Pipe from bluff

Fused or flanged connection specified in profile & plan.

HDPE moulded or fabricated tee same diameter and dimension as pipe.

Length = 2.0 x Diameter

Flow

Drill holes in front half of tee only.
Hole diameter (inches) = Tee diameter divided by 6.
(Example: 6 inch tee = 1" holes
18 inch tee = 3 inch holes)

No holes opposite pipe.

Hole spacing = 1.5 x hole diameter.

Note:
1. Source: Washington State Department of Transportation (WSDOT) Highway Runoff Manual, Figure 5-71.

Example Drawing M - 1
Diffuser Tee - WSDOT HRM Figure. 5-71
Softshore Detail

This drawing is only a template that needs to be adjusted and revised for each project.
Cover with 4" to 8" round beach rock

Bury pipe w/ 1" minus or equivalent

1/2" galvanized chain, spiral. Wrap completely around pipe

Attach to rock each end w/ 1/2" dia galvanized eye bolts epoxied into rock or drill hole clear through rock

24" dia HDPE SDR17 2/ (4) -1/2" x 9" slot perforations @ 4" o.c.

(2) - Three man rocks each side of each pipe section

Secure pipe w/ 1/2" galvanized chain, spiral wrapped completely around pipe and anchored to rocks

No perforations in tee section

24" HDPE SDR17 (or PVC ASTM 3034) w/ (4)-1/2" x 9" slot perforations @ 4" o.c.

Flange adaptor w/ bolt on blind flange each end w/ s.s. bolts

Butt fuse all joints unless otherwise noted or provide shop drawings for flanged connections

Example Drawing M -1a
Diffuser Tee-Buried (on High Energy Beach)
Softshore Detail
Seagrass and kelp

Herring spawning substrate; seagrass and macro algae

Pier spans forage fish spawning habitat (surf smelt and sand lance)

Proposed length from waters edge

Proposed width

Number, size, spacing of piles

Proposed length

Proposed length

25 ft.

Grated decking

25 ft., MHHW

Seagrass, kelp and herring spawning substrate

Min. distance, measured horizontally from edge of structure, in all directions to seagrasses, kelp and or herring spawning substrate.

Min. distance, measured horizontally from edge of structure, in all directions to seagrasses, kelp and or herring spawning substrate.

Indicate tide data for the float location.

Pier stops

1.0' Min. above bed

Stub Pile

+ 5.0 ft., MLLW

+11.0 ft., MHHW

Example Drawing M - 2

PIER TO RAMP TO FLOAT DETAIL
HORIZONTAL DISTANCES AND COMPASS HEADINGS FROM EACH REFERENCE POINT ON THE WATERWARD FACE OF THE BULKHEAD TO LOCAL BENCHMARKS ARE REQUIRED ON PLANS.

REFERENCE POINTS ARE MEASURED FROM MULTIPLE LOCATIONS TO ENSURE CORRECT ALIGNMENT.

WELL HOUSE / OUTBUILDING

APPLICANTS HOUSE

PLANT NEW SLOPE WITH NATIVE WOODY VEGETATION.

NEW TOP OF BANK

EXISTING TOP OF BANK

ANCHORED LOGS

OHWL - SHORELINE

M1: CENTER OF WELL HOUSE, 18 - FT.
M2: SOUTHWEST CORNER OF HOUSE, 18 - FT.
M3: CENTER OF HOUSE, 18 - FT.
M4: SOUTHEAST CORNER OF HOUSE, 18 - FT.
M5: METALLIC TAG NEAR BASE OF CEDAR TREE, 22 - FT.

EXISTING CONCRETE BULKHEAD TO BE REMOVED.

NOTE: BULKHEAD ALIGNMENT REFERENCE MARKING SHOULD FOLLOW GUIDANCE DOCUMENTS AND DRAWINGS.

PLAN VIEW

EXAMPLE DRAWING M-3A

BULKHEAD REMOVAL PLAN VIEW DETAIL

Engineer: D. PONDER
Drawn by: K. CORWIN
Reviewed by: C. MORSS
Approved by:

DATE: 7-27-20
SHEET: 1 OF 2
HORIZONTAL DISTANCES AND COMPASS HEADINGS FROM EACH REFERENCE POINT ON THE WATERWARD FACE OF THE BULKHEAD TO LOCAL BENCHMARKS ARE REQUIRED ON PLANS.

REFERENCE MEASUREMENTS FROM CORNER OF HOUSE TO EXISTING BULKHEAD AND ALTERNATIVE ARMOR FEATURES FOLLOWING CONSTRUCTION.

NEW TOP OF BANK.  NEW NATIVE WOODY VEGETATION.  EXISTING TOP OF BANK.

REMOVE FILL AND RESLOPE BANK.
REMOVE EXISTING CONCRETE BULKHEAD.

NEW HABITAT MIX GRAVEL.
NEW 2" TO 8" ROUND ROCK.
NEW FILTER FABRIC.
NEW ANCHORED LOG.
NEW ANCHOR CHAIN.
NEW EARTH ANCHOR.

SECTION A - A

EXAMPLE DRAWING M - 3B

SOFTSHORE DETAIL BULKHEAD REMOVAL SECTION
M1: SOUTHEAST CORNER OF WELL HOUSE, 10 – FT.

M2: METALLIC TAG NEAR BASE OF CEDAR TREE, 8 – FT.

M3: SOUTHEAST EDGE OF PORCH, 12 – FT.

REFERENCE POINTS

HORIZONTAL DISTANCES AND COMPASS HEADINGS FROM EACH REFERENCE POINT ON THE WATERWARD FACE OF THE BULKHEAD TO LOCAL BENCHMARKS ARE REQUIRED ON PLANS.

MEASURED TO WATERWARD FACE OF BULKHEAD, OR SHORELINE, AT BEACH GRADE.
HORIZONTAL DISTANCES AND COMPASS HEADINGS FROM EACH REFERENCE POINT ON THE WATERWARD FACE OF THE BULKHEAD TO LOCAL BENCHMARKS ARE REQUIRED ON PLANS.

REFERENCE POINTS ARE MEASURED FROM MULTIPLE LOCATIONS TO ENSURE CORRECT ALIGNMENT.

MEASUREMENT #1
SOUTHEAST CORNER OF WELL HOUSE, 10 – FT.

MEASUREMENT #2
METALLIC TAG NEAR BASE OF CEDAR TREE, 8 – FT.

MEASUREMENT #3
SOUTHWEST EDGE OF BACK PORCH, 12 – FT.

EXAMPLE DRAWING M-5
BULKHEAD FIELD MEASUREMENT DIAGRAM #2

Engineer: D.PONDER
Drawn by: K.CORWIN
Reviewed by: C.MORSS
Approved by:
Anchor distance A from shoreline to anchor shall be sufficient to:

1.) Prevent boat / float grounding at all tides by providing a minimum depth B of 1.0 - ft., and

2.) Prevent shading of eel grass by providing 25 - ft. separation C between boat / floats and eel grass beds.

Cross Section A-A

Plan View

Example Drawing M-6
Marine Buoy Placement
Minimum number of float stops, or stub piles to keep the watercraft lift a minimum 1-foot off the bed.