

Ordinance No. 00061

[\(Council Minutes 96/02/20\)](#)

ORDINANCE NO. 61

AN ORDINANCE of the City Council of the City of Lakewood, Washington, approving and authorizing the Interim City of Lakewood Site Development Regulations

WHEREAS, pursuant to statutes and regulatory requirements of the State statute, the City of Lakewood would be responsible for the development, adoption and enforcement of regulations to address site development occurring within the City, so as to provide consistent, safe and orderly development beneficial to the citizens and businesses of the City; and,

WHEREAS, because the City of Lakewood is a newly incorporated City it needs additional time to develop and adopt final Site Development Regulations to address long term needs of the City, however, in order to address the site development needs of the City pending completion of its final Site Development Regulations, it would be appropriate and advantageous for the City to have in place Interim Site Development Regulations.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF LAKEWOOD, WASHINGTON, DO ORDAIN as Follows:

Section 1. That the Interim City of Lakewood Site Development Regulations, a copy of which is attached hereto marked as Exhibit AA@ and incorporated herein by this reference, be, and the same hereby is approved and adopted as the Interim Site Development Regulations for the City of Lakewood and that a copy of the Interim Site Development Regulations shall be kept on file with the office of the City Clerk.

Section 2. That if any portion of this Ordinance including the attached Exhibit, or its application to any person or circumstance is held to be invalid, the remainder and its application to any other persons or circumstances shall be unaffected.

Section 3. That this Ordinance shall be in full force and effect five (5) days after publication of the Ordinance Summary and on February 28, 1996.

ADOPTED by the City Council this 20th day of February, 1996.

CITY OF LAKEWOOD

/S/

Bill Harrison, Mayor

Attest:

/S/

Alice M. Bush, CMC, City Clerk

Approved as to Form:

/S/

Daniel B. Heid, City Attorney

.....

March 27, 1997

Codifier's note:

Interim Site Development Regulations - Where the document reflects the Chapter as "Chapter 14.--.---" in should be "Chapter 17.--.---".

**CITY OF
LAKEWOOD**

**INTERIM
SITE
DEVELOPMENT
REGULATIONS**

ADOPTED

FEBRUARY 20, 1996

ACKNOWLEDGMENTS

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APPENDICES

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Chapter 17.46

SITE DEVELOPMENT REGULATIONS

Sections:

- 17.46.010 Applicability and Compliance with the Ordinance**
- 17.46.020 Violation of Regulations Constitutes a Misdemeanor**
- 17.46.030 Ordinance Available at Development Center**

17.46.010 Applicability and Compliance with the Ordinance

All requirements contained in the Pierce County Site Development Ordinance, identified as Exhibit "A" to this Ordinance, must be complied with prior to the approval of any proposed development in the City of Lakewood.

17.46.020 Violation of Regulations Constitutes a Misdemeanor

Violation of any of the provisions of these Regulations by an Applicant or Engineer shall be a misdemeanor. Each day or portion of a day during which a violation of these Regulations is continued, committed or permitted shall constitute a separate offense. Any work carried out contrary to these provisions shall constitute a public nuisance and may be enjoined as provided by the Statutes of the State of Washington.

17.46.030 Ordinance Available at Development Center

The City of Lakewood Site Development Ordinance shall be available for inspection or purchase at the City's Planning Department during normal business hours.

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14.46.040 INTRODUCTION AND PURPOSE

These Regulations establish criteria for review and analysis of all development including, but not limited to; grading, formal subdivision, short subdivision, large lot division, commercial building, binding site plans, planned unit developments, planned development districts, mobile home parks, or other projects when so required by the City of Lakewood Hearing Examiner or City Council. All development proposals, whether public or private, which are submitted to the City for review, must of conform to these Regulations, which are to be used as the basis for review, design, and construction.

These Regulations cannot address all situations. [They are intended to assist, but not to substitute, competent work by professional engineers.] It is expected that the professional engineer will bring to each project the best of his/her skills and abilities to see that the project is thoroughly analyzed and designed correctly, accurately, and in compliance with generally accepted engineering practices. These Regulations are not intended to unreasonably limit any innovative or creative effort in design and construction which could result in better quality, cost savings, or improved performance of a project's storm drainage system.

These Regulations are based on the premise that development should not impact adjacent and/or downstream property owners in a detrimental manner compared to the predevelopment condition. The engineer shall show by calculations, plans, and engineering data that the proposed project meets the requirements of these Regulations.

It is not the intent of these Regulations to make the City of Lakewood a guarantor or protector of public or private property in regard to land development activity.

14.46.050 Shortened Designation

The City of Lakewood Site Development Regulations will be cited routinely in the text as the "Regulations".

14.46.060 Exemptions

The following work is exempt from the requirements of these Regulations.

- A. Construction or maintenance of public roads or flood control projects when done by a public agency and the project has a completed Environmental Checklist, has been approved by the Washington State Department of Transportation (W.S.D.O.T.), City of Lakewood, or the City Engineer, and the work is in existing public right-of-way or easement dedicated or owned by the City of Lakewood.

- B. The removal or displacement of not more than a total of 250 cubic yards of material, or the deposit of not more than a total of 100 cubic yards of material, throughout the life of a development from its existing condition except as specified in Section 3.08, except in sensitive areas, except for excavation and/or fill placed within 25 feet of a drainage course, pothole, or floodplain, and except for road construction.¹
- C. Cutting and Clearing and/or grubbing of a parcel of land or portion thereof less than 20,000 square feet except as specified in Section 3.08 and except in sensitive areas.
- D. The stockpiling or broadcasting of less than 500 cubic yards of topsoil, peat, sawdust, mulch, bark, chips or solid nutrients on a lot, tract, or parcel of land, per year except as specified in Section 3.08 except in floodplains and except in sensitive areas.
- E. The installation of utilities in accordance with a valid City permit, well drilling activities, installation of sanitary drain fields, or excavation for soil logs, except as specified in Section 3.08.
- F. The excavation or filling required to accommodate only the footprint of a proposed single family residential structure in preparation for the proposed construction. The following conditions apply:
 - 1. A building permit application has been accepted by the City.
 - 2. The proposed structure is not located within 100 feet of a wetlands.
 - 3. The proposed structure is located a minimum of 50 feet from a drainage course.
 - 4. The proposed structure is not located in a floodplain.
 - 5. The proposed structure is not located in a sensitive area.
- G. Emergency sandbagging, diking, ditching, filling or similar work during or after periods of extreme weather conditions when done to protect life or property.

¹Road construction is not exempt from these regulations. The intent is that every road will be looked at for possible impacts to adjoining properties, although this does not indicate that every road will require a permit.

14.46.070 DEFINITIONS

Applicant:

The person, party, firm, corporation, or other legal entity that proposes to develop property in the City of Lakewood by submitting an application for any of the activities covered by these Regulations on a form furnished by the City and paying the required fees.

Area of Shallow Flooding: A designated "AO" or "AH" Zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and, velocity flow may be evident. "AO" is characterized as sheet flow and "AH" indicates ponding.

Areas of Special Flood Hazard:

Land in a floodplain within the City of Lakewood subject to a one percent or greater chance of flooding in any given year. Designations on maps will always include the letters "A" and "V". Areas of Special Flood Hazard will also include "B" zones as defined below.

Average Daily Traffic (ADT):

The total traffic during a given time period (in whole days) greater than 1 day and less than 1 year divided by the number of days in that time period. To determine the potential average daily traffic for a road, traffic generation figures will be in accordance with the publication "Trip Generation," by the Institute of Traffic Engineers or other approved sources and will include the traffic generated by the proposed development unless otherwise noted. Applications for building permits and projects requiring Hearing Examiner's approval will be considered proposed projects.

"B" Zone:

Certain areas subject to the "Base Flood" with contributing drainage areas of more than 100 acres and less than one square mile and all pothole areas.

Base Flood:

The flood having a one percent chance of being equaled or exceeded in any given year, also referred to as the "100-year flood." Designation on maps will always include the letter "A" or "V."

Base Flood Elevation:

The water surface elevation, in feet, above mean sea level for the base flood and referenced to the National Geodetic Vertical Datum of 1929 (or Pierce County Datum or United States Coast and Geodetic Survey 1929 Datum which are the same).

Bench:

A relatively level step excavated into natural earth or fill material.

Best Available Information:

In the absence of official flood insurance rate map data, communities can use data from other Federal, State, or other sources provided this data has either been generated using technical defensible methods or is based on reasonable historical analysis and experience.

Breakaway Wall:

A wall that is not a part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

Certification:

A written engineering opinion, stamped, signed, and dated by an engineer, concerning the progress or completion of work.

Change of Use:

Any change of purpose or use for which any land, building, or structure is occupied, maintained, designed, arranged, or intended.

Clearing:

The cutting, moving on site, or removal of standing or fallen timber (including stumps); the removal or moving on site of stumps; or the cutting or removal of brush, grass, ground cover, or other vegetative matter from a site in a way which exposes the Earth's surface of the site. In addition to the above, clearing is a activity which does not require reforestation per an approved Forest Practices Application/notification issued by the Department of Natural Resources.

Coastal High Hazard Area:

The area subject to high velocity waters, including, but not limited to, storm surge or tsunamis. The area is designated on the FIRM as Zone V1-V30, VE or V.

Compaction:

The densification of a fill by mechanical means.

City:

City Engineer or his/her designee.

Critical Facility:

A facility for which even a slight chance of flooding would be too great. Critical facilities include, but are not limited to: schools; hospitals; police; fire, and emergency response installations; nursing homes; installations that produce, use, or store hazardous materials or hazardous waste.

Curtain Drain or "French Drains":

A drain system used to intercept or collect groundwater and route it to another location. This includes footing or foundation drains.

Deep and/or Fast-Flowing Water:

A combination of water depth and velocity as shown in the graph. For the purposes of this Ordinance, the City of Lakewood will also consider deep and/or fast-flowing water to be a floodway area.

Detention:

The short-term storage of storm drainage runoff that has been artificially collected and then released at a predetermined rate.

Development:

Any man-made change to improved or unimproved real estate including, but not limited to, buildings or other structures, placement of manufactured home/mobile home, mining, dredging, clearing, filling, grading, paving, excavation, drilling operations, or the subdivision of property.

Diversions:

The act of changing or turning surface water from an established or accustomed drainage course to another discharge point.

Drainage:

Rainfall runoff from a basin or contributing area which flows on the surface of the ground.

Driveway:

Any area, construction, or facility between a public road and private property which provides access for vehicles from the public roadway to or from private property.

Earth/Earth Material:

Naturally occurring rock, soil, stone, dirt, or a combination thereof.

Earthwork:

Any operation involving the excavation, grading, filling, or moving of earth materials.

Engineer:

A professional civil engineer, currently licensed by the State of Washington, retained by and acting on behalf of the Applicant.

Erosion:

The wearing away of the earth's surface as a result of the movement of wind, water, or ice.

Existing Manufactured Home/Mobile Home Park, or Subdivision:

A manufactured home/mobile home park or subdivision for which the construction of facilities for servicing the lot on which the manufactured homes/mobile homes are to be affixed (including, at a minimum, the installation of utilities, either final site grading or the pouring of concrete pads, and the construction of streets) are completed before the effective date of these Regulations.

Expansion to an Existing Manufactured Home/Mobile Home Park, or Subdivision:

The preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes/mobile homes are to be affixed (including the installation of utilities, either final site grading or pouring of concrete pads, or the construction of streets).

Fill/Fill Material:

A deposit of earth material placed by mechanical means.

Filling:

The act of transporting or placing (by any manner or mechanism) earth material, including temporary stockpiling.

Flood or Flooding:

A general and temporary condition of partial or complete inundation of normally dry land areas from:

- The overflow of inland or tidal waters, and/or
- The unusual and rapid accumulation of runoff of surface waters from any source.

Floodfringe:

The area subject to inundation by the base flood, but outside the limits of the floodway, and which may provide needed temporary storage capacity for flood waters.

Flood Insurance Rate Map (FIRM):

The official map on which the Federal Insurance Administration has delineated Areas of Special Flood Hazard and the risk premium zones applicable to the City of Lakewood.

Flood Insurance Study:

The official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Boundary-Floodway Map, and the water surface elevation of the base flood.

Floodplain:

The total area subject to inundation by the base flood, including the floodfringe and the floodway areas.

Floodproof:

Structural provisions or adjustments to nonresidential buildings for the purpose of eliminating flood damages to those structures, including their utilities and contents.

Floodway:

The channel of a river, or other watercourse, and the adjacent land areas that must be reserved in order to convey and discharge the base flood without cumulatively increasing the water surface elevation by more than one foot, and those areas designated as deep and/or fast-flowing water.

Floodway Map:

The official map on which the Federal Insurance Administration has delineated a floodway.

Forest Practices Permit:

A permit issued by the Washington State Department of Natural Resources for the removal of timber and construction of necessary roads.

Grading:

Any excavating, filling, or creating of impervious surfaces or combination thereof.

Groundwater:

Subsurface water in the subsoil or in a zone of saturation.

Grubbing:

The removal and disposing of all unwanted vegetative matter from underground, such as sod, stumps, roots, buried logs, or other debris.

Impervious Surface:

Compacted gravel, asphalt concrete, Portland Cement Concrete, bituminous surface, oil mat, or other finished surface or ground which is impenetrable or nearly impenetrable by water.

Landscaping:

The improvement or installation on a parcel or portion thereof of objects or vegetation for decorative or ornamental effect. Examples include: trees, bushes, shrubs, flowers, grass, weeds, ornamental rocks or figures, and low-lying ground cover, sprinkler systems, sidewalks, and lighting fixtures.

Large Lot:

As defined by the City of Lakewood Subdivision Code.

Lowest Floor:

The lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, used solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built in such a manner as to render the structure in violation of the applicable non-elevation design requirements of these Regulations.

Maintained City Street:

A road dedicated to the City through various legal instruments or processes, or claimed through usage, and maintained by City maintenance forces on a periodic and regular basis, or as determined by the City. The road must be listed on the City of Lakewood most recent Road Log or accepted by the City for inclusion into the City's road system and not yet shown on the Road Log.

Major Driveway:

A driveway which will serve an area with the potential to contain, or which does contain, an excess of nineteen single-family residences, or which is used to provide access to business and non-residential enterprises, including, but not limited to, sales, services, industry, churches, or other quasi-public buildings.

Major Watercourse:

A watercourse with calculated or measured peak 100-year base flood discharge greater than 5,000 cubic feet per second at a specific location or throughout a specific reach as shown by the Flood Insurance Study or from other authoritative engineering data.

Manufactured Home/Mobile Home:

A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term "manufactured home/mobile home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days. For insurance purposes, the term "manufactured home/mobile home" does not include park trailers, travel trailers, recreational vehicles or other similar vehicles.

Manufactured Home/Mobile Home Park or Subdivision:

A parcel (or contiguous parcels) of land divided into two or more manufactured home/mobile home lots for rent, lease, or sale.

Minerals:

Coal, clay, stone, gravel, metallic ore, or any other similar solid material or substance occurring from natural deposits on or in the earth.

Mining:

The removal of minerals from deposits on or in the earth.

Minor Driveway:

A driveway which provides or has the potential to provide access to a residential development ranging in size from three lots or single-family structures to nineteen lots or single-family structures.

Natural Buffer Area (N.B.A.):

A parcel or strip of land that is designated to permanently remain in an undisturbed and untouched condition. No building, clearing, filling, or grading is permitted within this area, except for minor firewood harvest and watercourse maintenance when applicable.

Natural Drainage Course:

A surface flow of water in a vegetated swale, ravine, ditch, creek, river, or collection location of stormwater runoff that has continuous or intermittent flow, or has the potential to provide such. This does not include man-made storm drainage collection facilities.

New Construction:

Structures for which the "start of construction" commenced on or after the effective date of these Regulations.

Original Tract:

A unit of land which the applicant holds under single or unified ownership, or in which the applicant holds controlling ownership and the configuration of which may be determined by the fact that all land abutting said tract is separately owned by others, not including the applicant or applicants; provided that where a husband and wife own contiguous lots, both such lots shall constitute the original tract.

Parcel:

Any portion, piece, or division of land. Fractional part or subdivision of block, according to plat or survey; portion of platted territory measured and set apart for individual and private use and occupancy.

Paved Road:

A road that has been treated or covered with asphalt to create an oil mat surface; a road that has a bituminous surface treatment, asphalt, or cement concrete surface.

Percolation:

The downward or lateral movement of water through soil under either saturated or unsaturated ground conditions.

Permanent Erosion Control:

Continuous onsite and offsite control measures that are needed to control conveyance and/or the deposit of earth, turbidity, or pollutants after construction or development.

Person:

An individual, partnership, corporation, or other legal entity.

Pothole Area:

An area that is or will be the ultimate destination of drainage and which has no outlet except for percolation or evapotranspiration from a tributary area greater than two acres.

Predevelopment Conditions:

The condition of real property in its natural, undeveloped state.

Private Drainage System:

A system that is totally owned and maintained by an individual, joint venture, partnership, corporation, or other legal entity.

Public Drainage System:

A system that is owned by the County or exists through accepted easements.

Recreational Vehicle:

A vehicular-type unit designed as a temporary living facility for camping or travel purposes; such as travel trailers, camping trailers, truck campers, mobile homes, etc., which can be moved from a site within one hour without changing or damaging the unit.

Residential Driveway:

A driveway which is used to provide access to a single family residence, a duplex on one lot, or two single family residences on separate parcels which use one access.

Retention:

The long-term storage of water onsite with the dissipation of said water into the ground by means of percolation.

Right-of-Way:

That area of land dedicated for public road uses including all road appurtenances, secured by the County or the public for purposes of public traffic, drainage, and/or franchised utilities.

Roadway Width:

The sum of the traveled way width and the shoulder width measured at its narrowest location.

Runoff:

That portion of the precipitation on a drainage area that is discharged in the form of overland flow from the area to downhill properties, watercourses, or pipe systems.

Runoff Coefficient or "C" Factor:

An empirical coefficient representing a proportional relationship between rainfall and peak rate of existing or future surface runoff for various surface conditions.

Safety Concern:

Geometric or design conditions on an existing, maintained City streets which do not meet the standards as outlined in the most recent version of the City Street Standards. The speed limit established by City ordinance for the road shall be used as a basis for analyzing the deficiency. If the road was built to the City or County standards at the time of construction in accordance with plans approved by the City or County Engineer, a geometric design condition which is within 5 miles per hour of the established speed limit of the road will not be considered a safety concern. It occurs within an impacted area of the project but does not include a site-specific traffic mitigating measure. A safety concern also includes road widths that do not meet the criteria found in the Appendix #21.

Sensitive Area:

Those areas designated by resolution or ordinance of the City of Lakewood City Council pursuant to Washington Administrative Code 197-11-908.

Short Plat or Short Subdivision:

As defined in the City of Lakewood Subdivision Code.

Shoulder Width:

The improved and maintained area between the edge of the traveled way and the point of intersection of shoulder slope with the foreslope or ditch slope.

Single Family Residential Structure:

A structure used to house one or two families, including appurtenant structures such as a garage, storage shed, or other structure not used for living purposes, all for the private, non-commercial use of the property owner or renter..

Site:

Any parcel or combination of contiguous parcels where grading, filling, clearing, or creation of an impervious surface is proposed, and which may be controlled by more than one property owner.

Site Development Plan:

Site development plans shall include the following, as specifically required by the City in each instance: Site plan, erosion and sedimentation control plan, grading plan, storm drainage plan, stormwater drainage control report, soils report, flood study, entering sight distance variances and verifications, and other documents required in the review of proposed development of the property.

Site Development Permit:

A permit issued by the City of Lakewood authorizing the applicant to access the property; fill, grade or create an impervious surface or any combination thereof.

Site-Specific Traffic:

That traffic generated by a development. This traffic volume(s) shall be used to determine measures necessary to mitigate significant impacts on the City's street system.

Slope:

An inclined earth surface, the inclination of which is expressed as the ratio of horizontal distance to vertical distance.

Soils Engineer:

A professional civil engineer, licensed by the State of Washington, and-experienced and knowledgeable in soils engineering.

Start of Construction:

Includes substantial improvement, and means the date the building permit was issued; provided the actual start of construction, repair, reconstruction, placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home/mobile home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundation, or the erection of

temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

Stockpiling:

The placement of material that will be removed within a six month period or material that is placed on the property of a licensed business for sale.

Storm Event:

A peak discharge flow that may be expected to be equaled or exceeded on the average within a specified time period expressed in years.

Structure:

A walled and roofed building, manufactured home/mobile home, gas or liquid storage tanks, or bridges that are principally above ground, or any other improvement that exceeds \$500.00 in value.

Subdivisions:

Any division or redivision of land into lots, tracts, parcels, or sites for the purpose of sale, lease, or transfer of ownership by formal plat, short plat, large lot division, or planned development district, or other subdivisional process.

Surveyor:

A professional land surveyor, currently licensed in the State of Washington and retained and acting for the Applicant.

Subdivision or Formal Plat:

As defined in the City of Lakewood Subdivision Code.

Substantial Improvement:

Any repair, reconstruction, or improvement of a structure, the cost or value of which equals or exceeds 50 percent of the market value of the structure:

1. Before the improvement or repair is started, or
2. If the structure has been damaged and is being restored, before the damage occurred. For the purpose of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.
3. The term does not include:

- Any project for improvement of a structure to comply with existing State or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions, or
- Any alteration of a structure listed in the National Register of Historic Places or State Inventory of Historic Places.

Temporary Erosion Control:

Onsite and offsite control measures that are needed to control the conveyance or deposit of earth, turbidity, or pollutants during construction or development, but may not be needed when the project is completed or when ground conditions have been stabilized by permanent erosion control measures.

Temporary Driveway:

A driveway that will not be in place longer than ninety consecutive calendar days.

Time of Concentration (T_c):

The longest time required for the surface runoff from the most remote part of the drainage basin to reach the discharge point. It is the assumed time of equilibrium at which the rate of runoff is equal to the rate of rainfall supply or hydrologic calculations by the rational method. The T_c time for a specific project will be the longest time required for the onsite surface runoff to flow offsite.

Traffic Impacted Area:

All public roads within an area which would be impacted by the proposed project.

Traveled Way:

The improved driving surface of the road normally used by the traveling vehicle.

Traveled Way Width:

The measured width of the improved and maintained driving surface measured at the narrowest location. It does not include improved areas specifically designated for such purposes as bikeways or shoulder areas.

Uniform Building Code (U.B.C.):

The most recent version of the Uniform Building Code adopted by the City of Lakewood.

Unit Hydrograph:

A graph of direct runoff resulting from one inch of rainfall for a given area in a specific drainage basin. Each watershed has a characteristic unit hydrograph which can be used to derive rain storm duration to show the peak discharge, total runoff, and distribution of the rainfall over that duration. The graph is applied to a given point in the specific drainage system.

Unopened Road:

A road or right-of-way that is dedicated to or otherwise owned by the City but is not constructed to the City standards in effect at the time of its acquisition, and is not maintained by the City.

Unpaved Road:

A road that consists of gravel, crushed surfacing top course, or other dirt surface that has not received a surfacing coat of asphalt. A road treated with only a dust preventative or dust treatment shall be considered an unpaved road.

Watercourse:

A river, stream, creek, or other course of flowing water which flows intermittently or perennially and discharges into another watercourse or body of water.

Watercourse Alteration:

Any man-made change in the alignment, geometric cross-section, channel capacity, or channel efficiency of a watercourse in an Area of Special Flood Hazard.

Water Dependent:

A water-dependent structure is one which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations. Water-dependent structures shall include, but not be limited to; bulkheads, docks, stairs and boathouses.

Wetland or Wetlands:

"Wetland" or "wetlands" means an area or areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities. However, wetlands include those artificial wetlands intentionally created to mitigate conversion of wetlands.

W.S.D.O.T. Specifications:

The requirements or standards of the latest edition of the Washington State Department of Transportation Standard Plans and Specifications.

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14.46.080 DEVELOPMENT STANDARDS

14.46.090 Basis of Analysis, Design and Construction Criteria

These Regulations and the City's review criteria are based on fundamental principles of drainage, hydraulics, hydrology, and environmental considerations and publications, manuals, or texts which are accepted by the professional engineering community. The engineer may base his or her work on such publications along with the design and review standards found in these Regulations. A partial listing of publications which may be used as reference documents are:

- A. "Highway Hydraulic Manual", formerly published by the Washington State Department of Transportation.
- B. "Urban Hydrology for Small Watersheds", Technical Release Number 55, with Appendix for Type 1A rainfall, published by the Soil Conservation Service, U.S. Department of Agriculture.
- C. "Soil Survey of Pierce County Area, Washington", published by the Soil Conservation Service, U.S. Department of Agriculture.
- D. "Construction and Water Quality, A Guideline to Recommended Practices for the Control of Erosion and Sedimentation on Construction Sites", published by the King County Conservation District.
- E. "Standard Plans for Road, Bridge and Municipal Construction", published by the Washington State Department of Transportation.
- F. "City Street Standards" Ordinance or the most recent amendment.
- G. "Storm Drainage Control Requirements and Guidelines", published by King County, Department of Public Works, Division of Hydraulics.
- H. "Applied Handbook of Hydrology", Chow.
- I. "Handbook of Hydraulics", E.F. Brater and H.W. King.
- J. "Standard Specifications for Municipal Public Works Construction", published by Washington State Chapter of American Public Works Association.
- K. Other storm drainage manuals, texts, or handbooks acceptable to the City and based on general use in the professional engineering community.

The latest edition of all publications shall be used.

14.46.100 Storm Drainage

A. Storm drainage control will be required as a part of all site development proposals. The determination as to whether or not a formal drainage plan will be required will be made by the City Engineer on a case-by-case basis.

B. Drainage Analysis Requirements

1. Design Storm Event: The selection of a storm frequency event for the design of a project's storm drainage system and selection of a design release rate for a detention system are to be based on the magnitude of impact or damage that might occur in the event of drainage failure or overtopping due to insufficient capacity of the system for a particular storm event. The selection of a storm frequency for a release rate affects downstream properties, while the selection of a storm frequency for the project's onsite conveyance system would generally only affect a particular site. The intent in selecting a storm frequency is to minimize impact or potential damage to downstream properties as well as the project site itself. The following chart will be used to determine the applicable storm frequency event:

PROJECT SITUATION (Public or Private)	STORM FREQUENCY
Project's internal drainage system	25 year
Conveyance System for drainage courses ²	100 year
Detention basin and release structure design where the release is into a defined drainage system or drainage course with sufficient capacity	50% of two year predeveloped release in two year storm event; ten year predeveloped release in ten year storm event; 100 year predevelopment release in 100 year storm.
Detention basin and release structure design when the release is into a drainage course or system with inadequate capacity or in which the City is involved in litigation or when the calculated release rate is in excess of 1 cfs and may cause a downstream drainage problem.	Release and storage to be established by the City dependent on conditions. Multiple orifice release structure may be required.
Detention basin and release structure design when the release is into an undefined downstream drainage course.	2 year release with dispersion trench and 25 year equations for storage.
On-site retention system.	25 year storage with overflow provision. 100 year storage with no overflow provision.
Release rate directly to a pothole area with no adverse impact to adjacent properties: <ul style="list-style-type: none"> • Pothole entirely within project boundary, or • Drainage release obtained from all property owners adjacent to pothole. 	No detention required.
Release rate to a pothole area totally or partially offsite.	See Subsection 7.

²The intent is that if an undeveloped condition, the drainage course passes a 100-year storm, and the City has determined that the natural drainage courses can be altered, then 100-year conveyance system must be provided that will not cause a restriction and cause increased ponding upstream. Existing restrictions in a drainage course must be left if required by City.

2. **Field or Aerial Topographical and Survey Work:** To accurately determine existing ground conditions, a field survey must be done by the engineer or a professional land surveyor. Field topo must be done for all drainage plans for public and private drainage systems. Low points and swales must be accurately located so that invert elevations for cross culverts can be provided on the plan. Invert elevations, flow lines, existing surface water elevations, etc., shall be required to depict existing drainage conditions. All existing utilities and utility easements on the parcel and within adjacent City rights-of-way must be accurately located and shown on the site development plans.

City of Lakewood vertical datum shall be used. City of Lakewood vertical datum is based on the United States Coast and Geodetic Survey datum. The City of Lakewood bench mark elevation, location, and designation must be shown on the plans. Elevation equations shall not be used.

Bench marks or use of vertical datum will not be required for drywell systems that only serve individual residential structures.

3. **Multiple Orifice Release Rate and Corresponding Storage Volume Requirements:** When downstream drainage courses are inadequate or systems are undersized, or when in the opinion of the City, property or properties may be adversely affected by the existing and/or proposed stormwater release rate or when the calculated release rate is in excess of one cfs, a restricted release rate smaller than a two year storm event may be required. The release rate will be approved by the City and must be compatible with downstream drainage conditions. If a restricted release rate is required, the Applicant may correct and/or improve downstream drainage conditions so that the proposed release rate does not have to be further restricted. A multiple orifice release rate structure design which is approved by the City will be used to control the discharge from the drainage system. When a restricted release rate is used, a corresponding increase in storage must be provided based upon the volume equations found in the Appendix.
4. **Discharge to Downstream Property with No Established Drainage Course:** When an uphill parcel of property is proposed for development and no well-established drainage course exists onto the downstream or adjacent property or properties, a restricted release rate will be required. A dispersion trench will be required

at the outlet of the proposed system. Onsite retention systems or the obtaining of drainage easements from the downstream property owner or owners must be attempted before proceeding with a detention/dispersion design. The City must be contacted for written approval before proceeding with the detention/dispersion system design. The dispersion trench must be one foot long for every five feet of property line lying on the downhill side. The trench must be set back from the property line twenty feet and run parallel to the existing contours.

5. Discharge to Major Watercourses: Direct discharge of stormwater runoff into Puget Sound, major lakes or rivers, and in some cases, major wetland areas may be approved by the City if the City determines no adverse physical or environmental impact is likely to occur. The City must be contacted to obtain written approval for direct discharge before design of the project commences. In certain situations oil/water separators or biofiltration swales may be necessary for water quality purposes.

6. Discharge to a Public Storm Drainage System: When a proposed project will discharge stormwater into a public storm drainage system, a standard restrictor/oil pollution control device must be installed as the last structure of the onsite pipe network.

The structure may be located on either private or public property. If located on public property, the rim must be set to the elevation of the shoulder with three riser sections.

7. Discharge to a Pothole Area: When a proposed development is contributory to a pothole area, the engineer will be required to determine the 100-year flood elevation for the pothole area. Direct discharge to the pothole will be allowed if a drainage easement is obtained from all the property owners within the pothole, or the pothole is wholly within the Applicant's property.
 - a. If the pothole is offsite and drainage easements cannot be obtained, discharge to a pothole may be allowed up to a maximum volume of stormwater generated by each storm frequency; i.e., 2, 5, 10, 25, 50, 100 in the natural undeveloped condition of the parcel. The difference between the undeveloped and developed stormwater volume for the 100 year storm must be retained onsite.

- b. A multiple orifice must be installed to simulate undeveloped flows for the 2, 5, 10, 25, 50, and 100-year storm frequencies.
- c. If discharge from the orifice structure is not to a defined drainage channel, a dispersion trench will be required.
- d. Two methods of analysis can be used to determine the volume of water that will be developed within the pothole tributary area for Part One of the pothole analysis.
- e. One method utilizes the Soil Conservation Service (SCS) publication, "Urban Hydrology for Small Watersheds", Technical Release Number 55 with appendix for Type 1-A rainfall, to determine the volume of water that will be developed by the tributary area. Using this method, Table 2-1 can be used to determine the actual direct runoff in inches (Q) for a particular rainfall. Curve numbers (CN) shall be based on Table 2-2a of the most recent version of the "Urban Hydrology For Small Watersheds," published by the Soil Conservation Service. The total volume can be determined using the formula:
- f. Total volume (in cubic feet) - $3,630 \text{ ft}^2/\text{acre-inch} \times Q(\text{inches}) \times A(\text{acres})$. The CN number may be based on the existing condition of the tributary area. Existing retention system volumes may be subtracted from the pothole volume.
- g. The second method utilizes the 100-year, 24-hour storm event isopluvial chart to determine the volume of water that will be developed by the tributary area. Using this method of analysis, it will be assumed that the total amount of rainfall from the 100 year, 24 hour storm event will accumulate in the pothole. A copy of this chart is found in the Appendix.
- h. For Part Two of the pothole analysis which determines the impact of the calculated runoff on the pothole area, the City may require the engineer or a professional land surveyor to provide cross sections derived from field topography work to verify the available storage volume in the pothole area and may also require that the calculated 100-year flood elevation be surveyed in the field to accurately locate that line.
- i. The 100-year flood elevation must be accurately and clearly shown on the drainage plan, if applicable, the project's site

plan, and appropriately dimensioned and tied to the project's boundary lines or lot lines. An onsite temporary bench mark must be established on the project site by the engineer or a professional land surveyor and the elevation and location identified on the site plan.

- j. The pothole analysis must contain a description of the pothole area including vegetation, duration of standing water, land use, structures, etc. All lowest finished floor elevations for structures in or within 50 feet of the 100-year flood elevation must be identified.
 - k. When the existing pothole has no evidence of water in it and the soils are in the SCS Hydrologic Soil Grouping "A" or "B," with a minimum depth of four (4) feet over the entire pothole area, 75% of the total volume of water from Part 1 of the pothole analysis must be stored in the pothole area using the existing natural ground line as the starting point for the calculation of the 100-year flood elevation.
8. Situations when onsite retention is required or acceptable: A retention system must be used when soil and topographic conditions are conducive to such a design. A retention system may be required by the City based upon any one of the following conditions:
- a. The existing soils must not show evidence of high-water table within the design limits of the system either through observation or mottled soil conditions by actual soil logs.
 - b. A storm sewer system or natural drainage course does not exist on or adjacent to the project that would provide a positive outfall for the water. In some situations, a positive outfall may be available with limited capacity and the City will require onsite retention with outflow out of the system on an overflow basis.
 - c. A retention system can be adequately maintained and will not be subject to abnormal erosion or siltation problems that would render it ineffective.
 - d. When required by agencies such as the Washington State Department of Fisheries, Washington State Department of Ecology, etc., or when environmental considerations require

that disposal of stormwater runoff shall be by way of a retention system rather than discharging into an environmentally sensitive stream, lake or salt water area.

9. Situations when onsite retention cannot be used:
 - a. When agencies such as the Tacoma-Pierce County Health Department, Washington State Department of Social and Health Services, or the Department of Ecology prohibit its use.
 - b. When soils conditions and/or groundwater elevations limit retention design.
10. Soils Information and Soils Logs: Percolation rates shall be established using the E.P.A. (Environmental Protection Agency) Design Manual for On-Site Waste Water Treatment and Disposal Systems, specifically Chapter Three or the most current procedure accepted by the Tacoma-Pierce County Health Department. Soil logs must be dug at the location of the proposed percolation system and must be a minimum of one foot deeper than the limits of the percolation system. A minimum of one soil log per trench system up to seventy-five lineal feet in length and one soil log for each seventy-five feet of trench thereafter or one soil log per each one thousand square feet of retention floor area shall be required. Elevations for the soil logs must be shown and must correspond to the bench mark elevation established for the project.

In lieu of complying with the above paragraph, random soil logs dug at various locations over the entire parcel or parcels that show consistent soil classification over the parcel or parcels will allow the engineer to verify the actual soil types at the location of percolation trenches upon construction of the trenches. The observed soil types must be included in the letter of certification and must substantiate the percolation rates used in the design of the stormwater facility.

The maximum percolation rate that can be used for design purposes is three minutes per inch and the minimum permissible percolation rate is fifteen minutes per inch for public systems and thirty minutes per inch for private systems. Wet season , high water level information must be included as part of the design

information.³ The soil classification results, percolation tests, and corresponding site plan information shall be stamped and signed by the engineer. Retention systems shall not be installed in fill material and must be placed only in native material unless approved by the City upon submittal of information by the engineer which shows that the fill material exhibits conditions similar to the natural ground conditions.

A minimum of one foot of separation must be provided between the bottom of the percolation system and the normal water table or impermeable soils.

11. Positive Outflow: A positive outfall pipe may be required to be extended to the perimeter of the subdivision when the City has determined the location and grades of a future trunk storm sewer system.
12. Handling of Offsite Runoff
 - a. A development which encompasses a drainage course should convey the offsite water through the proposed site off-line from the onsite storm drainage system. The offsite water should be routed through the project site in its natural, undisturbed condition.
 - b. If piping or placing the offsite runoff in an artificial channel or system has no detrimental environmental or design effect, as certified by the engineer, the natural drainage may be rerouted around the project's onsite storm drainage system. Existing travel times, storage capacity, and other predeveloped conditions must be retained.
 - c. The City may allow the offsite runoff to be directed through the project's storm drainage system if it is shown that a separate system is not possible from a design aspect. A conceptual storm drainage plan shall be approved by the City prior to the design of such a system.
 - d. A runoff factor ("C" factor) shall be used that would reflect the maximum allowable development of the upstream

³The wet season for determining high water levels will normally be from January through April, unless conditions warrant modifications determined by the City.

tributary area as allowed by the existing Zoning Code for the design of a conveyance system. The entering and exiting flowline elevations, flow velocities, and volumes for the conveyance system must remain essentially the same before and after development.

- e. When it is not possible to convey the offsite runoff around the proposed detention system in its natural condition, or through a separate system, the orifice sizing for the detention system must be sized for a runoff rate that would occur from the site itself in its natural, predevelopment condition.
- f. Offsite runoff must be passed through the system as overflow and need not be taken into account in sizing the orifice, but must be incorporated into the design of the overflow, outflow and freeboard systems. The offsite area must be assumed to be in a fully-developed condition as allowed by the current Zoning Code.
- g. When it is not possible to convey the offsite runoff around the proposed retention system in its natural condition or through a separate system, the retention system must be designed to also accommodate the offsite runoff. The storm drainage study must be supplemented with a map showing the soils classifications for the tributary runoff area.
- h. When fill material has been placed on land that is relatively flat, ditching, pipe system or combination of both must be provided at the toe of the embankment to eliminate any ponding or drainage disruptions to adjacent properties.
- i. "C" Factors: "C" factors or runoff coefficients found in the Appendix shall be used for all storm drainage design calculations. For new development, a "C" factor which represents the property in its natural condition shall be used for design purposes even though a parcel of property may have been logged, cleared, and graded.
- j. Pipe sizing for new driveway culverts will be based on a "C" factor to reflect the maximum allowable development of the upstream tributary area as permitted by the existing Zoning Code.

14. Determination of Predeveloped Runoff Rates
 - a. Rational Method - The Rational Method utilizing the formula, $Q = CIA$, may be used for determining peak runoff rates for tributary runoff areas up to two hundred acres.
 - b. SCS Method - The Soil Conservation Service Method (SCS Method) should be used for contributing runoff areas in excess of two hundred acres. The methodology shall follow SCS Technical Release No. 55, "Urban Hydrology for Small Watersheds" for a Type 1-A rainfall.
15. Rainfall Intensity Charts: Pierce County's unusual geography creates a wide range of rainfall patterns which results in very different intensity levels throughout the County. Based on isopluvial charts, there are five different rainfall intensity zones in the County. These zones are found on the map titled "Rainfall Intensity Zones" in the Appendix.
16. Storage Volume and Release Rate Calculations: A number of methods are acceptable to calculate the required storage volumes necessary for storm drainage detention/retention systems. Any increase in the developed stormwater runoff rate above the predevelopment or existing runoff rate must be stored and released at a restricted rate either through surface discharge or through percolation. The following methods can be used to calculate the corresponding storage volumes necessary:
 - a. Soil Conservation Service Method (SCS Method) - The Soil Conservation Service Method is applicable to all watershed sizes and should be used when the tributary runoff area exceeds approximately two hundred acres as it produces more realistic values for larger tributary areas than does the Y and W Method. The publication, "Urban Hydrology for Small Watersheds," Technical Release No. 55, Soil Conservation Service for a Type 1-A storm, should be used for this methodology and associated values.
 - b. Unit Hydrograph Method - The Unit Hydrograph Method for storage volume calculations is based on the assumption that the area under the curve is equal to the volume of direct runoff resulting from one inch of effective rainfall. It is assumed that the rainfall is uniform throughout the area and

the rainfall intensity is constant during each interval of the storm.

17. Natural Buffer Area (N.B.A.): N.B.A.s may be required to protect drainage courses from erosion and pollutants. Engineering data must be submitted by the engineer documenting that the intended natural buffer area is undisturbed, and that the native vegetative cover, together with its root structure, is substantially preserved. A covenant must be placed on the plat or recorded with the County Auditor that will run with the land and provide for the perpetual preservation of the natural buffer area. The property owners are responsible for the preservation of the natural buffer area.

The effectiveness of natural buffer areas as pollution and erosion control measures is directly related to the condition of the soil surface and can be protected only where native vegetative cover such as salal, ferns, or forest duff is preserved intact. Traffic (pedestrian, vehicular, and animal) must be kept to an absolute minimum to protect and preserve the native vegetation and root structure. Mowed lawns and/or grazed pastures are not suitable for N.B.A.s

Utilities, roads, septic tank drainfield areas, and reserve drainfield areas are not permitted in natural buffer areas.

Natural buffer widths must be 25 feet minimum on each side of the centerline of the drainage course.

One hundred foot wide N.B.A.'s will be required adjacent to all wetlands, as documented in the Pierce County Wetland Atlas, except as allowed under these Regulations.

18. Conceptual Storm Drainage Plan: In certain situations, a conceptual storm drainage plan will be required before the project is given preliminary approval. Usually this will be applicable to formal plats, or as part of an environmental statement or study, but it could also apply to commercial projects such as mobile home parks, Planned Development Districts, Binding Site plans, and short plats and large lot divisions. A conceptual storm drainage plan will be prepared by the engineer and must show that it is feasible to mitigate all storm drainage impacts associated with the project. The report must describe the methods or improvements that will be used to negate the drainage or flooding problems and the land area that may be lost due to storm drainage problems.

A conceptual storm drainage plan will be required when the proposed site has substantial drainage problem(s) that may not be economically overcome in the development of the property, or when the Applicant may have to delete lots or increase average lot area, or when the Applicant may be required to construct expensive conveyance structures, retention or detention systems, or downstream improvements if the property is to be developed. Development in a sensitive area may require a conceptual storm drainage plan to show that the sensitive area will not be adversely affected by stormwater runoff and that storm drainage related environmental requirements can be met by the Applicant.

19. Energy Dissipation: Energy dissipation is required at all outlet structures where storm drainage is released to a natural drainage course. Water velocities shall be set at such a rate that erosion will not occur. Energy calculations shall be submitted along with an appropriate design such as riprapping, stilling basins, drop structures, etc. Riprapping size and apron size shall be in accordance with the chart(s) found in the Appendix.
20. Approach Drainage: Where an approach is to be constructed across an existing drainage ditch or course, or at a location where a ditch should exist, a culvert that is adequate to handle stormwater shall be installed. A minimum 12-inch concrete culvert pipe shall be installed when determined necessary by the City. If required by the City, the Applicant shall submit contributing area mapping and drainage calculations done by a professional engineer and shall construct all necessary drainage facilities to handle all on-site and off-site flows.
21. Curtain Drains: Curtain/French drains which collect groundwater shall not discharge directly into City rights-of-way.
22. Separation of Storm Drainage Retention or Open Detention Systems, Sanitary Drainfield Systems and Wells: A minimum separation shall be maintained between the extremities of all storm drainage retention or open detention systems and sanitary sewer infiltration systems as required by the requirements of the Tacoma-Pierce County Health Department.

Retention and detention ponds, including drywells, shall not be located within the designated well protection radius.

23. Drywells: Lots in plats not draining to a storm drainage collection system and which are considered "small", per Subsection 3.02.A of these Regulations, will require design and construction of a drywell facility for the individual building on the lot.

The drywell must be designed prior to approval of the plat and constructed prior to the final inspection of the structure.

Applicants for building permits on parcels located in sensitive areas will be required to install drywells to control the runoff from all proposed impervious surfaces. The drywell must be designed by a licensed engineer or the Applicant may use the design found in the Appendix.⁴

Prior to approval of the drywell plan, in a sensitive area, a financial guarantee must be submitted to the City to guarantee the proper construction of the drywell.

The applicant may choose to have a private engineer or the City inspect the drywell. If the City does the inspection, a drywell permit must be obtained from the City of Lakewood Planning Department and the applicable fees paid.

Prior to final inspection of the structure, the drywell construction must be certified as set forth in Section 4.02.D, by the engineer or accepted by the City.

24. Storage volume shall be based upon a twenty-five year storm event and the release rate shall be equivalent to a two-year storm event in an undeveloped condition.

If the time of concentration (TC) of the undeveloped parcel is greater than thirty minutes, the computation of storage volumes shall be based on the unit hydrograph method.

Within that portion of the watershed described in the Appendix, no stormwater drainage facilities, culverts, or outlet pipes shall be allowed or approved near or at the top of any steep slope conditions. All drainage water shall be directed to a point at or near the toe of the slope and energy dissipation facilities shall be included for dispersion and dissipation of energy.

⁴The drywell plan found in the Appendix is only for use in sensitive areas. All drywells required for plats must be designed by an engineer.

14.46.110 EARTHWORK

A. Excavation Standards

1. Cut Slopes: Slopes shall be no steeper than is safe for the intended use and shall not be steeper than 2 horizontal to 1 vertical, or as recommended by a soils engineer.
2. Set Back From Property Lines:

<u>Cut Depth</u>	<u>Set Back Distance</u>
Under 5 Feet	2 Feet
5 - 20 Feet	Height/2
Over 20 Feet	10 Feet

B. Fill Standards

1. General: Fills which are intended for building sites shall be constructed in conformance with the requirements of the latest edition of the U.B.C., as adopted by the City of Lakewood, and an assignment of allowable soil-bearing pressures will be under the jurisdiction of the City Building Official in accordance with the U.B.C.
2. Fill Location: Slopes shall be no steeper than is safe for the intended use and shall not be steeper than 1-½ horizontal to 1 vertical, or as recommended by a soils engineer. Fill sites must be approved by the engineer as suitable locations for the proposed fill.
3. Preparation of Ground: The ground surface for fills over five feet in height shall be prepared by removing vegetation, noncomplying fill, topsoil, and other unsuitable materials; scarifying to provide a bond with the new fill; and, where existing slopes are steeper than 5 horizontal to 1 vertical, by benching into competent material as determined by the engineer. The bench under the toe of a fill on a slope steeper than 5 horizontal to 1 vertical shall be at least 10 feet wide, or as recommended by a soils engineer.
4. Fill Material: Except as permitted by the City, no material other than earth material shall be buried or placed in fills. Placement of other than earth-material is regulated by state statutes or federal laws, and additional permits may be required.
5. Slope Stability: Fills shall be constructed using earth materials, compaction methods, and construction techniques so that stable fills are created.

6. Setback from Property Lines: The toe or catch point of fill slopes shall be set back from the site boundary line in accordance with the following table unless a retaining wall is designed by the engineer and constructed for the project:

<u>Fill Depth</u>	<u>Set Back Distance</u>
Under 5 Feet	2 Feet
5 - 40 Feet	Height of Fill/2"
Over 40 Feet	20 Feet

C. Soil Engineering-Geology Report

When, in the opinion of the City Engineer, onsite conditions or the proposed work involve slide-prone or unstable soils, the Applicant shall be required to retain a soils engineer to prepare a report that includes data regarding the nature, slide potential, soil bearing capacity, and slope stability of existing soils; conclusions and recommendations for grading procedures and design criteria for corrective measures when necessary; and opinions and recommendations covering adequacy of sites to be developed. The report shall be stamped and signed by the engineer. Recommendations in the report shall be incorporated in the proposed plans or specifications.

14.46.120 EROSION CONTROL

- A. Filter-fabric fences or lined berms can serve as temporary erosion control measures. Fences and dikes should be constructed running parallel with the contour lines. Intermediate berms/fences may be needed where long travel paths, moderate and steep slopes, and/or concentration of runoff cause flow velocities to exceed velocities allowed by the chart entitled "Design Velocities for Vegetated Channels".
- B. Where flow velocities and volumes exceed those which can be satisfactorily accommodated by dikes, berms, and/or filter-fabric fences, more sophisticated measures will be required. Normally, this will mean a siltation pond with appropriate release structures.
- C. Slopes must be prepared and maintained to control erosion. Slope protection must be installed immediately upon achieving final grade or as soon as weather permits. Where cut slopes are not subject to erosion, due to the nature of the materials, such protection may be omitted.
- D. Erosion facilities must be designed and installed that will protect adjacent properties, natural drainage courses, wetlands and storm drainage facilities during site development and home building phase.

14.46.130 FLOODPLAIN

A. Bases For Establishing the Areas of Special Flood Hazard

The Areas of Special Flood Hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for Pierce County," dated August 19, 1987, with accompanying Flood Insurance Rate Maps (FIRM) and floodway maps are hereby adopted by reference and declared to be a part of these Regulations.

The Flood Insurance Study and Maps provide the base information used in the administration of these Regulations. Where the Flood Insurance Study, FIRM, and floodway maps do not provide adequate, best, or most recent information, Pierce County may consider and interpret information from the Army Corps of Engineers, Department of Housing and Urban Development or other qualified person(s) or agencies to determine the locations of flood hazard areas.

The Flood Insurance Study is on file at the Pierce County Public Works Department, 2401 South 35th Street, Tacoma, Washington.

B. Warning and Disclaimer of Liability

The degree of flood protection required by these Regulations is deemed to be reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur. Flood heights may be increased by man-made or natural causes. These Regulations are not meant to imply that land outside the Areas of Special Flood Hazard or uses permitted within such areas will be free from flooding or flood damages. These Regulations create no liability on the part of the City of Lakewood, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that may result from the administration of these Regulations or any administrative decision lawfully made hereunder.

C. Use of Other Base Flood Data

When base flood elevation data has not been provided in accordance with Section 3.05.A, "BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD," the City shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a federal, state, or other source, in order to administer these Regulations.

D. Alteration of Watercourses

The City will notify adjacent communities and the Washington State Department of Ecology prior to any alteration or relocation of a watercourse proposed by the Applicant and submit evidence of such notification to the Federal Insurance Administration.

The City shall require that maintenance is provided within the altered or relocated portion of said watercourse, so that the flood-carrying capacity is not diminished.

The Engineer shall certify that the development will not result in any watercourse alteration which diminishes the capacity of the watercourse, raises the base flood elevation, or causes an adverse effect on adjacent, cross-channel, upstream, or downstream property owners.

E. Interpretation of Firm and Floodway Boundaries

The City may make interpretations, where needed, as to the exact locations of the boundaries of the Areas of Special Flood Hazard. When there is a conflict between the elevations and the mapped floodplain boundaries, the elevations shall govern.

The floodway boundaries are the mapped boundaries which are mathematically generated from flood model studies. FIRM maps were prepared to facilitate floodplain management for flood insurance purposes and may not show all detailed features in the floodplain which may be necessary for a specific site analysis.

Where there is insufficient information shown on the FIRM or flood hazard maps, the City may require the Applicant to verify that the site is out of the floodplain or floodway.

F. Map Corrections

Map corrections for the National Flood Insurance Program shall be in accordance with the most recent edition of Federal Regulation, Section 70 CFR.

G. Construction Materials and Methods

All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

Electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities shall be designed and/or elevated or located to prevent water from entering or accumulating within the components during conditions of flooding.

H. Utilities

All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems.

New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters.

Onsite waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

I. Developments

All subdivisions shall be consistent with the need to minimize flood damage.

All subdivisions shall have their access road(s) and public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.

All subdivisions shall have adequate drainage provided to reduce exposure to flood damage.

New developments in "A" zones, greater than 50 lots or five acres (whichever is less), shall calculate the base flood elevation and show the limits on the plat map.

Where base flood elevation data is not available, it shall be generated by the Engineer for subdivisions and other proposed developments when required by the City.

Base flood data and flood hazard notes shall be shown on the plat or development document including, but not limited to, the elevation of the existing ground, flood water depth, lowest permissible floor elevations, and the boundary of the base flood and floodway through the subdivision when required by the City.

New subdivisions in "B" Zones with existing structures on all lots will not require a Floodplain Development Permit. Future development of any of the lots will require compliance with this ordinance.

J. No Established Base Flood Elevation

Where elevation data is not available through the Flood Insurance Study or other authoritative sources, applications for building permits or development shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment, and includes use of historical data, high water marks, photographs of past flooding, etc., where available. Failure to elevate at least two feet above the grade in these zones may result in higher insurance rates.

K. Specific Standards

In Areas of Special Flood Hazard where base flood elevation data has been provided, the following provisions are required:

1. Residential Construction: New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated one foot above base flood elevation and two feet above base flood elevation for structures adjacent to major water courses.

Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or must meet or exceed the following minimum criteria:

- a. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
- b. The bottom of all openings shall be no higher than one foot above grade.
- c. Openings may be equipped with screens, louvers, or other covering or devices provided that they permit the automatic entry and exit of floodwaters.

2. **Manufactured Home/Mobile Homes:** All manufactured homes/mobile homes to be placed or substantially improved within all "A" Zones and "B" Zones shall be elevated on a permanent foundation such that the lowest floor of the manufactured home/mobile home is one foot above the base flood elevation and two feet above the base flood elevation for structures adjacent to major water courses and is securely anchored to an adequately anchored foundation system in accordance with the provisions of Section 3.05K.7. This paragraph applies to manufactured homes/mobile homes to be placed or substantially improved in a new or an expansion to an existing manufactured home/mobile home park or subdivision. This paragraph does not apply to manufactured homes/mobile homes to be placed or substantially improved in an existing manufactured home/mobile home park or subdivision except where the repair, reconstruction, or improvement of the streets, utilities, and pads equals or exceeds 50 percent of the value of the streets, utilities, and pads before the repair, reconstruction, or improvement has commenced.

The exemption to the requirement for constructing the lowest floor of the manufactured home/mobile home one foot/two feet above the base flood elevation in an existing manufactured home/mobile home park or subdivision expired on August 1, 1989, unless extended by the Federal Emergency Management Agency.

3. **Elevating By Fill, Pilings and Diking:**
 - a. No filling or grading shall be permitted which increases flood hazards, water velocities, or flood elevations. Compensatory storage volumes may be required.
 - b. Armoring protection such as rock riprap or bulkheads shall be constructed to protect filled areas when water velocities exceed two feet per second. All armoring protection shall be elevated at least three feet above the base flood elevation.
 - c. All construction elevated by piling must be designed by a professional structural engineer and approved by the City prior to construction.
4. **Nonresidential Construction:** New construction and substantial improvement of any commercial, industrial, or other nonresidential structure shall either have the lowest floor, including basement, elevated at least one foot above the base flood elevation and two feet above the

base flood elevation for structures adjacent to major water courses; or, together with attendant utility and sanitary facilities, shall:

- a. Be floodproofed to the elevations noted above, so that below those elevations the structure is watertight with walls substantially impermeable to the passage of water.
 - b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
 - c. Be certified by a registered professional engineer that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this Section based on the development and/or review of the structural design, specifications, and plans. Such certifications shall be provided to the official as set forth in Section 4.02.D.
 - d. Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in Section 3.05.K.4.
 - e. Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g., a building constructed to the base flood level will be rated as one foot below that level).
5. Critical Facilities: Critical facilities shall be to the extent possible located outside the limits of the 100-year floodplain as identified on the FIRM. Construction of new critical facilities shall be permissible within the 100-year frequency floodplain if no feasible alternative site is available. Critical facilities constructed within the 100-year frequency floodplain shall have the lowest floor elevated to three or more feet above the level of the 100-year frequency flood. Flood proofing and sealing measures must be taken to insure that toxic substances will not be displaced by or released into floodwaters.
- Access routes elevated to or above the level of the 100-year frequency flood shall be provided to all critical facilities.
6. Access Requirements: Private roads and access easements, where allowed, to all new construction or development shall be elevated to within one-half foot of the base flood elevation when water velocities are two feet per second or less. All other private roads and all public or future public roads must be armored and elevated one foot above the base

flood elevation. Parking lots are not considered as private roads or access easements.

7. Anchoring:

- a. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.
- b. All manufactured homes must likewise be anchored to prevent flotation, collapse, or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference Federal Emergency Management Agency "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques).

8. Maintenance: The City may require that flood control work done in an Area of Special Flood Hazard be accompanied by a perpetual maintenance agreement or that the improvements be dedicated to a public agency when other public dedications are involved with the development. All documents shall be recorded with the Pierce County Auditor's Office, and the Applicant shall provide title insurance when required by the City.

All facilities dedicated to the City shall be constructed to current City construction standards.

L. Floodways

A floodway is an extremely hazardous area due to the height and/or velocity of flood waters which carry debris, potential projectiles, and erosion potential. Encroachments, filling, new construction, and substantial improvements shall be prohibited except as follows:

1. Work done by or for a public agency or utility; such as bridges, flood control works, revetments, retaining walls, drainage structures, or other structures necessary to promote the public's health, safety, and welfare when the improvements do not obstruct the floodway, increase the water surface elevation more than one foot, or cause an adverse impact to adjacent, cross-channel or downstream properties, and the improvements utilize appropriate flood hazard protection standards.

Certification by a registered professional engineer is required to verify that the proposed work shall not result in any increase in flood levels during the occurrence of the base flood discharge.

2. Agricultural uses or recreational facilities that do not require the installation of utilities or structures.
3. Repairs and/or interior remodels (which are not substantial improvements), to a structure that do not increase the ground floor area or overall square footage of the structure.

M. Major Watercourses

Development within an Area of Special Flood Hazard for a major watercourse is not permitted unless flood control improvements are constructed to standards established by Pierce County River Improvement or Inter-County River Improvement and accepted by them for maintenance. Construction of additional improvements, such as access roads, may also be required. The City may require the Applicant to supply title insurance for all dedications made to the City of Lakewood.

N. Coastal High Hazard Areas

Located within Areas of Special Flood Hazard are Coastal High Hazard Areas, designated as Zones V1-V30, VE and/or V. These areas have special flood hazards associated with high velocity waters from tidal surges and, therefore, in addition to meeting all provisions in these Regulations the following provisions shall also apply:

1. Elevation Standards: All new construction and substantial improvements in Zones V1-V30 and VE (V if base flood elevation data is available) shall be elevated on piling and columns so that:
 - a. The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated a minimum of one foot above the base flood level; and
 - b. The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one percent chance of being equaled or exceeded in any given year (100-year mean recurrence interval).

A registered professional engineer shall develop or review the structural design, specifications and plans for the construction and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of 1. and 2. above.

2. **Elevation Certification:** An engineer or land surveyor shall provide the City with the elevation (in relation to mean sea level) of the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures in Zones V1-30 and VE, and whether or not such structures contain a basement.
3. **Location:** All new construction shall be located landward of the reach of mean high tide.
4. **Clear Space Below Finished Floor:** Provide that all new construction and substantial improvements have the space below the lowest floor either free of obstruction or constructed with nonsupporting breakaway walls, open wood lattice work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purpose of this Section, a breakaway wall shall be designed for a safe loading resistance of not less than 10 and no more than 20 pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by local or State statute) may be permitted only if a registered professional engineer certifies that the designs proposed meet the following conditions:
 - a. Breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and
 - b. The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and nonstructural). Maximum wind and water loading values to be used in this determination shall each have a one percent chance of being equaled or exceeded in any given year (100-year mean recurrence interval).
5. **Breakaway Walls:** If breakaway walls are utilized, such enclosed space shall be usable solely for parking of vehicles, building access, or storage. Such space shall not be used for human habitation.

6. Fill: Prohibit the use of fill for structural support of buildings.

14.46.140 Driveways

A. General Information

1. Driveway locations must be marked either at the edge of the asphalt road by a spray painted arrow or by a stake with flagging at the back of the ditch, within five working days after application for development permits.
2. Lots of record in existing formal plat subdivisions, short plats and large lots not served by a minor or major driveway shall be permitted a minimum of one residential driveway.
3. Gates on residential driveways must be set back from the right-of-way line a minimum of twenty feet. Gates on private roads served by minor or major driveways must be set back from the right-of-way line by a minimum of sixty feet.
4. All driveway locations must be shown on the plat mylars and/or on the site development plans. Residential driveway locations for lots in formal plats are not restricted to any location unless so noted on the plat mylar.

B. Residential Driveways

1. Residential driveways shall be constructed the maximum practical distance, but in no event, less than thirty-five feet or the posted speed limit in feet, whichever is greater, from a side street or intersection. The distance is measured from the road right-of-way line to the nearest edge of the driveway.
2. Wherever a potential access exists to any property from both a local access road and a road of a higher classification, the City shall refuse access to the higher classified road for residential uses.
3. All residential driveways which serve two lots or a duplex on one lot must be constructed to the maximum width as specified in the Appendix.

C. Minor Driveways

1. Minor driveways must be located a minimum of 125 feet from a side street or intersection except where physical site conditions and spacing of existing driveways may cause the City to require another location. The 125 feet is measured along the property line from the right-of-way of the perpendicular street to the edge of the driveway. New driveways that would create a four-legged intersection are undesirable unless the existing City street has an arterial classification, or if a stop condition to the City street exists. Access to a corner lot with a frontage less than 155 feet in width will be established on a case-by-case basis by the City and the driveway(s) shall be placed at such a location to maximize safety.
2. Wherever a potential access exists to any property from both a local access road and a primary road of a higher classification, the City may refuse access to the higher classified road for residential uses.
3. Wherever a potential access exists to any property from both a public road and a private easement, the City may refuse access to the public road.
4. New driveway locations created by the platting of property shall be unified whenever possible to create the fewest number of accesses onto a City street.
5. Spacing of minor driveways shall be 300 feet (centerline to centerline) for arterial roads and 200 feet for local roads. The City may be more restrictive in the number and location of minor driveways based on the volume and type of traffic generated by the development, other driveways in the vicinity of the proposed approach, the amount of lot frontage along the City street, and channelization/traffic control on the City street.

D. Major Driveways

1. Major driveways shall be located a minimum of 125 feet from a side street or intersection except where physical site conditions and spacing of existing driveways may cause the City to require another location. The 125 feet is measured along the property line from the right-of-way of the perpendicular street to the edge of the driveway. New driveways that would create a four-legged intersection are undesirable unless the existing City street has an arterial classification or if a stop condition to the City street exists. Access to a corner lot with a frontage less than 155 feet in width will be established on a case-by-case basis by the City and the driveway(s) shall be placed at such a location to maximize safety.

2. The number, location, and size of major driveways shall be determined by the volume and type of traffic generated by the development, other driveways in the vicinity of the proposed approach, the amount of lot frontage along the City street, and channelization/traffic control on the City street along the lot frontage.
3. When multiple major driveways to one parcel or development are permitted, they shall not be less than 125 feet apart, measured from centerline to centerline.
4. A minimum of two major driveways will be required for developments that will generate 500 ADT or more unless other mitigating measures are approved by the City.
5. Notwithstanding the requirements of these Regulations, the number and location of major driveways may be more restrictive than described herein if deemed necessary by the City. The City shall base its determination on existing and projected traffic volumes and channelization and signalization on the existing City street, traffic, and turning movements generated by the existing and/or proposed project and other applicable traffic design criteria.
6. When a three-lane driveway is requested, a traffic engineering study along with a signing, striping, and traffic channelization plan shall be done by the Applicant's engineer for submittal to the City for review and approval.

E. Temporary Driveways

1. All temporary driveways built within City rights-of-way must be constructed in conformance with the standards set forth herein. No site work may commence until a permit for the driveway has been issued by the City of Lakewood and the driveway constructed.
2. All standards, except paving, as set forth in this Section apply to temporary driveways.
3. All temporary driveways must be removed and the right-of-way restored within ninety days from the date of its approval.
4. One extension of this time limit may be granted in writing to the original Applicant by the City for a period not to exceed ninety days.

5. Prior to the approval of a temporary driveway, a financial guarantee must be submitted in an amount sufficient to cover all costs of removing the temporary driveway and restoring the right-of-way.

F. General Geometric and Construction Standards

1. Geometric Standards: Are as shown on the driveway details as found in the Appendix.
2. Guardrail: The outer edge of a driveway shall not be constructed closer than seventy feet to a bridge, culvert, or other structure that may warrant end protection using guardrailing in accordance with the most current criteria adopted by the Washington State Department of Transportation.

G. Parking Barrier

1. When a parking area is adjacent to an existing City street right-of-way, the Applicant may be required to install traffic curbing or other barriers on the Applicant's property to prevent unrestricted and uncontrolled access to the City street. The City shall determine the adequacy of the curbing or other barriers to physically control or restrict access to the City street. Other City parking and landscaping requirements, including those found in the City of Lakewood Zoning Code or those conditions imposed by the Hearing Examiner, shall be observed along with this requirement.

H. Entering Sight Distance

1. Entering sight distance must be equal to or exceed the desirable entering sight distance for the legal speed limit. Sufficient sight distance in each direction along a City street from a major or minor driveway must be provided to permit vehicles to safely enter the roadway. On roads which appear on the City's Six-Year Road Program for reconstruction, widening, or other improvement, the Applicant may be required to provide adequate sight distance for the roadway alignment as it will exist following the completion of the reconstruction, widening, or improvement.

2. The following speeds and desirable entering sight distance requirements apply, unless unusual design or safety considerations warrant increased sight distance requirements as determined by the City:

3. Posted/Legal Speed (m.p.h.)	Minimum Entering Sight Distance* ** (feet)	Required Entering Sight Distance* * (feet)
25	260	295
30	310	355
35	360	415
40	415	470
45	465	530
50	515	590

**Maximum road grade of 6%. *These are the absolute minimum entering sight distances and require written approval from the City-Engineer.

4. Entering sight distance shall be based on the following criteria:

Entering vehicle eye height	= 3.50 feet
Approaching vehicle height	= 4.25 feet

5. The sight distance is measured from a point in the driveway 10 feet back from the edge of the traveled way.
6. Entering sight distance must be calculated for situations that involve road grades in excess of 6%.

I. Landscaping in City Right-of-Way and Entering Sight Distance

1. Only grass or low shrubs/ground cover will be allowed within the sight distance triangle.

J. Entering Sight Distance Diagram

1. In situations where the entering sight distance is questionable, the City may require that an entering sight distance diagram and appropriate field measurements be submitted to the City for review and approval. The diagram and measurements shall be stamped and signed by a professional engineer or surveyor and will be done at the expense of the Applicant.
2. Entering sight distance verification information submitted to the City shall follow the form and criteria found in the Appendix.

K. Equitable Servitude or Covenant Running With The Land

1. Entering sight distance covenant forms have been developed by the City. These forms may be used for all projects being reviewed and approved by the City. The most recent version of these forms shall be used and will be available upon request from the City.

14.46.150 City Streets

All work within existing and proposed City right-of-way shall be in accordance with the City of Lakewood Code Road Standards.

A. Dedicated, But Unopened, City street

No development or single family residential building shall be allowed which proposes to use a dedicated, but unopened, City right-of-way.

If right-of-way exists and/or right-of-way can be deeded by the Applicant to provide right-of-way widths in accordance with the City of Lakewood Road Standards, the Applicant will be required to construct roads within the unopened right-of-way adjacent to the development boundaries and for distances necessary to provide access to the development.

B. Offsite Road Improvements

Road improvements in existing City rights-of-way in urban areas shall be constructed to City Standards.

C. Extending City streets

City streets must be extended with City streets.

D. Determination of Significant Impact

Significant impact shall be determined by comparing potential vehicular trips generated by a development to the average daily traffic volume existing on a maintained City street at the time of development submittal to the City.

To assess a development's impact on the City's road system, the City may require a traffic study completed in accordance with City requirements. The requirement for a traffic study will be based on the volume and/or type of traffic generated by a proposed development, size of the proposed

development, availability of previous studies in the area, existing roadway conditions, geometrics, traffic volumes, accident history, and expressed community concern.

Developments that generate truck traffic shall be assessed for impacts to the structural integrity of roads on which it has a significant impact.

F. Determination of a Safety Concern

The City may require the engineer to submit engineering plans and supplemental information, as necessary, so the City can better assess safety concern(s) which may exist on a maintained City street which is significantly impacted by a development. This may include, but is not limited to, as-built vertical profiles, horizontal alignment, stopping sight distance diagrams, etc., prepared in accordance with the City of Lakewood Code Road Standards.

G. Applicant's Responsibility for Making Off-Site Road Improvements

The City shall require the Applicant to make certain improvements in the following situations.

1. Impact, but No Significant Impact, No Safety Concern: If a development is accessing an existing, maintained City street(s), the Applicant shall be required to do one or more of the mitigating actions set forth herein:
 - a. Implement site-specific traffic mitigating measures immediately adjacent to the project such as right- or left-turn lanes, channelization, signalization, additional road and/or shoulder widening, and correction of geometric deficiencies which are determined to be necessary based upon information from a traffic or engineering study or other sources. These improvements shall be implemented only to mitigate impacts resulting directly from a proposed project's traffic on the City street at the entrance/exit to the project, and/or;
 - b. Deed to the County additional right-of-way as necessary from the property under consideration to create a right-of-way width which complies with state statutes, City ordinances, and/or any other statutes, ordinances, or regulations as a means of mitigating any impact the project may have on the City street system, and/or;
 - c. Projects that cause a City street to be reclassified to an arterial classification or higher classification of arterial shall be subject to the right-of-way requirements of the higher classified road, and/or;

- d. If the City streets which are serving as access to the development do not meet the requirements contained in Appendix #36, 21, the City shall require the applicant to construct the existing City streets for a length and in such areas as the City determines is necessary. Design and construction shall be in conformance with City of Lakewood Road Standards.
2. Significant Impact, but No Safety Concern: If a proposed project significantly impacts an existing maintained City street(s) and no safety concern exists within the impacted area, the Applicant shall be required to perform one or more of the following mitigating actions.
- a. Implement site-specific traffic mitigating measures immediately adjacent to the project such as right- or left-turn lanes, channelization, signalization, additional road and/or shoulder widening, and correction of geometric deficiencies which are determined to be necessary based upon information from a traffic or engineering study or other sources. These improvements shall be implemented only to mitigate impacts resulting directly from a proposed project's traffic on the City street at the entrance/exit to the project, and/or;
 - b. Deed to the City additional right-of-way as necessary from the property under consideration to create a right-of-way width in compliance with state statutes, City ordinances, and/or any other statutes, ordinances, or regulations as a measure of mitigating any impact the project may have on the City street system, and/or;
 - c. Projects that cause a City street to be reclassified to an arterial classification shall be subject to the right-of-way requirements of the higher classified road.
 - d. If the City streets which are serving as access to the development do not meet the requirements contained in Appendix 36, 21, the City shall require the applicant to construct or reconstruct the existing City streets for a length and in such areas as the City determines is necessary. Design and construction shall be in conformance with the City of Lakewood Road Standards.
3. Safety Concern within the Impacted Area: If a proposed project impacts and existing maintained City streets and a safety concern exists within the impacted area, the Applicant shall be required to:

Participate in road improvements to correct or improve safety concern(s) as directed by the City.

Provide construction plans for road improvements and make road improvements in accordance with approved plans in the amount of \$60.00 per new vehicular trip generated.⁵

H. Installation of Road Improvements Prior to Issuance of Occupancy Permits

Road improvements needed to mitigate any impact, significant impacts, site-specific traffic improvements, or safety concerns must be completed by the Applicant prior to plat approval or issuance of occupancy permits.

I. Design Standards

All design submittals and construction in the City right-of-way shall be in accordance with the City of Lakewood Road Standards.

J. Reimbursement by Other Property Owners - Revised Code of Washington (RCW) 35.72

When the City requires the Applicant to make offsite road improvements and adjacent property owner's may benefit from the improvement, the Applicant making the improvement thereof may request the formation of a reimbursement district pursuant to the provisions of Chapter 35.72. R.C.W., or the most recent version thereof.

The Applicant must notify the City that he/she wishes to pursue a reimbursement ordinance, and must furnish the City with all information necessary to establish the assessment reimbursement area and the ordinance document.

⁵The intent of this Section is that single safety concerns must be corrected and multiple safety concerns with an impacted area may be corrected up to a limit of \$60.00 per new vehicular trip per day generated. The cost for the design of construction plans is not included in the \$60.00.

Multiple developments, if submitted somewhat simultaneously, will be required to share in the cost of correcting single or multiple safety concerns.

14.46.160 Wetland Areas

All development shall comply with the wetlands section of the City's Critical Area and Natural Resource Lands regulations.

14.46.170 Archaeological Sites

Development of archaeological sites shall be done in accordance with Pierce County Code, Chapter 14.04 and Washington Administrative Code 25-48, as now adopted or as may be amended, or other applicable City, State, or Federal law.

14.46.180 CONSTRUCTION, INSPECTION AND MAINTENANCE STANDARDS FOR WORK IN RIGHTS-OF-WAY

14.46.190 Construction Standards and Approval Process for Work in Existing and Future City Street Rights-of-Way.

A. General

The construction of public roads and storm drainage systems must meet all requirements of the City of Lakewood Road and Storm Drainage Ordinance.

B. Construction Standards for Driveways

All driveways shall be paved with a minimum of two inches compacted depth of asphalt concrete over two inches compacted depth crushed surfacing top course, or six inches Portland Cement concrete, if the existing City street is asphalt concrete, Portland Cement Concrete B.S.T., or oil-mat surfacing. If the existing City street is gravel, a driveway constructed of four inches compacted depth, crushed surfacing, or top course is acceptable.

The minimum distance between the paved edge of a driveway and the face of an obstruction, including existing utility appurtenances which may cause a traffic hazard, may be no less than four feet without curbing and three (3) feet with curbing on the approach. Obstructions located closer than these distances which may cause a traffic hazard must be relocated at the Applicant's expense.

14.46.200 Construction and Approval Process for Private Developments

A. General

Developments that require temporary erosion or storm drainage systems, earthwork, etc., as a result of these Regulations must be constructed to a standard as proposed by the Engineer and shall follow all standards of good construction practices.

B. Inspections

The City shall be responsible for the inspection and acceptance of all clearing and grading work and erosion and sedimentation control facilities. The Applicant shall notify the City forty-eight hours in advance of each required inspection.

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	-Work in City right-of-way.

Minimal clearing to install erosion control facilities is allowable prior to inspection number 1. Site/lot clearing shall not start until erosion control facilities have been installed and approved by the City.

The Engineer shall be responsible for the inspection and approval of the storm drainage system. The Engineer must agree to act as the coordinator and liaison between the Applicant and the City.

C. Temporary Erosion Control Facilities

Temporary erosion control facilities are to be installed by the Development Applicant, per the approved plans or as required by the City, and are to be maintained by the Building Permit Applicant, during the building process.

Erosion control facilities may be removed upon completion of landscaping and final inspection by the City.

D. Notification of Completion

The engineer must submit a letter to the City certifying that the storm drainage system has been completed. The letter of certification shall be stamped and signed by the engineer and shall be worded as follows:

"I have inspected the constructed storm drainage control facility located on the project known as _____ and based on the standard of care and expertise which is usual and customary in this community for professional engineers, I find that it substantially conforms to the terms and conditions of the site development permit and the accepted design for the project."

The certification letter shall reference, if applicable, the building permit number(s), Development Engineering project number, plat name, project name, and the Section, Township, and Range.

An "as-built" set of plans for the storm drainage system must be submitted to the City with the certification letter. The plans must be identified as as-built and stamped, signed and dated by an engineer.

Any alterations to the system which vary from the accepted design must be listed in the certification letter or noted on "as-built" drawings which are submitted with the certification letter.

E. Maintenance of a Private Storm Drainage System

The Applicant, or any subsequent owner(s) of a parcel on which there is located a private storm drainage system, shall be responsible for the perpetual maintenance of the drainage system. The system may not be altered by the Applicant and/or successors without prior City authorization and must remain in its originally-designed condition. The Applicant or subsequent owner(s) must agree to be responsible for any damages caused by the failure of the private storm drainage system.

When a privately-owned and maintained system is proposed, the City shall require the Applicant to execute and record a covenant as public record that will run with the land, stating the system will be maintained by the Applicant and all future property owner(s) of the project. If the covenant cannot be filed and recorded as part of the original review document, it shall be filed and recorded as a separate document (see Appendix 30, 31, or 32) 15, 16, 17. The following wording must be placed on the plat mylar:

"The property included within the legal description on this document or on the attached Exhibit contains a private storm drainage system. The owner and/or successors are responsible for maintaining the private storm drainage system and for keeping the system in its originally-designed condition. The design of the private drainage system was done by the professional engineering firm of

*_____, a
copy of which is on file with the City of Lakewood."*

Applicants for developments with proposed private storm drainage systems that will connect to a City system shall be required to enter into a maintenance agreement and restrictive covenant with the City. See Appendix 18, 19, and 20.

14.46.210 Maintenance of Public Roads

A. Road Maintenance

The Applicant who obtains a building permit within a development shall be responsible for road cleaning, repair, and maintenance of erosion control facilities on all public roads in or adjacent to developments until such time as all structures are completed and the final approval has been granted by the City of Lakewood Building Division.

If debris or other problems resulting from the activities of the Applicant, or his/her agents, pose a hazard or nuisance to the public, the Applicant shall eliminate such hazard to the satisfaction of the Engineering Manager within two hours of notification by the City that such a hazard exists.

Failure to complete the work within the required period of time will result in the City performing the maintenance and obtaining reimbursement of all costs and expenses from the financial guarantee submitted by the Applicant.

The City also reserves the right to issue a "Stop Work" order on any parcel that is contributing to the accumulation of dust, debris, and soil upon the public road and/or within the storm drainage system.

B. Maintenance of Driveways

All driveways, drainage structures, curbs, landscaping, or any other improvements between the property line and the public roadway must be maintained in a safe and stable condition at the expense of the abutting property owner(s).

14.46.220 FINANCIAL GUARANTEES

Standard forms have been developed by the City and approved by the City Attorney's Office and the City Manager or his/her designee(s). These forms must be used for all projects being reviewed and accepted by the City.

Financial guarantees shall be on a City form or on a form acceptable to the City and will not be released by the City until the required improvements are constructed in accordance with the approved plans. All improvements financially guaranteed must be constructed and/or completed within three years from the date of issuance of the Site Development Permit and if not, the financial guarantee must be paid to the City to be used for completion of the required construction.

Financial guarantee forms are found in Appendix 13 and 14 and, when required, shall be used when making a submittal to the City:

Irrevocable Letters of Credit or other types of financial guarantees may be approved if acceptable to the City Attorney and City Manager or his/her designee.

Financial guarantees under \$5,000.00 must be by an assignment of funds.

All financial guarantees shall run continuously until released by the City and shall not be subject to expiration or cancellation without written authorization from the City.

The City may require a financial guarantee or withhold the certificate of occupancy of the structure to guarantee compliance with these Regulations.

To determine the amount of the financial guarantee, an estimate shall be submitted to the City by the engineer detailing the work to be accomplished and the cost thereof. The estimate shall be based on current construction costs. The City will review the engineer's estimate and, if acceptable, will establish the financial guarantee at 125% of the engineer's estimate to allow for inflation and administration expenses should the City have to complete the project.

A. Site Development Construction Guarantee

Prior to issuance of a permit, the Applicant will be required to submit a financial guarantee to the City to assure compliance with the provisions of these Regulations, the permit, and accepted plans.

B. Private Storm Drainage Maintenance Financial Guarantee

Prior to issuance of a building permit or approval of a plat, the Applicant will be required to submit a financial guarantee to the City to guarantee the maintenance of the private storm drainage system within the development.

C. Public Road and Storm Drainage Cleaning Financial Guarantee

An assignment of funds will also be required of the Building Permit Applicant to guarantee the cleaning of the public roads and storm drainage systems adjacent to or within the development. Cleaning frequency will be determined by the City and must continue until written notification is received from the City.

The assignment of funds must be submitted to the City upon application for a building permit and prior to issuance of the permit. The guarantee will be held by the City until the structure and the front yard landscaping has been completed.

The amount of the street cleaning guarantee will be \$150.00/lot for plats and \$1,000.00 to \$5,000.00 for commercial developments, as determined by the City.

D. Procedure for Releasing Financial Guarantee for Private Storm Drainage Construction

Upon receipt of an acceptable letter of completion from the Engineer, the City will release the applicable financial guarantee unless the City determines a drainage problem exists as a direct result of the development. If the Applicant fails to correct the drainage problem, the City may seek to foreclose on the financial guarantee to obtain the funds to correct the deficiency.

E. Procedure for Releasing Financial Guarantee for Private Storm Drainage Maintenance

Upon approval of the final inspection of all structures, and acceptance of a form supplied by the City, and completed by the developer, stating that the storm drainage system has been cleaned of all debris, dirt, sediment, etc., the City will release the applicable financial guarantee.

14.46.230 SITE DEVELOPMENT PERMITS**A. Permits**

Issuance of a permit by the City of Lakewood does not, in any way, imply or signify that the proposal complies with the requirements of or is allowed by other City ordinances, regulations, or requirements, or State or Federal laws. The Applicant is in no way relieved of responsibility and liability for compliance with all State, Federal, and local rules, requirements, laws, ordinances, and regulations.

B. Permit Required

Unless exempt per section 1.02.A., no person, party, firm, corporation, or entity shall do any grading, filling, cutting and clearing, excavating, or ditching, or create an impervious surface, unless the work is in accordance with a valid permit from the City issued pursuant to the provisions of these Regulations. Each site must have a separate permit.

All forested land within the City of Lakewood is designated "likely to be converted," or is to be preserved in its natural state as greenbelts, parks, or open space. Therefore, only Class IV DNR permits shall be issued within the city limits. All DNR permits will require an additional city clearing and grading permit. The City Engineer may require the posting of security to assure compliance with requirements of this permit, which may include but are not limited to provisions for minimizing off-site soil erosion, noise disturbance, and fire danger. The City clearing permit will not be issued until a development plan has been approved, and the applicant has demonstrated that he/she has the financial resources to proceed with the development project. Any cutting or removal of timber without a clearing permit will be subject to the penalties outlined in this code.

Short plats, large lots, formal plats, mobile home parks, and other development projects that indicate new roads to be developed are required to obtain a permit unless exempt per Section 1.02 and 4.05 . The permit issuance, payment of fees, and plan review must be completed prior to plat approval or issuance of building permits.

C. Application For a Permit

1. An application for a permit shall be made with the City of Lakewood Planning Department and will be valid for 210 days from date of application.

2. The application must be accompanied by the appropriate number of site development plans as requested by the City such as grading plans, erosion and sedimentation control plans, storm drainage plans, and a site development report.
3. When work occurs on a site not under control or ownership of the Applicant, the property owner must sign the application and agree to be responsible for all work that occurs on the property.
4. The applicant may provide additional information, as appropriate, to identify the scope of the work.
5. Comments regarding the application and requirements for additional studies, plans, information, or reports will be sent by the City to the Applicant within thirty days after proper submittal is made to the City of Lakewood Planning Department.

D. Permit Issuance

1. The City shall review the submitted information to determine if it complies with the provisions of these Regulations. If the proposed work, as identified by the application and plans, complies with the provisions herein or as imposed by the City pursuant to these Regulations or if they are corrected or amended to comply within the specified time limit, the City shall issue a permit to the Applicant.
2. The permit must be signed by the Applicant and, if applicable the property owner, before issuance by the City and is not transferable.
3. Site Development Permits cannot be issued until after the environmental and/or Hearing Examiner's decision is final, i.e., the appeal periods have expired, and no appeals have been filed.
4. Upon receiving Hearing Examiner approval (if required) and after the expiration of the appeal period, site development permits may be issued for clearing, site grading, road construction, and installation of storm drainage facilities individually or under one site development permit. If separate applications are submitted, they must be accompanied by the pertinent plans and reports.
5. A Determination of Non-Significance (DNS), Mitigated Determination of Non-Significant (MDNS) or a Final Environmental Impact Statement (FEIS) must be issued and the appeal period expired, before the permit is granted by the City.

6. The issuance of a site development permit shall not relieve the Applicant from complying with other applicable City zoning or land use regulations, State or federal regulations or laws.

E. Permit Time Limit

1. A site development permit shall be valid for three years from the date of approval by the City. A one year extension may be granted if deemed appropriate by the City.
2. A new permit must be obtained for completion of any work not finished within this time period. The new permit will be issued in accordance with the most recent version of these Regulations any other applicable rules, regulations, and ordinances.

F. Changed Conditions, Stop Work Order, and Permit Revocation

1. Should the City become aware of conditions that invalidate the original design data used to obtain the permit or determine that the Applicant is not complying with the conditions of the permit or approved plans, the City may revoke the original permit and/or order work stopped on the project. The City may require the Applicant to resubmit information or plans for review and approval and apply for a new permit.
2. The City may order all or part of the permitted work stopped for any period of time for any of the following reasons:
 - A. The Applicant fails to comply with the conditions of the permit.
 - B. The permit was granted on the basis of erroneous or incomplete information submitted to the City by the engineer or Applicant.
 - C. The weather or weather-created conditions cause offsite or downstream drainage or water quantity or quality problems.
 - D. The work has created a condition which is a hazard to life, endangers property, or adversely affects the use or stability of a public way or drainage course.

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14.46.240 SUBMITTAL STANDARDS**14.46.250 Engineer's Responsibility**

All site development plans submitted to the City for review and approval shall be prepared by an Engineer. The City will review the Engineer's work for compliance with these Regulations. Should errors, omissions, or inaccurate data related to the Engineer's work come to the City's attention, the Engineer shall agree to be responsible for correcting all deficiencies when necessary and shall agree to be responsible for any damages resulting from the defective work.

14.46.260 Site Development Plan Requirements

A site development plan shall consist of elements listed below and must be completed, stamped and signed by the Engineer. The Engineer shall be responsible for all elements of submitted work and must agree to take full responsibility for the accuracy, completeness, and ultimate workability of the plan.

A. Report

1. Short narrative outlining the scope of work and all other pertinent facts concerning the project. The narrative shall describe the condition of the property in its predevelopment and existing condition. Groundcover, topography, soils, potholes, wetlands, drainage patterns, surrounding properties, and other pertinent information about the parcel must be provided. The narrative shall describe what use will be made of the property and shall briefly describe the proposed drainage system for the project. If the project is to be constructed in stages, the narrative shall describe the phasing. The variables used in the design calculations shall be noted and a brief explanation as to why each value was chosen must be included.
 - a. Drainage Basin Boundary Mapping: A single map sheet showing the total contributing runoff area, using the best mapping available, shall be submitted to the City for the drainage basin boundary map. The map must distinctly outline the contributing tributary area and, if necessary, the boundary line must be verified by the engineer. City aerial photos, U.S.G.S. 7.5 minute series quadrangle maps, or other available map data should be used to supplement topographic mapping where the existing topographic mapping is incomplete or lacking in detail. All wetland areas, swamps, drainage courses, intermittent streams, storm sewer systems, and other drainage

features must be clearly shown on the topographic map that have an effect on the design of the proposed drainage system. When possible, one map showing both the onsite and offsite contributing tributary areas should be used. The drainage basin boundary map(s) must be stamped and signed by the engineer.

- b. The maximum contour interval for onsite topographic mapping will be five feet when the slope of the property is uniform and consistent and such contours accurately depict the topography of the property. When the property is undulating and cross slope varies or when pothole areas, wetlands, swales, or drainage courses exist on the property, a topographic map with contour intervals of two feet will be required. Topographic mapping must extend a minimum of fifty feet offsite. The scale shall not be greater than 1" = 50' for plats, 1" = 20' or 1" = 30' for commercial projects.
- c. When available, Pierce County topographic mapping must be used to delineate the off-site drainage basin and may need to be spliced together. When the contributing tributary area is large, supplemental mapping such as Pierce County aerial photographs or United States Geological Survey (U.S.G.S.) quadrangle maps may be used to illustrate the overall drainage basin boundary. When necessary, the engineer must field verify the contributing tributary area to assure its accuracy.
- d. When the SCS Method is used, one map showing the limits of the various hydrologic soils classifications with planimetered areas must be used to supplement the drainage calculations. The mapping must be legible and, if appropriate, color coding should be used to differentiate the various soils classifications into hydrologic soil groups.
- e. The Time of Concentration Line (T_c line) must be shown on the contributing tributary area mapping for both predevelopment and post development conditions. The T_c line for the offsite contributing area (if applicable) and the project parcel must be labeled and identified.
- f. Downstream Drainage Analysis: When detention or direct discharge systems are proposed, a downstream analysis must be completed as part of the drainage plan. The analysis must extend beyond the limits of the project for a minimum of one-quarter mile. The Engineer must field verify all existing storm drainage systems downstream from the project and determine that the capacity of the

drainage system(s) is adequate to handle both the existing flows, flows generated by the proposed project, and any overflow.

- g. If a capacity problem is encountered, the release rate must be restricted accordingly. City of Lakewood comprehensive storm drainage maps may be used as the basis for determining the capacity of existing systems. For naturally occurring drainage systems or undeveloped drainage courses, the engineer must take into account the hydraulic capacity of the existing drainage course and environmental considerations such as erosion, siltation, and increased water velocities or water depths.
- h. A copy of the City of Lakewood comprehensive storm drainage map showing the flow route of the onsite water for the 1/4 mile downstream distance must be included in the storm drainage calculations.
- i. Calculations: Calculations must be neatly printed or typed and follow a logical sequence in the drainage analysis and all supporting data must be justified or referenced by the engineer. Calculations must be shown for the following items: Time of concentration, developed quantity (Q) for the appropriate storm event, retention or detention sizing calculations (including head loss when appropriate), overflow calculations, overflow height for a restrictor device, storage volume calculations, all calculations applicable to the SCS curve number method, and all other calculations pertinent to the drainage analysis.
- j. Recommendations and Conclusions: The drainage analysis shall end with a paragraph outlining the engineer's recommendations and conclusions for the storm drainage design and must refer back to data developed by the analysis to support the recommendations, conclusions, and proposed design.

B. Plans

When site development plans are required by the City, they must be prepared by the engineer to show how the property will be accessed, graded, and stormwater controlled. The development plan must be on standard size, 24" x 36", and must be stamped and signed by the engineer. The development plan must show, as a minimum, the following items as required by the City:

1. A general vicinity map delineating the proposed site, access to the site, existing roads drawn to a scale of 4" - 1 mile, parcel number, and section, township, and range.
2. A stormwater drainage plan showing all the details necessary to construct the drainage facilities.
3. Existing and finished contour lines at two-foot vertical intervals (or five-foot intervals, if they are adequate to accurately describe the completed project) distinguishable from each other, existing and proposed drainage courses or systems, related construction improvements, property limits, and access details.
4. The limits of clearing, filling, and excavation must be clearly shown on the plans. Lots in proposed plats must be included in the grading plan.
5. Location of any buildings or structures on the site and the location of any buildings or structures on adjacent property which may be affected by the proposed work.
6. Existing soils information and groundwater conditions. Indicate soil log locations and descriptions per Section 4.06.J.
7. Information concerning construction methods, fill material specifications, source of fill material, compaction information, haul routes, and other construction information when known and applicable to the proposed work.
8. Information concerning wetlands, environmentally-sensitive areas, floodplains, watercourses, natural buffer areas, and similar applicable information.
9. Erosion and sedimentation control plan.
10. Two cross sections of retention/detention pond or cross section of infiltration trench.
11. Location of any proposed or existing access locations.
12. Standard notes as adopted by the City.
13. Bench mark datum and elevation information.
14. Name of project; Section, Township, and Range, and parcel number.

15. Easements.
16. Approval block.
17. Engineer's name, firm, address, and telephone number.
18. Applicant's name, address, and telephone number.
19. Scale of 1" = 50' for plats, or 1" = 20', 30', 40' for all others.
20. The centerline profile and typical cross section of any private road that requires storm drainage control per Section 4.05.
21. Landscaping (if proposed) within the City right-of-way.
22. All lettering shall be greater than 1/8 of an inch high.
23. Other necessary details.

The City has prepared informational drawings which are available to assist the engineer in the preparation of site development plans. A project review checklist is also available and provides additional information for plan requirements.

17.46.270 Submittal Procedure

- A. Two complete sets of site development plans must be submitted to the City with a transmittal letter. A third set of plans, if required, will be sent to outside agencies such as the Washington State Department of Transportation, Washington State Department of Fisheries, Washington State Department of Ecology, or other public agencies, when the proposed project will have an influence upon that agency or its area of jurisdiction or that agency requests to review the project's storm drainage plans and calculations. All submittals must comply with Revised Code of Washington 18.43.070 and must be stamped, signed, and dated by the Engineer.
- B. Site development plans submitted to the City will be reviewed in the chronological order that they are received. The Engineer's plans must be complete in content and detail before submittal to the City. If the City begins its review and finds that the submittal is incomplete, it will be returned to the Engineer unchecked and upon resubmittal it will be assigned a new review date. Reviewed plans will be returned directly to the Engineer for corrections and/or revisions.
- C. After the initial City review, all the revised site development reports, plans, City mark-ups, financial guarantees, legal documents, easements, etc., as required by the

Development Engineering Section, must be resubmitted to the City with a transmittal letter which has the plat name or City of Lakewood Planning Department file number on it.

- D. The City reserves the right to re-review a site development plan and require a new permit when the resubmitted plans are found to have significant design and/or conceptual changes or changes in field conditions from the original submittal. Design errors which go undetected do not relieve the Engineer from ultimate responsibility and are subject to revisions by the Engineer and review and approval by the City.

14.46.280 FEEs

A. General

1. Engineering review fees, as set by separate Resolution of the City, must be paid upon application or filing for the site development permit, preliminary plat, zoning application, Environmental Checklist/scoping document, or building permit. Additional review fees may be assessed by other City departments.
2. Permit fees must be paid at the City of Lakewood Planning Department and are nonrefundable.
3. City of Lakewood and its agencies are exempt from fees set forth herein.

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17.46.290 ADMINISTRATION

14.46.300 Penalties and Enforcement

A. General

1. Failure to comply with any of these Regulations will be cause for withholding or withdrawing approval of the overall project plans, revocation of the site development permit, suspension of building inspections, forfeiture of the financial guarantee submitted to the City, and/or non-acceptance of the work by the City.
2. The City is authorized to make inspections and take such actions as required to enforce these Regulations. The City representative shall present proper credentials and make a reasonable effort to contact the property owner before entering onto private property.
3. A site development application will not be issued on any parcel that has a valid non-conversion Forest Practices Permit for a period of six years from the date of the Forest Practice Application approval.
4. The City may require the property owner to remove or replace illegal earthwork and/or restore and reclaim an illegally graded parcel. Earth material brought onto a parcel must be removed to a properly-permitted disposal site.

B. Enforcement Powers

1. The City may remove, correct, or replace any improperly constructed facility, structure, or portion thereof which was allowed through an issued site development permit, and all expenses incurred by the City shall be paid by the property owner or Applicant. If the City is required to bring an action to recover such costs, the City will recover reasonable attorney's fees and interest at twelve percent per annum to run from the date the work was completed by the City. Applicants must agree to this provision as a condition of issuance of any permit authorized by these Regulations.

C. Penalties

1. Violation of any of the provisions of these Regulations by an Applicant or Engineer shall be a misdemeanor. Each day or portion of a day during which a violation of these Regulations is continued, committed, or permitted shall constitute a separate offense .

2. Any work carried out contrary to the provisions hereof shall constitute a public nuisance and may be enjoined as provided by the statutes of the State of Washington.

17.46.310 Severability

If any part of these Regulations shall be found invalid, all other parts shall remain in effect.

17.46.320 Variations

Variations may be authorized by the City only upon submittal and approval of information, plans, and/or design data by the Engineer which indicates that the requested variation is based upon sound engineering judgment, and that requirements for safety, environmental considerations, function, appearance, and maintainability are fully met and the variation is in the best interest of the public. ALL VARIATIONS MUST BE APPROVED BY THE CITY IN WRITING PRIOR TO THE START OF CONSTRUCTION

17.46.330 Appeals

Any person or agency aggrieved by an act or decision of the City under these Regulations may appeal to the City of Lakewood Hearing Examiner pursuant to the provisions of the City of Lakewood Code, Chapter 61.20, as now enacted or hereafter amended. Administration, including staff report preparation and public hearing notification, shall be prepared by the City. The Applicant shall file the appeal with the City on the form entitled "Appeal of a Decision of an Administrative Official", available at the City of Lakewood Planning Department. Payment of appeal fees shall be in accordance with Ordinance 85-182S, or the most recent version thereof, with said fees payable to the City before acceptance of the appeal by the City for processing.

**MINIMUM STANDARDS FOR DEVELOPMENTS USING MAINTAINED COUNTY
LOCAL ACCESS ROADS**

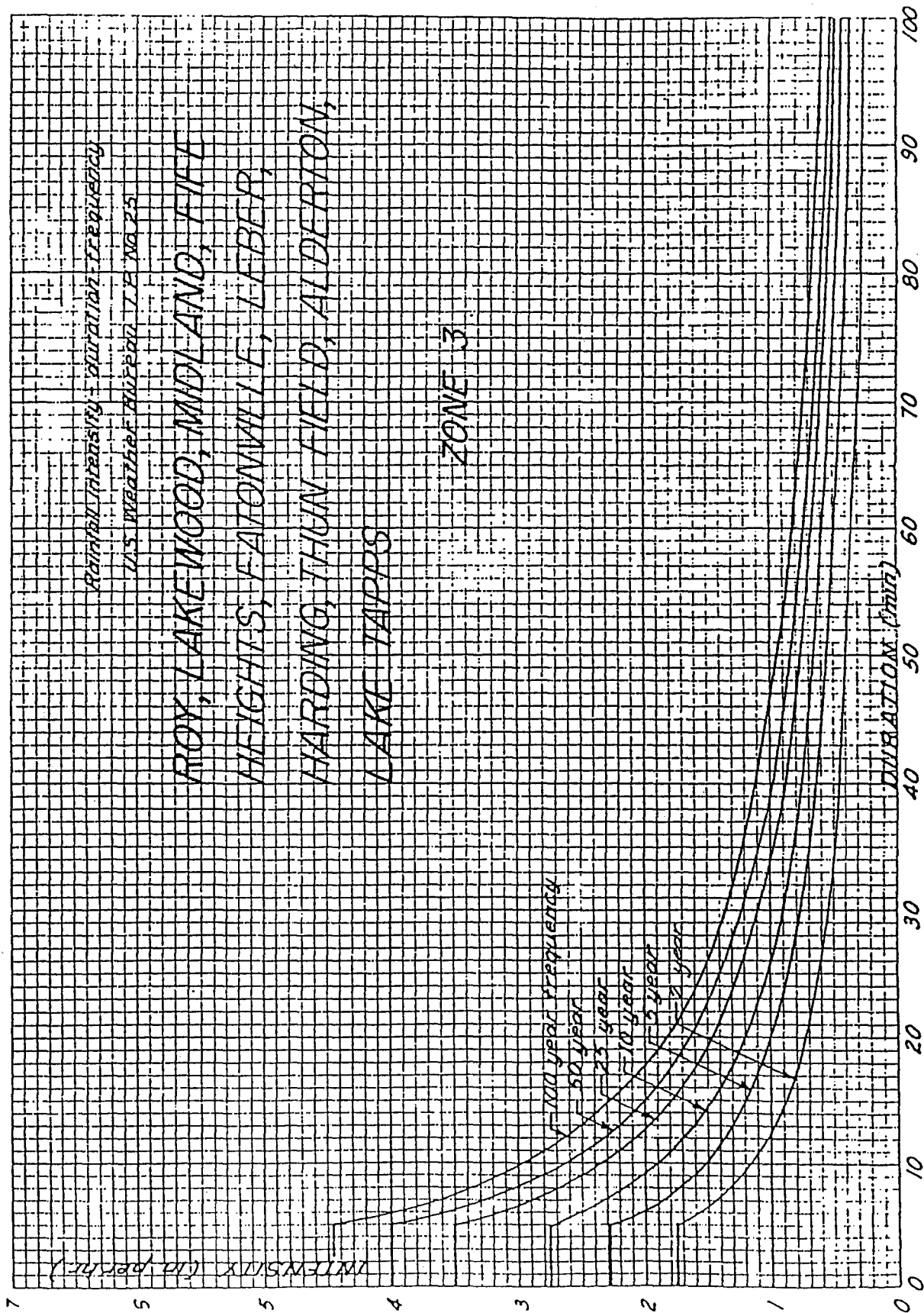
AVERAGE DAILY TRAFFIC	TRAVELED WAY	TRAVELED WAY SURFACING	
< 40	20	Gravel or Paved	
41 - 100	20	Gravel or Paved	
101 - 300	22	Paved	
301 - 1000	24	Paved	
>1000	24	Paved	

Appendix 1
Retention/Detention Basis Equations

RETENTION/DETENTION BASIN EQUATIONS

AREA (ZONE)	TYPE OF OUTLET	25-YEAR DESIGN STORM		100-YEAR DESIGN STORM	
		PEAK STORAGE TIME (MINUTES)	MAX. STORAGE VOLUME (FT ³ /AC)	PEAK STORAGE TIME (MINUTES)	MAX. STORAGE VOLUME (FT ³ /AC)
① KEY PENIN- SULA, ELBE, UPPER FAIRFAX, GREENWATER, NATIONAL	ORIFICE WITH HEAD	$T = -25 + \sqrt{\frac{3075}{Q_0}}$	$V_4 = \frac{4920T}{T+25} - 40 Q_0 T$	$T = -25 + \sqrt{\frac{4163}{Q_0}}$	$V_4 = \frac{6660T}{T+25} - 40 Q_0 T$
	CONSTANT FLOW	$T = -25 + \sqrt{\frac{2050}{Q_0}}$	$V_4 = \frac{4920T}{T+25} - 60 Q_0 T$	$T = -25 + \sqrt{\frac{2700}{Q_0}}$	$V_4 = \frac{6480T}{T+25} - 60 Q_0 T$
② GIG HARBOR PENINSULA, ANDERSON IS., MOUNTAIN RD., ALDER, OPTING, HARROWKIN,	ORIFICE WITH HEAD	$T = -25 + \sqrt{\frac{2706}{Q_0}}$	$V_4 = \frac{4329T}{T+25} - 40 Q_0 T$	$T = -25 + \sqrt{\frac{3450}{Q_0}}$	$V_4 = \frac{5520T}{T+25} - 40 Q_0 T$
	CONSTANT FLOW	$T = -25 + \sqrt{\frac{1804}{Q_0}}$	$V_4 = \frac{4329T}{T+25} - 60 Q_0 T$	$T = -25 + \sqrt{\frac{2300}{Q_0}}$	$V_4 = \frac{5520T}{T+25} - 60 Q_0 T$
③ LAKEWOOD, MIDLAND, E HEIGHTS, EATONVILLE, LEBER, HARDING, THUN FIELD, ALDEPTON, LAKE TAPP,	ORIFICE WITH HEAD	$T = -25 + \sqrt{\frac{2194}{Q_0}}$	$V_4 = \frac{3510T}{T+25} - 40 Q_0 T$	$T = -25 + \sqrt{\frac{2850}{Q_0}}$	$V_4 = \frac{4560T}{T+25} - 40 Q_0 T$
	CONSTANT FLOW	$T = -25 + \sqrt{\frac{1462}{Q_0}}$	$V_4 = \frac{3510T}{T+25} - 60 Q_0 T$	$T = -25 + \sqrt{\frac{1900}{Q_0}}$	$V_4 = \frac{4560T}{T+25} - 60 Q_0 T$
④ HARTZ LAKE, POLE LINE, SPANAWAY, SUMMIT, PUYALLUP EDGEWOOD	ORIFICE WITH HEAD	$T = -25 + \sqrt{\frac{2138}{Q_0}}$	$V_4 = \frac{3420T}{T+25} - 40 Q_0 T$	$T = -25 + \sqrt{\frac{2775}{Q_0}}$	$V_4 = \frac{4440T}{T+25} - 40 Q_0 T$
	CONSTANT FLOW	$T = -25 + \sqrt{\frac{1425}{Q_0}}$	$V_4 = \frac{3420T}{T+25} - 60 Q_0 T$	$T = -25 + \sqrt{\frac{1832}{Q_0}}$	$V_4 = \frac{4440T}{T+25} - 60 Q_0 T$
⑤ LAKE JUNCTION, CRYSTAL MOUNTAIN	ORIFICE WITH HEAD	$T = -25 + \sqrt{\frac{5013}{Q_0}}$	$V_4 = \frac{8020T}{T+25} - 40 Q_0 T$	$T = -25 + \sqrt{\frac{6638}{Q_0}}$	$V_4 = \frac{10,620T}{T+25} - 40 Q_0 T$
	CONSTANT FLOW	$T = -25 + \sqrt{\frac{3342}{Q_0}}$	$V_4 = \frac{8020T}{T+25} - 60 Q_0 T$	$T = -25 + \sqrt{\frac{4425}{Q_0}}$	$V_4 = \frac{10,620T}{T+25} - 60 Q_0 T$

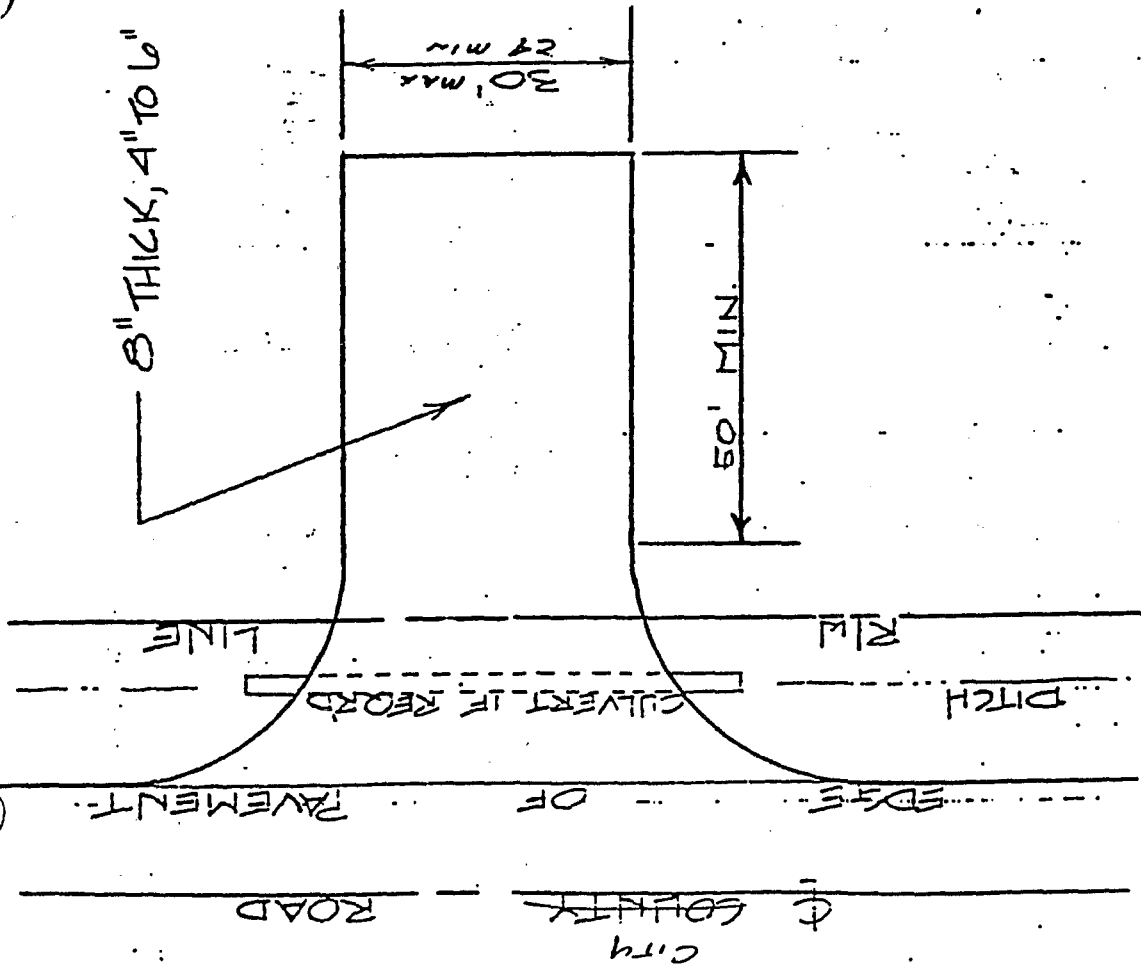
Appendix 2
Rainfall Intensity/Duration/Frequency
[Key Peninsula, Elbe, National, Upper Fairfax, Greenwater (Zone 1)]



Appendix 6

Construction Approach

8" THICK, 4" TO 6" QUARRY SPALLS



7013

- 1) CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND CLEANING THE APPROACH ON A REGULAR BASIS.
- 2) IF DIRECTED BY THE ^{CITY} COUNTY ADDITIONAL QUARRY SPALLS MUST BE ADDED.
- 3) THE CONSTRUCTION APPROACH MUST BE LOCATED AT THE PERMANENT APPROACH LOCATION.

CONSTRUCTION
APPROACH

Appendix 7 Runoff Factors

RUNOFF FACTORS (C FACTORS)

	<u>FLAT</u> <u>0 - 5%</u>	<u>ROLLING</u> <u>> 5%</u>
<u>UNDEVELOPED LAND</u>		
Wood & Forest.....	0.05	0.10
Sparse Trees, Ground Cover.....	0.10	0.15
Light Grass to Bare Ground.....	0.15	0.20
<u>DEVELOPED AREA</u>		
Pavement & Roofs.....	0.90	0.90
Gravel Roads & Parking Lots.....	0.75	0.80
City Business.....	0.85	0.90
Apartment Dwelling Areas.....	0.80	0.85
Industrial Areas (Heavy).....	0.70	0.80
Industrial Areas (Light).....	0.60	0.70
Earth Shoulder.....	0.50	0.50
Playground.....	0.25	0.30
Lawns, Meadows & Pastures.....	0.20	0.25
Parks & Cemetery.....	0.15	0.20

SINGLE FAMILY RESIDENTIAL (Dwelling Unit/Gross Acre)

1.0-1.5 DU/GA.....	0.30
1.5-3.0 DU/GA.....	0.35
3.0-3.5 DU/GA.....	0.40
3.5-4.0 DU/GA.....	0.45
4.0-6.0 DU/GA.....	0.50
6.0-9.0 DU/GA.....	0.60
9.0-15.0 DU/GA.....	0.70

MULTIPLE ORIFICE DESIGN FORMULAS

AREA (ZONE)	TYPE OF OUTLET	10 YEAR DESIGN		25 YEAR DESIGN	
		PEAK 4TOPAGE TIME (MIN.)	MAXIMUM 4TOPAGE VOLUME (FT ³ /AC.)	PEAK 4TOPAGE TIME (MIN.)	MAXIMUM 4TOPAGE VOLUME (FT ³ /AC.)
① KEY PENINSULA, NATIONAL, UPPER FAIRFAX, GREENWATER	3 ORIFICES, W/HEAD	$T = -25 + \sqrt{\frac{104100}{26.4Q_0}}$	$V_h = \frac{4164T}{T+25} - 26.4Q_0T$	$T = -25 + \sqrt{\frac{123000}{26.4Q_0}}$	$V_h = \frac{4320T}{T+25} - 26.4Q_0T$
② ALDER, HARPOW 4IN, OPTING, BUCKLEY, GIG HARBOR PENIN- sula, ANDERSON ISLAND, MOUNT ROAD	3 ORIFICES, W/HEAD	$T = -25 + \sqrt{\frac{80173}{26.4Q_0}}$	$V_h = \frac{3407T}{T+25} - 26.4Q_0T$	$T = -25 + \sqrt{\frac{108225}{26.4Q_0}}$	$V_h = \frac{4329T}{T+25} - 26.4Q_0T$
③ BOY, LAKEWOOD, FIFE HEIGHTS, MIDLAND, THUN FIELD, EATON- VILLE, LEBER, HARDING, LAKE TAPP, ALBERTON	3 ORIFICES, W/HEAD	$T = -25 + \sqrt{\frac{75000}{26.4Q_0}}$	$V_h = \frac{3000T}{T+25} - 26.4Q_0T$	$T = -25 + \sqrt{\frac{87750}{26.4Q_0}}$	$V_h = \frac{3510T}{T+25} - 26.4Q_0T$
④ HART, LAKE, POLE LINE, PUYALLUP, 4PANAWAY 4UMMIT, EDGE- WOOD	3 ORIFICES, W/HEAD	$T = -25 + \sqrt{\frac{70500}{26.4Q_0}}$	$V_h = \frac{2820T}{T+25} - 26.4Q_0T$	$T = -25 + \sqrt{\frac{85500}{26.4Q_0}}$	$V_h = \frac{3420T}{T+25} - 26.4Q_0T$
⑤ 4KATE MOUNTAIN, CRY4TAL MOUNTAIN	3 ORIFICES, W/HEAD	$T = -25 + \sqrt{\frac{163050}{26.4Q_0}}$	$V_h = \frac{6522T}{T+25} - 26.4Q_0T$	$T = -25 + \sqrt{\frac{200500}{26.4Q_0}}$	$V_h = \frac{8020T}{T+25} - 26.4Q_0T$

STILLING WELL DESIGN

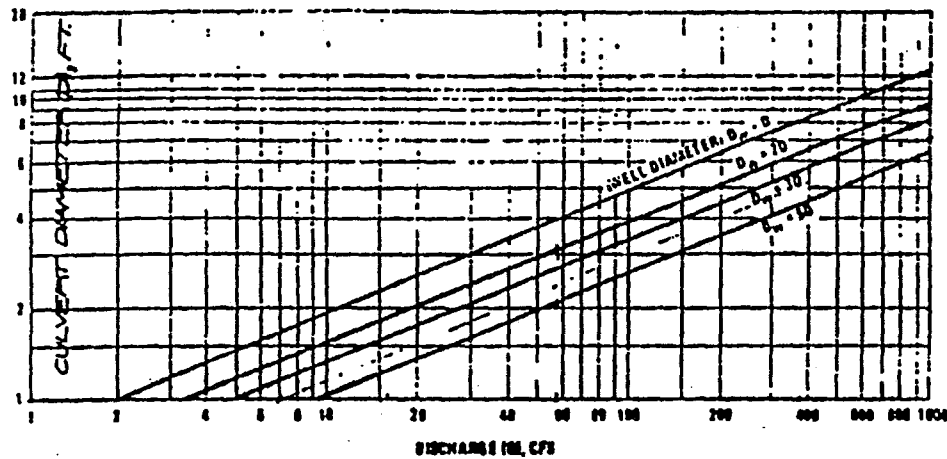


FIGURE 1. STILLING WELL DIAMETER (D_w)

Example:

Given: 24" pipe on 2:1 slope carrying 15 cfs.

Find stilling well dimensions:

- (1) $D = 2$ feet $Q = 15$ cfs.
- (2) From Figure 1 $D_w = 1.5D$ $D_w = 3$ feet - THIS IS A MINIMUM VALUE
- (3) Slope = Vertical/Horizontal = $1/2 = 0.5$ From Figure 2 $h_1 / D_w = .42$
- (4) $h_1 = .42(3.0) = 1.26$ feet say 1.3 feet - THIS IS A MINIMUM VALUE
- (5) $h_2 = 3(D) = 3(2) = 6$ feet
- (6) Total Height of Structure = $h_1 + h_2 = 1.3$ feet + 6 feet = 7.3 feet

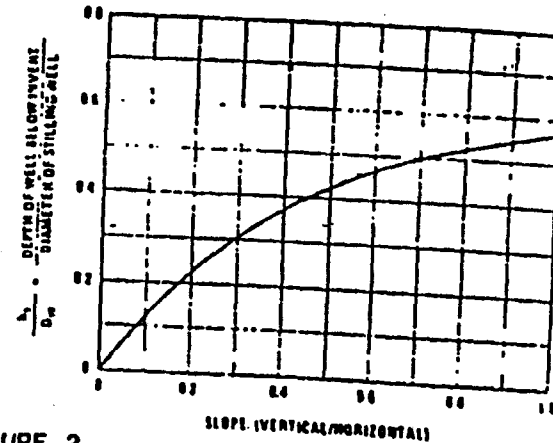


FIGURE 2.

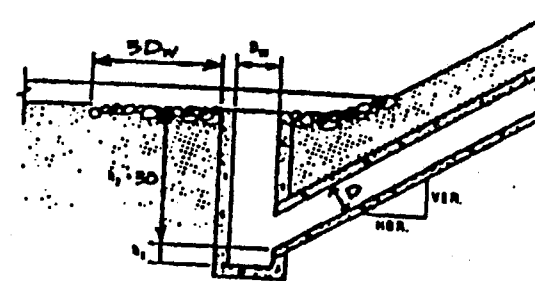


FIGURE 3. STILLING WELL HEIGHT

GRATE B FOR GRATE
INLET, TYPE 1 OR
EQUIVALENT TO COVER
OPENING

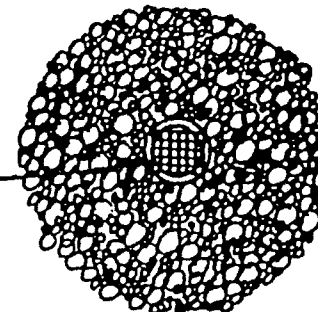
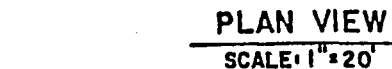


FIGURE 4. STILLING WELL PLAN VIEW

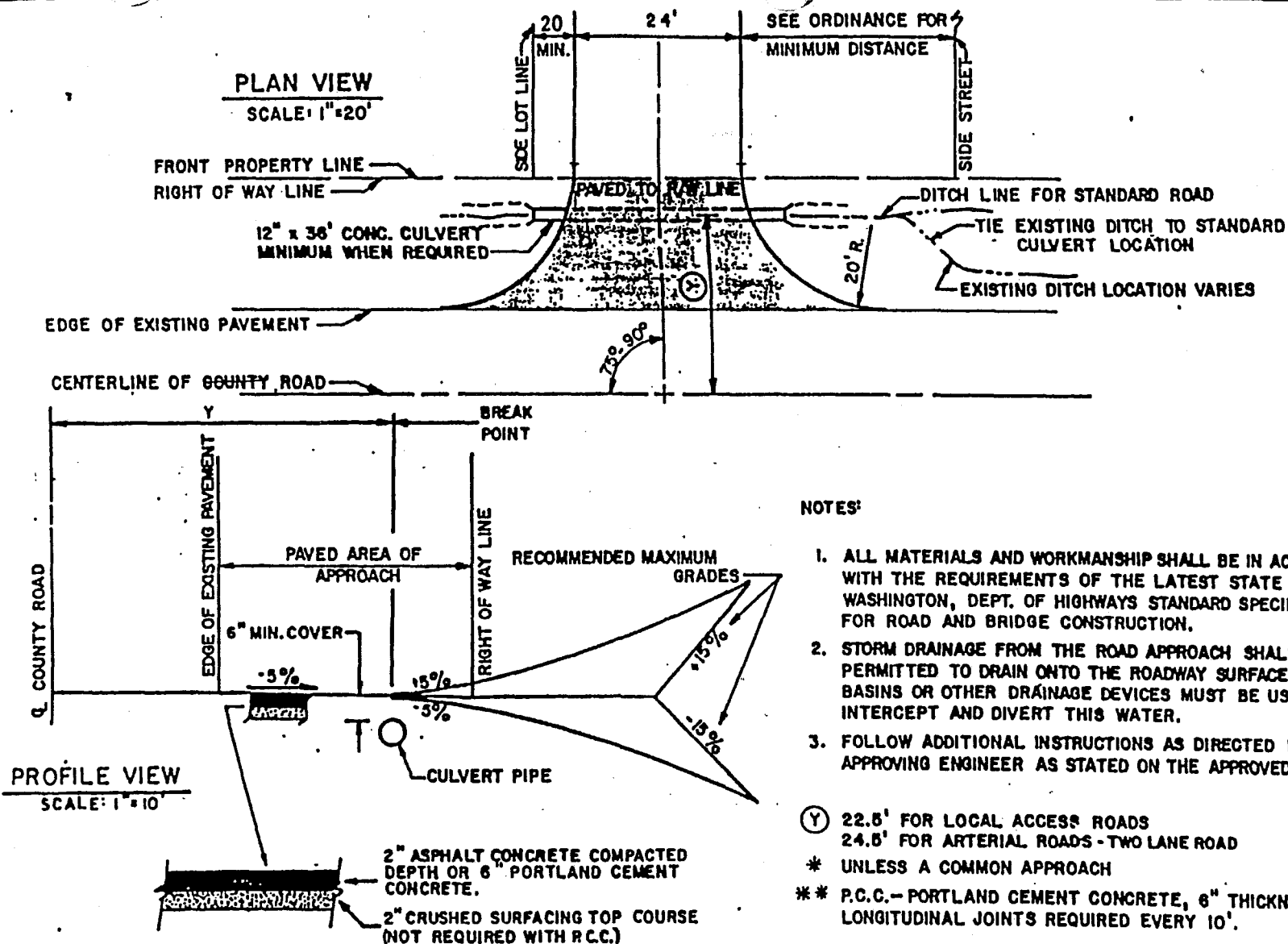


1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST STATE OF WASHINGTON, DEPT. OF HIGHWAYS STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
 2. STORM DRAINAGE FROM THE ROAD APPROACH SHALL NOT BE PERMITTED TO DRAIN ONTO THE ROADWAY SURFACE. CATCH BASINS OR OTHER DRAINAGE DEVICES SHALL BE USED TO INTERCEPT AND DIVERT THIS WATER.
 3. FOLLOW ADDITIONAL INSTRUCTIONS AS DIRECTED BY THE APPROVING ENGINEER AS STATED ON THE APPROVED PERMIT.
 4. A 33 FOOT WIDTH MAYBE ALLOWED FOR 3 CAR-GARAGE ON A LOCAL ROAD FEEDER, LOCAL ROAD MINOR, OR LOCAL ROAD CUL-DE-SAC.
- ⑦ 22.5' FOR LOCAL ACCESS ROADS
24.5' FOR ARTERIAL ROADS - TWO LANE ROAD

**P.C.C. - PORTLAND CEMENT CONCRETE, 6" THICKNESS WITH
LONGITUDINAL JOINTS REQUIRED EVERY 10'**

7/9/85	GEN. REVISIONS		C8P
3/8/84	ORIGINAL DRAWING		KLT
DATE	REVISION	APPROVED	DRAWN

RESIDENTIAL
DRIVEWAY



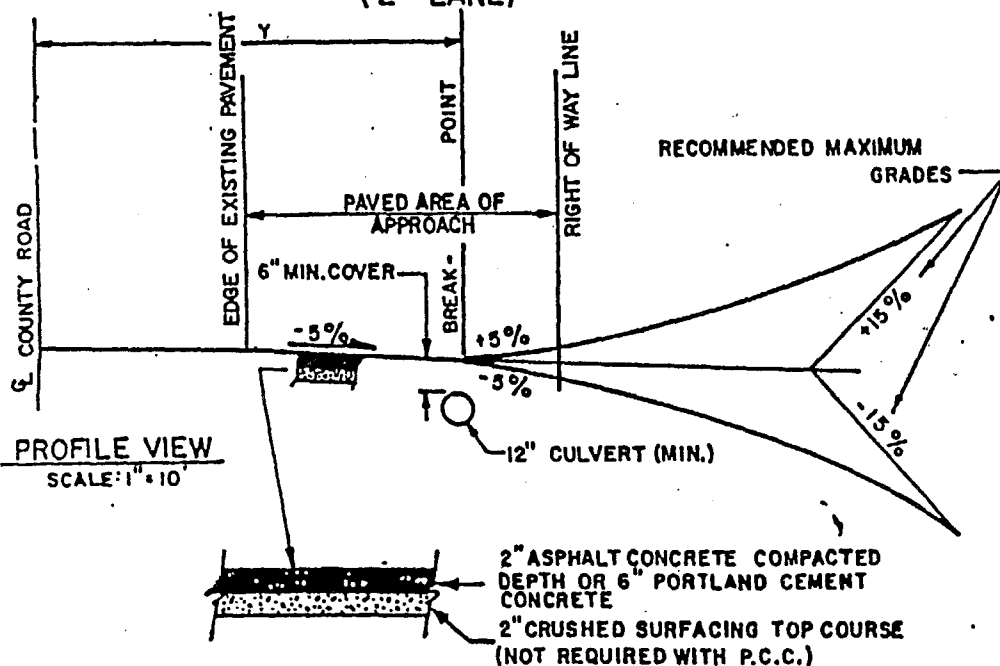
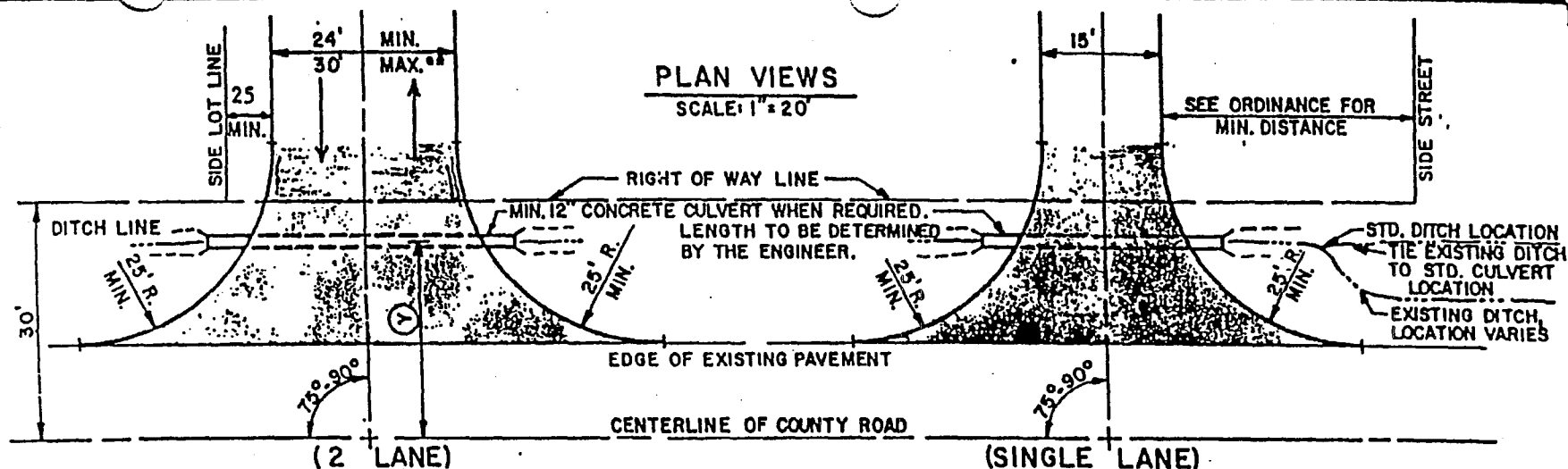
PIERCE COUNTY APPROACH REGULATIONS ARE FOUND IN ORDINANCE 84-127

DATE	REVISIONS	APPROVED	DRAWN
7/9/84	GEN. REVISIONS		CBP
3/21/84	ORIGINAL DRAWING		KLT

MINOR
DRIVEWAY

PLAN VIEWS

SCALE: 1" = 20'



NOTES:

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST STATE OF WASHINGTON, DEPT. OF HIGHWAYS STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. STORM DRAINAGE FROM THE ROAD APPROACH SHALL NOT BE PERMITTED TO DRAIN ONTO THE ROADWAY SURFACE. CATCH BASINS OR OTHER DRAINAGE DEVICES MUST BE USED TO INTERCEPT AND DIVERT THIS WATER.
3. FOLLOW ADDITIONAL INSTRUCTIONS AS DIRECTED BY THE APPROVING ENGINEER AS STATED ON THE APPROVED PERMIT.
 - * UNLESS A COMMON APPROACH
 - ** UNLESS A MULTIPLE LANE APPROACH IS APPROVED
 - 40' LENGTH 1:10 TAPERS MAY BE REQUIRED AS DIRECTED BY P.C.P.W.D.
 - LONGITUDINAL JOINTS REQUIRED EVERY 10' WHEN USING PORTLAND CEMENT CONCRETE

- Ⓢ 22.5' FOR LOCAL ACCESS ROADS
24.5' FOR ARTERIAL ROADS - TWO LANE ROAD

PTERCE COUNTY APPROACH REGULATIONS ARE FOUND IN ORDINANCE 84-127.

7/9/85	GEN. REVISIONS		CBP
3/21/84	ORIGINAL DRAWING		KLT
DATE	REVISIONS	APPROVED	DRAWN

MAJOR
DRIVEWAY

**Appendix 13
Financial Guarantee - Assignment**

FINANCIAL GUARANTEE - ASSIGNMENT

In lieu of a performance bond at the direction of _____ for the proposed construction of _____, we are holding funds in the amount of _____ (\$ _____) in Account Number _____ for the sole purpose of completing the referenced construction of standards acceptable to the City of Lakewood.

We have been instructed by _____ that these funds are to be used for the sole purpose described above. In the event said principle fails to complete said construction to standards acceptable to the City of Lakewood, said funds in Account Number _____ will be made available to said City of Lakewood for the sole and specific purpose of completing the above described construction. Failure of the above noted financial institution to hold the minimum required amount until released to the City of Lakewood will bond the financial institution for the amount owed, and for legal fees and costs necessary to enforce collection of the Assignment.

Signed and dated at _____, Washington, this _____ day of _____, 19____.

This authorization to remain in full force and effect until a written release is received from the City of Lakewood, which shall be at the time the specified construction is completed to standards acceptable to the City.

ACKNOWLEDGED:

DATE: _____

Principal or Agent _____

Financial Institution _____

Address _____

Officer _____

City, State, Zip _____

Address _____

Telephone Number _____

City, State, Zip _____

Telephone Number _____

STATE OF WASHINGTON

}

ss.

COUNTY OF PIERCE

On this _____ day of _____, 19____, before me the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared _____

_____ to me known to be the individual described in and who executed the foregoing instrument, and acknowledged to me that he signed and sealed this said document as a free and voluntary act and deed for the uses and purposes therein mentioned.

Given under my hand and official seal this _____ day of _____, 19____.

Notary Public in and for the State of Washington/
Residing at _____

ACCEPTANCE

City of Lakewood _____

Date _____

APPENDIX 14
Financial Guarantee - Bond

SERIAL NUMBER _____

KNOW BY ALL MEN THESE PRESENTS:

THAT we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the State of Washington, for the use and benefit of the City of University Place, a Political Subdivision, as Obligee, in the full and just sum of \$ _____ Dollars to the payment of which well and truly be made we do bind ourselves, successors and assigns, firmly by these presents.

WHEREAS, the Principal is developing a certain tract of land in the City of University Place in Section _____, Township _____, Range _____, WM., which development is known as _____, prepared by _____, Engineer, which development requires the improvement of certain streets and/or storm drainage facilities in University Place, and

WHEREAS, said obligee requires that a good and efficient bond be furnished by said Principal guaranteeing the satisfactory completion of said road improvements and/or storm drainage facilities as shown in detail on the road construction plans and approved by the City of University Place Public Works Department on _____, 19____.

NOW, THEREFORE, the condition of this obligation is such that if said Principal shall well and truly construct the said road improvements and/or storm drainage facilities in accordance with the above-designated design specifications to the satisfaction of the City of University Place, on or before _____, 19____, and pays the costs incurred in completing the same, then this obligation shall be void, otherwise to remain in full force and effect.

SEALED with our seals and dates this _____ day of _____, 19____.

Principal

Surety

Signature of Principal

Name of Surety

Address

Address of Local Issuing Agency

Telephone Number

Telephone Number

Surety's Signature

Attach Power of Attorney Form if Required

APPENDIX 15
Memorandum of Agreement and Covenant to Run With the Land
(Individual Form)

FORM NO. _____

THIS AGREEMENT is made this ____ day of _____, 19____, by and between _____ and the City of Lakewood, by and through the Lakewood Public Works Department.

WHEREAS, _____, is the owner or contract purchaser of certain piece of property located in the City of Lakewood, State of Washington, and described as follows:

WHEREAS, LAKEWOOD, by and through its Public Works Department, has approved a storm drainage plan for a project on the above noted parcel of property. The approval and approved plans are on file in the office of the Lakewood Public Works Department, 9315 Gravelly Lake DR SW, Lakewood, Washington.

NOW, THEREFORE, pursuant to this agreement, the parties agree to the following:

1. That the applicant has voluntarily applied for the above-stated approval which grants the applicant the right to use or develop said premises in the approved manner, and after due consideration, the City of Lakewood granted the approval.
2. These obligations shall run with the property and shall be binding on the applicant, heirs, successors and assigns.
3. The property legally described above or on the attached exhibit contains a private storm drainage system. The owner and/or heirs, successors, and assigns agree to maintain the private storm drainage system and to keep the system operating in its originally designed condition. The design of the private drainage system was done by the professional engineering firm of _____, a copy of which is on file with the City of Lakewood.

Applicant

Address

City, State, Zip

STATE OF WASHINGTON

} ss.

COUNTY OF PIERCE

On this ____ day of _____, 19____, before me the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared _____

to me known to be the individual described in and who executed the foregoing instrument, and acknowledged to me that he signed and sealed this said document as a free and voluntary act and deed for the uses and purposes therein mentioned.

Given under my hand and official seal this ____ day of _____, 19____.

Notary Public in and for the State of Washington/
Residing at _____

APPENDIX 16

Memorandum of Agreement and Covenant to Run With the Land
(Partnership Form) [changes Individual to Partnership]

FORM NO. _____

THIS AGREEMENT is made this ____ day of _____, 19____, by and between _____ and the City of Lakewood, by and through the Lakewood Public Works Department.

WHEREAS, _____ is the owner or contract purchaser of certain piece of property located in the City of Lakewood, State of Washington, and described as follows:

WHEREAS, LAKEWOOD, by and through its Public Works Department, has approved a storm drainage plan for a project on the above noted parcel of property. The approval and approved plans are on file in the office of the Lakewood Public Works Department, 9315 Gravelly Lake Dr SW, Lakewood, Washington.

NOW, THEREFORE, pursuant to this agreement, the parties agree to the following:

1. That the applicant has voluntarily applied for the above-stated approval which grants the applicant the right to use or develop said premises in the approved manner, and after due consideration, the City of Lakewood granted the approval.
2. These obligations shall run with the property and shall be binding on the applicant, heirs, successors and assigns.
3. The property legally described above or on the attached exhibit contains a private storm drainage system. The owner and/or heirs, successors, and assigns agree to maintain the private storm drainage system and to keep the system operating in its originally designed condition. The design of the private drainage system was done by the professional engineering firm of _____, a copy of which is on file with the City of Lakewood.

IN WITNESS WHEREOF, said partnership has caused this instrument to be executed this ____ day of _____, 19____.

By: _____

By: _____

STATE OF WASHINGTON

}

ss.

COUNTY OF PIERCE

On this day before me personally appeared _____ and _____ to me known to be the person(s) who executed the foregoing instrument, and who, being duly sworn, by me did depose and say that he/they are partner(s) in the general partnership known as _____ and that he/they is/are duly authorized to sign the same and duly acknowledged to me that he/they executed the same as the act and deed of said partnership, for the uses and purposes mentioned therein.

IN WITNESS THEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

Notary Public in and for the State of Washington/
Residing at _____

APPENDIX 17
Memorandum of Agreement and Covenant to Run With the Land
(Corporate Form)

File No. _____

THIS AGREEMENT is made this _____ day of _____, 19____, by and between _____ and the City of Lakewood, by and through the Lakewood Public Works Department.

WHEREAS, _____, is the owner or contract purchaser of certain piece of property located in the City of Lakewood, State of Washington, and described as follows:

WHEREAS, LAKEWOOD, by and through its Public Works Department, has approved a storm drainage plan for a project on the above noted parcel of property. The approval and approved plans are on file in the office of the Lakewood Public Works Department, 9315 Gravelly Lake Dr SW, Lakewood, Washington.

NOW, THEREFORE, pursuant to this agreement, the parties agree to the following:

1. That the applicant has voluntarily applied for the above-stated approval which grants the applicant the right to use or develop said premises in the approved manner, and after due consideration, the City of Lakewood granted the approval.
2. These obligations shall run with the property and shall be binding on the applicant; heirs, successors and assigns.
3. The property legally described above or on the attached exhibit contains a private storm drainage system. The owner and/or heirs, successors, and assigns agree to maintain the private storm drainage system and to keep the system operating in its originally designed condition. The design of the private drainage system was done by the professional engineering firm of _____, a copy of which is on file with the City of Lakewood.

IN WITNESS WHEREOF, said corporation has caused this instrument to be executed this _____ day of _____, 19____.

A Corporation

By: _____

By: _____

STATE OF WASHINGTON

COUNTY OF PIERCE

) ss.

On this day before me personally appeared _____ and _____ to me known to be the _____ and _____ of the corporation who executed the within and foregoing instrument, and acknowledged said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that said corporation authorized them to execute said instrument.

IN WITNESS THEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

Notary Public in and for the State of Washington/
Residing at _____

APPENDIX 18
Maintenance Agreement and Restrictive Covenant
(Partnership Form)

UP FORM NO. _____

THIS MAINTENANCE AGREEMENT AND RESTRICTIVE COVENANT is made this ____ day of _____, 19 __, by _____ (Grantor) and the City of Lakewood, a municipal corporation (Grantee.)

1.0 Recitals:

1.1 Grantor is the owner of certain real property in the City of Lakewood, Washington, described as set forth in Exhibit "A" and referred to in this agreement as the "property."

1.2 In connection with the Grantor's proposed development of the Property, Lakewood has required and Grantor has agreed to construct a stormwater collection and detention system. The drainage system is described and shown on a construction drawing prepared by the engineering firm of _____ for the Grantor's property and in file with Lakewood.

1.3 As a condition of project approval and/or as a condition of Grantor utilizing Grantee's storm drainage system Grantor has agreed to enter into this Maintenance Agreement and Restrictive Covenant ensuring that the drainage system will be constructed and maintained in accordance with the approved plans.

2.0 Construction and Maintenance:

Grantor agrees to construct and maintain a drainage system as shown on that certain construction drawing described above. The drainage system shall be maintained and preserved until such time as Grantor, its heirs, successor or assigns and Grantee agrees that the system should be altered in some manner or eliminated.

3.0 No Removal

No part of the drainage system shall be dismantled, revised, altered or removed except as necessary for maintenance, repair or replacement.

4.0 Access

Each manhole housing and outlet orifice shall have a locking cover, designed and built to permit Grantor and Grantee access to the system at all times. Grantor hereby grants to Grantee the right to enter upon the property to inspect the system and to provide necessary maintenance as set forth below.

5.0 Failure to Maintain

If Grantor fails to adequately maintain or repair the drainage system, Grantee shall provide Grantor with oral or written notice of such failure to adequately maintain or repair the drainage system, and following receipt of such notice, Grantee shall provide Grantor with a reasonable opportunity to adequately repair said drainage system; provided that in the event of an emergency, Grantee has the right to repair said drainage system without notice to the Grantor. In the event Grantee performs any maintenance or repair on said drainage system, Grantee shall charge Grantor the reasonable cost of such work. If Grantee is required to bring action to recover such costs, the Grantee shall also recover its reasonable attorney's fees and interest at the rate of twelve (12%) percent per annum on any monies expended or the reasonable costs of such repair work.

6.0 Enforcement

This agreement may be enforced by Grantee in law or equity against the Grantor, its heirs, successors and assigns.

7.0 Successors and Assigns

These obligations shall run with the Property and be binding on the Grantor, its heirs, successors and assigns.

DATED this _____ day of _____, 19____.

Signature

Signature

Signature

Address

Address

Address

City, State, Zip

City, State, Zip

City, State, Zip

STATE OF WASHINGTON

} ss.

COUNTY OF PIERCE

On this _____ day of _____, 19____, before me personally appeared _____ and

_____ to me known to be the person(s) who executed the foregoing instrument, and who, being duly sworn, by me did depose and say that he/they are partner(s) in the general partnership known as

_____ and that he/they is/are duly authorized to sign the same and duly acknowledged to me that he/they executed the same as the act and deed of said partnership, for the uses and purposes mentioned therein.

IN WITNESS THEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

Notary Public in and for the State of Washington/
Residing at

Approved as to Form Only:

City of Lakewood, City Attorney

APPENDIX 19
Maintenance Agreement and Restrictive Covenant
(Corporate Form)

UP FORM NO. _____

THIS MAINTENANCE AGREEMENT AND RESTRICTIVE COVENANT is made this ____ day of _____, 19____, by _____ (Grantor) and the City of Lakewood, a municipal corporation (Grantee.)

1.0 Recitals:

1.1 Grantor is the owner of certain real property in the City of Lakewood, Washington, described as set forth in Exhibit "A" and referred to in this agreement as the "property."

1.2 In connection with the Grantor's proposed development of the Property, Lakewood has required and Grantor has agreed to construct a stormwater collection and detention system. The drainage system is described and shown on a construction drawing prepared by the engineering firm of _____ for the Grantor's property and in file with Lakewood.

1.3 As a condition of project approval and/or as a condition of Grantor utilizing Grantee's storm drainage system Grantor has agreed to enter into this Maintenance Agreement and Restrictive Covenant ensuring that the drainage system will be constructed and maintained in accordance with the approved plans.

2.0 Construction and Maintenance:

Grantor agrees to construct and maintain a drainage system as shown on that certain construction drawing described above. The drainage system shall be maintained and preserved until such time as Grantor, its heirs, successor or assigns and Grantee agrees that the system should be altered in some manner or eliminated.

3.0 No Removal

No part of the drainage system shall be dismantled, revised, altered or removed except as necessary for maintenance, repair or replacement.

4.0 Access

Each manhole housing and outlet orifice shall have a locking cover, designed and built to permit Grantor and Grantee access to the system at all times. Grantor hereby grants to Grantee the right to enter upon the property to inspect the system and to provide necessary maintenance as set forth below.

5.0 Failure to Maintain

If Grantor fails to adequately maintain or repair the drainage system, Grantee shall provide Grantor with oral or written notice of such failure to adequately maintain or repair the drainage system, and following receipt of such notice, Grantee shall provide Grantor with a reasonable opportunity to adequately repair said drainage system; provided that in the event of an emergency, Grantee has the right to repair said drainage system without notice to the Grantor. In the event Grantee performs any maintenance or repair on said drainage system, Grantee shall charge Grantor the reasonable cost of such work. If Grantee is required to bring action to recover such costs, the Grantee shall also recover its reasonable attorney's fees and interest at the rate of twelve (12%) percent per annum on any monies expended or the reasonable costs of such repair work.

6.0 Enforcement

This agreement may be enforced by Grantee in law or equity against the Grantor, its heirs, successors and assigns.

7.0 Successors and Assigns

These obligations shall run with the Property and be binding on the Grantor, its heirs, successors and assigns.

DATED this _____ day of _____, 19____.

Signature

Signature

Signature

Address

Address

Address

City, State, Zip

City, State, Zip

City, State, Zip

STATE OF WASHINGTON

} ss.

COUNTY OF PIERCE

On this day before me personally appeared

_____ and
_____ to me known to be the
_____ and _____ of the corporation who executed
the within and foregoing instrument, and acknowledged said instrument to be the free and voluntary act
and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that said
corporation authorized them to execute said instrument.

IN WITNESS THEREOF, I have hereunto set my hand and affixed my official seal the day and
year first above written.

Notary Public in and for the State of Washington/
Residing at _____

Approved as to Form Only:

Accepted By:

City of Lakewood, City Attorney

City of Lakewood City Manager

APPENDIX 20
Maintenance Agreement and Restrictive Covenant
(Individual Form)

UP FORM NO. _____

THIS MAINTENANCE AGREEMENT AND RESTRICTIVE COVENANT is made this _____ day of _____, 19____, by _____ (Grantor) and the City of Lakewood, a municipal corporation (Grantee.)

1.0 Recitals:

1.1 Grantor is the owner of certain real property in the City of Lakewood, Washington, described as set forth in Exhibit "A" and referred to in this agreement as the "property."

1.2 In connection with the Grantor's proposed development of the Property, Lakewood has required and Grantor has agreed to construct a stormwater collection and detention system. The drainage system is described and shown on a construction drawing prepared by the engineering firm of _____ for the Grantor's property and in file with Lakewood.

1.3 As a condition of project approval and/or as a condition of Grantor utilizing Grantee's storm drainage system Grantor has agreed to enter into this Maintenance Agreement and Restrictive Covenant ensuring that the drainage system will be constructed and maintained in accordance with the approved plans.

2.0 Construction and Maintenance:

Grantor agrees to construct and maintain a drainage system as shown on that certain construction drawing described above. The drainage system shall be maintained and preserved until such time as Grantor, its heirs, successor or assigns and Grantee agrees that the system should be altered in some manner or eliminated.

3.0 No Removal

No part of the drainage system shall be dismantled, revised, altered or removed except as necessary for maintenance, repair or replacement.

4.0 Access

Each manhole housing and outlet orifice shall have a locking cover, designed and built to permit Grantor and Grantee access to the system at all times. Grantor hereby grants to Grantee the right to enter upon the property to inspect the system and to provide necessary maintenance as set forth below.

5.0 Failure to Maintain

If Grantor fails to adequately maintain or repair the drainage system, Grantee shall provide Grantor with oral or written notice of such failure to adequately maintain or repair the drainage system, and following receipt of such notice, Grantee shall provide Grantor with a reasonable opportunity to adequately repair said drainage system; provided that in the event of an emergency, Grantee has the right to repair said drainage system without notice to the Grantor. In the event Grantee performs any maintenance or repair on said drainage system, Grantee shall charge Grantor the reasonable cost of such work. If Grantee is required to bring action to recover such costs, the Grantee shall also recover its reasonable attorney's fees and interest at the rate of twelve (12%) percent per annum on any monies expended or the reasonable costs of such repair work.

6.0 Enforcement

This agreement may be enforced by Grantee in law or equity against the Grantor, its heirs, successors and assigns.

7.0 Successors and Assigns

These obligations shall run with the Property and be binding on the Grantor, its heirs, successors and assigns.

DATED this _____ day of _____, 19____.

Signature

Signature

Signature

Address

Address

Address

City, State, Zip

City, State, Zip

City, State, Zip

STATE OF WASHINGTON

}

ss.

COUNTY OF PIERCE

On this _____ day of _____, 19____, before me the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared

to me known to be the individual described in and who executed the foregoing instrument, and acknowledged to me that he signed and sealed this said document as a free and voluntary act and deed for the uses and purposes therein mentioned.

Given under my hand and official seal this _____ day of _____, 19____.

Notary Public in and for the State of Washington/
Residing at _____

Approved as to Form Only:

Accepted By:

City of Lakewood, City Attorney

City of Lakewood City Manager

Appendix 21 **Road Adequacy Chart**

SURFACING	TRAVELED WIDTH	④ APPLIES TO ENTIRE COLUMN ROADWAY	SINGLE FAMILY	ONE LOT SUBDIVISION	① APPLIES TO ENTIRE COLUMN ALL OTHERS
UNPAVED / GRAVEL		<16'	YES	YES	NO
GRAVEL		≥16'	YES	YES	② ≤1000 YES >1000 NO
PAVED	<16'	<16'	YES	YES	NO
PAVED	<16'	≥16'	YES	YES	③ NO
PAVED	≥16'	<18'	YES	YES	≤1000 YES >1000 NO ③
PAVED	≥16'	≥18'	YES	YES	YES
UNOPENED R/W			NO	NO	NO

① TRAFFIC ANALYSIS MAY BE REQUIRED AND MAY CAUSE A LIMITATION ON DEVELOPMENT.

② NO FORMAL OR COMMERCIAL DEVELOPMENT TO BE ALLOWED ACCESSING AN UNPAVED OR GRAVEL ROAD.

③ UNLESS REVIEWED AND APPROVED BY THE COUNTY.

④ MAINTAINED COUNTY ROAD

CHART 1

STAPLES OR WIRE RINGS
(TYPICAL)

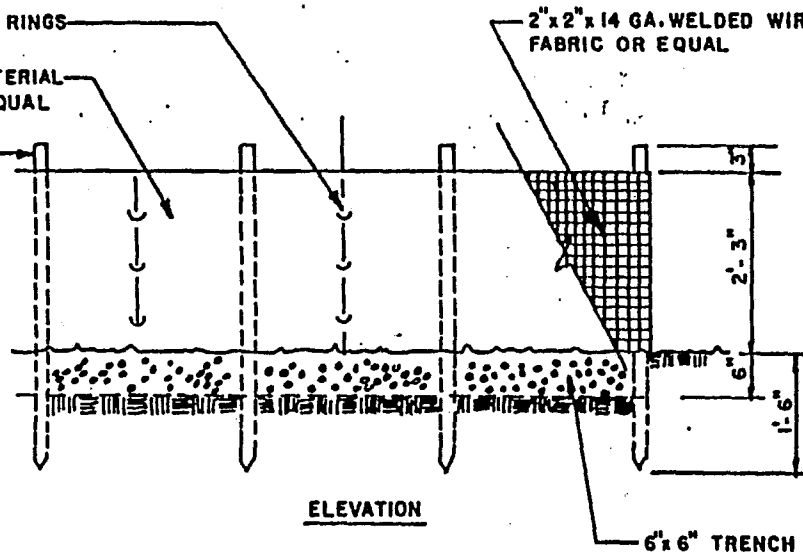
FILTER FABRIC MATERIAL
MIRAFI 100 X OR EQUAL

2" x 4" DOUG. FIR
AT 4' O.C.

2" x 2" x 14 GA. WELDED WIRE
FABRIC OR EQUAL

NOTES:

1. PLACE 1' OF 3/4" - 1-1/2" WASHED ROCK OR PEA GRAVEL ON BOTH SIDES OF FENCE TO CREATE A BEVEL SHAPE.
2. FABRIC SHALL COVER BOTTOM OF 6" x 6" TRENCH AND EXTEND BEYOND THE LIMITS OF THE GRAVEL IN ORDER TO MAINTAIN AN EXCESS OVERLAP OF 2" MINIMUM AS SHOWN IN TYPICAL CROSS-SECTION.



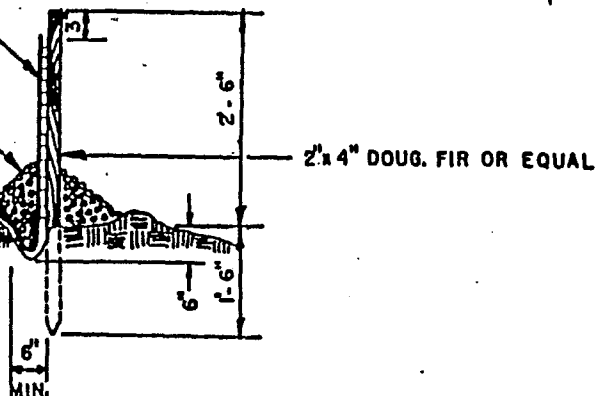
FILTER FABRIC MATERIAL
2" x 2" x 14 GA. W.W.F.

1-1/2" WASHED ROCK
OR PEA GRAVEL

6" x 6" TRENCH

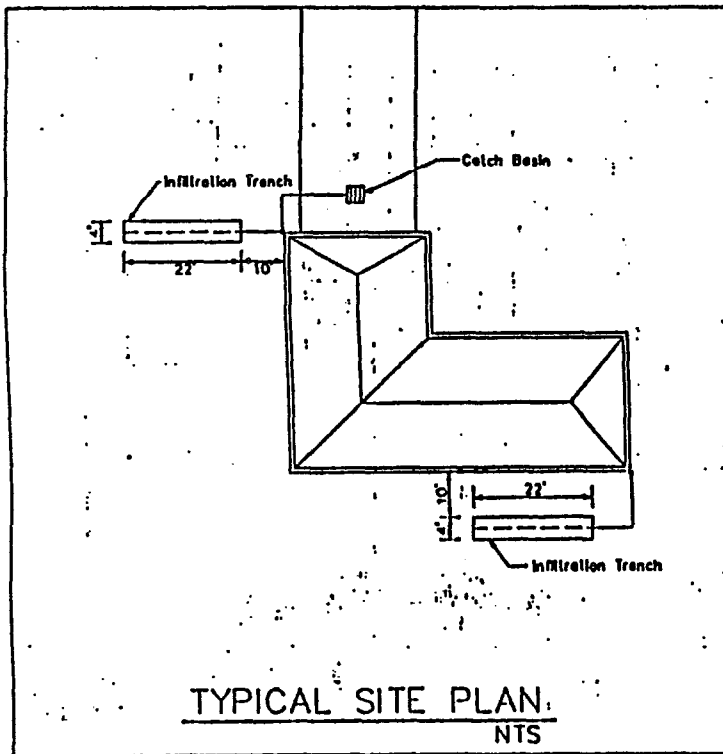
2" EXCESS OVERLAP

TYPICAL CROSS SECTION



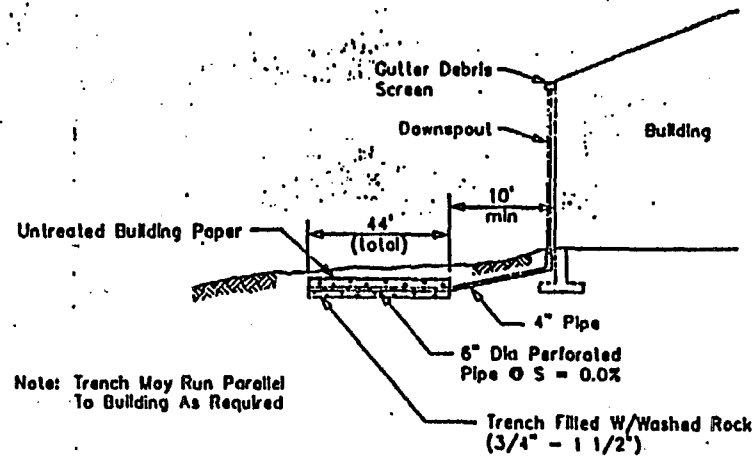
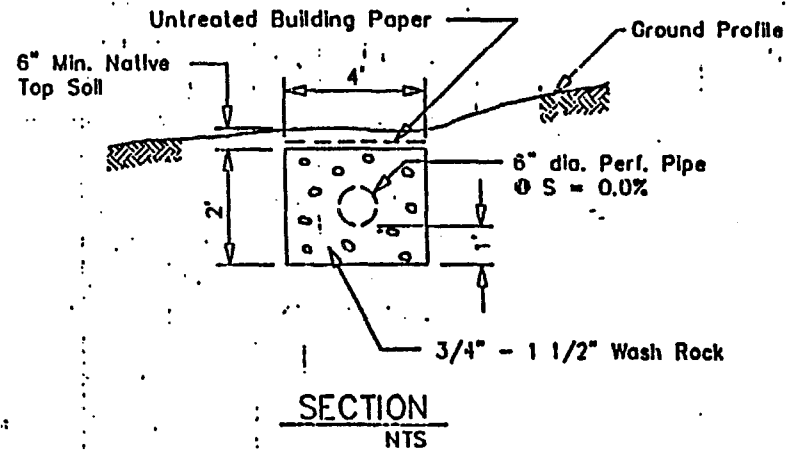
3/26/84	ORIGINAL DRAWING		C.W.I.
DATE	REVISIONS	APPROVED	DRAWN

SILTATION FENCE DETAIL



NOTES

1. On-site erosion control shall be the responsibility of the applicant.
2. The Pierce County Building Inspector shall inspect the infiltration trench before backfilling.
3. All stormwater runoff from roof and driveway shall be collected and lightlined to the infiltration trench.
4. A total of 44 feet of infiltration trench shall be installed.
5. Trenches shall be installed only in undisturbed ground which has not been filled or excavated.
6. Trenches shall be placed to run parallel with the natural contours of the land.
7. The storm drainage infiltration system shall be separated from septic drainfields by a minimum of 30 feet.



INFILTRATION TRENCH DETAIL

Appendix 24

Estimation of Stone Size and Dimensions for Culvert Aprons

Step i) Estimate flow velocity V_o at culvert or paved channel outlet.

Step ii) For pipe culverts D_o is diameter.

For pipe arch, arch, and box culverts, and paved channel outlets, $D_o = A_o$, where A_o = cross sectional area of flow at outlet.

For multiple culverts, use $D_o = 1.25 \times D_o$ of single culvert.

Step iii) For apron grades of 10% or steeper, use recommendations for next high zone (zones 1 through 6).

ESTIMATION OF STONE SIZE AND DIMENSIONS FOR CULVERT APRON

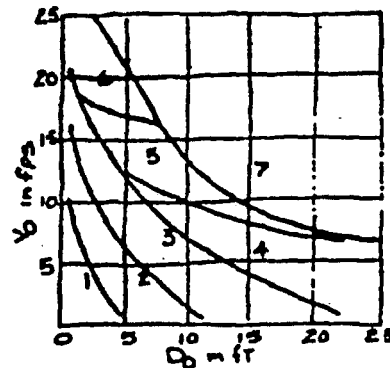


figure 1
ZONES FOR
SELECTED
VELOCITIES AND
PIPE DIAMETERS

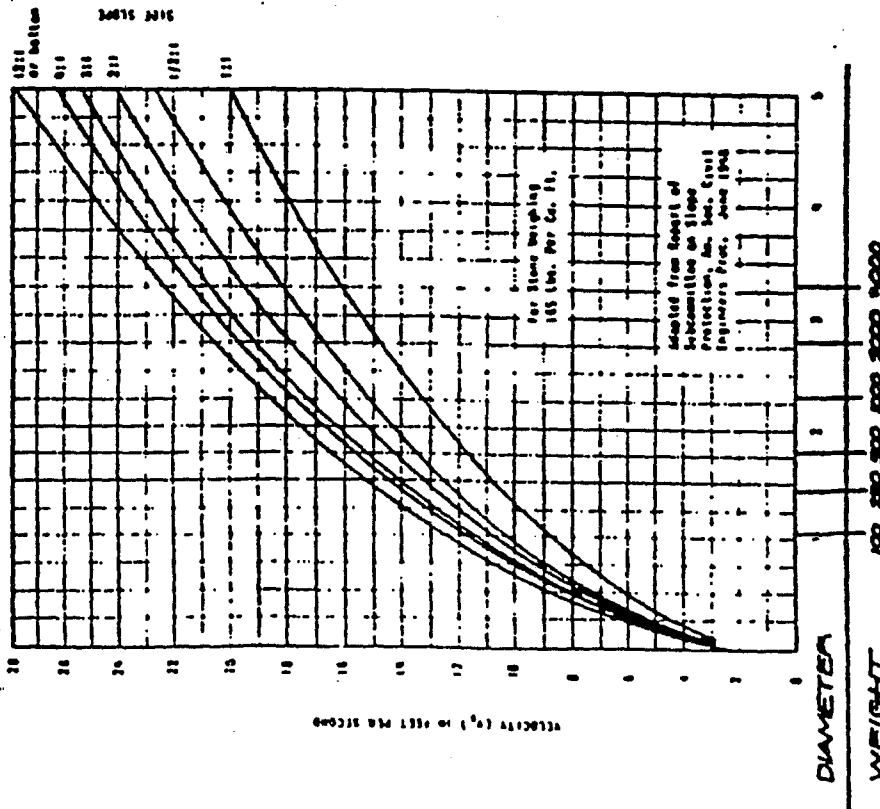
Zone	Apron Material	Length of Apron	
		To Protect Culvert L_1	To Prevent Scour Hole L_2
1	Stone Filling (Fine)	$3 \times D_o$	$4 \times D_o$
2	Stone Filling (Light)	$3 \times D_o$	$6 \times D_o$
3	Stone Filling (Medium)	$4 \times D_o$	$8 \times D_o$
4	Stone Filling (Heavy)	$4 \times D_o$	$8 \times D_o$
5	Stone Filling (Heavy)	$5 \times D_o$	$10 \times D_o$
6	Stone Filling (Heavy)	$6 \times D_o$	$12 \times D_o$
7	Special study required (energy dissipators, stilling basin, or larger size stone).		

figure 2
APRON LENGTH &
CONSTITUTION

STONE SIZE FOR RIPRAPPING

Appendix 25 Stone Size for Riprapping

MAXIMUM WEIGHT OF STONE REQUIRED	MINIMUM & MAXIMUM RANGE IN WEIGHT OF STONES	WEIGHT RANGE OF 75% OF STONES
(LB.)	(LB.)	(LB.)
150	25-150	50-150
200	25-200	50-200
250	25-250	50-250
400	25-400	100-400
600	25-600	150-600
800	25-800	200-800
1,000	50-1,000	250-1,000
1,200	50-1,200	250-1,200
1,600	50-1,600	400-1,600
2,000	75-2,000	600-2,000
2,700	100-2,700	800-2,700



CREDIT: W4.D.O.T. HYDRAULICS MANUAL
AND KING COUNTY DRAINAGE MANUAL

Appendix 26

Example for Calculating Temporary Erosion Control for Runoff Volume and Sediment Volume

A 60-acre watershed is to have 30 acres opened to develop, the soil is an Alderwood gravelly loam on a 10 percent slope with an average slope length of 800 feet. The watershed is presently used for forest production and is ungrazed. Determine the temporary storage required for sediment removal and storage using a 2 year, 24 hour precipitation even of 2.0 inches.

Solution:

Temporary Runoff Volume Detention:

For thirty acres of property in an ungrazed, forested condition:

- Alderwood soil is hydrologic soil group "C".
- Enter Hydrologic Soil Group Chart "1" with "C" soil.
- Read vertically to forest (ungrazed).
- Read horizontally on Precipitation chart #2 to 2.0 inches precipitation.
- Read vertically down on Storage Volume Chart #3 to a sandy loam texture.
- Read horizontally to 450 ft³ per acre.
- Then multiply 30 acres x 450 ft³ = 13,500 ft³.

Use the same procedure for 30 acres cleared for housing:

- 30 acres x 1,250 ft³ = 37,500 ft³.
- The total runoff volume to be stored for 75 percent sediment removal from the watershed during land use conversion will be:
 - 51,000 ft³ (13,500 ft³ + 37,500 ft³)

Sediment Volume Determinations During Construction:

- Enter slope length Chart #4
- Read vertically up from 800 feet to a slope of 10 percent.
- Read horizontally on Erosion Tons per Acre Chart #5 to K = 0.20 for an Alderwood soil.
- Read vertically down on Average Annual Sediment Volume Chart #6 to a watershed size of 60 acres. Use the entire contributing runoff area.
- Then horizontally and read annual sediment volume of 70 ft per acre. 60 acres x 70 ft /acre = 4,200 ft³.

A temporary structure with a two year life span will store:

- 2 x 70 x 35 = 4,200 cubic feet.
- Sediment Storage = 4,200 ft³
- Runoff Storage Volume from Step One = 51,000 ft³
- Total Volume of Pond = 55,200 ft³
- or divide 55,200 to get acre feet = 1.27 Acre Feet

