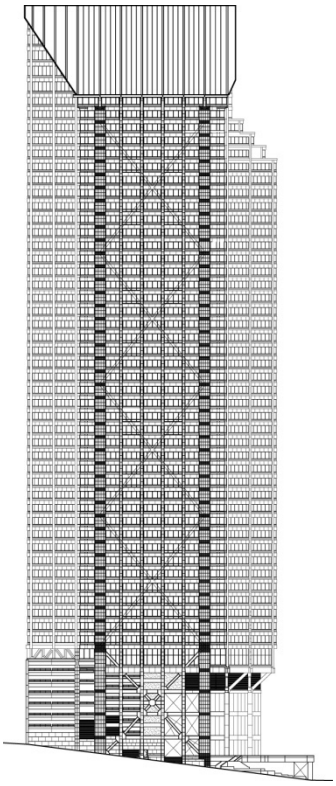
Seattle Municipal Tower
Weatherization Program

Final Draft: June 27, 2012

VOLUME I: Executive Summary and Report
VOLUME II: Project Drawings (under separate cover)
VOLUME III: Appendices (under separate cover)



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Seattle Municipal Tower *Weatherization Program*

A: Executive Summary

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I. Executive Summary

The focus of this project is the creation of an information base and analysis leading to the development and documentation of an implementation plan for the weatherization of the Seattle Municipal Tower (SMT) complex. Weatherization is defined in this context as including both the short term repairs and longer term improvements necessary to maintain and extend the service life of the SMT exterior envelope in accordance with industry practices.

This document compiles information created in the 2011 Roofing and Waterproofing Survey Evaluation prepared by Building Envelope Technology & Research with supplementary assessments by IBA Consultants West, Rushing Engineers, Davis Langdon Cost Consultants and Miller Hayashi Architects.

The Seattle Municipal Tower was constructed in 1989 as the AT&T Gateway Tower to the design of Bassetti Norton Metler Rekevics Architects. The SMT was purchased by the City of Seattle in 1996, and currently houses City of Seattle offices as well as private office and retail tenants. The SMT building management firm is CBRE. The horizontal weather envelope of the tower is composed of aluminum framed glass roof assemblies, paver ballasted membrane roof decks, paver ballasted pedestrian plazas and stairs, plaza planter assemblies, standing seam metal roofs, and skylights. The vertical weather envelope is composed of the stone panel veneer and aluminum framed window system of the tower, prefinished aluminum panels and aluminum framed glass curtain wall assemblies at the tower base, and painted concrete, stucco and EIFS assemblies at the parking garage structure. The weather envelope also includes large soffit areas, notably the suspended metal panel soffit 80' above the pedestrian plaza, as well as cement plaster (stucco) soffits at lower heights around the plaza and building entrances.

Approach The work of this study included:

- The creation of a CAD drawing set of the building envelope to identify each building component and indicate approximate surface areas.
- The creation of an electronic archive database of scanned construction drawings and fabrication drawings for the original construction and major improvements since that time, including the Fifth Avenue Entry Structure and the 14th Floor Swimming Pool structure.
- The analysis of conditions of construction access to the various envelope assemblies.
- The analysis of approximate construction costs for repair, refurbishment, and/or replacement alternatives for the various exterior assemblies.
- The analysis of relative priorities and time frames for the execution of projects to maintain and extend the life of the envelope assemblies.
- The compilation of a construction cost plan integrating component cost analysis with the priorities for envelope improvements.
- The compilation of a maintenance check-list for the ongoing monitoring and spot repair of systems to extend the service life between major replacements.

Findings Significant findings of the study include:

- At twenty three years old, the weathering of the building envelope overall indicates that the original systems are performing close to design expectations.
- The long term average cost of maintaining and refurbishing the envelope assemblies as the building ages is approximately $1.3M/year (hard construction costs in 2012 dollars.) This is based on averaging the refurbishment of major tower and water-proofing assemblies every 30 years, with the more frequent but less expensive maintenance and refurbishment of garage and plaza level finishes on a ten to fifteen year cycle.
- Recent projects have replaced many of the lower level roof membranes with 20 year assemblies. However, several of the most extensive building systems are approaching the end of their anticipated 20 to 25 year service life, most notably the silicone joint sealants which provide the primary barrier to water entry at the tower facades and glass curtain walls, and the plaza deck waterproofing membranes.
- Major projects to be anticipated in the short to midterm include the replacement of sealants and treatment of window gaskets on the vertical sides of the tower, and the refurbishment of the aluminum framed sloped roof glazing system.
- Replacing the insulated glazing units at the sloped glass tower roof with higher performance glazing units represents a specific opportunity to realize significant energy efficiency gains and reduce operating costs.
- The building has been well maintained, and an even more comprehensive and proactive building maintenance program as the building ages will be a critical component to extending the service life of the building assemblies and reducing life cycle costs.

Components of the Report

Scope of Work Spreadsheet: Following the Executive Summary, this table condenses each Weatherization Program activity with the recommended repair or replacement activity, anticipated service life remaining, and estimated cost of each activity in 2012 hard construction costs. The table is keyed to the project drawings included as Volume II of the report.

Scope of Work Summaries: The summaries provide additional detail for each activity, and link to the organization of the 2011 BET&R evaluation report.

Maintenance Program: This table itemizes ongoing maintenance activities needed to extend the service life of envelope assemblies, and includes maintenance activities performed by CBRE.

Illustrations: The Weatherization Program activities are charted based on system type and specialty subcontractor, access requirements, relative cost and priority. This information is summarized in an illustrated implementation plan. The activities are charted on a 40 year plus time line to illustrate the cyclical nature of the Weatherization process.

Seattle Municipal Tower *Weatherization Program*
B: Scope of Work Spreadsheet

Work Areas Keyed to Drawings & Keyed to 2011 BET&R Building Envelope Survey

6/27/2012

Area	Description	Service Life Until Replacement is Critical	Repair/Replacement Detail	Cost if Bid Package > 1,000,000	Cost if Separate JOC < 300,000	Cost if Bid > 300,000 but less than 1,000,000	Expected Service Life after Repair/Replacement	Remarks
A-1	Level 6 Plaza Deck 175'-0" Level (Chews)	5-7 yrs	Repairs: Repair base flashing along the base of wall transition. The paver assembly will need to be removed along the perimeter to clean and fully access the base flashing condition. Repairs should include removing pavers at the plaza perimeter and inspecting the base flashing for open joints, deterioration and abrasion and other forms of damage and degradation. Damaged areas should be replaced.	$ 40,879.71			5 yrs	
			Replacements: 215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.	$ 94,886.24	$ 134,358.92		30 yrs (20 yr warranty)	1
A-2	LEVEL 4 & 5 COLUMBIA STREET ENTRY PLAZA DECK & STAIRS	5-7 yrs	Repairs: base flashing along the base of wall transition. The paver assembly will need to be removed along the perimeter to clean and fully access the base flashing condition. Repairs should include removing pavers at the plaza perimeter and inspecting the base flashing for open joints, deterioration and abrasion and other forms of damage and degradation. Damaged areas should be replaced.	$ 43,289.89			5 yrs	
			Replacements: 215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.	$ 90,427.72	$ 128,045.65		30 yrs (20 yr warranty)	1
A-3	LEVEL 5 CHERRY STREET ENTRY PLAZA & STAIRS	5-7 yrs	Repairs: base flashing along the base of wall transition. The paver assembly will need to be removed along the perimeter to clean and fully access the base flashing condition. Repairs should include removing pavers at the plaza perimeter and inspecting the base flashing for open joints, deterioration and abrasion and other forms of damage and degradation. Damaged areas should be replaced.	$ 18,112.70			5 yrs	
			Replacements: 215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.	$ 38,947.44	$ 55,149.58		30 yrs (20 yr warranty)	1
A-4	SEALANT AT BUILDING/SIDEWALK JOINT	0 yrs (open to weather)	Repairs: Remove and replace sealant with multi-component polyurethance traffic rated sealant system	$ 20,000.00	$ 28,320.00		15 yrs	
B-1	LEVEL 6 PLAZA DECK 180'-0" LEVEL	5-7 yrs	Repairs: base flashing along the base of wall transition. The paver assembly will need to be removed along the perimeter to clean and fully access the base flashing condition. Repairs should include removing pavers at the plaza perimeter and inspecting the base flashing for open joints, deterioration and abrasion and other forms of damage and degradation. Damaged areas should be replaced.	$ 191,825.02			5 yrs	
			Replacements: 215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.	$ 445,246.64		$ 512,033.64	30 yrs (20 yr warranty)	1

Area	Description	Service Life Until Replacement is Critical	Repair/Replacement Detail	Cost if Bid Package > 1,000,000	Cost if Separate JOC < 300,000	Cost if Bid > 300,000 but less than 1,000,000	Expected Service Life after Repair/Replacement	Remarks
B-2	LEVEL 6 PLAZA: INFILL AREA AT FIFTH AVENUE ENTRY ADDITION	5-7 yrs	Repairs: Replace sealant at Fifth Avenue Addition surface mount flashing with high-quality polyurethane sealant.	$ 3,305.52			5 yrs	
			Replacements: 215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.	$ 7,672.48	$ 10,864.23		30 yrs (20 yr warranty)	1
C-1	LEVEL 4 PLANTERS AT COLUMBIA STREET ENTRY	CBRE Maintenance	Remove soil, clean drains, repair irrigation, membranes, flashing & insulation, replace landscaping	$ -			CBRE Maintenance	
C-2	LEVEL 5 PLANTERS AT CHERRY STREET ENTRY	CBRE Maintenance	Remove soil, clean drains, repair irrigation, membranes, flashing & insulation, replace landscaping	$ -			CBRE Maintenance	
C-3	LEVEL 6 PLANTERS AT PLAZA	CBRE Maintenance	Remove soil, clean drains, repair irrigation, membranes, flashing & insulation, replace landscaping	$ -			CBRE Maintenance	
C-4	LEVEL 6 PLANTERS ADJACENT TO FIFTH AVENUE ADDITION	CBRE Maintenance	Remove soil, clean drains, repair irrigation, membranes, flashing & insulation, replace landscaping	$ -			CBRE Maintenance	
D	LEVEL 6 LOW SLOPE ROOF AT SW CORNER (CHEWS)	30 yrs	repaired in 2012	$ -			30 yrs	
E	LEVEL 6 LOW SLOPE ROOF AT NW CORNER (AMIGA'S & BEBA'S)	30 yrs	repaired in 2012	$ -			30 yrs	
F	LEVEL 6 PAVER-BALLASTED ROOF ABOVE MAIN ENTRY	5-7 yrs	Repairs: Spot Repair exposed EPDM base flashings. Cover all exposed EPDM base flashings with prefinished sheet metal skirt flashings to provide UV protection. Remove gravel, dirt and organic material and clean drain mat around roof drains to allow free drainage, install formed perforated stainless steel drain surrounds instead of gravel. Coordinate with adjacent EIFS repair described at Area II.	$ 36,634.08			5 yrs	
			Replacements: 60 mil EPDM membrane and base flashings, new kynar aluminum skirt flashings, new geotextile mat, confirm condition of existing materials and allow for 25% replacement of existing pavers &rigid insulation.	$ 80,465.00	$ 113,938.44		30 yrs (20 yr warranty)	1

Area	Description	Service Life Until Replacement is Critical	Repair/Replacement Detail	Cost if Bid Package > 1,000,000	Cost if Separate JOC < 300,000	Cost if Bid > 300,000 but less than 1,000,000	Expected Service Life after Repair/Replacement	Remarks
G	LEVEL 6 STEEP SLOPE SHT METAL ROOF AT FIFTH AVE ENTRY	20 yrs	repaired in 2012	$ -			20 yrs	
H	LEVEL 6 STEEP SLOPE SHT METAL ROOF AT SW CORNER (CHEWS)	20 yrs	repaired in 2012	$ -			15 yrs	
I	AT NW CORNER(AMIGA'S & BEBA'S)	20 yrs	repaired in 2012	$ -			15 yrs	
J-1	LEVEL 6 GLASS EXTERIOR CANOPIES	10-12 yrs	Repairs: Provide bulb strainers at all downspouts. Provide shop-welded kynar-finished aluminum pyramid caps at each pyramid unit to cover open joints. Replace broken glass units near Cherry St. entrance. Replace sealant joints at lap seams in gutter system. Apply a wet-seal silicone sealant at glass canopy sheet metal caps to prolong water-tight integrity	$ 28,026.08	$ 39,684.93		15 yrs	2
			Replacements: PVDF finished aluminum skylight system, stainless steel gutters.	$ 239,678.90			30 yrs (20 yr warranty)	
J-2	LEVEL 6 LOBBY SKYLIGHTS	10-12 yrs	Repairs: Replace failed insulated glazing unit with matching unit	$ 16,135.01			20+ yrs	
			Replacements: PVDF finished aluminum skylight framing system.	$ 50,832.60	$ 71,978.96		30 yrs (20 yr warranty)	3
K	LEVEL 14 PAVER BALLASTED ROOF LOWER EAST TERRACE DECK (TRIANGLE)	30 yrs	replaced in 2012	$ -			30 yrs	
L	LEVEL 14 PAVER BALLASTED ROOF ABOVE AUX. MECH ROOM	30 yrs	replaced in 2011	$ -			30 yrs	
M	LEVEL 14 PAVER BALLASTED ROOF ABOVE POOL/CLUB	30 yrs	replaced in 2012	$ -			30 yrs	
N	LEVEL 14 PAVER BALLASTED ROOF ABOVE ELEVATORS	30 yrs	replaced in 2012	$ -			30 yrs	
O	LEVEL 14 PAVER BALLASTED ROOF ABOVE MECH ROOM	30 yrs	replaced in 2012	$ -			30 yrs	

Area	Description	Service Life Until Replacement is Critical	Repair/Replacement Detail	Cost if Bid Package > 1,000,000	Cost if Separate JOC < 300,000	Cost if Bid > 300,000 but less than 1,000,000	Expected Service Life after Repair/Replacement	Remarks
P	LEVEL 53, 54, 55, 56 WEST TERRACE DECKS	5-7 yrs	Alt 1 Repairs: Apply additional resin at all open cuts and lapped seams so that all exposed fleece reinforcing is completely embedded in resin. Clean and spot coat repair areas and holiday areas with resin topcoat. Repair isolated "unbounded" areas by slicing, drying and adhering areas in resin and applying round fleece patches embedded in resin. Repair membrane at downspouts to extend resin embedded fleece down into the pipe. Verify that membrane extends over gutter edge by removing metal cap flashing, and extend the membrane if it does not. Repair sealant joints at metal wall flashings at membrane perimeter. (Coordinate with Stone Cladding joint repair Area FF.)	$ 47,043.19			10 yrs	
			Alt 2 Repairs: Apply new topcoat in addition to above	$ 72,446.51	$ 102,584.26		30 yrs	4
Q-1	LEVEL 14 NORTHEAST TRIANGLE CORNER TERRACE DECK	30 yrs	replaced in 2012	$ -			30 yrs	
Q-2	LEVEL 14 PLANTERS	2-5 yrs	Repairs: Remove all ivy due to invasive root structure; Remove planting soil to a level 6" below adjacent EIFS surfaces. Replace failed polyurethane sealant with silicone sealant and backer at the top edge all around perimeter of each planter. (best if done together with next item) Recommended in next 6 to 18 months. Repair/replace the self adhered membrane at the top 6" around the planters to prevent further soil migration behind insulation board. Replace sealant joints at stone copings around planter perimeter.	$ 87,545.53			5 yrs	
			Replacements: Fiber reinforced catalyzed resin membrane (Kemperol)	$ 114,400.35	$ 161,990.90		30 yrs (20 yr warranty)	1,5
Q-3	LEVEL 14 CONCRETE CAPS	0 yrs (open to weather)	Alt. 1 Repairs: Remove and replace sealant and backer at joints between precast units and surrounding assemblies.	$ 4,065.70			10 yrs	
			Alt. 2 Repairs: Install fleece reinforced catalyzed resin membrane (Kemperol) over top of precast caps, with counter flashing at wall assembly above.	$ 4,847.05	$ 6,863.42		20-30 yrs	1
R	TOWER ROOF BMU DECK	30 yrs	replaced in 2009	$ -			30 yrs	

Area	Description	Service Life Until Replacement is Critical	Repair/Replacement Detail	Cost if Bid Package > 1,000,000	Cost if Separate JOC < 300,000	Cost if Bid > 300,000 but less than 1,000,000	Expected Service Life after Repair/Replacement	Remarks
AA	LOW SLOPE GLASS ROOF	2-5 yrs (ongoing leaks)	Alt. 1 Repairs: Remove and replace all wet sealants.	$ 202,462.34			10 yrs	
			Alt. 2 Repairs: Remove and replace compression bars, gaskets, cover bars, and reseal entire system.	$ 293,570.40		$ 337,605.96	20 yrs	6
			Alt. 3 Repairs: In addition to 2, replace IGUs with thermally improved IGUs.	$ 452,098.42			30 yrs (20 yr warranty)	
			Alt. 4 Repairs: In addition to 2 & 3, replace aluminum glass framing system with internal gutter framing system (i.e. all new system back to primary structure).	$ 913,238.80			30 yrs (20 yr warranty)	7
BB-1	STEEP SLOPE GLASS ROOF	2-5 yrs (ongoing leaks)	Alt. 1 Repairs: Remove and replace all wet sealants.	$ 959,601.81			10 yrs	
			Alt. 2 Repairs: Remove and replace compression bars, gaskets, cover bars, and reseal entire system.	$ 1,276,270.41			20 yrs	6
			Alt. 3 Repairs: In addition to 2, replace IGUs with thermally improved IGUs.	$ 2,807,794.91			30 yrs (20 yr warranty)	
			Alt. 4 Repairs: In addition to 2 & 3, replace aluminum glass framing system with internal gutter framing system (i.e. all new system back to primary structure).	$ 4,548,627.75			30 yrs (20 yr warranty)	7
BB-2	HIGH ROOF CONCRETE GUTTER ASSEMBLY	2-5 yrs (ponding)	Repairs: Clean and prep concrete to substrate, replace sealants at expansion joints, new epoxy grout crickets to existing drains, new fleece reinforced catalyzed resin waterproofing membrane	$ 89,880.39	$ 127,270.63		30 yrs	
CC	MAIN EXTERIOR WALLS - NORTH ELEVATION	5-7 yrs	Alt. 1 Repairs: Systematic Spot Repair: Map out areas accessed by sequential BMU drops into a schedule to access the entire tower cladding assembly. Systematically inventory and spot repair currently failed sealants at aluminum window to stone cladding joints and at joints between stone cladding panels. Replace failed window gaskets, repair damaged window frames (very few), inventory and repair broken stone panels. Assume.	$ 1,642,237.95			10 yrs	
			Alt 2 Repairs: Systematic Sealant Replacement: In addition to above, remove and replace ALL system sealants at wall area accessible with each drop in BMU	$ 3,876,811.58			30 yrs (20 yr warranty)	1
DD	MAIN EXTERIOR WALLS - SOUTH ELEVATION	5-7 yrs	Alt. 1 Repairs: Systematic Spot Repair: Map out areas accessed by sequential BMU drops into a schedule to access the entire tower cladding assembly. Systematically inventory and spot repair currently failed sealants at aluminum window to stone cladding joints and at joints between stone cladding panels. Replace failed window gaskets, repair damaged window frames (very few), inventory and repair broken stone panels. Assume.	$ 1,587,956.23			10 yrs	
			Alt 2 Repairs: Systematic Sealant Replacement: In addition to above, remove and replace ALL system sealants at wall area accessible with each drop in BMU	$ 3,748,669.36			30 yrs (20 yr warranty)	1

Area	Description	Service Life Until Replacement is Critical	Repair/Replacement Detail	Cost if Bid Package > 1,000,000	Cost if Separate JOC < 300,000	Cost if Bid > 300,000 but less than 1,000,000	Expected Service Life after Repair/Replacement	Remarks
EE	MAIN EXTERIOR WALLS - NORTHEAST ELEVATION	5-7 yrs	Alt. 1 Repairs: Systematic Spot Repair: Map out areas accessed by sequential BMU drops into a schedule to access the entire tower cladding assembly. Systematically inventory and spot repair currently failed sealants at aluminum window to stone cladding joints and at joints between stone cladding panels. Replace failed window gaskets, repair damaged window frames (very few), inventory and repair broken stone panels. Assume.	$ 2,320,993.80			10 yrs	
			Alt 2 Repairs: Systematic Sealant Replacement: In addition to above, remove and replace ALL system sealants at wall area accessible with each drop in BMU	$ 5,479,142.42			30 yrs (20 yr warranty)	1
FF	MAIN EXTERIOR WALLS - WEST ELEVATION	5-7 yrs	Alt. 1 Repairs: Systematic Spot Repair: Map out areas accessed by sequential BMU drops into a schedule to access the entire tower cladding assembly. Systematically inventory and spot repair currently failed sealants at aluminum window to stone cladding joints and at joints between stone cladding panels. Replace failed window gaskets, repair damaged window frames (very few), inventory and repair broken stone panels. Assume.	$ 2,266,218.83			10 yrs	
			Alt 2 Repairs: Systematic Sealant Replacement: In addition to above, remove and replace ALL system sealants at wall area accessible with each drop in BMU	$ 5,349,835.80			30 yrs (20 yr warranty)	1
GG	MAIN LOBBY CURTAIN WALL	7-10 yrs	Alt 1 Repairs: Systematic spot repair of wet sealing at IGU to frame joint: Remove failed wet seals at IGU to frame joints, clean surfaces, solvent wipe, install bond-breaker tape and silicone sealant.	$ 197,033.86			5 yrs	
			Alt 2 Repairs: Systematic Sealant Replacement: Replace all wet sealing at IGU to frame joint: Remove existing wet seals at IGU to frame joints, clean surfaces, solvent wipe, install bond-breaker tape and silicone sealant. Replace all Sealant Joints at Curtain Wall/Louver Framing: Remove sealant joints at curtain wall and louver vent assembly frame joints. Clean, solvent wipe, dry, install backer rod/bond-breaker tape and new silicone sealant.	$ 262,055.03		$ 301,363.28	20 yrs	1
HH	ELEVATOR BAY CURTAIN WALL	2 -5 yrs (leaks)	Alt. 1 Repairs: Systematic spot repair of wet sealing at IGU to frame joint: Remove failed wet seals at IGU to frame joints, clean surfaces, solvent wipe, install bond-breaker tape and silicone sealant. Remove and replace failed dry seal window seal gaskets. Replace one failed IGU. Repair one damaged aluminum frame at base condition by grinding and sealing. Repair water damaged interior gwb at elevator shaft	$ 46,912.82			5 yrs	
			Alt. 2 Repairs: Systematic Sealant Replacement: Same as above but systematically replace all wet sealing: Remove existing wet seals at IGU to frame joints, clean surfaces, solvent wipe, install bond-breaker tape and silicone sealant. Systematically replace all dry seal gaskets at window frames.	$ 62,394.06	$ 88,349.99		20 yrs	1
II	EIFS CLADDING AT ELEVATOR BAY AND GARAGE	2 -5 yrs (substrate degradation)	Repairs: Systematic Repair and Re-coating: Perform destructive testing to verify substrate conditions prior to repairs. Patch miscellaneous holes in lamina. Repair miscellaneous cracks (typically at corners/openings). Remove and replace all sealants: remove sealant and backer rod, clean joints, install backer rod and tooled sealant. Clean, prep and recoat all EIFS lamina surfaces with three-coat elastomeric system.	$ 73,627.07	$ 104,255.93		10 yrs	2
			Replacements: with PVDF finished metal cladding with rain screen properties over rigid insulation and weather barrier	$ 394,744.00			30 yrs	

Area	Description	Service Life Until Replacement is Critical	Repair/Replacement Detail	Cost if Bid Package > 1,000,000	Cost if Separate JOC < 300,000	Cost if Bid > 300,000 but less than 1,000,000	Expected Service Life after Repair/Replacement	Remarks
JJ	GARAGE CONCRETE FACE AND PLANTERS	5-7 yrs	1. Painted Concrete-Cased Steel Columns (primary structure) and painted Precast Concrete Spandrels: Surface cracks should be evaluated by a structural engineer. Repair cracks per engineer's recommendation, with epoxy injection. Survey and repair all spalled concrete. Recoat with 3-coat system 2. Painted Precast Concrete Planters: NA: Planters are subject to CBRE maintenance and repair cycle similar to that described at Area C-3. 3. Prefinished Aluminum Panels: NA: see sealants description below. 4. Acrylic Stucco: Repair, clean, prep and recoat with 3-coat elastomeric system. 5. Stone Panel Cladding: Survey and epoxy repair all cracks. 6. Sealants: Systematic sealant replacement: Replace all polyurethane sealants stucco and concrete with silicone. Spot repair all silicone sealant joints at Metal Panels, Stone Cladding, Precast Concrete Panels, and at joints between these systems and adjacent systems.	$ 96,409.70	$ 104,255.93		10 yrs	8
JJ-1	STRUCTURAL EVALUATION OF GARAGE STRUCTURE	0 yrs (structural inspection)	Surface Cracks in painted concrete-cased steel columns (primary structure) should be evaluated by a structural engineer.	$ -			pending inspection	
KK	FIFTH AVENUE ENTRY ADDITION CURTAIN WALL	5-7 yrs (monitor)	Alt. 1 Repairs: Research with manufacturer and replace rubber gasket system between frames (under warranty??)	$ 188,431.31			unknown	
			Alt. 2 Repairs: Replace rubber gasket system between frames with backer rod and silicone sealant system if weep system design intent allows. Inspect and repair sealant joints at all perimeter conditions. Repair PMMA at buttress top adjacent to freeway on ramp (see illustration). (Note that base flashing sealant repair where the 2004 addition meets the 6th Level plaza and planters is described in Area B-2 and C-4)	$ 201,660.61	$ 285,551.42		20 yrs	1
LL-1	SOFFITS LEVEL 6: CEMENT PLASTER STUCCO SOFFITS	2-5 yrs (create inspection access)	Inspection & Access: Provide (4) access hatches to monitor stucco system suspension at walkways. Repair cracks in cement plaster – see Repair Detail. Clean, prep and paint cement plaster soffits. Provide additional soffit venting where warranted.	$ 24,401.37	$ 34,552.34		pending inspection	8
LL-2	SOFFITS LEVEL 6: METAL PANEL SOFFITS	pending - see LL-3	Repairs: Remove and replace plaster areas adjacent to Spider Track and reinforce or replace suspension system. Provide (4) access hatches at metal soffits above public plaza to allow for system inspection and monitoring. Clean stained metal panels. Provide additional venting for soffit areas.	$ 94,224.33	$ 133,421.65		20 yrs	9
LL-3	SOFFITS LEVEL 6: SPIDER TRACK & CEMENT PLASTER TRIM STRIP	0 yrs (inspection & acess, high overhead)	Inspection & Access: Provide access and remove finishes as required for inspection of track suspension by a structural engineer. Provide (4) access hatches to monitor system suspension (coordinate with LL-2 Metal Soffit System access hatches). Remove sagging stucco areas adjacent to track, inspect and reinforce or replace suspension system per structural engineer, and replace stucco trim strip.	$ 14,356.02	$ 20,328.12		pending inspection	9

Area	Description	Service Life Until Replacement is Critical	Repair/Replacement Detail	Cost if Bid Package > 1,000,000	Cost if Separate JOC < 300,000	Cost if Bid > 300,000 but less than 1,000,000	Expected Service Life after Repair/Replacement	Remarks
LL-4	MISCELLANEOUS CEMENT PLASTER SOFFITS	2-5 yrs (create inspection access)	Inspection & Access: Provide access hatches to inspect/monitor system suspension at high traffic and/or high altitude soffit locations; Crack Repair, Repair of Deflecting Stucco, Recoating of stucco soffits	$ 75,403.49	$ 106,771.34		pending inspection	8

Remarks:
1: Replacement significantly lowers life cycle cost and offers potential for warranty
2: Repair offers lower life cycle cost with this assembly
3: Better to wait and replace all IGU's at once for cost and glazing match
4: Difficult access and tenant interruption make a single project with long term life more desirable
5: Coordinate with adjacent work at Activity II
6: Most cost effective mid-term solution
7: Potential for energy savings and project subsidies with high performancy glazing system
8: These assemblies by nature require ongoing short-cycle (10 yrs) repainting/resealing
9: Pending assessment of suspension systems

Seattle Municipal Tower *Weatherization Program*

C: Scope of Work Summaries

Final Draft: 6/27/12

Weatherization Scope of Work Summaries
Work Areas Keyed to Drawings&
Keyed to 2011 BET&R Building Envelope Survey

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DD MAIN EXTERIOR WALLS - SOUTH ELEVATION
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LL-3 SOFFITS LEVEL 6: SPIDER TRACK & CEMENT PLASTER TRIM STRIP
LL-4 MISCELLANEOUS CEMENT PLASTER SOFFITS

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A-1	**LEVEL 6 PLAZA DECK 175'-0" LEVEL (CHEWS)**
Approx. SF	1,954 Reference A2.06
Installed	1989
Existing System	Concrete pavers set in mortar onto brick pedestals over two layers of asphaltic protection board, and one ply of self-adhering rubberized-asphalt waterproofing membrane (i.e. Grace Bituthene) applied onto a light-weight concrete structural slab. At the perimeter a base flashing is turned up under a counter flashing mounted behind the adjacent cladding assemblies. Standing water was observed under the paver assembly. Minimal slope is provided above the waterproofing surface. Drains appear clogged.
Maintenance Schedule	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers each year
Recommended Repairs	Replace sealant joint at surface-mounted flashing along Fifth Avenue Entry Addition. Inspect and repair base flashing at deck to wall transition at entire perimeter
Service Life Remaining	As-is: 5-7 years Repairs: 8-12 years ReplacementSystem: 30+ years (20 year warranty)
Replacement System	215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.
Repair Detail	Replace sealant at Fifth Avenue Addition surface mount flashing with high-quality polyurethane sealant. Repair base flashing along the base of wall transition. The paver assembly will need to be removed along the perimeter to clean and fully access the base flashing condition. Repairs should include removing pavers at the plaza perimeter and inspecting the base flashing for open joints, deterioration and abrasion and other forms of damage and degradation. Damaged areas should be replaced.
M&E Coord	Remove pavers, clean drains, verify water flows freely into drains, and seal all leaks. Identify areas of standing water and evaluate if additional drains are required. Apply the new membrane system to mechanically adhere to the existing or new drain body. With new membrane applications, it's typically more economical to replace the existing drain with a new one. Coordinate sealant electrical conduits beneath paver system. Maintain electrical conduit mounts. Replace and repair any signs of corrosion and compromised watertight raceway connections. Replace housekeeping receptacles with GFCI-protected outlets and weatherproof while-in-use covers.
General Conditions	The repair contractor will complete the majority work during regular business hrs. Pedestrian protection and signage will be required. No access areas can be fully blocked. Materials are readily available. There is an abundant sub pool for this work.
Cost to Repair	40,879.71
Cost to Replace	94,886.24

A-2	**LEVEL 4 & 5 COLUMBIA STREET ENTRY PLAZA DECK & STAIRS**
Approx. SF	1,405 + 327 = 1,732 Reference A2.04-2.05
Installed	1989
Existing System	Similar assembly to A-1 extends down several levels of stairs to sidewalk level at corner of 5th and Columbia. Repairs/replacement in this area could be staged separately from A-1 work to allow unimpeded access. Concrete pavers set in mortar onto brick pedestals over two layers of asphaltic protection board, and one ply of self-adhering rubberized-asphalt waterproofing membrane (i.e. Grace Bituthene) applied onto a light-weight concrete structural slab. At the perimeter a base flashing is turned up under a counter flashing mounted behind the adjacent cladding assemblies.
Maintenance Schedule	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers each year
Recommended Repairs	Inspect and repair base flashing at deck to wall transition at entire perimeter
Service Life Remaining	As-is: 5-7 years Repairs: 8-12 years Replacement System: 30+ years (20 year warranty)
Replacement System	215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.
Repair Detail	Repair base flashing along the base of wall transition. The paver assembly will need to be removed along the perimeter to clean and fully access the base flashing condition. Repairs should include removing pavers at the plaza perimeter and inspecting the base flashing for open joints, deterioration and abrasion and other forms of damage and degradation. Damaged areas should be replaced.
M&E Coord	Remove pavers, clean drains, verify water flows freely into drains, and seal all leaks. Identify areas of standing water and evaluate if additional drains are required. Apply the new membrane system to mechanically adhere to the existing or new drain body. With new membrane applications, it's typically more economical to replace the existing drain with a new one. Coordinate sealant electrical conduits beneath paver system. Maintain electrical conduit mounts. Replace and repair any signs of corrosion and compromised watertight raceway connections. Replace housekeeping receptacles with GFCI-protected outlets and weatherproof while-in-use covers.
General Conditions	The repair contractor will complete the majority work during regular business hrs. Pedestrian protection and signage will be required. No access areas can be fully blocked. Materials are readily available. There is an abundant sub pool for this work. Contractor must work in small areas at a time. Work must be completed before moving on.
Cost to Repair	$43,289.89
Cost to Replace	$90,427.72

A-3	**LEVEL 5 CHERRY STREET ENTRY PLAZA & STAIRS**
Approx. SF	776 Reference A2.05
Installed	1989
Existing System	Plaza finishes are above slab on grade in this area with no occupied space below. Similar assembly to A-1 extends down stairs to sidewalk level at corner of 5th and Cherry. Note that a portion of this area is a slab on grade assembly with no occupied space below. Repairs/replacement in this area could be staged separately from A-1 work to allow unimpeded access.
Maintenance Schedule	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers each year
Recommended Repairs	Inspect and repair base flashing at deck to wall transition at entire perimeter
Service Life Remaining	As-is: 5-7 years Repairs: 8-12 years Replacement System: 30+ years (20 year warranty)
Replacement System	215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.
Repair Detail	Repair base flashing along the base of wall transition. The paver assembly will need to be removed along the perimeter to clean and fully access the base flashing condition. Repairs should include removing pavers at the plaza perimeter and inspecting the base flashing for open joints, deterioration and abrasion and other forms of damage and degradation. Damaged areas should be replaced.
M&E Coord	Remove pavers, clean drains, verify water flows freely into drains, and seal all leaks. Identify areas of standing water and evaluate if additional drains are required. Apply the new membrane system to mechanically adhere to the existing or new drain body. With new membrane applications, it's typically more economical to replace the existing drain with a new one. Coordinate sealant electrical conduits beneath paver system. Maintain electrical conduit mounts. Replace and repair any signs of corrosion and compromised watertight raceway connections. Replace housekeeping receptacles with GFCI-protected outlets and weatherproof while-in-use covers.
General Conditions	The repair contractor will complete the majority work during regular business hrs. Pedestrian protection and signage will be required. No access areas can be fully blocked. Materials are readily available. There is an abundant sub pool for this work. Contractor must work in small areas at a time. Work must be completed before moving on.
Cost to Repair	$18,112.70
Cost to Replace	$38,947.44

A-4	**BUILDING PERIMETER JOINT AT SIDEWALKS**
Approx. LF	433 Reference A2.04
Installed	1989
Existing System	The joint between the building perimeter and sidewalk is an approximately ¾" wide sealant joint located on the west, north and east sides of the building where the occupied structure extends below grade. Existing gaps provide an avenue for water to penetrate into the subgrade adjacent to the subterranean structure. This may be partially responsible for water intrusion from the subgrade into the deeper subterranean levels of the building at the northwest corner. Such intrusion has been reported by building operators in rooms including the Main Electrical Room and Main Telephone Room.
Maintenance Schedule	After sealant replacement, Inspect the perimeter joint annually and spot repair. After sealant replacement, monitorsubgrade areas for sign of continued water intrusion, particularly at areas housing building critical electrical and communications infrastructure.
Recommended Repairs	See Replacement System
Service Life Remaining	As-is: water intrusion has been seen below these areas Repairs: NA Replacement of Sealant System: 20+ years
Replacement System	Traffic-resistant multi-component chemically curing polyurethane joint sealant rated for slope up to 10%, such as Tremco THC 901 installed with manufacturer approved backer. (Note: investigation of the need for additional interior water management measures is recommended due to the importance of the electrical and telecomm infrastructure in rooms below grade).
Repair Detail	NA
M&E Coord	
General Conditions	The repair contractor will complete the majority work during regular business hrs. Pedestrian protection and signage will be required. No access areas can be fully blocked. Materials are readily available. There is an abundant sub pool for this work. Contractor must work in small areas at a time. Work must be completed before moving on.
Cost to Repair	NA
Cost to Replace	$xxxx

B-1	**LEVEL 6 PLAZA DECK 180'-0" LEVEL**
Approx. SF	9,169 Reference A2.06
Installed	1989
Existing System	Concrete pavers set in mortar onto brick pedestals over two layers of asphaltic protection board, and one ply of self-adhering rubberized-asphalt waterproofing membrane (i.e. Grace Bituthene) applied onto a light-weight concrete structural slab. At the perimeter a base flashing is turned up under a counter flashing mounted behind the adjacent cladding assemblies.
Maintenance Schedule	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	Inspect and repair base flashing at deck to wall transition at entire perimeter
Service Life Remaining	As-is: 5-7 years Repairs: 8-12 years Replacement System: 30+ years (20 year warranty)
Replacement System	215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.
Repair Detail	Repair base flashing along the base of wall transition. The paver assembly will need to be removed along the perimeter to clean and fully access the base flashing condition. Repairs should include removing pavers at the plaza perimeter and inspecting the base flashing for open joints, deterioration and abrasion and other forms of damage and degradation. Damaged areas should be replaced.
M&E Coord	Remove pavers, clean drains, verify water flows freely into drains, and seal all leaks. Identify areas of standing water and evaluate if additional drains are required. Apply the new membrane system to mechanically adhere to the existing or new drain body. With new membrane applications, it's typically more economical to replace the existing drain with a new one. Coordinate sealant electrical conduits beneath paver system. Maintain electrical conduit mounts. Replace and repair any signs of corrosion and compromised watertight raceway connections. Replace housekeeping receptacles with GFCI-protected outlets and weatherproof while-in-use covers.
General Conditions	The repair contractor will complete the majority work during regular business hrs. Pedestrian protection and signage will be required. No access areas can be fully blocked. Materials are readily available. There is an abundant sub pool for this work. Contractor has larger working areas for production effort.
Cost to Repair	$191,825.02
Cost to Replace	$445,246.64

B-2	**LEVEL 6 PLAZA: INFILL AREA AT FIFTH AVENUE ENTRY ADDITION**
Approx. SF	158 Reference A2.06
Installed	2004
Existing System	This small area of the plaza was raised from 175' to 180' level during the addition. Pavers set on PVC pipe pedestals on one layer of asphalt protection board over torch-applied multiple-ply SBS modified waterproofing system. At the perimeter the membrane forms a base flashing turned up under a surface applied stainless steel counter flashing with an exposed sealant cup joint at the top. The waterproofing membrane was in good condition; but the individual plies did not appear to be fully heat welded together as one monolithic membrane. It appears that the base flashing lap under the cap flashing is not complete in all areas.
Maintenance Schedule	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers each year
Recommended Repairs	Replace sealant joint at surface-mounted flashing along Fifth Avenue Entry Addition. Inspect and repair base flashing at deck to wall transition at entire perimeter
Service Life Remaining	As-is: 5-7 years Repairs: 8-12 years Replacement System: 30+ years (20 year warranty)
Replacement System	215 mil Fiber Reinforced Rubberized Asphalt Membrane direct to concrete substrate (Hydrotech or sim.), new drains, new perimeter flashings, and reinstall existing pavers (10% new) on new pedestal system.
Repair Detail	Replace sealant at Fifth Avenue Addition surface mount flashing with high-quality polyurethane sealant.
M&E Coord	Remove pavers, clean drains, verify water flows freely into drains, and seal all leaks. Identify areas of standing water and evaluate if additional drains are required. Apply the new membrane system to mechanically adhere to the existing or new drain body. With new membrane applications, it's typically more economical to replace the existing drain with a new one. Coordinate sealant electrical conduits beneath paver system. Maintain electrical conduit mounts. Replace and repair any signs of corrosion and compromised watertight raceway connections. Replace housekeeping receptacles with GFCI-protected outlets and weatherproof while-in-use covers.
General Conditions	The repair contractor will complete the majority work during regular business hrs. Pedestrian protection and signage will be required. No access areas can be fully blocked. Materials are readily available. There is an abundant sub pool for this work.
Cost to Repair	$3,305.52
Cost to Replace	$7,672.48

C-1	**LEVEL 4 PLANTERS AT COLUMBIA STREET ENTRY**
Approx. SF	158 Reference A2.04
C-2	**LEVEL 5 PLANTERS AT CHERRY STREET ENTRY**
Approx. SF	239 Reference A2.05
C-3	**LEVEL 6 PLANTERS AT PLAZA**
Approx. SF	1,920 Reference A2.06
Installed	1989 (periodic renovation on CBRE schedule)
Existing System	Hot liquid applied rubberized asphalt membrane, 1/8" asphaltic protection board at bottom, geotextile filter fabric mat, 1" EPS board at walls. Self adhering membrane is applied at top 6". Substrate is concrete with stone copings and exterior cladding.
Maintenance Schedule	Excavate and repair clogged drains After Repairs: Annual inspection and renewal of sealant joints After Repairs: Every five years: spot check with partial excavation to observe condition of planter membrane.
Recommended Repairs	Remove all ivy due to invasive root structure. Replace failed polyurethane sealant with silicone sealant and backer at the top edge all around perimeter of each planter. Repair/replace the self adhered membrane at the top 6" around the planters to prevent further soil migration behind insulation board. Replace sealant joints with silicone sealant at stone copings around planter perimeter.
Service Life Remaining	These are renovated by CBRE on a rotating schedule. 10-15 year cycle with monitoring.
Replacement System	NA due to maintenance program. Options for system replacement are: liquid-applied hot rubberized membrane –or- reinforced catalyzed resin waterproofing (Kemperol or Siplast), flashed under stone copings which would have to be removed and replaced, coping joints re-sealed with silicone.
Repair Detail	See above
M&E Coord	Remove all debris from drains, verify water flows freely, and seal all leaks.Coordinate sealant electrical conduits within planters. Maintain electrical conduit mounts, receptacles and flood lights. Replace and repair any signs of corrosion and compromised watertight raceway connections. Replace housekeeping receptacles with GFCI-protected outlets and weatherproof while-in-use covers. All original light fixtures are at end of life and should be replaced. Energy savings can be achieved through replacement of fixtures with units of greater efficiency.
General Conditions	This work should be completed one continuous planter at a time. Remove all materials and completely dispose before repairs. Install all new materials after repairs.
Cost to Repair	C-1: $9,203.07, C-2: $13,921.10, C-3: $111,834.75

Cost to Replace	N/A
C-4	**LEVEL 6 PLANTERS ADJACENT TO FIFTH AVENUE ADDITION**
Approx. SF	303 Reference A2.06
Installed	2004
Existing System	These planters were retrofitted with multiple-ply modified asphalt membrane applied in cold asphalt adhesive, 1/8" insulation board, geotextile filter fabric drain mat at time of the addition.
Maintenance Schedule	Excavate and repair clogged drains After Repairs: Annual inspection and renewal of sealant joints After Repairs: Every five years: spot check with partial excavation to observe condition of planter membrane.
Recommended Repairs	Remove all ivy due to invasive root structure Replace failed polyurethane sealant with silicone sealant and backer at the top edge all around perimeter of each planter. Repair/replace the self adhered membrane at the top 6" around the planters to prevent further soil migration behind insulation board. Replace sealant joints at stone copings around planter perimeter.
Service Life Remaining	These are renovated by CBRE on a rotating schedule. Approx. 10-15 year schedule with monitoring.
Replacement System	NA due to maintenance program. Options for system replacement are: liquid-applied hot rubberized membrane –or- reinforced catalyzed resin waterproofing (Kemperol or Siplast), flashed under stone copings which would have to be removed and replaced, coping joints re-sealed with silicone.
Repair Detail	Remove EPS protection board and dirt. Replace board with seam tape and sealant at top edge. Clean/replace drain assemblies. BETR recommends spot repair and retrofit of the 6-inch self adhered waterproofing membrane at the top of planter walls. BETR recommends spot repair of all failed and deteriorated sealant joints at stone coping with new backed or bond broken tooled sealant joints.
M&E Coord	Remove all debris from drains, verify water flows freely, and seal all leaks. Coordinate sealant electrical conduits within planters. Maintain electrical conduit mounts, receptacles and flood lights. Replace and repair any signs of corrosion and compromised watertight raceway connections. Replace housekeeping receptacles with GFCI-protected outlets and weatherproof while-in-use covers. All original light fixtures are at end of life and should be replaced. Energy savings can be achieved through replacement of fixtures with units of greater efficiency.
General Conditions	This work should be completed one continuous planter at a time. Remove all materials and completely dispose before repairs. Install all new materials after repairs. Additional safety equipment will be required. Access will remain from Plaza level.
Cost to Repair	$20,777.33

Cost to Replace	N/A

D	**LEVEL 6 LOW SLOPE ROOF AT SW CORNER (CHEWS)**
Approx. SF	836 Reference A2.07
Installed	(VERIFY 2012)
Existing System	(VERIFY 2012 ASSEMBLY): 60 mil EPDM membrane
Maintenance Schedule	Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	N/A
Service Life Remaining	30 years (20 year warranty)
Replacement System	N/A
Repair Detail	N/A
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	Access from Level 6 Plaza Deck with ladder
Cost to Repair	N/A
Cost to Replace	N/A

E	**LEVEL 6 LOW SLOPE ROOF AT NW CORNER (AMIGA'S & BEBA'S)**
Approx. SF	1677 Reference A2.07
Installed	(VERIFY 2012)
Existing System	(VERIFY 2012 ASSEMBLY): 60 mil EPDM membrane
Maintenance Schedule	Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	N/A
Service Life Remaining	30 years (20 year warranty)
Replacement System	N/A
Repair Detail	N/A
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	Access from Level 6 Plaza Deck with ladder
Cost to Repair	N/A
Cost to Replace	N/A

F	**LEVEL 6 PAVER-BALLASTED ROOF ABOVE MAIN ENTRY**
Approx. SF	1,853 Reference A2.07
Installed	1989
Existing System	20”x20” concrete pavers over Firestone geotextile drain mat over unreinforced Firestone .045” EPDM membrane. Exposed EPDM base flashings around perimeter. Substrate is 3.5” loose laid EPS insulation on metal roof deck w/ fireproofing below.
Maintenance Schedule	Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	Spot Repair exposed EPDM base flashings. Cover all exposed EPDM base flashings with prefinished sheet metal skirt flashings to provide UV protection Remove gravel, dirt and organic material and clean drain mat around roof drains to allow free drainage, install formed perforated stainless steel drain surrounds instead of gravel. Clean out joints and replace sealants at all surrounding counter flashings and parapets. Coordinate with adjacent EIFS repair described at Area II.
Service Life Remaining	As-is: 6-8 years Repairs: 8-10 years, no warranty Replacement: 30 years (20 year warranty)
Replacement System	60 mil EPDM membrane and base flashings, new kynar aluminum skirt flashings, new geotextile mat,new rigid insulation, confirm condition of existing pavers and allow for 25% replacement of existing pavers.
Repair Detail	See above
M&E Coord	Prevent dust and fumes from entering outside air intake louver located at grid 13/G. No impact to electrical systems.
General Conditions	Access from Level 7 Garage, Level 6 Plaza Deck with secured ladder. Operation conducted by small team due to access and area.
Cost to Repair	$36,624.65
Cost to Replace	$80,465.00

G	LEVEL 6 STEEP SLOPE SHT METAL ROOF AT FIFTH AVE ENTRY
Approx. SF	2,682 Reference A2.07
Installed	2003, repairs 2012
Existing System	22 gauge prefinished standing seam metal roof, prefinished flashings, 22 gauge stainless steel built-in gutter system.
Maintenance Schedule	Inspect & clean drains each year Inventory & repair exposed sealants every 5 years Wash organic material from flat seams every 5 years
Recommended Repairs	N/A
Service Life Remaining	As-is: 20 years with regular maintenance and spot repair.
Replacement System	N/A
Repair Detail	
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	Access from Level 6 Plaza Deck with ladder
Cost to Repair	N/A
Cost to Replace	N/A

H	**LEVEL 6 STEEP SLOPE SHT METAL ROOF AT SW CORNER (CHEWS)**
Approx. SF	900 Reference A2.07
I	**AT NW CORNER(AMIGA'S & BEBA'S)**
Approx. SF	900 Reference A2.07
Installed	1989
Existing System	Factory finished 24 gauge steel snap-lock standing seam hipped roof, 6:12 slope. Substrate was not uncovered for BETR observation. Venting is provided with vents mounted in the base curb below the sloped roof. 1989 drawings A4.19 indicate 16ga framing on top of flat composite structural deck, sheathing and ventilation is not indicated. Kitchen equipment penetrations are improperly flashed and leaking. Top of panel detail at hip is substandard (no tonged & sealed upturn) and has temporary patch to reduce windblown rain penetration, bottom of panel detail is substandard (no drip edge or expansion).
Maintenance Schedule	Inspect and repair sealant joints yearly
Recommended Repairs	Reflash kitchen exhaust penetration (being replaced during 2012 repairs) Reseal vent flanges at curb (being replaced during 2012 repairs) Provide a continuous drip edge at bottom of panels. At hip condition, clean the top of each panel, seal, install backer rod bedded in sealant at each panel, install prefinished metal closure trim pieces at each panel, seal around closure trim.
Service Life Remaining	As-is:ongoing minor leaking needs attention Repair:12-15 years Replacement: 30 years (20 year warranty)
Replacement System	Prefinished Kynar standing seam metal roof and flashings over approved underlayment over new plywood sheathing on existing metal framing.
Repair Detail	
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	Access by secured ladder from Level 6 plaza, the sloped roof is surrounded by paver protected low slope roof system – see D. Area has narrow standing ledge.
Cost to Repair	H: $13,860.90, I: $7,330.87
Cost to Replace	H:$21,689.64 I: $11,471.41

J-1	**LEVEL 6 GLASS EXTERIOR CANOPIES**
Approx. SF	1635 Reference A2.07
Installed	1989
Existing System	Painted HSS welded steel tube frames with pyramid shaped glass infill panels secured with pressure plates with Torx head fasteners, covered with prefinished aluminum cover plate. A sheet metal gutter system drains the individual components discharging through a tight lined downspout.
Maintenance Schedule	Clean gutters of organic debris twice yearly, remove strainers and flush downspouts once yearly.
Recommended Repairs	Provide bulb strainers at all downspouts. Provide shop-welded Kynar-finished aluminum pyramid caps at each pyramid unit to cover open joints. Replace broken glass units near Cherry St. entrance Replace sealant joints at lap seams in gutter system. Apply a wet-seal silicone sealant at glass canopy sheet metal caps to prolong water-tight integrity.
Service Life Remaining	As-is: 10-12 years Repairs: 18 to 22 years Replacement: 30 years+
Replacement System	PVDF finished aluminum skylight system, stainless steel gutters.
Repair Detail	See above
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	Access with secured ladders. Multiple areas can be repaired at a time. Entries to restaurants will slightly reduce production time.
Cost to Repair	$28,026.08
Cost to Replace	$239,678.90

J-2	**LEVEL 6 GLASS SKYLIGHTS**
Approx. SF	390 Reference A2.07
Installed	1989
Existing System	Painted HSS welded steel tube frames with insulated glass unit infill panels secured with pressure plates with Torx head fasteners, covered with prefinished aluminum cover plate.
Maintenance Schedule	Inspect and spot repair sealants annualy.
Recommended Repairs	Replace failed insulated glazing unit with matching unit.
Service Life Remaining	As-is: 20 years+, monitor compression gaskets and glass units. Insulated Glazing Units: Units are 23 years old with limited failure and could be anticipated to last as long as 20 year sealant replacement cycle with limited replacement.
Replacement System	PVDF finished aluminum skylight framing system.
Repair Detail	See above
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	Access by ladder from Level 6 plaza, or from Level 7 parking garage.
Cost to Repair	$16,135.01
Cost to Replace	$50,832.60

K	LEVEL 14 PAVER PROTECTED ROOF LOWER EAST TERRACE DECK
Approx. SF	1623 Reference A2.14
Installed	2012
Existing System	Replaced in 2012 with: 20”x20” concrete pavers on pedestals over two layers of 1/8” asphaltic protection board over single layer unreinforced .060” polyethylene-faced rubberized asphalt waterproofing membrane. Exposed membrane base flashing. Substrate lightweight structural concrete over steel deck w/ fireproofing below.
Maintenance Schedule	Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	NA
Service Life Remaining	30 years (20 year warranty)
Replacement System	NA
Repair Detail	NA
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	**Special Conditions:** Unheated parking garage below.This area receives run-off from face of 40 floors above. Cooling tower support and pipe penetrations in deck. Wall supported piping runs in front of adjacent cladding.Access by Ladder down from Level 14 door, hatch from Level 13 garage below. Work area is open with no likely hood of work interruption. Materials may be delivered to 14th level with panel jack. Materials must be loaded on jack to comply with elevator requirements for weight.
Cost to Repair	NA
Cost to Replace	NA

L	**LEVEL 14 PAVER BALLASTED ROOF ABOVE AUX. MECH ROOM**
Approx. SF	1,028 Reference A2.14
Installed	2011
Existing System	New membrane (NEED 2011 SYSTEM DESCRIPTION AND RELATED WORK)
Maintenance Schedule	Inspect/Clean Roof Drains 2x/year Inspect/Spot Repair Sealants yearly Replace broken pavers yearly
Recommended Repairs	N/A
Service Life Remaining	30 years (20 year warranty)
Replacement System	N/A
Repair Detail	N/A
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	Access through Doors at Level 14.
Cost to Repair	N/A
Cost to Replace	N/A

M	**LEVEL 14 PAVER BALLASTED ROOF ABOVE POOL/CLUB**
Approx. SF	5,070 Reference A2.14
Installed	2012
Existing System	Replaced in 2012 with: 20”x20” concrete pavers on pedestals over two layers of 1/8” asphaltic protection board over single layer unreinforced .060” polyethylene-faced rubberized asphalt waterproofing membrane. Exposed membrane base flashing. Substrate lightweight structural concrete over steel deck w/ fireproofing below.
Maintenance Schedule	Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	NA
Service Life Remaining	30 years (20 year warranty)
Replacement System	NA
Repair Detail	NA
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	
Cost to Repair	NA
Cost to Replace	NA

N	**LEVEL 14 PAVER BALLASTED ROOF ABOVE ELEVATORS**
Approx. SF	765 Reference A2.14
Installed	2012
Existing System	Replaced in 2012 with: 20”x20” concrete pavers on pedestals over two layers of 1/8” asphaltic protection board over single layer unreinforced .060” polyethylene-faced rubberized asphalt waterproofing membrane. Exposed membrane base flashing. Substrate lightweight structural concrete over steel deck w/ fireproofing below.
Maintenance Schedule	Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	NA
Service Life Remaining	30 years (20 year warranty)
Replacement System	NA
Repair Detail	NA
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	
Cost to Repair	NA
Cost to Replace	NA

O	**LEVEL 14 PAVER BALLASTED ROOF ABOVE MECH ROOM**
Approx. SF	4,349 Reference A2.14
Installed	2012
Existing System	Replaced in 2012 with: 20”x20” concrete pavers on pedestals over two layers of 1/8” asphaltic protection board over single layer unreinforced .060” polyethylene-faced rubberized asphalt waterproofing membrane. Exposed membrane base flashing. Substrate lightweight structural concrete over steel deck w/ fireproofing below.
Maintenance Schedule	Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	NA
Service Life Remaining	30 years (20 year warranty)
Replacement System	NA
Repair Detail	NA
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	
Cost to Repair	NA
Cost to Replace	NA

P	**LEVEL 53, 54, 55, 56 WEST TERRACE DECKS**
Approx. SF	2,911 Reference A2.53
Installed	2005
Existing System	Fabric reinforced catalyzed resin waterproofing membrane over structural concrete deck. At the building wall sheet metal flashing protects the upturned membrane. At level 53 and 55 the outer edge is a gutter assembly, at level 54 and 56 the outer edge is a flashed drainage edge. It is not confirmed that the membrane extends over the gutter edges under the metal cover flashing. The membrane wraps up onto penetrating elements (window washing support brackets) and into downspouts (though not adequately per BETR observations).
Maintenance Schedule	Provide lay down pads for window washing support brackets to protect membrane. Inspect and spot repair sealant joints.
Recommended Repairs	Near Term: Apply additional resin at all open cuts and lapped seams so that all exposed fleece reinforcing is completely embedded in resin. Clean and spot coat repair areas and holiday areas with resin topcoat.Repair isolated “unbounded” areas by slicing, drying and adhering areas in resin and applying round fleece patches embedded in resin.Repair membrane at downspouts to extend resin embedded fleece down into the pipe. Verify that membrane extends over gutter edge by removing metal cap flashing, and extend the membrane if it does not.Repair sealant joints at metal wall flashings at membrane perimeter. (Coordinate with Stone Cladding joint repair Area FF.) In Ten Years: Apply new resin top coat.
Service Life Remaining	As-is: 10 to 14 years Repairs & top coat: 20 to 30 years.
Replacement System	NA
Repair Detail	See above
M&E Coord	Clean drains, verify water flows freely into drains, and seal all leaks. Apply the new membrane system to mechanically adhere to the existing or new drain body. With new membrane applications, it’s typically more economical to replace the existing drain with a new one.
General Conditions	Accessing these areas is best made through the opening atthese levels through adjacent office windows (no doors to terraces). Security passes will be required. Materials maybe delivered to each level with a panel jack. Materials mustbe loaded on jack to comply with elevator requirementsforweight. Proper teaming will be necessary for efficiency.
Cost to Repair	A: Near Term repairs: $47,043.19 B: New resin top coat: $72,446.51
Cost to Replace	

Q-1	**LEVEL 14 NORTHEAST CORNER TERRACE DECK**
Approx. SF	640 Reference A2.14
Installed	2012
Existing System	Replaced in 2012 with: 20”x20” concrete pavers on pedestals over two layers of 1/8” asphaltic protection board over single layer unreinforced .060” polyethylene-faced rubberized asphalt waterproofing membrane. Exposed membrane base flashing. Substrate lightweight structural concrete over steel deck w/ fireproofing below.
Maintenance Schedule	Inspect & clean drains 2x each year Replace any broken pavers
Recommended Repairs	NA
Service Life Remaining	30 years (20 year warranty)
Replacement System	NA
Repair Detail	NA
M&E Coord	(VERIFY 2012 REPAIRS)
General Conditions	Access is through terrace door at Sports Club Men’s locker room on 14th Floor. **Special Conditions:** Unheated parking garage below. This area receives run-off from face of 40 floors Work area is open but access is through Men's locker room. Materials may be delivered to 14th level with panel jack. Materials must be loaded on jack to comply with elevator requirements for weight.
Cost to Repair	NA

Q-2	**LEVEL 14 PLANTERS**
Approx. SF	1,193 Reference A2.14
Installed	1989
Existing System	Hot liquid applied rubberized asphalt membrane, 1/8" asphaltic protection board at bottom, geotextile filter fabric mat, 1" EPS board at walls. Self adhering membrane is applied at top 6". Substrate is concrete with stone copings and stone/stucco cladding. (Perimeter detail: 5,8/A4.16G, detail at adjacent penthouse wall: O/A4.14).
Maintenance Schedule	Excavate and repair clogged drains Annual inspection and renewal of sealant joints Every five years: spot check with partial excavation to observe condition of planter membrane.
Recommended Repairs	Remove all ivy due to invasive root structure Remove planting soil to a level 6" below adjacent EIFS surfaces Replace failed polyurethane sealant with silicone sealant and backer at the top edge all around perimeter of each planter. (best if done together with stone coping joints) Recommended in next 6 to 18 months. Repair/replace the self adhered membrane at the top 6" around the planters to prevent further soil migration behind insulation board. Replace sealant joints at stone copings around planter perimeter.
Service Life Remaining	As-is: 5 years Repairs: 10 year repair cycle. Replacement: 30 years (20 year warranty).
Replacement System	Fabric reinforced catalyzed resin waterproofing system (Kemperol or approved)
Repair Detail	See above
M&E Coord	Remove all debris from drains, verify water flows freely, and seal all leaks. Coordinate sealant around conduits within planters. Maintain electrical conduit mounts and receptacles. Replace and repair any signs of corrosion and compromised watertight raceway connections. Replace housekeeping receptacles with GFCI-protected outlets and weatherproof while-in-use covers.
General Conditions	**Special Condition:** Access is constrained by drop off on exterior face and adjacent wall on interior sides of planters at this level. Deck level access is only available in the area adjacent to the tower at Q1 and K decks. Coordinate with work described at II EIFS Penthouse Cladding and JJ Precast Concrete Spandrels at Garage. Planters are accessed from the 14th level roof. All work can be completed from there. Pedestrian protection below will be required.
Cost to Repair	$87,545.53
Cost to Replace	$114,400.35

Q-3	**LEVEL 14 CONCRETE CAPS at NORTH ELEVATION**
Approx. SF	40 sf Reference A2.14
Installed	1989
Existing System	Precast concrete caps in sloped triangular shapes to make transition from tower base to face of garage at 14th Level. Horizontal sealant joints between precast units and to wall above and wall below are disbonded.
Maintenance Schedule	Annual inspection and spot repair of sealant joints.
Recommended Repairs	Alt. 1: Remove and replace sealant and backer at joints between precast units and surrounding assemblies with silicone. Alt. 2: Install fabric reinforced catalyzed resin waterproofing membrane (Kemperol or similar) with color top coat over top of precast caps, with counter flashing at wall assembly above.
Service Life Remaining	As-is: Needs attention since upward facing joints are open. Alt 1: New sealant joints: 15 years. Alt. 2: New fabric reinforced catalyzed resin waterproofing membrane with color top coat: 30 years (20 year warranty).
Replacement System	NA
Repair Detail	See above
M&E Coord	Prevent dust and fumes from entering outside air intake louver located at grid 5/G.
General Conditions	**Special Condition:** Access is constrained by drop off on exterior face and adjacent tower wall. Should be sequenced with other work
Cost to Repair	Alt 1: $4,065.70 Alt. 2: $4,847.05
Cost to Replace	NA

R	**TOWER ROOF BMU DECK**
Approx. SF	1,484 Reference A2.63
Installed	2009
Existing System	New re-roof with BMU installation
Maintenance Schedule	Inspect/Clean Roof Drains 2x/year Inspect/Spot Repair Sealants yearly
Recommended Repairs	N/A
Service Life Remaining	30 years, (currently under 20 year warranty?)
Replacement System	N/A
Repair Detail	N/A
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	Access is From level 60 through stair tower and hatch.
Cost to Repair	N/A

AA	**LOW SLOPE GLASS ROOF**
Approx. SF	8553 Reference A2.63
Installed	1989
Existing System	Aluminum-framed glazing system utilized as low-sloped roof system Approx 2.75/12 slope. Insulated glass units (mfr'd by Viracon, silicone sealed) secured by gasketed compression bars with Torx fasteners at vision and opaque lites. Compression bars were originally wet sealed with silicone sealant. Vertical joints are covered with snap-in (friction fit) cover plates. Every fourth vertical joint has a sheet metal pan previously used by the maintenance trolley but now obsolete. Cover plate system was originally wet sealed with silicone sealant, since repaired with surface applied silicone tape and silicone sealant. There are lateral rails and stanchions for the old (decommissioned) maintenance trolley, maintenance roof anchors, snow retention fences, aviation warning lights. System was wet-sealed from top surface by Pioneer Masonry in 2011.
Maintenance Schedule	Annual inspection and wet-sealant spot repair
Recommended Repairs	Alt. 1: Remove and replace all wet sealants. Alt. 2: Remove and replace compression bars, gaskets, cover bars, and reseal entire system. Alt. 3: In addition to 2, replace IGUs with thermally improved IGUs. Alt. 4: In addition to 2 & 3, replace aluminum glass framing system with internal gutter framing system (i.e. all new system back to primary structure).
Service Life Remaining	As-is: annual spot repairs are essential to manage water infiltration Alt. 1: 8-12 years Alt. 2: 15-20 years Alt. 3: 30 years+, warranty on new Insulated Glazing Units Alt. 4: 30 years+, warranty on new Insulated Glazing Units
Replacement System	See Alt. 3, 4: Note: Significant operating (energy) costs savings are possible with selection of solar-gain reducing glass assembly.
Repair Detail	Alt. 1: Comprehensive Wet Seal Replacement: Removing existing wet seals, clean the glass and adjoining surfaces with a diluted detergent solution and soft-nylon bristled scrub brushes, double-rinse with fresh water, blow-dry and solvent-wipe. Wipe dry with clean white cloths. Back angular-shaped joints with bond-breaker tape. Install new fillet-seal beads applied wet, utilizing quality-formulated Dow silicone sealant and Dow silicone tapes. Alt. 2: Major Retrofit/Replacement of compression bars, gaskets and sealants: Remove sheet metal covers and mullion caps, remove compression bars and gaskets, remove existing sealant. Clean IGUs at sealant edges. Replace the finned butt sealant spacers with a profile that does not compromise the sealant joint. Install new EPDM gaskets and new compression bars with new stainless steel fasteners, torqued in sequence to compress gaskets. Seal fasteners immediately upon torque check. Install new bond breaker tape and silicone sealant wet sealing at all compression bars and joints. Install new mullion caps with clips and mechanical fastening. Install new closed cell backer rod silicone sealant, then pre-formed tape and sealant at glazing butt joints, mullion caps, and flashing joints. Wet seal sides of mullion caps with sealant.

	Alt. 3: Replace Insulated Glazing Units: Remove and dispose of all insulated glazing units. Select a new silicone sealed Insulated Glazing Unit assembly with solar heat gain coefficient and/or internal shading mesh to significantly reduce energy costs to cool the top floors. Protect the interior from weather during the work, and replace interior finishes as required. Alt. 4: Replace Aluminum Framing System:Remove and dispose of existing aluminum window framing system to primary structure. Select a new kynar finished aluminum sloped roof framing system with internal gutter system (skylight profile), and new Insulated Glazing Units per above.
M&E Coord	In the 4/3/12 meeting, the building operators stated the HVAC system positively pressurizes each floor preventing the proper application of the sealants or gaskets. Turning off the HVAC unit or installing an air barrier was discussed as methods of reducing this pressure. Building stack effect, a natural process, will have a significant impact of the pressurization of each floor as the glazing is removed for repair. On cold days, the pressure on the upper floors will be positive and on the lower floors the pressure will be negative. Aviation warning lights to remain. No changes to electrical systems.
General Conditions	Access from BMU deck at top of building. **Special Condition:** This roof area transitions to the adjacent steep slope glass roof (assembly BB) and overhangs the vertical building face at the east and west elevations. Access via BMU. Glazing work requires HVAC Mgmt.
Cost to Repair/ Replace	**Alt. 1:** $202,462.34 **Alt. 2:** $293,570.40 **Alt. 3:** $452,098.42 **Alt. 4:**$913,238.80

BB-1	**NORTH AND SOUTH STEEP SLOPE GLASS ROOF**
Approx. SF	25,676 Reference A2.63
Installed	1989
Existing System	Aluminum-framed glazing system utilized as sloped roof system 9:12 (37 degree) slope at top, 21:12 (60 degree) slope at floors below. Insulated glass units (mfr'd by Viracon, silicone sealed) secured by gasketed compression bars with Torx fasteners at vision and opaque lites. Compression bars were originally wet sealed with silicone sealant. Vertical joints are covered with snap-in (friction fit) cover plates. Every fourth vertical joint has a sheet metal pan previously used by the maintenance trolley but now obsolete in terms of function. Cover plate system was originally wet sealed with silicone sealant, since repaired with surface applied silicone tape and silicone sealant. There are lateral rails and stanchions for the now obsolete maintenance trolley, snow retention fences, aviation warning lights. System was wet-sealed from top surface in 2011.
Maintenance Schedule	Annual inspection and wet-sealant spot repair
Recommended Repairs	Alt. 1: Remove and replace all wet sealants. Alt. 2: Remove and replace compression bars, gaskets, cover bars, and reseal entire system. Alt. 3: In addition to 2, replace IGUs with thermally improved IGUs. Alt. 4: In addition to 2 & 3, replace aluminum glass framing system with internal gutter framing system (i.e. all new system back to primary structure).
Service Life Remaining	As-is: annual spot repairs are essential to manage water infiltration Alt. 1: 8-12 years Alt. 2: 15-20 years Alt. 3: 30 years+, warranty on new Insulated Glazing Units Alt. 4: 30 years+, warranty on new Insulated Glazing Units
Replacement System	See Alt. 3, 4: Note: Significant operating (energy) costs savings are possible with selection of solar-gain reducing glass assembly.
Repair Detail	Alt. 1: Comprehensive Wet Seal Replacement: Removing existing wet seals, clean the glass and adjoining surfaces with a diluted detergent solution and soft-nylon bristled scrub brushes, double-rinse with fresh water, blow-dry and solvent-wipe. Wipe dry with clean white cloths. Back angular-shaped joints with bond-breaker tape. Install new fillet-seal beads applied wet, utilizing quality-formulated Dow silicone sealant and Dow silicone tapes. Alt. 2: Major Retrofit/Replacement of compression bars, gaskets and sealants: Remove sheet metal covers and mullion caps, remove compression bars and gaskets, remove existing sealant. Clean IGUs at sealant edges. Replace the finned butt sealant spacers with a profile that does not compromise the sealant joint. Install new EPDM gaskets and new compression bars with new stainless steel fasteners, torqued in sequence to compress gaskets. Seal fasteners immediately upon torque check. Install new bond breaker tape and silicone sealant wet sealing at all compression bars and joints. Install new mullion caps with clips and mechanical fastening. Install new closed cell backer rod silicone sealant, then pre-formed tape and sealant at glazing butt joints, mullion caps, and flashing joints. Wet seal sides of mullion caps with sealant.

	Alt. 3: Replace Insulated Glazing Units: Remove and dispose of all insulated glazing units. Select a new silicone sealed Insulated Glazing Unit assembly with solar heat gain coefficient and/or internal shading mesh to significantly reduce energy costs to cool the top floors. Protect the interior from weather during the work, and replace interior finishes as required. Alt. 4: Replace Aluminum Framing System: Remove and dispose of existing aluminum window framing system to primary structure. Select a new kynar finished aluminum sloped roof framing system with internal gutter system (skylight profile), and new Insulated Glazing Units per above.
M&E Coord	In the 4/3/12 meeting, the building operators stated the HVAC system positively pressurizes each floor preventing the proper application of the sealants or gaskets. Turning off the HVAC unit or installing an air barrier was discussed as methods of reducing this pressure. Building stack effect, a natural process, will have a significant impact of the pressurization of each floor as the glazing is removed for repair. On cold days, the pressure on the upper floors will be positive and on the lower floors the pressure will be negative. Aviation warning lights to remain. No changes to electrical systems.
General Conditions	Access from BMU deck at top of building. **Special Condition:** This roof area transitions to the adjacent steep slope glass roof (assembly BB) and overhangs the vertical building face at the east and west elevations. Access via BMU. Glazing work requires HVAC Mgmt.
Cost to Repair	**Alt. 1:** $959,601.81 **Alt. 2:** $1,276,270.41 **Alt. 3:** $2,807,794.91 **Alt. 4:**$4,548,627.75

BB-2	**HIGH ROOF CONCRETE GUTTER ASSEMBLY**
Approx. SF	792 Reference A2.63
Installed	1989
Existing System	Precast concrete gutter lined with non-reinforced polyurethane membrane in weathered condition, no internal slope, cast iron side-outlet drains. Assembly is mounted to structural steel outriggers.
Maintenance Schedule	Annual inspection and clean drains.
Recommended Repairs	NA
Service Life Remaining	As-is: Needs work to avoid ponding Replacement: 30 years for new membrane, 20 year warranty.
Replacement System	Clean and prep concrete to substrate, replace sealants at expansion joints, new epoxy grout crickets to replacement drains, new fully adhered fabric reinforced catalyzed resin waterproofing membrane (Kemperol or approved) lap under counter flashing at building and stop at outer edge of concrete gutter edge.
Repair Detail	NA
M&E Coord	Replace the gutter drains. No impact to electrical systems.
General Conditions	Accessed by the rooftop Building Maintenance Unit (BMU)
Cost to Repair	$89,880.39

CC	**MAIN EXTERIOR WALLS Level 14 and above - NORTH ELEVATION**
Approx. SF	66,589 Reference A3.01
DD	**Level 14 and above - SOUTH ELEVATION**
Approx. SF	64,388Reference A3.02
EE	**Level 14 and above - EAST ELEVATION including NE and SE FACES**
Approx. SF	E: 24,727 NE: 34,692 SE: 34,692 Reference A3.01
FF	**Level 14 and above - WEST ELEVATION including NW & SW faces**
Approx. SF	W: 31,590 NW: 30,150 SW: 30,150 Reference A3.02
Installed	1989
Existing System	The tower cladding system is a surface-sealed barrier system incorporating stone panels, formed aluminum panels, aluminum framed windows and spandrels with insulated glazing units (IGU's) and prefinished aluminum framed louvers. At and below Level 14 there are additional cladding systems described in following sections. Condition of the IGUs is good overall, with minimal internal seal failures. Condition of the stone is good overall but with several locations where panels are cracked or chipped. Condition of the sealant system is fair overall with some leaks reported but many signs of sealants and gaskets that are brittle/unbounded and potentially nearing the end of their service life - refer to detailed BETR assessments. It is the Miller Hayashi team's understanding from conversations with building operations team that the building does not have a continuous weather barrier or moisture management system inboard of the cladding assembly, and that the building relies on a positive pressure HVAC system as a secondary defense against moisture that infiltrates through the cladding system.
Maintenance Schedule	Annual inspection and sealant repair as individual conditions are noticed.
Recommended Repairs	**Alt. 1:**Systematic Spot Repair: Map out areas accessed by sequential BMU drops into a schedule to access the entire tower cladding assembly. Systematically inventory and spot repair currently failed sealants at aluminum window to stone cladding joints and at joints between stone cladding panels. Replace failed window gaskets, repair damaged window frames (very few), inventory and repair broken stone panels. **Alt. 2:**Systematic Sealant Replacement: In addition to above, remove and replace ALL system sealants at wall area accessible with each drop in BMU.
Service Life Remaining	As-is: Increasing ongoing spot repair can be expected as sealants age. **Alt. 1:** 10 year cycle of systematic sealant spot repair. **Alt. 2:**20 year cycle of systematic sealant replacement (with warranty). Insulated Glazing Units: IGUs are 23 years old. They appear to be in good condition for duration of Alt. 2 systematic re-sealing life with some potential for limited failure of internal seal and need for replacement on a case by case basis.
Replacement System	NA

Repair Detail	**Alt 1:** Sealant at Aluminum Window Frame-to-Stone Cladding: Remove failed sealant joint a minimum of 1 ½ inches beyond the disbonded area. Inspect the backer rod to ensure it is in good serviceable condition. If it is not replace it. Then properly apply a new sealant joint using Project approved sealant. Be careful to feather the new sealant into the remaining existing joint, tooling it to a flush finished joint. Sealant at Stone Cladding-to-Stone Cladding: Perform a sealant specific survey of the elevation and perform spot repairs at all disbonded locations. Once a sealant joint location is deemed to be disbonded, remove failed sealant joint a minimum of 1 inch beyond the disbonded area. Inspect the backer rod to ensure it is in good serviceable condition. If it is not replace it. Then properly apply a new sealant joint using Project approved sealant. Be careful to feather the new sealant into the remaining existing joint, tooling it to a flush finished joint. Aluminum Window Frames: Open gaps and damage at mullion caps have topical sealant applied over the gaps. This is a maintenance item. Clean and prepare substrates per manufacturer's requirements, and apply a silicone tape cover, bed in sealant, over mullion joints at these locations. Although routine maintenance of these sealant applications may be adequate to mitigate water entry into the building, BET&R recommends replacing the window frames that have incurred impact damage with a new frame to match, as a more permanent repair. Window Gaskets: Numerous UV degraded window gaskets should be carefully removed. Procure new Project-approved gaskets from the manufacturer. Carefully and completely install new gaskets between the glass and the frame. Dimensional Stone Cladding Panels: Perform a Stone panel specific survey to identify all areas of damage to panels. Where possible, repair in situ via 2-component epoxy, and/or by replacing portions of panels with matching stone, utilizing appropriate supplemental anchoring hardware, proper crack preparation, and Project Approved epoxy adhesives, injection, and fillers. (*Stock of stone for replacement panels is limited and the quarry is now closed.)* **Alt 2:** Using similar methodology, expand the scope to replace ALL sealants and glazing seals from corner to corner of each window/stone panel.
M&E Coord	In the 4/3/12 meeting, the building operators stated the HVAC system positively pressurizes each floor preventing the proper application of the sealants or gaskets. Turning off the HVAC unit or installing an air barrier was discussed as methods of reducing this pressure. Building stack effect, a natural process, will have a significant impact of the pressurization of each floor as the glazing is removed for repair. On cold days, the pressure on the upper floors will be positive and on the lower floors the pressure will be negative. Prevent dust and fumes from entering outside air intake louver located at grid 5/0. No impact to electrical systems.
General Conditions	Accessed by the rooftop Building Maintenance Unit (BMU)
Cost to Repair	CC Alt. 1: $1,642,237.95 CC Alt. 2: $3,876,811.58 DD Alt. 1: $1,587,956.23 DD Alt. 2: $3,748,669.36 EE Alt. 1: $2,320,993.80 EE Alt. 2: $5,479,142.42 FF Alt. 1: $2,266,218.83 FF Alt. 2: $5,349,835.80

GG	**MAIN LOBBY CURTAIN WALL**
Approx. SF	7676 Reference A3.10,12,13
Installed	1989
Existing System	Aluminum framed glass curtain wall 60' tall with 20' tall kynar finished aluminum louver panels above. Wet sealed with silicone sealant, sealants nearing end of their service life. IGU's appear to be in good condition.
Maintenance Schedule	Annual inspection and spot repair sealants.
Recommended Repairs	**Alt. 1:**Systematic spot repair of wet sealing at IGU to frame joint: Remove failed wet seals at IGU to frame joints, clean surfaces, solvent wipe, install bond-breaker tape and silicone sealant. **Alt. 2:**Systematic Sealant Replacement: Replace all wet sealing at IGU to frame joint: Remove existing wet seals at IGU to frame joints, clean surfaces, solvent wipe, install bond-breaker tape and silicone sealant. Replace all Sealant Joints at Curtain Wall/Louver Framing: Remove sealant joints at curtain wall and louver vent assembly frame joints. Clean, solvent wipe, dry, install backer rod/bond-breaker tape and new silicone sealant.
Service Life Remaining	As-is: Increasing risk of water penetration/need for spot repair at seals. **Alt. 1:** Systematic Sealant Spot Repair: 5 year cycle **Alt. 2:**Systematic Re-sealing: 20 year cycle. Insulated Glazing Units: IGUs are 23 years old. They appear to be in good condition for duration of Alt. 2 systematic re-sealing life with some potential for limited failure of internal seal and need for replacement.
Replacement System	NA
Repair Detail	**Alt. 1**: Systematic Sealant Repairs: Wet Seal Repairs at IGU-to-Frame Intersections: Carefully remove all failed wet seals, clean glass and adjoining surfaces with a diluted detergent solution and medium or soft-nylon bristled scrub brushes, followed by a thorough double-rinse with fresh water, then squeegee, blow-dry, and solvent wipe. Then wipe dry with clean white, lint-free cloths. Back angular-shaped fillet joints with bond-breaker tape. Then, install new fillet-sealant beads properly applied and fully tooled, utilizing quality-formulated Dow silicone sealant. Be careful to feather the new sealant into the remaining existing joint, tooling it to a flush properly-shaped finished joint. **Alt. 2:**Systematic Sealant Joint Replacement: Carefully remove failed sealant joints in curtain wall assembly and louver vent assembly. Clean all substrates with diluted detergent solution and medium-nylon bristled scrub brushes, followed by a thorough double-rinse with fresh water, and then wipe and blow-dry, and solvent wipe. Then wipe dry with clean white lint-free cloths. Then back joint with baker rod or bond-breaker tape for proper two-sided adhesion of the sealant. Then install new silicone sealant (and silicone tape at select locations) utilizing quality-formulated Dow products.New Wet Sealing at IGU-to-Frame Intersections: Carefully remove all existing wet seals, clean glass and adjoining surfaces with a diluted detergent solution and soft-nylon bristled scrub brush, followed by a thorough double-rinse with fresh water, then blow-dry and solvent wipe. Then wipe dry with clean white cloths. Then back angular-shaped joints with bond-breaker tape. Then, install new fillet-sealant bead properly applied and fully tooled, utilizing

	quality formulated Dow silicone sealant. If properly designed, thoroughly specified, and correctly detailed, then properly bid to high-quality specialty sealant contractors and properly executed, this repair could provide up to 20 or more years of service, provided that IGUs do not fail and require replacement due to seismic or other movement.
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	Accessed by Spider lift drop from Level 14 soffit; use lightweight lift or scaffold from Level 6 plaza deck
Cost to Repair	**Alt. 1**: $197,033.86 **Alt. 2**: $262,055.03
Cost to Replace	**NA**

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HH	**ELEVATOR BAY CURTAIN WALL**
Approx. SF	2014 Reference A3.13
Installed	1989
Existing System	Aluminum framed glass curtain wall 7 stories tall with weeps at horizontal mullions. Frames are wet sealed with silicone sealant, IGU's are safety glass and are dry sealed with glazing beads. One failed IGU is noted.
Maintenance Schedule	Annual inspection of weeps and spot repair sealants.
Recommended Repairs	**Alt. 1:** Systematic spot repair of wet sealing at IGU to frame joint: Remove failed wet seals at IGU to frame joints, clean surfaces, solvent wipe, install bond-breaker tape and silicone sealant. Remove and replace failed dry seal window seal gaskets. Replace one failed IGU. Repair one damaged aluminum frame at base condition by grinding and sealing. Repair water damaged interior gwb at elevator shaft. **Alt. 2:** Systematic Sealant Replacement: Same as above but systematically replace all wet sealing: Remove existing wet seals at IGU to frame joints, clean surfaces, solvent wipe, install bond-breaker tape and silicone sealant. Systematically replace all dry seal gaskets at window frames.
Service Life Remaining	As-is: increasing risk of water penetration and increasing need for annual spot repair at seals. **Alt. 1:** Systematic Spot Repair: 5 year cycle **Alt. 2:**Systematic Re-sealing: 20 year cycle Insulated Glazing Units: IGUs are 23 years old. Only one has currently failed internal seal. They appear to be in good condition for duration of Alt. 2 systematic re-sealing life with some potential for limited failure of internal seal and need for replacement.
Replacement System	Sealant Replacement: see Repair Alt. 2
Repair Detail	See above
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	Access From 6th Floor Plaza to 6th Floor Roof Area F or down from 14th Level Roof Plan Area N.
Cost to Repair	Alt. 1: $ 46,912.82 Alt. 2: $ 62,394.06
Cost to Replace	NA

II	EIFS CLADDING AT ELEVATOR BAY and 14TH FLOOR PENTHOUSES
Approx. SF	Elevator Bay: 1498 SF Mechanical Penthouse and Pool Building: 5469 SF Reference A3.11,12,13
Installed	1989
Existing System	EIFS system consisting of rigid insulation panels with two-coat fiberglass-reinforced acrylic lamina. (assumed, not tested, attachment should be verified). Material is found at 7 story tall elevator tower, at 14th floor penthouse cladding, and at insets between preformed metal panels located between level 5 and 14 at the garage exterior. General condition of lamina is aged but repairable. Polyurethane sealant joint system is near end of service life. The 14th level planters that are adjacent to the EIFS surfaces allow plants to compromise the lamina. At Roof Level L, selected penthouse walls were over-clad with prefinished metal profile panels in 2011 as part of the membrane replacement in that area.
Maintenance Schedule	Spot repair sealants annually. Repaint EIFS every 10 years.
Recommended Repairs	Systematic Repair and Re-coating: Perform destructive testing to verify substrate conditions prior to repairs.Patch miscellaneous holes in lamina.Repair miscellaneous cracks (typically at corners/openings). Remove and replace all sealants: remove sealant and backer rod, clean joints, install backer rod and tooled sealant. Clean, prep and recoat all EIFS lamina surfaces with three-coat elastomeric system.
Service Life Remaining	As-is: Needs systematic repair very soon to forestall accelerating deterioration and need for total replacement. EIFS: Anticipate 10 year cycle of repair and recoating. Sealants: Anticipate 20 year sealant replacement cycle with interim spot repair.
Replacement System	Long term recommendation: replacement with PVDF finished metal cladding with rain screen properties over rigid insulation and weather barrier.
Repair Detail	See above
M&E Coord	Prevent dust and fumes from entering outside air intake louver located below level 14 on the west side of the building No impact to electrical systems.
General Conditions	Elevator Bay: from 6th Floor Plaza up to 6th Floor Roof Area F or down from 14th Level Roof Plan Area N. Penthouses: from 14th Level Roof decks and perimeter planter. **Special Condition:** Coordinate with work at Area Q-2 Level 14 Planters
Cost to Repair	$73,627.07
Cost to Replace	$394,744.00

JJ	**GARAGE WALLS: CONCRETE, STONE, STUCCO AND METALPANEL SYSTEMS**
Approx. SF	SEE BELOW Reference A3.10-13
Installed	1989
Existing System	Following assemblies clad the garage from Level 5 to Level 14: 1. Painted Precast Concrete Spandrels (example 8/A4.16H) 10886 SF 2. Painted Precast Concrete Planters (example 11/A4.16G) 690.25 LF 3. Prefinished Aluminum Panels covering steel cross bracing (A4.16K) 5314 SF. (These are .125 Aluminum fabrications with aluminum stiffeners and studs, stainless steel screw fastening, provided by Fentron, with PPG Duranar coating: color: Grecian Amber) 4. Painted 1" acrylic stucco on ½" gyp sheathing on metal stud infill panels (example 11/A4.16B). 5717 SF 5. Stone Panel Cladding: At Plaza Level 6/Sidewalk level applied to CMU backup wall (see F,G/A4.11 and 1/A4.16H) 10,256 SF 6. Stone Panel Cladding: Cladding over vertical columns extending from Street/Plaza Level to base of tower at 14th Level. Stone panels are applied to concrete-cased and fireproofed steel elements. (see A4.16A & A4.16B): 2008 SF 7. Sealant joints between these systems.
Maintenance Schedule	Inspect and spot repair sealants annually Recoat painted surfaces every 10-15 years.
Recommended Repairs	1. Painted Precast Concrete Planters: NA: Planters are subject to CBRE maintenance and repair cycle similar to that described at Area C-3. 2. Prefinished Aluminum Panels: NA: see sealants description below. 3. Acrylic Stucco: Repair, clean, prep and recoat with 3-coat elastomeric system. 4. Stone Panel Cladding: Survey and epoxy repair all cracks. 5. Sealants: Systematic sealant replacement: Replace all polyurethane sealantsstucco and concrete with silicone. Spot repair all silicone sealant joints at Metal Panels, Stone Cladding, Precast Concrete Panels, and at joints between these systems and adjacent systems.
Service Life Remaining	1. Paint at precast concrete spandrels: Check last time painted. Anticipate 10 year recoating cycle. 2. Paint at precast concrete planters: Check last time painted. Anticipate 10 year recoating cycle. 3. Prefinished Aluminum Panel Coating: Estimate 20 years on existing PVDF finish. 4. Acrylic Stucco Coating: As-is needs recoating to avoid system deterioration. Anticipate 10 year recoating cycle. 5. Sealants: As-is needs sealant repair now to avoid system deterioration. Anticipate 20 year sealant replacement cycle with interim spot repair.
Replacement System	NA

Repair Detail	Sealants: Concrete-to-Stucco Cladding: At locations of sealant failure (including all existing Polyurethane sealant) and prepare the substrates to receive new sealant. Remove open-cell backer rod. Install closed-cell backer rod into the open joint. Install silicone sealant joint. Sheet Metal-to-Stucco Cladding: Perform a sealant specific survey of the elevation and perform spot repairs at all disbonded locations. At locations of sealant failure, carefully remove the sealant at least one-and ½-inches back from the affected area. Remove open-cell backer rod. Install closed-cell backer rod into the open joint, install a new sealant joint.
M&E Coord	No impact to mechanical systems. Existing cellular antenna systems and CCTV cameras to remain. System connections shall be maintained.
General Conditions	Access From sidewalk at N, E, S, from Level 6 Plaza and Level 6 Roofs at West. **Special Condition:** Coordinate penthouse EIFS work with work described at Area Q-2 at Level 14 planters.
Cost to Repair	$96,409.70
Cost to Replace	NA

JJ-1	**GARAGE COLUMNS INSPECTION& REPAIR**
Approx. SF	NA Reference A3.10-13
Installed	1989
Existing System	Painted concrete-cased steel parking garage columns (example 6/A4.16B)
Maintenance Schedule	Recoat painted surfaces every 10-15 years.
Recommended Repairs	Garage Columns are primary structure. Surface cracks should be evaluated by a structural engineer. Repair cracks per engineer's recommendation. Repair spalled areas. Recoat with 3-coat system
Service Life Remaining	NA
Replacement System	NA
Repair Detail	Concrete Cracks: BET&R recommends the Structural Engineer of record,MagnussonKlemencic, be engaged to provide an opinion on whether the observed cracks represent a structural issue. Concrete Spalls: BET&R recommends that loose material be removed, corroded steel be ground to white metal and coated with one coat of Tnemec 394 Zinc Primer. Then the broken concrete surface should be prepared with an application of approved bonding agent and filled in with approved concrete patching material, trowelled smooth to match the profile of the beam or column. Where necessary, build temporary forms to properly form the patch area. Recoating:Once the patch has cured, the entire area should be prepped and coated with one coat of Tnemec 151-1051 Elastogrip, followed by the application of two coats of Tnemec 156 Envirocrete. BET&R recommends all exterior concrete that is currently painted be coated in this manner.
M&E Coord	No impact to mechanical systems.
General Conditions	Easily accessibleat each level of the parking garage.
Cost to Repair	NA
Cost to Replace	NA

KK	**FIFTH AVENUE WEST ELEVATION CURTAIN WALL**
Approx. SF	6119 Reference A3.13
Installed	2004
Existing System	Aluminum framed flush-glazed glass curtain wall 3+/- stories tall. IGUs are secured and sealed with silicone system to frame track. Joint between frame tracks is drysealed with manufacturer's rubber gasket (this gasket system is not providing continuous seal and design intent should be reviewed with system manufacturer.) Some leakage noted, no IGU failure noted by BETR. In review with the Owner it was noted that lobby was subject to occasional interior condensation prior to a ventilation system modification several years ago, and the visible moisture staining at interior wall panels may be residual from that situation.
Maintenance Schedule	Annual inspection and spot repair of sealants.
Recommended Repairs	Alt. 1: Repair interior wall panels showing moisture stains. Monitor the curtain wall to see if there is active leakage during windblown rain. Research rubber gasket system with the manufacturer; verify if it is under warranty. Alt. 2: Replace rubber gasket system between frames with backer rod and silicone sealant system if weep system design intent allows. Inspect and repair sealant joints at all perimeter conditions. Repair fabric reinforced catalyzed resin waterproofing at buttress top adjacent to freeway on ramp (see illustration). (Note that base flashing sealant repair where the 2004 addition meets the 6th Level plaza and planters is described in Area B-2 and C-4)
Service Life Remaining	As-is: Active monitoring is needed due to signs of previous water intrusion. Repairs: 20 year cycle for silicone sealant replacement, with interim spot repair. Replacement: NA Insulated Glazing Units: These are 8 years old and should be anticipated to perform for life of 20 year sealant replacement with minimal unit seal failures.
Replacement System	Sealant Replacement: see Repair Alt. 2
Repair Detail	Window-to-Window Synthetic Rubber Weather Stripping: The extruded rubber glazing strips are failing and some were improperly installed and appear to be contributing to current water entry. Before implementing repairs, the Owner may wish to contact the glass curtain wall system's manufacturer to request the deficiencies be addressed under the warranty. BET&R recommends the rubber glazing strips be removed and the substrates properly cleaned and repaired and the aluminum frame be sealed with bond breaker and silicone sealant joints. Or, once the pre-formed strips are removed and the frames and glass is cleaned, this system could be sealed with field-fit closed-cell foam backer rod and gun-grade silicone sealant. Existing Silicone Sealant Joints: failing joints were observed at areas surveyed. These could be contributing to water entry and may shorten the effective service life of the IGU's. If the visible failed sealant is properly repaired/replaced, those repairs could perform for 10-13years. Other areas may fail adhesively as the system and sealant age.

M&E Coord	No impact to mechanical and electrical systems.
General Conditions	**Access:** From street at 5th Avenue, from 6th Floor Plaza. **Special Condition:** Adjacent to freeway on ramps at street level. 2004 curtain wall abuts the 1989 planter system at two angled faces, there is some indication of interior moisture in these areas, source not identified, could be from curtain wall above.
Cost to Repair	$188,431.31
Cost to Replace	NA

LL-1	**SUSPENDED CEMENT PLASTER SOFFITS ABOVE LEVEL 6 PLAZA**
Approx. SF	1,306 Reference A4.06
Installed	1989
Existing System	Suspended painted cement plaster stucco soffit assembly. BETR report refers to several cracks and sagging in several areas. (Refer to details on A4.15B).
Maintenance Schedule	Annual inspection for support.
Recommended Repairs	Provide (4) access hatches to monitor stucco system suspension at walkways. Repair cracks in cement plaster – see Repair Detail Clean, prep and paint cement plaster soffits. Provide additional soffit venting where warranted.
Service Life Remaining	Paint and sealants: 10 years for paint and sealants after recoating Suspended soffits: 10 years+ for suspension system, subject to continued annual monitoring.
Replacement System	NA
Repair Detail	Repair of Deflecting Stucco:Conduct invasive/destructive testing to determine the full causation and extent of existing conditions and damage and inspect the condition of suspension assemblies. Repair or retrofit the framing and stucco to ensure stucco soffit panels are securely attached to the building's structure. The repairs will likely require at least some additional stucco removal and retrofit of framing members, and then lath and stucco patching-in, prior to refinishing the select locations. Install inspection access panels at each discontinuous area of suspended soffit. Crack Repair: Following additional investigation and necessary repair to fully attach stucco panels to the Building's structure, and repair of all leaks through the soffits, carefully rout out cracks in stucco soffit panels. Clean stucco surfaces, whisk-brush clean and thoroughly blow out residual dust with oil-free compressed air. Prime substrates as required by sealant manufacturer and back angular-shaped joints with bond-breaker tape. Then install new bead of quality formulated polyurethane sealant. Recoating of Stucco Soffits: Carefully scrub and thoroughly clean, and prepare stucco soffit panels for coating. Once dry, then prime properly prepared stucco soffits with Tnemec 151 and the coat with two full and separate coats of Tnemec 156. If properly designed, thoroughly specified, and correctly detailed, then bid to quality-oriented stucco contractors specializing in repair and associated work required, so all materials can be properly applied, then this repair sequence could provide another 20 – 30+ years of service with routine maintenance.
M&E Coord	No impact to mechanical systems. Coordinate all stucco repair with existing light fixtures (estimated 15 units) recess mounted in soffit. Original light fixtures are at end of life and should be replaced. Energy savings can be achieved through replacement of fixtures with units ofgreater efficiency.
General Conditions	These are low soffits accessible from Plaza deck. Access with scissor lift or JLG. Pedestrian protection required.
Cost to Repair	$24,401.37
Cost to Replace	NA

LL-2	**SUSPENDED METAL PANEL SOFFITS ABOVE LEVEL 6 PLAZA**
Approx. SF	4,555 Reference A4.06
Installed	1989
Existing System	Suspended prefinished aluminum flush panel soffit system with cement stucco perimeter strips (see detail 8/A4.16J). Stains are visible below area of previous plumbing leak (repair of leak since BETR report is confirmed byOwner). It is difficult to see above the panels but there is limited visual evidence of surface corrosion in the suspension system. There is approximately 24" clear height above metal pan soffit to bottom of structural deck above, less at fireproofed steel beams. The details do not show that the bottom of the floor deck above is insulated. It appears that venting is provided only at the spider track slot. See LL-3 Below for adjacent spider track and plaster detail.
Maintenance Schedule	Annual visual inspection of suspension system to monitor corrosion.
Recommended Repairs	Remove and replace plaster areas adjacent to Spider Track and reinforce or replace suspension system. Provide (4)accesshatchesat metal soffits above public plaza to allow for system inspection and monitoring. Clean stained metal panels. Provide additional venting for soffit areas.
Service Life Remaining	As-is: Provision of inspection access is recommended ASAP. Metal Panel Suspension System: Suspension system needs to be inspected, then monitored for corrosion and replaced (with stainless steel system) or reinforced as warranted under the direction of a structural engineer Metal Panel Finish: PVDF finish 20+ years remaining.
Replacement System	NA: Verify suspension system, potential long term replacement with stainless steel suspension system.
Repair Detail	See above
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	Soffit is on two levels, one located 60' and one located 80' above 6th Floor Plaza Level.These are low soffits accessible from Plaza deck. Access with scissor lift or JLG. Pedestrian protection required.
Cost to Repair	$94,224.33
Cost to Replace	NA

LL-3	**SPIDER TRACK & CEMENT PLASTER TRIM STRIP SOFFITS ABOVE LEVEL 6 PLAZA**
Approx. SF	694 Reference A4.06
Installed	1989
Existing System	Steel Spider Track in three discontinuous locations for operation of suspended window washing chair. Tracks are located 60' and 80' above Plaza Level 6. Tracks are bounded by field of prefinished metal panel soffit on open side, and by narrow strip of suspended painted cement plaster stucco trim at window wall. (see detail 8/A4.16J for similar condition without track). The narrow strip of cement plaster is observed to have sagged in several locations and requires systematic inspection as soon as possible.
Maintenance Schedule	Annual inspection of spider track suspension system.
Recommended Repairs	Provide access and remove finishes as required for inspection of track suspension by a structural engineer. Provide (4) access hatches to monitor system suspension (coordinate with LL-2 Metal Soffit System access hatches). Remove sagging stucco areas adjacent to track, inspect and reinforce or replace suspension system per structural engineer, and replace stucco trim strip.
Service Life Remaining	As-is: This system requires immediate attention due to the observed sagging and location above public plaza. Repairs: Track reinforcements and soffit trim strip replacement/finishes could anticipate 20 year repair/replacement cycle with annual inspection in the interim.
Replacement System	NA (Note: If structural reinforcements are recommended after engineer's inspection, then alternatives to Spider track system for window maintenance access should be discussed with window washing vendor.)
Repair Detail	See above
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	Access with scissor lift or JLG. Pedestrian protection required.
Cost to Repair	$14,356.02
Cost to Replace	NA

LL-4	**MISCELLANEOUS CEMENT PLASTER SOFFITS**
Approx. SF	See below for each area
Installed	1989
Existing System	Painted suspended cement plaster stucco soffits at miscellaneous locations: **4.1**Above terraces at Level 58, 61, 62 on West elevation, access difficult to 61 & 62; 168 SF.Reference A4.57 **4.2**Below tower bays at Level 16, access from 14 except difficult at North/West facades; 101 SF. Reference A4.14 **4.3**Narrow strips at recessed window heads below Level 16. Access same as previous; 386 SF. Reference A4.14 **4.4**Soffits at Columbia Street Entry: Access from 4th Level Plaza; 630 SF A4.04 **4.5**Soffits at 5th Avenue Entry Addition, Access from sidewalk; 464 SF. **4.6**Soffits at Freeway Entrances, Access from street requires ramp closure; 3728 SF. Reference A4.04
Maintenance Schedule	Annual inspection of suspension system.
Recommended Repairs	Provide access hatches to inspect/monitor system suspension at high traffic and/or high altitude soffit locations. See repair detail.
Service Life Remaining	As-is: Soffit suspension systems: Exact condition unknown where access for inspection is not provided, and is subject to continued annual monitoring. As-is: Stucco, paint and sealants - verify last repainting Repairs: 10 year cycle for paint and sealant after recoating
Replacement System	NA

Repair Detail	Repair of Deflecting Stucco: Following further invasive/destructive, once authorized, to determine the full causation and extent of existing conditions and damage, the repair or retrofit of the framing and stucco as necessary to ensure stucco soffit panels are securely attached to the Building's structure and are not in danger of collapse. The repairs will likely require at least some additional stucco removal and retrofit of framing members, and then lath and stucco patching-in, prior to refinishing the select locations. Crack Repair: Following additional investigation and necessary repair to fully attach stucco panels to the Building's structure, and repair of all leaks through the soffits, carefully rout out cracks in stucco soffit panels. Clean stucco surfaces, whisk-brush clean and thoroughly blow out residual dust with oil-free compressed air. Prime substrates as required by sealant manufacturer and back angular-shaped joints with bond-breaker tape. Then install new bead of quality formulated polyurethane sealant. Recoating of Stucco Soffits: Carefully scrub and thoroughly clean, and prepare stucco soffit panels for coating. Once dry, then prime properly prepared stucco soffits with Tnemec 151 and the coat with two full and separate coats of Tnemec 156. If properly designed, thoroughly specified, and correctly detailed, then bid to quality-oriented stucco contractors specializing in repair and associated work required, so all materials can be properly applied, then this repair sequence could provide another 20 – 30+ years of service with routine maintenance.
M&E Coord	No impact to mechanical and electrical systems.
General Conditions	**Special Condition:** Access to these conditions varies, and their relatively small scale makes them easy to overlook. Special Condition over Freeway Access requires WSDOT coordination. Access with scissor lift or JLG. Pedestrian protection required.
Cost to Repair	$75,403.49

Seattle Municipal Tower *Weatherization Program*
D: Maintenance Program

6/27/2012

Area	Description	Access	Maintenance Program	Maintenance Frequency (in Months)
A-1	Level 6 Plaza Deck 175'-0" Level (Chews)	Plaza level 6	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers each year	6
A-2	LEVEL 4 & 5 COLUMBIA STREET ENTRY PLAZA DECK & STAIRS	Sidewalk, street, plaza level 6	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers each year	6
A-3	LEVEL 5 CHERRY STREET ENTRY PLAZA & STAIRS	Sidewalk, street, plaza level 6	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers each year	6
A-4	SEALANT AT BUILDING/SIDEWALK JOINT	Sidewalk, Street	Inspect and repair sealant joints yearly	12
B-1	LEVEL 6 PLAZA DECK 180'-0" LEVEL	Parking Garage, Plaza level 6	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year Replace any broken pavers each year	6
B-2	LEVEL 6 PLAZA: INFILL AREA AT FIFTH AVENUE ENTRY ADDITION	Plaza level 6	Identify drain locations with stainless steel pins. Inspect & clean drains 2x each year	6
			Replace any broken pavers each year	12
C-1	LEVEL 4 PLANTERS AT COLUMBIA STREET ENTRY	Sidewalk, street, plaza level 6	Excavate and repair clogged drains After Repairs: Annual inspection and renewal of sealant joints	12
			After Repairs: Every five years: spot check with partial excavation to observe condition of planter membrane	60

Area	Description	Access	Maintenance Program	Maintenance Frequency (in Months)
C-2	LEVEL 5 PLANTERS AT CHERRY STREET ENTRY	Sidewalk, street, plaza level 6	Excavate and repair clogged drains After Repairs: Annual inspection and renewal of sealant joints	12
			After Repairs: Every five years: spot check with partial excavation to observe condition of planter membrane	60
C-3	LEVEL 6 PLANTERS AT PLAZA	Sidewalk, street, plaza	Excavate and repair clogged drains After Repairs: Annual inspection and renewal of sealant joints	12
			After Repairs: Every five years: spot check with partial excavation to observe condition of planter membrane	60
C-4	LEVEL 6 PLANTERS ADJACENT TO FIFTH AVENUE ADDITION	Sidewalk, street, plaza level 6	Excavate and repair clogged drains After Repairs: Annual inspection and renewal of sealant joints	12
			After Repairs: Every five years: spot check with partial excavation to observe condition of planter membrane.	60
D	LEVEL 6 LOW SLOPE ROOF AT SW CORNER (CHEWS)	Ladder & lifts from Plaza level 6	Inspect & clean drains 2x each year Replace any broken pavers	6
E	LEVEL 6 LOW SLOPE ROOF AT NW CORNER (AMIGA'S & BEBA'S)	Ladder & lifts from Plaza level 6	Inspect & clean drains 2x each year Replace any broken pavers	6
F	LEVEL 6 PAVER-BALLASTED ROOF ABOVE MAIN ENTRY	Level 7 Garage, Ladder & lifts from Plaza level 6	Inspect & clean drains 2x each year Replace any broken pavers	6
G	LEVEL 6 STEEP SLOPE SHT METAL ROOF AT FIFTH AVE ENTRY	Ladder & lifts from Plaza level 6	Inspect & clean drains each year	12
			Inventory & repair exposed sealants every 5 years Wash organic material from flat seams every 5 years	60
H	LEVEL 6 STEEP SLOPE SHT METAL ROOF AT SW CORNER (CHEWS)	Ladder & lifts from Plaza level 6	Inspect and repair sealant joints yearly	12
I	AT NW CORNER(AMIGA'S & BEBA'S)	Ladder & lifts from Plaza level 6	Inspect and repair sealant joints yearly	12

Area	Description	Access	Maintenance Program	Maintenance Frequency (in Months)
J-1	LEVEL 6 GLASS EXTERIOR CANOPIES	Level 7 Garage, Ladder & lifts from Plaza	Clean gutters of organic debris twice yearly	6
			Remove strainers and flush downspouts once yearly.	12
J-2	LEVEL 6 LOBBY SKYLIGHTS	Level 7 Garage, Ladder & lifts from Plaza	Inspect and spot repair sealants annually.	12
K	LEVEL 14 PAVER BALLASTED ROOF LOWER EAST TERRACE DECK (TRIANGLE)	Ladder from Level 14 door, hatch from Level 13 garage below.	Inspect & clean drains 2x each year Replace any broken pavers	6
L	LEVEL 14 PAVER BALLASTED ROOF ABOVE AUX. MECH ROOM	Doors at Level 14	Inspect/Clean Roof Drains 2x/year	6
			Inspect/Spot Repair Sealants yearly Replace broken pavers yearly	12
M	LEVEL 14 PAVER BALLASTED ROOF ABOVE POOL/CLUB	Doors at Level 14	Inspect & clean drains 2x each year Replace any broken pavers	6
N	LEVEL 14 PAVER BALLASTED ROOF ABOVE ELEVATORS	Doors at Level 14	Inspect & clean drains 2x each year Replace any broken pavers	6
O	LEVEL 14 PAVER BALLASTED ROOF ABOVE MECH ROOM	Doors at Level 14	Inspect & clean drains 2x each year Replace any broken pavers	6
P	LEVEL 53, 54, 55, 56 WEST TERRACE DECKS	adjacent office windows (no doors to terraces).	Provide lay down pads for window washing support brackets to protect membrane. Inspect and spot repair sealant joints.	12
Q-1	LEVEL 14 NORTHEAST TRIANGLE CORNER TERRACE DECK	Men's locker room on 14th Floor	Inspect & clean drains 2x each year Replace any broken pavers	6
Q-2	LEVEL 14 PLANTERS	constrained by drop off on exterior face and adjacent wall on interior sides of planters at this level.	Excavate and repair clogged drains Annual inspection and renewal of sealant joints	12
			Every five years: spot check with partial excavation to observe condition of planter membrane.	60

Area	Description	Access	Maintenance Program	Maintenance Frequency (in Months)
Q-3	LEVEL 14 CONCRETE CAPS	constrained by drop off on exterior face and adjacent tower wall.	Annual inspection and spot repair of sealant joints.	12
R	TOWER ROOF BMU DECK	level 60 through stair tower and hatch	Inspect/Clean Roof Drains 2x/year	6
			Inspect/Spot Repair Sealants yearly	12
AA	LOW SLOPE GLASS ROOF	from BMU deck tie-offs at top of building	Annual inspection and wet-sealant spot repair	12
BB-1	STEEP SLOPE GLASS ROOF	from BMU deck tie-offs at top of building	Annual inspection and wet-sealant spot repair	12
BB-2	HIGH ROOF CONCRETE GUTTER ASSEMBLY	Rooftop Building Maintenance Unit (BMU)	Annual inspection and clean drains.	12
CC	MAIN EXTERIOR WALLS - NORTH ELEVATION	Rooftop Building Maintenance Unit (BMU)	Annual inspection and sealant repair as individual conditions are noticed.	12
DD	MAIN EXTERIOR WALLS - SOUTH ELEVATION	Rooftop Building Maintenance Unit (BMU)	Annual inspection and sealant repair as individual conditions are noticed.	12
EE	MAIN EXTERIOR WALLS - NORTHEAST ELEVATION	Rooftop Building Maintenance Unit (BMU)	Annual inspection and sealant repair as individual conditions are noticed.	12
FF	MAIN EXTERIOR WALLS - WEST ELEVATION	Rooftop Building Maintenance Unit (BMU)	Annual inspection and sealant repair as individual conditions are noticed.	12
GG	MAIN LOBBY CURTAIN WALL	Spider Lift Drop from Level 14 soffit; scaffold or lift from Level 6 Plaza	Annual inspection and spot repair sealants.	12
HH	ELEVATOR BAY CURTAIN WALL	From 6th Floor Plaza to 6th Floor Roof Area or 14th Level Roof Plan Area N	Annual inspection of weeps and spot repair sealants.	12

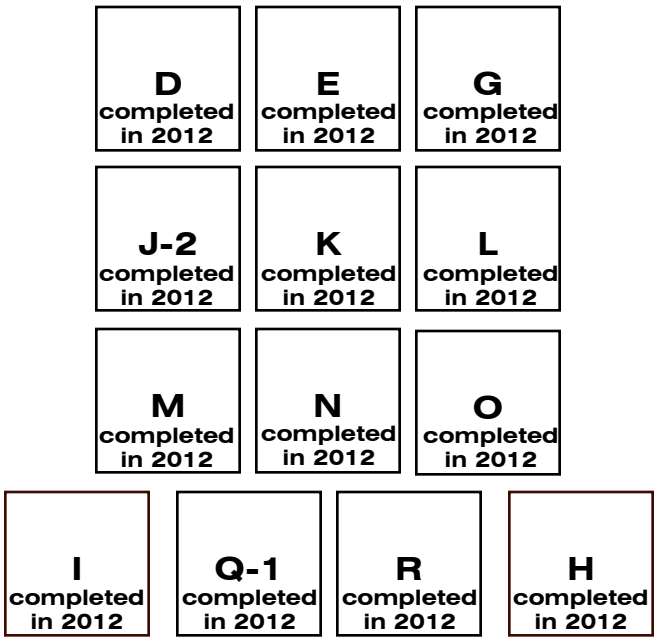
Area	Description	Access	Maintenance Program	Maintenance Frequency (in Months)
II	EIFS CLADDING AT ELEVATOR BAY AND GARAGE	from 6th Floor Plaza up to 6th Floor Roof Area F or down from 14th Level	Spot repair sealants regularly.	6
			Recoat every 10 years.	120
JJ	GARAGE CONCRETE FACE AND PLANTERS	sidewalk at N, E, S, from Level 6 Plaza and Level 6 Roofs at West	Inspect and spot repair sealants annually	12
			Recoat painted surfaces every 10-15 years	120
JJ-1	STRUCTURAL EVALUATION OF GARAGE STRUCTURE	Throughout Parking Garage Areas		
KK	FIFTH AVENUE ENTRY ADDITION CURTAIN WALL	street at 5th Avenue, from 6th Floor Plaza	Annual inspection and spot repair of sealants.	12
LL-1	SOFFITS LEVEL 6: CEMENT PLASTER STUCCO SOFFITS	low soffits accessible from Plaza deck.	Annual inspection for support.	12
LL-2	SOFFITS LEVEL 6: METAL PANEL SOFFITS	Spider Track or Scaffod	Annual visual inspection of suspension system to monitor corrosion.	12
LL-3	SOFFITS LEVEL 6: SPIDER TRACK & CEMENT PLASTER TRIM STRIP	Spider Track or Scaffod	Annual inspection of spider track suspension system.	12
LL-4	MISCELLANEOUS CEMENT PLASTER SOFFITS	Ladder, Scafford, Condition over Freeway Access requires WSDOT coordination	Annual inspection of suspension system.	12

Seattle Municipal Tower *Weatherization Program*

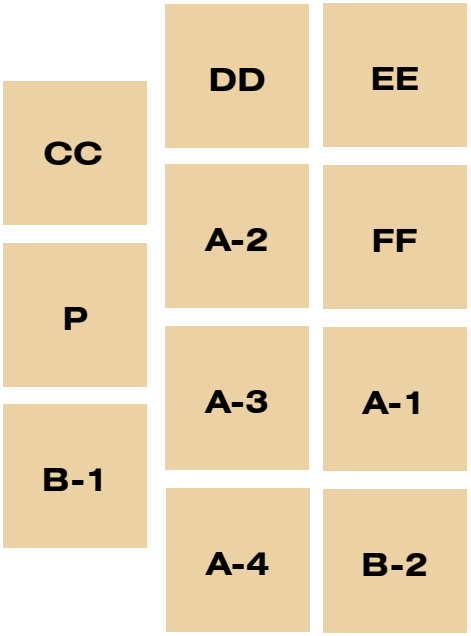
E: Illustrations

Final Draft: 6/27/12

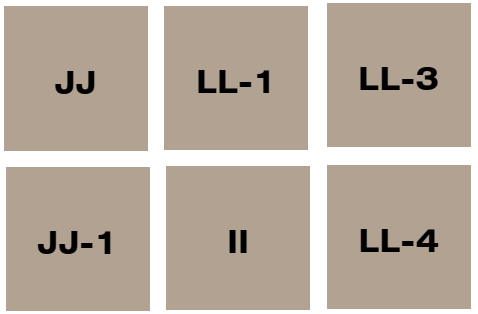
Work Areas Keyed to Drawings&
Keyed to 2011 BET&R Building Envelope Survey



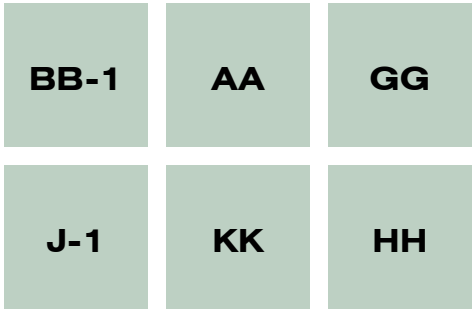
No Immediate Work Required



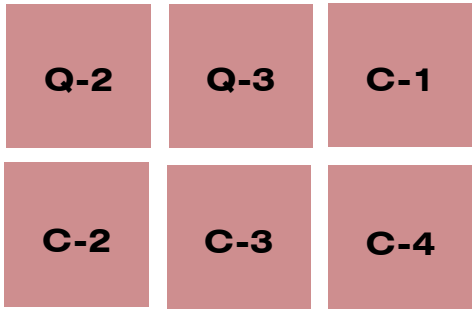
Waterproofing (Seal-ants)/Mason



Stucco Contractor & Carpenter



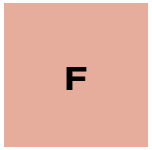
Glazing



Waterproofing (Planters)

Waterproofing (PMMA)

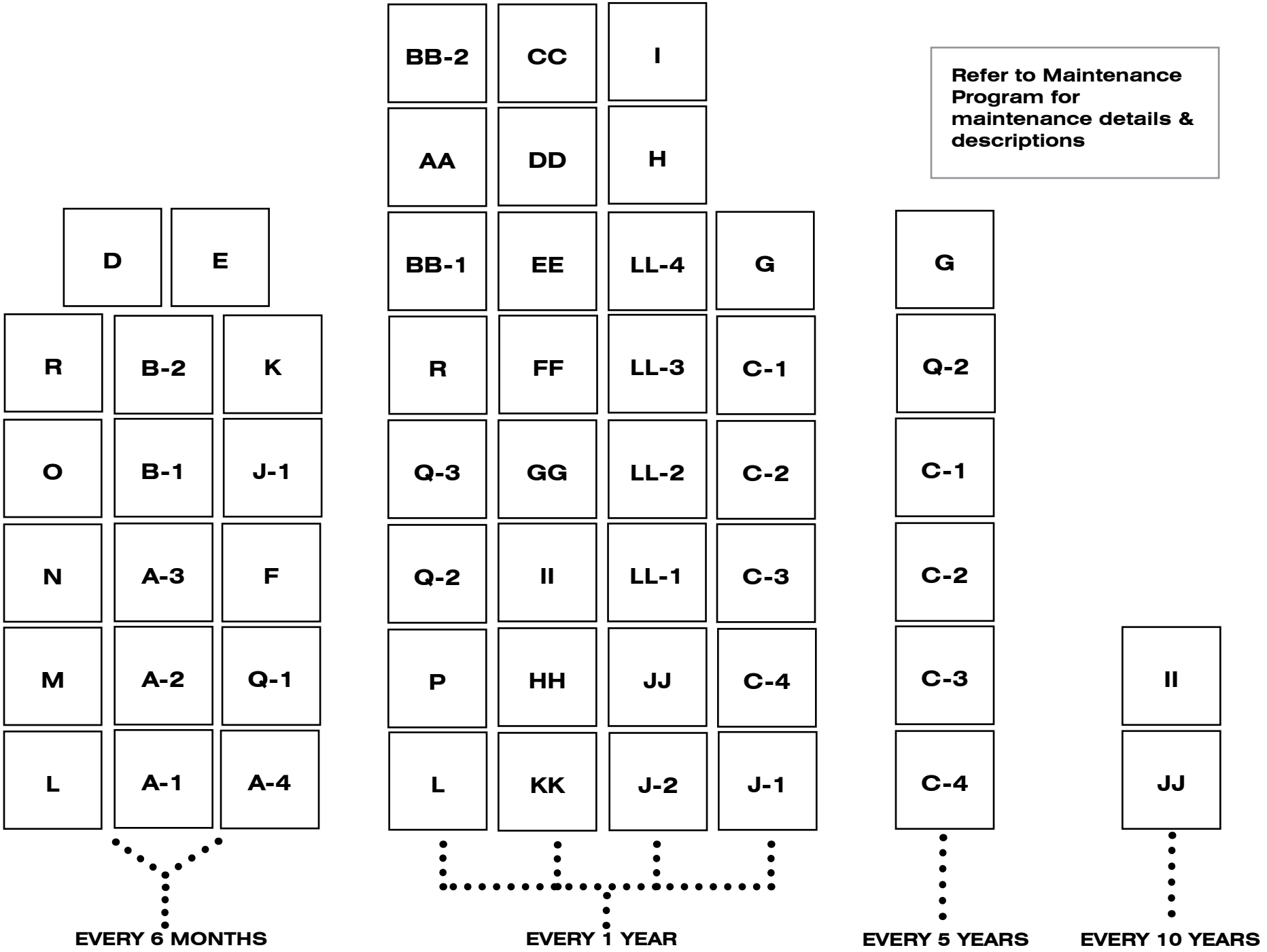
Metal (Soffit) Contractor & Carpenter



EPDM Roofing Contractor

TYPES OF REPLACEMENT SYSTEMS - DL Classification

Seattle Municipal Tower Weatherization
Miller Hayashi Architects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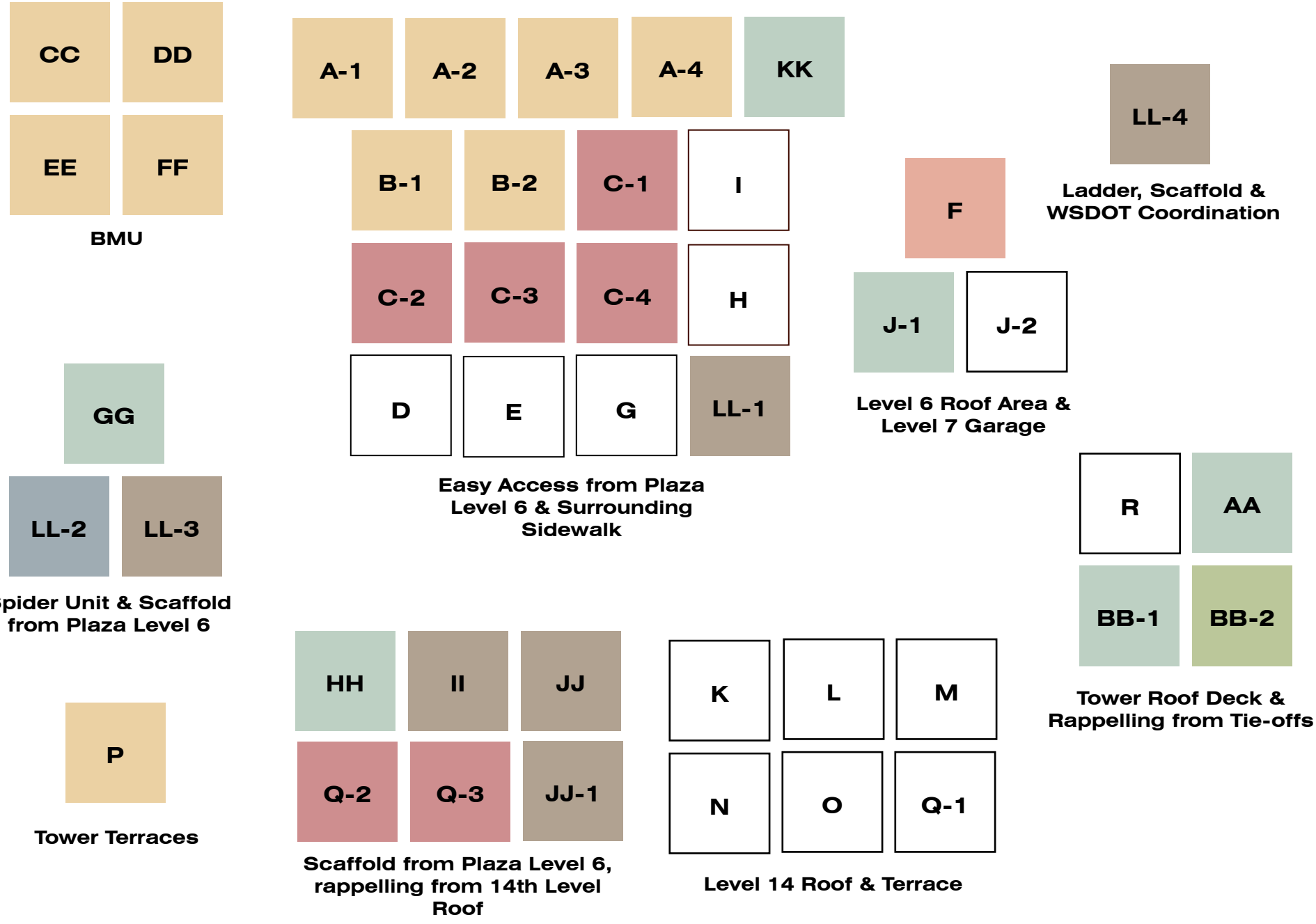
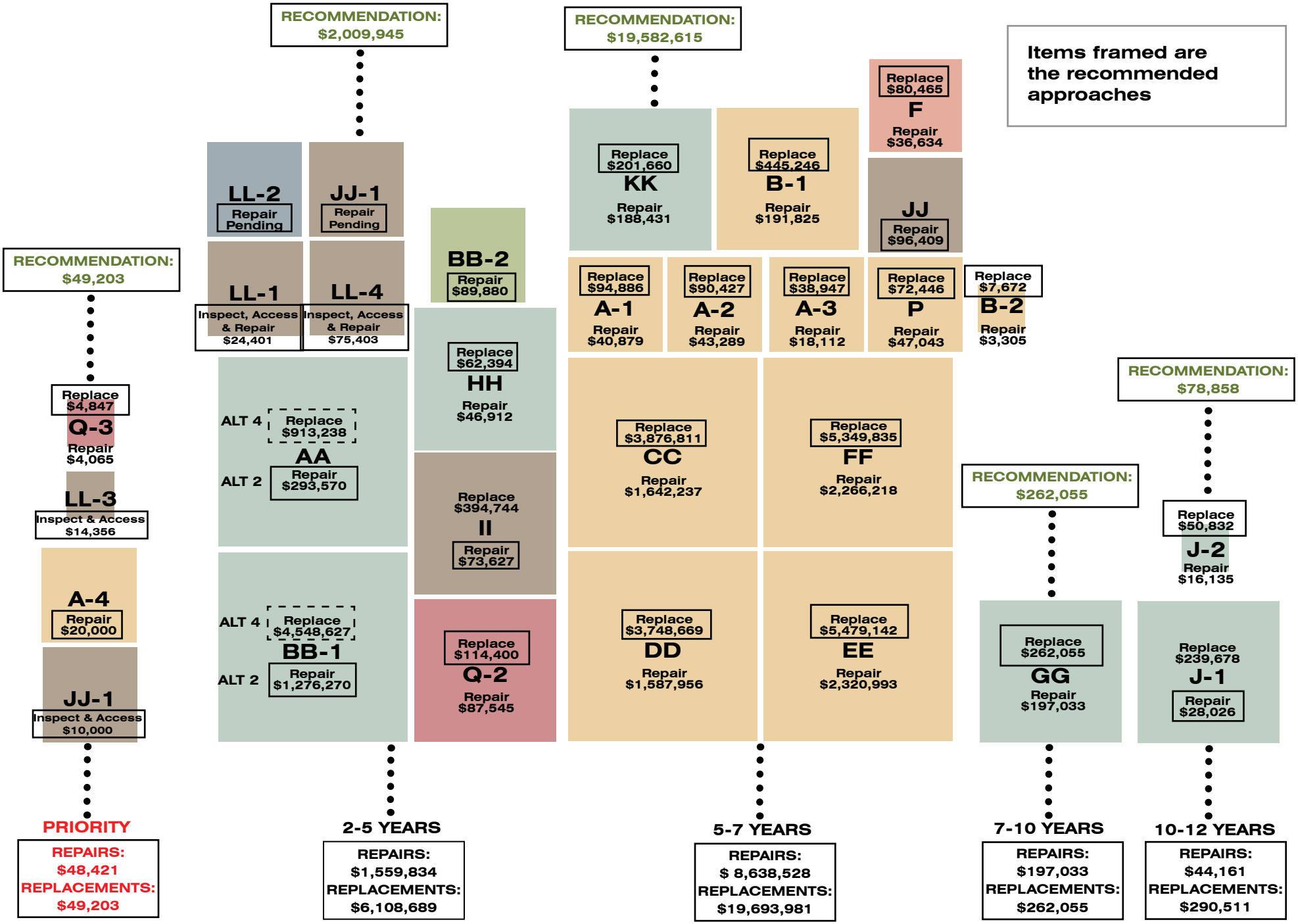
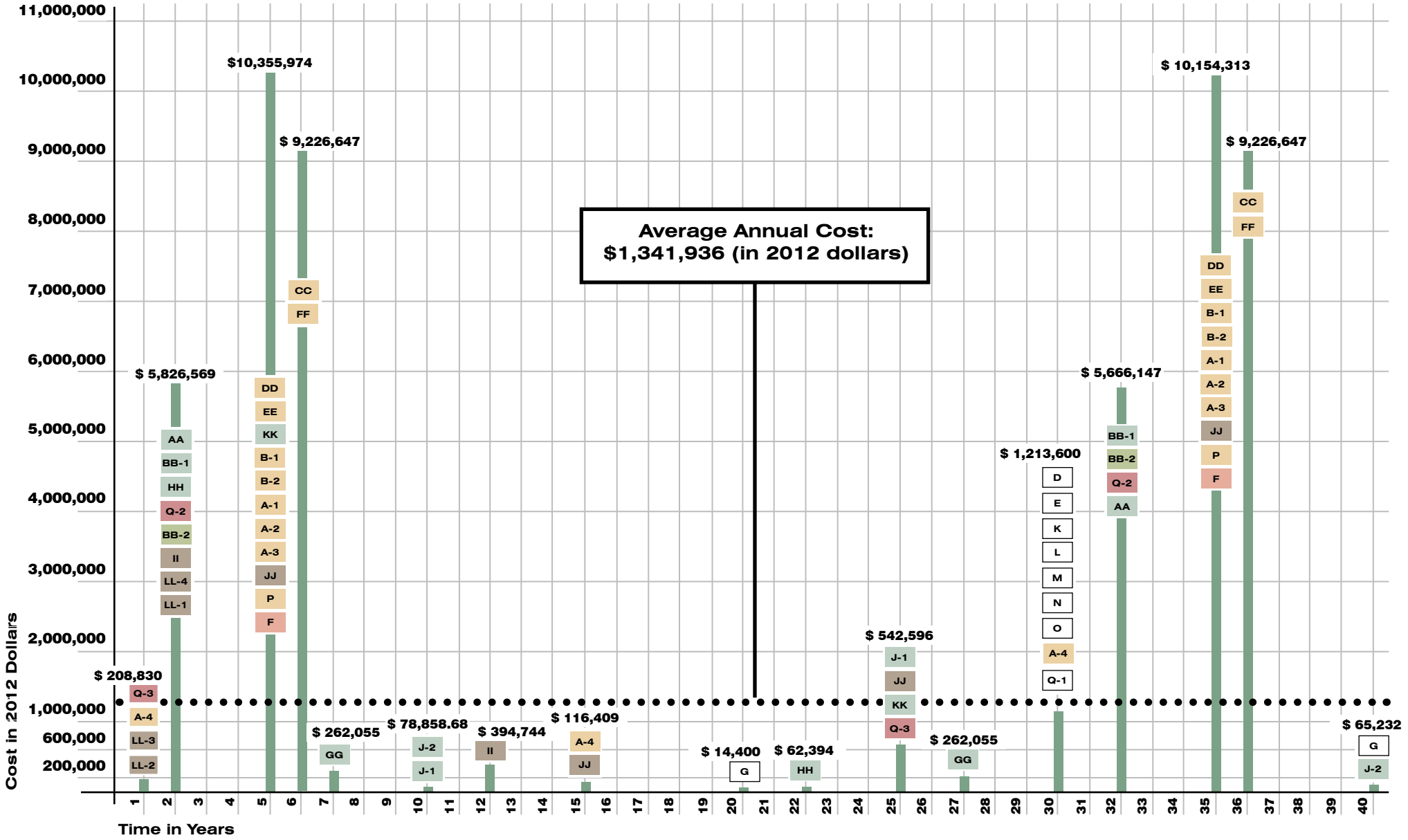
JJ
C-4
L
KK
J-2
J-1
EVERY 1 YEAR
G
Q-2
C-1
C-2
C-3
C-4
EVERY 5 YEARS
II
JJ
EVERY 10 YEARS
Refer to Maintenance Program for maintenance details & descriptions


CC
DD
EE
FF
BMU
A-1
A-2
A-3
A-4
KK
B-1
B-2
C-1
I
C-2
C-3
C-4
H
D
E
G
LL-1
Easy Access from Plaza Level 6 & Surrounding Sidewalk
F
J-1
J-2
Level 6 Roof Area & Level 7 Garage
LL-4
Ladder, Scaffold & WSDOT Coordination
GG
LL-2
LL-3
Spider Unit & Scaffold from Plaza Level 6
R
AA
BB-1
BB-2
Tower Roof Deck & Rappelling from Tie-offs
P
Tower Terraces
HH
II
JJ
Q-2
Q-3
JJ-1
Scaffold from Plaza Level 6, rappelling from 14th Level Roof
K
L
M
N
O
Q-1
Level 14 Roof & Terrace


RECOMMENDATION:
$49,203
Replace
$4,847
Q-3
Repair
$4,065
LL-3
Inspect & Access
$14,356
A-4
Repair
$20,000
JJ-1
Inspect & Access
$10,000
PRIORITY
REPAIRS:
$48,421
REPLACEMENTS:
$49,203
RECOMMENDATION:
$2,009,945
LL-2
Repair
Pending
JJ-1
Repair
Pending
LL-1
Inspect, Access
& Repair
$24,401
LL-4
Inspect, Access
& Repair
$75,403
ALT 4
Replace
$913,238
AA
ALT 2
Repair
$293,570
ALT 4
Replace
$4,548,627
BB-1
ALT 2
Repair
$1,276,270
BB-2
Repair
$89,880
Replace
$62,394
HH
Repair
$46,912
Replace
$394,744
II
Repair
$73,627
Replace
$114,400
Q-2
Repair
$87,545
2-5 YEARS
REPAIRS:
$1,559,834
REPLACEMENTS:
$6,108,689
RECOMMENDATION:
$19,582,615
Replace
$201,660
KK
Repair
$188,431
Replace
$445,246
B-1
Repair
$191,825
Replace
$94,886
A-1
Repair
$40,879
Replace
$90,427
A-2
Repair
$43,289
Replace
$38,947
A-3
Repair
$18,112
Replace
$72,446
P
Repair
$47,043
Replace
$80,465
F
Repair
$36,634
JJ
Repair
$96,409
Replace
$7,672
B-2
Repair
$3,305
Replace
$3,876,811
CC
Repair
$1,642,237
Replace
$5,349,835
FF
Repair
$2,266,218
Replace
$3,748,669
DD
Repair
$1,587,956
Replace
$5,479,142
EE
Repair
$2,320,993
5-7 YEARS
REPAIRS:
$ 8,638,528
REPLACEMENTS:
$19,693,981
RECOMMENDATION:
$262,055
Replace
$262,055
GG
Repair
$197,033
7-10 YEARS
REPAIRS:
$197,033
REPLACEMENTS:
$262,055
RECOMMENDATION:
$78,858
Replace
$50,832
J-2
Repair
$16,135
Replace
$239,678
J-1
Repair
$28,026
10-12 YEARS
REPAIRS:
$44,161
REPLACEMENTS:
$290,511
Items framed are
the recommended
approaches



Scope Areas not Included: H, I, R

40 YEAR COST ANALYSIS

Seattle Municipal Tower Weatherization
Miller Hayashi Architects