LAKEWOOD CITY COUNCIL
STUDY SESSION AGENDA

Monday, May 14, 2018
7:00 P.M.
City of Lakewood
City Council Chambers
6000 Main Street SW
Lakewood, WA 98499

Page No.

CALL TO ORDER

ITEMS FOR DISCUSSION:

(3) 1. West-Pierce Fire and Rescue update. – *Fire Chief Jim Sharp*

(11) 2. Engineering and pavement standards update. - (Memorandum)

(68) 3. Rental housing safety program update. – (Memorandum)

(81) 4. Review of a Memorandum of Understanding with the Rotary Club of Lakewood relative to the Ft. Steilacoom Park Pavilion. – (Memorandum)

(88) 5. Review of surface water management fee ordinance. – (Memorandum)

ITEMS TENTATIVELY SCHEDULED FOR THE MAY 21, 2018 REGULAR CITY COUNCIL MEETING:

1. Business showcase. – Pacific Machine, *Mr. Jim Tschimperle, Owner*

2. Tacoma-Pierce County Habitat for Humanity award presentation. – *Ms. Maureen Fife, CEO*

3. Ordinance No. 682 – *(continued from the meeting of May 7, 2018)*

   Establishing a moratorium on the filing of applications for licenses, permits and approvals for adult family home, group home, enhanced service facility or comparable business in residential zones for a period of six months.

4. Adopting the 2018 carry forward budget adjustments. – (Ordinance – Regular Agenda)

The Council Chambers is accessible to persons with disabilities. Equipment is available for the hearing impaired. Persons requesting special accommodations or language interpreters should contact the City Clerk's Office, 253-589-2489, as soon as possible in advance of the Council meeting so that an attempt to provide the special accommodations can be made.

http://www.cityoflakewood.us

City Hall will be closed 15 minutes after adjournment of the meeting.

5. Amending Title 18A of the Lakewood Municipal Code, Land Use and Development Code, relative to marijuana uses. – (Ordinance – Regular Agenda)

6. Adopting surface water management fees. – (Ordinance – Regular Agenda)

7. Authorizing the execution of a Memorandum of Understanding with the Rotary Club of Lakewood relative to the Ft. Steilacoom Park Pavilion. – (Motion – Regular Agenda)

REPORTS BY THE CITY MANAGER

COUNCIL COMMENTS

ADJOURNMENT

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West Pierce Fire & Rescue

LAKEWOOD CITY COUNCIL UPDATE – MAY 14, 2018

2017 Year in Review

- Responded to 15,896 calls for service, 73% EMS
- Visited 256 elementary school classrooms (K-5)
- Taught CPR to 540 high school students
- Trained 67 new Community Emergency Response Team (CERT) members (487 total)
- Installed over 700 smoke alarms in more than 200 homes
- Received over $2,000,000 in grant awards

Youth Academy

Entry Level Hiring

- Maximum roadblocks
- High costs
  - Written test
  - CPAT
  - EMT
- Significant time commitment
- Every step must be redone multiple times
- Lacking in diversity

New Hiring Process

- Recruitment and Retention Committee created
- Roadblocks removed
- Reduced costs
  - Written test
  - CPAT
  - EMT
- Increased access and availability
- Increased diversity participation

Green Initiative

- Purchased first plug-in hybrid in 2016
- Saved over 500 gallons of fuel in first year
- Operating costs reduced by 90%

Future Planning

- Currently developing a strategic plan
  - Standards of Cover
  - Capital Assets Plan
  - Medical programs operational plan
- Both Deputy Chiefs and one Assistant Chief retiring in 2019
- Four-year levy renewal on ballot in 2019

QUESTIONS

TO: Mayor and City Councilmembers

FROM: Shannon Kelley-Fong, Assistant to the City Manager

THROUGH: John J. Caulfield, City Manager

DATE: May 14, 2018

SUBJECT: Pavement Standards Update

PURPOSE: Research has shown that trench cuts degrade the overall condition of pavement and by doing so, reduce the design life cycle of roadwork, this has been found to be particularly acute for newer pavement. Road management, i.e., maintenance, rehabilitation, and reconstruction of streets, is one of the most resource intensive responsibilities undertaken by the City of Lakewood (hereinafter, the "City"). Given this, the City has established and implemented pavement management methods, found within the Engineering Standards Manual (**Attachment B**), to extend the lifecycle of road work by standardizing patching and road construction, preventing unnecessary road degradation, and requiring appropriate levels of compensation to mitigate for damages incurred when work is performed in the public rights-of-way (ROW). The purpose of the memorandum is to provide other pavement moratorium options that could be implemented by the City to further decrease unnecessary pavement degradation, maintain structural integrity of the street, preserve acceptable levels of serviceability (ride-ability), and limit negative visual impact.

BACKGROUND: Research on street pavement has found that properly designed and maintained asphalt streets can last around twenty (20) years without the need for comprehensive reconstruction. Notably, the longevity of a road is dependent on a number of conditions, such as traffic volume, associated vehicle weight, and subsequent road work. The presence of utility cuts can accelerate pavement deterioration. Research has shown that pavement trench cuts degrade the condition of pavement, as well as reduce the design life cycle of the roadwork. A study in San Francisco found that pavement condition index (PCI) scores of roadways with utility cuts were significantly lower than comparable roads of the same age with no utility cuts.[1] Additionally, research has found that, damage by utility cuts undermines newer roadways at a more significant rate, ultimately accelerating the funding requirements needed to maintain, rehabilitate, and reconstruct these roadways. Furthermore, other potential problems that can arise from frequent utility cuts, including the following:

- Excessive delays to the traveling public due to closed traffic lanes.
- Increased traffic congestion and related air quality issues.
- Damage to vehicles due to excessive road roughness.

[1] Impact of Excavation on San Francisco Streets (1998).

Utility cuts reduce pavement life due, in large part, due to the way in which providers access their infrastructure. The most common method utilized, as it is the cost efficiency, is a process known as trenching. Generally, trenching is defined as a man-made excavation in which the depth of a trench is greater than its width, but the width of a trench (measured at the bottom) is not greater than 15 feet.[2] **Attachment A** provides a schematic of trenching. The main issue with trenching is that it causes sagging and/or slumping of the trench sides as the lateral support of the soil is removed. Research has found that the area undermined by trenching extends around three feet from each edge of the trench wall. The degree to which an area is undermined is dependent on soil type, moisture content, and the overall depth of the trench. Undermined areas have been shown to fail more rapidly than other parts of the pavement, typically at first observable by the presence of fatigue (alligator) cracking within this area. The more utility cuts on a street the more likely the street will fail prematurely.

In total the City is responsible for the construction, repair, maintenance, and management of 179.9 centerline miles of asphalt pavement (or 431 lane miles). Per a Public Works report to the City Council in 2017, it would cost approximately $130,000,000 to replace the City's entire street network. Given the resource level associated with reconstructing and rehabilitating streets, the City is currently proactively attempting to extend the life of existing pavement through various pavement management practices, such as timely maintenance, standardizing engineering standards, and by implementing a five year pavement cut moratorium on newly paved streets.

Over the past few years, the City has made substantial progress in improving the overall rating of streets within the City per the pavement condition index (PCI). PCI rates the condition of the surface of a road network, where 0 is the worst possible condition and 100 is the best. New roads have a PCI score of 100, while failing roads have a PCI score of less than 25. **Table A** lists PCI categories by score. The City conducts a comprehensive PCI every two years. The last PCI scoring of City streets occurred in 2016. The next PCI scoring of City streets will occur this summer. During the evaluation period, PCI inspectors, typically engineering interns, look for the type, frequency, and severity of specific surface defects on a standardized checklist. While overall this method is subjective, most PCI raters agree on which roads are rated as excellent and which ones are rated as poor.

The current overall PCI rating for the City is a 78, putting Lakewood in the 90th percentile amongst peer jurisdictions according to StreetSaver, a web-based software platform the City utilizes to help track and calculate PCI. The overall PCI for a City is calculated by weighting the areas of arterial, collector and residential streets to the total combined area. **Table B** lists the PCI score for principal arterials, minor arterials, collector arterials, and local access streets.

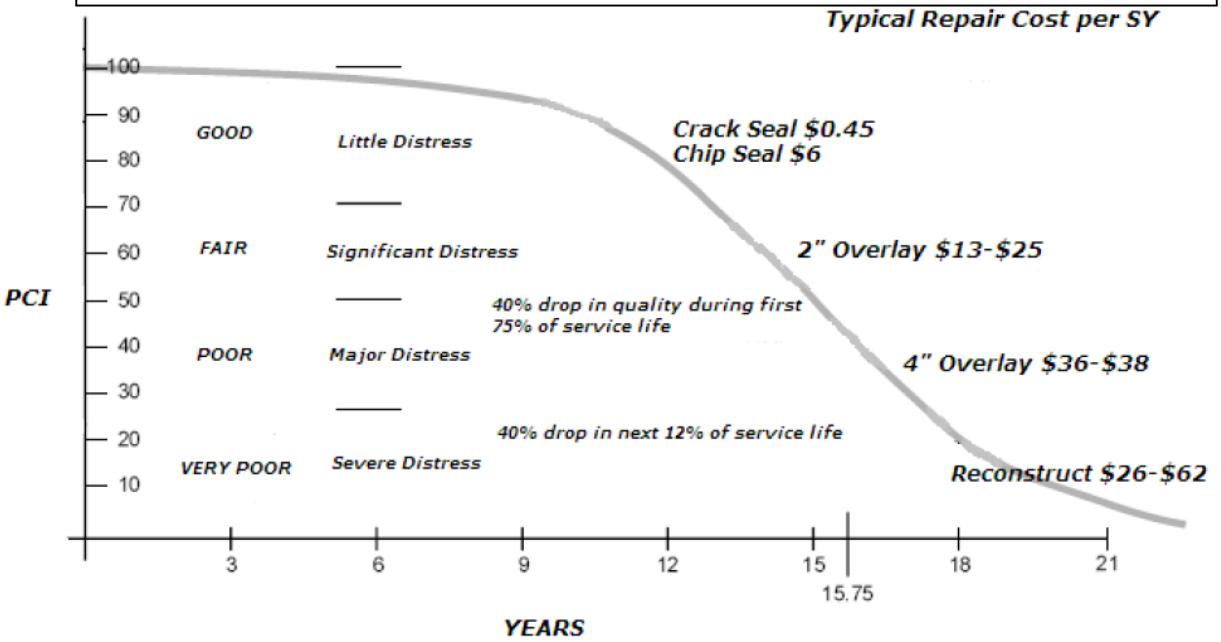
Table A	
Standard PCI Rating Scale	
100	Good
85	Satisfactory
70	Fair
55	Poor
40	Very Poor
25	Serious
10	Failed

[2] OSHA. Trenching and Excavation Safety. (2015). https://www.osha.gov/Publications/osha2226.pdf

Table B										
PCI: LAKEWOOD HISTORICAL NETWORK CONDITION SUMMARY										
CLASSIFICATION	**LANE MILES**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Principal Arterial	94.07	77	76	75	79	78	77	78	77	**83**
Minor Arterial	66.39	79	76	79	79	79	76	76	73	**79**
Collector Arterial	44.82	75	71	71	75	75	72	72	70	**75**
Local Access	225.71	77	73	73	76	76	73	75	72	**77**
OVERALL NETWORK PCI		***76***	***73***	***73***	***76***	***76***	***74***	***75***	***73***	***78***

Graph 1, PCI over Time, demonstrates the typical PCI of a road over time and its respective repair cost per square yard. As evident by **Graph 1**, the cost to maintain and repair a road depends on the condition.

GRAPH 1: PCI over Time



The City affords quarterly transportation meetings with the utility providers in Lakewood. For these meetings the City sends out meeting agendas beforehand and provides notes to all utility providers via email following each meeting regardless of a utility provider's attendance at the meetings. The adopted Transportation Improvement Plan is disseminated to utility providers typically at the third quarter meeting.

Pavement Cuts: Pavement cuts are at times necessary and, therefore, cannot be avoided, i.e., utilities needing to provide services to new customers and repair existing utility assets. Given this, the City has incorporated a level of pavement management practices within the City's Engineering Standard Manual, **Attachment B**.

Lakewood Municipal Code (LMC) 12A.03.010, Engineering Standard Manual, states that the construction standards found within the City's Engineering Standards Manual are enforceable through the provisions of LMC regulations. Pursuant to the City's Engineering Standards Manual (2016) section 6.8, Pavement Restoration, the goal of pavement restoration is to "have a pavement in

better or as good as pre-trench cut condition." In effort to do this the manual affords the following provisions:

b) Lane width restoration requirements. For longitudinal utility trench cuts in pavements over five years old, a minimum 2-inch overlay or full-depth pavement reconstruction is required for the following widths:

    1. One-lane overlay or reconstruction: when trench cut or patch is within one travel lane.

    2. Two-lane overlay or reconstruction: when trench cut or patch is within two travel lanes.

    3. Additional overlay or reconstruction: when the remaining pavement area to the edge of existing pavement on either side is less than one travel lane or pavement is less than five years old. No longitudinal joints will be allowed in the wheel path.

c) Pavement Restoration Requirements. The following table describes pavement restoration requirements for various size projects and various existing pavement conditions.

d) Transverse Utility Crossings. Transverse utility crossings must be bored or completed by another trenchless method. Bore pits must be restored pursuant to these Pavement Standards.

e) Trench Cuts in New Pavements. Trench cuts are not permitted in pavements that have been constructed or rehabilitated within five years. Rehabilitation includes all asphalt overlays. If there is no other option but to cut into a new pavement, the pavement must be restored pursuant to requirements found in the following table.

f) Exemption from Pavement Restoration Requirements and Financial Penalties. Utilities can appeal in writing directly to the City Engineer for exemption from pavement restoration requirements and financial penalties associated with trenching in new pavements. Utilities may be exempt from pavement financial penalties if there is no other viable alternative and under the following conditions:

    1. If the City failed to give six months' notice of an upcoming roadway rehabilitation project either because of: (a) A change in property ownership, or (b) A change in the City's Capital Facilities Plan.

    2. An emergency project requiring immediate attention for the preservation of life or property."

Notably, pursuant to section 6.8(f) there is a moratorium on trench cuts on streets that were constructed or rehabilitated in the proceeding five years. **Attachment C** provides a list of streets that meet this criteria.

The existing City's pavement restoration requirements essentially works on a three tier system. Tier 1, new pavement less than five years old, is subject to a trench moratorium. In circumstances where necessity requires these new pavement areas to be trenched, large projects require complete reconstruction (or overlay) of the trenched roadway (all lanes). Large projects consist of longitudinal trench cuts through paved road way surfaces fifty (50) linear feet of greater, or four or more traverse trench cuts per three hundred (300) linear feet of roadway.

Small projects consist of trench cuts through paved road way surfaces less than fifty (50) linear feet, or less than four traverse trench cuts per three hundred (300) linear feet of roadway. In Tier 1, small projects require patches per the Standard Plan and a trench restoration penalty determined by the City or, in lieu of a trench restoration penalty, for traverse cuts, the utility provider can grind two (2) inches deep, thirty (30) feet longitudinally for the entire length of the trench and inlay that area with Hot-Mix Asphalt (HMA), or for longitudinal cuts, grind two (2) inches deep, one lane wide, for at least the length of the trench and inlay with HMA.

Based on data from 2015 to present, a typical small project trench restoration penalty is approximately $16.50 per square foot of patch. However, this is contingent on the depth necessary for HMA and crushed surface material (CSTC), the cost of these materials per ton, labor, excavation, signage needs, and traffic control. Additionally, this calculation assumes that any repair by the City would require an additional foot beyond the original patch size. Thus, if the trench cut patch is six (6) foot by eight (8) feet, then the moratorium restoration fee would be applied to an area of seven (7) by nine (9) feet.

Tier 2, pavement over five years old, is subject to different standards. For large projects, contractors must grind, inlay, reconstruct, or overlay trenches per the Pavement Standards. For Tier 2, small projects require patches per the Standard Plan.

Tier 3 is pavement identified by the City to be reconstructed within two years. Pavement restoration requirements are the minimum outlined in the Standard Plan.

PAVEMENT MORATORIUM OPTIONS: The City could implement any of the following to bolster pavement management practices utilized by the City in regards to pavement moratoriums:

1. Increase the overall length of the pavement moratorium. The current pavement moratorium in effect by the City is five years. This length appears to the industry standard as it is on par with other jurisdictions in Washington as well as outside of the state. **Table C** lists the pavement moratorium of other Washington jurisdictions.

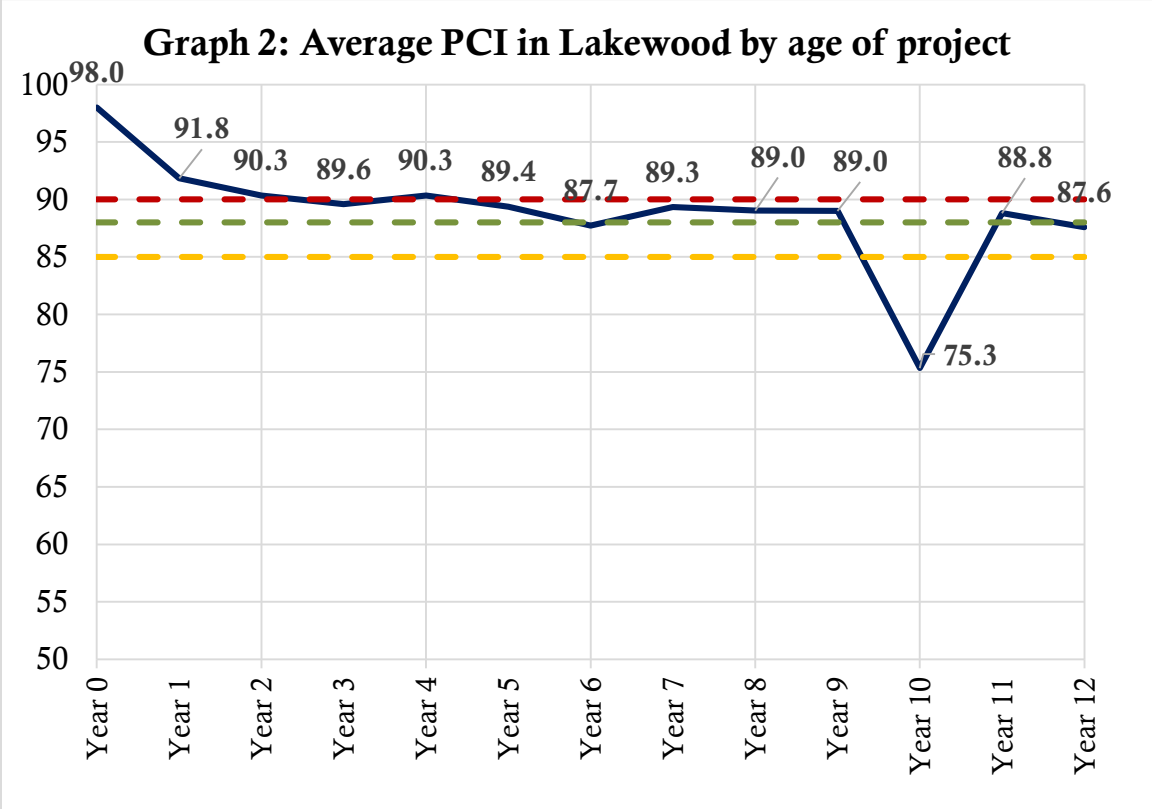
   Nonetheless, while atypical, the City could extend its moratorium beyond five years. There are a limited number of jurisdictions within the US that have done this, such as Chicago, Illinois, and Cupertino, California, which has since changed their moratorium to five years.

Table C	
Jurisdiction	**Pavement Moratorium**
Lakewood, WA	5 years
Kent, WA	5 years
Fife, WA	5 years
SeaTac, WA	5 years
Kenmore, WA	5 years
Tacoma, WA	5 years
Kenmore, WA	5 years
Maple Valley, WA	5 years
Burien, WA	5 years

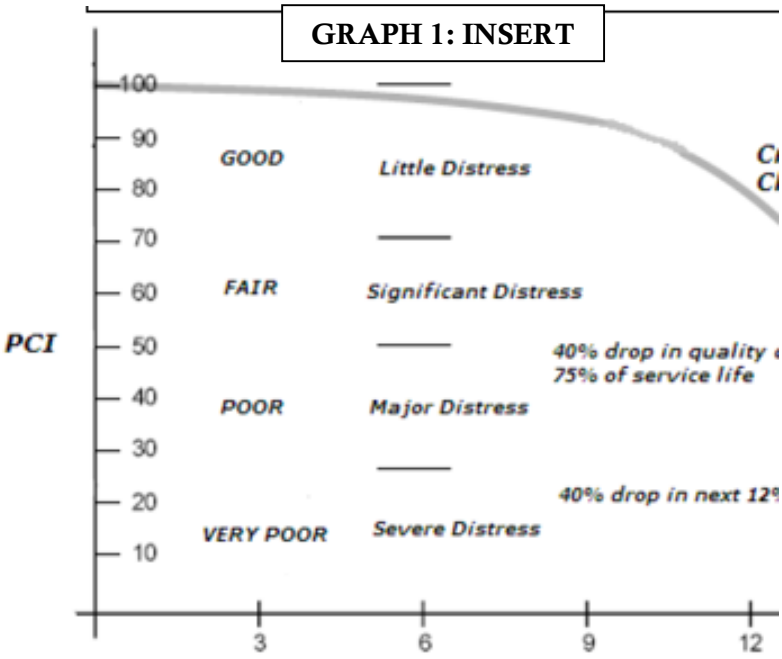
2. As variation of the above, the City could retain the initial five year moratorium with the stipulation that the moratorium would extend (indefinitely or for a determined period of time contingent) on the roadway remaining at a PCI score above a specified threshold, for example

a PCI of 90, or 88, or 85. This would, in essence, produce a "performance" based model for pavement restoration requirements, which would allow well-maintained streets to have a pavement cut moratorium that extends well-beyond the existing five year moratorium.

Graph 2 depicts the average roadway PCI for roadway projects in Lakewood over the past twelve years. The dashed red line indicates a PCI of 90; the dashed green line indicates a PCI of 88; and the dashed yellow line indicates a PCI of 85. The City's PCI by age over this period of time is similar to the PCI curve in **Graph 1** (see insert below).



GRAPH 1: INSERT



Note: The dramatic dip in Year 10 is due a small sample group of three sections in 2008 which consisted of the following: Pacific Highway Southwest overlay, South Tacoma Way overlay, and Bristol Avenue Southwest reconstruction. Pacific Highway Southwest and South Tacoma Way (overlays) have PCIs of 67 and 66 respectively, while Bristol Avenue (full reconstruction) has a PCI of 93. Pacific Highway Southwest and South Tacoma are major arterials, receiving a high volume of traffic and heavier vehicle weight. Furthermore, in these locations, the Hot Mix Asphalt (HMA) overlay was placed over existing concrete roadway panels. Reflective cracks have started to show through the overlay surface as a result of the HMA pavement being more flexible than the rigid concrete panels underneath. These cracks on the outer lanes correspond to the "seams" in the concrete roadway. The difference between these materials types coupled with the volume of traffic has resulted in a more rapid deterioration of the overlay had it been replaced exclusively with either HMA or cement concrete.

Based on the City's maintenance and rehabilitation data, if a pavement moratorium was to extend until the PCI score fell below 90, on average the moratorium would not extend beyond five years. Of the eighty six (86) roadway maintenance projects over five years old twenty (20), or twenty-three percent (23%) have a PCI above 90.

If a pavement moratorium was to extend until the PCI score fell below 88, the moratorium could theoretically extend well beyond five years. For example, of the twenty-six (26) roadway maintenance projects over nine years old, 21 have scores at a PCI of 88 or above, this equates to eighty-one percent (81%) of projects over nine years old.

If a pavement moratorium was to extend until the PCI score fell below 85, the moratorium could theoretically extend well beyond ten years. Of the fifteen (15) roadway maintenance projects over ten years old, eleven (11) have scores at 85 or above, this equates to seventy-three percent (73%) of projects over ten years old.

The City could extend this moratorium and "performance model" to include a pro-rated pavement restoration fee based on PCI to:

A. To all arterial and/or collector streets regardless of age; or

B. To all arterial and/or collector streets from five to ten years of age.

This would allow the City to recuperate some degree of resources for loss of functionality and longevity due to utility cuts.

Table D provides an example of **Option 2 (A),** extend performance model to all arterial and/or collector streets regardless of age based on PCI score.

Table D	
Pavement (no age limitations)	
PCI Score	**Percentage of Trench Restoration Penalty**
100-90	100%
89-80	70%
79-70	30%
69-50	10%
49-0	0%

Table E provides an example of how **Option 2 (A)** would work based on a hypothetical trench patch of one hundred and sixty feet (160) square feet with and a trench restoration penalty of $16.50 per square foot of patch.

Table E				
PCI Score	**Trench Restoration penalty**	**Trench length**	**Cost per sq/ft of patch**	**Cost**
Any Pavement with a PCI 100-90	100%	160 sq/ft	$16.50	$2,640
Any Pavement with a PCI 89-80	70%	160 sq/ft	$16.50	$1,848
Any Pavement with a PCI 79-70	40%	160 sq/ft	$16.50	$1,056
Any Pavement with a PCI 69-50	10%	160 sq/ft	$16.50	$264
Any Pavement with a PCI 49-0	0%	160 sq/ft	$16.50	$0

Table F provides an example of **Option 2 (B),** extend a performance model to all arterial and/or collector streets from five to ten years based on PCI.

Table F	
Pavement 5 to 10 years old	
PCI Score	**Percentage of Trench Restoration Penalty**
Pavement 5-10 years, 100-90	100%
Pavement 5-10 years, 89-80	70%
Pavement 5-10 years, 79-70	30%
Pavement 5-10 years, 69-50	10%
Pavement 5-10 years, 49-0	0%

Table G provides an example of how **Option 2 (B)** would work based on a hypothetical trench patch of one hundred and sixty feet (160) square feet with and a trench restoration penalty of $16.50 per square foot of patch.

Table G				
PCI Score	**Trench Restoration penalty**	**Trench length**	**Cost per sq/ft of patch**	**Cost**
New Pavement >5 years old	100%	160 sq/ft	$16.50	$2,640
Pavement 5-10 years, PCI 100-90	100%	160 sq/ft	$16.50	$2,640
Pavement 5-10 years, PCI 89-80	70%	160 sq/ft	$16.50	$1,848
Pavement 5-10 years, PCI 79-70	40%	160 sq/ft	$16.50	$1,056
Pavement 5-10 years, PCI 69-50	10%	160 sq/ft	$16.50	$264
Pavement 5-10 years, PCI 49-0	0%	160 sq/ft	$16.50	$0

In these examples, for **Options 2 (A) and 2 (B)**, the pro-rated PCI categories are in increments of ten and then larger increments; this is an example, exact increments could be determined at a later time. Pavement inspection is conducted on representative inspection units. An inspection unit is a small representative segment of a pavement section or management unit selected of convenient size which is then inspected in detail. The distress found in the inspection unit is used to calculate the PCI for the inspection unit inspected. The PCI of the inspection units in the section are then used to represent the condition of the entire section.

3. Increase the fee associated with trench restoration penalties for small pavement projects. One method of recovering the cost of damaged pavements is to require the utility company performing the work to pay a fee commensurate with the damage done to the pavement.

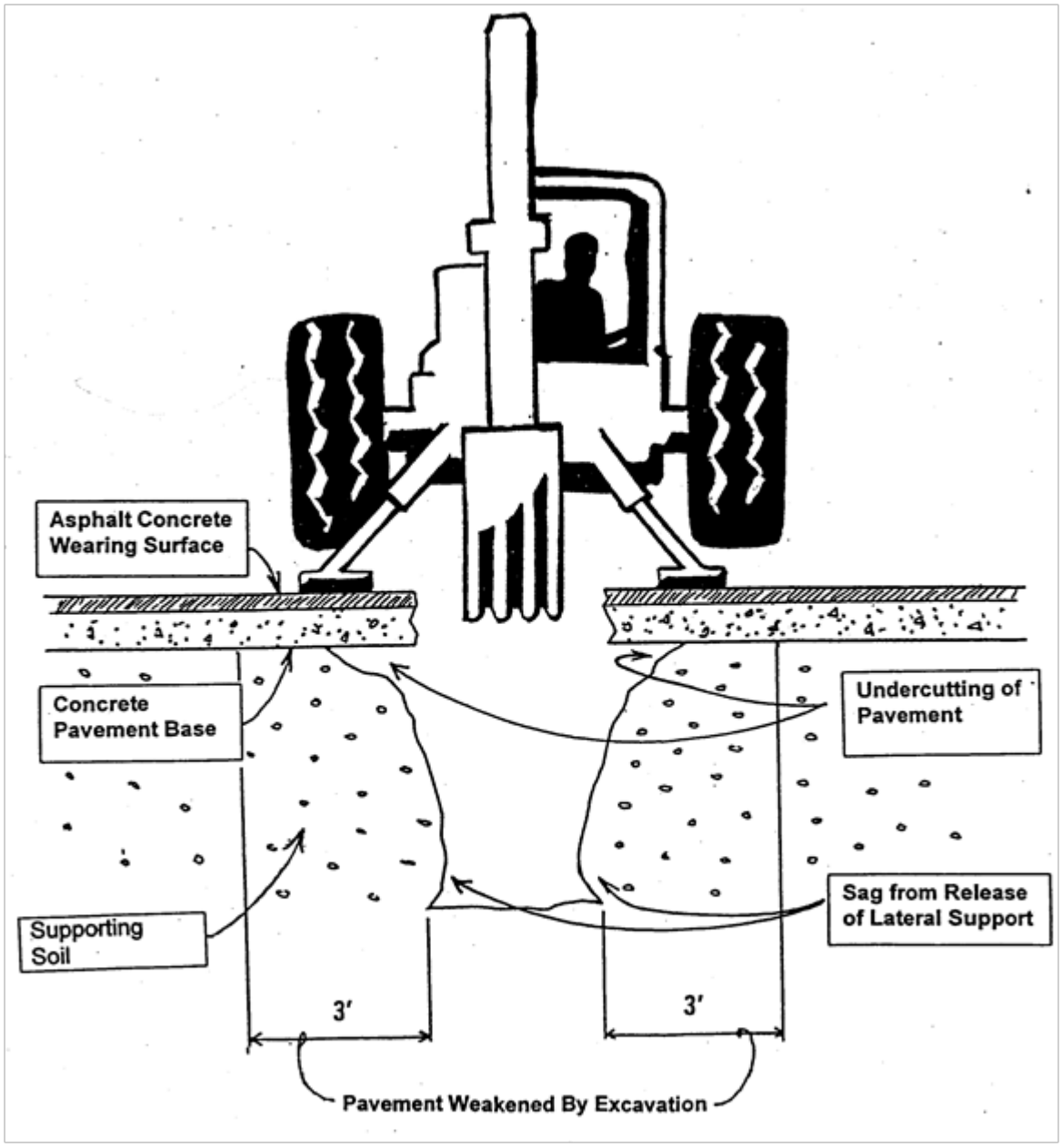
   However, the quantification of this damage can be problematic to determine. Currently, the City has a patch fee of approximately $16.50 per square foot based on data from the past few years. This number could be increased to dissuade unnecessary road trenching and to help the City fully recuperate future maintenance costs associated with the inevitable structural damage caused by trenching. Furthermore, this rate should be annually increased to account for construction cost inflation.

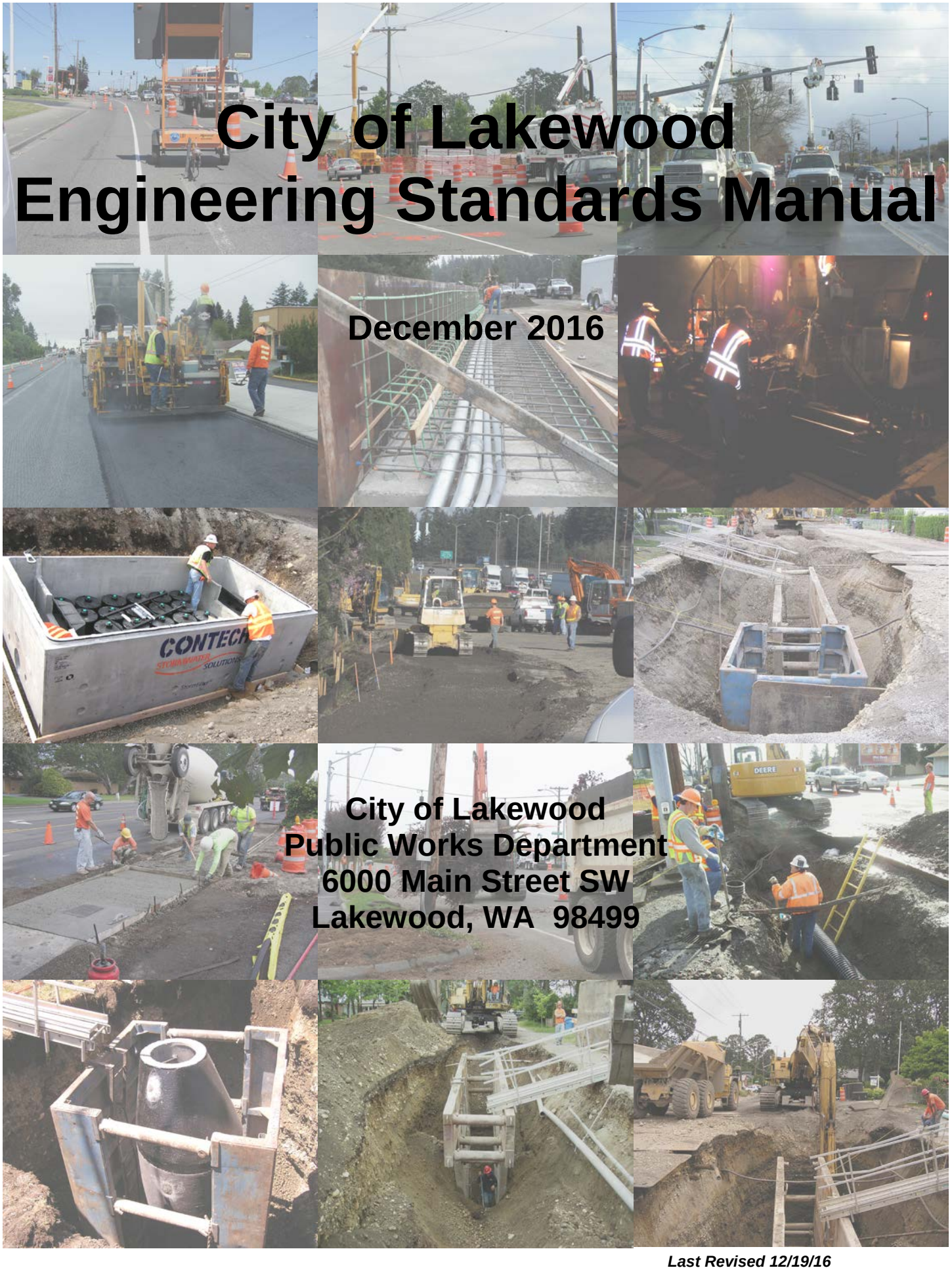
4. The City could also require the increased use of trenchless technologies, where possible. Such policies can reduce disruption to the pavement structure and to the traveling public.

RECOMMENDATION: Pursue further analysis of **Option 2**, retain the initial five year moratorium and extend this moratorium per **Option 2 (A)**, indefinitely, or **Option 2 (B)**, up to ten years, as long as a roadway, arterial or collector, contingent on the roadway maintaining a PCI score above a specified threshold. Respective to the selection of **Option 2 (A)** or **Option 2 (B)**, implement a pro-rated pavement cut fee based on PCI score in effort to recuperate assets for future loss of functionality and shortened longevity caused by utility cuts.

NEXT STEPS: If the recommendation detailed above is found to be of interest to the Council, further research will be performed on **Option 2**. City personnel will return to Council with research results at a future Study Session in July.

ATTACHMENTS:
Attachment A –Trenching schematic
Attachment B – Engineering Standards Manual
Attachment C – Current streets with 5-year moratorium


Asphalt Concrete Wearing Surface
Concrete Pavement Base
Supporting Soil
Undercutting of Pavement
Sag from Release of Lateral Support
3′
3′
Pavement Weakened By Excavation



City of Lakewood
Engineering Standards Manual

December 2016

City of Lakewood
Public Works Department
6000 Main Street SW
Lakewood, WA 98499

Last Revised 12/19/16

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PREFACE

This manual has been prepared to provide a graphic and written representation of minimum standards for construction of public improvements within the public right-of-way, easements, city properties, and on private property relating to development improvements.

This manual is compiled and published by the City of Lakewood Public Works Department. The intent is to achieve maximum uniformity of engineering and construction practices within the City of Lakewood.

Table of Contents

1.0 General Considerations

All requirements contained in the Engineering Standards Manual, together with any and all amendments thereto, are applicable to all design and construction of private and public development, including utilities, within the City of Lakewood.

The purpose of these standards is to ensure that minimum public safety requirements are met and to provide the most effective and appropriate design elements for the function each street serves. The appropriate design elements should address safety, welfare, appearance, and economics of a street design.

These standards are intended to serve as guidelines to direct the appropriate design features of the street to be built. The standards are to be followed by and are intended to assist professional engineers, planners, and developers to apply their skills and professional judgments in the design of better quality and cost effective streets. The City Engineer will be the final authority in resolving disputes concerning questions of fact in connection with work not covered by these standards.

1.1. References

These standards are intended to be consistent with the most currently adopted provisions and editions of the City's Six-Year Transportation Improvement Program, Comprehensive Plan, other adopted plans and policies, and the works cited below:

- A Policy on Geometric Design of Highways and Streets, published by the American Association of State Highway and Transportation Officials
- Design Manual, published by the Washington State Department of Transportation
- Highway Runoff Manual, published by the Washington State Department of Transportation
- Manual on Uniform Traffic Control Devices (MUTCD), published by the U.S. Department of Transportation as adopted and amended by the State of Washington.
- Pierce County Stormwater Management and Site Development Manual
- Soil Survey of Pierce County Area, Washington, published by the Natural Resources Conservation Service, U.S. Department of Agriculture
- Standard Plans for Street, Bridge and Municipal Construction, published by the Washington State Department of Transportation
- Standard Specifications for Highway Bridges, published by the American Association of State Highway and Transportation Officials
- Standard Specifications for Street, Bridge and Municipal Construction, published by the Washington State Department of Transportation and the Washington State Chapter of the American Public Works Association

- Stormwater Management Manual for Western Washington, published by the Washington State Department of Ecology, and including Appendix 1 of the Western Washington Phase II Municipal Stormwater Permit, or approved equivalent
- Trip Generation Manual, published by the Institute of Transportation Engineers
- Highway Capacity Manual, published by the Transportation Research Board
- WSDOT Pavement Guide, published by the Washington State Department of Transportation
- ADA Accessibility Guidelines, published by the United States Access Board

1.2. Permits

Permits, approvals, or agreements are required by the City, and sometimes other jurisdictions, prior to the initiation of any construction described within this manual. The majority of work covered under these standards will require multiple permit authority review and approvals.

1.3. Professional Qualifications

Professionals in technical fields including Civil Engineering, Electrical Engineering, Geotechnical Engineering, Landscape Architecture, Soils Engineering, and Surveying who prepare or are responsible for the preparation of drawings, plans and specifications, or technical reports for obtaining permits and approvals shall be currently licensed or registered in the State of Washington and qualified by both experience and educational background in the technical areas as warranted by the specifics of the proposed development project.

1.4. Deviation from Standards

Provisions for deviations from these standards are described in the City of Lakewood Public Works Code, Section 12A.04.020.

1.5. Transit Facilities

Transit facilities may be required as part of a development project. Contact Pierce Transit to determine if required; and if so, for design guidelines.

1.6. Survey Control

Survey control for all construction activities shall be based on the following standards:

- Coordinate system: Washington Coordinate System of 1983
- Horizontal datum: North American Datum of 1983/91 (NAD 83/91), South Zone
- Vertical datum: North American Vertical Datum of 1988 (NAVD 88)
- Units: Survey Feet

1.7. Quality Assurance and Quality Control Standards

1.7.1 Approval of Materials, Equipment, and Material Sources

The engineer shall be required to provide quality assurance and quality control for all project materials and equipment. The engineer shall review all material submittals to verify that what is supplied and utilized on the project meets the approved plans and specifications. When required by the City the engineer shall provide all documentation of approval of materials and material

sources, including but not limited to: requests for approval of material (RAMs); catalog cut sheets; shop drawings; and installation manuals.

If upon review of material documentation, the City finds that materials or sources were utilized that do not meet City standards and the approved plans, the permit holder will be required to either: (1) replace unacceptable materials and equipment, or (2) provide a maintenance guarantee to the City as defined in LMC Section 12A.05.090.

1.7.2 Testing Requirements

The permit holder will be required to secure a certified independent testing firm to provide quality control testing as outlined in the WSDOT Construction Manual and the requirements outlined below. Some of the more typical testing frequencies and requirements are listed below. All projects must have at least one test completed regardless of quantities. When requested, test results shall be provided to the City prior to final acceptance.

1.7.3 Hot-Mix Asphalt:

- When requested, the permit holder shall provide the City a current, WSDOT-approved HMA mix-design for the mix specified in the plans and specifications.
- A compaction test shall be performed at least every 1,000 LF per lane, per lift.
- When requested, a copy of batch plant tickets showing where, date, and time mix was delivered shall be provided to the City.

1.7.4 Portland Cement Concrete

- When requested, the permit holder shall provide the City a current, WSDOT-approved PCC mix-design for the class specified in the plans and specifications.
- The completed mix shall be sampled for air, temp, slump, and comp. strength.

1.7.5 Backfill, Embankment, and Subgrade

- For backfilling trenches compaction testing shall be performed at a minimum of 2 foot depth increments and at the top of subgrade.

2.0 Public Works Review Process

The Public Works Department plan review process is independent of the review processes of all other City departments. Therefore, plans or other materials requiring Public Works review and approval shall be submitted directly to the Public Works Department.

2.1. Pre-Application Conference (Optional)

The pre-application conference is strongly encouraged and is scheduled through the Community Development Department. The applicant, and his/her contractor and engineers meet with review staff to discuss their proposal. The purpose of this conference is to prepare the applicant for the project submittal process.

2.2. Fee Schedule

Permit fees shall be paid at the time of permit application in accordance with the adopted fee schedule.

2.3. Plan Checklist

The Plan Set Requirements (Section 3.0 of this manual) are included as a guide to help the engineer in the plan preparation process. The City recommends that these standards be used by the engineer to help facilitate the plan review process.

2.4. Plan Approval and Review Sequence

2.4.1. Submittal Procedure

Plans shall be submitted to the Public Works Department with an appropriate permit application. For proposed street and drainage construction by a developer, complete street plans and profile, together with drainage calculations, supported topography mapping, contributing areas, etc., shall be signed and stamped by the applicant's engineer for the City's review. Plans shall be reviewed by the City according to the date they were submitted. Previously approved plans submitted to the City for revisions shall be considered a new submittal. Approved plans under construction will be reviewed prior to new submittals.

2.4.2. Time Limitation of Approval

Site development permit approval shall be valid for a period of two years, and may be renewed for up to one additional year at the discretion of the City Engineer. Plans not implemented within this time period shall require a new permit and all applicable fees. The new plans shall be subject to code requirements at the time of re-submittal. The new plans shall be submitted with revisions or modifications to the City for review and approval by the City.

2.4.3. Revisions to Approved Plans

When the City has authorized revisions to the approved construction plans, the engineer shall submit to the City record drawings of construction plans, stamped and signed, reflecting the approved revisions in accordance with LMC Section 12A.06.000.

3.0 Plan Set Requirements

3.1. Plan Sheets

3.1.1. Formatting Standards

Plan-profile sheets and plan sheets shall use a sheet size of 22" x 34", or 24" x 36". Sheets shall be engineering grade bond paper. All lettering shall be greater than one-eighth (1/8) of an inch high.

The project name, the applicant's and the applicant's engineer's name, address, and telephone number shall be included in the title block. All submitted work shall be stamped by the applicant's engineer before review by the City. Prior to approval, the applicant's engineer shall stamp, sign, and date submitted work.

Typical project plans will include but not be limited to information on streets, grading, stormwater, erosion and sediment control, utilities, channelization, signage, and illumination. Smaller projects may combine information onto fewer sheets when space allows. Regardless of project size, all project plans shall be laid out in a logical, easy to follow sequence.

3.1.2. Cover Sheet

Construction plans submitted to the City for review and approval for streets in a proposed formal plat, short plat, large lot division, or work in existing City right-of-way shall have a plan cover sheet.

The plan cover sheet shall be Sheet 1 of the construction plans and shall contain the following information:

- An approval block containing the following information:

  CITY OF LAKEWOOD PUBLIC WORKS DEPARTMENT

  APPROVED THIS _____ DAY OF _____, 20___
  BY THE CITY OF LAKEWOOD PUBLIC WORKS DEPARTMENT

  _____
  CITY ENGINEER OR DESIGNEE

- An overall site plan drawn to an appropriate scale; such as, 1" = 100', 1" = 200', or 1" = 400' showing the entire development and street system network including its connection to an existing City street or State highway.
- Section, Township, and Range on each page, plat, or project name.
- North arrow pointing to the top or to the right side of the sheet.
- The project's storm sewer system along with easements, tracts, drainage facilities, all buffer and screening areas, off-site and on-site natural drainage courses or areas shall be shown on the overall site plan.
- Soil logs and soil log locations when an on-site storm drainage percolation system is proposed.
- A vicinity map drawn to a scale of 4" = 1 mile or other similar scale, showing project site, existing public street system and any other pertinent information.
- Standard notes which are applicable to the project.
- When more than three (3) sheets are used, a table of contents shall be shown.

At the City Engineer's discretion, cover sheet information may be shown on additional sheets.

3.2. Submittals

3.2.1. First Submittal

The first submittal shall include but not be limited to the following: two sets of prints of plans, profiles, and detail sheets, stormwater calculations, and site distance calculations and exhibits if necessary.

3.2.2. Final Submittal

Red line drawings (marked up plans) and three sets of corrected plans, containing the following information shall be included in the final submittal:

- Corrected plans, profiles, and detail sheets.
- Corrected stormwater calculations if necessary.
- Quantity take-off and engineer's cost estimate of proposed construction when the project is required to have a financial guarantee.

3.3. General Site Plans

3.3.1. General Site Plan Standards

The following information shall be included on site plans:

- Plans shall be drawn at a scale range of 1" = 20' to 1" = 40'. Details for clarification may be shown on a more convenient scale.
- Identification of all existing City streets and adjoining subdivisions when it is pertinent to the scope of the project.
- Right-of-way lines and width for proposed street(s) and intersecting streets.
- Dimensioned lot lines and lot numbers to properly locate and dimension all tract and easement areas.
- All topographic features within right-of-way limits and sufficient area beyond to resolve questions of setback, slope, drainage, access onto abutting property, and street continuations. This shall include, but is not limited to, ditch flow lines, all drainage structures with invert elevations, utility locations, fences, structures, existing curbing and approaches, pertinent trees and shrubbery, and other appurtenances which would affect the construction of the project.
- Existing and proposed contours at 2-foot intervals.
- Field topographic information including contour lines of the property in its natural undeveloped condition. City or USGS topographic mapping must be field verified and supplemented with additional field topographic information when necessary to provide an accurate depiction of the property. Field topographic information submitted for the project's storm drainage plan does not have to be duplicated on the street construction plans. A 2-foot contour interval shall be used except when the property is extremely flat or undulating and the cross slope varies or when pothole areas, wetlands, swales, or drainage courses exist on the property, then a topographic map with 1-foot contour intervals shall be required. Topographic surveys shall be stamped and signed by a Washington State licensed professional land surveyor.
- Utility locations (new and existing) for: water system, sanitary sewer system, gas, telephone, power, cable TV.
- Delineation of critical areas.

- Lakes, rivers, streams, flood plains, wetlands, sensitive slopes, and other sensitive areas.
- Limits and elevations of 100-Year Flood Plain, including delineation of the floodway and flood fringe where applicable.

3.3.2. General Site Plan Notes

The following general notes shall be shown on site plans.

GENERAL NOTES:

1. All work in City right-of-way requires a Right-of-Way permit from the City of Lakewood.
2. After completion of all items shown on these plans and before acceptance of the project, the contractor shall obtain a "punch list" prepared by the City's inspector detailing remaining items of work to be completed. All items of work shown on these plans shall be completed to the satisfaction of the City prior to acceptance of the project.
3. All materials and workmanship shall conform to the City of Lakewood Public Works Code, Engineering Standards Manual, and other referenced manuals or documents.
4. A copy of these approved plans, specifications, and details shall be on site during construction.
5. Any revisions made to these plans must be reviewed and approved by the developer's engineer and the City Engineer prior to any implementation in the field. The City shall not be responsible for any errors and/or omissions in these plans.
6. The contractor shall have all utilities verified on the ground prior to any construction. Call 811 or 1-800-424-5555 (Call Before You Dig Hotline) at least 48 hours in advance. Call Pierce County Traffic (253) 531-6990 for locations of City-owned traffic signals. Call WSDOT Signal Shop (360) 357-2616 for locations of state-owned traffic signals. The applicant and applicant's engineer shall be contacted immediately if a conflict exists.
7. Any structure and/or obstruction which require removal or relocation relating to this project shall be done so at the developer's expense.
8. Locations of existing utilities are approximate. It shall be the contractor's responsibility to determine the true elevations and locations of hidden utilities. All visible items shall be the engineer's responsibility.
9. The contractor shall install, replace, or relocate all signs, as shown in the plans or as affected by construction.
10. All construction surveying for extensions of public facilities shall be done under the direction of a Washington State licensed professional land surveyor or professional civil engineer.
11. During construction, all public streets adjacent to this project shall be kept clean of all material deposits resulting from on-site construction, and existing structures shall be protected as directed by the City.
12. Certified record (as-built) drawings are required prior to project acceptance per LMC Section 12A.06.010.

13. A NPDES Construction Stormwater General Permit & Coverage may be required by the Washington State Department of Ecology for this project. Contact the Department of Ecology for more information.
14. Any disturbance or damage to Critical Areas and associated buffers, or significant trees designated for preservation and protection shall be mitigated in accordance with a Mitigation Plan reviewed and approved by the City of Lakewood Community Development Department. Preparation and implementation of the Mitigation Plan shall be at the developer's expense.

3.4. Roadway Plans

3.4.1. Horizontal Plan

Horizontal plan elements shall include the following in addition to those items required on the cover sheet when a cover sheet is not required. The horizontal plan shall be drawn at the scale range of 1" = 20' to 1" = 40'. Details for clarification may be shown on a more convenient scale.

- Street alignments with 100-foot stationing, preferably increasing to the north or east and reading from left to right, and stationing at points of curve, tangent, and intersection, with ties to section or quarter corners or other established survey control points at the intersection of the proposed street or streets and the existing City street. All lettering shall be right reading.
- Bearings on street centerline.
- Curve data including radius, delta, and arc length for all horizontal alignments.
- Typical street way cross-section(s) of proposed street.

3.4.2. Roadway Plan/Profile Sheets

Off-site and on-site plans shall be on separate sheets.

On-site plans are generally only prepared on plan sheets. When cross-sections for grading plans or profiles for sanitary sewer lines are required, the profile shall be drawn on the plan/profile sheets.

Off-site plans shall be on plan/profile sheets. Each sheet shall have the corresponding plan/profiles on the same sheet with aligned stationing.

Plan/profile elements shall include the following:

- Vertical scale of 1" = 5'. Clarifying details may be done to a more convenient scale.
- Original ground line at 100-foot stations and at significant ground breaks and topographic features, with accuracy to within 0.2 feet on unpaved surface and 0.02 feet on paved surface.
- Survey control shall be in accordance with Section 1.6 of this manual. Established USC&GS control or City bench marks shall be used when they are located within one-half mile of the project.
- Street names.

- Right-of-way and width; lot/subdivision lines and street addresses.
- Right-of-way radii.
- Curb-to-curb pavement width.
- When streets end at a property line, continue the existing ground profile for a minimum of 200 feet to show that the proposed vertical alignment is reasonable.
- Center line bearings.
- Center line/baseline stationing.
- Center line elevations at 50-foot intervals, except as otherwise stated.
- Street grade and vertical curve data; street to be measured at centerline.
- Horizontal curve datum at center line.
- Centerline grade shall be in percentage (%).
- When intersecting profile grades have a difference of 1% or less, a vertical curve is not required. All other vertical grade intersections will require a vertical curve.
- Include gutter line elevations at 25-foot intervals, and the beginning, end, and other critical locations throughout the project limits.
- Accurate locations of monuments at all center line intersections, cul-de-sacs, and other geometric reference points.
- Identification of horizontal or vertical utility conflicts.
- Final street and storm drain profile with stationing the same as the horizontal plan, preferably reading from left to right, to show stationing of points of curve, tangent, and intersection of vertical curves, with elevations to 0.01 feet for each street in the project.
- Length, type, and location of curb and gutter.
- Intersection gutter line elevations at ¼ points and right-of-way curve.
- Intersection elevation datum at ¼ points of radii.
- Location, length, width of sidewalks, and driveways.
- Wheelchair ramp locations.
- Mailbox design and/or placement/replacement.
- Street landscaping and irrigation.
- Height and profile of existing or proposed retaining structures.
- Measures for protection of trees and/or landscaping required to be retained.

3.4.3. Roadway Plan Notes

The following notes shall be shown in the plans.

ROADWAY NOTES:

1. All work in City right-of-way requires a Right-of-Way permit from the City of Lakewood. Prior to any work commencing, the general contractor shall arrange for a preconstruction meeting to be attended by all major contractors, representatives of involved utilities, and the City of Lakewood. Contact the City of Lakewood Public Works Department to schedule the meeting. The contractor is responsible to have their set of plans at the meeting.
2. For work in City right-of-way inspections are required at the following construction stages:

   Inspection No. 1: Clearing and grubbing, embankment and excavation, underground drainage, when trenching and placement of pipe are complete but prior to cover or temporary water detention/retention and siltation control

   Inspection No. 2: General roadway, when the drainage system, underground utilities, and grading to suitable subgrade are complete, including gravel ballast if required

   Inspection No. 3: General roadway, when the crushed gravel surfacing has been placed

   Inspection No. 4: General roadway, while the paving is in progress

   Inspection No. 5: Overall roadway, after paving, cleaning of drainage system and all necessary cleanup, striping, buttoning, monuments, and all delineation work
3. Monuments shall be installed at all street intersections, at angle points, and points of curvature in each street. All boundary monuments must be installed according to the Washington State Subdivision laws.
4. Signage and traffic control devices are safety items and shall be installed prior to issuance of any certificate of occupancy. All signage shall be in accordance with the MUTCD.
5. Sidewalks, driveways, and other improvements identified in the preliminary plat approval shall be installed prior to final plat approval unless a financial guarantee has been granted for the installation of said improvements.
6. Prior to any sign or striping installation or removal the Contractor shall contact the City to arrange for an on-site meeting to discuss placement and uniformity.
7. New or revised stop signs, yield signs, and traffic signals shall be advance-warned using the procedure outlined in the MUTCD. Advance warning signs and flags shall be maintained by installer for 30 days and then removed.

3.5. Stormwater Plans

3.5.1. Stormwater Plan and Detail Sheets

The following information shall be included in stormwater plans:

- Two cross-sections of each retention/detention pond or infiltration system showing original ground, property lines, slope catch points, and all other pertinent information to adequately construct the facilities.
- Existing and proposed drainage features, indicating direction of flow, size, and kind of each drainage channel, pipe, and structure. The status of existing drainage structures must be clarified as either "existing-retain," "existing-abandon," or "existing-remove."

- Retention/detention systems including:
    - Volume of storage provided
    - Storage elevation
    - Storage/ponding limits
    - Overflow elevation and location
    - Discharge control orifice size
    - Roof drain connections
    - Bypass area
    - Stabilization/erosion control
    - Water quality features
- Storm pipe including locations, lengths, materials, slopes, depths, and sizes
- Manholes and catch basins including location, types, and rim and invert elevations
- All new and existing manholes and catch basins shall be numbered consecutively.
- Typical ditch cross-sections shall be shown on the plans.
- Public utility easement and private easement widths and locations
- Identify any possible utility conflicts.
- Roof drains
- The distance from the center line of pipes to any building structure
- An all-weather maintenance access to all structures, ditches, ponds, etc., including typical cross-section of said access road
- Natural drainage ways

3.5.2. Stormwater Plan Notes

The following applicable notes shall be shown on the plans.

STORMWATER NOTES:

1. During construction and until final site stabilization, all existing and newly installed drainage structures shall be protected from sediments.
2. All drain pipes shall be laid on a properly prepared foundation in accordance with WSDOT Standard Specifications, Section 7-08. This shall include necessary leveling of the trench bottom or the top of foundation material as well as placement and compaction of required bedding material to uniform grade so that the entire length of pipe will be supported on a dense unyielding base. If native material in the trench bottom meets requirements for WSDOT "Gravel Backfill for Pipe Bedding", then the first lift of pipe bedding may be omitted provided the trench bottom material is loosened, regraded and compacted to form a dense unyielding base.

3. All paved areas shall drain to catch basins. Run grade in straight line/plane between spot elevations shown on the plans. Make adjustments in grade to avoid standing water. Take special care at catch basins to avoid "bird baths" in surrounding pavement.
4. All catch basin grates shall be adjusted to final grades upon completion of paving.
5. All storm drain mains shall be television inspected prior to final acceptance by the City. A copy of the inspection data shall be provided to the City.

3.6. Grading, Erosion, and Sediment Control Plans

3.6.1. Grading, Erosion, and Sediment Control Plan Sheets

The following information shall be included in the grading, erosion, and sediment control plans:

- Drawings shall be to scale.
- The type and locations of fill material and compaction requirements.
- Limits of grading, clearing, filling, and excavation.
- The fill and/or excavation quantities in cubic yards.
- Existing and proposed contours at 2-foot intervals.
- A minimum of one cross-section.
- Construction entrance.
- Proposed sequence of construction that will provide the maximum drainage and erosion control during construction.
- Perimeter ditches to control water flow.
- Siltation control measures to protect adjacent properties.
- When silt fences are required, show the location with a typical fence detail. Silt fences will usually be required unless site work is lower than the surrounding property.
- Storm Retention/Detention features as follows:
    - How water quality and quantity will be controlled.
    - Ponding limits showing the high water elevations.
    - Existing and proposed storm pipes including locations, lengths, materials, slopes, depths, sizes, rims, and inverts.
    - The location, number, and type of manholes and catch basins.
    - Measures taken to prevent silt laden water from entering the public storm system.
    - Storm pipes and control structures that are temporary and not part of the final storm system.
    - The highest groundwater elevation.
- Critical areas and associated buffers.

- All existing trees that are proposed to be removed, or retained, as required in the Tree Retention Plan issued by the Community Development Department. The location, size and species of each tree shall be shown.

3.6.2. Grading, Erosion, and Sediment Control Plan Notes

The following applicable notes shall be shown on the grading, erosion, and sediment control plans.

GRADING, EROSION AND SEDIMENTATION CONTROL NOTES:

1. On-site inspections are required at the following construction stages:

   Inspection No. 1: Installation of erosion control facilities prior to clearing

   Inspection No. 2: Completion of clearing

   Inspection No. 3: Upon completion of excavation, filling, and earthwork

   Inspection No. 4: Completion of project

   Inspection No. 5: As needed to determine compliance with approved plans and/or specifications

2. All limits of clearing and areas of vegetation preservation as prescribed on the plans shall be clearly flagged in the field and observed during construction.
3. All temporary sedimentation and erosion control measures, and protective measures for critical areas and significant trees shall be installed prior to initiating any construction activities.
4. All required sedimentation and erosion control facilities must be constructed and in operation prior to any land clearing and/or other construction to ensure that sediment laden water does not enter any existing drainage system. The contractor shall schedule an inspection of the erosion control facilities PRIOR to any land clearing and/or other construction. All erosion and sediment facilities shall be maintained in a satisfactory condition as determined by the City, until such time that clearing and/or construction is completed and the potential for on-site erosion has passed. The implementation, maintenance, replacement, and additions to the erosion and sedimentation control systems shall be the responsibility of the permittee.
5. The erosion and sedimentation control system facilities depicted on these plans are intended to be minimum requirements to meet anticipated site conditions. As construction progresses and unexpected or seasonal conditions dictate, facilities will be necessary to ensure complete siltation control on the site. During the course of construction, it shall be the obligation and responsibility of the permittee to address any new conditions that may be created by their activities and to provide additional facilities, over and above the minimum requirements, as may be needed to protect adjacent properties, sensitive areas, natural water courses, and/or storm drainage systems.
6. Any disturbed area which has been stripped of vegetation and where no further work is anticipated for a period of 7 days or more during the dry season (May 1 – Sept 30) or 2 days or more in the wet season (Oct 1 – Apr 30), shall be immediately stabilized with mulching, grass planting, or other approved erosion control treatment applicable to the time of year in question. Grass seeding alone will be acceptable only during the months of May through

September inclusive. Seeding may proceed outside the specified time period whenever it is in the interest of the permittee but shall be augmented with mulching, netting, or other treatment approved by the City.

7. In case erosion or sedimentation occurs to adjacent properties, all construction work within the development that will further aggravate the situation must cease, and the owner/contractor shall immediately commence restoration methods. Restoration activity will continue until such time as the affected property owner is satisfied.
8. No temporary or permanent stockpiling of materials or equipment shall occur within critical areas or associated buffers, or the critical root zone for vegetation proposed for retention.

3.7. Utility Plans

3.7.1. Utility Plan Sheets

The following information shall be included in the utility plans:

- The plans shall be drawn at the scale range of 1” = 20’ to 1" = 40'. Details for clarification may be shown on a more convenient scale.
- Street alignments with 100-foot stationing, preferably increasing to the north or east and reading from left to right, and stationing at points of curve, tangent, and intersection, with ties to section or quarter corners or other established survey control points at the intersection of the proposed street or streets and the existing City street. All lettering shall be right reading.
- Street names.
- Utility locations with details and cross-sections.
- Identification of horizontal or vertical utility conflicts.

3.8. Channelization, Signage, and Illumination Plans

3.8.1. Channelization, Signage, and Illumination Plan Sheets

The following information shall be included in the channelization, signage, and illumination plans:

- The plans shall be drawn at the scale range of 1” = 20’ to 1" = 40'. Details for clarification may be shown on a more convenient scale.
- Street alignments with 100-foot stationing, preferably increasing to the north or east and reading from left to right, and stationing at points of curve, tangent, and intersection, with ties to section or quarter corners or other established survey control points at the intersection of the proposed street or streets and the existing City street. All lettering shall be right reading.
- Street names.
- Right-of-way and width.
- Curb-to-curb pavement width.

- Right-of-way radii.
- Channelization locations and details.
- Sign locations and details.
- Street light locations and details.
- Lighting calculations to be provided separate as required by the City Engineer.

3.9. Project Record Drawings

Certified record drawings (also known as "as-built drawings") shall be provided by a Washington State licensed professional civil engineer or surveyor and shall accurately reflect all field design revisions made during the construction process. Record drawings shall be in accordance with LMC Section 12A.06.010. All required information shall be clearly shown on the original design drawings approved by the City of Lakewood. Each sheet of the record plans shall include the following statement along with the applicant's engineer's or surveyor's stamp, signed and dated, located at the bottom right-hand corner of the sheet when possible:

> "These plans are record drawings and the information shown accurately reflects existing field conditions as of this date: _____."

The record plans should include all existing or abandoned utilities that were encountered during construction that were not shown in the design plans. The following required information is intended to provide a minimum guide to the engineer of record and should be used along with good engineering practices as the type of project and situation warrants.

3.9.1. Public/Private Streets

- Center line elevations at 50-foot intervals
- Center line slopes and vertical curve data
- Gutter line elevations at 25-foot intervals
- Gutter line slopes and curve data
- Gutter line elevations at intersections and as applicable
- Driveways: Locations, lengths, and types
- Channelization: Locations and types
- Signing: Locations and types
- Illumination: Locations, types, heights, and wattages
- Service cabinets: Locations and types
- Junction boxes: Locations and types
- Conduits/Wire: Locations, types, sizes, and depths
- Controller cabinet: Locations and types
- Signalization: Locations, types, heights, and foundation depths and sizes

- Right-of-Way: Locations and widths
- Easements: Locations and widths
- Location, types, and sizes of gas, power, phone, and cable TV lines
- Center line monument locations (property monuments if a plat)
- Sidewalks/planter strip: Locations and width

3.9.2. Stormwater

- Manholes/catch basins: Locations, types, rim and invert elevations
- Storm lines: Locations, lengths, slopes, and sizes
- Public utility easements: Locations and widths
- Retention/detention systems:
    - Volume of storage provided
    - Storage elevation
    - Storage/ponding limits
    - Overflow elevation and location
    - Discharge control orifice size
    - Roof drain connections
    - Bypass area
    - Stabilization/erosion control
    - Water quality features
- All storm drainage systems shall include the following statement: "The storm drainage system has been constructed in conformance with the approved plans and is functioning as designed."
- Connections and/or points of discharge to critical areas

3.9.3. Water

- Water lines: Materials, lengths, sizes, and locations
- Water valves: Locations and types
- Fire hydrants: Locations and types
- Water meters: Sizes and locations
- Water services: Sizes, locations, and materials
- Public utility easements: Locations and widths

3.9.4. Sanitary Sewer:

- Manholes: Locations, types, rim/invert elevations

- Sewer line: Materials, locations, lengths, slopes, and sizes
- Side sewers: Materials, locations relative to property lines and sewer manholes in the street, lengths, slopes, sizes, depth below finish grade at property line, and inverts
- Public utility easements: Locations and widths

4.0 Roadway Standards

4.1. Street Classifications

The City of Lakewood has four street classifications: Principle Arterial, Minor Arterial, and Collector Arterial, and Local Access. Street classifications are further described in LMC Section 12A.09.020. Streets not identified as arterials are Local Access streets. Street widths and right-of-way widths are described in the appendices.

4.2. Location of Streets

The location of all streets shall conform to the Lakewood Six-Year Transportation Plan, Comprehensive Plan and other adopted plans and policies. All proposed street systems shall extend existing streets at the same or greater width, but in no case less than the required minimum width.

4.3. Cross-sections

Streets shall be constructed in accordance with the Public Works Code and Engineering Standards Manual. When an existing road is to be widened, upon approval from the City Engineer, the transverse slope of the new portion of roadway may vary ±1% from the existing road slope. The new transverse slope shall not to be less than 1% or more than 4%. If the transverse slope cannot be maintained within the 1% to 4% limits, the existing roadway shall be removed and replaced to City standards or overlaid with a minimum of 1 ½ inches HMA Cl. ½" PG 64-22 pavement.

4.4. Intersections

4.4.1. Intersections of Streets and Arterials

Streets intersecting with existing or proposed public highways and principal or minor arterials shall be minimized and are subject to review and approval by the City Engineer.

4.4.2. Intersection Spacing

Intersections should be located as follows:

- Spacing between principal arterials shall be approximately one mile.
- Spacing between principal arterials and minor arterials shall be approximately one-half mile.
- Spacing between principal/minor arterials and collectors shall be approximately one-quarter mile.
- Street intersection offsets or jogs with centerline offsets of less than 125 feet shall not be allowed.

- Streets are to intersect at 90 degrees (preferred) ± 20 degrees measured at centerline intersects.

4.4.3. Intersection Geometry

The geometric design at intersections to achieve drainage shall meet the following requirements:

- At the intersection of different classifications of streets (e.g., a minor arterial with a collector), the center line slope and typical cross-section should be carried through the intersection of the higher classified street with the lower classified street matching in a manner which will not interfere with the slope or cross-section of the higher classified street.
- Where the same class of streets intersect (e.g., residential with residential), the center line and slopes should be matched at the center line of the intersection with cross slopes varying through the intersection to allow drainage, unless directed otherwise by the City Engineer.

4.5. Cul-De-Sacs

Cul-de-sacs shall not exceed 500 feet in length measured from the edge of the intersecting roadway to the opposite limits of the cul-de-sac. The radius to face of curb shall be no less than 45 feet. The right-of-way radius shall be no less than 50.5 feet.

4.6. Temporary Turn-Around and Street Ends

Where, in the opinion of the City Engineer, it is desirable to provide for street access to adjoining property, proposed streets shall be extended by dedication to the boundary of such property. Such cul-de-sac streets shall be provided with a paved temporary turn-around having a roadway radius of at least 35 feet on a temporary easement. Such temporary easement shall be automatically released upon the extension and construction of said street beyond the boundary of the original subdivision. These streets shall have a type III barricade installed across the entire width of the roadway at the end of the driving surface with adequate signage provided.

4.7. Dead End Streets/No Outlet Signs

Dead end streets shall be signed with a “Dead End” sign at the entrance to the street. Dead end streets that are planned to be extended in the future shall have a type III barricade installed across the entire width of the roadway at the end of the driving surface with adequate signage provided.

A street network which has only one point of ingress/egress shall have a “No Outlet” sign located at the entrance.

4.8. Alleys

Alleys may be provided as a secondary means of vehicular or pedestrian access to abutting property. Alley right-of-way width shall be at least twenty feet wide.

4.9. Change in Roadway Width

When an existing road is required to be widened a taper of length (L), not less than that calculated using the equations below, shall be provided at the transition point where the direction

of traffic goes from the wider roadway to the narrower roadway. Where the direction of travel goes from narrower to wider a taper rate of 5:1 shall be used. Applicable channelization and signage shall be provided in accordance with the MUTCD.

$L = S \times W$ for speeds of 45 mph or more
$L = WS^2/60$ for speeds of 40 mph or less

Where:
L = Minimum length of taper in feet
S = Posted speed limit in mph
W = Width of offset in feet

4.10. Access Easements and Tracts

An access easement may be used to serve up to four lots. Private access roads in tracts may serve any number of lots. The standards in this section apply to access easements and tracts.

The proposed development shall be reviewed for adequate ingress and egress to all proposed lots. Extension of streets or access rights from property line to property line of the short subdivision land may be required in order that such street access may be extended in the future.

If there is other reasonable access available, the City Engineer may limit the location of direct access to City arterials or other City streets. A right-of-way that is proposed to be dedicated to the City shall meet City standards.

When an adjoining landowner will be obligated to construct or maintain a future road, a note to this effect shall be stated on the face of the recording document.

Existing legal easements less than the required width may be allowed to remain. However, additional lots shall not be served with such existing easement unless widened to the minimum required width.

The minimum easement and pavement widths are shown in the following table:

Number of Dwelling Units	Minimum Easement Width	Minimum Pavement Width	Minimum Pavement Setback From Property Line
1-2	20 feet	15 feet	2.5 feet
3-4	30 feet	20 feet	5 feet
5 or more	Must be built to local road standards.		
Non-Residential	24	24	0

Note: Easement and pavement widths are also subject to emergency vehicle access requirements.

4.11. Road Reserved Areas

Where a City street or arterial may be, or is being planned for the short subdivision land area, the City Engineer may require that a right-of-way area be dedicated for a future street.

4.12. Flag Lot Access

A flag lot may be permitted with stem access, provided the stem shall have a minimum easement width of 20 feet and a maximum length of 200 feet, and shall serve no more than one lot.

5.0 Curb, Gutter and Sidewalk Standards

5.1. Curb and Gutter

Concrete curb and gutter shall be constructed in accordance with the Lakewood Public Works Code and Engineering Standards Manual. Curb cuts may be allowed to accommodate low impact development best management practices.

5.2. Driveways and Driveway Approaches

Driveways shall be constructed in accordance with the Lakewood Public Works Code and Engineering Standards Manual. Type of driveway to be constructed shall be the same as other driveways within the project area as determined by the City Engineer. Grading and restoration of the private street or driveway beyond the end of the street approach shall be done to provide a smooth, passable, and safe transition to the existing or proposed facility.

5.3. Sidewalks

Sidewalks shall be provided on public and private streets in accordance with the Lakewood Public Works Code and Engineering Standards Manual. After the removal of the forms, the sidewalk shall be backfilled and the right-of-way restored to the satisfaction of the City.

5.4. Curb Ramps

All curb ramps shall conform to ADA requirements. The ramp centerline shall be perpendicular to or radial to curb returns unless otherwise approved by the City Engineer. When ramps are constructed on one side of a street, ramps shall be constructed at corresponding sidewalk locations on opposite sides of the street.

All curb ramps on public streets shall include truncated domes. All truncated domes shall be pre-cast concrete and shall be mortared in place. Truncated domes shall be red in color at controlled intersections; and yellow in color at uncontrolled intersections. No plastic truncated domes are allowed. Retrofitted curb ramps adding truncated domes may use pre-cast concrete or surface applied liquid plastic (Vanguard or equivalent).

6.0 Pavement Standards

6.1. Hot-Mix Asphalt (HMA) Pavement

The design of flexible (Hot-Mix Asphalt (HMA)) pavements shall be based on the latest AASHTO Guide for Design of Pavement Structures. The following criteria shall be used:

a) Traffic requirements based on acceptable engineering procedures starting with recent traffic counts. Type of traffic loadings shall be based on anticipated loadings paying close attention to number and types of trucks and bus loadings. Growth rate shall be 2.0% unless otherwise approved by the City Engineer. A 50/50 split in the direction of traffic shall be assumed. One hundred percent (100%) of the 50/50 split must be assumed in the design lane.

b) Design life for flexible pavements shall be twenty (20) years.

c) The soil support capacity by Resilient Modulus (Mr), Resistance R-value or California Bearing Ratio (CBR) shall be determined from actual soils analysis. Soils tests shall consist of one sample per each 500 LF centerline with three minimum per project representative of the roadway subgrade to determine a statistical representation of the existing soil condition. An engineering firm specializing in soils analysis shall perform the tests and the soils report shall accompany the pavement design.

d) The reliability factor, R and overall standard deviation, So will be as follows:

    a. For principal, minor, and collector arterials: R = 85% and So = 0.45

    b. For local access roads: R = 80% and So = 0.45

e) All vehicle loadings, including automobiles shall be converted to 18-KIP equivalent single axle loads (ESALs). Show load factors in calculations.

f) Terminal Serviceability Index shall be 2.5. Initial Serviceability Index shall be 4.2.

g) Structural coefficients shall be according to AASHTO recommendations, local conditions, and approved by the City of Lakewood.

6.2. Portland Cement Concrete (PCC) Pavement

The design of Portland Cement Concrete (PCC) pavement shall be based on latest AASHTO Guide for Design of Pavement Structures. The following criteria shall be used:

a) Traffic requirements based on acceptable engineering procedures starting with recent traffic counts. Type of traffic loadings shall be based on anticipated loadings paying close attention to number and types of trucks and bus loadings. Growth rate shall be 2.0% unless otherwise approved by the City Engineer. A 50/50 split in the direction of traffic shall be assumed. One hundred percent (100%) of the 50/50 split must be assumed in the design lane.

b) Design life for rigid pavements shall be fifty (50) years.

c) The soil support capacity by Resilient Modulus (Mr), Resistance R-value or California Bearing Ratio (CBR) shall be determined from actual soils analysis. Soils tests shall consist of one sample per each 500 LF centerline with three minimum per project representative of the roadway subgrade to determine a statistical representation of the existing soil condition. An engineering firm specializing in soils analysis shall perform the tests and the soils report shall accompany the pavement design.

d) The reliability factor, R and overall standard deviation, So will be as follows:

    a. For principal, minor, and collector arterials: R = 85% and So = 0.45

    b. For local access roads: R = 80% and So = 0.45

e) All vehicle loadings, including automobiles shall be converted to 18-KIP equivalent single axle loads (ESALs). Show load factors in calculations.

f) Terminal Serviceability Index shall be 2.5. Initial Serviceability Index shall be 4.5.

g) Structural coefficients shall be according to AASHTO recommendations, local conditions, and approved by the City of Lakewood.

h) All transverse joints shall be doweled

6.3. Minimum Pavement Sections

The following minimum pavement sections shall be utilized.

Minimum Pavement Sections

	Principal and Minor Arterials	Collector Arterials	Local Access
HMA Pavement	6.0 inches HMA 4.0 inches crushed surfacing base course	4.0 inches HMA 4.0 inches crushed surfacing base course	3.0 inches HMA 4.0 inches crushed surfacing base course
PCC Pavement	10.0 inches PCC	10.0 inches PCC	N/A

6.4. Pavement Materials

a) HMA pavements shall be HMA ½" PG 64-22. All HMA shall be a WSDOT approved mix design. Certified mix designs shall be submitted to the City of Lakewood prior to commencing paving.
b) Recycled materials for roadway sections will only be allowed if approved by the City Engineer.
c) Permeable pavement will be allowed where practicable.

6.5. Roadway Widening

a) Existing HMA shoulders shall not be used as new driving lanes for roadway widening unless subsurface investigations confirm there is an existing pavement section that is better or equal to the required HMA design. Substandard shoulder pavement sections shall be removed and replaced.
b) Roadway widening shall be accomplished so that no longitudinal joint is within any wheel path.
c) Additional pavement restoration may be required per Section 6.8 of these Pavement Standards.

6.6. Pavement Construction

All pavement construction shall be in accordance with the WSDOT Standard Specifications except as modified herein.

a) Compaction tests shall be performed by an approved geotechnical or testing firm under the direction of a professional engineer registered in the State of Washington. Copies of the reports shall be furnished to the City of Lakewood inspector within 24 hours of testing.

b) Compaction tests shall be performed for every 400 tons of HMA and no less than 2 locations per lift of HMA. Compaction tests shall be performed on subgrade at 150 foot intervals. Compaction tests shall be performed on top course at 150 foot intervals.

c) HMA shall be compacted in lifts not to exceed 0.25' except that the final lift shall not exceed 0.17' unless approved by the City Engineer. The minimum compacted depth of HMA shall be 0.125'.

d) Base course (crushed surfacing) shall be compacted in depths not to exceed 0.50' except the top course shall be 0.17' unless otherwise directed. Density shall be 95% of ASTM D1557.

e) The prepared subgrade shall be compacted in the top 0.50' to 95% of ASTM D 1557. If the underlying subgrade is too soft to permit compaction of the upper 6" layer, the contractor shall over excavate and remove, and compact the subgrade until the top layer can meet compaction requirements. Fill sections shall be prepared in accordance with the Standard Specifications Section 2-03.3(14)C, Method B except ASTM D1557 shall determine the maximum density.

f) Where HMA is placed in lifts, tack coat in accordance with the Standard Specifications shall be used unless the lifts are placed on the same day and approved by the Director.

g) In areas where soft subgrades require stabilization, approved geotextile may be used and/or soil stabilization may be used. Stabilization designs shall be provided by a professional engineer licensed in the State of Washington and are subject to approval by the City of Lakewood.

h) Adjustment of utilities shall be per City of Lakewood Standard Plans MI-11 and MI-12. Developers are required to coordinate with effected utilities on utility adjustments and shall replace utility-provided castings as required by the affected utility.

6.7. Trench Restoration

a) Trenches shall be constructed and restored according to the Standard Specifications and City of Lakewood Standard Plan RW-07.

b) Where cuts have been made in either HMA, or in Bituminous Surface Treatment (BST) (aka. Oil mats), the contractor shall reconstruct the trench areas with a minimum three (3) inch HMA pavement placed on six (6) inches of crushed surfacing top course (CSTC). In all cases, the pavement section shall meet or exceed the existing pavement section.

c) Additional pavement restoration may be required per Section 6.8 of these Pavement Standards.

d) Pavement Cutting – All pavements shall be neatly saw cut or edge ground prior to pavement restoration.

e) Compaction tests shall be performed on all trench lines, four (4) feet below sub-grade and at sub-grade every 150 feet.

6.8. Pavement Restoration

a) Introduction. Trench cuts in roadways greatly degrade the condition of the pavement, as well as reduce the design life. The most significant damage can be seen in newer pavements. A restored trench cut in a newly paved road lowers the Pavement Management System (PMS) rating up to 30 points (on a scale of 0 to 100). It is the goal of pavement restoration to have a pavement in better or as good as pre-trench cut condition. This can be achieved through prevention of trench cuts through utility coordination, and high-quality pavement restoration.

b) Lane width restoration requirements. For longitudinal utility trench cuts in pavements over five years old, a minimum 2-inch overlay or full-depth pavement reconstruction is required for the following widths:

1. One-lane overlay or reconstruction: when trench cut or patch is within one travel lane.
2. Two-lane overlay or reconstruction: when trench cut or patch is within two travel lanes.
3. Additional overlay or reconstruction: when the remaining pavement area to the edge of existing pavement on either side is less than one travel lane or pavement is less than five years old. No longitudinal joints will be allowed in the wheel path.

c) Pavement Restoration Requirements. The following table describes pavement restoration requirements for various size projects and various existing pavement conditions.
d) Transverse Utility Crossings. Transverse utility crossings must be bored or completed by another trenchless method. Bore pits must be restored pursuant to these *Pavement Standards*.
e) Trench Cuts in New Pavements. Trench cuts are not permitted in pavements that have been constructed or rehabilitated within five years. Rehabilitation includes all asphalt overlays. If there is no other option but to cut into a new pavement, the pavement must be restored pursuant to requirements found in the following table.
f) Exemption from Pavement Restoration Requirements and Financial Penalties. Utilities can appeal in writing directly to the City Engineer for exemption from pavement restoration requirements and financial penalties associated with trenching in new pavements. Utilities may be exempt from pavement financial penalties if there is no other viable alternative and under the following conditions:
    1. If the City failed to give six months' notice of an upcoming roadway rehabilitation project either because of:
        (a) A change in property ownership, or
        (b) A change in the City's Capital Facilities Plan.
    2. An emergency project requiring immediate attention for the preservation of life or property.

6.9. Gravel Shoulder Design or Restoration

New gravel shoulders constructed as part of a project or existing gravel shoulders disturbed during project activities shall be graded to drain as necessary and shall be constructed as a minimum 3 inches crushed surfacing top course over 95% compacted subgrade per Section 6.6.

Pavement Restoration Requirements

Project Type	New Pavement < 5 years old	Pavement > 5 years Old	Pavement Identified by the City to be Reconstructed within 2 years
Large Projects Consists of projects requiring a longitudinal trench cut through paved roadway surface, 50 linear feet or greater, or four or more transverse trench cuts per 300 linear feet of roadway.	Complete reconstruction, grind/inlay, or overlay of entire paved surface (all lanes).	Grind / inlay, reconstruct, or overlay. Width per lane requirements in Section 6.8 of these Pavement Standards.	Depending on intended reconstruction strategy, could utilize lesser pavement restoration. Minimum restoration is patch per Standard Plan RW-07.
Small Projects Consists of projects requiring a longitudinal trench cut through the paved roadway surface less than 50 linear feet or less than four transverse trench cuts per 300 linear feet of roadway.	Patch per Standard Plan RW-07. Trench restoration penalty[1] assessed per square yard of trench. The cost will be calculated by the City based on full depth of patch replacement one time over the life of the pavement. In lieu of a penalty, for transverse cuts, the project proponent shall grind 2" deep, 30 feet longitudinally for the entire length of the trench, and inlay with HMA. For longitudinal cuts, the proponent shall grind 2" deep, one lane wide, for at least the trench length, and inlay with HMA.	Patch per Standard Plan RW-07	Depending on intended reconstruction strategy, could utilize lesser pavement restoration. Minimum restoration is patch per Standard Plan RW-07.
Emergency Projects Unforeseen projects requiring immediate attention for the preservation of life or property.	Grind/inlay, reconstruct, overlay, or patch (dependent on project size – see above). Width per Section 6.8 of the Pavement Standards.	Grind/inlay, reconstruct, overlay, or patch (dependent on project size – see above). Width per Section 6.8 of the Pavement Standards.	Depending on intended reconstruction strategy, could utilize lesser pavement restoration. Minimum restoration is patch per Standard Plan RW-07.

1. Trench restoration penalty fees will be used by the City to make pavement repairs in the city to improve overall pavement conditions.

7.0 Stormwater Standards

7.1. Stormwater Manual

The Stormwater Management Manual for Western Washington, published by the Washington State Department of Ecology (DOE Manual) (including Appendix 1 of the Western Washington Phase II Municipal Stormwater Permit), as modified by the City of Lakewood, or an approved equivalent, shall be used for storm drainage design.

For development sites 1 acre or smaller in size the following table may be used in lieu of infiltration rate design methods found in the DOE Manual:

RECOMMENDED SOIL INFILTRATION RATES

Soil Texture Class (Hydrologic Soil Group)	Infiltration Rate (in/hr)
1. Gravel, course sand (A)	60
2. Medium sand (A)	12
3. Fine sand, loamy sand (A)	4
4. Sandy loam, loam (B)	2
5. Loam, porous silt loam (C)	1

Note: For design purposes the above infiltration rates shall be divided by a factor of safety of 2.

7.2. Erosion and Sediment Control

All engineering plans for projects that propose land disturbing activities shall include an approved temporary "Erosion and Sedimentation Control" (ESC) Plan to prevent sediment-laden runoff from leaving the site during construction. The plans shall be designed in accordance with the DOE Manual, the WSDOT Highway Runoff Manual, the Pierce County Stormwater Management and Site Development Manual, or an approved equivalent.

Clearing and grading shall be designed in accordance with the following standards:

- Clearing and grading design required for project site development should be done in conjunction with proposed site development construction plans.
- Cross-sections of fill/grading shall be shown on the plans through all properties and at least 10 feet beyond the property lines.
- The fill/grading plan shall be designed so as not to affect any public right-of-way or adjacent properties.
- All side slopes shall be stabilized with approved erosion control treatment.
- No fill or cut side slopes shall be steeper than 2H: 1V unless a geotechnical report dictates otherwise.
- A minimum setback of 5 feet shall be provided between the toe of any fill placement and the top of the bank of any defined drainage channel or critical area or associated buffer boundary.

- When filling a site, particular care should be taken to prevent the impediment of existing upstream surface drainage flow.
- Any material to be exported shall not be deposited within the City Limits unless previously approved by the City Engineer. The quantity of both the fill and the cut shall be noted on the plans.
- No clearing, filling, grading, or other alteration shall occur within any critical areas or associated buffer areas unless authorized by the City.
- Construction recommendations from a soils report shall be followed during all construction activities.

8.0 Survey Monuments, Pavement Markings, and Signs

8.1. Monuments

All existing survey control monuments which are disturbed, lost, or destroyed during construction shall be replaced by a licensed surveyor pursuant to WAC 332-120.

Survey control monuments shall be placed by a licensed land surveyor as shown on the approved construction plans or City of Lakewood Standard Plans in accordance with recognized good practice in land surveying, and in conformance with the approved details for survey monuments.

Survey monuments shall be required at all intersections, PCs, PTs, centers of cul-de-sacs, and other appropriate locations as determined by the City Engineer. Monuments at PCs and PTs may be eliminated and replaced with a monument at the PI if the PI falls within the paved street surface.

For formal recorded documents containing a surveyor's certificate, monuments and staking shall be placed in accordance with the certificate and the Survey Recording Act by the responsible surveyor.

8.2. Channelization and Signage

Channelization and signage shall be in accordance with the latest edition of the City of Lakewood standards, the Manual on Design Guidelines and Specifications for Road and Bridge Construction in Pierce County, and the MUTCD, as amended by the City of Lakewood.

The developer is responsible for paying for signs required for development and shall coordinate work with the City.

All symbols, crosswalks, lettering, stop bars, etc., shall be a hot-applied durable product such as supplied by Flint Trading™, Zumar Hot Tape™, or approved equivalent, except bike symbols, which shall be painted.

8.3. Stop Signs and Stop Bars

Stop signs shall be installed at locations determined by the City prior to the street under construction being open to vehicular use. Placement of stop signs shall be by right-of-way permit and in accordance with approved street construction plans.

All stop-sign controlled intersections with a painted crosswalk shall be per City of Lakewood Standard Plans.

Traffic studies for signs and signals shall satisfy a warrant study as identified in the most recent edition of the MUTCD.

If the intersection warrants a traffic signal, no stop signs shall be placed. All intersections with a traffic signal shall have stop bars on all approaching lanes, regardless if there is a painted crosswalk or not.

8.3.1. Stop Signs at Intersections with Principal/Minor Arterials

Stop signs with stop bars shall be used on all local access/collector streets intersecting with principal/minor arterials. The exception shall be if the street intersecting the arterial is an alley. In this case, a traffic study may be performed to determine if a stop bar is warranted.

8.3.2. Stop Signs at Local Access Streets Intersecting with a Collector

Stop signs shall be placed on all residential streets that intersect a collector. Existing intersections of local access and collectors shall be investigated as requested by the City Engineer to determine if a stop bar is warranted.

8.3.3. Stop Signs where Local Access Streets Intersect Local Access Streets

Residential streets intersecting residential streets do not require stop or yield signs unless a traffic study determines that a stop or yield sign is warranted.

9.0 Illumination and Signals

The design and installation of street lights and traffic signals requires coordination with the City of Lakewood and the electrical service provider.

9.1. Street Lighting Specifications

Street lighting shall be required on all interior streets of a subdivision and on all street frontages abutting a proposed development. Street lighting design shall conform to current IES standards. The contractor is to verify that detail specifications and equipment locations meet the serving utility's requirements as well as City of Lakewood requirements. For projects with multiple lights, lighting calculations shall be required as determined by the City Engineer.

The design plans shall be stamped and signed by a professional engineer hired by the developer. Safe Wiring labels required by the Washington State Department of Labor and Industries and National Electrical Code (NEC) shall apply.

Street light standards shall be either aluminum or concrete as directed by the City Engineer and are specified as follows:

Street Light Standards and Arms – ALUMINUM

1. Street light poles shall be round tapered aluminum, satin finish, and standard base per USS Manufacturing, HAPCO or approved equivalent.
2. Arterial street mounting height shall be 35 feet. Mounting height may be reduced with City Engineer's approval to match existing conditions or provide required vertical utility clearance.
3. Residential street mounting height shall be 30 feet. Mounting height may be reduced with City Engineer's approval to match existing conditions or provide required vertical utility clearance.
4. Each lighting pole shall contain an internal grounding lug with 3/8" diameter hole for the purpose of attaching a grounding connector.
5. Slip bases are not required when clear zone requirements are met.
6. Street light arms shall be aluminum tapered bracket arm per USS Manufacturing TER Series or approved equivalent. Arm length shall be 10 feet unless otherwise approved by the City Engineer.

Street Light Standards and Arms – CONCRETE

1. Street light poles shall be anchored-based, octagonal, pre-stressed concrete, Ameron™ MBO, Stresscrete Group, Union Metal Corporation or approved equivalent with natural exposed buff colored finish.
2. Arterial roadway mounting height shall be 35 feet. Mounting height may be reduced with engineer's approval to 33 feet or 30 feet to match existing conditions or provide required vertical utility clearance.
3. Residential roadway mounting height shall be 30 feet. Mounting height may be reduced with engineer's approval to 25 feet to match existing conditions or provide required vertical utility clearance.
4. Each lighting pole shall contain an internal grounding lug with 3/8" diameter hole for the purpose of attaching a grounding connector.
5. Each lighting pole shall contain a ground wire for base of pole to top of pole to luminaire arm and luminaire.
6. Slip bases are not required when clear zone requirements are met.
7. Street light arms shall be aluminum davit tapered, Ameron™ MO-AD. Arm length shall be 10 feet unless otherwise approved by the City Engineer.

Luminaires for Cobra Head Style LED Fixture:

Each luminaire shall have fuses and fuse holders for each power conductor above ground potential. Fuses shall be 1.0 cm × 1.8 cm (13/31" × 1.5"). Fuses shall be slow blow type (carry 100%, open at 135% within 1 hour, carry 200% for minimum of 10 seconds. Luminaires 49 watt (150 watt HPS) and below shall have 5 amp fuses. Luminaires 95 watt (200-400 watt HPS) and above shall have 10 amp fuses.

Housing: Luminaire housing with integral cooling fins shall be die cast aluminum with universal four-bolt slip fitter for mounting to 11/4 " to 2" (15/8" to 23/8" O.D.) diameter mast arm.

Electrical components shall be accessed without tools and are mounted on power door. Conductors from power supply to terminal block and LED board must be spliced with quick style electrical disconnects. Photocontrol receptacle is standard and shall be rotatable without tools.

Optical Systems: White light: correlated color temperature – standard 4000 L, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% upright and restrict backlight to within sidewalk depth, providing optimal application coverage and pole spacing.

Electrical: Expected life: LED light engines are rated >100,000 hours at 25 degrees C, L70. Electronic driver has an expected life of 100,000 hours at a 25 degree ambient.

Surge protect shall provide a minimum of IEEED/ANSI C62.41 Category C protection.

Listings/Ratings/Warranties: Luminaires shall be UL listed for use in wet locations in the United States and Canada. Optical systems shall maintain an IP66 rating. Five-year limited warranty is required for all components.

Photometry: All luminaires shall be photometrically tested by certified independent testing laboratories in accordance with IESNA LM-79 testing procedures.

The Cobra Head Style LED Fixture Shall Meet The Following:

Arterial streets:
Series: American Electric Lighting Autobahn Series ATBM-D-MVOLT-R3-NL-P7 (95 watt)
Light Source: LED
Performance package: 11,600 lumens
Voltage: 120-277V
Wattage: 95 (164 maximum)
Light Distribution: Type 3
Nominal Color Temperature: 4000K CCT, 70 CRI Min.
Finish: Gray
Surge Protection: Acuity SPD
NEMA Label Indicating Wattage
7-pin photo control receptacle
ATBSHSS house side shield for field installation when required by the engineer.

Residential streets:
Series: American Electric Lighting Autobahn Series ATBS-F-MVOLT-R3-NL-P7 (49 watt)
Light Source: LED
Performance package: 4,600 lumens
Voltage: 120-277V
Wattage: 49 (72 maximum)
Light Distribution: Type 3

Nominal Color Temperature: 4000K CCT, 70 CRI Min.
Finish: Gray
Surge Protection: Acuity SPD-10kV/5kA with inductive filter (standard)
NEMA Label Indicating Wattage
7-pin photo control receptacle
ATBSHSS house side shield for field installation when required by the engineer.

Photoelectric Controls for Cobra Head Style LED Fixture:
Assembled photocontrols and each of their individual components shall be designed and constructed to have a nominal life of 20 years.

Photocontrol circuit boards shall be constructed of glass epoxy material. Circuit board components shall be protected from the environment with a thin, transparent coating that does not promote heat buildup. Each photocontrol shall be provided with a means to conveniently and permanently record date of installation and date of removal. Each photocontrol shall be provided with an internal, 160 joule minimum, metal-oxide varistor (MOV) type surge arrester. Photocontrols shall be provided with a means of sealing according to the requirements of ANSI C136.10, Section 4.3. Photocontrol base gasket shall be fabricated from a neoprene blend.

Photocontrols shall be tested according to the requirements of ANSI C136.10. Test results shall be provided upon request. Each individual photocontrol shall be marked with the manufacturer's name, model number, voltage rating, load rating, north orientation, and rotation of installation/removal.

Plug type: Twist locking type, three-pole, three-wire
Photosensor type: Silicon
Operating voltage range, Volts, AC: 105-305
Load rating, LED, minimum watts: 1000
Operating temperature range, ambient, degrees C: -40 to +70
Turn on response time range, seconds: 0.5 to 5.0
Turn off response time range, seconds: 0.5 to 5.0
Turn on light level, fc: 2.8 +/- 0.6
Turn off light level, maximum, fc: 5.1
Turn-off/turn-on ratio, nominal: 1.5
Fail mode, nominal: Fail-On

Utility owned and maintained wood poles may be used as determined by the City Engineer

9.2. Electrical Service Cabinet

Electrical service cabinets shall be required when two or more street lights are installed.

Electrical service cabinet and foundation shall be installed per City standard plans.

Electrical service cabinet shall be TESCO 27-000 service pedestal meeting USERC requirements.

Service cabinet shall be furnished with the following equipment:
Meter Base: 200 AMP utility purveyor approved meter base.
100 AMP utility purveyor approved meter base may be permitted with City Engineer approval.
Branch Breakers:
One (1) 20 amp 1P LL&P or 2P PSE and TPU street lighting circuit for each circuit used
Four (1) 20 amp 1P LL&P or 2P PSE and TPU spare circuit breakers
One (1) 20 amp 1P utility circuit with ground fault receptacle
One (1) 15 amp 1P thermostat circuit
One (1) 15 amp 1P strip heater circuit
Ground fault receptacle: 20 amp, 120 VAC, duplex
Thermostat: 22 amp, 120 VAC, SPST, 40 degrees F "ON", adjustable
Strip Heater: 125 VAC, 100 watt, with guard

The electrical service panel must receive satisfactory inspection approval from electrical inspection authority. Contractor shall notify City of inspection request and results within 3 working days**.**

A copy of the wiring diagram shall be provided in a plastic holder mounted conveniently inside the electrical service cabinet.

9.3. Street Lighting Operations

It shall be the developer's responsibility to coordinate the installation of the street light system with all utilities, private and public, to avoid schedule and location conflicts. On public streets it shall be the developer's responsibility to obtain all permits associated with installation and energizing of new street light installations.

Street lighting will be energized when a home is occupied adjacent to the street light or immediately across the street. At the developer's request, any or all of the street lights may be energized prior to the occupancy. The developer shall notify the City when the light is ready to be energized. Street lights are not intended to light private property nor provide home security.

For street lighting on private streets, the developer shall be responsible to install adequate lighting to meet IES standards for the street. The developer shall coordinate power needs and installation with the serving utility.

The developer shall surrender to the City of Lakewood any guarantee or warranty acquired as a normal trade practice in connection with the purchase of any materials or items used in the construction of the illumination on public streets.

9.4. Location

In general, street lights shall be located on the highest corner of the intersection. One street light shall be placed at all new intersections and at the end of all cul-de-sacs. All new signal poles shall be equipped with a luminaire arm.

If a street changes direction at sufficient angle and is a substantial distance from another light location, another light may be added at the discretion of the City Engineer.

For projects with multiple lights, lighting calculations shall be required as directed by the City Engineer. Maximum streetlight spacing is shown in the following table:

	Maximum Streetlight Spacing	
	Commercial/Industrial	Residential
Principal Arterial	150 feet	150 feet
Minor Arterial	150 feet	300 feet
Collector Arterial	150 feet	300 feet
Local Access Street	300 feet	300 feet

Table Notes:
1. Distances are measured along roadway centerline typical. Pole placement is staggered, alternating sides of the roadway if possible.
2. Where roads divide two land use classifications, the commercial/industrial classification shall take precedence, unless otherwise approved by the City Engineer.

9.5. Traffic Signals

Traffic signal design requirements and specifications will be provided by the City Engineer upon request.

10.0 Traffic Control

Traffic control plans shall be prepared in accordance with the latest edition of the WSDOT Work Zone Traffic Control Guidelines for Maintenance Operations and the MUTCD.

Appendix 1 Definitions

Access Easement: An easement that creates a legal source of access from a public street to an existing or proposed lot, lots of record, or project, across other parcels of property

ADA: Americans with Disabilities Act

ADT: Average Daily Traffic

Applicant: Any person who makes an application to the City of Lakewood for a development permit

City Engineer: The City Engineer of the City of Lakewood or his/her designee

City: The City of Lakewood

Clear Zone: The roadside area defined by a calculated Control Zone distance where the placement of utility objects is controlled or prohibited (ref. WSDOT Design Manual)

Contractor: The individual responsible for the construction of a project

Developer: The individual responsible for the construction plans of a project

Engineer: A professional civil engineer licensed by the State of Washington

HMA: Hot Mix Asphalt

IES: Illuminating Engineers Society

Mitigation Plan: A plan approved by the Community Development Department that includes actions that, to some degree, softens the impact of development on critical or sensitive areas

MUTCD: Manual on Uniform Traffic Control Devices, published by the Federal Highways Administration

NPDES: National Pollutant Discharge Elimination System, a federal permit program (administered by the Washington State Department of Ecology) that requires all point sources discharging pollutants into waters of the United States to obtain a permit

Owner: The individual with legal title to a property

PC: Point of curvature

PG: Performance Grade binder

PI: Point of intersection

Private Street: A street that is owned, controlled, and maintained by one or more private property owner

PT: Point of tangent

Record Drawings: Drawings that reflect changes made during the construction process, recording differences between the original design and the completed project

Red Line Drawings: Markings on approved construction plans that reflect changes made during the construction process, recording differences between the original design and the completed project

Right-of-way: The area of land dedicated for public road uses including all road appurtenances, secured by the City for the public for the purposes of public traffic, drainage, and/or franchised utilities

ROW: Right-of-way

Surveyor: A professional land surveyor licensed by the State of Washington

Traffic Study: An analysis prepared by a transportation engineer that identifies traffic impacts, safety concerns, and potential actions to mitigate traffic impacts and safety concerns

TWLTL: Two-way left turn lane

USC&GS: United States Coastal and Geodetic Survey

USGS: United States Geological Survey

WSDOT: Washington State Department of Transportation

Appendix 2 Table 1: Lakewood Service Providers Contact Information

Service Provider	Type of Service	Address	Phone
Comcast		410 Valley Avenue NW, Ste 9 Puyallup, WA 98391	(253) 864-4200
Lakeview Light & Power	Power	11509 Bridgeport Way S.W. P.O. Box 98979 Lakewood, WA 98498-0979	(253) 584-6060
Lakewood Community Development Dept.	Permitting	6000 Main Street SW Lakewood, WA 98499-5027	(253) 512-2261
Lakewood Fire District	Fire, Emergency services	10928 Pacific Hwy SW Lakewood, WA 98499	(253) 582-4600
Lakewood Police Department	Police Services	9401 Lakewood Dr. SW Lakewood, WA 98499	(253) 830-5000
Lakewood Public Works Department	Engineering Review	6000 Main Street SW Lakewood, WA 98499-5027	(253) 589-2489
Lakewood Refuse	Solid Waste	3869 94th St. SW Lakewood, WA 98499	(253) 588-1705
Lakewood Water District	Water	11900 Gravelly Lake Drive SW PO Box 99729 Lakewood, WA 98498	(253) 588-4423
Qwest Engineering Department	Cable TV	2510 South 84th Street, STE 18 Lakewood, WA 98499	(253) 597-5090
Parkland Light & Water	Water	12918 Park Avenue Tacoma, WA 98444-0426	(253) 531-5666
Pierce County Utilities	Sewer	9850 64th Street West University Place, WA 98467	(253) 798-4050
Pierce County Signal	Signals	1424 112th Street East	(253) 531-6990
Pierce Transit	Transit	3701 96th Street SW PO Box 99070 Lakewood, WA 98499-0070	(253) 581-8001
Puget Sound Energy	Power, Natural Gas	3130 S. 38th Street Tacoma, WA 98409	(253) 476-6315
Tacoma Public Utilities	Power	3628 So. 35th Street Tacoma, WA 98411-3711	(253) 502-8277
U.S. Post Office			800-275-8777
Washington State Department of Ecology	Environmental information, stormwater manual	www.ecy.wa.gov	(800) 917-0043 (permitting)
Washington State Department of Labor and Industries	Electrical service standards	www.lni.wa.gov	(800) 547-8367
Washington State Department of Transportation	Reference plans and documents	www.wsdot.wa.gov	(360) 705-7000

Appendix 2 Table 2: Roadway Design Criteria

Classification	Principal Arterial	Minor Arterial	Collector Arterial	Local Access
Function	Serve the longest trips and carry the principal portion of trips entering and leaving the overall area.	Connect principal arterials to collector arterials and small generators. Distribute traffic to smaller geographic areas than principal arterials.	Distribute trips from principal and minor arterials to and from local access streets or destinations. Serve high proportion of local traffic and a low proportion of overall area traffic.	Provides circulation within residential areas away from the arterial system. Through-traffic is discouraged.
Access	No direct residential lot access. Driveways, consolidated where practical, may serve commercial, industrial, and public facilities. Access may be allowed with City Engineer approval			Provides direct access to abutting properties. Requirement for consolidating access points at the discretion of the City Engineer.
ADT	5,000 – 30,000	2,500 – 15,000	2,500 – 15,000	Varies
Design Speed[1]	40	35	35	30
Travel way				
Through Lanes[2] (minimum width)	Multilane: 11 feet; Outside lane: 12 feet; Inside lane adjacent to raised median: 12 feet; Two-lane facility: 16 feet		Two Lane facility: 14 feet minimum to 16 feet wide maximum	Two lanes only, 12 feet minimum to 14 feet wide maximum
TWLTL[3]	12-foot minimum			Not allowed
Designated Left-Turn Lane	12-foot minimum			n/a
Right-Turn Lane	12-foot minimum			n/a
Channelization	Painted or curbed islands and traffic separation when warranted.			n/a
Traffic Control	Center stripe required. Lane line and channelization striping required when applicable. Pavement marking required when applicable. Signalization when warranted and required by City Engineer.			n/a
Roadside				
Drainage	Closed drainage required			
Curb and Gutter	Use of concrete vertical curb and gutter required unless approved otherwise by the City Engineer.			
Bike Lane	When required by City Engineer, shall consist of five-foot paved bike lane from edge of travel way to gutter line.			Optional. Five feet paved bike lane from edge of travel way to gutter line.

[1] Typical. Required design speed shall be determined by the City Engineer.
[2] Number of lanes is a function of traffic volume and level of service.
[3] Application is a function of turning movement volume, existing driveway spacing, and safety

Classification	Principal Arterial	Minor Arterial	Collector Arterial	Local Access
Shared Use Bikeway	Three-foot paved shoulder from edge of travel way to gutter line.			When required by the City Engineer, three feet additional pavement from edge of travel way to gutter line.
Sidewalk (requires vertical face curb and gutter)	Six feet wide[4]. Ten feet wide required at transit stops.		5 foot wide with buffer, 6 foot wide without buffer.[4]	Five feet wide[5], ten feet required at transit stops.[4]
Buffer (Optional)	Four feet minimum to eight feet maximum in width, from face of curb to edge of sidewalk. Maintenance agreement required.			Four feet minimum to six feet maximum in width, from face of curb to edge of sidewalk. Maintenance agreement required.
Bicycle Path	Optional. Eight feet minimum width.			
Transit Facilities	Requires 10-foot sidewalk where facilities required.			
Border				
Cut-Fill	Requires soils analysis. Function of safety and geometric requirements.			
Retaining Walls	Required when stabilization is necessary and ROW limits length of cut or fill.			
Median	Allowed in City ROW at the discretion of the City Engineer. Minimum 10-foot wide (curb face to curb face), maximum 16 feet. Use of concrete barrier curb only. Landscaping as approved by the City Engineer.			
Minimum ROW Width	80 feet	70 feet	60 feet	50 feet with underground utilities[6] 60 feet with surface utilities
Easement	n/a	n/a	Allowed only for public utilities. Private collector arterials only allowed at discretion of City Engineer.	Allowed beyond roadside for underground public utilities.

[4] In Central Business District (CBD) Zones all sidewalks shall be 8 feet wide unless otherwise approved by the City Engineer.
[5] Sidewalk widths may be reduced to minimum ADA standards to accommodate low impact development design.
[6] Right of way widths may be reduced to 40 feet to accommodate low impact development design.

Appendix 2 Table 3: Geometric Design Criteria

Design Speed	**40 mph**	**35 mph**	**30 mph**
Horizontal Curvature[7]			
• D Max (degrees)	9.1	13.6	17.1
• R Min (feet)	628	419	333
Maximum Superelevation (%)	4	4	2
Grade			
• Max (%)	10	10	12
• Min (%) (longitudinal)	0.7	0.7	0.7
• Min (%) (cross-section)	2	2	2
Posted Speed[8] (mph)	35	30	25
Entering Sight Distance[9] (feet)	415	355	295

[7] Table values based on maximum superelevation. Actual D Max and R Min is a function of the superelevation, maximum side friction, and design speed.
[8] Posted speed (and corresponding design speed) may vary as approved by the City Engineer.
[9] Entering site distance shall apply to all intersections and driveways unless otherwise approved by the City Engineer. Distances are based on an object height of 0.5 feet and a driver's eye height of 3.5 feet.

Appendix 2 Table 4: Roadway Intersection Design Standards

Intersection Spacing	
Distance Between Major Arterials - 1 mile ±	
Distance from principal and minor arterials to collector arterials - ½ mile ±	
Spacing of intersection on arterials shall be 300 feet or more - ¼ mile ±	
Spacing of intersections on local access roads shall be 150 feet or more.	
The intent of spacing is to minimize the number of intersections on arterials/local road feeders.	
Minimum angle	90 degrees ± 20 degrees
Minimum curb radius	35 feet (arterial streets) 25 feet (local street)[10]
Minimum property line radius	25 feet (arterial streets) 20 feet (local streets)[10]
Maximum landing grade	Not to exceed 1 foot difference in elevation for a distance of 30 feet approaching an arterial of 20 feet approaching a local street, measured from the nearest ROW line (extended) of intersecting street
Driveway widths	Refer to standard details and the site development regulations
Entering sight distance	Refer to tables for geometric design criteria by posted speed limit

[10] Radii may be reduced to accommodate low impact development design.

Road Name	Begin Location	End Location	Treatment Date	Treatment	Inspected Date	Inspected PCI	Current PCI
Pacific Highway Southwest	ES Bridgeport Way SW	WS Cline Rd SW (Private)	9/1/2006	2 inch HMA Overlay	5/17/2016	96	89
Pacific Highway Southwest	NS Cline Rd SW (Private)	WS 47th St SW	9/1/2006	2 inch HMA Overlay	5/17/2016	100	89
Pacific Highway Southwest	ES RR-Xing Bridge	WS 112th St SW	9/1/2006	2 inch HMA Overlay	5/17/2016	85	83
Pacific Highway Southwest	WS 112th St SW	WS Montgrove Dr SW	9/1/2006	2 inch HMA Overlay	7/12/2016	100	90
Pacific Highway Southwest	WS Montgrove Dr SW	NS 108th St SW	9/1/2006	2 inch HMA Overlay	7/12/2016	92	87
Bridgeport Way Southwest	NS Pacific Hwy SW	NS RR-Xing	4/1/2007	2 inch HMA Overlay	7/14/2016	100	90
112th Street South	ES South Tacoma Way	WS 34th Av S	5/4/2007	2 inch HMA Overlay	7/11/2016	94	89
112th Street South	ES 34th Av S	WS 26th Av S	5/4/2007	2 inch HMA Overlay	7/11/2016	93	88
112th Street South	ES 26th Av S	WS Steele St S	5/4/2007	2 inch HMA Overlay	7/11/2016	95	89
Lakewood Drive Southwest	NS Steilacoom Blvd SW	NS of Bridge	9/1/2007	2 inch HMA Overlay	7/1/2016	100	89
Pacific Highway Southwest	WS 47th Av SW	ES RR-Xing Bridge	9/1/2007	2 inch HMA Overlay	5/17/2016	99	89
Bristol Avenue Southwest	End Public Road: Mall Entrance	SS 100th St SW	9/1/2008	RECONSTRUCT STRUCTURE (AC)	6/3/2016	100	93
Pacific Highway Southwest	WS 108th St SW	South Tacoma Way	10/1/2008	2 inch HMA Overlay	7/12/2016	70	66
South Tacoma Way	Pacific Hwy SW	NS Perkins Ln SW	10/1/2008	2 inch HMA Overlay	7/12/2016	71	67
Bridgeport Way Southwest	NS 59th Av SW	NS Mt Tacoma Dr SW	7/1/2009	2 inch HMA Overlay	6/2/2016	100	89
Bridgeport Way Southwest	NS Mt. Tacoma Dr SW	NS Gravelly Lake Dr SW	7/1/2009	2 inch HMA Overlay	6/2/2016	100	89
Bridgeport Way Southwest	NS Gravelly Lake Dr SW	NS Gerlings Dr SW	7/1/2009	2 inch HMA Overlay	6/2/2016	100	89
Bridgeport Way Southwest	NS Gerlings Dr SW	NS Steilacoom Blvd SW	7/1/2009	2 inch HMA Overlay	6/2/2016	100	89
Lakewood Drive Southwest	NS Bridgeport Way SW	SS 100th St SW	9/1/2009	2 inch HMA Overlay	5/23/2016	100	89
Gravelly Lake Drive Southwest	WS Nyanza Rd SW	NS 112th St SW	10/1/2009	2 inch HMA Overlay	5/18/2016	100	89
Gravelly Lake Drive Southwest	NS 112th St SW	NS School St SW	10/1/2009	2 inch HMA Overlay	5/20/2016	100	89
Gravelly Lake Drive Southwest	NS School St SW	NS Wildaire Rd SW	10/1/2009	2 inch HMA Overlay	5/20/2016	100	89
Gravelly Lake Drive Southwest	NS Wildaire Rd SW	NS Avondale Rd SW	10/1/2009	2 inch HMA Overlay	5/20/2016	100	89
Gravelly Lake Drive Southwest	NS Avondale Rd SW	NS Alfaretta St SW	10/1/2009	2 inch HMA Overlay	5/20/2016	100	89
Gravelly Lake Drive Southwest	NS Alfaretta St SW	NS 99th St SW	10/1/2009	2 inch HMA Overlay	6/3/2016	100	89
146th Street Southwest	ES Murray Rd SW	WS Spring St SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/12/2016	100	90
146th Street Southwest	WS Spring St SW	WS 73rd Av Ct SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/12/2016	100	90
150th Street Southwest	WS Spring St SW	WS 72nd Av Ct SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/12/2016	100	89
150th Street Southwest	WS 72nd Av Ct Sw	WS 69th Av SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/12/2016	84	81
Berkeley Street Southwest	SE Portland Av SW	NW Union Av SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/12/2016	100	89
Portland Avenue Southwest	Boundary Rd SW	WS Berkley St SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	100	90
Portland Avenue Southwest	WS Berkley St SW	WS Forest Rd SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	84	80
Portland Avenue Southwest	WS Forest Rd SW	WS West Thorne Ln SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	87	84
Portland Avenue Southwest	ES West Thorne Ln SW	WS Maple St SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	100	93
Portland Avenue Southwest	ES Maple St SW	WS North Thorne Ln SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	100	93
Spring Street Southwest	NS 150th St SW	SS 146th St SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/12/2016	100	90
Spruce Street Southwest	NS Union Av SW	End City Road	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	100	90
Union Avenue Southwest	ES Berkeley St SW	WS Orchard St SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	100	89
Union Avenue Southwest	WS Orchard St SW	WS Maple St SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	100	89
Union Avenue Southwest	WS Spruce St SW	WS North Thorne Ln SW	3/9/2010	RECONSTRUCT SURFACE (AC)	5/16/2016	100	89
Union Avenue Southwest	WS Maple St SW	WS Lake St SW	3/10/2010	RECONSTRUCT STRUCTURE (AC)	5/16/2016	100	89
Union Avenue Southwest	WS Lake St SW	WS Spruce St SW	3/10/2010	RECONSTRUCT STRUCTURE (AC)	5/16/2016	100	89
59th Avenue Southwest	NS Bridgeport Way SW	NS 95th St SW	6/30/2010	2 inch HMA Overlay	6/3/2016	100	93
59th Avenue Southwest	NS 95th St SW	SS Gravelly Lake Dr SW	6/30/2010	2 inch HMA Overlay	6/3/2016	100	93
Gravelly Lake Drive Southwest	NS 99th St SW	NS Mount Tacoma Dr SW	6/30/2010	2 inch HMA Overlay	6/3/2016	100	89
Gravelly Lake Drive Southwest	NS Mt Tacoma Dr SW	WS Bridgeport Way SW	6/30/2010	2 inch HMA Overlay	6/3/2016	100	89
Gravelly Lake Drive Southwest	NS I-5 (End of Bridge)	200' n/o Pacific Highway SW	7/1/2010	2 inch HMA Overlay	5/19/2016	99	89
Pacific Highway Southwest	ES Gravelly Lake Dr SW	WS Glenwood Av SW	7/1/2010	2 inch HMA Overlay	5/17/2016	100	89
Pacific Highway Southwest	WS Glenwood Av SW	WS Monument @12837	7/1/2010	2 inch HMA Overlay	5/17/2016	100	89
Pacific Highway Southwest	WS Monument @12837	New York Ave SW	7/1/2010	2 inch HMA Overlay	5/17/2016	100	89
Pacific Highway Southwest	WS New York Av SW	WS Chicago Av SW	7/1/2010	2 inch HMA Overlay	5/17/2016	100	89
Pacific Highway Southwest	WS Chicago Av SW	WS Seattle Av SW	7/1/2010	2 inch HMA Overlay	7/12/2016	99	90
Pacific Highway Southwest	WS Seattle Av SW	WS Bridgeport Way SW	7/1/2010	2 inch HMA Overlay	7/12/2016	99	90
Steilacoom Boulevard Southwe	WS Farwest Dr SW	WS Chapel Gate Dr	8/1/2010	2 inch HMA Overlay	6/16/2016	100	89
Steilacoom Boulevard Southwe	WS Chapel Gate Dr	WS Circle Dr	8/1/2010	2 inch HMA Overlay	6/16/2016	100	89
Steilacoom Boulevard Southwe	WS Circle Dr	WS Private Road	8/1/2010	2 inch HMA Overlay	6/16/2016	100	89
Steilacoom Boulevard Southwe	WS Private Road	WS 87th Av SW	8/1/2010	2 inch HMA Overlay	6/16/2016	100	89
Bridgeport Way Southwest	NS Steilacoom Blvd SW	NS 86th St SW	7/1/2011	2 inch HMA Overlay	6/24/2016	100	89
Bridgeport Way Southwest	NS 86th St SW	NS 83rd St SW	7/1/2011	2 inch HMA Overlay	6/24/2016	100	89
Grant Avenue Southwest	ES Berkeley St SW	WS West Thorne Ln SW	7/1/2011	RECONSTRUCT STRUCTURE (AC)	5/16/2016	100	90
146th Street Southwest	WS 73rd Av Ct SW	WS 70th Av Ct SW	2/2/2012	RECONSTRUCT SURFACE (AC)	5/12/2016	100	90
146th Street Southwest	WS 70th Av Ct SW	WS Woodbrook Dr SW	2/2/2012	RECONSTRUCT SURFACE (AC)	5/12/2016	100	90
150th Street Southwest	ES Murray Rd	WS Spring St SW	8/5/2012	RECONSTRUCT STRUCTURE (AC)	5/12/2016	100	89
Murray Road Southwest	NS Roundabout	NS 148th St SW	8/5/2012	RECONSTRUCT STRUCTURE (AC)	5/12/2016	100	89
Murray Road Southwest	NS 148th St SW	NS 146th St SW	8/5/2012	RECONSTRUCT STRUCTURE (AC)	5/12/2016	100	89
Murray Road Southwest	NS 146th St SW	I-5 North Bound Ramp	8/5/2012	2 inch HMA Overlay	5/12/2016	100	89
100th Street Southwest	ES Gravelly Lake Dr SW	WS Bristol Av SW	8/8/2012	2 inch HMA Overlay	6/3/2016	100	89
100th Street Southwest	WS Bristol Av SW	WS 59th Av SW	8/8/2012	2 inch HMA Overlay	6/3/2016	100	89
Washington Avenue Southwes	186' East of Lake St SW	WS Spruce St SW	9/1/2012	2 inch HMA Overlay	5/16/2016	100	90
Bridgeport Way West	NS 75th St W	NS Meadow Park Rd W	9/25/2012	2 inch HMA Overlay	6/24/2016	100	89
Bridgeport Way West	NS Meadow Park Rd W	NS Wal Mart Entrance	9/25/2012	2 inch HMA Overlay	6/24/2016	100	89
Bridgeport Way West	NS Wal Mart Entrance	End City Road	9/25/2012	2 inch HMA Overlay	6/24/2016	100	89
34th Avenue South	SS 11000 34th Ave S	End City Road	10/26/2012	RECONSTRUCT STRUCTURE (AC)	7/12/2016	70	67

Kendrick Street Southwest	End City Road	SS 111th St SW	10/31/2012	RECONSTRUCT STRUCTURE (AC)	5/17/2016	100	90
John Dower Road Southwest	NS Custer Rd SW	NS 79th St W (Private Road)	7/22/2013	2 inch HMA Overlay	6/30/2016	100	93
John Dower Road West	NS 79th St W (Private Road)	NS 78th St W	7/22/2013	2 inch HMA Overlay	6/30/2016	100	89
John Dower Road West	NS 78th St W	NS 76th St Ct W	7/22/2013	2 inch HMA Overlay	6/30/2016	100	89
Bridgeport Way Southwest	NS 112th St SW	NS 109th St SW	8/10/2013	2 inch HMA Overlay	5/23/2016	98	89
Bridgeport Way Southwest	NS 109th St SW	NS Occident Ln SW	8/10/2013	2 inch HMA Overlay	5/23/2016	100	89
Bridgeport Way Southwest	NS Occident Ln SW	NS 104th St Ct S	8/10/2013	2 inch HMA Overlay	5/23/2016	100	89
Bridgeport Way Southwest	NS 104th St Ct S	NS Lakewood Mall Blvd SW	8/10/2013	2 inch HMA Overlay	5/23/2016	100	89
Bridgeport Way Southwest	NS Lakewood Mall Blvd	NW 100th St SW	8/10/2013	2 inch HMA Overlay	6/2/2016	100	89
Bridgeport Way Southwest	NW 100th St SW	NW Oak Park Dr (South)	8/10/2013	2 inch HMA Overlay	6/2/2016	100	89
Bridgeport Way Southwest	NS Oak Park Dr (South)	NS Oak Park Dr (North)	8/10/2013	2 inch HMA Overlay	6/2/2016	100	89
Bridgeport Way Southwest	NS Oak Park Dr (North)	NS 59th Av SW	8/10/2013	2 inch HMA Overlay	6/2/2016	100	89
Berkeley Street Southwest	SE Portland Av SW	NW Union Av SW	10/2/2014	2 inch HMA Overlay	5/12/2016	100	89
Berkeley Street Southwest	NW Union Av SW	NW RR-xing	10/2/2014	2 inch HMA Overlay	5/12/2016	100	93
Union Avenue Southwest	ES Berkeley St SW	WS Orchard St SW	10/2/2014	2 inch HMA Overlay	5/16/2016	100	89
Bridgeport Way Southwest	NS 83rd St SW	NS 78th St SW	5/4/2015	2 inch HMA Overlay	6/24/2016	100	89
Bridgeport Way West	NS 78th St Ct W	NS Custer Rd SW	5/4/2015	2 inch HMA Overlay	6/24/2016	100	89
Bridgeport Way West	NS Custer SW	NS 75th St SW	5/4/2015	2 inch HMA Overlay	6/24/2016	100	89
San Francisco Avenue Southw	WS Addison St SW	ES Bridgeport Way SW	6/19/2015	RECONSTRUCT STRUCTURE (AC)	5/18/2016	100	90
59th Avenue Southwest	NS 100 St SW	SS Bridgeport Way SW	7/2/2015	RECONSTRUCT STRUCTURE (AC)	6/3/2016	100	93
Main Street Southwest	ES Gravelly Lake Dr SW	WS 59th Av SW	7/10/2015	2 inch HMA Overlay	5/2/2016	100	90
Main Street Southwest	SS 59th Av SW	NS 108th St SW	7/10/2015	2 inch HMA Overlay	5/20/2016	100	90
Bridgeport Way Southwest	NS RR-Xing	NS Arrowhead Rd SW	9/12/2015	2 inch HMA Overlay	5/17/2016	100	89
Bridgeport Way Southwest	NS Arrowhead Rd SW	NS 112th St SW	9/12/2015	2 inch HMA Overlay	5/17/2016	100	89
Steilacoom Boulevard Southwe	WS Lakewood Dr SW	WS Hagness Dr SW	9/12/2015	2 inch HMA Overlay	6/24/2016	100	89
Steilacoom Boulevard Southwe	WS Hagness Dr SW	WS Tyler St SW	9/12/2015	2 inch HMA Overlay	6/24/2016	100	89
Steilacoom Boulevard Southwe	WS Tyler St SW	WS Lakeview Av SW	9/12/2015	2 inch HMA Overlay	6/24/2016	100	89
Steilacoom Boulevard Southwe	WS Lakeview Av SW	WS Durango St SW	9/12/2015	2 inch HMA Overlay	6/24/2016	100	89
Bridgeport Way Southwest	NS McChord Dr SW	NS Sanfransico Av SW	9/1/2016	RECONSTRUCT STRUCTURE (AC)	9/1/2016	100	90
Bridgeport Way Southwest	NS Sanfransico Av SW	NS Solberg Dr SW	9/1/2016	RECONSTRUCT STRUCTURE (AC)	9/1/2016	100	90
Bridgeport Way Southwest	NS Solberg Dr SW	I-5 NB Entrance	9/1/2016	RECONSTRUCT STRUCTURE (AC)	9/1/2016	100	90
Seattle Avenue Southwest	WS Bridgeport Way SW	End City Road	9/1/2016	RECONSTRUCT STRUCTURE (AC)	9/1/2016	100	91
150th Street Southwest	WS 69th Av SW	ES Woodbrook Dr SW	10/20/2016	RECONSTRUCT STRUCTURE (AC)	10/20/2016	100	90
Woodbrook Drive Southwest	NS 150th St SW	SS 146th St SW	10/20/2016	RECONSTRUCT STRUCTURE (AC)	10/20/2016	100	91
108th Street Southwest	WS Main St SW	WS Villa Ln SW	5/3/2017	RECONSTRUCT STRUCTURE (AC)	5/3/2017	100	92
108th Street Southwest	WS Villa Ln SW	WS Westwood Dr SW	5/3/2017	RECONSTRUCT STRUCTURE (AC)	5/3/2017	100	92
108th Street Southwest	ES Westwood Dr SW	WS 108th St Ct SW	5/3/2017	RECONSTRUCT STRUCTURE (AC)	5/3/2017	100	92
108th Street Southwest	ES 108th St Ct SW	WS Bridgeport Way SW	5/3/2017	RECONSTRUCT STRUCTURE (AC)	5/3/2017	100	92
100th Street Southwest	WS 36th Av Ct SW	WS South Tacoma Way	5/25/2017	2 inch HMA Overlay	5/25/2017	100	91
96th Street Southwest	WS Crosswalk Signal	WS South Tacoma Way	5/25/2017	2 inch HMA Overlay	5/25/2017	100	92
Lakeview Avenue Southwest	ES 111th St SW	NS 109th St SW	5/25/2017	2 inch HMA Overlay	5/25/2017	100	91
Lakeview Avenue Southwest	NS 109th St SW	NS 108th St SW	5/25/2017	2 inch HMA Overlay	5/25/2017	100	92
South Tacoma Way	NS Perkins Ln SW	NS 100th St SW	5/25/2017	2 inch HMA Overlay	5/25/2017	100	91
South Tacoma Way	NS 100th St S	NS Private Road: N of 100 St S	5/25/2017	2 inch HMA Overlay	5/25/2017	100	91
South Tacoma Way	NS Private Road: N of 100 St S	NS 96th St S	5/25/2017	2 inch HMA Overlay	5/25/2017	100	91
Lakewood Drive Southwest	NS 100th St SW	NS 95th St SW	6/7/2017	RECONSTRUCT STRUCTURE (AC)	6/7/2017	100	92
Lakewood Drive Southwest	NS 95th St SW	NS 93rd St SW	6/7/2017	RECONSTRUCT STRUCTURE (AC)	6/7/2017	100	92
Lakewood Drive Southwest	NW 93rd St SW	SS Steilacoom Blvd SW	6/7/2017	RECONSTRUCT STRUCTURE (AC)	6/7/2017	100	92
88th Street South	ES South Tacoma Way	WS 34th Av S	6/22/2017	2 inch HMA Overlay	6/22/2017	100	93
South Tacoma Way	NS Steilacoom Blvd SW	NS 88th St S	6/22/2017	2 inch HMA Overlay	6/22/2017	100	91
Steilacoom Boulevard Southwe	WS Durango St SW	WS South Tacoma Way	6/22/2017	2 inch HMA Overlay	6/22/2017	100	92
150th Street Southwest	ES Woodbrook Dr SW	WS 65th Av Ct SW	11/20/2017	RECONSTRUCT STRUCTURE (AC)	11/20/2017	100	94
John Dower Road Southwest	NS Steilacoom Blvd SW	NS Patton Av SW	3/6/2018	RECONSTRUCT STRUCTURE (AC)	3/6/2018	100	98
John Dower Road Southwest	NS Patton Av SW	NS 84th Ct SW	3/6/2018	RECONSTRUCT STRUCTURE (AC)	3/6/2018	100	98
John Dower Road Southwest	NS 84th Ct SW	SS Custer Rd SW	3/6/2018	RECONSTRUCT STRUCTURE (AC)	3/6/2018	100	98

TO: Mayor and City Councilmembers

FROM: Jeff Gumm, Program Manager

THROUGH: John J. Caulfield, City Manager

DATE: May 14, 2018 (Council Study Session)

SUBJECT: Rental Housing Safety Program Update

Background:

This memorandum will provide the City Council with an update of the status of the Rental Housing Safety Program. This memo is accompanied by a PowerPoint presentation that will cover the following elements:

- Recent activities;
- Program registration;
- RHSP lottery;
- Inspections by property type and result;
- Common inspection items failed;
- Inspections scheduled; and
- Program's next steps.

Community Development staff will be present to answer questions regarding the Rental Housing Safety Program progress and recent developments.

Rental Housing Safety Program Update

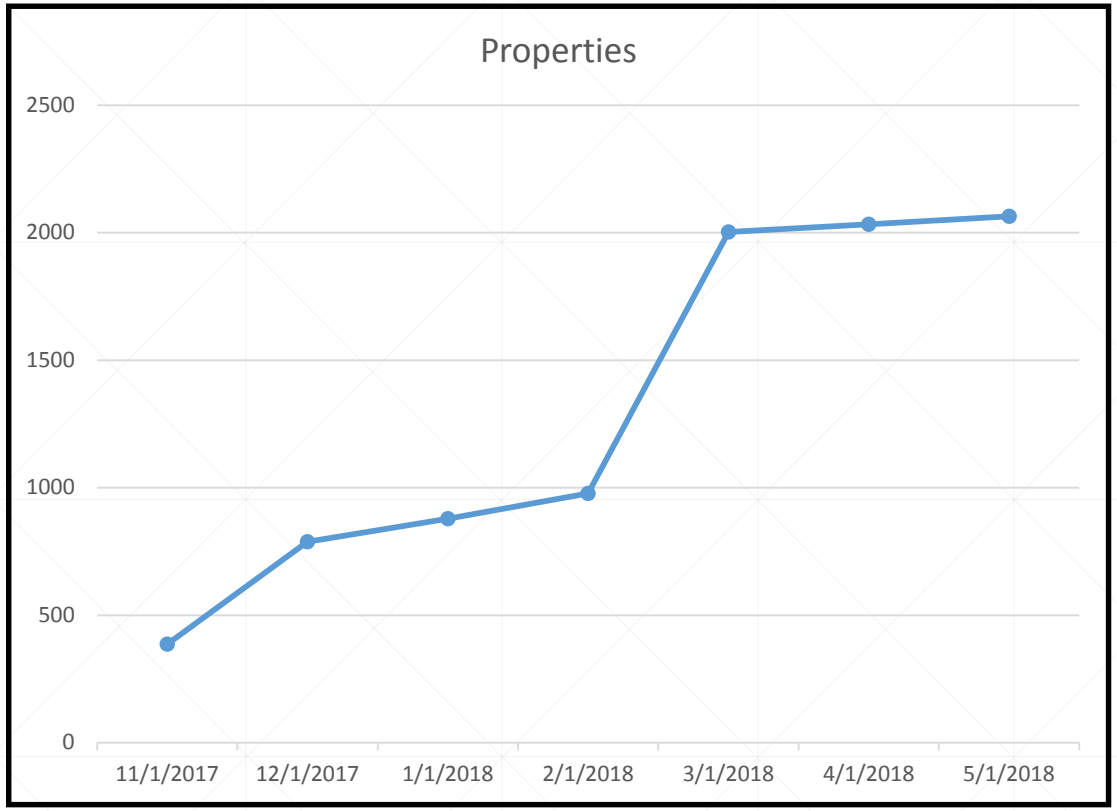
City Council Presentation

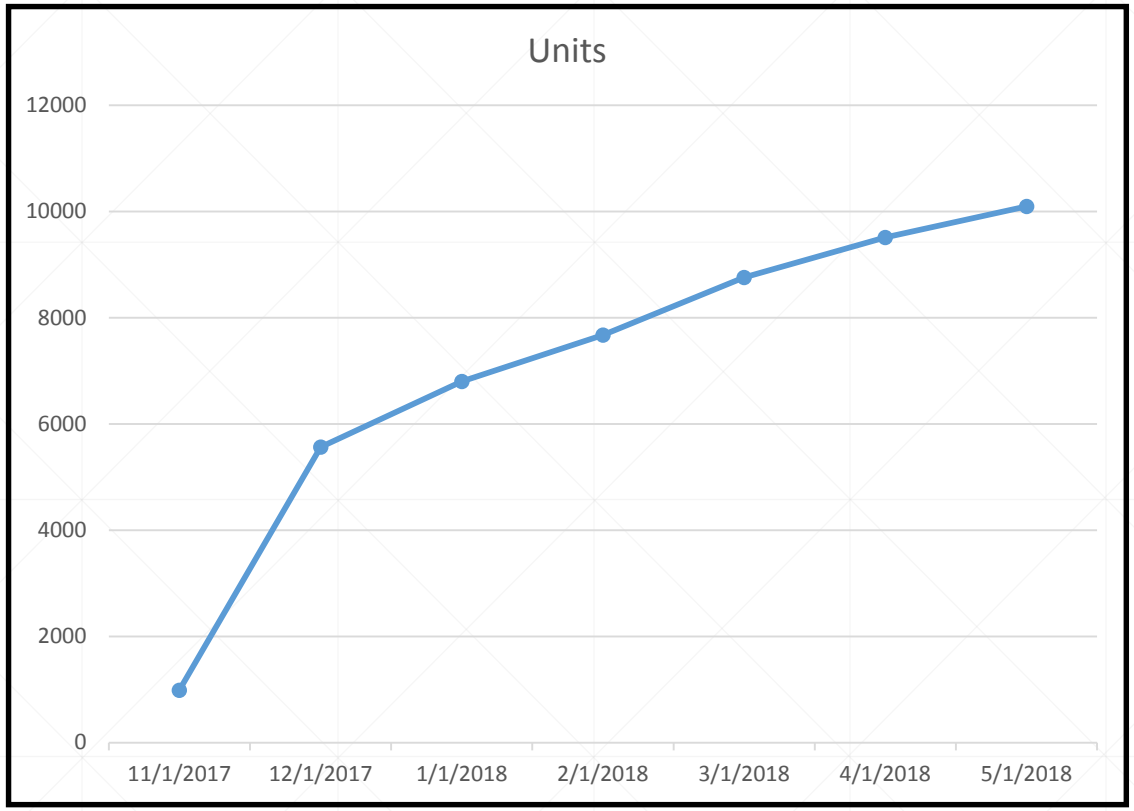
May 14, 2018

Overview

- Program Registration
- Registered as Percentage of Total
- RHSP Lottery
- Recent Activities
- Inspection By Property Type
- Inspections and Results
- Common Inspection Items Failed
- Continuing Inspections/Next Steps

Registration of Property & Unit by Date

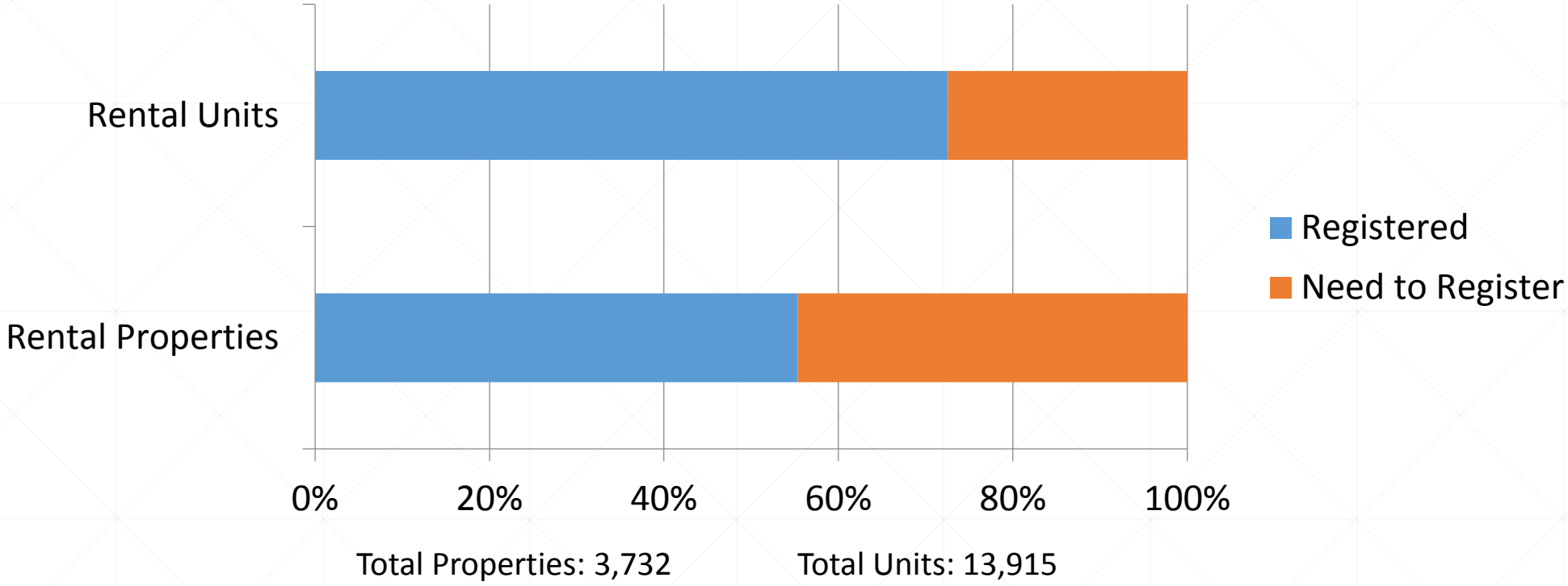




Total Rental Properties: 3,732 Properties

Total Rental Units: 13,915 Units

Registered as Percentage of Total



Total Properties: 3,732

Total Units: 13,915

→ Additional Data Point → 1,578 properties totaling 3,606 units have been exempted

RHSP Lottery

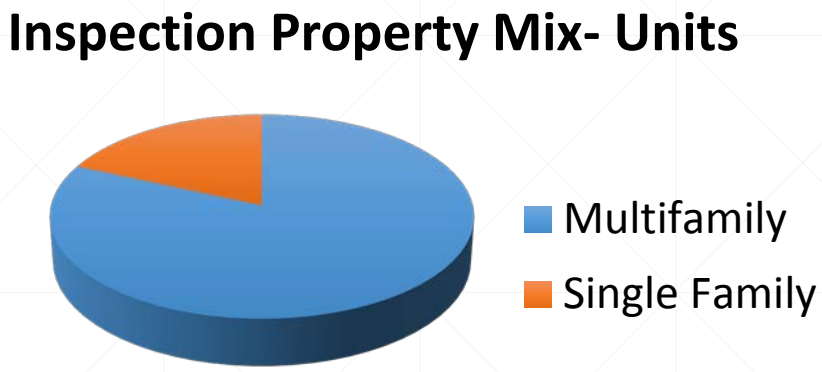
- March 21, 2018 – RHSP Lottery Initiated

✓Selected approximately 20% of registered and unregistered properties
*Mix of units selected based on historical property mix- 82% MF/18% SF

✓913 total properties selected/ 2,451 total units selected

✓450 single family properties selected

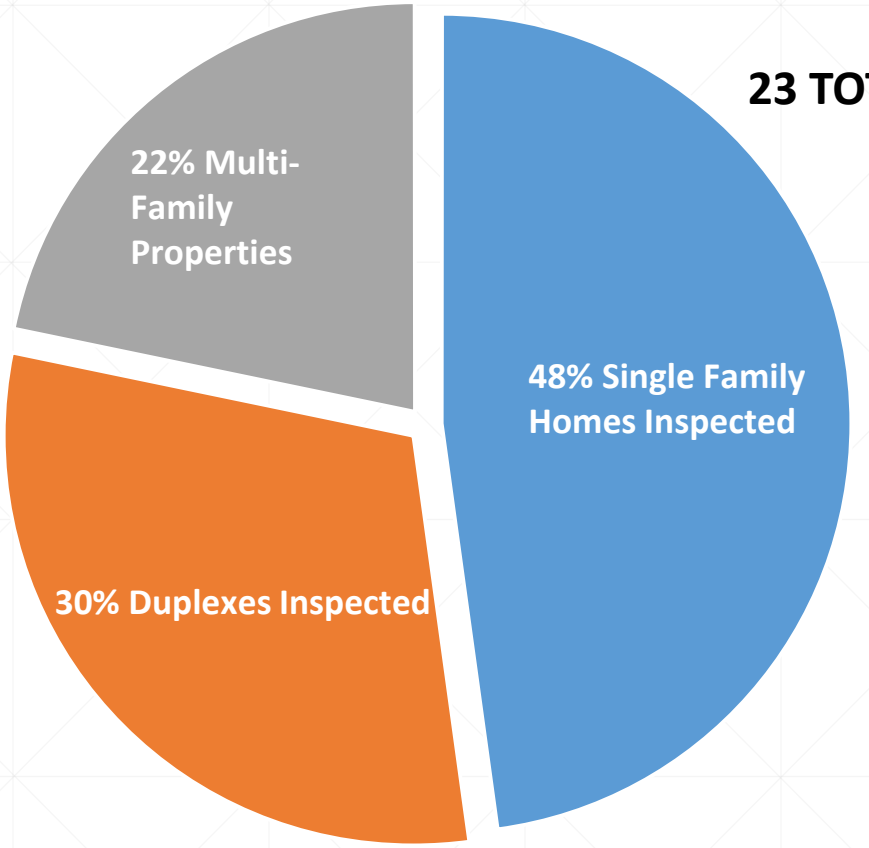
✓463 multifamily properties selected
(2,001 total rental units)



Recent Activities

- March 21, 2018: RHSP Lottery
- March 23, 2018: Single Family Lottery Notices Mailed
- March 26, 2018: Multifamily Lottery Notices Mailed
- April 16, 2018: City Conducts First Inspection Under RHSP
- May 1, 2018: Fourth Registration Reminder Letter Mailed (approx. 1,200)

Inspection by Property Type



23 TOTAL PROPERTIES INSPECTED AS OF MAY 4, 2018

* 1st inspection conducted on April 16, 2018

Total Single Family Homes Inspected Total Duplexes Inspected Total Multi-Family Properties Inspected

Inspections and Results

Inspections-

- Total properties inspected: 23
- Total units inspected: 66
- Total units represented by properties inspected: 196

*1st inspection conducted April 16, 2018

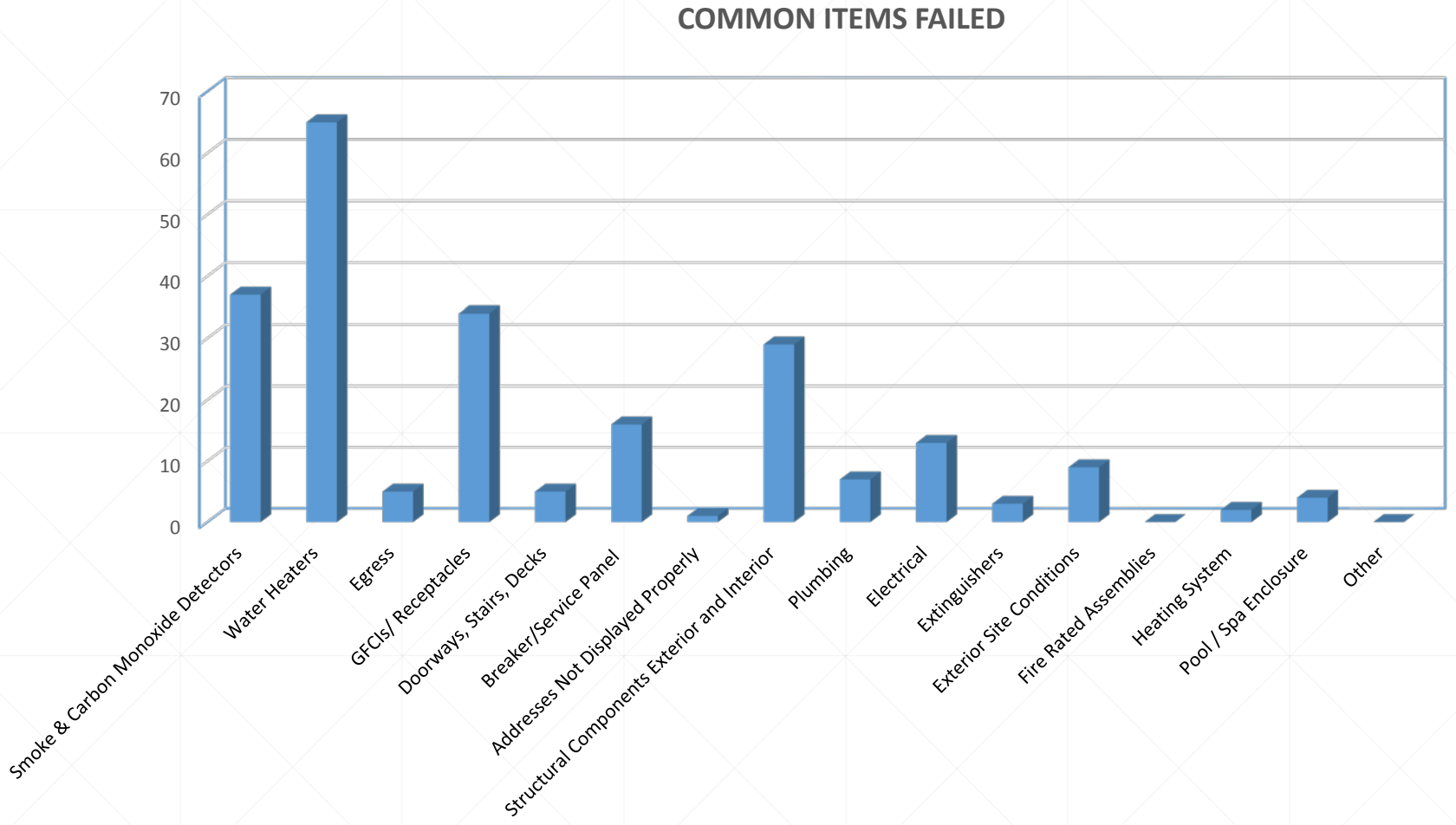
Results-

- Upon initial inspection, only 3 properties/5 units have passed
- 7 units have passed re-inspection
- Most commonly failed items- water heaters, smoke detectors and electrical

*as of May 4, 2018

Property Address	Total Units	Total Units Inspected	Initial Inspection Date	Choose PASS/FAIL	Reinspection	Date	Choose PASS/FAIL
11013 KENDRICK ST SW	3	3	4/16/2018	FAIL	YES	04/30/18	PASS
10302 VILLA LANE SW	2	2	4/16/2018	FAIL	YES		
11019 & 11021 MILITARY RD SW	2	2	4/16/2018	FAIL	YES	05/04/18	PASS
25 THUNDERBIRD PRKWAY	49	10	4/18/2018	FAIL	YES		
10505 ADDISON ST	1	1	4/20/2018	FAIL	YES		
10618 RAINIER AVE	1	1	4/20/2018	FAIL	YES	05/01/18	PASS
10301 TO 10319 115TH ST CT SW	10	4	4/20/2018	FAIL	YES		
10405 OCCIDENT ST SW	1	1	4/23/2018	FAIL	YES		
8211 NORTH WAY SW	1	1	4/23/2018	FAIL	YES	05/01/18	PASS
6727 WILDAIRE RD SW	1	1	4/23/2018	FAIL	YES		
3405 97TH ST S	6	4	4/23/2018	FAIL	YES		
7101 88TH ST SW	1	1	4/24/2018	FAIL	YES		
9315 WESTVIEW DR SW	1	1	4/24/2018	FAIL	YES		
3262 & 3264 88TH ST S	2	2	4/24/2018	FAIL	YES		
8206 88TH ST CT SW	1	1	4/27/2018	FAIL	YES		
9313 76TH ST CT SW	1	1	4/27/2018	FAIL	YES		
9111 DEKOVEN DR SW	1	1	4/27/2018	FAIL	YES		
9627 BRIDGEPORT WY SW	1	1	4/30/2018	FAIL	YES		
6703 & 6705 STEILACOOM BLVD	2	2	4/30/2018	FAIL	YES		
6931 SACRAMENTO	1	1	5/1/2018	PASS	NO		
7427 TO 7515 LAKEWOOD DR W	104	21	5/3/2018	FAIL	YES		
9831 MEADOW RD SW	2	2	5/4/2018	PASS	NO		
9835 MEADOW RD SW	2	2	5/4/2018	PASS	NO		

Common Inspection Items Failed



Recent Inspection Items Failed

Continuing Inspections/Next Steps

- Inspections Scheduled- Not Yet Conducted:

  48 properties/229 units
- Website Update- Users/Reports
- Website Update- Common Failure Items and Inspection Reminders
- Monitor Registration/Inspection Trends

QUESTIONS?

TO:	Mayor and City Councilmembers
FROM:	Mary Dodsworth, Parks, Recreation & Community Services Director
THROUGH:	John J. Caulfield, City Manager
DATE:	May 14, 2018 (Council Study Session)
SUBJECT:	Second Memorandum of Understanding (MOU) between City of Lakewood and Rotary Club of Lakewood
ATTACHMENT:	MOU #2 between City of Lakewood and Rotary Club of Lakewood

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Background: Over the past three years, the City and the Rotary Club of Lakewood have collaborated to establish a community gathering space at Fort Steilacoom Park. After a community review process and several potential design options, a preferred multi-use enclosable structure and location was selected for the "Pavilion in the Park" project. The proposed structure is approximately an acre in size and includes a stage, sound and lighting equipment and storage rooms along with access and park space to support perimeter building needs, landscaping and spectator seating. The Pavilion will provide a venue for community get-togethers, ceremonies, performances and entertainment.

In June, 2017 the City Council approved a memorandum of understanding to confirm the City's commitment to build the structure and to define each party's responsibilities.

Current Status: The second MOU presented is to further define and clarify each party's authority and responsibilities including financial contributions. The Pavilion is under construction and anticipated to be completed in time for SummerFEST (July 14).

Future Issues: Upon completion of the Pavilion, we anticipate the parties will execute a final MOU (#3) addressing the City's sole ownership along with any outstanding issues which may include: future complimentary Rotary days, any warranty requirements for plants, landscaping or paint, how to proceed with signage, plaza, bricks (or future bricks), ongoing maintenance of the signs and bricks, and additional payments or donations still outstanding.

Rotary has informed the City they will request naming rights for the stage. Naming of a park or a facility within a park (or in this case a portion of a facility) is reviewed and approved per city policy (Resolution 2016-18). Rotary has also requested use of three

mutually agreed upon complimentary Pavilion days each year; one for an annual Rotary meeting at the Pavilion (weekday) and two for special events (weekend concerts, festivals or fundraisers) sponsored by Rotary. If approved, complimentary use should apply to the special use permit fee for the pavilion area and not associated event requirements as noted on an approved permit. Event requirements could include sanitation, garbage, event staff, security, etc.). Based on the business plan we anticipate the current value of the three days to be $2,400.

SECOND MEMORANDUM OF UNDERSTANDING BETWEEN

THE CITY OF LAKEWOOD AND ROTARY CLUB OF LAKEWOOD

THIS SECOND MEMORANDUM OF UNDERSTANDING, dated this _____ day of _____, 2018, is entered into by and between the City of Lakewood, a Municipal Corporation of the State of Washington, hereinafter referred to as the "City," and the Rotary Club of Lakewood, a 501(c)(3) volunteer organization, hereinafter referred to as "Rotary" (hereinafter both the City and Rotary shall be collectively referred to as the "Parties").

WITNESSETH:

WHEREAS, the Parties work to improve the community in general and the City of Lakewood specifically; and

WHEREAS, the Parties have each identified a need within the City for a public gathering space, the "Pavilion in the Park"; and

WHEREAS, the Pavilion in the Park would address the existing need for a community gathering space capable of supporting a variety of events both public and private; and

WHEREAS, a community gathering space will enhance the activities available at the park and encourage use of the parks to their full extent while preserving the integrity of the property and the park experience of others; and

WHEREAS, the City is not financially capable of meeting this need immediately without outside support; and

WHEREAS, Rotary is able to provide support for meeting this need both through direct donations as well as in-kind assistance; and

WHEREAS, the parties have worked together pursuant to a Memorandum of Understanding that detailed the obligations and responsibilities of the parties appropriate to the knowledge of the parties and stage of the project at that time; and

WHEREAS, the parties will benefit from an updated documentation of the understanding as to how the contributions from the Parties shall be made to accomplish the project enumerated herein in light of each parties more detailed understanding of the requirements of the project and their ability to contribute to it; and

NOW, THEREFORE, in exchange for the mutual promises enumerated herein, the Parties enter into the following Second Memorandum of Understanding (hereinafter "Second Memorandum"):

I. PROJECT DESCRIPTION: This Second Memorandum encapsulates an agreement for construction of the Pavilion in the Park, at Fort Steilacoom Park in the City of Lakewood (construction of the Pavilion in the Park may also be referred to as the "Project"). The City will build a multi-use outdoor stage structure that can be

enclosed by a hydraulic door to allow for storage or multi-day events. The structure will be built in Fort Steilacoom Park, a 350+ acre site located in Lakewood, Washington and will include a covered stage, storage areas, utilities and open space for spectators to view programs and events. This new venue will serve park visitors from every demographic group and neighborhood area.

II. PURPOSE: The purpose of this Second Memorandum is to more specifically identify the obligations and responsibilities related to building the Pavilion in the Park.

III. RESPONSIBILITIES: The parties commit to ensuring construction of the Pavilion in the Park through performance of certain tasks and contribution of funding as follows:

A. The City of Lakewood shall perform the following tasks:
   - **a.** Acquire full ownership of Fort Steilacoom Park;
   - **b.** Provide approximately one acre within Fort Steilacoom Park for the arts;
   - **c.** Serve as fiscal agent for the project;
   - **d.** Manage and make all final decisions during the construction period; and
   - **e.** Own the facility and be responsible for management, maintenance and operations.

B. The Rotary Club of Lakewood shall perform the following tasks:
   - **a.** Provide construction management of the project of at least $25,000 in value; and
   - **b.** Provide painting, landscaping and other general contributions per project plans and specifications to the project of at least $38,685 in value.
   - **c.** Additional contributions can be made but will not reduce cash revenue expectations.

C. Financial contributions of the parties shall be as follows:

Fort Steilacoom Park Pavilion Project	February 2018 Updated Budget	Responsible party
Revenues		
Rotary – cash	$150,000	Rotary
Rotary – in-kind	$150,000	Rotary
City – lodging and tax grants	$853,490	City
City – General Fund	$150,724	City *
Total Project Revenues	$1,304,214	

* included in 2018 carry forward budget

Expenditures		
Development Costs		
Survey/Geotechnical Report	$10,570	City
Construction planning/drawings (in-kind)	$77,120	Rotary
Building Permit and bidding	$6,300	City
Subtotal	$93,990	City
Building Costs		
Construction Costs (taxes, bond, overhead)	$816,337	City
Construction Management (in-kind)	$25,000	Rotary
Contributions to Project (in-kind or cash)	$38,685	Rotary
Hydrant & Fire Flow requirements	$234,700	City
Rotary pavers and sign (in-kind or cash)	$10,000	Rotary
Contingency 10%	$85,502	City
subtotal	$1,210,224	
Total Project Cost	$1,304,214	

The responsible party for each component part shall execute any and all necessary tasks and agreements to accomplish that component part.

D. Ongoing Agreement to be Executed at Project Conclusion

Upon completion of the Project, the Parties will execute an Agreement addressing the details of the City's ownership and Rotary rights to use, along with other details of the maintenance, operation and use of the Pavilion in the Park going forward.

IV. **CITY SPECIFICALLY RESERVES THE FOLLOWING AUTHORITY:**

a. Naming rights will be in accordance with City of Lakewood ordinances and policies.
b. The City shall comply with all state purchasing and public bidding laws.
c. All project management or fiscal decisions during the construction period.

V. **AMENDMENTS.** This Second Memorandum reflects the agreement of the parties based on the project and their respective resources as currently known and understood. This Second Memorandum is an explicit writing as contemplated in section V. of the original Memorandum and reflects the current agreement of the parties, specifically replacing and superseding any prior agreements regarding this project.

This Second Memorandum may only be amended by written agreement between the City of Lakewood and the Rotary Club of Lakewood. This Second Memorandum shall constitute the entire agreement between the Parties, unless the Parties otherwise agree in writing, signed by both Parties. This Second Memorandum may only be superseded by an explicit writing.

VI. **SEVERABILITY.** If any section of this Second Memorandum is adjudicated to be invalid, such action shall not affect the validity of any section not so adjudged.

VII. **INDEMNIFICATION.** Each Party to this Agreement shall remain solely liable for its own negligence, errors and/or omissions, and shall defend and hold harmless the other Party from any negligence, errors or omissions of the indemnifying Party. Neither shall be deemed to be an agent of the other Party, for purposes of this Memorandum.

VIII. **GOVERNING LAW AND THIRD PARTY RIGHTS.** This Memorandum shall be governed by the laws of the State of Washington and there shall be no third party beneficiaries to this Memorandum.

IX. **SURVIVAL AND NON-WAIVER.** The provisions of this Section shall survive the expiration or termination of this Memorandum with respect to any event occurring prior to such expiration or termination. The failure of either party to insist upon strict performance of any provision of this Memorandum shall not constitute a waiver of any right to insist upon such performance at a later time.

X. **TERM AND TERMINATION.** This Memorandum shall terminate on _____, 20____, unless terminated sooner as provided herein. Either party may terminate this Memorandum without cause upon the giving of thirty (30) days written notice of the intent to terminate. This Memorandum must be extended for additional periods by written agreement of the parties.

XI. **EFFECTIVE DATE.** This Memorandum shall be effective on the last date entered below.

IN WITNESS WHEREOF, the parties hereto executed with their signatures this agreement on the date first above set forth.

CITY OF LAKEWOOD

_____

John J. Caulfield, City Manager

Dated: _____

Attest:

_____

Alice M. Bush, MMC, City Clerk

Approved as to Form:

_____

Heidi Ann Wachter, City Attorney

ROTARY CLUB OF LAKEWOOD

_____

Don Daniels, President

To: Mayor and City Councilmembers

From: Greg Vigoren, Public Works Engineering Services Manager
Tho Kraus, Assistant City Manager/Administrative Services
Paul Bucich, Public Works Engineering Director

Via: John Caulfield, City Manager

Subject: Follow-up to Public Hearing on Surface Water Management Fee

Date: May 14, 2018

BACKGROUND

The purpose of this memo is to provide the City Council with additional information specifically as it relates to rate credits.

RATE CREDITS

1) Policy justification/reason and the mechanics for changing the credit from maximum 85% to maximum 43%:

Summary:

Historically, the Utility has provided an 85% credit based on mirroring the Pierce County Stormwater Utility rate structure which was the template for the Utility when formed. It is unclear what Pierce County used for their original credit assessment as that work was done in the late 1980s and they have been unable to provide that to staff so far. Recently, Pierce County conducted a similar assessment of their stormwater Utility rates that resulted in reducing their maximum rate credit to 30% with a grandfathering clause (see below table).

For the analysis of our stormwater fees, FCS Group used the same assessment protocols and divided our stormwater costs into two primary components: *base* costs and *use* costs. *Base* costs are those components of our fee associated with engineering functions, NPDES obligations, and a portion of our overhead costs for operations. *Use* costs are those efforts associated with operations of our built infrastructure primarily associated with staffing, benefits, and operational expenses. When evaluating the application of a credit program, we recognized that *base* costs are the minimum required to support the stormwater utility functions without regard to off-site stormwater contributions. With that in mind, the only benefit to the Utility for on-site containment of stormwater is that associated with the *use* cost component of our fee. The percentage of the total stormwater fee associated with the *use* costs was determined to be 43% which is what the credit program reflects. This assumes 100% retention of all on-site runoff. Detention facilities would receive a lower credit based on design of the facility.

Staff contacted twelve jurisdictions and collected the following information on their rate credit programs:

Comparison of credits:
(From the same jurisdictions included in the comparison for single-family residential fees)

Jurisdiction	SFR Rate	Credit
Puyallup	$147.96	No credit program
Kent	$150.12	No credit program
Bonney Lake	$168.00	No credit program
Steilacoom	$207.72	No credit program
Tacoma	$279.36	Low Impact developments can qualify for one category rate reduction
University Place	$191.15	10% to 25%
Fife	$164.09	20% to 40%
Pierce County	$127.32	30% *Old credit program of 10% to 85% being phased out 2018-27*
Edgewood	$159.00	30% *Old credit program of 10% to 85% being phased out 2018-27*
Fircrest	$201.00	25% to 50%
Sumner	$190.20	25% to 50%
Lakewood (proposed)	***$116.74***	***43% credit***
DuPont	$183.60	35% to 67% (67% discount applies to vacant land only)

2) Number of properties/parcels that take advantage of the credit program.

119 properties currently take advantage of the credit program. The full list of properties is included at the end of the memorandum. The table below identifies the number of parcels at differing credit percentages and the before vs. after fee along with the aggregate credit for those parcels. At the current rates, the Utility gives a total credit amount of $314,526 annually with the most benefiting properties at the 10% and 85% credit levels. This equates to $1,572,630 over five years.

# of Parcels	% Credit	Fee Before Credit	Fee After Credit	Credit
31	10%	$ 22,773	$ 20,496	$ 2,277
1	17%	$ 5,044	$ 4,187	$ 858
1	20%	$ 439	$ 351	$ 88
3	21%	$ 69,540	$ 54,937	$ 14,603
1	22%	$ 16,089	$ 12,549	$ 3,539
1	25%	$ 3,358	$ 2,518	$ 839
1	28%	$ 3,325	$ 2,394	$ 931
6	40%	$ 141,258	$ 84,755	$ 56,503
1	60%	$ 58,911	$ 23,564	$ 35,346
1	62%	$ 21,532	$ 8,182	$ 13,350
72	85%	$ 219,049	$ 32,857	$ 186,191
119		**$561,316**	**$246,790**	**$314,526**

Comparison of parcels and existing credit program

3) Option to grandfather existing systems at the 85% credit rate with new systems adhering to 43%.

Three options for council consideration for the properties currently receiving a credit have been developed:

1) Leave the credit program as is for existing properties. Credit given to property owners totals $314,526 annually at the current stormwater rates. With the proposed 50% rate increase, the credit given for these parcels would increase to approximately $471,800 annually. This equates to a reduced collection of $1,179,500 over five years compared to dropping the credit to a maximum of 43% in 2019.

2) Reduce the current credit rates (>10% to 85%) in a stepwise fashion to the new credit rates over 5 years. The properties with the existing 10% rate would go to zero after 5 years. The credit would reduce just approximately 8% per year. Reducing the credit to a maximum of 43% would reduce the credit to $157,609 annually at the current stormwater rates as reflected in the table below. With the proposed 50% rate increase, the credit given after the final step down year would be greater at approximately $236,400 annually. The net Utility rate revenue reduction equates to $590,139 over five years compared to dropping the credit to a maximum of 43% in 2019.

3) Leave the current credit rates in place for now and then reduce them to the new rates in 2023. Eliminate the 10% rate starting in 2023. This option would allow properties time to prepare for the credit reduction. The five year comparison is the same as for option one: $1,179,500 over five years, but that reduced collection would end in 2023.

Credit program funding impacts on the SWM budget with 50% rate increase:

85% maximum credit: (($314,526 X 1.5) = $471,800) X 5 years = $2,359,000
43% maximum credit: (($157,609 X 1.5) = $236,400) X 5 years = $1,182,000

Funding reductions over 5 years:

Option 1 (leave credit in perpetuity):	$2,359,000 - $1,182,000 = $1,179,500 in reduced revenue
Option 2 (step down credit over 5 years):	$1,772,139 - $1,182,000 = $590,139 in reduced revenue
Option 3 (leave credit as is for 5 years):	$2,359,000 - $1,182,000 = $1,179,500 in reduced revenue

NEXT STEPS

Request Council provide direction on the credit program for inclusion in the ordinance on May 21st.

Adopt the ordinance on May 21, 2018.

Submit revised rates to Pierce County by October 1, 2018.

Name	Address	Parcel #	% Credit	Fee Before Credit	Fee After Credit	Credit
Total		**119**		**$561,316**	**$246,790**	**$314,527**
State of Washington / Western State Hospital	8200 87th Ave SW	0220321000	40%	$ 98,148	$ 58,889	$ 39,259
Northwest Building LLC	4823 95th St SW	4002220052	21%	$ 37,131	$ 29,333	$ 7,797
Clover Park Technical College (main campus)	4500 Steilacoom Blvd SW	0220363037	60%	$ 58,911	$ 23,564	$ 35,346
Pierce College	9401 Farwest DR SW	0220324000	21%	$ 26,693	$ 21,088	$ 5,606
Northwest Building LLC	9704 47th Ave SW	4002220030	40%	$ 26,354	$ 15,812	$ 10,542
Northwest Building LLC	9216 47th Ave SW	4002220010	22%	$ 16,089	$ 12,549	$ 3,539
Clover Park School District #400	8102 Phillips Rd SW	0220346014	62%	$ 21,532	$ 8,182	$ 13,350
JRD Pierce LLC	11013 Pacific Highway SW	0219014063	40%	$ 8,425	$ 5,055	$ 3,370
Northwest Building LLC	4500 92nd St Ct SW	4002220060	21%	$ 5,717	$ 4,516	$ 1,200
Northwest Building LLC	4429 95th St W	4002220070	17%	$ 5,044	$ 4,187	$ 858
Pierce Transit	3701 96th Street SW	0220364093	85%	$ 22,105	$ 3,316	$ 18,789
Clover Park School District #400 (Lakes High School)	10320 Farwest Drive SW	0219054071	85%	$ 21,903	$ 3,285	$ 18,618
Chambers Gardens Condominiums	7107 90th Ave Ct SW	$21.75 x 126 units	10%	$ 3,045	$ 2,741	$ 305
Northwest Building LLC	4215 95th St SW	4002220090	25%	$ 3,358	$ 2,518	$ 839
JRD Pierce LLC	10901 Pacific Highway SW	0219014057	40%	$ 4,158	$ 2,495	$ 1,663
Northwest Building LLC	9725 47th Ave SW	4002220120	28%	$ 3,325	$ 2,394	$ 931
Walmart Real Esate Business Tru	7001 Bridgeport Way SW	0220262052	85%	$ 15,303	$ 2,296	$ 13,008
Clover Park School District Auxiliary Services Center	9219 Lakewood Dr SW	0220354093	85%	$ 13,823	$ 2,073	$ 11,750
JRD Pierce LLC	11011 - 10915 Pacific Highway SW	0219014064	40%	$ 3,107	$ 1,864	$ 1,243

TCAM Core Property Fund Operating	11101 S Tacoma Way	5003430050	85%	$ 12,428	$ 1,864	$ 10,564
Clover Lake Apartments	4828 123rd St SW	0219123084	10%	$ 2,053	$ 1,848	$ 205
Star Lite Swap Meet	8327 South Tacoma Way	0320312046	85%	$ 11,146	$ 1,672	$ 9,474
City of Lakewood	9420 Front Street S	0320314090	85%	$ 10,828	$ 1,624	$ 9,204
Evergreen Business Park	3413 - 3415 Chapel Street	0319067002	10%	$ 1,658	$ 1,492	$ 166
The Bluffs		$7.24 x 186 units	85%	$ 8,978	$ 1,347	$ 7,631
Titus Will Land, LLC	11503 Pacific Hwy SW	0219122031	85%	$ 7,846	$ 1,177	$ 6,669
RAM International Land Company	10019 59th Ave SW	4002020050	10%	$ 1,199	$ 1,079	$ 120
KAMG	10204 S. Tacoma Way	6831000060	10%	$ 1,187	$ 1,068	$ 119
Aves LLC	4711 115th St Ct SW	0219122073	10%	$ 988	$ 889	$ 99
Siew Michael T & Junghi Kim	7701 Steilacoom Blvd SW	0220346013	10%	$ 928	$ 835	$ 93
RAM International Land Company	10009 59th Ave SW	4002020060	10%	$ 925	$ 832	$ 92
Northwest Building LLC	4425 100th St SW	4002220111	85%	$ 5,284	$ 793	$ 4,492
Steeplechase Apartment / Harrison Apartments	8302 – 8320 84th Ave SW	0220331060	85%	$ 5,204	$ 781	$ 4,424
KAMG	10104 S. Tacoma Way	6831000090	10%	$ 859	$ 773	$ 86
Miles, Frank L & Jean A	10608 - 10610 34th Ave South	5000490030	85%	$ 5,033	$ 755	$ 4,278
Miles / Miles / Kittlsby	10701 34th Ave South	5000490230	85%	$ 4,539	$ 681	$ 3,858
Northwest Building LLC	4424 98th St Ct SW	4002220101	85%	$ 4,474	$ 671	$ 3,803
Fairfield Estates	2902 South 92nd	0320313012	85%	$ 4,460	$ 669	$ 3,791
Mountaire LLC	6420 Lake Grove St SW	0219022012	10%	$ 718	$ 646	$ 72
JRD Pierce LLC	11021 Pacific Highway SW	0219014069	40%	$ 1,067	$ 640	$ 427
Evergreen Business Park	3411 Chapel Street	0319067001	10%	$ 677	$ 610	$ 68
J & SLFC	5726 100th St SW	4002020010	10%	$ 677	$ 610	$ 68
Yuan Shang's Colonial Court Apartments	9120 Lawndale Ave S	5005006410	10%	$ 674	$ 606	$ 67
KAMG	10114 S. Tacoma Way	6831000070	10%	$ 652	$ 587	$ 65

1661 Investment LLC	9914 32nd Ave South	5001010010	85%	$ 3,733	$ 560	$ 3,173
Francis Court LLC	3213 S 83rd Street	0320312003	85%	$ 3,731	$ 560	$ 3,172
KAMG	10110 S. Tacoma Way	6831000080	10%	$ 605	$ 544	$ 60
City of Lakewood	6000 Main St SW	4001880095	85%	$ 3,613	$ 542	$ 3,071
ROC II Wa Village at Seelye Lake LLC	9303 55th Ave Ct	7523000187	85%	$ 3,577	$ 537	$ 3,041
Drake Family LP (Sundance Apartments)	7503 Lakewood Drive SW	0220264071	85%	$ 3,548	$ 532	$ 3,016
Grand Central Propertiesx	10117 South Tacoma Way	0319062077	85%	$ 3,507	$ 526	$ 2,981
Steilacoom Group LLC	7609 Steilacoom Blvd SW	5029500010	10%	$ 581	$ 523	$ 58
DCL Meadow Park LLC	7304 Lakewood Drive W	0220268020	85%	$ 3,367	$ 505	$ 2,862
Evergreen Business Park	3421 Chapel St	0319067003	10%	$ 519	$ 467	$ 52
RAM International Land Company	10013 59th Ave SW	4002020040	10%	$ 513	$ 461	$ 51
Peterson, JK Family LLC	3620 100th St SW	0219015013	10%	$ 477	$ 430	$ 48
Chang Family LLC & Bridgeport Way Professional Bldg	11318 Bridgeport Way SW	0219111082	85%	$ 2,830	$ 425	$ 2,406
McGowan LP	3625 Perkins Lane	6831000010	10%	$ 466	$ 419	$ 47
Yuan Shang's Colonial Court Apartments	9104 New Grove Ave SW	2205000510	10%	$ 462	$ 416	$ 46
RAM International Land Company	xxx 100th St SW	4002020020	10%	$ 448	$ 403	$ 45
IC USA #15 Property Limitied Partnership	5401 - 5423 110th Street SW	2335201262	85%	$ 2,652	$ 398	$ 2,255
Hidden Lake Mountaire LLC	3425 Lake Grove St SW	0219026002	10%	$ 431	$ 388	$ 43
City of Lakewood	9401 Lakewood Dr SW	4002220020	85%	$ 2,519	$ 378	$ 2,141
Titus Will Land, LLC	11503 Pacific Hwy SW	0219122157	85%	$ 2,457	$ 369	$ 2,088
CLOP Associates	11116 Gravelly Lake Dr SW	0219023016	85%	$ 2,417	$ 362	$ 2,054
Evergreen Business Park	3423 Chapel Street	0319067004	10%	$ 392	$ 353	$ 39
S & B Investment	5202 112th Street SW	0219111042	20%	$ 439	$ 351	$ 88
Windridge Apartments LLC	4409 106th St Ct SW	5080001561	85%	$ 2,259	$ 339	$ 1,920
Rock Solid Properties LLC	3305 108th Street South	5000490011	85%	$ 2,235	$ 335	$ 1,899

ABN Prorperties	9209 Washington Blvd	5005002421	10%	$ 369	$ 332	$ 37
Mt Tacoma LLC	3214 South 96th Street	0319062003	85%	$ 1,993	$ 299	$ 1,694
Lakewood 92 Associates LLC	10214 Lakeview Ave SW	0219012032	85%	$ 1,684	$ 253	$ 1,432
Lakewood 92 Associates LLC	10214 Lakeview Ave SW	0219012030	85%	$ 1,677	$ 252	$ 1,426
Steilacoom Group LLC	7609 Steilacoom Blvd SW	5029500020	10%	$ 259	$ 234	$ 26
KAMG	10116 S. Tacoma Way	6831000040	10%	$ 248	$ 223	$ 25
RAM International Land Company	5808 - 5812 100th St SW	4002020030	10%	$ 230	$ 207	$ 23
MB Partnership	8311 Durango St SW	6990100080	85%	$ 1,319	$ 198	$ 1,121
KAMG	xxx 36th Ave Ct S	6831000020	10%	$ 217	$ 195	$ 22
KAMG	10116 S. Tacoma Way	6831000050	10%	$ 185	$ 167	$ 19
Jenco Development LLC	10526 Steele St South	9560400033	85%	$ 1,107	$ 166	$ 941
Whitman Condominiums LLC	9811 Whitman Ave SW, Unit 3	$7.24 x 20 units	85%	$ 965	$ 145	$ 821
Faulds, Douglas & Donna Ernst	3601 112th Street SW	0219014082	85%	$ 931	$ 140	$ 791
R2K2 A Ltd Partnership	10408 South Tacoma Way	5095000034	85%	$ 891	$ 134	$ 758
Faulds, Douglas & Donna Ernst	3601 112th Street SW	0219014083	85%	$ 870	$ 131	$ 740
Jenco Development LLC	10507 24th Ave South	0319064020	85%	$ 862	$ 129	$ 733
IC USA #15 Property Limitied Partnership Hidden Lake	5419 110th Street SW	2335201261	85%	$ 845	$ 127	$ 719
Jenco Development LLC	10526 Steele St South	9560400010	85%	$ 845	$ 127	$ 718
KAMG	xxx 36th Ave Ct S	6831000030	10%	$ 133	$ 120	$ 13
Jenco Development LLC	10526 Steele St South	9560400020	85%	$ 800	$ 120	$ 680
C C's Classy Chassis Inc.	7701 Custer Rd W	3905000860	85%	$ 727	$ 109	$ 618
1996 Redford Family LP	11115 34th Ave South	0319063013	85%	$ 710	$ 107	$ 604
7320 Lakewood Dr West AKA HL Produce	7320 Lakewood Drive West	0220268021	85%	$ 671	$ 101	$ 571
Ham, Myong Hwan & Hei Sook	10515 South Tacoma Way	0219014100	85%	$ 631	$ 95	$ 537
Anderson, Stephen C ETAL	110 Country Club Lane	6435000201	85%	$ 612	$ 92	$ 520

Campbell Corwyn S & Lisa M	7609 Custer Rd W	3905000451	85%	$	579	$	87	$	492
Chang Family LLC & Bridgeport Way Professional Bldg	11202-11208 Bridgeport Way SW	0219111018	85%	$	553	$	83	$	470
City of Lakewood	6006 Main St SW	4001880094	85%	$	543	$	82	$	462
Financial Holdings / Tucci & Sons, Inc.	11102 Steele St SW	4776500130	85%	$	514	$	77	$	437
Turner, Roger	11212 Bridgeport Way SW	0219111043	85%	$	439	$	66	$	373
Financial Holdings / Tucci & Sons, Inc.	11105 26th Ave S	4776500160	85%	$	353	$	53	$	300
Arkim LLC	9702 South Tacoma Way	0219011009	85%	$	342	$	51	$	291
R2K2 A Ltd Partnership	10518 S Tacoma Way Unit J	5095000035	85%	$	237	$	36	$	201
Ham, Myong & Hei Sook	10515 South Tacoma Way	5095000123	85%	$	174	$	26	$	148
Arkim LLC	9702 South Tacoma Way	0219011024	85%	$	166	$	25	$	141
Alden, Christy A & Cannon Cheryl M	6404 - 6406 Montclair Ave SW	5140000993	85%	$	101	$	15	$	86
Financial Holdings / Tucci & Sons, Inc.	11105 26th Ave S	4776500150	85%	$	97	$	15	$	83
Acra, Terry D	12004 58th Ave SW	4000490010	85%	$	77	$	12	$	66
Arkim LLC	9702 South Tacoma Way	0219011029	85%	$	77	$	12	$	66
Bourgault Lieselotte TTEE	12014 58th Ave SW	4000490040	85%	$	77	$	12	$	66
Financial Holdings / Tucci & Sons, Inc.	11105 26th Ave S	4776500180	85%	$	77	$	12	$	66
Kirby, Joseph & Deborah A	12023 58th Ave SW	4000490080	85%	$	77	$	12	$	66
Lehman, Joseph D & Cheryl M	12007 58th Ave SW	4000490100	85%	$	77	$	12	$	66
Marley, John T IV & Sun Y	12019 58th Ave SW	4000490090	85%	$	77	$	12	$	66
Morgan, Bert & Ursula Ttee	12016 58th Ave SW	4000490050	85%	$	77	$	12	$	66
Naylor Family	12010 58th Ave SW	4000490030	85%	$	77	$	12	$	66
Nelson, Karen	12006 58th Ave SW	4000490020	85%	$	77	$	12	$	66
Toledo Diana & Christopher Forre	7003 Phillips Rd SW	0220271071	85%	$	77	$	12	$	66
Wilson, Arthur & Wol Yong	12020 58th Ave SW	4000490060	85%	$	77	$	12	$	66
Beadle Jared & Krystal L	8407 112th Street SW	5900000510	85%	$	77	$	12	$	66

Maximum Credit Methodology

Functional Allocation

Rate Components

Base

Base Costs ÷ Base ESUs*

Use

Use Costs ÷ Use ESUs*

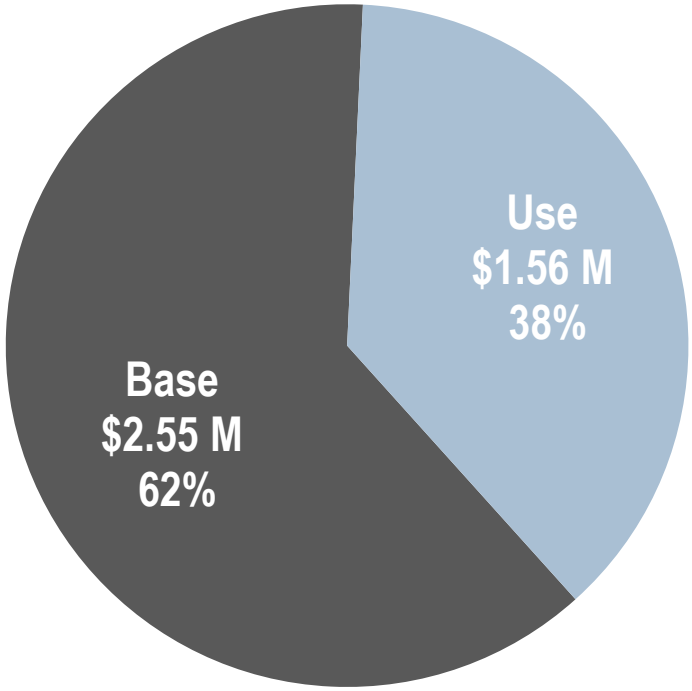
Total Rate = Base + Use Components

Use Component ÷ Total Rate = Max Credit

*1 ESU = 1 residential equivalent (2,640 sq. ft. in LMC 3.38.030)

2019 Revenue Requirement: Functional Allocation

Base
Costs related to total system



Use
Costs related to increased burden on the system (water volume or quality)

Maximum Credit (Effective 2019)

Functional Allocation

Surface Water Management Utility Costs

- Base
- Use

Rate Components

Base			Use			Total Rate =
$2.55 M	÷	38,242 ESUs*	$1.56 M	÷	31,265 ESUs*	
$66.60			$49.50			$116.10

Use Component	÷	Total Rate	=	Max Credit
$49.50	÷	$116.10	=	43%

*1 ESU = 1 residential equivalent (2,640 sq. ft. in LMC 3.38.030)

Sample Bill Impacts

- Sample bill impacts with newly calculated rate credit (Scenario 3 as an example)

Customer Class	2018 - Existing Charge			2019 - Scenario 3			$	%
	Charge	Credit	Adjusted Charge	Charge	Credit	Adjusted Charge	Change	Change
Residential	$77.40	n/a	$77.40	$116.10	n/a	$116.10	$38.70	50%
Commercial (13,000 i.s.f.)								
Example 1 (No Credit)	$381.14	0%	$381.14	$571.71	0%	$571.71	$190.57	50%
Example 2 (Max Credit)	$381.14	85%	$57.17	$571.71	43%	$325.87	$268.70	470%

- Previous parcel getting 85% credit would now receive 43% credit.
- Current 85% policy provides between $300,000 and $350,000 in annual credits