

# Permit Review Checklist

Salt Lake County  
Flood Control Permits  
2001 South State Street, Suite N3100  
Salt Lake City, Utah 84190-4600

FC Permit No. \_\_\_\_\_  
Grantee: \_\_\_\_\_  
Contact: \_\_\_\_\_  
Phone: \_\_\_\_\_

## Documentation

- Identified the name and mailing address of the person or entity that is ultimately responsible for maintenance of improvements installed under the permit.
- Identified the name and phone number of the contractor onsite during construction.
- Briefly described the project purpose, the work to be done, the street address, and the affected Flood Control Facility in the description area in the middle of Page 1.
- Applicant (or Authorized Agent) has signed, dated and identified their title in the "Terms ... accepted" on page 2.
- Applicant has provided ONE (1) hard copy or electronic file for the following:
  - Permit Application (2 part form)
  - Design Plan & Profile (folded) - PE/LS Stamp: Yes No
  - Site Plat (folded) - PE/LS Stamp: Yes No
  - Survey: Stamped \_\_\_ Datum \_\_\_\_\_ Contour Interval \_\_\_\_\_
  - Channel Cross Sections-Interval \_\_\_\_\_
  - Maintenance Easement of form: \_\_\_\_\_
  - Hydrology Calculations for: Site Drain \_\_\_\_\_ Ponds \_\_\_\_\_ Flood Facility \_\_\_\_\_
  - Overall Drainage Plan \_\_\_\_\_
  - Detail Pages: Channel Mods \_\_\_\_\_ Structures \_\_\_\_\_
  - Other documentation required (specify) \_\_\_\_\_

## Hydrology

- Flood Facility: Type \_\_\_\_\_ Name \_\_\_\_\_ Slope \_\_\_\_\_ Capacity \_\_\_\_\_ Detail \_\_\_\_\_
- Flood Data: FIRM Panel \_\_\_\_\_ Elev<sub>Q100</sub> \_\_\_\_\_ Datum \_\_\_\_\_ Freeboard \_\_\_\_\_ FW Width \_\_\_\_\_
- Flow Data: Site Runoff ( $Q_{PEAK}$ ) \_\_\_\_\_ Allowable Discharge ( $Q_{ALLOW}$ ) \_\_\_\_\_ Flood Facility ( $Q_{100}$ ) \_\_\_\_\_
- Discharge Pipe/Culvert: Type \_\_\_\_\_ Size \_\_\_\_\_ Slope \_\_\_\_\_ FL \_\_\_\_\_ Capacity \_\_\_\_\_ Detail \_\_\_\_\_
- Soils Data: Classification \_\_\_\_\_ Infiltration \_\_\_\_\_ Gradation \_\_\_\_\_
- Site Runoff:  Rational: ( $Q_p = C_f C_i A$ ) Storm Event \_\_\_\_\_  $C_f$  \_\_\_\_\_  $C$  \_\_\_\_\_  $I$  (in/hr) \_\_\_\_\_  $A$  (ac) \_\_\_\_\_  
 SCS TR-55: ( $q_p = q_u A_m Q F_p$ )  $q_u$  (cfs/mi<sup>2</sup>/in) \_\_\_\_\_  $A_m$  (mi<sup>2</sup>) \_\_\_\_\_  $Q$  (in) \_\_\_\_\_  $F_p$  \_\_\_\_\_
- Ponds: Location \_\_\_\_\_ Inflow \_\_\_\_\_ Outflow \_\_\_\_\_ Capacity \_\_\_\_\_  Orifice: Size \_\_\_\_\_
- Spillway: Capacity \_\_\_\_\_
- Erosion Control:  Filter - Granular Fabric  Silt Fence  Riprap - Grouted  Gabion - Mattress  Soil Cement  
 Articulated Block  Root Wads  Trenchfill  Windrow Revetment  Longitudinal Peaked Stone Toe Protection  
 Longitudinal Fill Stone Toe Protection

Comments or Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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## Hydraulics

Ref: Hydrology & Hydraulic Systems, Pgs 503-510

Modeling: Software \_\_\_\_\_  $Q_{design}$  \_\_\_\_\_  $y_{flow\ depth}$  \_\_\_\_\_  $A_{flow}$  \_\_\_\_\_  $d_{flow\ sec}$  \_\_\_\_\_  
 $b_{width}$  \_\_\_\_\_  $T_{width}$  \_\_\_\_\_  $P_{wetted}$  \_\_\_\_\_  $R_{Hydraulic}$  \_\_\_\_\_  $D_{Hydraulic}$  \_\_\_\_\_ Section Factor (Z) \_\_\_\_\_  
 Slope = \_\_\_\_\_ Velocity = \_\_\_\_\_  $R_e = (V_{mean} * D_{Hyd}) / \text{viscosity} =$  \_\_\_\_\_  $Fr = V_{mean} / \text{sqrt}(g * D_{Hyd}) =$  \_\_\_\_\_

Plan & Profile: Sheet \_\_\_\_\_   $Q_{design}$  shown?  HGL shown?   $Q_{100}$  surface?  Connection Detail: Sheet \_\_\_\_\_

Outfall Detail: Sheet \_\_\_\_\_  Modeling Data Provided? Specify medium (i.e.; CDROM, etc.) \_\_\_\_\_

**Culvert Data:**

Inv Elev: Up = \_\_\_\_\_ ft Down = \_\_\_\_\_ ft Length = \_\_\_\_\_ ft Slope = \_\_\_\_\_ % Rise = \_\_\_\_\_ in  
 Shape (i.e.; Box, etc.) \_\_\_\_\_ Span (in) \_\_\_\_\_ Barrels \_\_\_\_\_ Manning's (n) \_\_\_\_\_ Inlet \_\_\_\_\_  
 Bank Elev \_\_\_\_\_ Bank Top Width \_\_\_\_\_ Crest Length \_\_\_\_\_ Tailwater \_\_\_\_\_ ft

Flows:  $Q_{MIN}$  = \_\_\_\_\_  $Q_{MAX}$  = \_\_\_\_\_  $Q_{INCR}$  = \_\_\_\_\_

Culvert Check? Filename \_\_\_\_\_ Results Printed? Y N Overtopping? Y N  $Q_{Culvert}$  \_\_\_\_\_

**Riprap Data:**

$V_{Avg}$  = \_\_\_\_\_ fps Side Slopes \_\_\_\_\_ :1  $V_{Riprap}$  \_\_\_\_\_ pcf Safety Factor \_\_\_\_\_ Channel Depth \_\_\_\_\_ ft Friction Angle \_\_\_\_\_ °

Riprap Check? Filename \_\_\_\_\_ Results Printed? Y N Designed  $D_{50}$  \_\_\_\_\_ Recommend  $D_{50}$  \_\_\_\_\_

Bed Scour Data:  $y_{max}$  = \_\_\_\_\_ ft  $V_m$  = \_\_\_\_\_ ft/s  $y_h = A_{sec} / T_{width} =$  \_\_\_\_\_ ft  $S_e =$  \_\_\_\_\_ ft/ft  $\alpha =$  \_\_\_\_\_ °

Zeller Equations: General -  $y_{gs} = y_{max} [(0.0685 V_m^{0.8} / y_h^{0.4} S_e^{0.3}) - 1] =$  \_\_\_\_\_ ft

Bend -  $y_{bs} = (0.0685 y_{max} V_m^{0.8} / y_h^{0.4} S_e^{0.3}) * [2.1 (\sin^2(\alpha/2) / \cos \alpha)^{0.2} - 1] =$  \_\_\_\_\_ ft

## Irrigation

Canal Name: \_\_\_\_\_ Canal Contact: \_\_\_\_\_ Phone: \_\_\_\_\_

Description:  Bridge  Culvert  Discharge  Diversion  Overflow  Utility Crossing  
 New  Mod  New  Mod  New  Mod  New  Mod  New  Mod  New  Mod

Flow: \_\_\_\_\_ Flow: \_\_\_\_\_ Flow: \_\_\_\_\_ Flow: \_\_\_\_\_ Flow: \_\_\_\_\_ Cover: \_\_\_\_\_

Size: \_\_\_\_\_ Size: \_\_\_\_\_ Size: \_\_\_\_\_ Size: \_\_\_\_\_ Size: \_\_\_\_\_ Cap: Y N

FreeBrd: \_\_\_\_\_ FreeBrd: \_\_\_\_\_ FreeBrd: \_\_\_\_\_ FreeBrd: \_\_\_\_\_ FreeBrd: \_\_\_\_\_ Material: \_\_\_\_\_

Other Work:  Fence: Setback \_\_\_\_\_ Removable? \_\_\_\_\_  Bank/Levee: describe \_\_\_\_\_

Muni/Owner: Jurisdiction \_\_\_\_\_ Parcel(s) \_\_\_\_\_

Dates: Cnty Review \_\_\_\_\_ Cnty Recommend \_\_\_\_\_ Sent \_\_\_\_\_ By \_\_\_\_\_  
 Method

Irrigation approval? By: \_\_\_\_\_ Date: \_\_\_\_\_ Name: \_\_\_\_\_  
 Method

Other requirements \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# Permit Review Checklist

## Embankment Stabilization

Bed Stability:

Shear Stresses:  $\gamma_w = 62.4$  pcf  $\gamma_s =$  \_\_\_\_\_ pcf  $R_{Hydraulic} =$  \_\_\_\_\_ ft  $S_f =$  \_\_\_\_\_ ft/ft  $D_{avg} =$  \_\_\_\_\_ ft  $D_{50} =$  \_\_\_\_\_ ft

$\tau_0 = \gamma_w * R_H * S_f =$  \_\_\_\_\_  $\tau_c = [ 0.1 ( \gamma_s - \gamma_w ) D_{50} ] / [ \log 19 ( D_{50} / D ) ] =$  \_\_\_\_\_ If  $\tau_0 < \tau_c$ , => Stable @  $D_{50}$

Stream Characterization:  Aggradation  Degradation Stream Type: \_\_\_\_\_

Stabilize Method:  Rock  Gabion  Drop Struct  Terraces  Toe Protect  Trenchfill  Vanes \_\_\_\_\_

Debris Jam  Root Ball  Retain Wall  Planting  Grade Cntrl  Wier type \_\_\_\_\_

Other Methods: \_\_\_\_\_

Rip-Rap Design:  USACE - Size \_\_\_\_\_  ASCE - Size \_\_\_\_\_  Isbash - Size \_\_\_\_\_  USBR - Size \_\_\_\_\_  
 CBSP - Size \_\_\_\_\_  USGS - Size \_\_\_\_\_  HEC-11 - Size \_\_\_\_\_

Revetment Height: (Height above Design Water Surface due to Superelevation ( $\Delta y$ ) along bends.)  $C_{FLOW} = 0.5_{tr tranquil} = 1.0_{rapid}$

Data:  $V_{avg} =$  \_\_\_\_\_ fps  $W_{top} =$  \_\_\_\_\_ ft  $r_{bend} =$  \_\_\_\_\_ ft  $g = 32.2$  ft/sec<sup>2</sup> =>  $\Delta y = C_{flow} ( V_{avg}^2 W / gr ) =$  \_\_\_\_\_ ft

Grade Controls: Initial Slope ( $S_0$ ) \_\_\_\_\_ Final Slope ( $S_i$ ) \_\_\_\_\_ Project Length ( $L_p$ ) \_\_\_\_\_ Total Drop (H) \_\_\_\_\_  
 Structure Drop (h) \_\_\_\_\_ Total Structures (N) \_\_\_\_\_ ( $H = (S_0 - S_i) * L_p$ ;  $N = H / h$ ; Horiz Spacing =  $L_p / N$ )

Bioengineering:

Channel Width/Depth Ratio:  3H:1V (Preferred)  2H:1V (Standard)  1H:1V (Minimum)

Other comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## Environmental & Water Quality

WQ Enhancement: Device \_\_\_\_\_ Treatment Time \_\_\_\_\_ Design Efficiency \_\_\_\_\_

Max Flow \_\_\_\_\_ Service Life \_\_\_\_\_

BMP(s):  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  
 \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  
 \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

### Additional Comments

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# Permit Review Checklist

**Review Performed by:** \_\_\_\_\_  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

**Applicant notified** of additional requirements on \_\_\_\_\_ By \_\_\_\_\_  
Date \_\_\_\_\_ Name/Title \_\_\_\_\_

**Applicant notified** of review completion on \_\_\_\_\_ By \_\_\_\_\_  
Date \_\_\_\_\_ Name/Title \_\_\_\_\_

**Applicant notified** of other permit agencies on \_\_\_\_\_ By \_\_\_\_\_  
Date \_\_\_\_\_ Name/Title \_\_\_\_\_

- UPDES - # \_\_\_\_\_
- USACE 404 - # \_\_\_\_\_
- EPA (1) - # \_\_\_\_\_
- EPA (2) - # \_\_\_\_\_
- UT Small Dam - # \_\_\_\_\_
- UDOT ROW - # \_\_\_\_\_
- UT SA - # \_\_\_\_\_
- UT Sov Lnds - # \_\_\_\_\_
- Bldg Permit - # \_\_\_\_\_
- Grading Permit - # \_\_\_\_\_
- Conditional Use - # \_\_\_\_\_
- Juris \_\_\_\_\_
- Health Dept. - # \_\_\_\_\_
- Sewer - # \_\_\_\_\_
- Water - # \_\_\_\_\_
- Gas - # \_\_\_\_\_
- Electric - # \_\_\_\_\_
- Sanitation - # \_\_\_\_\_
- Canal Agreements - # \_\_\_\_\_
- Canal \_\_\_\_\_

**How** (check form of notification): \_\_\_\_\_ U. S. Mail \_\_\_\_\_ Telephone \_\_\_\_\_ E-Mail \_\_\_\_\_ In Person

**Applicant complied** with additional requirements and special conditions on \_\_\_\_\_ By \_\_\_\_\_  
Date \_\_\_\_\_ Name/Title \_\_\_\_\_

**By** (specify documents submitted for compliance): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_