

CONSTRUCT BERMS WHERE NECESSARY TO ACCOMMODATE HEAVY ROCK RIPRAP
TOP OF FILL TO BE 300 MINIMUM ABOVE TOP OF ROCK
(MAY OR MAY NOT APPLY AT BOTH ENDS)

NOTE:
REFER TO "GEOTECHNICAL AND EROSION CONTROL DESIGN GUIDES" FOR EROSION PROTECTION MEASURES AND FOR DITCH DRAINAGE ADJACENT TO THE STRUCTURE

* NOTE
STEEPER SLOPE MAY BE PROVIDED TO ENSURE CLAY SEAL DOES NOT EXTEND BELOW ROAD TOP

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)
PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

COMPACT THE UPPER 300 OF EMBANKMENT OR BASE COURSE TO MINIMUM OF 100% OF STANDARD PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT

NOTE:
ADJUST BACKFILL ENVELOPE, BACKFILL MATERIAL, AND COMPACTION WHERE WARRANTED DUE TO SIZE OF PIPE, HEIGHT OF COVER, OR AS REQUIRED BY HEAVIER LOADS

PLACE, SPREAD AND BLADE SMOOTH IN SUCCESSIVE LAYERS NOT TO EXCEED 150 OF LOOSE MATERIAL. COMPACT TO A MINIMUM OF 95% OF STANDARD PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT. PLACE BACKFILL SUCH THAT THE DIFFERENCE IN ELEVATION OF THE COMPACTED LAYERS ON OPPOSITE SIDES OF THE PIPE IS NOT MORE THAN 300

EXCAVATE AS REQUIRED TO REMOVE EXISTING STRUCTURES AS APPLICABLE AND TO INSTALL THE NEW PIPE. REMOVE OR STABILIZE SOFT OR YIELDING MATERIAL. FLATTEN AND/OR BENCH SLOPES AS REQUIRED TO PROVIDE A STABLE, SAFE EXCAVATION

NOTE:
CUT SLOPE DESIGNS FOR SLOPES GREATER THAN 6 m IN HEIGHT SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF ALBERTA

COMPACT CRUSHED AGGREGATE MATERIAL AT THIS LEVEL TO A MINIMUM OF 95% OF STANDARD PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT

PLACE WOVEN GEOTEXTILE FILTER FABRIC BEFORE PLACING CRUSHED AGGREGATE MATERIAL. GEOTEXTILE IS NOT CONTINUOUS THROUGH THE CLAY SEALS. FABRIC TO BE CONTINUOUS IN THE TRANSVERSE DIRECTION AND LAPPED IN THE LONGITUDINAL DIRECTION ACCORDING TO MANUFACTURER'S DIRECTIONS

A SECTION - BACKFILL DETAILS

PLACE BACKFILL AND ADJACENT EMBANKMENT BY EQUIPMENT MOVING PARALLEL TO THE LONGITUDINAL AXIS OF THE PIPE WITH SIMULTANEOUS HANDWORK ALONG THE PIPE. (SEE SECTION "A" FOR BACKFILL DETAILS OVER PIPE)

NOTE:
FOR CULVERTS ON SKEW CONSTRUCT TRIANGULAR BENCH AND ADJUST SLOPE OF EMBANKMENT TO PROVIDE SYMMETRIC SLOPE AT ENDS OF PIPE, BLENDING WHERE REQUIRED

HEAVY CONSTRUCTION EQUIPMENT AND LARGE COMPACTION EQUIPMENT SHALL NOT BE PERMITTED WITHIN 1.0 m OF THE PIPE SIDEWALL (TYP)

PLAN

ROAD WIDTH

ROAD

CROWN

ROAD SHOULDER (TYP)

VARIES

COMPACTED CLAY SEAL (TYP BOTH ENDS)

TOP BEVEL POINT

PLACE ROCK FLUSH ALONG EDGES OF BEVEL ENDS

TOP OF ROCK ELEVATION AS SPECIFIED ON SITE SPECIFIC DETAILS (TYPICAL BOTH ENDS)

TOP OF BANK (OR BERM)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED AGGREGATE MATERIAL

CLAY SEAL LENGTH = 2.0 x RISE

ROCK RIPRAP APRON LENGTH = 2.0 x RISE (MIN)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYPICAL BOTH ENDS)

PLACE ROCK FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

ROCK PLACED FLUSH TO SLOPING EDGE OF BEVEL ENDS (TYP)

NON-WOVEN GEOTEXTILE FILTER FABRIC (TYP)

PLACE ROCK FLUSH WITH BOTTOM OF PIPE

BURIAL DEPTH 0.25 x RISE (TYP)

STREAMBED

FLOW

KEY IN ENDS OF FABRIC 300 MINIMUM (TYP)

PLACE END OF FABRIC BETWEEN ROCK RIPRAP AND CLAY SEAL (TYP)

ROCK RIPRAP APRON LENGTH = 1.5 x RISE (MIN)

CLAY SEAL LENGTH = 2.0 x RISE

U/S INVERT

WOVEN GEOTEXTILE FILTER FABRIC (SEE SECTION "A" FOR DETAILS)

CRUSHED AGGREGATE BEDDING MATERIAL IN AN UNCOMPACTED STATE

CRUSHED