71 Units
W Sector	18 Buildings	132 Units
T Sector	11 Buildings	81 Units
S Sector	9 Buildings	64 Units

The units are further divided into different categories or unit type based on floor plan and general building configuration (example; studio, one-bedroom, two-bedroom, etc.)

Scope of Work

PacRim was provided access to a vacant residence and the following community buildings, Head Start, Boys and Girls Club, Administrative Building and Residence Initiative Center. The residential units inspected were occupied during the inspection therefore asbestos sample collection was limited to non-destructive sampling techniques.

Field inspection, data collection, and report generation were based on the following Scope of Work:

Asbestos-Containing Materials (ACM)

1. Bulk sampling of suspect ACM.
2. Analysis of suspect ACM by a NVLAP accredited laboratory.
3. Quantity estimates of ACM.

Report Generation

4. Written report for asbestos including: sample descriptions, sample locations, and sample analysis results for asbestos.

List of Units Inspected

Asbestos inspection and testing was performed by AHERA Inspector Todd Carter of Pacific Rim Environmental, Inc. (PacRim).

Unit 627 – 1026 Broadway / 3 Bedroom

Unit Description

Two-story three-bedroom

Unit 627 is a two-story three-bedroom apartment. The structure is finished with vinyl siding and newer vinyl frame windows. The single-pitch roof is covered with asphalt rolled roofing.

The interior walls observed were finished with plaster over gypsum wallboard. The floors are finished with floor tile and sheet vinyl flooring. The unit is heated with electric baseboard heaters.

Asbestos Summary by ACM Category

Suspect asbestos-containing materials are classified as **surfacing materials**, **thermal system insulation**, or **miscellaneous materials**. Surfacing materials are those, which are either spray applied or troweled-on for acoustical, decorative, or fireproofing purposes. Thermal system insulation (TSI) is insulation used to inhibit heat transfer or to prevent condensation on pipes, boilers, tanks, ducts and various other components. Miscellaneous materials include all other materials not included in the above categories such as floor tile, ceiling tile, roofing felt, cementitious materials, wallboard systems and products such as caulkings, mastics and putties.

Thermal System Insulation:

No suspect asbestos-containing TSI was identified in the other unit.

Surfacing Materials:

The wall and ceilings are finished with drywall and plaster. The wall and ceiling material was sampled and no asbestos was detected.

Miscellaneous Materials:

Floor Tile and Mastic

Suspect asbestos-containing 12" floor tile and mastic was identified throughout the unit. The material was sampled and found to contain 1-3% Chrysotile asbestos in the tile layer only.

Sheet Vinyl Flooring

Asbestos-containing sheet vinyl flooring was identified in the bathroom and storage cubby above the stairwell.

Asbestos-containing sheet vinyl flooring was also identified on the stair treads of the stairs leading to the second floor.

Tub Surround Mastic

Suspect asbestos-containing tub surround mastic was identified in the bathroom. The material was sampled and no asbestos was detected.

Cove Base Mastic

Suspect asbestos-containing vinyl cove base and associated mastic was identified in the unit. The cove base and mastic was sampled and no asbestos was detected.

Roofing

The single-pitch roof on the unit was not inspected and no testing was performed. The roofing material must be tested prior to disturbance.

TABLE A

Unit Type	Building Type	Total Buildings	Total by unit	No. of Bedrooms	Square Footage	Unit Comments	Area

Limitations

This survey is not intended for, nor should be used as a design specification. The Asbestos in Schools Hazard Amendment and Reauthorization Act (ASHARA), effective November 20, 1990, expanded accreditation requirements to apply to persons who work with asbestos in public and commercial buildings as well as schools. Specifically, ASHARA expanded the Toxic Substances Control Act (TSCA) Section 206 (a) (1) and (3) to require accreditation for any person who designs or conducts a response action with respect to friable ACM in a building. TSCA Section 207 provides for civil penalties of $5,000 for each day of a violation for not employing accredited individuals to design and conduct response actions.

Sampling of suspect asbestos-containing materials was conducted as prescribed in 40 CFR 763.86.

Suspect asbestos-containing materials were identified and classified as a surfacing material, thermal system insulation, or miscellaneous materials. Surfacing materials are those, which are either spray applied or troweled-on for acoustical, decorative, or fireproofing purposes. Thermal system insulation (TSI) is insulation used to inhibit heat transfer or to prevent condensation on pipes, boilers, tanks, ducts and various other components. Miscellaneous materials include all other materials not included in the above categories such as floor tile, ceiling tile, roofing felt, cementitious materials, wallboard systems and products such as caulkings, mastics and putties.

Summary of ACM by Unit Type

Lead-based Paint

Lead-based paint has been identified at Yesler Terrace. The lead-based paint inspection and testing was performed by others.

It is important to keep in mind that although the EPA/HUD standard uses a criterion of 5,000 parts per million dry weight or 1.00 milligrams per square centimeter (1.00 mg/cm^2) for lead-based paint, there still may be lead present in those results reported as negative. In the event that lead is present, Federal OSHA and Washington State Department of Labor & Industries regulations will still apply, since neither agency has established a concentration of lead in paint below which the lead in construction standards do not apply. Workers wearing respiratory protection and who have received proper training in the handling of lead contaminated materials must be used for any construction activities (including manual scraping, manual/power sanding, heat gun applications, general cleanup, and demolition) that affect a paint film containing lead.

This inspection was conducted following the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing with the 1997 revisions and all State and Local regulations except that a different visible color shall, by itself, result in a separate testing combination for a room equivalent. The EPA standard for lead-based paint of 1.0 mg/cm^2 was followed. All requirements for the NITON XRF usage contained in the Performance Characteristics Sheet for the specific XRF were followed.

PACIFIC RIM ENVIRONMENTAL, INC.

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Asbestos Survey

Yesler Terrace
Unit 627
1026 Broadway
Seattle WA

Performed for:

Construction Group International
18684 142nd Avenue NE Bldg. E
Woodinville, WA 98072

Prepared By:

Todd P. Carter AHERA Inspector

Date Prepared: 07/15/2010

PRE#: 14239

Corporate Office
6510 Southcenter Blvd., Ste. #4
Seattle, WA 98188
Phone: (206) 244-8965
Fax: (206) 244-9096

Anchorage Office
Phone (907) 569-8081
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Table of Contents

Section 1.0 Scope of Work
Unit 627 - Yesler Terrace

Pacific Rim Environmental (PacRim) performed an asbestos survey at the vacant two-story residence located at 1026 Broadway in Seattle, WA. The two-story, three-bedroom apartment has bedrooms and bathroom on the second floor and kitchen, living room and laundry room on the first floor. The apartment is heated with electric baseboard heaters.

Asbestos-Containing Materials (ACM)

1. Bulk sampling and analysis of suspect asbestos-containing materials (ACM).
2. Analysis of suspect ACM by a NVLAP accredited laboratory.
3. Quantity estimates of ACM.
4. Written report including recommendations based on the technician's observations, abatement (removal) cost estimates, sample descriptions, and sample location.
5. Statement of Compliance with W.A.C. 296-62-07721 Sign-off form.

The survey was intended to identify possible asbestos-containing materials (ACM) on the interior and exterior of the building. This inspection covered only those areas, which were exposed and/or physically accessible to the inspector. Materials uncovered during the course of demolition, renovation, or maintenance activities that are not identified in this inspection report must be presumed to contain asbestos until PLM analysis proves that this material is not asbestos-containing.

This survey is not intended for, nor should be used as a design specification. The Asbestos in Schools Hazard Amendment and Reauthorization Act (ASHARA), effective November 20, 1990, expanded accreditation requirements to apply to persons who work with asbestos in public and commercial buildings as well as schools. Specifically, ASHARA expanded the Toxic Substances Control Act (TSCA) Section 206 (a) (1) and (3) to require accreditation for any person who designs or conducts a response action with respect to friable ACM in a building. TSCA Section 207 provides for civil penalties of $5,000 for each day of a violation for not employing accredited individuals to design and conduct response actions. Sampling of suspect asbestos-containing materials was conducted as prescribed in 40 CFR 763.86.

Suspect asbestos-containing materials within the structure were identified and classified as a surfacing material, thermal system insulation, or miscellaneous materials. Surfacing materials are those, which are either spray applied or troweled-on for acoustical, decorative, or fireproofing purposes. Thermal system insulation (TSI) is insulation used to inhibit heat transfer or to prevent condensation on pipes, boilers, tanks, ducts and various other components. Miscellaneous materials include all other materials not included in the above categories such as floor tile, ceiling tile, roofing felt, cementitious materials, wallboard systems and products such as caulking, mastics and putties.

Bulk samples collected were submitted for sample analysis in accordance with method EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk building Materials". Analyses were performed in Pacific Rim Environmental Inc.'s NVLAP Accredited Laboratory (Lab Code 101631-0). Materials are positive for asbestos if they are found to contain greater than 1% or 1% asbestos.

A total of twelve (12) were collected and submitted for PLM laboratory analysis. Five (5) of these samples were found to contain greater than 1% asbestos.

Section 2.0 Asbestos-containing Materials (ACM) Survey Narrative
Unit 627 - Yesler Terrace

Bulk samples collected were submitted for sample analysis in accordance with method EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk building Materials". Analyses were performed in Pacific Rim Environmental Inc.'s NVLAP Accredited Laboratory (Lab Code 101631-0). Materials are positive for asbestos if they are found to contain greater than 1% or 1% asbestos.

Thermal Systems Insulation (TSI)

No suspect TSI was identified on the subject Property.

If during the course of wall, ceiling or floor demolition, any TSI materials that are not listed in this report are uncovered, sampling ***must*** be performed prior to disturbing these materials.

Surfacing Materials

Suspect asbestos-containing **drywall and joint compound** was identified in the structure. The suspect material was sampled and ***no asbestos was detected***.

Suspect asbestos-containing **plaster** was identified on the walls and ceilings. The material was sampled and ***no asbestos was detected***.

If during the course of wall, ceiling or floor demolition, any surfacing materials not identified in this report are uncovered, sampling ***must*** be performed prior to disturbing these materials.

Miscellaneous Materials

Suspect asbestos-containing **sheet vinyl flooring and associated mastic** was identified in the bathroom. The material was sampled and found to contain ***50-55% Chrysotile in the backing layer only***.

Suspect asbestos-containing **sheet vinyl flooring and associated mastic** was identified in the storage cubby above the stairwell. The material was sampled and found to contain ***50-55% Chrysotile in the backing layer only***.

Suspect asbestos-containing **sheet vinyl flooring and associated mastic** was identified on the stair treads. The material was sampled and found to contain ***45-50% Chrysotile in the backing layer only***.

Suspect asbestos-containing **floor tile and associated mastic** was identified throughout the residence. The material was sampled and found to contain ***1-3% Chrysotile asbestos in the tile only***.

Suspect asbestos-containing **white sink undercoating** was identified on the kitchen sink. The material was sampled and ***no asbestos was detected***.

Suspect asbestos-containing **vinyl cove base and associated mastic** was identified throughout the residence. The material was sampled and ***no asbestos was detected***.

Suspect asbestos-containing **tub surround mastic** was identified on the bathroom walls. The material was sampled and ***no asbestos was detected***.

If during the course of wall, ceiling or floor demolition, any miscellaneous materials that are not listed in this report are uncovered, sampling ***must*** be performed prior to disturbing these materials.

Section 3.0 Asbestos Abatement Cost Estimate
Unit 627 - Yesler Terrace

The following abatement costs are "best-effort" estimates and are based on current industry averages. The following estimates are subject to many variables beyond the control of PRE. Such variables include, but are not limited to: project duration, contractor work schedule, hours of work allowed by the owner, contractor performance, regulatory agency interpretation of changing regulations, logistics of removal of material and miscellaneous delays. The estimate is meant only as a guideline to assist in the selection of an abatement contractor and may not reflect the actual final costs of asbestos removal. They do not include owner costs such as abatement project oversight and monitoring for compliance to law, and compliance to project plans and/or specifications. These estimates assume that adequate, professional plans and specifications are prepared. Generally, abatement costs are minimized by professional project management as well as utilizing the same asbestos abatement contractor to remove all asbestos containing materials during a single project. It is in no way intended to serve as, or replace, a comprehensive abatement specification. Estimates include permitting, removal and disposal.

Sheet vinyl flooring (bathroom)	54 square feet	@	$6.00 per foot	$ 324.00
Sheet vinyl flooring (storage cubby)	12 square feet	@	$6.00 per foot	$ 72.00
Sheet vinyl flooring (stair treads)	36 square feet	@	$6.00 per foot	$ 216.00
Floor tile (throughout unit)	820 square feet	@	$2.50 per foot	$ 822.50
			TOTAL	**$1,434.50**

Section 4.0 Statement of Compliance
Unit 627 - Yesler Terrace

In accordance with W.A.C. 296-62-07721 and PSCAA Regulation III, Article 4, Pacific Rim Environmental, Inc. performed an asbestos survey of the apartment residence located at 1026 Broadway, Seattle WA.. Should employees or contract personnel encounter any suspect asbestos-containing materials (ACM) it is their responsibility to:

1. Contact a representative of the owner.
2. Consult the inspection report to determine whether or not the suspect material contains asbestos.
3. If the suspect material does not appear in the inspection report, then that material was not sampled and must be presumed to contain asbestos until proven otherwise by sampling and PLM analysis.
4. Ensure that all employees and contractors are informed and advised of the location and type of materials that contain asbestos.

The following asbestos-containing materials were identified at the subject property:

- **Sheet vinyl flooring (bathroom, stair treads, storage cubby)**
- **Floor tile (throughout residence)**

I Hereby Attest:

The inspection report has been made available to me. I will inform all subcontractors of the location and types of materials containing asbestos. I am authorized to sign on behalf of my company.

Contractor:	_____	Owner's Rep:	_____
Signature:	_____	Signature:	_____
Print Name:	_____	Print Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

Appendix A **Asbestos Sample Summary**

Asbestos Summary

Project Name / Address: Yesler Terrace- Unit 627

Project ID	Sample #	Sample Location	AHERA Category	Sample Description	Asbestos Type/%	Approximate Quant.
14239	01	Kitchen	Miscellaneous	White sink undercoating	None Detected	N/A
14239	02	Laundry room	Miscellaneous	White 12x12 floor tile and mastic	Layer 1 (Tile): Chrysotile 1-3%, Layer 2 (Mastic and Tar Paper): None Detected	408 Sq. Ft.
14239	03	Laundry room	Miscellaneous	Brown 4" vinyl cove base and mastic	None Detected (both layers)	N/A
14239	04	Laundry room	Surfacing	Plaster on walls and ceiling	None Detected (both layers)	N/A
14239	05	Laundry room	Surfacing	Plaster on walls and ceiling	None Detected (all layers)	N/A
14239	06	Laundry room	Surfacing	Plaster on walls and ceiling	None Detected (all layers)	N/A
14239	07	Stairs	Miscellaneous	SVF on stair treads	Layer 1 (Vinyl): None Detected, Layer 2 (Backing): Chrysotile 45-50%	36 Sq. Ft.
14239	08	2nd floor hallway	Miscellaneous	SVF in storage cubby above stairs	Layer 1 (Vinyl): None Detected, Layer 2 (Backing): Chrysotile 50-55%	12 Sq. Ft.
14239	09	Bathroom	Miscellaneous	SVF, pebble pattern	Layer 1 (Vinyl): None Detected, Layer 2 (Backing): Chrysotile 50-55%, Layer 3 (Tar Paper): None Detected, Layer 4 (Mastic): None Detected, Layer 5 (Compound): None Detected	54 Sq. Ft.
14239	10	Bedroom 2	Miscellaneous	White 12x12 floor tile and mastic, on wood	Layer 1 (Tile): Chrysotile 1-3%, Layer 2 (Mastic): None Detected, Layer 3 (Tar Paper): None Detected	412 Sq. Ft.
14239	11	Bedroom 3 closet	Surfacing	Wall plaster over GWB	None Detected (all layers)	N/A

Project ID	Sample #	Sample Location	AHERA Category	Sample Description	Asbestos Type/%	Approximate Quant.
14239	12	Bathroom	Miscellaneous	Tub surround mastic	None Detected (all layers)	N/A

Appendix B Bulk Sample Analysis Report

PACIFIC RIM ENVIRONMENTAL, INC.
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BULK SAMPLE ANALYSIS REPORT

CLIENT:	Construction Group International	PRE # :	14239
	18684 142nd Ave. NE, Bldg. E	REPORT # :	2010-07-010
	Woodinville, WA 98072	DATE RECEIVED :	7/2/2010
		ANALYST :	William F .Golloway
PROJECT:	Yesler Terrace - Unit 627	DATE ANALYZED :	7/6/2010
		REPORT BY :	Amy Jackson
		REPORT DATE :	7/7/2010
SAMPLE DATE:	7/2/2010	TURNAROUND:	3-5 Days
CONTACT:	George Bruce	PAGE :	1 of 5

Attached are the results of analysis of 12 bulk samples submitted for asbestos identification: lab ID #2010-07-010 through 2010-07-021.

Samples were analyzed in accordance with method EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk Building Materials".

Unless otherwise noted, samples were inhomogeneous; subsamples of components were analyzed to achieve representative analysis. Separate layers of layered samples are analyzed and reported separately. Unless otherwise stated, asbestos content was quantified by calibrated visual estimation (CVES). CVES concentrations are reported in 2 to 3 percent ranges for fiber concentrations ranging from 1-10%, and 5 percent ranges for concentrations greater than 10%. Samples in which asbestos was not observed are reported as "none detected".

Limitations and Uncertainty:

Factors such as sample quality, sample size, interfering matrix material, fiber size, and fiber concentration contribute to the uncertainty of asbestos concentration measurements in bulk materials. Relative errors exceeding 100% may occur in samples containing <1-10% asbestos. Relative errors are typically below 30% in samples with greater than 10% asbestos, and approach zero as the asbestos concentration approaches 100%.

Asbestos fibers with diameters below approximately 0.25 micrometers are not detectable by PLM. These extremely fine fibers may occur in such products as floor tile, adhesives, and cement products. This limitation can be overcome, however, by the use of alternate analytical methods, such as Transmission Electron Microscopy (TEM).

This report cannot be represented by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. Test results pertain only to the samples submitted for analysis.

NVLAP Accredited LAB #: 101631-0
Samples submitted by: PRE

Reports Reviewed By: _____
Approved Signatory

Corporate Office
6510 Southcenter Blvd., Ste. #4
Seattle, WA 98188
Phone: (206) 244-8965
Fax: (206) 244-9096

Anchorage Office
Phone (907) 569-8081
www.pacrimenv.com

Pacific Rim Environmental, Inc.
BULK SAMPLE ANALYSIS REPORT

CLIENT:	Construction Group International 18684 142nd Ave. NE, Bldg. E Woodinville, WA 98072	PRE # :	14239
		REPORT # :	2010-07-010
		DATE RECEIVED :	7/2/2010
		ANALYST :	William F .Golloway
PROJECT:	Yesler Terrace - Unit 627	DATE ANALYZED :	7/6/2010
		REPORT BY :	Amy Jackson
		REPORT DATE :	7/7/2010
SAMPLE DATE:	7/2/2010	TURNAROUND:	3-5 Days
CONTACT:	George Bruce	PAGE :	2 of 5

Field/Lab ID Number	Sample Location and Description	Asbestos Type(s) / %	Other Material(s)	Date Analyzed
1 2010-07-010	**Kitchen (white sink undercoating).** White, crumbled sink undercoating material. Note: Sample appears homogeneous.	None Detected	Cellulose (20-25%), Binder, Mineral Aggregate.	7/6/10
2 2010-07-011	**Laundry room (white 12x12 floor tile and mastic).** White, brittle floor tile (layer 1) with brown mastic on tar paper (layer 2). Note: Mastic and tar paper were inseparable.	**Layer 1** (Tile): **Chrysotile 1-3%** **Layer 2** (Mastic and Tar Paper): None Detected	**Layer 1:** Mineral Aggregate, Binder. **Layer 2:** Cellulose (60-65%), Tar, Adhesive.	7/6/10
3 2010-07-012	**Laundry room (brown 4" vinyl cove base and mastic).** Brown, flexible cove base (layer 1) with brown mastic (layer 2).	**Layer 1** (Cove Base): None Detected **Layer 2** (Mastic): None Detected	**Layer 1:** Vinyl, Mineral Aggregate. **Layer 2:** Cellulose (<1%), Adhesive, Mineral Aggregate, Paint.	7/6/10
4 2010-07-013	**Laundry room (plaster on walls and ceiling).** Light gray-painted, white, coarse-grained plaster skimcoat (layer 1) on light gray, coarse-grained plaster with adhering paper (layer 2).	**Layer 1** (Skimcoat): None Detected **Layer 2** (Plaster): None Detected	**Layer 1:** Cellulose (<1%), Mineral Aggregate, Binder, Paint. **Layer 2:** Cellulose (<1%), Mineral Aggregate, Binder.	7/6/10

Pacific Rim Environmental, Inc.
BULK SAMPLE ANALYSIS REPORT

CLIENT:	Construction Group International 18684 142nd Ave. NE, Bldg. E Woodinville, WA 98072	PRE # :	14239
		REPORT # :	2010-07-010
		DATE RECEIVED :	7/2/2010
		ANALYST :	William F .Golloway
PROJECT:	Yesler Terrace - Unit 627	DATE ANALYZED :	7/6/2010
		REPORT BY :	Amy Jackson
		REPORT DATE :	7/7/2010
SAMPLE DATE:	7/2/2010	TURNAROUND:	3-5 Days
CONTACT:	George Bruce	PAGE :	3 of 5

Field/Lab ID Number	Sample Location and Description	Asbestos Type(s) / %	Other Material(s)	Date Analyzed
5 2010-07-014	**Laundry room (plaster on walls and ceiling).** Light gray-painted, white, coarse-grained plaster skimcoat (layer 1) on light gray, coarse-grained plaster (layer 2) on white, chalky drywall with brown paper (layer 3).	**Layer 1** (Skimcoat): None Detected **Layer 2** (Plaster): None Detected **Layer 3** (Drywall): None Detected	**Layer 1:** Cellulose (<1%), Mineral Aggregate, Binder, Paint. **Layer 2:** Cellulose (<1%), Mineral Aggregate, Binder, Paint. **Layer 3:** Cellulose (7-10%), Gypsum, Mineral Aggregate, Binder.	7/6/10
6 2010-07-015	**Laundry room (plaster on walls and ceiling).** Light gray-painted, white, coarse-grained plaster skimcoat (layer 1) on light gray, coarse-grained plaster (layer 2) on white, chalky drywall with brown paper (layer 3).	**Layer 1** (Skimcoat): None Detected **Layer 2** (Plaster): None Detected **Layer 3** (Drywall): None Detected	**Layer 1:** Cellulose (<1%), Mineral Aggregate, Binder, Paint. **Layer 2:** Cellulose (<1%), Mineral Aggregate, Binder, Paint. **Layer 3:** Cellulose (7-10%), Gypsum, Mineral Aggregate, Binder.	7/6/10
7 2010-07-016	**Stairs (SVF on stair treads).** Brown and yellow sheet vinyl (layer 1) with gray-brown, fibrous backing and light brown mastic (layer 2). Note: Mastic and backing were inseparable.	**Layer 1** (Vinyl): None Detected **Layer 2** (Backing): **Chrysotile 45-50%**	**Layer 1:** Vinyl, Mineral Aggregate. **Layer 2:** Cellulose (<1%), Binder, Mineral Aggregate, Adhesive, Wood.	7/6/10

Pacific Rim Environmental, Inc.
BULK SAMPLE ANALYSIS REPORT

CLIENT:	Construction Group International 18684 142nd Ave. NE, Bldg. E Woodinville, WA 98072	PRE # :	14239
		REPORT # :	2010-07-010
		DATE RECEIVED :	7/2/2010
		ANALYST :	William F .Golloway
PROJECT:	Yesler Terrace - Unit 627	DATE ANALYZED :	7/6/2010
		REPORT BY :	Amy Jackson
		REPORT DATE :	7/7/2010
SAMPLE DATE:	7/2/2010	TURNAROUND:	3-5 Days
CONTACT:	George Bruce	PAGE :	4 of 5

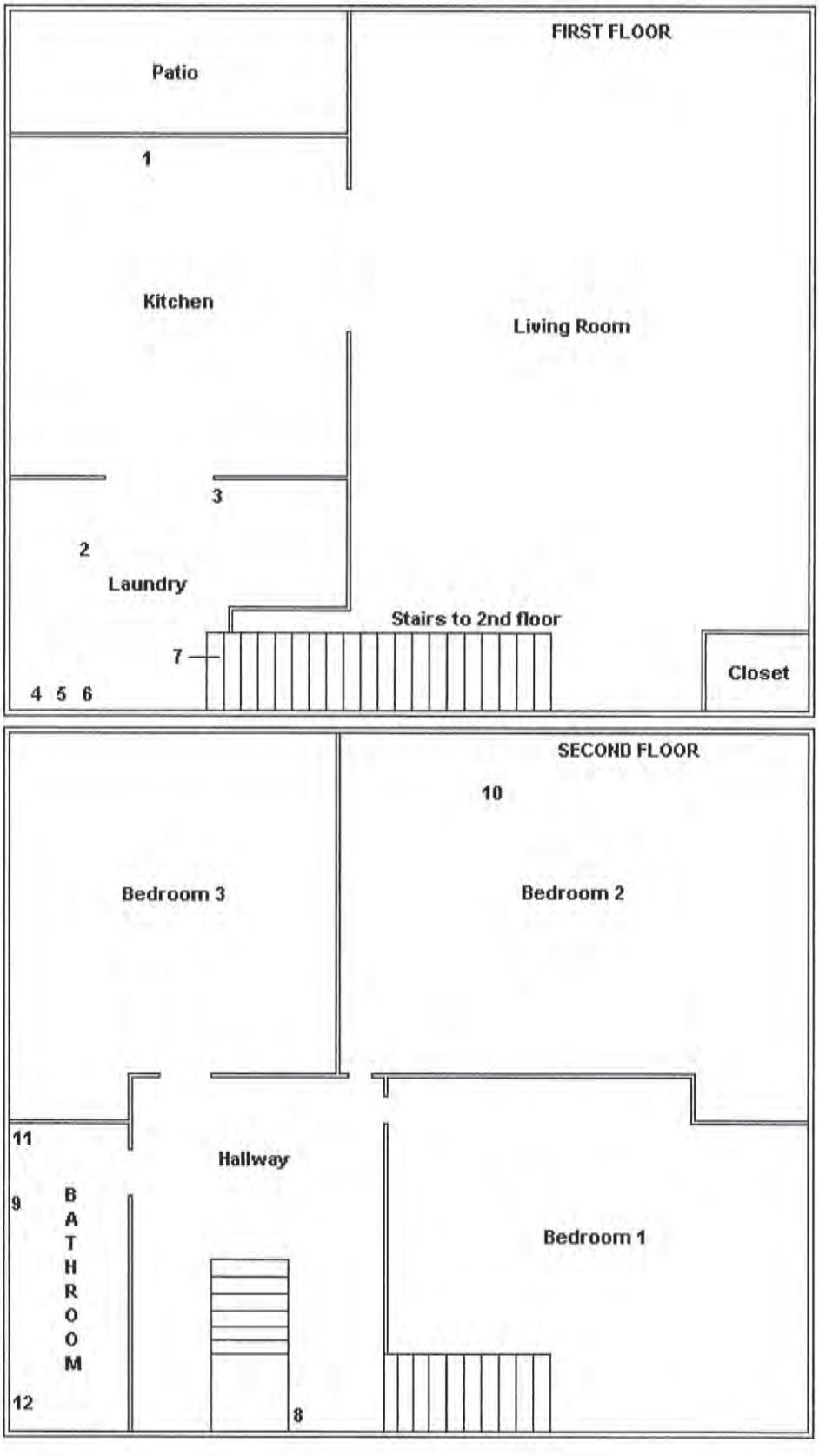
Field/Lab ID Number	Sample Location and Description	Asbestos Type(s) / %	Other Material(s)	Date Analyzed
8 2010-07-017	**2nd floor hallway (SVF in storage cubby above stairs).** White, light green and gray sheet vinyl (layer 1) with light gray, fibrous backing and yellowish-brown mastic (layer 2). Note: Mastic and backing were inseparable.	**Layer 1** (Vinyl): None Detected **Layer 2** (Backing): **Chrysotile 50-55%**	**Layer 1:** Vinyl, Mineral Aggregate. **Layer 2:** Cellulose (1-3%), Binder, Mineral Aggregate, Adhesive.	7/6/10
9 2010-07-018	**Bathroom (SVF, pebble pattern).** White, light green and light brown sheet vinyl (layer 1) with light gray, fibrous backing and yellow mastic (layer 2) on tar paper (layer 3) with brown mastic (layer 4) with white and light brown, chalky compound (layer 5). Note: Mastic and backing were inseparable in layer 2).	**Layer 1** (Vinyl): None Detected **Layer 2** (Backing): **Chrysotile 50-55%** **Layer 3** (Tar Paper): None Detected **Layer 4** (Mastic): None Detected **Layer 5** (Compound): None Detected	**Layer 1:** Vinyl, Mineral Aggregate. **Layer 2:** Cellulose (1-3%), Binder, Mineral Aggregate, Adhesive. **Layer 3:** Cellulose (65-70%), Tar. **Layer 4:** Cellulose (1-3%), Adhesive, Mineral Aggregate. **Layer 5:** Cellulose (<1%), Binder, Mineral Aggregate.	7/6/10
10 2010-07-019	**Bedroom 2 (white 12x12 floor tile and mastic, on wood).** White floor tile (layer 1) with red mastic (layer 2) on black tar paper with brown mastic (layer 3). Note: Tar paper and mastic in layer 3 were inseparable; white compound present in layer 3 but insufficient to test.	**Layer 1** (Tile): **Chrysotile 1-3%** **Layer 2** (Mastic): None Detected **Layer 3** (Tar Paper): None Detected	**Layer 1:** Mineral Aggregate, Binder. **Layer 2:** Cellulose (5-7%), Adhesive. **Layer 3:** Cellulose (60-65%), Synthetics (1-3%), Tar, Adhesive, Mineral Aggregate, Wood.	7/6/10

Pacific Rim Environmental, Inc.
BULK SAMPLE ANALYSIS REPORT

CLIENT:	Construction Group International 18684 142nd Ave. NE, Bldg. E Woodinville, WA 98072	PRE # :	14239
		REPORT # :	2010-07-010
		DATE RECEIVED :	7/2/2010
		ANALYST :	William F .Golloway
PROJECT:	Yesler Terrace - Unit 627	DATE ANALYZED :	7/6/2010
		REPORT BY :	Amy Jackson
		REPORT DATE :	7/7/2010
SAMPLE DATE:	7/2/2010	TURNAROUND:	3-5 Days
CONTACT:	George Bruce	PAGE :	5 of 5

Field/Lab ID Number	Sample Location and Description	Asbestos Type(s) / %	Other Material(s)	Date Analyzed
11 2010-07-020	**Bedroom 3 closet (wall plaster over GWB).** White-painted, white, coarse-grained plaster skimcoat (layer 1) on light gray, coarse-grained plaster (layer 2) and white, chalky drywall with brown paper (layer 3).	**Layer 1** (Skimcoat): None Detected **Layer 2** (Plaster): None Detected **Layer 3** (Drywall): None Detected	**Layer 1:** Mineral Aggregate, Binder, Paint. **Layer 2:** Cellulose (<1%), Mineral Aggregate, Binder. **Layer 3:** Cellulose (5-7%), Gypsum, Mineral Aggregate, Binder.	7/6/10
12 2010-07-021	**Bathroom (tub surround mastic).** White and brown, hard, laminate material (layer 1), and yellow-brown mastic (layer 2) on brown paper with white foam (layer 3) and yellow mastic on brown paper on white, chalky drywall (layer 4). Note: Mastic and paper were inseparable in layer 4.	**Layer 1** (Laminate): None Detected **Layer 2** (Mastic): None Detected **Layer 3** (Paper with Foam): None Detected **Layer 4** (Drywall with Mastic): None Detected	**Layer 1:** Cellulose (40-45%), Binder. **Layer 2:** Cellulose (<1%), Adhesive. **Layer 3:** Cellulose (15-20%), Foam, Binder. **Layer 4:** Cellulose (10-15%), Fiberglass (<1%), Gypsum, Mineral Aggregate, Binder, Adhesive.	7/6/10

Appendix C **Site Sketch**



Construction Group International Yesler Terrace Unit 627	***Pacific Rim Environmental, Inc.*** 6510 Southcenter Boulevard, #4 Tukwila, WA 98188 Tel. (206) 244-8965 FAX (206) 244-9096	Project #: 14239 Sampling Date: 7/2/2010 Drawing By: Amy Jackson Drawing Not To Scale

SAMPLE #	DESCRIPTION
1	Kitchen (white sink undercoating).
2	Laundry room (white 12x12 floor tile and mastic).
3	Laundry room (brown 4" vinyl cove base and mastic).
4	Laundry room (plaster on walls and ceiling).
5	Laundry room (plaster on walls and ceiling).
6	Laundry room (plaster on walls and ceiling).
7	Stairs (SVF on stair treads).
8	2nd floor hallway (SVF in storage cubby above stairs).
9	Bathroom (SVF, pebble pattern).
10	Bedroom 2 (white 12x12 floor tile and mastic, on wood).
11	Bedroom 3 closet (wall plaster over GWB).
12	Bathroom (tub surround mastic).

Construction Group International

Yesler Terrace
Unit 627

Pacific Rim Environmental, Inc.
6510 Southcenter Boulevard, #4
Tukwila, WA 98188

Tel. (206) 244-8965 FAX (206) 244-9096

Project #: 14239
Sampling Date: 7/2/2010
Drawing By: Amy Jackson
Drawing Not To Scale

Appendix D Inspector/Laboratory Certifications

Certificate of Completion

This is to certify that

Todd P. Carter

has satisfactorily completed
4 hours of refresher training as an

Asbestos Building Inspector

to comply with the training requirements of
TSCA Title II / 40 CFR 763 (AHERA)

Certificate Number: 1066937

Instructor

EPA Provider Cert. Number: 1085

ARGUS PACIFIC
TRAINING • CONSULTING

May 26, 2010
Date(s) of Training

Exam Score: NA

Expiration Date: May 26, 2011

Argus Pacific, Inc. • 1900 W. Nickerson, Suite 315 • Seattle, Washington • 98119 • (206) 285.3373 • fax (206) 285.3927

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101631-0

Pacific Rim Environmental, Inc.

Tukwila, WA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

BULK ASBESTOS FIBER ANALYSIS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2010-04-01 through 2011-03-31

Effective dates

DEPARTMENT OF COMMERCE ★ UNITED STATES OF AMERICA ★

Sally S. Bruce

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)

NVLAP® National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Pacific Rim Environmental, Inc.
6510 Southcenter Boulevard
Suite #4
Tukwila, WA 98188
Mr. William F. Golloway
Phone: 206-244-8965 Fax: 206-244-9096
E-Mail: fgolloway@pacrimenv.com

BULK ASBESTOS FIBER ANALYSIS (PLM) **NVLAP LAB CODE 101631-0**

NVLAP Code	*Designation / Description*
18/A01	EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples

2010-04-01 through 2011-03-31
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

cgi construction group international

COLLINS WOERMAN
ARCHITECTURE • PLANNING • INTERIOR DESIGN

Seattle HOUSING AUTHORITY

LYDIG CONSTRUCTION

Seattle Housing Authority - Yesler Terrace

Hazardous Materials & Demolition Assessment

Collins Woerman
700 2nd Avenue, Suite 1400
Seattle, WA 98104
Jon Taylor, Project Architect

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Bellevue, WA 98005
Sean Woerman, Director, Special Projects

Construction Group International LLC
18684 142nd Avenue NE, Bldg. E
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George Bruce, Vice President

August 5, 2010

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GENERAL OVERVIEW

Yesler Terrace is a Seattle Housing Authority property consisting of 561 units divided into groups of buildings designated as R, S, T, U, W, Y & Z. There is a group V that comprises of the Community Center and other buildings utilized by the community that are not included in this assessment. Building 1042 in Group T is a former housing unit that is currently utilized as offices.

The housing units are predominantly composed of 2-story, wood framed structures with concrete or CMU foundations built in 1941 and 1942. The overall site is on a hill that descends from north to south and most all of the foundations are stepped. Many of the buildings have ground floors that are partially below grade. Given the hillside, there are numerous retaining walls constructed of recycled concrete or rockeries. There is a network of sidewalks, fenced yards and playground areas throughout the complex.

A brief description of each cluster with building type is as follows:

Group R – Thirteen (13) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding.

Group S – Nine (9) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding. There is one (1) 1-story building that serves as a laundry facility and a central playground area. The original steam plant and an additional multi-story brick building is located within this group, but not included in the scope of work.

Group T – Eleven (11) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding. Building 1042 is currently being used as offices for the complex.

Group U – Six (6) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding. There is one (1) 1-story building that serves as a laundry facility.

Group W – Eighteen (18) 2-story buildings, concrete foundations, slightly pitched built-up roofs, vinyl siding over original wood siding. There is one (1) 1-story building that serves as a laundry facility.

Group Y – Five (5) 3-story buildings, CMU foundations, pitched roofs with composition asphalt, wood siding.

Group Z – Four (4) 2-story buildings, CMU foundations, pitched roofs with composition asphalt, wood siding. There is one (1) 1-story building that was formerly a residence on the corner of Boren and Yesler.

EXISTING CONDITIONS & HAZARDOUS MATERIALS

Overall, the condition of the existing buildings is fair to good given their age, however, it is apparent that constant maintenance is a given. There were some notable issues that will affect the longevity of the buildings, which include visible water intrusion, deteriorated roofing, clogged downspouts and gutters, plant growth in gutters and animal habitation in gutters and attics. Most of the buildings have built-up roofing which appears to be deteriorating. The life span of a built-up roof is typically 20 years. Most of the buildings have had vinyl siding installed over the original siding, which may have been done to mitigated lead paint issues.

Apparently, previous hazardous material surveys have been conducted, however, CGI has not received any copies of the previous reports. CGI's sub-consultant, Pacific Rim Environmental did conduct a limited good faith inspection for asbestos in one (1) unit, which confirmed that the flooring materials in the unit were sheet

vinyl (SVF) and vinyl asbestos tile (VAT). A copy of this survey and an executive summary is attached. Prior to any renovation or demolition, a comprehensive good faith inspection must be performed as per L&I regulations. A cost for this has been including in the estimate below. Since a comprehensive survey has not been performed, CGI is assuming that the same materials exist in all units. We suspect that these materials may have been removed from some units or new flooring and/or subflooring has been installed over existing. For the purposes of cost estimating, CGI believes it is prudent to assume a worst case scenario.

CGI does not believe that the lead containing paint will be an "abatement" issue. Lead in construction requires an initial negative exposure assessment to confirm that airborne concentrations are below the permissible exposure limit (PEL) and that a Toxicity Characteristic Leachate Procedure (TCLP) test be performed on the waste streams leaving the site.

COSTS

- **Level 1 – Do Nothing**

  GRAND TOTAL COST – Level 1 = $ 0

- **Level 2 – Replace All Interior Finishes**

  - Will require the removal of asbestos containing building materials, which consist of VAT and SVF flooring materials.
  - Removal of interior drywall, insulation, floor finishes, base and trim.
  - Removal of interior doors.

  Abatement

Notifications @ $150 X 66 buildings =		$ 9,900
Yesler Terrace Offices		$ 18,204
SVF @ 66 SF X 2 EA = 132 SF X $6 =	$ 792	
SVF @ 102 SF X 6 EA = 612 SF X $6 =	$ 3,672	
VAT @ 624 SF X 2 EA = 1,248 SF X $2.50 =	$ 3,120	
VAT @ 708 SF X 6 EA = 4,248 SF X $2.50 =	$ 10,620	
Studios @ 400 SF		$ 43,085
SVF @ 66 SF X 35 EA = 2,310 SF X $6 =	$ 13,860	
VAT @ 334 SF X 35 EA = 11,690 SF X $2.50 =	$ 29,225	
1 BR @ 483-690 SF		$ 376,272
SVF @ 66 SF X 192 EA = 12,762 SF X $6 =	$ 76,572	
VAT @ 624 SF X 192 EA = 119,808 SF X $2.50 =	$ 299,520	
2 BR's @ 630-810 SF		$ 545,478
SVF @ 102 SF X 229 EA = 23,358 SF X $6 =	$ 140,148	
VAT @ 708 SF X 229 EA = 162,132 SF X $2.50 =	$ 405,330	
3 BR's @ 880-1,000 SF		$ 245,702
SVF @ 102 SF X 86 EA = 8,772 SF X $6 =	$ 52,632	
VAT @ 898 SF X 86 EA = 77,228 SF X $2.50 =	$ 193,070	
4 BR's @ 1,025 SF		$ 58,390
SVF @ 102 SF X 20 EA = 2,040 SF X $6 =	$ 12,240	
VAT @ 923 SF X 20 EA = 18,460 SF X $2.50 =	$ 46,150	
Good Faith Survey as per AHERA Protocols =		$ 20,000
TOTAL ABATEMENT COST =		**$1,316,851**

Selective Demolition

Studios @ 400 SF		$ 93,240
Drywall @ 2,320 SF X 35 EA = 81,200 SF X $1 =	$ 81,200	
Insulation @ 640 SF X 35 EA = 22,400 SF X $.35 =	$ 7,840	
Base & Trim @ 35 EA X $80 =	$ 2,800	
Doors = 35 EA X $40 =	$ 1,400	
1 BR @ 483-690 SF		$ 810,470
Drywall @ 3,730 SF X 192 EA = 716,160 SF X $1 =	$ 716,160	
Insulation @ 832 SF X 192 EA = 159,744 SF X $.35 =	$ 55,910	
Base & Trim @ 192 EA X $120 =	$ 23,040	
Doors = 384 EA X $40 =	$ 15,360	
2 BR's @ 630-810 SF		$1,238,890
Drywall @ 4,682 SF X 229 EA = 1,072,178 SF X $1 =	$1,072,178	
Insulation @ 1,280 SF X 229 EA = 293,120 SF X $.35 =	$ 102,592	
Base & Trim @ 229 EA X $160 =	$ 36,640	
Doors = 687 EA X $40 =	$ 27,480	
3 BR's @ 880-1,000 SF		$ 555,629
Drywall @ 5,608 SF X 86 EA = 482,288 SF X $1 =	$ 482,288	
Insulation @ 1,408 SF X 86 EA = 121,088 SF X $.35 =	$ 42,381	
Base & Trim @ 86 EA X $200 =	$ 17,200	
Doors = 344 EA X $40 =	$ 13,760	
4 BR's @ 1,025 SF		$ 134,050
Drywall @ 5,755 SF X 20 EA = 115,100 SF X $1 =	$ 115,100	
Insulation @ 1,450 SF X 20 EA = 29,000 SF X $.35 =	$ 10,150	
Base & Trim @ 20 EA X $240 =	$ 4,800	
Doors = 100 EA X $40 =	$ 4,000	
TOTAL DEMOLITION COST =		**$2,832,279**

GRAND TOTAL COST – LEVEL 2 = $4,149,130

- **Level 3 – Replace Exterior Elements**
  - Removal of exterior siding and trim.
  - Removal of windows and trim.
  - Removal of roofing.

Selective Demolition

Studios @ 400 SF	
Windows @ 60 SF X 35 EA = 2,100 SF X $6 =	$ 12,600
1 BR @ 483-690 SF	
Windows @ 104 SF X 192 EA = 19,968 SF X $6 =	$ 119,808
2 BR's @ 630-810 SF	
Windows @ 122 SF X 229 EA = 27,938 SF X $6 =	$ 167,628
3 BR's @ 880-1,000 SF	
Windows @ 150 SF X 86 EA = 12,900 SF X $6 =	$ 77,400
4 BR's @ 1,025 SF	
Windows @ 154 SF X 20 EA = 3,080 SF X $6 =	$ 18,480
SUBTOTAL COST – WINDOWS =	**$ 395,916**

Group R		
Vinyl & Wood Siding @ 64,960 SF X $1.50 =	$ 97,440	
Group S		
Vinyl & Wood Siding @ 40,064 SF X $1.50 =	$ 60,096	
Group T		
Vinyl & Siding @ 56,128 SF X $1.50 =	$ 84,192	
Group U		
Vinyl & Wood Siding @ 40,672 SF X $1.50 =	$ 61,008	
Group W		
Vinyl & Siding @ 112,416 SF X $1.50 =	$ 168,624	
Group Y		
Wood Siding @ 30,720 SF X $1 =	$ 30,720	
Group Z		
Wood Siding @ 46,656 SF X $1 =	$ 46,656	
SUBTOTAL COST – SIDING =		**$ 548,736**
Group R		
Built-Up Roofing @ 45,020 SF X $2 =	$ 90,040	
Group S		
Built-up Roofing @ 28,464 SF X $2 =	$ 56,928	
Group T		
Built-up Roofing @ 40,200 SF X $2 =	$ 80,400	
Group U		
Built-up Roofing @ 30,264 SF X $2 =	$ 60,528	
Group W		
Built-up Roofing @ 76,064 SF X $2 =	$ 152,128	
Group Y		
Composition Roofing @ 21,794 SF X $1.50 =	$ 32,691	
Group Z		
Composition Roofing @ 41,012 SF X $1.50 =	$ 61,518	
SUBTOTAL COST – ROOFING =		**$ 534,233**
GRAND TOTAL COST – LEVEL 3 =		**$1,478,885**
GRAND TOTAL COST – LEVELS 2 + 3 =		**$5,628,015**

- **Level 4 – Complete Demolition**
  - Will require the removal of asbestos containing building materials, which consist of VAT and SVF flooring materials. There could also be additional abatement work with respect to the original underground steam system that feeds each building via crawl space or partial basement area. This abatement work would be limited to any exposed asbestos and does not address any costs to excavate and abate subterranean asbestos containing materials.
  - Removal of building structures to the foundations with the existing foundation to remain.

Structure Demolition

Yesler Terrace Offices		
690 SF X 2 + 810 SF X 6 = 6,240 SF X $5 =	$ 31,200	
Studios @ 400 SF		

400 SF X 35 EA = 14,000 SF X $5 =	$ 70,000	
1 BR @ 483-690 SF		
690 SF X 192 EA = 132,480 SF X $5 =	$ 662,400	
2 BR's @ 630-810 SF		
810 SF X 229 EA = 185,490 SF X $5 =	$ 927,450	
3 BR's @ 880-1,000 SF		
1,000 SF X 86 EA = 86,000 SF X $5 =	$ 430,000	
4 BR's @ 1,025 SF		
1,025 SF X 20 EA = 20,500 SF X $5 =	$ 102,500	
SUBTOTAL COST – STRUCTURE DEMOLITION =		**$2,223,550**
TOTAL ABATEMENT COST =		**$1,316,851**

GRAND TOTAL COST – LEVEL 4 = $3,540,401

If new structures with more levels than the existing were to be eventually constructed within the same footprints, the existing foundations are inadequate and there would be additional costs involved with removing them. In addition, a new construction project would also require a significant amount of excavation and utility installation that would likely require the removal of retaining walls, sidewalks, playground slabs, fences, etc. These costs have not been calculated a part of this report, however, if requested, CGI could readily provide this information.

Background

Our examination of the existing structural condition of the Yesler Terrace housing community is based on a review of historical documents, and a site investigation of three units. The site investigation included a review of the structural building systems based on criteria outlined in ASCE/SEI Standard 31, Seismic Evaluation of Existing Buildings.

The existing housing units were built in the 1940's and are constructed with wood framing supported on conventional concrete foundations. The stem walls connecting the wood framing to the foundations are constructed with reinforced concrete or CMU. The stem walls vary in height depending on the site slope conditions. The ground floor of the majority of the units consists of a conventional slab-on-grade on native soil. Basements are constructed with concrete walls and concrete support beams.

The interior and exterior structural stud walls consist primarily of 2 inch nominal framing members at 16 inches on center with posts or bundled studs at beams and corner windows. Floor and roof framing consists of either 2 inch nominal tongue and groove decking over 2 inch nominal joists or 6 inch nominal tongue and groove decking spanning between bearing walls and beams.

The lateral force resisting system consists of wood stud walls with gypsum board and wood lap sheathing and tongue and groove floor framing.

Structural Observations

Unit 631

Unit 631 is a two bedroom unit located in Section Y. The unit is two stories tall is part of a multi-unit two-story building. This unit was occupied at the time so we were only able to observe the existing conditions in a small basement at one end of the unit (Photograph #1).

The first floor framing above the basement consists of nominal 2x tongue and groove decking over nominal 2x joists at 16 inches on center. The joists bear directly on the concrete beams and perimeter concrete retaining walls and are not anchored with bolts or other mechanical fasteners. This was verified by reaching up between the joist spaces and feeling for bolts or other mechanical fasteners. There is some deterioration of the reinforced concrete retaining walls in one areas and one of the walls in the basement is constructed with unreinforced clay tile.

Photograph #1 – Unit 631 Basement

Unit 627

Unit 627 is a two bedroom flat located in Section Y. The unit is two stories tall and is part of a multi-unit two story building. This unit and the rest of the units in this building have newer vinyl siding applied over lap siding or 3/8 inch thick plywood backing. This was visually verified by prying up the vinyl siding in several locations without damaging the siding. The unit walls are framed with nominal 2x wood studs at 16 inches on center.

The ground floor of this unit is a conventional slab-on-grade and the upper floors are framed with nominal 4x tongue and groove decking spanning between wood beams and stud walls. The interior walls of this unit are all sheathed with gypsum board. This unit and the other units in this building have corner windows in several rooms with a single corner post to support the framing above.

There are several areas around the perimeter of this building that do not appear to have good drainage which may be causing water intrusion into the wall cavity (Photograph #2).

Photograph #2 – Unit 631 Poor Drainage

Unit 833 & 835

These units are part of a three-story multi-unit building in Section S. Most of the first floor walls are constructed with reinforced concrete and CMU (Photograph #3).

Photograph #3 – Unit 833 & 835 First Floor Walls

The unit walls above the second floor are framed with nominal 2x wood studs at 16 inches on center. The ground floor of this unit is a conventional slab-on-grade and the upper floors are framed with nominal 4x tongue and groove decking spanning between wood beams and stud walls. The upper floors of this unit are sagging noticeably (Photograph #4). The floors were checked using a carpenter's level to determine the maximum slope of the floor.

Photograph #4 – Unit 833 & 835 Floor Sag

These units and the rest of the units in this building have newer cedar siding applied over 3/8 inch thick plywood backing. The plywood is nailed to the wall studs with a minimal number of nails that do not meet structural requirements for seismic force resistance (Photograph #5). There is also evidence of water intrusion into the wall cavity at wall corners and door openings. The interior walls of this unit are all sheathed with gypsum board.

Photograph #5 – Inadequate Exterior Sheathing Attachment

Unit 439

This unit is part of a three-story multi-unit building in Section Z. Most of the first floor walls are constructed with reinforced concrete and CMU. The unit walls above the second floor are framed with nominal 2x wood studs at 16 inches on center.

The ground floor of this unit is a conventional slab-on-grade and the upper floors are framed with nominal 4x tongue and groove decking spanning between wood beams and stud walls (Photograph #6).

Photograph #6 – Unit 439 Floor Framing

There is a noticeable sag in the ceiling and there are several cracks in the plaster that have widened due to the sag in the floor.

These units and the rest of the units in this building have newer cedar siding applied over 3/8 inch thick plywood backing. The plywood is nailed to the wall studs with a minimal number of nails that do not meet structural requirements for seismic force resistance. The interior walls of this unit are all sheathed with gypsum board.

Summary of Existing Building Conditions

Based on our observations, the existing living units are in poor condition. The overall lateral force resisting systems for the units do not meet minimum seismic standards based on the requirements in ASCE 31. Several units have corner windows which result in a vertical discontinuity in the lateral force resisting system. It is likely that the structural studs inside building walls are decaying due to water intrusion and poor ventilation. It is highly likely that extensive decay of structural walls is occurring at walls with vinyl siding applied directly over wood siding or where the site is poorly drained. All interior walls are inadequately sheathed with gypsum board or lath and plaster and there is no structural grade sheathing on the exterior

walls. There is no evidence to indicate that wood stud walls and wood sill plates are mechanically connected to the foundation system with bolts or steel hold down straps. There is also no evidence to indicate that the structural walls are interconnected between floors to allow for proper transfer of seismic forces through the floor and into the foundation. All of the deficiencies described above could result in significant damage to structural elements, finishes, mechanical systems and personal belongings in the event of a design level seismic event. The resulting damage may also cause the units to be uninhabitable for an extended period of time following the seismic event.

In addition to the deficiencies in the lateral force resisting system, the floor framing does not meet the current minimum standard of 1/240 times the floor span for deflection. There is currently noticeable sag that is greater than 1/240 times the floor span in the in several units. This deficiency will result in continued cracking in ceiling finishes over time.

Redevelopment Option Summaries

Repair Units

In order to extend the useful life of the existing units another 40 years, the structural lateral force resisting system will need to be upgraded per ASCE 31 requirements. The seismic upgrade will include removing and replacing decayed or damaged framing members, mechanically fastening the bearing and shear walls to the foundation, adding a layer of plywood sheathing to the exterior walls and interior floors and fastening exterior walls together through the floors at corners and window openings. Based on our investigation and the age and visible condition of the buildings, we believe that approximately 25% of the existing framing members will need to be replaced due to decay and damage. In order to meet ASCE 31 requirements, we anticipate that 80% of the exterior walls and 20% of the interior walls will need to be covered with structural grade plywood or OSB sheathing. All exterior walls will need to be bolted to the existing foundation system with ½" diameter bolts spaced at no more than 36 inches on center and exterior walls will need to be connected together with steel bolts and/or light gage steel straps.

Replace Units

Replace the existing units with conventional wood framed units that meet current building code requirements. Exterior walls will be 2x6 construction and interior walls will be 2x4 or 2x6 construction. Exterior walls will be sheathed with plywood or engineered wood sheathing panels as needed to resist lateral forces. Floor and roof framing will be conventional 2x framing or engineered lumber with plywood sheathing. Exterior and interior walls will be anchored to existing or new foundations with standard anchor bolts. Destructive and non-destructive testing of the existing foundations will need to be performed to determine if some or all of them can be reused. Existing stem walls cannot be reused effectively due to current code requirements for embedded anchor rods.

Background

The housing units for Yesler Terrace are predominantly 1940's era, stick frame construction, mostly slab on grade with some units having crawlspaces. The buildings are one to three stories with individual units of one to four bedrooms.. A handful of units are not available to lease due to sewer pipe damage just beyond the building.

Each unit has electric baseboard heating with wall thermostats or baseboard mounted thermostats, kitchen ventilation hood, bathroom exhaust fan and a clothes washer and dryer connections (for tenant provided appliances). Dryer vent, kitchen hood and bathroom exhaust ducting is directly to the exterior and terminates with at wall vent with backdraft damper.

Plumbing in each unit consists of an electric hot water heater, fixtures in the kitchen and bathroom and combination shower and bathtub. The domestic piping is copper pipe.

Operable windows provide ventilation air for some units where windows have been replaced. Other units have fixed windows and therefore cannot provide ventilation, which is in violation of the current mechanical code.

Each unit observed has differences in mechanical and plumbing equipment. As the current equipment wears out and fails over time, it is replaced by maintenance personnel with a similar available product that may or may not match the previous equipment. Typical service life of equipment in commercial use is shown in Table 1 below. In residential applications, the service life would be expected to be reduced due to increased usage.

Table 1. Median Equipment Service Life (ASHRAE, National Association of Home Builders

Equipment Item	Life Expectancy (years)
Baseboard heater	13
Bathroom exhaust fan	10
Kitchen range hood	14
Lavatory	15
Water Heater	11

Equipment service life will vary depending on amount of use, product material and maintenance.

Existing Conditions

A site observation was performed on 30 June 2010 in several dwelling units: Nos. 627, 631, 833, 835 and 845. Subsequent observations for units 773, 439 and 518 were accomplished at later dates.

Unit 627

This unit has newer vinyl frame, double pane windows. Baseboard heaters appear to be in reasonable condition with some dents and scratches. One baseboard in particular needs its control panel re-attached in order to keep the wiring covered. Some wall thermostats are missing cover plates or control knobs and need to be replaced as Photo 1 below illustrates.

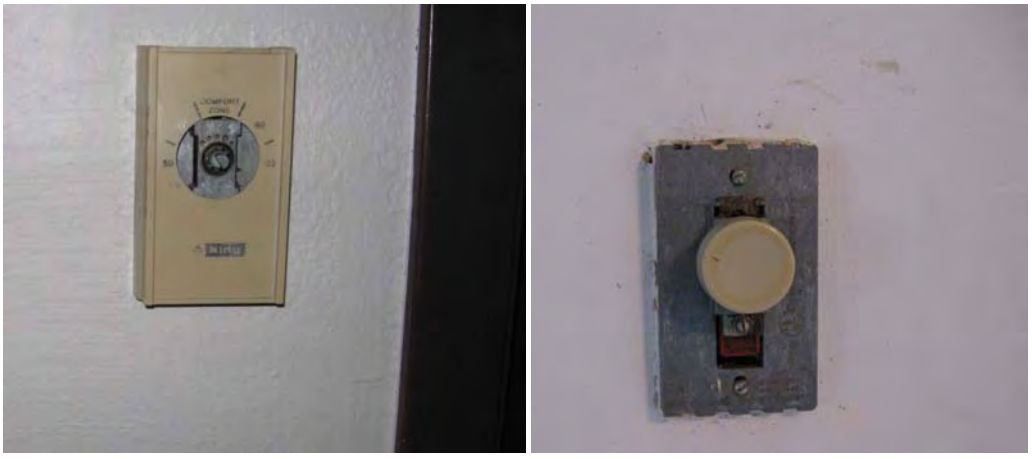


Photo 1 Wall Thermostats

Shown in Photo 2, the bathroom exhaust fan is very poor shape and needs to be replaced. The shower and tub combination and lavatory are all in poor condition and need to be replaced.

The kitchen range hood appears to be older and is not mounted level with the cabinet.

Photo 2 Bathroom Exhaust Fan

The control knobs are illegible to read, the hood has been scratched and repainted before and should probably be replaced, or at a minimum, cleaned, repainted and repositioned level with the cabinet. The exhaust duct in the cabinet is in decent condition but may need an enclosure around it to prevent it from being damaged. Other units did have duct enclosures.

It is apparent that the clothes dryer lint trap was not maintained as it should have been, see Photo 3 below. The wall termination was completely obstructed by lint build-up,

Photo 3 Dryer Exhaust Termination with Lint Build-up

therefore restricting dryer airflow. This is a fire hazard and needs to be thoroughly cleaned before the space is leased. Additionally, this is an improper type of wall cap to be used for this application. This should be replaced with one which has a single backdraft damper blade.

Unit 631

This unit was occupied and only access to the crawlspace was permitted. Note that there are some units that are slab on grade, the others have crawlspaces. This crawlspace area was originally a community clothes wash area. The original galvanized plumbing has been abandoned in place. Insulation is correctly installed in the crawlspace with the vapor barrier facing the floor above. Some insulation has fallen from its supports and needs to be re-anchored.

There did not appear to be ventilation openings for the crawlspace, which is a violation of the current building code. The current minimum opening requirement is one square foot of opening per 150 square foot of crawlspace.

Chemicals and other cleaning agents were observed to be stored in the crawlspace. This creates the possibility of fume build-up in the space. An exhaust fan should be provided for this crawlspace, if it will continue to be used for this storage, per Seattle Mechanical Code 401.6. Other units that have crawlspaces should be inspected for exhaust or ventilation requirements and remediation performed to meet code requirements.

Unit 833

In general, this unit is in decent shape and appears to have been recently refurbished. The water heater, bathroom fan and kitchen range hood appear to have been recently replaced and are in good condition. The bathroom and kitchen fixtures are free of cosmetic defects.

Unit 835

This unit is in the process of being repaired due to some smoke damage. The toilet and shower fixtures have been removed and are being replaced. The bathroom exhaust fan needs replacement, or at a minimum, be thoroughly cleaned. Baseboard heater thermostats are missing control knobs and need to be replaced. The kitchen range hood is in decent cosmetic shape but may need to be replaced due to smoke damage.

Unit 845

This unit appears to be in decent shape. There was no noticeable cosmetic damage to mechanical equipment and items have been replaced as needed.

Unit 773

This unit is part of the Seattle Housing Authority's YWCA program. Ventilation is provided by operable windows in the living areas and bedrooms. Windows are metal frame with double pane glazing. Metal framed windows are a problem in our climate. During cold weather, moisture condenses on the frames which runs down and collects on the window sill. Excessive moisture breeds mold and is a health hazard. Electric

Photo 4 Baseboard Heater in Poor Condition

baseboard heaters are in very bad condition, as seen in the Photo 4, and need to be replaced. Their respective wall mounted thermostats also need replacement.

The kitchen range hood (see Photo 5), sink and fixture are in poor condition and all need to be replaced.

Photo 5 Kitchen Rangehood Exhaust Fan

The bathroom exhaust fan is in satisfactory condition but needs to be cleaned. The fiberglass shower-tub and vitreous china lavatory all need replacing.

Domestic water piping to the multi-unit building is copper, with one shut-off valve for the building. The water heater is 2006 vintage and appears to be in decent condition. Domestic water piping in this unit is copper and in reasonable appearance based on the visual inspection from one wall opening.

Unit 439

Ventilation is provided by operable windows in the living areas and bedrooms. Windows are vinyl frame with double pane glazing. Electric baseboard heaters and thermostats are in fair condition, except one baseboard that is damaged and needs to be replaced, see Photo 6. The face plate does not completely cover the heating elements and is a fire hazard.

Photo 6 Electric Baseboard Heater with Panel Cover

Kitchen exhaust hood has rust and is in poor condition and needs to be replaced. The associated ductwork should be enclosed to prevent damage. The bathroom light/exhaust fan, at a minimum, needs to be cleaned and a cover for the light added. Given the age of the fan, a new one should be installed.

Dryer duct is layered with lint and must be cleaned to prevent a fire. The wall termination has broken backdraft dampers and needs to be replaced. Clothes washer connection box needs to be replaced due to unsightly rust stains.

This building has a crawlspace with ventilation openings scattered at various locations. It appears that the opening areas may be inadequate to meet current code for crawlspace ventilation. One square foot of opening per 150 square foot of crawlspace area is the current International Building Code requirement.

Part of the crawlspace includes an old community laundry facility that has been closed off for some time. The only entrance to it is through an access door at the exterior. There is galvanized piping throughout the laundry area that appears to be abandoned in place. Newer plastic waste and rainleader piping was added about 1997.

As seen in Photo 7, this basement area has been flooded. A visual inspection should

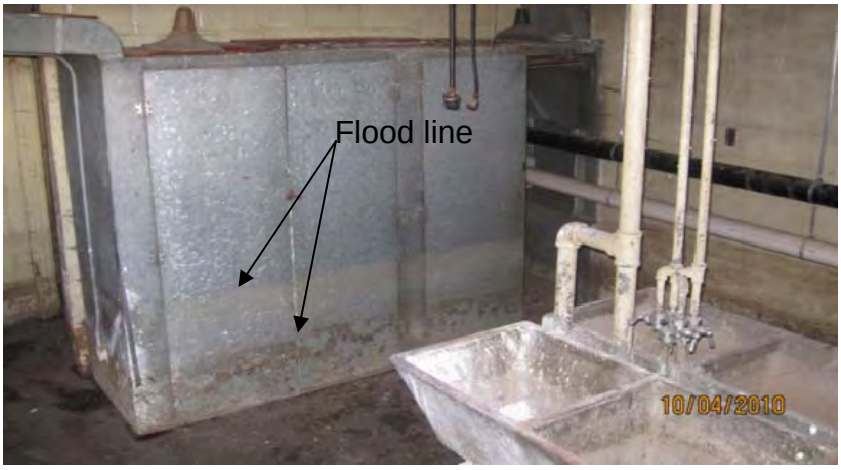


Photo 7 Basement Area with Abandoned Existing Laundry Facility

be performed regularly to verify if the basement area is flooding currently or if this was an issue that was resolved in the past.

Unit 518

Ventilation is provided by operable windows in the living areas and bedrooms. Windows are vinyl frame with double pane glazing. Electric baseboard heaters and thermostats are in fair condition.

Kitchen exhaust hood is in reasonable condition for its age. The associated ductwork should be enclosed to prevent damage. The bathroom exhaust fan, at a minimum, needs to be cleaned. Given the age of the fan, a new one should be installed. The bathtub is in satisfactory condition but the surround and fixtures needs to be replaced.

Dryer duct is clean and free from obstructions. The wall termination backdraft dampers are in working order. Washer water connection box needs to be replaced due to unacceptable rust stains.

This building has a crawlspace with ventilation openings scattered at various locations. Some vents are damaged and should be replaced. It appears that the opening areas may be inadequate to meet current code for crawlspace ventilation. One square foot of opening per 150 square foot of crawlspace area is the current International Building Code requirement.

Challenges and Recommendations

General

The majority of the units observed had equipment that well exceeded their useful life. In order to extend the service life for all living units at Yesler Terrace an additional 40 years, all mechanical and plumbing systems should be replaced. Also note that major components need to be replaced at approximately 15 year intervals, see Table 1.

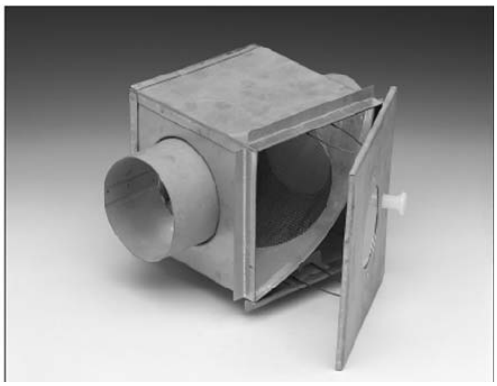
Ventilation

Ventilation is required in residential applications as listed in the Seattle Mechanical Code. All housing units for Yesler Terrace are naturally ventilated through operable windows. In order to comply with the code, all occupiable rooms must have operable window area equal to 4% of the floor area, at a minimum. Some units already meet this requirement but others do not as some rooms were observed to have non-operable windows.

For current mechanical code compliance, a whole house ventilation system is required. Operable windows alone do not satisfy this requirement so a separate exhaust fan and timeclock controls would need to be installed.

The clothes dryers in some units are located a significant distance away from the exterior wall termination. Starting 23 November 2010, the mechanical code will allow a maximum of 35 equivalent feet of clothes dryer duct equivalent length unless the dryer manufacturer specifies that further lengths are acceptable. Note that this overall length must be reduced 5 feet for every duct elbow. This means that a dryer duct system with two elbows can have a maximum of 25 feet actual duct length. Longer duct distances can be achieved with the addition of a dryer booster fan. The fan would need to be located in a ceiling soffit with an access door.

The dryer ductwork needs to be inspected and cleaned along its entire length on a regular basis. Where duct is concealed and unavailable for inspection a, supplemental lint trap should be installed such as the Fantech DBLT4 as shown in Picture 1 below. Installing a secondary lint trap will help mitigate this lint build-up.



Picture 1 Secondary Dryer Lint Trap

Piping

Existing hot and cold domestic water piping was observed to be copper pipe. Given that the buildings were originally constructed in the early 1940's and galvanized pipe was found abandoned in place in closed off areas, the exact age of the copper pipe cannot be determined. The last major renovations were completed in the early and late 1980's so it is a reasonable assumption that the copper piping is at least 30 years old.

Velocity of domestic water through the pipes is likely higher than that permitted under the current plumbing code. Maximum pipe velocities of 8 and 5 feet per second are allowed for cold and hot water, respectively, at this time. As recently as 2003, maximum velocities were 10 feet per second for both hot and cold water. These higher velocities were found to erode the pipe wall thickness at a faster rate, thus reducing the life expectancy of the pipe. It is a reasonable assumption that when the copper piping was installed at Yesler Terrace, pipe velocities would be on the high end.

Lead based solder was banned under the provisions of the Safe Drinking Water Act Amendments of 1986. Since the vast majority of renovations were performed prior to this law, there is a high probability that lead based solder was used in the copper piping. The exception would be the units in Z and Y Sectors, as these buildings were modernized in 1988 and should not have lead solder. Excessive levels of lead in drinking poses a significant health risk to humans, especially to children. Many of the tenants living at Yesler Terrace are children so this is a serious issue.

Therefore, given the assumed age of the copper pipe, probable water velocity erosion and the likelihood that lead based solder was used, all the domestic water piping in areas other than Sectors Y and Z should be replaced with a plumbing system meeting current plumbing codes. Sectors Y and Z will need, at a minimum, the hot water piping replaced in order to achieve an additional 40 year service life. This is due to the pipe

erosion caused by high pipe velocity. The cold water velocity has changed little and may likely be sufficient for the short term but should still be replaced to ensure an additional 40 year service life extension.

Costs

Table 2 below lists HVAC and plumbing cost breakdowns for demo and installation of typical fixtures and equipment found in all units. Note that these costs do not include cutting and patching of walls or access doors by the general contractor. These costs would be realized for their general replacement and would occur several times per living unit in order to extend a 40 year service life.

Table 2 Repair Maintenance Costs and Expected Replacement Times to Add 40 Year Life

Equipment Item	$/item in 2010*	Times Replaced in Future	
Single 8' Baseboard heater	$370	3	1110
Baseboard heater remote thermostat	$156	3	468
Bathroom exhaust fan w/ timeclock	$422	3	1266
Rangehood and ductwork modification	$483	3	1449
Dryer lint trap	$105	1	105
Dryer booster fan and controls	$485	3	1455
(1) Water Closet	$3,220	3	9660
(1) Kitchen sink	$1,210	3	3630
(1) Shower	$2,420	2	4840
(1) Lav	$1,210	4	4840
(1) Water Heater	$2,820	4	11280
(0.5) Hose Bibb	$600	2	1200

** Excludes cost and labor inflation*

Scenario 1 Repair to extend current life of units another 40 years

In order to extend the life of Yesler Terrace an additional 40 years, a complete demo and re-installation of the mechanical and plumbing systems is required on a like-for-like basis. Existing plumbing waste and vent piping would be re-used, hot and cold water would be new copper piping. Below is an itemized summary for 561 units:

Repair
Construction

	HVAC		Plumbing	
	per unit	all Units	per unit	all Units
Demo Cost (561 units)	$1,930	$1,082,730	$3,719	$2,086,359
Install Cost (561 units)	$6,623	$3,715,503	$11,110	$6,232,710
Sub Total		$4,798,233		$8,319,069
Total				$13,117,302
Whole House vent	$3,909	$2,192,949		
Grand Total				$15,310,251

The line item for whole house ventilation is for the addition of a ventilation fan and controls to bring the units up to current ventilation code requirements. This does not include electrical costs.

Scenario 2 Total Replacement

All mechanical and plumbing is demolished and complete new systems meeting current codes are installed. They include whole house ventilation, kitchen range hood, toilet exhaust, electric baseboard heat, electric water heater with copper piping and new fixtures. There are 561 units, with 106 units having the ¾ bath.

Replacement
New Construction

	HVAC		Plumbing	
	per unit	all Units	per unit	all Units
Demo Cost (561 units)	$1,313	$736,593	$2,506	$1,405,866
Install Cost (561 units)	$6,550	$3,674,550	$7,021	$3,938,781
3/4 Bath Install (102 units)	$867	$91,902	$5,568	$590,208
Sub Total		$4,503,045		$5,934,855
Grand Total				$10,437,900

MacDonald-Miller
FACILITY SOLUTIONS

Project YESLER TERRACE
Job # 760-9093-00 Date 6/30/2010
By J LIENING
Page 1 Of

SITE VISIT NOTES

UNIT #631
- ACCESS TO CRAWLSPACE ONLY, OCCUPIED ABOVE
- SOME INSULATION IS HANGING & NEEDS TO BE RE-SECURED
- GALVANIZED PIPE
- DUCTWORK EXPOSED, DOES NOT APPEAR TO BE INSULATED
- IS GALVANIZED PIPE DOMESTIC? STEAM?

UNIT #627
- WATER HEATER OK
- MISSING THERMOSTAT COVERS
- SOME BASEBOARD UNITS NEED TO BE REPLACED
- TUB + LAV NEED REPLACING
- BATHROOM FAN NEEDS REPLACING
- KITCHEN HOOD NEEDS REPLACING. (DUCT EXPOSED IN CABINET)
- DRYER DUCT TERMINATION PLUGGED W/ LINT

UNIT #833
- TUB OK, LAV OK
- BATHROOM FAN OK
- WATER HEATER LOOKS OK
- BB HEAT, THERMOSTATS OK
- RANGE HOOD OK

M003 REV 5/03

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Project
Job # Date
By
Page 2 Of

UNIT 835

- WATER HEATER OK
- BB HT SATISFACTORY. T'STATS NEED TO BE FIXED
- RANGE HOOD OK, (EXPOSED DUCT IN CABINET)
- BATHROOM FAN NEEDS REPLACING
- FIBERGLASS TUB NEEDS REPLACING

UNIT #845

- RANGE HOOD OK
- BB HEAT OK
- LAV + TUB OK

M003 REV 5/03

9/29/2010

9:30 Yesler Terrace Site Visit - Unit 773

Kitchen:

- ☐ Sink/faucet - old stainless stl. - needs rep
- ☐ Range hood - Bad condition - " "
- ☐ Heating - elect. BB - Very bad cond. - " "
- ☐ Ventilation - NONE

Bathroom:

- ☐ Lav/faucet - Vit China - " "
- ☐ Shower/tub - fiberglass " "
- ☐ exhaust - OK cond. but need long term replacement
- ☐ heat - NONE

Living Room

- ☐ Heat - Elect BB - Very bad cond, needs rep
- ☐ Ventilation - operable windows - doesn't mt. code

Bedrooms

- ☐ Heat - Elect. BB - Very bad cond. needs rep
- ☐ Ventilation - operable windows - doesn't mt. code

Cut into wall at cloths washer box - piping is copper.

Water service to bldg is copper - one shut off valve per building.

MacDonald-Miller
FACILITY SOLUTIONS

Project SHA YESLER TERRACE
Job # 760-9093-00 Date 10/4/2010
By J LIENING
Page 1 Of

SITE VISIT NOTES

UNIT 439
- OPERABLE WINDOWS FOR NATURAL VENTILATION
- BASEBOARD HEAT IN OK SHAPE, ONE NEEDS REPLACING
- KITCHOON HOOD NEEDS TO BE REPLACED & DUCT PROTECTED
- BATHROOM EXH FAN NEEDS TO BE CLEANED AT A MINIMUM
- DRYER EXH DUCT NEEDS TO BE CLEANED
- NAT VENT. CRAWLSPACE. FREE AREA APPEARS TO BE INADEQUATE
- TYPE L COPPER PIPING IN WALL
- LEAKING HOSE BIB
- CRAWLSPACE HAD COMMUNITY LAUNDRY FACILITY
  - WATER LINES (FLOOD) ON WALLS
  - GALVENIZED PIPE (PROBABLY ABANDONED
- WATER METER IN POOR CONDITION

UNIT 518
- NAT. VENT CRAWLSPACE (MAY NOT HAVE ENOUGH FREE AREA)
- BASEBOARD HEAT IS OK
- WATER DAMAGE AROUND WASHER CONNECTION BOX
- KITCHEN HOOD OK, SHOULD BE REPLACED
- OPERABLE WINDOWS FOR NAT. VENT.
- BATHROOM EXH FAN NEEDS TO BE CLEANED, AT A MINIMUM
- TUB/SHOWER NEEDS REPLACEMENT

UNIT 631
- CRAWLSPACE WAS FORMER LAUNDRY AREA
- GALVENIZED PIPE IS PROBABLY ABANDONED IN PLACE

M003 REV. 5/03

Purpose

This report reviews existing conditions of the infrastructure and site conditions at Yesler Terrace with respect to evaluating improvements or corrective work that may need to occur to enable a "40-year life" at the residential complex. Infrastructure includes utilities, roads, walks, streetscape and franchise utilities. Site work includes utility services, private access drives and parking, paths, site landscape, fencing and play areas.

Background

The 2010 Existing Conditions Report for Yesler Terrace identifies deficiencies regarding infrastructure and site issues. This report is based on general site visits, City Data, and discussion of needs with various City and SHA staff.

Costs

Estimates of probable costs for the site related elements are included in this report following the text. Costs are based on the City of Seattle Unit Cost Reports and also using bids for similar work at other sites for the Seattle Housing Authority and other work within the City of Seattle. Costs are summarized into the areas of public infrastructure or site. The public infrastructure cost summary includes roads, utilities, and public walks. The site cost summary includes parking, pedestrian paths, site utilities, grading, drainage, play areas, entrance walks and exterior unit enhancements. Costs referenced are hard costs (physical construction costs) and do not include soft costs or administration.

Construction costs for Scenario 1 – Minimal Repair to Existing Housing totals $10,801,000. Construction costs for Scenario 2 – Rebuild the existing housing complex with replaced or upgraded site and infrastructure components totals $28,891,000. Contractor overhead, sale tax on materials, and planning contingency has been applied to the total costs for public infrastructure and site elements to develop the hard costs.

Assumptions for Identified Improvements

Scenario 1 – Minimal Repair to Existing Housing Stock to Enable a "40 year life"

The approach to this program of repair versus major improvements focuses on code related upgrades and upgrades to improve maintenance approaches. It also considers ADA compliance improvements for access to 8 units.

INFRASTRUCTURE

Roads: The public concrete roads are in relatively good condition. The public asphalt roads are in fair condition. These roads are maintained as part of Seattle Department of Transportation's (SDOT) road maintenance program. No improvements are assumed for the public roadways.

Sidewalks and planter area: It is assumed that approximately 35 percent replacement of public sidewalks will be repaired. An allowance for infill street trees is also included to restore the edge condition, and create a better streetscape environment.

Public Water Main: Seattle Public Utilities (SPU) has reported the existing water main system is in good condition and does not require any repair. Any repairs that might become apparent would be the responsibility of SPU.

Public Combined Sewer: SPU has reported the existing combined sewer system is in good condition. There are several combined sewer pipes located within SHA property that convey sewer flows from property and right-of-way north of Yesler Terrace. Some of these pipes are identified on side sewer cards as private. Further investigation of these pipes is necessary to identify ownership and parties responsible for maintenance. For this report, the combined sewer pipes identified on the SPU side sewer card as private and noted as needing repair are included in the Sitework sanitary side sewer repair costs, but some replacement costs may be the responsibility of SPU.

Public Storm Drainage: Stormwater runoff from the right-of-way is conveyed to the combined sewer system. (Pipes that convey both sanitary sewer and storm sewer flows). See comments on public combined sewer system above. It is assumed that the Repair Scenario will not trigger flow or water quality upgrades.

Electrical: The existing electrical distribution system is in need of repair with replacement of the wood utility poles. This system is under the jurisdiction of Seattle City Light and the agency will perform this maintenance requirement. An allowance will be provided to install minimal exterior lighting from the buildings to improve safety conditions.

Franchise Utilities: Upgrading the communications system and upgrading or replacing some gas service has been included as an allowance. Costs included are for trenching and backfilling for gas service assuming the piping itself would be installed by the franchise.

Sitework

Parking: The on-site asphalt surface level parking lots are in fair condition; however, the on-site lots do not meet ADA requirements for accessible parking stalls. For this scenario, the parking lots will be overlayed with new asphalt and restriped to meet UFAS requirements.

Pedestrian Paths and Access Walks: The condition of the site access walks are in fair to poor condition. This scenario will replace approximately 70 percent of these walks. Some of the walks will be replaced with pervious concrete to meet the GSI MEF requirements as described in the rebuild scenario site drainage section. An allowance will be provided for the replacement of walks. The cost estimate also includes an allowance for replacing the stacked rubble concrete site walls that are now failing in some locations. Included in the allowance is allocation for the replacement of 30 percent of the site fencing.

Water Service: For the repair scenario, 30 percent of the existing water service system is assumed to be replaced. This work will include replacing a portion of the water service pipe, meters, and building connections.

Sanitary Side Sewers: The repair improvements to the sanitary sewer system include replacing the failing sewer pipes and relining side sewer service to the main as identified by maintenance staff at locations that require continuous maintenance.

Site Drainage: For the repair scenario, it is assumed maintenance of the existing storm drain system will occur. This will include cleaning of catch basins and storm drain lines. This scenario also assumes 30 percent replacement of the existing storm drain system.

Building Drainage: In the late 1990's, SHA replaced the majority of the building downspout connections to the side sewers. A small allowance will be added to the site drainage for connection of the remaining buildings.

Lead Soil Remediation: An allowance for partial removal and disposal of the soil profile that has lead concentrations has been included in the cost. The work includes removal of lead soils from the back yards of the units. The allowance is based on the cost from similar housing sites; removal of soil six feet from building walls and for a depth of six inches.

Unit Exterior Improvements: Residents have requested exterior space improvements including upgrades in lighting for safety. The cost estimate includes an allowance to replace partial fencing, patios and improved landscaping for each unit.

General Landscape Improvements: Enhancements to the site landscaping are recommended and have been included in the costs. An Additional allowance is also provided for the large open space for field improvements.

Site furnishings/Play Areas: The repair scenario provides an allowance for the repair of the sites benches and tables. The allowance also includes the replacement of the six outdated play areas and the associated protective surfacing.

Scenario 2 – Rebuild the existing housing complex with all new components
This scenario assumes replacement of all private utilities, hardscapes, parking lots and providing access to 29 ground floor units upgrades for ADA compliance.

INFRASTRUCTURE

Roads: The public concrete roads are in good condition. The public asphalt roads are in fair condition. These roads are maintained under the jurisdiction of Seattle Department of Transportation's (SDOT) road maintenance program. Only repair to roads for replaced utility connections are assumed for this scenario. The costs are included in the private utility connections.

Sidewalks and planter area: For the rebuild scenario, it is assumed all public sidewalks are replaced including upgraded planter areas.

Public Water Main: Seattle Public Utilities (SPU) has reported the existing water main system is in good condition and does not require any repair. Any repairs would be provided by SPU.

Public Combined Sewer: SPU has reported the existing combined sewer system is in good condition. There are a few combined sewer pipes located within SHA property that conveys sewer flows from property and right-of-way north of Yesler Terrace. Some of these pipes are identified on SPU's side sewer cards as private. Further investigation is necessary to identify ownership and parties responsible for maintenance. For this report, the combined sewer pipes identified on the side sewer card as private and noted as needing repair are included in the Sitework sanitary side sewer costs.

Public Storm Drainage: Stormwater runoff from the right-of-way is collected and conveyed to the combined sewer system. (Pipes that convey both sanitary sewer and storm sewer flows). See comments on public combined sewer system above.

Electrical: The existing electrical distribution system is in need of repair with replacement of the wood utility poles. This work would be under the responsibility of Seattle City Light. An allowance will be provided for new services to each unit. A separate allowance will be provided to install exterior lighting from the buildings.

Franchise Utilities: Upgrading the communications system and upgrading or replacing gas service has been included as an allowance. Costs include trenching and backfilling for gas service assuming the piping itself would be installed by the franchise.

Sitework

Parking: The rebuild scenario would replace parking lots down to subgrade, restripe parking lot to meet ADA requirements for accessible parking stalls, and upgrade storm drainage including installing flow control for replaced impervious surface.

Pedestrian Paths and Access Walks: The majority of the walks are in poor condition. The full replacement of the walks and stairs is recommended due to impacts from "rebuild" construction. Some of the walks will be replaced with pervious concrete to meet the GSI MEF requirements as described in the site drainage section. The cost estimate includes an allowance to replace the concrete rubble retaining walls and hand rails and 50 percent of the site fences.

Water Service: Full replacement of the existing water system is recommended. The water meter bills and our experience with housing projects of similar age indicate probable pipe leakage. Included in the replacement will be new water meters and connections to the water mains.

Sanitary Side Sewers: Full replacement of the existing sanitary side sewer system is proposed. According to the Seattle Housing Authority (SHA) maintenance staff, the onsite combined sewer system is in poor condition. Starting in 1997, SHA began the replacement of side sewer connections from the

buildings to the main side sewer lateral. Now the laterals downstream of the replaced pipes are failing.

Site Drainage: Full replacement of the existing storm drain system is recommended. The majority of the onsite catch basins and inlets are plugged and or are not located at the low point; therefore, ponding occurs during rain events. In addition to the collection and conveyance system, the new and replaced impervious surfaces created with the new walks and parking lots will need to be mitigated for flow control. Permanent stormwater control systems would be installed to serve the Yesler Terrace redevelopment. The stormwater control systems would be designed and constructed in accordance with the City of Seattle Drainage Code, green stormwater infrastructure (GSI) for flow control and water quality treatment would be used to the maximum extent feasible (MEF). Examples of GSI included in the costs are bioretention cells, bioretention planters and permeable pavement. If GSI installation is not feasible, underground flow control detention tanks or vaults would be installed.

Building Drainage: In the late 1990's, SHA replaced the majority of the building downspout connections to the side sewer. A small allowance will be added to the site drainage for connection of the remaining buildings and also an allowance for replacing the footing drainage.

Lead Soil Remediation: An allowance for removal and disposal of the soil profile that has lead concentrations has been included in the cost. The allowance is based on the cost from similar housing sites; removal of soil six feet from building walls and for a depth of six inches.

Unit Exterior Improvements: Residents have requested exterior spaces improvements including upgrades in lighting for safety. The cost estimate includes an allowance to replace fencing, patios and improved landscaping for each unit.

General Landscape Improvements: Enhancements to the site and building unit landscaping are recommended and have been included in the costs. An

Additional allowance is also provided for the large open space for major field upgrades.

Site furnishings/Play Areas: The repair scenario provides an allowance for the repair of the sites benches and tables. The allowance also includes the replacement of the six outdated play areas and the associated protective surfacing.

Conclusion

Renovating the Yesler Terrace Development to standards reflecting a 40-year life will be very costly due to the constraints of the layout and the age of the existing infrastructure. Site constraints cause construction inefficiencies and will result in significantly higher costs than might be expected for major reconstruction. Spot repairs to existing facilities can be 30% more than new construction. Sitework and utility construction are labor intensive.

SvR DESIGN COMPANY

Yesler Terrace Redevelopment

Existing Conditions Report

Date: October 8, 2010

Prepared for: Seattle Housing Authority
PO Box 19028
120 Sixth Avenue North
Seattle, WA 98109

Prepared by: SvR Design Company
1205 Second Avenue, Suite 200
Seattle, WA 98101

SvR Project No. 08037.07

SvR DESIGN COMPANY

Yesler Terrace Redevelopment
Existing Conditions Report

Methodology and Purpose

The purpose of this report is to provide a summary of the existing conditions of the infrastructure and site of Seattle Housing Authority's (SHA) Yesler Terrace Housing Development (Yesler Terrace). The report is based upon fall 2010 site visits by SvR Design Company's (SvR) landscape architects and civil engineers, review of previous reports and drawings, research with local jurisdictions, and discussions with SHA staff.

Inspection visits were documented with photographs, annotated plans, and notes. In this report the team focused on the physical conditions of the site, access and utility services for residential units, and infrastructure. The assessment's scope includes:

- the relationship of the buildings to the neighborhood context;
- the appropriateness of the building layout and site amenities for housing;
- the development's site layout footprint, density and scale; and
- the development's exterior physical conditions and the challenges for maintenance on the infrastructure systems that are over 70 years old.

Description of Housing Development and Neighborhood

Yesler Terrace is a public housing development located on the southern end of First Hill in Seattle. The 36.6-acre site currently contains 561 public housing units, a community center and various other buildings. From this vantage, Yesler Terrace provides panoramic views out to the Puget Sound and the Olympic Mountains, the Duwamish River, downtown Seattle, the SODO neighborhood, Cascade Mountains, and Mount Rainier. The sloping site hosts an array of homogenous two-story housing units that were originally developed as public housing during World War II.

Yesler Terrace is over 70 years old. More than one-fifth of the 561 housing units were built during World War II as temporary defense housing. Construction of the development was completed in 1942; construction of a second phase of development, started immediately after and was finished in 1943. The total, two-phase development consisted of 863 dwelling units in 97 residential buildings, along with community buildings and a steam plant.

Several changes to the Yesler Terrace property have been made since its original construction. The most significant change occurred with the construction of Interstate 5, in 1962, which required demolition of 266 housing units and taking 11 acres of the site. In 2003, 21 housing units were removed to allow for construction of the Yesler Community Center by the Seattle Department of Parks and Recreation.

Yesler Terrace is generally bound by I-5 on the west, Alder Street and E Fir Street on the north, 12th Avenue on the east, and S Main Street on the south. The Yesler Terrace site slopes from north to south and also slopes from west to east on the eastern portion of the site. The western portion of the site is characterized by steep grades sloping to a retaining wall adjacent to the Interstate 5 corridor. The site has an elevation change of 150 feet from its lowest point south of the S Main Street right-of-way to its highest points near Harborview Hospital. The southern section of the site includes an area of steep slopes as defined by the City of Seattle code and designated as a critical area. There is an additional 140-foot drop from the lowest part of the site to Downtown Seattle 2nd Avenue to the west.

Exterior Conditions

Yesler Terrace site contains 69 low-rise, 2 and 3-story wood-frame residential buildings, with fenced, private open space yards for unit occupants, paved parking areas, roads, and off-street walkways. Other structures include the Jesse Epstein office building, the Steam Plant, the Yesler Community Center, the Yesler Gym building, the Yesler Administration building, the Head Start building, a storage building, and five laundry buildings for use by residents. Vegetation primarily consists of mature trees and lawns with some shrubs and miscellaneous landscaping.

The site's original layout was kept simple and repeated on each part of the site. The following problems are therefore typical for all areas within Yesler Terrace.

The buildings were originally laid out to maximize the number of units. Buildings are long rectangles, clustered in groups of three to seven. The buildings are generally sited parallel to the site's contours and stack up the slopes. Chain link fencing delineates private yards, contributing to the barracks-like feel. Access to most individual units is via footpaths within and between building clusters, rather than directly off the street. Both the roads and footpaths can be quite steep. Parking is generally street parking and not assigned to individual residents.

In most instances the original layout of buildings does not provide front entry zones or on-site parking within sight distance of the units. Window blinds are often closed for privacy because there is no transition between interior private spaces and exterior common areas. As a result, the common areas do not function well as a means of access to the units or as community oriented outdoor space. While there are expansive views

from many portions of the site, the steep topography, worn open spaces, numerous retaining walls, out of scale plantings, poor lighting and narrow access ways create a claustrophobic, unsafe feeling in some areas of the site.

Streets, Driveways and Parking

Five arterials surround, intersect, or enter Yesler Terrace. Boren Avenue South and 12th Avenue South are principal arterials that create the eastern boundary of the site. These streets are under the jurisdiction of the Seattle Department of Transportation. Yesler Way, Broadway Avenue South, and 9th Avenue are minor arterials that enter or bisect the site. The remaining streets within Yesler Terrace are classified as local access streets. Access Streets include 8th Avenue, 10th Avenue, Terry Avenue, South Washington Street, South Fir Street, and Spruce Street.

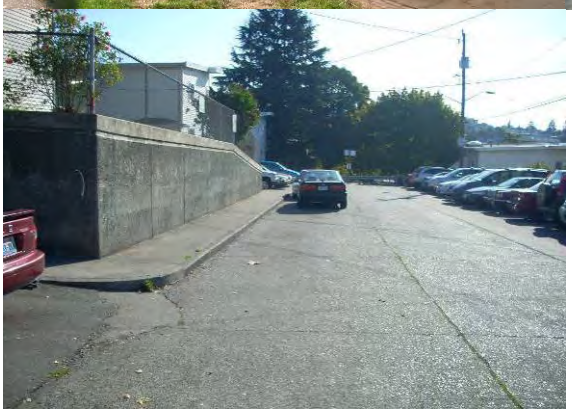
The following are concrete streets within the Yesler Terrace:

- Yesler Way
- Spruce Street
- S Washington Street
- 8th Avenue South
- 9th Avenue South
- 10th Avenue South

The concrete streets are in relatively good shape with isolated concrete panels that need repair due to settlement, cracking or poor utility cut repairs.

The asphalt streets include:

- East Fir Street, and Alder Street
- Terry Avenue
- Broadway
- South Main Street



The asphalt roads are in fair to poor shape. East Fir Street appears to be an asphalt overlay on an existing brick road. The asphalt is cracking and deteriorating in several locations. The other asphalt roads are also showing signs of base failure with the cracking of the asphalt surfacing.

There are five off-street parking sites throughout Yesler Terrace and the remainder of the resident parking is on the street. The on-street parking is also used by neighboring businesses and employees and visitors of Harborview Hospital. A Residential/Restricted Parking Zone (RPZ) was created by the City for First Hill in 1972.

The on-site asphalt surface level parking lots are in overall fair condition; however, the on-site lots do not meet UFAS requirements for accessible parking stalls. Specifically, the requirement for the minimum number of accessible parking stalls, the requirement for access aisles adjacent to accessible parking stalls, and the requirements for maximum slope gradients within accessible parking spaces are not met. On street parking is in overall fair condition. The condition of on street parking stalls is generally consistent with the conditions of the streets. Both parallel and perpendicular parking stalls are located in the roads surrounding Yesler Terrace. Neither planter strips nor wheel stops are provided at locations with perpendicular parking. As such, vehicles typically overhang adjacent sidewalks which create constricted use of the walks for pedestrians.

Pedestrian Access (Streets, Sidewalks and Walkways, Accessibility Issues)

The public streets listed above largely have curbs, planting strips and sidewalks. The public sidewalks ordering to the Yesler Terrace blocks are in overall fair condition with the exception of a few areas that have partially settled, creating lips (tripping hazards) at the pavement joints. Where provided, curb ramps are outdated and do not appear to meet American with Disabilities Act (ADA). Curb ramps are currently not provided at a number of crosswalks and intersections.

The internal walkways within the Yesler Terrace Community are in poor condition. The walks have also settled unevenly over time. Lips at pavement joints and cracks in areas of deteriorating pavement produce abrupt grade changes which are greater than the ½-inch ADA maximum. The sidewalks are narrow. Several walk areas pond during wet weather. As the Yesler Terrace Community is located on a hillside, the majority of the units are not ADA accessible due to steep gradients and/or stairs that are required for residents to access their units from parking areas or street access. Pathways frequently have slopes (both longitudinal and cross) that exceed ADA grades. Most of the stairways throughout the site do not meet ADA requirements for the number of handrails (minimum two per stairway) and the placement.

Pedestrian and Site Safety Concerns

The numerous stairs, cracked and narrow sidewalks, and slope of pathways make it difficult and challenging for seniors and the disabled to move around the site, as well as for those with small children. The distance from roadways to resident's doors and the poor site lines raise potential safety concerns. Parking is often a half block away and the pedestrian corridors are narrow and have frequent blind spots and poor lighting.

Open Space and Landscaping (Urban Forest, Parks, Gardens, Yards, Other Open Space)

Overall, there are approximately 20.9 acres of public, private and semi-private open space in the portion of Yesler Terrace west of Boren Avenue, and an additional 1.3 acres in the 12th Street and Yesler Way parcels that are east of Boren Avenue. Useable recreational open space at Yesler Terrace is limited.

The majority of the open space (17.1-acres) is private and semi-private and consists of small fenced yards or areas, such as the community gardens, that are only accessible to residents. There is a 1.7 acre open space just south of Yesler Way adjacent to the community center.

Urban Forest

There are many large, mature trees within Yesler Terrace, giving a warm character to the site that partially balances out the negative character defining elements provided by the configuration of existing residential buildings. The trees create a sense of enclosure, define spaces and provide buffers from the weather. Individual trees and clusters of two to three trees dominate the landscape. There is little to no understory or groundcover and no tree groves of any significant size. The following non-native ornamentals dominate the species mix: European White Birch, Norway Maple, Horsechestnut, Red Oak, Purple leaf Sycamore, Port Orford Cedar, Chinese Photinia, Scotch Pine, Hawthorn. There are a substantial number of Sawara Cypress and both fruiting and non-fruiting plums. While there are few native trees on the site, there are several good specimens of native Shore Pine and Western Red Cedar. The size and types of trees on site suggests that many of the existing trees were likely planted in the 1940s when Yesler Terrace was originally developed.

The tree survey for the site was updated in June 2010 in consultation with the City of Seattle's Arborist. According to the survey, the site contains 409 trees. Twenty-three of

these trees are considered “Exceptional” under current City of Seattle code. According to the tree survey, species currently in decline are likely reaching the end of their life span.

Other than the trees, the site’s vegetation is relatively sparse and unevenly distributed, with few shrubs or groundcovers. Ivy and other invasive species exhibit a strong presence. Most open areas consist of patchy lawn and exposed soils flanked by cracked paving. Garbage scraps and litter are scattered across some of the less well-maintained areas. As a result, many of the site’s open areas feel empty and uncared for, despite the spreading canopy of some larger trees.

Open Recreational Areas

Many of the recreation areas at Yesler Terrace are located at and around the Yesler Community Center. The community center facility and a children’s play area located behind the building are owned by the City of Seattle and maintained by the Seattle Parks and Recreation Department. All the other open spaces and recreation areas are owned and maintained by SHA.

The main recreational area is the Yesler Playfield, located behind the Community Center. This 1.7 acre ballfield is primarily used for softball and baseball. Owned by SHA, it is open for use by the larger Seattle community.

There are four P-Patch community gardens located in the site's southern half. These gardens are managed by Seattle's Department of Neighborhoods and are open only to Yesler Terrace's residents. Available garden plots are assigned to interested residents free of charge. The garden plots are well used and well tended. There are additional informal open spaces at Yesler Terrace that are accessible to the general public, including some lawn areas and small hardscaped areas.

Along the western edge of the community above I-5, there is a steep, coniferous buffer zone through which informal trails have been established. This area is somewhat secluded from the rest of the site. Garbage is scattered throughout and there are indications that the buffer zone is used as a camp site by the homeless. The area's unmaintained character suggests that it gets little regular use by residents and may be perceived as unsafe.

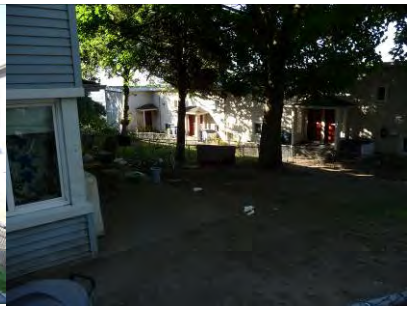
Semi Private Open Space

In addition to the recreational uses near the community center, there are four smaller play areas within the residential block clusters. Although no doubt intended to foster community interaction and to provide smaller gathering spaces for children and young families, these areas feel abandoned. Vegetation consists of patchy grass with few shrubs; the hardscape is old, stained concrete flanked by concrete rubble retaining walls topped with chain link fences.

Interior sidewalks and pathways that traverse the neighborhood function as a semi-public circulation system and informal gathering places for neighbors and residents. This internal circulation system is in relatively poor shape. The paths are typically bordered by chain link fencing and/or residential units with entrances directly adjacent to the pathway's edge, leaving no space for landscaping.

Private Open Space

A majority of the existing residential units within Yesler Terrace have private yards, which are the only form of fully private open space within the community. These yards vary in size and are defined by chain link fencing on three sides. Maintenance levels and use varies from unit to unit. While some residents have left their yards unmaintained or as turfgrass, a large percentage of residents use their yards for intensive food cultivation, suggesting an unmet need within Yesler Terrace for more community garden space.


Site Furnishings (Benches, Tables, Signage and Other Site Furnishings)

Site furnishings include benches made of wood slats on concrete posts or of metal, as well as metal garbage cans. There are few exterior tables and some of the table tops are missing. Most of the benches and tables show signs of heavy deterioration and have reached the end of their useful lives. While brightly painted, the playground equipment (installed in the mid-1990's) in the smaller play areas between the building clusters is nearing the end of a useful lifespan. The play equipment is installed over rubber tiles as safety fall surfacing. Some of the rubber tiles have edges that are curling up, introducing potential tripping hazards.



Yesler Terrace contains little signage, other than worn parking, “crime watch” and warning signs. This contributes to the feeling that Yesler Terrace is an undefined space. No signs herald entry into the development and there is no coherent wayfinding system that defines Yesler Terrace as a neighborhood or helps the general public navigate the site.

Storm Sewers, Drainage and Soils (overland and piped)

The public storm drain system consists of catch basins and inlets located along the public streets to collect stormwater runoff and convey stormwater to the public combined sewer main. The majority of the existing system was installed with the construction of the streets in the late 1890s to early 1900s. With the construction of Interstate 5, a new 12-inch storm drain pipe was installed parallel to the freeway along the west edge of Yesler Terrace’s property line to convey flows from Alder Street to Yesler Way. Prior to the Yesler Way crossing, City of Seattle Sewer Cards identify the 12-inch storm pipe conveying flows to a combined sewer with the connection of the housing located north of Yesler, south of Alder St and west of 9th Avenue..

The existing private storm drainage system at Yesler Terrace site was installed in the early 1940’s with the construction of the Yesler Terrace housing complex. The storm drain system includes catch basins, inlets, building roof downspouts and conveyance pipes ranging from 6 to 12 inches. In the late 1990s, SHA replaced/or repaired most of the side sewer connections from the buildings to the site’s main side sewers. Included in this work was the replacement of the many downspout connections to the side sewers. There are still a few downspouts that discharge to the surface. SHA maintenance staff reported that several of the existing catch basins located on the site are filled with debris or are not located at low points. This condition causes localized ponding of water within or near interior walkways during wet weather conditions.

Sanitary Sewers (side sewers and public combined system)

City of Seattle records indicate that the existing public sewer system within the site was first installed in 1892. This system is a combined sewer system and collects both sanitary sewer flows and stormwater runoff from the site and public rights-of-way.

Collected sewer flows from the site are conveyed to one of two public combined sewer basins: the West Conveyance Basin and the East Conveyance Basin.

The West Conveyance Basin serves approximately 11.9 acres of the western portion of the Yesler Terrace site and drains to a 24-inch combined sewer main located at the end of 8th Avenue S, south of Yesler Way. From this location, sewer flows travel under I-5 to 7th Avenue S. From there, flows travel south to S Royal Brougham Way and then west connecting to the King County Metro Sewer trunk line in Occidental Avenue S where the flows are conveyed to the West Point Sewage Treatment Plant.

The East Conveyance Basin serves approximately 24.7 acres of the Yesler Terrace site and is generally located east of 9th Avenue. The area drains to the 12-inch combined sewer main that runs east along Yesler Way. The East Basin flows to the south and east where it leaves the site through one of three combined sewer mains (along E Yesler Way, S Washington Street, and Main Street). From there, it connects to the 30-inch wide by 45-inch tall SPU Rainier Avenue combined sewer pipe that flows south and connects to the King County Metro Sewer Hanford trunk line where the flows are conveyed to the West Point Sewage Treatment Plant.

Both the East and West Conveyance Basins eventually connect to the King County Metro system for final treatment and disposal at the West Point treatment plant prior to discharge to Puget Sound. Per the July 2010 *Combined Sewer Overflow Control Program*

2009 Annual Report by King County Wastewater Treatment Division, the Connecticut Street and Rainier Avenue combined sewer overflows (CSOs), located downstream of the Yesler Terrace site experience CSOs into Elliot Bay and Lake Washington during large storm events.

Through meetings with SHA maintenance staff and review of SHA maintenance records, it is apparent that the private combined sewer system is in poor condition. As noted above, SHA began the replacement of side sewer connections from the buildings to the main side sewer laterals in 1997. It's evident that these main side sewer laterals downstream of the replaced sewer pipes are now failing. It is highly likely that the system will require extensive repairs or replacement of major sections of these side sewers to retain and remain functions. Below are examples of current ongoing maintenance issues:

- Housing units in Block Y located along the east side of Terry Ave north of Spruce Street are off-line due to failing side sewers.
- Housing units in Block R located on the west side of 9th Avenue, north of the Spruce Street housing unit side sewer, requires routine snaking and pressure washing.
- The 12-inch sanitary sewer that is conveying flows from Block R and serves buildings south of Yesler Way and west of 8th Avenue has shifted and has a belly (or low point) in the line that requires continuous maintenance.
- The side sewer north of the units, south of Yesler Way, and east of 10th Avenue in Block W has a severe root intrusion problem and the bottom concrete has eroded away.
- Also in Block W, the sanitary sewer line serving the southern units is also experiencing separating, shifting, pipe erosion, and tree root intrusion. Approximately 500 linear feet of sewer pipe is in need of replacement.

Water Service (Lines and Meters, Fire Protection Capacity and Service, Public Water Mains)

Seattle Public Utilities (SPU) currently supplies Yesler Terrace domestic water needs through a gridded water system served from the Volunteer Reservoir (Volunteer 430 Pressure Zone) with pressures ranging between 47psi and 100 psi. Some of the first cast iron public water mains were installed over 120 years ago and have exceeded their design life. SPU has replaced portions of the 6 to 12-inch water mains with ductile iron pipe along 9th Avenue and Spruce Street. The 8-inch mains on 8th Avenue north of Yesler way and 10th Avenue were replaced between 1940 and 1960. All other water main pipes date back to the period from 1890 to 1920. The existing water main system located south of Yesler along 8th Avenue and South Washington Street is a 6-inch line. There is also an 8 inch line along 10th Avenue South. Per the GIS information, the fire hydrant located at 10th Avenue South and South Washington Street has 4,000 to 8,000 gpm of available

flow and a fire hydrant along S Washington Street east of 10th Avenue South has 2,000 to 4,000 gpm of available flow. Both water systems have water pressure readings ranging between 80 and 119 psi.

For the individual Yesler Terrace blocks, master water meters serve several buildings. These distribution systems were installed with the construction of the site in the early 1940s. From 2009 water use records 97,000 gallons per day of water is used equating to approximately 80 gallons per person per day. Water use statistics from the Seattle Public Utility Department indicates that this usage rate is higher than the estimated 60 gallons per person per day average. The additional water usage may be from leaky pipes, fixtures, irrigation use, or higher than estimated residents.

Electrical Utility and Service Lines

The existing Yesler Terrace site is served by Seattle City Light electrical feeder lines, all above ground (overhead), at 9th Avenue, Terry Avenue, Broadway, and 12th Avenue. The Terry Avenue and Broadway feeder line intersect at E Fir Street and head east to 10th Avenue and continue south along 10th Avenue S
Redevelopment will likely replace the on-site distribution system and connect to the existing feeder lines. SCL has stated that the feeder lines have sufficient capacity to support redevelopment of the site at increased densities.

Franchise Utilities (Natural Gas and Communications)

Natural Gas

There is an existing natural gas distribution system located in the street right-of-ways at Yesler Terrace. This system is owned and operated by Puget Sound Energy. Most of the existing residential units at Yesler Terrace do not have gas services. Electricity is the primary means for cooking and heating.

Communications

The Yesler Terrace site is currently served by overhead communications services including telephone, cable television, and high-speed internet. There is also an existing fiber optic cable line along Alder Street, 9th Avenue, Spruce Street, 8th Avenue, and Yesler Way. The capacity and current usage of this cable line is not known.

SvR DESIGN COMPANY

SHA Yesler Terrace - Estimate of Probable Construction Costs
REBUILD SCENARIO

SvR Design Company | **Print Date:** October 8, 2010
SvR File No. 08037.01 | **Edit Date:** October 8, 2010

Item		
SITE PREPARATION & MOBILIZATION	$	1,860,000
Mobilization/Demobilization/Record Drawings		
Remove Sidewalk		
Remove wall		
Lead Soil Remediation		
TESC	$	48,000
Construction fencing (6' high chain link)		
Silt Fence		
TESC Allowance for Stormwater		
Catch Basin Protection		
STORM DRAINAGE	$	3,665,000
Cleanout		
Catch Basin Type 241		
Inlet Type 250		
8" Dia. PVC Service Drain Pipe		
Connect to Existing Storm Drain Line		
Connect to Existing Manhole		
Flow Control Allownce		
Footing Drain Allowance		
UTILITIES - Sanitary Sewer	$	934,000
SSMH Type 200		
Cleanout		
Side sewer 8" PVC		
12" Dia. Sanitary Sewer		
Reline Existing Sanitary Sewer		
UTILITIES - Water Distribution	$	1,076,000
4" Water Service		
Fire Service		
Connection to Existing System		
4" Domestic Service		
4" Fire Service by SPU		
UTILITIES - Power/Franchise	$	575,000
Lighting Allowance		
Electrical/Gas/Telephone/Cable Allowance		

SvR DESIGN COMPANY

SHA Yesler Terrace - Estimate of Probable Construction Costs
REBUILD SCENARIO

SvR Design Company | **Print Date:** October 8, 2010
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Private Hardscape	$	4,867,000
Pervious Concrete Sidewalk (5" concrete over 6" drainage agg)		
Asphalt (3" HMA over 6" crushed base)		
Cement Concrete Sidewalk		
Concrete Driveways		
Concrete Stairs including Railing		
Walls		
ADA Accessibility Allowance		
Signage		
Striping		
Public Hardscape	$	485,000
Cement Concrete Sidewalk		
Concrete Driveways		
LANDSCAPE	$	100,000
ROW Planting Strip		
Site Landscaping	$	5,409,000
Site Landscaping		
Play Structures		
Misc Landscaping		
Open Field Upgrade		
Fencing		

Subtotal All Areas		**$**	**19,019,000**
(a)Subtotal ROW Improvements		$	19,019,000
Contractor Overhead & Profit	14%	$	2,662,660
Sale Tax on Materials (materials@30% of subtotal)	9.5%	$	542,042
(b) Subtotal		$	22,223,702
Planning Level Contingency	30%	$	6,667,110
Hard Costs Rebuild Scenario		**$**	**28,891,000**

OMB Approval No. 2577-0269
(exp. 2/28/2010)

CHOICE NEIGHBORHOODS – CERTIFICATION OF SEVERE PHYSICAL DISTRESS

I hereby certify that:

1. I am a licensed engineer ☐ architect ☒ (check one).

2. I am not an employee of the Lead Applicant, Co-Applicant (if any), Principal Team Member (if any), or unit of local government in which the housing project identified below is located.

3. The public housing development listed below meets (in the manner described in either subparagraph A or B below) the following definition of severe physical distress:

   Requires major redesign, reconstruction or redevelopment, or partial or total demolition, to correct serious deficiencies in the original (including inappropriately high population density), deferred maintenance, physical deterioration or obsolescence of major systems, and other deficiencies in the physical plant of the project

   Check one:

   A. ☒ The development currently meets the above definition of severe physical distress;

   Or

   B. ☐ The development has been legally demolished and HUD has not yet provided replacement housing assistance, other than tenant-based assistance, for the demolished units. However, the development satisfied the definition of severe physical distress (as defined above) as of the day the demolition was approved by HUD.

Name: Arlan Collins

Signature: _____ Date: 10.7.2010

License number: 3858 State of Registration: Washington

Lead Applicant: _____

Name of Targeted Public and/or Assisted Housing Site(s):

_____

Warning: HUD will prosecute false claims and statements. Conviction may result in the imposition of criminal and civil penalties. (18 U.S.C. 1001, 1010, 1012, 31 U.S.C. 3729, 3802)

SvR DESIGN COMPANY

October 20, 2010

Tom Tierney, Executive Director
Seattle Housing Authority
PO Box 19028
120 Sixth Avenue North
Seattle, WA 98109

Re: Yesler Terrace Garden Community
Existing Conditions Structural Deficiencies (Infrastructure and Sitework)
SvR Project No. 08037.02

Dear Mr. Tierney:

The following letter summarizes the infrastructure and sitework deficiencies based on site visits, the review of previous reports and drawings, research with local jurisdictions, and discussions with SHA staff.

General Site Description

Yesler Terrace is a 1940's public housing development located on the southern end of First Hill in Seattle. The 36.6-acre site currently contains 69 low-rise, two and three-story wood-frame residential buildings, containing 561 public housing units, a community center and various other buildings. Yesler Terrace is generally bound by I-5 on the west, Alder Street and E. Fir Street on the north, 12th Avenue on the east, and S. Main Street on the south. The Yesler Terrace site slopes from north to south and also slopes from west to east on the eastern portion of the site. There are approximately 17 acres of private and semi-private open space consisting of small fenced yards, play areas and a 1.7 acre baseball field next to the community center at Yesler Terrace.

Public Roads, Sidewalks and Planter Area

The public concrete roads are generally in good condition. The public asphalt roads are in fair condition, showing signs of base failure with the cracking of the asphalt surfacing. The public sidewalks are in fair condition with the exception of a few areas that have partially settled, creating tripping hazards at the pavement joints. Where provided, curb ramps are outdated and do not appear to meet the American with Disabilities Act (ADA). Curb ramps are currently not provided at a number of crosswalks and intersections. Planter areas are in poor condition; mostly filled in with patchy grass, concrete or asphalt with insufficient street trees.

Public Utilities

Seattle Public Utilities (SPU) has reported that the existing water main and existing combined sewer system are in good condition and do not require major repair.

Electrical

The Seattle City Light existing overhead electrical distribution system is in need of upgrade including the replacement of old wood utility poles.

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Parking

The on-site asphalt surface level parking lots are overall in fair condition; however, the on-site lots do not meet UFAS/ADA requirements for accessible parking stalls. There are no water quality treatment or stormwater flow control facilities.

Pedestrian Paths and Access Walks

The internal walkways within the Yesler Terrace Community are in poor condition. The walks have settled unevenly over time and pond due to localized depressions and a failed storm drain system. Pavement joints and cracks produce abrupt grade changes which are greater than the 1/4-inch ADA maximum. As the Yesler Terrace Community is located on a hillside, the majority of the units are not ADA accessible due to steep gradients and/or stairs that are required for residents to access their units. Most of the stairways throughout the site also do not meet International Building Code and ADA requirements for the minimum number of handrails (two per stairway) and the placement.

Private Utilities

Higher than expected water meter bills and experience with housing projects of similar age indicate probable pipe leakage at Yesler Terrace. None of the existing two and three-story buildings have fire sprinkler systems. Fire access to the buildings is constrained by slope and access. According to the Seattle Housing Authority (SHA) maintenance staff, the site sewer system is in poor condition. Starting in 1997, SHA began the replacement of side sewer connections from the buildings to the main side sewer lateral. Now the laterals downstream of the replaced pipes are failing. The majority of the onsite catch basins and inlets are plugged and/or are not located at the low point; therefore, ponding occurs during rain events. Footing drains have either failed or were not installed with the original buildings construction.

General Landscape/Open Space/Site furnishings

Overall, the landscape and site furnishings are in poor condition and need to be replaced. Community gathering spaces are hidden, minimizing viable use for outdoor recreation. Most of the benches and tables show signs of heavy deterioration and have reached the end of their useful lifespan. Play structures are over 15 years old and also nearing the end of a useful lifespan. Site lighting is poor and walking paths lack clear sight lines.

Summary

The infrastructure at Yesler Terrace has exceeded its design life. Key issues are the sanitary sewer system, site accessibility and poor lighting, and open spaces discouraging healthy active living. Renovating Yesler Terrace to standards reflecting a 40-year life will be very costly due to the layout and age of the existing infrastructure. Site constraints cause construction inefficiencies and will result in significantly higher costs than might be expected for major reconstruction. The end results will likely still lack a site quality that encourages active living.

Sincerely,
SvR Design Company

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