# Special Provisions for Improvements to CDID#1 Facilities

As adopted by the:

Consolidated Diking Improvement District No. 1 of Longview, Washington

CDID #1
CONSOLIDATED DIKING IMPROVEMENT DISTRICT NO. 1

**2021**

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# SPECIAL PROVISIONS

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# SPECIAL PROVISIONS

## CDID#1 DRAINAGE & LEVEE SYSTEMS

## 1-00 GENERAL REQUIREMENTS

These Special Provisions are intended to represent the minimum design standards for maintenance and improvements constructed within the internal drainage areas and Cowlitz and Columbia River perimeter levees operated by the Consolidated Diking Improvement District No. 1 (CDID#1).

The purpose of these Special Provisions is to ensure maintenance and improvements are constructed consistently; provide straight forward guidance to property owners, developers, design consultants and contractors; and to formally document the criteria used by CDID#1 when making decisions on proposed projects within the District's system boundary.

Compliance with these standards does not alleviate the designer or contractor of their responsibility to apply sound professional judgement to preserve the integrity of the flood protection levee and conveyances, and to protect the health, safety and welfare of the public. All designs for levee improvements shall be stamped by a registered Professional Engineer licensed by the State of Washington.

All improvements proposed within the CDID#1 levee system shall be constructed in accordance with CDID#1 standard plans, City of Longview or Cowlitz County standards (as applicable), these Special Provisions and the latest edition of United States Army Corps of Engineers (USACE) guidance documents including but not limited to the following:

- EM 1110-1-1904, Settlement Analysis
- EM 1110-2-1902, Slope Stability
- EM 1110-2-1913, Design and Construction Levees
- EM 1110-2-2902, Conduits, Culverts, and Pipes
- ETL 1110-2-583, Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures

Any inconsistency in the requirements of local, state and federal construction standards shall be resolved by following the most stringent guideline. Any project-specific conditions required by a permit issued by the USACE shall take precedence over contract provisions and City/County standard plans and specifications.

All construction within the federal levee right of way is subject to inspection and approval by CDID#1. The Contractor shall notify CDID#1 at least two business days prior to the start of construction. Before starting work, the Contractor shall be required to provide material submittals, manufacturer cut sheets and mix designs to CDID#1 for review and approval at least two weeks prior to starting work.

The Contractor is responsible to determine the location of all underground utilities prior to the start of construction and/or any excavation. The Contractor is required to contact the Northwest Utility Notification Center at 811 or www.callbeforeyoudig.org at least two full business days in advance.

## 2-00 INTERNAL DRAINAGE SYSTEM

This section shall apply to all areas of CDID#1 internal drainage system including primary ditches, secondary ditches, natural and man-made sloughs (improved or unimproved), drains and culverts.

### 2-01 ACCESS & EASEMENTS

Where CDID#1 owns or maintains an asset of the levee and/or interior drainage system or portion of a property, access for operations and maintenance shall be provided.

New buildings, fences and other structures shall not be permitted in areas where CDID#1 has an easement. If an existing building encroachment is partially or fully demolished or substantially improved, it shall not be re-constructed within CDID#1 easement area.

All new development along CDID#1 drainage ways shall be required to provide an access and maintenance easement to CDID#1 for ongoing maintenance. An access route for maintenance equipment shall be provided if an existing route does not exist or will be altered. Access roads shall not exceed 10% slope, and 10% cross-slope.

Where new easements are required, the Owner shall be responsible to provide a survey and complete legal description produced by a registered Professional Land Surveyor and pay all recording fees. CDID#1 shall be responsible to provide standard easement language, record the new easement and provide copies to the Owner.

Driveway approaches for new access points shall be constructed in accordance with CDID#1 Standard Detail C-7 with a minimum throat width not less than 25-feet and minimum thickness not less than 10-inches.

If an access route is fenced, a minimum 16- ft wide gate shall be provided which meets CDID#1 standards. Gate locks shall be keyed to match CDID#1 keying system, or a gate keeper installed to facilitate multiple gate locks.

The minimum requirements for easements shall be determined according to the following:

Table 2.1 Minimum Required Easement Width

| Minimum Easement Width | Pipe or Culvert | Drains[1] | Ditches[1] |
|---|---|---|---|
| | 20-ft | 25-ft | 25-ft |

[1] Measured from top of bank assuming level ground. Add 5-feet per 5% increase if slope or cross-slope exceeds 10%.

### 2-02 MINIMUM CLEARANCES

Utility crossings shall not restrict CDID#1 access or hydraulic capacity.

Borings under a ditch, drain or slough shall be as determined by geotechnical review but shall not be less than 10-feet below the bottom elevation of the channel, measured from "hard" bottom, and shall be encased to protect the utility.

Overhead utilities shall be a minimum of 25-feet above the top of the ditch, drain or slough cross-section, measured from the highest bank, to provide long-term for maintenance.

## 2-03 MATERIAL SCHEDULE – NON-FEDERAL IMPROVEMENTS

Construction materials shall be specified in accordance with design requirements based on service type, operating pressure, trench loading, exposure, soil conditions, etc. The following materials are suitable for common gravity storm drain lines which discharge to CDID#1 ditches and drains, and miscellaneous appurtenances associated with other CDID#1 facilities.

### A. GRAVITY STORM DRAINS

- Pipe 4-inch through 10-inch: ASTM D3034 SDR35 PVC, solid wall, JM Eagle or equal
- Pipe 12-inch and larger: ASTM F2648 HDPE, double wall, smooth interior, ADS N-12 or eq.
- Joints: Bell and spigot (push-on) elastomeric gasketed joints, water tight
- Gaskets: NBR (Nitril or Buna-N)
- Tracer wire: 12 AWG solid copper, 30 mil HDPE or HMWPE insulation jacket, green
- Bedding / Backfill: 5/8" minus CSTC meeting WSDOT specification 9-03.9(3)
- Armoring: 3"-8" quarry spalls meeting WSDOT specification 9-13.1(5)
- Grass Seed: 100% native perennial ryegrass and fescue blend
- Safety Grate: Galvanized steel frame, stainless steel hardware
- Locator Post: White reflective fiberglass, 3.75" wide x 6' long Carsonite marker or equal.

### B. ACCESS ROADS & DRIVEWAYS

- Fabric: Non-woven geotextile, 6 oz. per square yard minimum
- Aggregates (Base Course): 3-inch minus, no reject material allowed
- Aggregates (Top Course): 1-1/4 inch or 5/8-inch minus, depending on application and use
- Aggregates (Fine): #10-0 crushed aggregate for combined use trails
- Concrete: Class 4000# commercial mix, air entrained, minimum 10-inch thickness
- Expansion Joint: Asphalt impregnated, flexible, self-sealing joint board, WR Meadows or better

### C. ACCESS GATES

- Hinge / Lock Post: 3-inch Schedule 40 mild steel pipe
- Gate / Brace: 4-inch Schedule 80 mild steel pipe
- Caps / Plates: A36 Grade B mild steel flatbar
- Concrete: Class 4000# commercial mix, air entrained
- Paint: 3-layer coating system (primer, intermediate layer and top coat), non-lead, exterior grade, minimum 8 mils total dry film thickness, CAT yellow finish color, Tnemec or equal

### D. SIGNS

- Posts: 2"x2" perforated square tubing, telescoping, 12 gauge, galvanized, Unistrut or equal
- Receivers: 2-1/4" x 2-1/4" solid square tubing, 12 gauge, galvanized, Unistrut or equal
- Signs: Engineer grade, retroreflective, installed on a minimum 0.080 gauge sign blank

## E. RECYCLED CONCRETE

CDID#1 accepts recycled concrete rubble at no charge and uses it to shore the banks of its internal drainage system. Concrete must be dense, durable material free from cracks, seams and other defects which increase deterioration from handling and natural causes.

- Size: Nominal size 24"x24" and smaller. Maximum dimension 36".
- Shape: Square to rectangular, flat or cubic
- L/W Ratio: 1:2 or less
- Thickness: 4" minimum. Less than 1/3 of greatest dimension
- Rebar: None. Acceptable if none is exposed; Cut protruding steel flush with surface.
- Gradation: Less than 5% by weight of chips, fragments and spalls
- Other: Mechanically broken, sound, clean, asphalt free
- Location: 5350 Pacific Way, Longview unless directed otherwise based on stockpile
- Delivery: Single trucks only.

# 3-00 LEVEE MAINTENANCE

This section shall apply to all areas of CDID#1 levee system including the federally constructed Cowlitz and Columbia River flood protection works, and non-federal internal levee (Ditch No. 6).

## 3-01 POTHOLES & RUTTING

Potholes, ruts and other surface defects that develop in the levee access road due to vehicular traffic, settlement and poor crown slope shall be corrected to prevent ponding. Ponded water seeps into the levee embankment and saturates the foundation material, increasing the susceptibility for failure.

Prior to placing aggregates, all at-grade organics, sawdust and objectional material shall be removed.

The method of repair needed to address surface defects depends on their severity. Severity levels shall be determined according to the following:

Table 3.1 Surface Defect Severity Levels

| Maximum Depth | Average Diameter | | | |
|---|---|---|---|---|
| | Less than 1-foot | 1-2 feet | 2-3 feet | More than 3-feet |
| 1/2- to 2-inch | Low | Low | Medium | Medium |
| 2- to 4-inch | Low | Medium | High | High |
| 4-inch and over | Medium | High | High | High |

- Low severity defects may be corrected by grading.
- Medium severity defects shall be corrected by grading, adding aggregate, water and compacting using mechanical methods.
- High severity defects shall be cut to the depth required to provide a firm base, brought back up with aggregate placed in lifts no more than 6-inches, shaped at ½-inch per foot to provide a crown, watered as necessary to attain optimal moisture content, and thoroughly compacted to a relative density of 95% of optimum.

## 3-02 EMBANKMENT SLOPES

Ruts, burrows and other depressions that develop in the levee embankment slopes due to mowing, animal activity, vandalism, settlement or erosion shall be corrected to prevent instability as follows:

1. Prepare the areas of concern. Clear, grub, strip and scarify per EM 1110-2-1913, Section 7-2.
   - Clearing: Remove objectional material and obstructions that are at grade.
   - Grubbing: Remove objectional material that is below grade - stumps, roots, old piling, old paving, abandoned utilities, etc.
   - Stripping: Remove vegetation, sawdust, organics and topsoil to expose clean subgrade.
   - Scarify: Roughen the area where fill will be placed to eliminate a slip plane at the interface between fill and foundation, and ensure a good bond.

2. Fill areas of concern with clean import fill or borrow. Per EM 1110-2-1913, Section 4-2 almost any soil is suitable unless it is too wet, too fine or full of organics. Onsite stockpiles consisting of native sandy loam and gravels are generally acceptable. Material placed on the riverward side is generally preferred to be more earthen and material placed on the landward side is generally preferred to be more pervious.

3. Place fill in lifts no more than 12" deep and compact each lift using a reversing plate compactor, minimum 5,000# centrifugal force. See EM 1110-2-1913, Table 7-1 Category II for Semi-compacted construction methods. Compaction testing may be required at the discretion of CDID#1 depending on the means and methods employed.

4. Shape the landward and riverward slopes to match the original levee geometry. Coordinate with CDID#1 to determine the design levee crest height and prism slopes per the original authorization established by the Flood Control Act of 1936 (set at 1894 Flood plus 5-feet).

## 3-03 SOD COVER

Sod cover must be maintained to protect the levee against erosion caused by runoff, channel flow and wave wash. Regular mowing is necessary to maintain good ground cover with nominal grass height ranging between 3- and 10- inches. The entire levee profile should be mowed to approximately 15-ft beyond the toe of the embankment.

Where bare spots exist, the soil shall be loosened and hydroseeded or hand seeded at an application rate of 4- to 5-pounds per thousand square feet. Seeding shall coincide with fall or spring growing season or be watered until established.

Newly hand seeded areas shall be covered with a thin layer of weed-free straw to keep birds from eating the grass seed, help hold moisture and promote germination.

Surface roughening or erosion control jute mats shall be required to stabilize and protect seed on slopes steeper than 3H:1V. Surface roughening shall not exceed a depth of 2- to 4-inches and methods shall be conducive to mowing.

Grazing is not permitted on the levee.

Application Rate (Seeding): 4- to 5-lbs per 1,000 SF

## 3-04 HERBICIDE USE FOR UNWANTED VEGETATION

Where mowing is impractical, an approved herbicide may be used to control unwanted vegetation and/or noxious weeds including but not limited to alder saplings, bamboo, tansy, thistle, knotweed, scotch broom, and blackberries.

Trees should not be allowed on the levee prism or within 15-feet of the toe of the embankment including riprapped areas. Saplings should be cut and chemically treated. Trees 2-inches in diameter or greater should be cut down, root ball removed, voids filled with impervious material, and the fill material firmly compacted and reseeded.

For the control of woody plants, vines and annual and perennial broadleaf weeds in levee right of way areas, CDID#1 uses Garlon® 4 specialty herbicide at an application rate of 1 oz/gallon. All herbicides must be used in accordance with state and local regulations, and applied according to the manufacturer's recommendations.

Application Rate (Garlon ® 4): 1 oz/gallon

## 3-05 MATERIAL SCHEDULE – LEVEE REPAIRS

### A. AGGREGATES

Aggregates for low severity pothole repairs shall be 5/8-inch minus CSTC meeting the requirements of WSDOT Standard Specification 9-03.9(3).

Aggregates for medium or high severity pothole repairs and re-surfacing shall be 1 1/4-inch minus CSBC meeting the requirements of WSDOT Standard Specification 9-03.9(3).

### B. EMBANKMENT FILL

Almost any soil or coarse-grained sand is suitable except very wet, fine grained soiled soil/silt or highly organic soils. Water content should be low enough to allow placement and adequate compaction. For more information, refer to EM 1110-2-2913, Section 4-2

### C. GRASS SEED

Seed mixtures used to restore sod cover shall consist of 100% native perennial ryegrass.

If the local environment, activity, soils, or other conditions will not support grass growth, non-vegetative means of erosion control shall be employed.

## 4-00 LEVEE PENETRATIONS

Directional bore or other trenchless methods are not permitted for new pipe penetrations through the levee. All proposed utilities or other improvements shall be installed in an open cut trench.

Care shall be taken not to over-excavate. Unsuitable soils or organic material found within the levee right of way during the course of excavation shall be removed to the minimum depth required to provide a firm foundation and thoroughly compacted to a relative density of 95% of optimum.

A minimum cover of 24" is required above top of pipe to finish grade. This assumes the pipe is installed in accordance with manufacturer's recommendations and does not address the cover needed to prevent floatation or special loading conditions.

Pipe shall be laid to a true line and grade at the invert of the pipe and care shall be exercised to match pipe joints for concentricity and compatibility.

Tracer wire is required and must be installed in a continuous strand. Wire shall be taped to top of pipe in a straight line every 8-10 feet and terminated at grade to a SnakePit. Continuity testing is required.

A mix design for controlled density fill (CDF) shall be submitted to CDID#1 for review and approval prior to placement. CDF shall be self-compacting, cementitious material requiring no vibration or tamping to achieve consolidation. CDF shall have a minimum 28-day strength of 50 psi, maximum 28-day strength not to exceed 300 psi, and shall be flowable (3 to 10-inch slump). A Certificate of Compliance is required for each truck load of CDF placed in the levee.

All hydrostatic testing shall be witnessed by CDID#1 with a minimum of 2-days advance notice provided for scheduling and coordination. Testing requirements are as follows:

- Storm lines shall be pressure tested in accordance with WSDOT Standard Specification 7-04.
- Sanitary lines shall be pressure tested in accordance with WSDOT Standard Specification 7-17.
- Water lines shall be tested at 1.5 times normal operating pressure or 200 psi, whichever is greater.
- Manholes shall be vacuum tested in accordance with ASTM Designation C 1244-93.

As-built drawings, TV reports and inspection documentation which demonstrates successful completion of required performance testing shall be submitted to CDID#1 upon project completion.

## 4-01 PIPE INSPECTIONS

Pipes which penetrate the levee must be periodically dewatered and inspected on an on-going basis to evaluate condition. Pipe condition coding shall be in accordance with the National Association of Sewer Service Companies' (NASSCO) Pipeline Assessment Certification Program (PACP). Copies of inspection reports and video recordings shall be submitted to CDID#1 on a USB flash drive.

- Penetrations below the 100-year flood elevation must be inspected every 5-years.
- Penetrations above the 100-year flood interval must be inspected every 10-years.
- Pipes less than 48-inch must be inspected remotely using closed circuit television (CCTV).
- Pipes 48-inches or larger diameter may be inspected by walking through the pipe and documenting the walk-thru using CCTV. CDID#1 shall be provided access for walk-thru inspections and notified at least 2-days in advance.

For more information, refer to USACE "Guidance for CCTV and Sonar Inspection for Pipe Penetrating Levees" dated 11 November 2010.

## 4-02 MATERIAL SCHEDULE – NEW UTILITIES

Pipe material, joints and fittings shall be specified in accordance with design requirements based on service type, operating pressure, trench loading, exposure, soil conditions, etc. All pressurized pipe shall be doubly restrained using clamp-on restraining devices and thrust blocking, and have positive closure devices for rapid closure in the event of a break or leak. The following materials are suitable for common utility installations including potable water, sanitary sewer and storm drain lines.

### A. POTABLE WATER LINES

- Pipe: AWWA C151 ductile iron MJ pipe, Class 52, asphalt coated, US Pipe or equal
- Valves (up to 10-inch): AWWA C509 or C515 gate valve, 250 psig rating, Class 150B
- Valves (12-inch and larger): AWWA C504 butterfly valve, 250 psig rating, Class 150B
- Fittings: AWWA C110 or AWWA C153 ductile iron
- Joints: AWWA C111 rubber gasket joints, mechanically restrained
- Lining: AWWA C104 cement mortar, standard thickness, seal coated
- Restraints: Ductile iron with cor-ten rods and bolts, 150 psi rating, EBAA Iron or equal
- Gaskets: AWWA C111 mechanical joint gasket or full face 1/8" NBR (Nitril or Buna-N)
- Tracer wire: 12 AWG solid copper, 30 mil HDPE or HMWPE insulation jacket, blue

### B. LOW PRESSURE FORCE MAINS (less than 50 psig)

- Pipe: AWWA C900 for 4-inch to 12-inch, or AWWA C905 for 14-inch to 36-inch, DR 18
- Gate Valve: AWWA C509 or C515, 250 psig, Class 150B, NRS, RW, Watts 405 or Zurn 48
- Eccentric Plug Valve: ASTM 536 Grade 65-45-12, 285 psig, ductile iron, DeZurik PEC or equal
- Fittings: Fusion epoxy lined and coated push-on ductile iron AWWA C110 or C153
- Joints: AWWA C111, mechanically restrained using clamp-on restraining devices
- Restraints: Ductile iron with cor-ten rods and bolts, 150 psi rating, EBAA Iron or equal
- Gaskets: NBR (Nitril or Buna-N)
- Tracer wire: 12 AWG solid copper, 30 mil HDPE or HMWPE insulation jacket

### C. GRAVITY SANITARY SEWER & STORM DRAINS

- Pipe: ASTM 3034 SDR35 PVC
- Valves: ASTM A126 Class B eccentric plug valve, 175 psig, cast iron, DeZurik PEC or equal
- Fittings: ASTM 3034 SDR 35 PVC
- Joints: Bell and spigot (push-on) elastomeric gasketed joints, ASTM D3212
- Gaskets: NBR (Nitril or Buna-N)
- Tracer wire: 12 AWG solid copper, 30 mil HDPE or HMWPE insulation jacket, green

### D. THRU-LEVEE CASING

- Pipe: Steel, minimum thickness as determined by calculations and EM 1110-2-2902
- Insulators: Injection molded HDPE, non-deteriorating, Calpico Model PX or equal
- End seals: 30 mil membrane PVC liner material
- Fasteners: 316 stainless steel
- Annulus fill: Self-compacting, flowable, cementitious controlled density fill (CDF)

# 5-00 LEVEE SECTION DETAILS

## 5-01 COWLITZ RIVER LEVEE

Refer to the following documents for detailed information about the Cowlitz River Levee:

- Table 5.1 of these Special Provisions
- CDID#1 Standard Detail C-10: Cowlitz River Typical Cross Section
- CDID#1 Standard Detail C-11: Cowlitz River USACE Section Details
- USACE Dwg. CL-05-16/13: 1952 Proposed Improvements (Authorized Levee Plan & Section)
- USACE Dwg. CL-05-16/14: 1952 Proposed Improvements (Authorized Levee Profile & Details
- USACE Dwg. CLW-64-8/1
- USACE Dwg. CLW-64-8/2
- USACE Dwg. CLW-64-9/1
- USACE Dwg. CLW-64-2/6

## 5-02 COLUMBIA RIVER LEVEE

Refer to the following documents for detailed information about the Columbia River Levee:

- Table 5.2 of these Special Provisions
- CDID#1 Standard Detail C-12: Columbia River Typical Cross Section
- CDID#1 Standard Detail C-13: Columbia River USACE Section Details
- USACE Dwg. CL-05-16/13: 1952 Proposed Improvements (Authorized Levee Plan & Section)
- USACE Dwg. CL-05-16/14: 1952 Proposed Improvements (Authorized Levee Profile & Details
- USACE Dwg CLW-64-10/2

Table 5.1 Cowlitz River Levee Details

| ENGR STATION | USACE STATION | NEAREST ADDRESS | LOCATION | LEVEE ROW DIMENSIONS | | | LEVEE CREST ELEV. NAVD88 | LAND WARD SLOPE H:V | TOE DRAIN AS REQ. REFERENCE USACE DWG CL-05-16/14 | | TOE DRAINS CONT. REFERENCE USACE DWG CL-05-16/14 | | GRAVEL BLANKETS REFERENCE USACE DWG CLW-64-8/1 | | IMPERV. BLANKETS REFERENCE USACE DWG CLW-64-9/1 | | STONE REVETMENT REFERENCE USACE DWG CLW-64-2/6 | | LEVEE SECTION C REFERENCE USACE DWG CL-05-16/13 | | LEVEE SECTION D REFERENCE USACE DWG CL-05-16/13 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TOTAL | TO LAND | TO RIVER | | | START | END | START | END | START | END | START | END | START | END | START | END | START | END |
| 29+73 | 773+45 | ------- END OF COWLITZ RIVER LEVEE ------- | | 100 | 50 | 50 | 40.8 | 6:1 | | | | | | | | | | | | | | |
| 28+00 | 771+41 | 135 West Side Hwy | | 100 | 50 | 50 | 40.6 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 24+00 | 767+35 | 129 West Side Hwy | | 100 | 50 | 50 | 39.2 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 20+00 | 763+35 | 101 Fishers Lane | | 100 | 50 | 50 | 39.7 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 16+00 | 759+35 | 400 Block NW 1st Ave | | 100 | 50 | 50 | 38.8 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 12+00 | 755+35 | 300 Block NW 1st Ave | | 100 | 50 | 50 | 39.2 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 8+00 | 751+35 | Cowlitz Way Bridge | Cowlitz Way Bridge | 100 | 50 | 50 | 39.0 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 4+00 | 747+35 | 200 Block NW 1st Ave | | 100 | 50 | 50 | 38.6 | 6:1 | | | | | | | | | 746+00 | 747+20 | | | 562+00 | 773+45 |
| 436+00 | 743+18 | West Main Street | Allen Street Bridge | 100 | 50 | 50 | 35.3 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 432+00 | 739+18 | 85 Catlin Street | | 100 | 50 | 50 | 35.1 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 428+00 | 735+18 | 312 SW First Avenue | Hall of Justice | 100 | 50 | 50 | 33.4 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 424+00 | 731+18 | 1942 First Avenue | Cowlitz Co. Boat House | 175 | 75 | 100 | 34.2 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 420+00 | 727+18 | 1826 First Avenue | Regina's Restaurant | 175 | 75 | 100 | 34.2 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 416+00 | 723+18 | 1742 First Avenue | | 175 | 75 | 100 | 37.8 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 412+00 | 719+18 | 1632 Third Avenue | | 175 | 75 | 100 | 36.6 | 6:1 | | | 689+50 | 733+50 | | | | | 712+20 | 721+70 | | | 562+00 | 773+45 |
| 408+00 | 715+18 | 1548 River Road | Rivers Edge Condos | 175 | 75 | 100 | 34.5 | 6:1 | | | 689+50 | 733+50 | | | | | 712+20 | 721+70 | | | 562+00 | 773+45 |
| 404+00 | 711+18 | 1508 River Road | | 175 | 75 | 100 | 37.4 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 400+00 | 707+18 | 1408 River Road | Nipp & Tuck Drywall | 200 | 100 | 100 | 37.1 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 396+00 | 703+18 | 1322 River Road | Riverview Condos | 200 | 100 | 100 | 34.0 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 392+00 | 699+18 | 1310 River Road | Levee House Apts | 200 | 100 | 100 | 36.5 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 388+00 | 695+18 | 1154 River Road | Waste Control | 200 | 100 | 100 | 34.5 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 384+00 | 691+18 | 1152 River Road | Waste Control | 200 | 100 | 100 | 34.6 | 6:1 | | | 689+50 | 733+50 | | | | | | | | | 562+00 | 773+45 |
| 380+00 | 687+18 | 950 Third Avenue | Waste Control | 200 | 100 | 100 | 34.1 | 6:1 | | | | | | | | | 682+00 | 690+00 | | | 562+00 | 773+45 |
| 376+00 | 683+18 | 1100 Third Avenue | Glacier Northwest | 200 | 100 | 100 | 34.1 | 6:1 | | | | | | | | | 682+00 | 690+00 | | | 562+00 | 773+45 |
| 372+00 | 679+18 | 850 Third Avenue | | 200 | 100 | 100 | 35.2 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 368+00 | 675+18 | 850 Third Avenue | | 200 | 100 | 100 | 35.2 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 364+00 | 671+08 | 850 Third Avenue | | 200 | 100 | 100 | 34.7 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 360+00 | 667+08 | 760 Marine View Drive | | 235 | 135 | 100 | 34.2 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 356+00 | 663+18 | 740-749 Marine View Dr | | 235 | 135 | 100 | 33.4 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 352+00 | 659+18 | 726-736 Marine View Dr | | 235 | 135 | 100 | 33.5 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 348+00 | 655+18 | Tennant Way | Third Avenue Off-Ramp | 235 | 135 | 100 | 33.0 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 344+00 | 651+18 | Tennant Way | Third Avenue Off-Ramp | 235 | 135 | 100 | 33.5 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 340+00 | 647+18 | Tennant Way | Third Avenue Off-Ramp | 235 | 135 | 100 | 33.3 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 336+00 | 643+18 | Tennant Way | SR-432 | 235 | 135 | 100 | 32.9 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 332+00 | 639+18 | Tennant Way | SR-432 | 235 | 135 | 100 | 33.0 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 328+00 | 635+18 | Tennant Way | SR-432 | 235 | 135 | 100 | 33.6 | 6:1 | 635+00 | 681+00 | | | | | | | | | | | 562+00 | 773+45 |
| 324+00 | 631+18 | Tennant Way | SR-432 | 235 | 135 | 100 | 33.7 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 320+00 | 627+18 | Tennant Way | SR-432 | 235 | 135 | 100 | 33.1 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |

| ENGR STATION | USACE STATION | NEAREST ADDRESS | LOCATION | LEVEE ROW DIMENSIONS | | | LEVEE CREST ELEV. NAVD88 | LAND WARD SLOPE H:V | TOE DRAIN AS REQ. REFERENCE USACE DWG CL-05-16/14 | | TOE DRAINS CONT. REFERENCE USACE DWG CL-05-16/14 | | GRAVEL BLANKETS REFERENCE USACE DWG CLW-64-8/1 | | IMPERV. BLANKETS REFERENCE USACE DWG CLW-64-9/1 | | STONE REVETMENT REFERENCE USACE DWG CLW-64-2/6 | | LEVEE SECTION C REFERENCE USACE DWG CL-05-16/13 | | LEVEE SECTION D REFERENCE USACE DWG CL-05-16/13 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | START | END | START | END | START | END | START | END | START | END | START | END | START | END |
| 316+00 | 623+18 | 500 Tennant Way | Lakeside Industries | 235 | 135 | 100 | 32.7 | 6:1 | | | | | | | | | 621+00 | 626+00 | | | 562+00 | 773+45 |
| 312+00 | 619+18 | 500 Tennant Way | Lakeside Industries | 235 | 135 | 100 | 33.9 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 308+00 | 615+18 | 500 Tennant Way | Lakeside Industries | 235 | 135 | 100 | 35.0 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 304+00 | 611+18 | 500 Tennant Way | Lakeside Industries | 235 | 135 | 100 | 33.5 | 6:1 | | | | | | | | | | | | | 562+00 | 773+45 |
| 300+00 | 607+18 | 500 Tennant Way | Lakeside Industries | 235 | 135 | 100 | 32.6 | 6:1 | | | 562+00 | 610+00 | | | | | | | | | 562+00 | 773+45 |
| 296+00 | 603+18 | 500 Tennant Way | Lakeside Industries | 235 | 135 | 100 | 32.6 | 6:1 | | | 562+00 | 610+00 | | | | | 578+00 | 603+00 | | | 562+00 | 773+45 |
| 292+00 | 599+18 | 240 Tennant Way | Swanson Bark & Wood | 235 | 135 | 100 | 33.4 | 6:1 | | | 562+00 | 610+00 | 599+00 | 602+00 | | | 578+00 | 603+00 | | | 562+00 | 773+45 |
| 288+00 | 595+18 | 240 Tennant Way | Swanson Bark & Wood | 235 | 135 | 100 | 33.0 | 6:1 | | | 562+00 | 610+00 | | | | | 578+00 | 603+00 | | | 562+00 | 773+45 |
| 284+00 | 591+18 | 240 Tennant Way | Swanson Bark & Wood | 235 | 135 | 100 | 32.2 | 6:1 | | | 562+00 | 610+00 | | | | | 578+00 | 603+00 | | | 562+00 | 773+45 |
| 280+00 | 587+18 | 240 Tennant Way | Swanson Bark & Wood | 275 | 175 | 100 | 33.0 | 6:1 | | | 562+00 | 610+00 | | | | | 578+00 | 603+00 | | | 562+00 | 773+45 |
| 276+00 | 583+18 | 240 Tennant Way | Swanson Bark & Wood | 275 | 175 | 100 | 35.6 | 6:1 | | | 562+00 | 610+00 | | | | | 578+00 | 603+00 | | | 562+00 | 773+45 |
| 272+00 | 579+18 | 240 Tennant Way | Swanson Bark & Wood | 275 | 175 | 100 | 35.1 | 6:1 | | | 562+00 | 610+00 | | | | | 578+00 | 603+00 | | | 562+00 | 773+45 |
| 268+00 | 575+18 | 200 Freedom Way | Gearhart Gardens | 325 | 175 | 150 | 35.6 | 6:1 | | | 562+00 | 610+00 | | | | | | | | | 562+00 | 773+45 |
| 264+00 | 571+18 | 200 Freedom Way | Gearhart Gardens | 325 | 175 | 150 | 35.3 | 6:1 | | | 562+00 | 610+00 | | | | | | | | | 562+00 | 773+45 |
| 260+00 | 567+18 | 200 Freedom Way | Gearhart Gardens | 325 | 175 | 150 | 34.6 | 6:1 | | | 562+00 | 610+00 | | | | | | | | | 562+00 | 773+45 |
| 256+00 | 563+18 | Tennant Way | SR-432 | 325 | 175 | 150 | 32.5 | 6:1 | | | 562+00 | 610+00 | | | | | | | | | 562+00 | 773+45 |
| 252+00 | 559+18 | Tennant Way | SR-432 | 325 | 175 | 150 | 32.6 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 248+00 | 555+18 | Tennant Way | Burthington Northern RR | 275 | 175 | 100 | 34.7 | 4:1 | | | | | 546+00 | 555+00 | | | | | 476+00 | 562+00 | | |
| 244+00 | 551+18 | 100 Tennant Way | J.E. McAmis Shipyard | 275 | 175 | 100 | 37.0 | 4:1 | | | | | 546+00 | 555+00 | | | | | 476+00 | 562+00 | | |
| 240+00 | 547+18 | 100 Tennant Way | J.E. McAmis Shipyard | 275 | 175 | 100 | 37.8 | 4:1 | | | | | 546+00 | 555+00 | | | | | 476+00 | 562+00 | | |
| 236+00 | 543+18 | 100 Tennant Way | J.E. McAmis Shipyard | 275 | 175 | 100 | 37.5 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 232+00 | 539+18 | 100 Tennant Way | J.E. McAmis Shipyard | 350 | 175 | 175 | 36.9 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 228+00 | 535+18 | 100 Tennant Way | J.E. McAmis Shipyard | 350 | 175 | 175 | 35.6 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 224+00 | 531+18 | 100 Tennant Way | J.E. McAmis Shipyard | 350 | 175 | 175 | 37.1 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 220+00 | 527+18 | 100 Tennant Way | J.E. McAmis Shipyard | 350 | 175 | 175 | 36.2 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 216+00 | 523+18 | Log Locks | Log Locks | 310 | 175 | 135 | 33.9 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 212+00 | 519+18 | 300 Fibre Way | Westrock Pulp & Paper | 275 | 175 | 100 | 35.1 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 208+00 | 515+18 | 300 Fibre Way | Westrock Pulp & Paper | 275 | 175 | 100 | 34.4 | 4:1 | | | | | | | | | 514+75 | 517+94 | 476+00 | 562+00 | | |
| 204+00 | 511+18 | 300 Fibre Way | Westrock Pulp & Paper | 275 | 175 | 100 | 34.7 | 4:1 | | | | | | | 482+00 | 512+00 | | | 476+00 | 562+00 | | |
| 200+00 | 507+18 | 300 Fibre Way | Westrock Pulp & Paper | 275 | 175 | 100 | 34.7 | 4:1 | | | | | | | 482+00 | 512+00 | 506+49 | 510+49 | 476+00 | 562+00 | | |
| 196+00 | 503+18 | 300 Fibre Way | Westrock Pulp & Paper | 275 | 175 | 100 | 35.4 | 4:1 | | | | | | | 482+00 | 512+00 | | | 476+00 | 562+00 | | |
| 192+00 | 499+18 | 300 Fibre Way | Westrock Pulp & Paper | 275 | 175 | 100 | 35.7 | 4:1 | | | | | | | 482+00 | 512+00 | | | 476+00 | 562+00 | | |
| 188+00 | 495+18 | 300 Fibre Way | Westrock Pulp & Paper | 275 | 175 | 100 | 35.5 | 4:1 | | | | | | | 482+00 | 512+00 | | | 476+00 | 562+00 | | |
| 184+00 | 491+18 | 300 Fibre Way | Westrock Pulp & Paper | 275 | 175 | 100 | 35.4 | 4:1 | | | | | | | 482+00 | 512+00 | | | 476+00 | 562+00 | | |
| 180+00 | 487+18 | 300 Fibre Way | Westrock Pulp & Paper | 325 | 175 | 100 | 35.3 | 4:1 | | | | | | | 482+00 | 512+00 | | | 476+00 | 562+00 | | |
| 176+00 | 483+18 | 300 Fibre Way | Westrock Pulp & Paper | 325 | 175 | 100 | 35.3 | 4:1 | | | | | | | 482+00 | 512+00 | | | 476+00 | 562+00 | | |
| 172+00 | 476+18 | 300 Fibre Way | Westrock Pulp & Paper | 325 | 175 | 100 | 35.2 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| 168+00 | 475+18 | 300 Fibre Way | Westrock Pulp & Paper | 325 | 175 | 100 | 34.5 | 4:1 | | | | | | | | | | | 476+00 | 562+00 | | |
| **166+00** | **473+00** | **------ START OF COWLITZ RIVER LEVEE ------** | | **325** | **175** | **100** | **34.4** | **4:1** | | | | | | | | | | | | | | |

Table 5.2 Columbia River Levee Details

| ENGR STATION | USACE STATION | NEAREST ADDRESS | LOCATION | LEVEE ROW DIMENSIONS | | | LEVEE CREST ELEV. NAVD88 | LAND WARD SLOPE H:V | TOE DRAIN AS REQ. REFERENCE USACE DWG CL-05-16/14 | | TOE DRAINS CONT. REFERENCE USACE DWG CL-05-16/14 | | GRAVEL BLANKETS REFERENCE USACE DWG CLW-64-8/1 | | IMPERV. BLANKETS REFERENCE USACE DWG CLW-64-9/1 | | STONE REVETMENT REFERENCE USACE DWG CLW-64-10/2 | | LEVEE SECTION C REFERENCE USACE DWG CL-05-16/13 | | LEVEE SECTION D REFERENCE USACE DWG CL-05-16/13 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TOTAL | TO LAND | TO RIVER | | | START | END | START | END | START | END | START | END | START | END | START | END | START | END |
| 26+90 | 26+90 | ------- START OF COLUMBIA RIVER LEVEE ------- | | 200 | 100 | 100 | 29.6 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | | |
| 24+00 | 24+00 | 5350 Pacific Way | CDID#1 Main Pump Stn. | 200 | 100 | 100 | 28.4 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 20+00 | 20+00 | 5431 Pacific Way | Coal Creek Slough | 200 | 100 | 100 | 28.3 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 16+00 | 16+00 | Pacific Way | Coal Creek Slough | 200 | 100 | 100 | 28.7 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 12+00 | 12+00 | Pacific Way | Coal Creek Slough | 200 | 100 | 100 | 28.9 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 8+00 | 8+00 | Pacific Way | Coal Creek Slough | 200 | 100 | 100 | 30.0 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 4+00 | 4+00 | Pacific Way | Coal Creek Slough | 200 | 100 | 100 | 29.5 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 0+00 BK | 0+00 | Coal Creek Rd | West Longview Lagoons | 200 | 100 | 100 | 27.1 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 7+00 | 3+00 | Coal Creek Rd | West Longview Lagoons | 200 | 100 | 100 | 28.1 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 11+00 | 7+00 | Coal Creek Rd | West Longview Lagoons | 200 | 100 | 100 | 28.9 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 15+00 | 11+00 | Coal Creek Rd / SR4 | | 200 | 100 | 100 | 29.0 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 19+00 | 15+00 | 6050 Ocean Beach Hwy | SR432 | 200 | 100 | 100 | 33.3 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 23+00 | 19+00 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 32.3 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 27+00 | 23+00 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 32.4 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 31+00 | 27+00 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 32.0 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 33+53BK | 29+53 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 32.2 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 242+00 | 33+55 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 31.6 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 238+00 | 37+55 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 32.0 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 234+00 | 41+55 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 31.2 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 230+00 | 45+55 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 30.6 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 226+00 | 49+55 | Willow Grove Conn. Rd | SR432 | 200 | 100 | 100 | 32.9 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 222+00 | 53+55 | 5340 Willow Grove Rd. | | 425 | 225 | 200 | 32.5 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 218+00 | 57+55 | 5343 Willow Grove Rd. | | 425 | 225 | 200 | 30.9 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 216+58BK | 58+97 | Willow Grove Rd. | | 425 | 225 | 200 | 30.8 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 212+00 | 63+60 | Willow Grove Rd. | | 425 | 225 | 200 | 30.4 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 208+00 | 67+60 | 5558 Willow Grove Rd. | Fishers Island RV Park | 425 | 225 | 200 | 30.7 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 204+00 | 71+60 | 5558 Willow Grove Rd. | Fishers Island RV Park | 425 | 225 | 200 | 29.9 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 200+00 | 75+60 | 5558 Willow Grove Rd. | Fishers Island RV Park | 425 | 225 | 200 | 29.6 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 196+00 | 79+60 | 5558 Willow Grove Rd. | Fishers Island RV Park | 375 | 200 | 175 | 29.0 | 6:1 | 26+12 | 81+00 | | | | | | | | | | | 26+12 | 467+25 |
| 192+00 | 83+60 | 5401 Willow Grove Rd. | Willow Grove Boat & RV | 375 | 200 | 175 | 28.5 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 188+00 | 87+60 | 149 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 29.0 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 184+00 | 91+60 | 149 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 29.4 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 180+00 | 95+60 | 151 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 29.0 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 176+00 | 99+60 | 187 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 29.7 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 172+00 | 103+60 | 193 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 29.5 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 168+00 | 107+60 | 201 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 29.3 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 164+00 | 111+60 | 221 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 30.2 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |

| ENGR STATION | USACE STATION | NEAREST ADDRESS | LOCATION | LEVEE ROW DIMENSIONS | | | LEVEE CREST ELEV. NAVD88 | LAND WARD SLOPE H:V | TOE DRAIN AS REQ. REFERENCE USACE DWG CL-05-16/14 | | TOE DRAINS CONT. REFERENCE USACE DWG CL-05-16/14 | | GRAVEL BLANKETS REFERENCE USACE DWG CLW-64-8/1 | | IMPERV. BLANKETS REFERENCE USACE DWG CLW-64-9/1 | | STONE REVETMENT REFERENCE USACE DWG CLW-64-10/2 | | LEVEE SECTION C REFERENCE USACE DWG CL-05-16/13 | | LEVEE SECTION D REFERENCE USACE DWG CL-05-16/13 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | START | END | START | END | START | END | START | END | START | END | START | END | START | END |
| 160+00 | 115+60 | Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 30.2 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 156+00 | 119+60 | 263 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 30.2 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 152+00 | 123+60 | 274 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 30.1 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 148+00 | 127+60 | 278 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 29.3 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 144+00 | 131+60 | 283 Barlow Point Rd. | Barlow Point | 375 | 200 | 175 | 29.4 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 140+00 | 135+60 | Dike Road | | 375 | 200 | 175 | 30.4 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 136+00 | 139+60 | Dike Road | | 375 | 200 | 175 | 30.4 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 132+00 | 143+60 | Dike Road | | 375 | 200 | 175 | 29.4 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 128+00 | 147+60 | Dike Road | | 375 | 200 | 175 | 28.9 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 124+00 | 151+60 | Dike Road | | 375 | 200 | 175 | 28.6 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 120+00 | 155+60 | Dike Road | | 375 | 200 | 175 | 28.8 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 116+00 | 159+60 | Dike Road | | 375 | 200 | 175 | 28.9 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 112+00 | 163+60 | Dike Road | | 375 | 200 | 175 | 30.0 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 108+00 | 167+60 | Dike Road | | 375 | 200 | 175 | 29.7 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 104+00 | 171+60 | Dike Road | | 375 | 200 | 175 | 29.6 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 100+00 | 175+60 | Dike Road | | 375 | 200 | 175 | 29.9 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 96+00 | 179+60 | Dike Road | | 375 | 200 | 175 | 30.2 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 92+00 | 183+60 | Dike Road | | 375 | 200 | 175 | 30.6 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 88+00 | 187+60 | Dike Road | | 375 | 200 | 175 | 30.5 | 6:1 | | | 150+00 | 191+00 | | | | | | | | | 26+12 | 467+25 |
| 84+00 | 191+60 | Dike Road | | 375 | 200 | 175 | 30.7 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 80+00 | 195+60 | Dike Road | CDID#1 Reynolds PS | 375 | 200 | 175 | 30.9 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 76+00 | 199+60 | 4029 Industrial Way | Millennium Bulk Term. | 325 | 175 | 150 | 29.7 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 72+00 | 203+60 | 4029 Industrial Way | Millennium Bulk Term. | 325 | 175 | 150 | 29.7 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 68+00 | 207+60 | 4029 Industrial Way | Millennium Bulk Term. | 325 | 175 | 150 | 30.1 | 6:1 | | | | | | | | | | | 206+00 | 213+00 | 26+12 | 467+25 |
| 64+00 | 211+60 | 4029 Industrial Way | Millennium Bulk Term. | 325 | 175 | 150 | 31.2 | 6:1 | | | | | | | | | | | 206+00 | 213+00 | 26+12 | 467+25 |
| 60+00 | 215+60 | 4029 Industrial Way | Millennium Bulk Term. | 325 | 175 | 150 | 30.5 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 56+00 | 219+60 | 4029 Industrial Way | Millennium Bulk Term. | 325 | 175 | 150 | 30.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 52+00 | 223+60 | 4029 Industrial Way | Millennium Bulk Term. | 325 | 175 | 150 | 31.0 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 48+00 | 227+60 | 4029 Industrial Way | Millennium Bulk Term. | 250 | 150 | 100 | 31.0 | 6:1 | | | | | | | | | | | 227+00 | 233+00 | 26+12 | 467+25 |
| 44+00 | 231+60 | 4029 Industrial Way | Millennium Bulk Term. | 250 | 150 | 100 | 31.5 | 6:1 | | | | | | | | | | | 227+00 | 233+00 | 26+12 | 467+25 |
| 40+00 | 235+60 | 4029 Industrial Way | Millennium Bulk Term. | 250 | 150 | 100 | 31.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 36+00 | 239+60 | 4029 Industrial Way | Millennium Bulk Term. | 250 | 150 | 100 | 32.0 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 32+00 | 243+60 | 4029 Industrial Way | Millennium Bulk Term. | 250 | 150 | 100 | 30.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 28+00 | 247+60 | 4029 Industrial Way | Millennium Bulk Term. | 250 | 150 | 100 | 29.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 24+00 | 251+60 | 4029 Industrial Way | Millennium Bulk Term. | 250 | 150 | 100 | 30.3 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 19+33 BK | 256+27 | 4029 Industrial Way | Millennium Bulk Term. | 250 | 150 | 100 | 29.5 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 48+00 | 259+18 | 4029 Industrial Way | Dike Rd / Hoehne Ave | 250 | 150 | 100 | 28.3 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 44+00 | 263+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 29.2 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |

| ENGR STATION | USACE STATION | NEAREST ADDRESS | LOCATION | LEVEE ROW DIMENSIONS | | | LEVEE CREST ELEV. NAVD88 | LAND WARD SLOPE H:V | TOE DRAIN AS REQ. REFERENCE USACE DWG CL-05-16/14 | | TOE DRAINS CONT. REFERENCE USACE DWG CL-05-16/14 | | GRAVEL BLANKETS REFERENCE USACE DWG CLW-64-8/1 | | IMPERV. BLANKETS REFERENCE USACE DWG CLW-64-9/1 | | STONE REVETMENT REFERENCE USACE DWG CLW-64-10/2 | | LEVEE SECTION C REFERENCE USACE DWG CL-05-16/13 | | LEVEE SECTION D REFERENCE USACE DWG CL-05-16/13 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | START | END | START | END | START | END | START | END | START | END | START | END | START | END |
| 40+00 | 267+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 29.7 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 36+00 | 271+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 31.2 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 32+00 | 275+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 30.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 28+00 | 279+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 29.5 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 24+00 | 283+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 31.1 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 20+00 | 287+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 28.2 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 16+00 | 291+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 30.7 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 12+00 | 295+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 30.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 8+00 | 299+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 31.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 4+00 | 303+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 32.4 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 0+00 BK | 307+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 30.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 4+00 | 311+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 30.4 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 8+00 | 315+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 30.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 12+00 | 319+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 33.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 16+00 | 323+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 31.9 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 20+00 | 327+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 32.2 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 24+00 | 331+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 31.6 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 28+00 | 335+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 31.6 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 32+00 | 339+18 | 3001 Industrial Way | NORPAC Paper Co. | 250 | 150 | 100 | 31.7 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 36+00 | 343+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 31.8 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 40+00 | 347+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 33.5 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 44+00 | 351+18 | 3401 Industrial Way | Nippon Dynawave | 250 | 150 | 100 | 32.9 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 48+00 | 355+18 | 1701 Industrial Way | Weyerhaueser Co. | 300 | 200 | 100 | 32.0 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 52+00 | 359+18 | 1701 Industrial Way | Weyerhaueser Co. | 300 | 200 | 100 | 31.0 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 56+00 | 363+18 | 1701 Industrial Way | Weyerhaueser Co. | 300 | 200 | 100 | 31.2 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 60+00 | 367+18 | 1701 Industrial Way | Weyerhaueser Co. | 300 | 200 | 100 | 31.7 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 64+00 | 371+18 | 1701 Industrial Way | Weyerhaueser Co. | 300 | 200 | 100 | 31.6 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 68+00 | 375+18 | 1701 Industrial Way | Weyerhaueser Co. | 300 | 200 | 100 | 31.2 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 72+00 | 379+18 | 1701 Industrial Way | Weyerhaueser Co. | 300 | 200 | 100 | 32.6 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 76+00 | 383+18 | 1701 Industrial Way | Weyerhaueser Co. | 300 | 200 | 100 | 32.5 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 80+00 | 387+18 | Oregon Way | Lewis & Clark Bridge | 300 | 200 | 100 | 33.3 | 6:1 | 333+76 | 400+00 | | | | | | | | | | | 26+12 | 467+25 |
| 96+00 | 403+18 | 10 International Way | Port of Longview | 300 | 200 | 100 | 33.5 | 6:1 | | | | | | | | | 403+34 | 419+00 | | | 26+12 | 467+25 |
| 100+00 | 407+18 | 10 International Way | Port of Longview | 300 | 200 | 100 | 33.3 | 6:1 | | | | | | | | | 403+34 | 419+00 | | | 26+12 | 467+25 |
| 104+00 | 411+18 | 10 International Way | Port Longview - Berth 6 | 300 | 200 | 100 | 33.5 | 6:1 | | | | | | | | | 403+34 | 419+00 | | | 26+12 | 467+25 |
| 108+00 | 415+18 | 10 International Way | Port Longview - Berth 6 | 275 | 175 | 100 | 32.9 | 6:1 | | | | | | | | | 403+34 | 419+00 | | | 26+12 | 467+25 |
| 112+00 | 419+18 | 10 International Way | Port Longview - Berth 6 | 275 | 175 | 100 | 32.8 | 6:1 | | | | | | | | | 403+34 | 419+00 | | | 26+12 | 467+25 |
| 116+00 | 423+18 | 10 International Way | Port of Longview | 275 | 175 | 100 | 32.7 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 120+00 | 427+18 | 10 International Way | Port of Longview | 275 | 175 | 100 | 32.5 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 124+00 | 431+18 | 10 International Way | Port of Longview | 275 | 175 | 100 | 32.3 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |

| ENGR STATION | USACE STATION | NEAREST ADDRESS | LOCATION | LEVEE ROW DIMENSIONS | | | LEVEE CREST ELEV. NAVD88 | LAND WARD SLOPE H:V | TOE DRAIN AS REQ. REFERENCE USACE DWG CL-05-16/14 | | TOE DRAINS CONT. REFERENCE USACE DWG CL-05-16/14 | | GRAVEL BLANKETS REFERENCE USACE DWG CLW-64-8/1 | | IMPERV. BLANKETS REFERENCE USACE DWG CLW-64-9/1 | | STONE REVETMENT REFERENCE USACE DWG CLW-64-10/2 | | LEVEE SECTION C REFERENCE USACE DWG CL-05-16/13 | | LEVEE SECTION D REFERENCE USACE DWG CL-05-16/13 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | START | END | START | END | START | END | START | END | START | END | START | END | START | END |
| 128+00 | 435+18 | 10 International Way | Port of Longview | 275 | 175 | 100 | 32.1 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 132+00 | 439+18 | 10 International Way | Port of Longview | 325 | 175 | 150 | 31.8 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 136+00 | 443+18 | 10 International Way | Port of Longview | 325 | 175 | 150 | 32.6 | 6:1 | | | | | | | | | 441+00 | 445+50 | | | 26+12 | 467+25 |
| 140+00 | 447+18 | 10 International Way | Port Longview - Berth 9 | 325 | 175 | 150 | 33.6 | 6:1 | | | | | | | | | | | | | 26+12 | 467+25 |
| 144+00 | 451+18 | 10 International Way | Port Longview - Berth 9 | 325 | 175 | 150 | 34.4 | 6:1 | | | | | | | | | 448+50 | 466+00 | | | 26+12 | 467+25 |
| 148+00 | 455+18 | 10 International Way | Port Longview - Berth 9 | 325 | 175 | 150 | 33.9 | 6:1 | | | | | | | | | 448+50 | 466+00 | | | 26+12 | 467+25 |
| 152+00 | 459+18 | 300 Fibre Way | Westrock Pulp & Paper | 325 | 175 | 150 | 34.3 | 6:1 | | | | | | | | | 448+50 | 466+00 | | | 26+12 | 467+25 |
| 156+00 | 463+18 | 300 Fibre Way | Westrock Pulp & Paper | 325 | 175 | 150 | 35.0 | 6:1 | | | | | | | | | 448+50 | 466+00 | | | 26+12 | 467+25 |
| 160+00 | 467+18 | 300 Fibre Way | Westrock Pulp & Paper | 325 | 175 | 150 | 34.4 | 6:1 | 467+25 | 562+00 | | | | | | | | | | | 26+12 | 467+25 |
| 164+00 | 471+18 | 300 Fibre Way | Westrock Pulp & Paper | 325 | 175 | 150 | 34.2 | 4:1 | 467+25 | 562+00 | | | | | | | | | 467+25 | 473+00 | | |
| **166+00** | **473+00** | **------- END OF COLUMBIA RIVER LEVEE -------** | | **275** | **175** | **100** | **34.4** | **4:1** | 467+25 | 562+00 | | | | | | | | | | | | |

# 6-00 CDID#1 STANDARD PLANS

The following Standard Plans are intended to represent the minimum standards for improvements constructed within or discharging to facilities owned, managed or operated by CDID#1.

The purpose of these Standard Plans is to ensure improvements are consistently designed and constructed; provide straight forward guidance to property owners, developers, designers and contractors; and to formally document the criteria used by CDID#1 when making decisions on proposed projects within the District's system boundary.

Compliance with these standards does not alleviate the designer or contractor of their responsibility to apply sound professional judgement to preserve the integrity of the flood protection levee and conveyances, and to protect the health, safety and welfare of the public.

CIVIL IMPROVEMENTS

- C-1: Standard Access Gate
- C-2: Chicane Access Gate
- C-3: Typical Bore Under Ditch *(coming soon)*
- C-4: Thru-Levee Encasement
- C-5: Typical Trench Restoration
- C-6: Levee Trench Restoration
- C-7: Access Driveway
- C-8: Gravel Access Road
- C-9: Trail Sign
- C-10: Cowlitz River Levee Typical Section
- C-11: Columbia River Levee Typical Section
- C-12: USACE Reference Typical Levee Section Details
- C-13: Temporary Levee Raise
- C-14: Staff Gage

EROSION & SEDIMENT CONTROLS

- EC-1: Erosion Control General Notes
- EC-2: Surface Roughening Methods
- EC-3: Construction Entrance

STORMWATER IMPROVEMENTS

- SD-1: Stormwater Outfall
- SD-2: Culvert Safety Grate
- SD-3: Locator Post Installation

## 7-00 RECORD OF REVISIONS

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 1/20/21 | ADDED STANDARD DETAIL C-14, STAFF GAGE | A.BLAIN |
| 2 | 1/20/21 | ADDED SPECIFICATION FOR RECYCLED CONCRETE | A.BLAIN |
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DISCLAIMER:

*Anyone using the CDID#1 Special Provisions and Standard Details for design and/or construction shall be responsible to assure the most current revisions are utilized.*