Practice: 587 - Structure for Water Control

Scenario # 1 Inline Flashboard Riser, Metal

Scenario Description: **Actual Scenario # 2** **New York**

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the embankment. They are often fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 36" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment.

Associated Practices: Critical Area Planting, Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Before Practice Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Practice Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342).

Scenario Feature Measure:

Flashboard Weir Length (in) x Barrel Length (ft)

Scenario Typical Size:	1800	Inch-Foot	Tot Unit Cost	$3.94

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Lumber, planks, posts and timbers,	4	Board Foot	$1.53	$6.12
Materials	Pipe, Steel, 30", Std Wt, USED	50	Foot	$80.44	$4,022.00
Materials	Pipe, Steel, 36", Std Wt, USED	6	Foot	$102.71	$616.26
Materials	Steel, Angle, 3" x 3" x 1/4"	24	Foot	$3.53	$84.72
Materials	Steel, Plate, 3/8"	10	Square Foot	$13.99	$139.90
Equip./Install.	Hydraulic Excavator, .5 CY	4	Hour	$61.42	$245.68
Equip./Install.	Earthfill, Manually Compacted	15	Cubic yard	$6.05	$90.75
Equip./Install.	Earthfill, Roller Compacted	190	Cubic yard	$4.60	$874.00
Labor	Equipment Operators, Heavy	4	Hour	$36.55	$146.20
Labor	Skilled Labor	7	Hour	$39.82	$278.74
Labor	General Labor	10	Hour	$23.16	$231.60
Mobilization	Mobilization, medium equipment	1	Each	$282.78	$282.78
Mobilization	Mobilization, very small equipment	1	Each	$78.08	$78.08

Total Cost: $7,096.83

Payment types:

PayType	Unit Payment
EQIP	$2.96
WHIP	$0.00

PayType	Unit Payment
EQIP-HU	$3.55
WHIP-HU	$0.00

587 1 Inline Flashboard Riser, Metal

Practice: 587 - Structure for Water Control

Scenario # 2 Commercial Inline Flashboard Riser

Scenario Description: **Actual Scenario # 3** **New York**

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20", height of six feet, The pipe is 50' of 15" SCH 40 PVC (inlet and outlet combined).

Associated Practices: Critical Area Planting (342), Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Before Practice Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Practice Situation:

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342).

Scenario Feature Measure:

Flashboard Weir Length (in) x Barrel Length (ft)

Scenario Typical Size:	1000	Inch-Foot	Tot Unit Cost	$3.65

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Pipe, PVC, 16", SCH 80	50	Foot	$36.49	$1,824.50
Equip./Install.	Hydraulic Excavator, .5 CY	2	Hour	$61.42	$122.84
Equip./Install.	Earthfill, Manually Compacted	15	Cubic yard	$6.05	$90.75
Equip./Install.	Earthfill, Roller Compacted	190	Cubic yard	$4.60	$874.00
Labor	Equipment Operators, Heavy	2	Hour	$36.55	$73.10
Labor	Skilled Labor	3	Hour	$39.82	$119.46
Labor	General Labor	8	Hour	$23.16	$185.28
Mobilization	Mobilization, medium equipment	1	Each	$282.78	$282.78
Mobilization	Mobilization, very small equipment	1	Each	$78.08	$78.08
				Total Cost:	$3,650.79

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$2.74	EQIP-HU	$3.29
WHIP	$0.00	WHIP-HU	$0.00

Practice: 587 - Structure for Water Control

Scenario # 3 Culvert <30 inches HDPE

Scenario Description: **Actual Scenario # 4** **New York**

Install a new HDPE culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing for culverts ≥ 30 inches or perennial flow.

Associated practices: Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Before Practice Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Practice Situation:

Water is conveyed in a controlled manner.

Scenario Feature Measure:

Pipe Diameter (In) x Pipe Length (Ft)

Scenario Typical Size:	960	Inch-Foot	Tot Unit Cost	$2.20

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Pipe, HDPE, CPT, Double Wall, Soil	40	Foot	$18.31	$732.40
Materials	Aggregate, Gravel, Graded	5	Cubic yard	$30.22	$151.10
Materials	Rock Riprap, Placed with geotextile	2	Cubic yard	$73.51	$147.02
Equip./Install.	Earthfill, Manually Compacted	45	Cubic yard	$6.05	$272.25
Equip./Install.	Excavation, Common Earth, side	5	Cubic yard	$2.48	$12.40
Labor	General Labor	10	Hour	$23.16	$231.60
Mobilization	Mobilization, medium equipment	2	Each	$282.78	$565.56
				Total Cost:	$2,112.33

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$1.65	EQIP-HU	$1.98
WHIP	$0.00	WHIP-HU	$0.00

Practice: 587 - Structure for Water Control

Scenario # 4 Culvert <30 inches CMP

Scenario Description: **Actual Scenario # 5** **New York**

Install a new Corrugated Metal Pipe (CMP) culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing instead for culverts ≥ 30 inches or perennial flow.

Associated practices: Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Before Practice Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Practice Situation:

Water is conveyed in a controlled manner.

Scenario Feature Measure:

Pipe Diameter (In) x Pipe Length (Ft)

Scenario Typical Size:	960	Inch-Foot	Tot Unit Cost	$2.51

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Pipe, CMP, 24", 12 Gauge	40	Foot	$25.82	$1,032.80
Materials	Aggregate, Gravel, Graded	5	Cubic yard	$30.22	$151.10
Materials	Rock Riprap, Placed with geotextile	2	Cubic yard	$73.51	$147.02
Equip./Install.	Earthfill, Manually Compacted	45	Cubic yard	$6.05	$272.25
Equip./Install.	Excavation, Common Earth, side	5	Cubic yard	$2.48	$12.40
Labor	General Labor	10	Hour	$23.16	$231.60
Mobilization	Mobilization, medium equipment	2	Each	$282.78	$565.56
				Total Cost:	$2,412.73

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$1.88	EQIP-HU	$2.26
WHIP	$0.00	WHIP-HU	$0.00

Practice: 587 - Structure for Water Control

Scenario # 5 Trench Drain with grate

Scenario Description: **Actual Scenario # 6** **New York**

This involves installing a concrete cross drain with grate to collect and redirect surface away from another practice to reduce volume of nutrient materials to be collected. Typically used up gradient of a heavy use area and/or waste storage faciliity.

Associated practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area (561), Roof Runoff Structure (558), Underground Outlet (620) Waste Storage Facility (313), Waste Trasnfer (634), Solid/Liquid Waste Separation Facility (632)

Before Practice Situation:

Upsite surface water adding additional volume to existing heavy use area or waste storage facility.

After Practice Situation:

Install a12' long 1" wide by 18" deep concrete box to direct runoff away from existing HUA.

Scenario Feature Measure:

Each

Scenario Typical Size:	1	Each	Tot Unit Cost	$1,573.13

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Aggregate, Gravel, Graded	0.5	Cubic yard	$30.22	$15.11
Materials	Welded Bar Grate, metal	15	Square Foot	$14.54	$218.10
Equip./Install.	Backhoe, 80 HP	4	Hour	$61.42	$245.68
Equip./Install.	Concrete, CIP, formed reinforced	1.2	Cubic yard	$477.12	$572.54
Labor	Skilled Labor	6	Hour	$39.82	$238.92
Mobilization	Mobilization, medium equipment	1	Each	$282.78	$282.78
				Total Cost:	$1,573.13

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$1,179.85	EQIP-HU	$1,415.82
WHIP	$0.00	WHIP-HU	$0.00

Practice: 587 - Structure for Water Control

Scenario # 6 Water Bar

Scenario Description: **Actual Scenario # 7** **New York**

This scenario is the installation of a permanant water bar to direct water off an existing animal trail or access road. Installation of water bars on new animal trails or access roads is covered by that practice. This scenario assists in addressing the resource concerns: water management.

Associated Practices: Animal Trails Walkways (575), Access road(560), Diversion (362), Grass Waterway (412)

Before Practice Situation:

Surface water flowing down associated practice causeing scouring or installation avoids same situation.

After Practice Situation:

Three water bars are installed at intervals as per standard. Construction involved reshaping existing site, rolling sub-base,and placing compacted gravel surface at an angle accross the associated practice. Other options include buried industrial belting on edge or two timber buried with spacer for water flow. Typical situation is a spacing of 300 per feet over 1000 feet of roadway.

Scenario Feature Measure:

Each

Scenario Typical Size:	3	Each	Tot Unit Cost	$621.04

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Aggregate, Gravel, Graded	28	Cubic yard	$30.22	$846.16
Equip./Install.	Track Loader, 95HP	3	Hour	$97.13	$291.39
Equip./Install.	Earthfill, Roller Compacted	1	Cubic yard	$4.60	$4.60
Labor	Equipment Operators, Heavy	3	Hour	$36.55	$109.65
Labor	Supervisor or Manager	1	Hour	$45.77	$45.77
Mobilization	Mobilization, medium equipment	2	Each	$282.78	$565.56
				Total Cost:	$1,863.13

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$465.78	EQIP-HU	$558.94
WHIP	$0.00	WHIP-HU	$0.00

Practice: 587 - Structure for Water Control

Scenario # 7 Grated Dropbox

Scenario Description: **Actual Scenario # 8** **New York**

This involves installing a concrete box with grate to collect and redirect surface water away from another practice to reduce volume of nutrient materials to be collected or to prevent surface erosion. Typically used up gradient of a heavy use area and/or waste storage faciliity.

Associated practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area (561), Roof Runoff Structure (558), Underground Outlet (620) Waste Storage Facility (313), Waste Trasnfer (634), Solid/Liquid Waste Separation Facility (632)

Before Practice Situation:

Upsite surface water causing downslope erosion or adding cleanwater to nutrient rich areas.

After Practice Situation:

Install 2'x4'x4' deep concrete box with grate to collect surface water.

Scenario Feature Measure:

Each

Scenario Typical Size:	1	Each	Tot Unit Cost	$1,065.85

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Aggregate, Gravel, Graded	0.4	Cubic yard	$30.22	$12.09
Materials	Catch Basin, concrete, 2'x2'x6'	1	Each	$645.69	$645.69
Equip./Install.	Backhoe, 80 HP	1	Hour	$61.42	$61.42
Labor	Skilled Labor	1	Hour	$39.82	$39.82
Labor	Equipment Operators, Light	1	Hour	$24.05	$24.05
Mobilization	Mobilization, medium equipment	1	Each	$282.78	$282.78
				Total Cost:	$1,065.85

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$799.39	EQIP-HU	$959.26
WHIP	$0.00	WHIP-HU	$0.00

Practice: 587 - Structure for Water Control

Scenario # 8 Flow Meter with Mechanical Index

Scenario Description: **Actual Scenario # 17** **New York**

Permanently installed water flow meter with mechanical, cumulative volume and rate index. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes.
Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plantproductivity and health, and Inefficient Energy Use - Equipment and facilities
Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Practice Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Practice Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Scenario Feature Measure:

Nominal Diameter of Meter

Scenario Typical Size: 10 inch | Tot Unit Cost $188.40

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Flow Meter, with mechanical Index	1	Each	$1,727.79	$1,727.79
Mobilization	Mobilization, very small equipment	2	Each	$78.08	$156.16
				Total Cost:	$1,883.95

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$141.30	EQIP-HU	$169.56
WHIP	$0.00	WHIP-HU	$0.00

Practice: 587 - Structure for Water Control

Scenario # 9 **Flow Meter with Electronic Index**

Scenario Description: **Actual Scenario # 18** **New York**

Permanently installed water flow meter with an electronic index . Meters can be any flow measurement device that meets CPS 433, (i.e., meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes or data logging capability. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch turbine flow meter, with electronic index output.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plantproductivity and health, and Inefficient Energy Use - Equipment and facilities

Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waster Transfer, and 590-Nutrient Management.

Before Practice Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Practice Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Scenario Feature Measure:

Nominal Diameter of Meter

Scenario Typical Size: 10 | Inches | Tot Unit Cost | $355.99

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Flow Meter, with Electronic Index	1	Each	$3,403.71	$3,403.71
Mobilization	Mobilization, very small equipment	2	Each	$78.08	$156.16
				Total Cost:	$3,559.87

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$266.99	EQIP-HU	$320.39
WHIP	$0.00	WHIP-HU	$0.00

Practice: 587 - Structure for Water Control

Scenario # 10 **Flow Meter with Electronic Index & Telemetry**

Scenario Description: **Actual Scenario # 19** **New York**

Permanently installed water flow meter with an electronic flow rate and volume index and data telemetry transmission system. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch magnetic flow meter, with electronic index output and telemetry data transfer system for monitoring irrigation system flow rate.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plantproductivity and health, and Inefficient Energy Use - Equipment and facilities

Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Practice Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Practice Situation:

Producer is able to access instantaneous rate and cumulative flow volume data from a personal computer or cell phone at any time. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Scenario Feature Measure:

Nominal Diameter of Meter

Scenario Typical Size:	10	Inches	Tot Unit Cost	$453.14

Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Flow Meter, with electronic Index	1	Each	$4,375.26	$4,375.26
Mobilization	Mobilization, very small equipment	2	Each	$78.08	$156.16
				Total Cost:	$4,531.42

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	$339.86	EQIP-HU	$407.83
WHIP	$0.00	WHIP-HU	$0.00