

<u>GARAP Number</u>	1C
Section:	3
Station:	772+25
Stream Name:	Unnamed tributary to Locke Branch
Stream Type:	“Waters with Available Conditions”
Feature Number:	STR-C2 & SPG-C15
Impact:	Encapsulation of 103 ft. of existing open stream.
Structure Type:	French drain with 24 inch perforated pipe.

The non-impact alternative for this location would be the construction of a standard bridge rather than the use of a French drain with 24 inch perforated pipe. During the design process a comparison was made between encapsulating this stream with a French drain with 24 inch perforated pipe and building a structure over it. Hydraulic calculations were performed using available hydrological data and accepted engineering practices. The results of these calculations indicated that a French drain with 24 inch perforated pipe with a 103± foot length would be adequate to accommodate the design flow. Using a standard bridge in place of the French drain with 24 inch perforated pipe would have a greater cost and create a hydraulic opening much larger than that necessary to carry the design flow. As a result the non-degradation alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The chosen alternative at this location includes a French drain with 24 inch perforated pipe that is 103± feet long. This alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Locke Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design.

The proposed pipe structure alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running through the culvert and the duration of time spent in the structure. After reviewing the ecology information, the habitat score for the subject stream was in the poor range and the following species were identified: Caddisflies. For additional details concerning aquatic life please see the previously submitted Form “G”. Due to the type of structure the available habitat and substrate will be limited.

Based on the General Aquatic Resource Alteration Permits criteria from TDEC, this crossing should meet the requirements of the General Permit for Construction and Removal of Minor Road Crossing. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed.

Mitigation:

TDOT specification for erosion prevention, water quality and sediment control will apply.

GARAP Number 2Ca

Section Number: 3

Station: Sta. 771+60 ± to Sta. 771+90 ±

Feature Name: Unnamed Wetland

Feature Type: “Waters with Available Conditions” Wetland

Feature Number: WTL-C1

Impact: Permanent wetland impact of 0.003 acre

The proposed SR-840 preferred alignment impacts wetland WTL-C1. Approximately 0.003 acre of wetland will be permanently lost. The preferred alternative was selected to minimize overall impacts to resources throughout the project area.

Chosen Alternative:

The proposed alternative will permanently impact 0.003 acre of the wetland. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to surface water resources in the area. Where appropriate and feasible, minimization measures have been incorporated into the final design.

Mitigation:

We propose to mitigate the permanent wetland impacts by debiting, at a 2:1 ratio, 0.006 acre from available wetland credits at the Harpeth Wetland Mitigation Bank. Therefore TDOT feels that the proposed wetland impact would result in no net loss of resource value to the watershed. TDOT specification for erosion prevention, water quality and sediment control will apply. The alignment for the east bound ramp was shifted to minimize impacts to this wetland.

GARAP Number 2Cb

Section: 3

Station: Sta. 789+60 ± to Sta. 790+00 ±

Feature Name: Unnamed Wetland

Feature Type: “Waters with Available Conditions” Wetland

Impact: Permanent wetland impact of 0.025 acre

The proposed SR-840 preferred alignment impacts wetland WTL-C2. Approximately 0.025 acre of wetland will be permanently lost. The preferred alternative was selected to minimize overall impacts to resources throughout the project area.

Chosen Alternative:

The proposed alternative will permanently impact 0.025 acre of the wetland. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to surface water resources in the area. Where appropriate and feasible, minimization measures have been incorporated into the final design.

Mitigation:

We propose to mitigate the permanent wetland impacts by debiting, at a 2:1 ratio, 0.05 acre from available wetland credits at the Harpeth Wetland Mitigation Bank. Therefore TDOT feels that the proposed wetland impact would result in no net loss of resource value to the watershed. TDOT specifications for erosion prevention, water quality and sediment control will apply. The alignment for the east bound ramp was shifted to minimize impacts to this wetland.

<u>GARAP Number</u>	3C
Section:	3
Station:	793+05 ±
Stream Name:	Unnamed tributary to Boston Branch
Stream Type:	“Waters with Available Conditions”
Feature Number:	STR-C6
Impact:	The outfall structure from a wet weather conveyance impacts the beginning of STR-C6
Structure Type:	Outfall structure for an 8 ft. x 4 ft concrete box culvert. 16 x 8 x 3 Class B rip-rap was also used at the outlet

Alternatives Analysis:

The non-impact alternative for this location would be the construction of a standard bridge over the wet weather conveyance, rather than the use of an 8 ft. x 4 ft. reinforced concrete box culvert and outfall. Since impacts to wet weather conveyances and the construction of outfalls into streams are not considered degradation, this alternative is not reasonable. The water from the wet weather conveyance must reach the stream in some manner. Not building the outfall was rejected because that would result in the water making its own channel over time, which could cause erosion problems. Consideration of building the outfall without rip-rap was rejected because it could cause stream stability and erosion problems.

Chosen Alternative:

The chosen alternative at this location includes an 8 ft. x 4 ft. reinforced concrete box culvert 360 feet long with an outfall structure and 16 x 8 x 3 Class B rip-rap constructed at the outlet. The outfall structure and rip-rap impact the beginning of STR-C6. This alternative minimizes channel changes, potential stream stability and erosion problems, and impacts to surrounding properties.

The proposed outfall structure alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running across the proposed rip-rap. After reviewing the ecology information, the habitat score for the subject stream was in the marginal range and the following species were identified: Isopods and midges. For additional details concerning aquatic life please see the previously submitted Form “G”. Due to the type of impact, the habitat conditions should not be limited and there will be minimal impact on the overall stream habit, available substrate and movement of aquatic life. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed structure.

Based on the criteria given to us by TDEC, this crossing should meet the requirements of TDEC's General Permits for Alteration of Wet Weather Conveyances and for Construction of Intake and Outfall Structures. Therefore TDOT feels that the proposed culvert and outfall would result in no net loss of resource value to the watershed.

Mitigation:

TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply.

GARAP Number 4C

Section: 3

Station: Frontage Road A Sta. 9+00 ±
SR 840 Sta. 814+80 ± Rt.

Stream Name: Unnamed tributary to Moore's Branch

Stream Type: "Waters with Available Conditions"

Feature Number: STR-C8

Impact: Encapsulation of 140 ft. of existing open stream

Structure Type: 30-inch reinforced concrete pipe

Alternatives Analysis:

The non-impact alternative for this location would be the construction of a standard bridge rather than the use of a reinforced concrete pipe. During the design process a comparison was made between encapsulating this stream with a concrete pipe or box culvert and building a structure over it. Hydraulic calculations were performed using available hydrological data and accepted engineering practices. The results of these calculations indicated that a 30 inch reinforced concrete pipe with a 140 foot length would be adequate to accommodate the design flow. Using a standard bridge in place of the 30 inch reinforced concrete pipe would lead to increased costs and create a hydraulic opening much larger than that necessary to carry the design flow. As a result the non-degradation alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The chosen alternative at this location includes a 30-inch reinforced concrete pipe that is 140 feet long. This alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Moore's Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design. This alternative was selected to minimize overall impacts to water features in the project area.

The proposed pipe structure alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running through the culvert and the duration of time spent in the structure. After reviewing the ecology information, the habitat score for the subject stream was not given and no species were identified. For additional details concerning aquatic life please see the previously

submitted Form "G". Due to the type of structure and short length of impact (encapsulation less than 200 feet of stream), the available habitat and substrate will be limited but the pipe should have a minimal impact on the overall stream habit, substrate and movement of aquatic life. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed culvert. As seen at culverts on other sections of State Route 840 these areas become vegetated within a period of months.

Based on the General Aquatic Resource Alteration Permits criteria from TDEC, this crossing should meet the requirements of the General Permit for Construction and Removal of Minor Road Crossing. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed.

Mitigation:

TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply.

TDOT Alternatives Analysis

September 14, 2008

<u>GARAP Number</u>	5C
Section:	3
Station:	843+35.80
Stream Name:	Garrison Creek
Stream Type:	Exceptional Tennessee Waters
Feature Number:	Stream STR-C11
Impact:	Construction of dual three span 414-foot long bridges
Structure Type:	Dual three span 414-foot long bridges.

Alternatives Analysis:

The non-impact alternative was determined feasible. During the evolution of the design process, a comparison was made between encapsulating this creek in a 48-inch diameter reinforced concrete pipe and building two structures over it. The cost of the two bridges was estimated at \$3.76 million and the cost of the culvert was approximately \$54,600 plus \$84,000 in mitigation. Although constructing a culvert would have saved over \$3.6 million, it was decided to avoid impacting this water resource and thus dual 414-foot three span bridges are proposed.

Chosen Alternative:

Dual three span 414-foot long bridges will be constructed rather than using a reinforced concrete pipe to encase the stream as originally designed. The additional cost of the bridges is around \$3.6 million compared to a culvert system.

The proposed bridge alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running under the proposed bridge and the ability for air and light to reach the stream. After reviewing the ecology information, the habitat score for the subject stream was in the suboptimal range and the following species were identified: EPT, water pennies, hellgrammites, snails, darters, minnows, and algae. For additional details concerning aquatic life please see the previously submitted pre-construction benthic and pre-construction fishery surveys and Form "G". Once construction is completed post-construction benthic and post-construction fishery surveys will be submitted to TDEC for their review. Due to the type of structure the available habitat and substrate should not be affected and movement of aquatic life should not be restricted. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed bridge. Bank areas upstream or downstream that have been disturbed will be planted with native trees/ shrubs upon construction completion.

Based on the General Aquatic Resource Alteration Permits criteria from TDEC, this crossing should meet the requirements of the General Permit for Construction and Removal of Minor Road Crossing. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed.

Mitigation:

TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of rip-rap and other materials within the stream channel will apply.

<u>GARAP Number</u>	6C
Section:	3
Station:	870+64.33
Stream Name:	Unnamed tributaries to South Garrison Branch
Stream Type:	Exceptional Tennessee Waters
Feature Number:	STR-C14, STR-C15, STR-C13 SEP-C9, SEP-C8, SPG-C5, SPG-C6
Impact:	Construction of dual three span 211 foot long bridges (See Attached Bridge Layout).
Structure Type:	Dual three span 211-foot long bridges.

Alternatives Analysis:

The non-impact alternative was determined feasible. During the evolution of the design process, a comparison was made between encapsulating this creek in a 24-inch diameter reinforced concrete pipe and building a structure over it. The cost of the bridges was estimated at \$4.03 million and the cost of the culvert was approximately \$22,000 plus \$95,000 in mitigation. Although constructing a culvert would have saved over \$3.9 million, it was decided to avoid impacting this water resource and thus dual 211-foot three span bridges are proposed.

Chosen Alternative:

Dual three span 211-foot long bridges will be constructed rather than using a reinforced concrete pipe to encase the stream as originally designed. The additional cost of the bridges is around \$3.9 million compared to a culvert system. There is an associated impact to SPG-C5. Rip-rap needed for the two bridge abutments will cover SPG-C5's spring head.

The proposed bridge alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running under the proposed bridge and the ability for air and light to reach the stream. After reviewing the ecology information, the habitat score for stream STR-C13 was not given and the following species were identified: Amphipods and Coleoptera. The habitat score for stream STR-C14 was not given and the following species were identified: Tipulidae and Elimia sp. The habitat score for stream STR-C15 was in the suboptimal range, and the following species were identified: Helicopsychae, Heptageniidae, water pennies, Trichoptera, fish, filamentous green, and Cambaridae. For additional details concerning aquatic life please see the previously submitted pre-construction benthic and pre-construction fishery surveys (for STR-C15 only) and Form "G". Once construction is completed post-construction benthic and post-construction fishery surveys for stream

STR-C15 will be submitted to TDEC for their review. Due to the type of structure the available habitat and substrate should not be affected and movement of aquatic life should not be restricted. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed bridge. Bank areas upstream or downstream that have been disturbed will be planted with native trees/ shrubs upon construction completion.

Based on the General Aquatic Resource Alteration Permits criteria from TDEC, this crossing should meet the requirements of the General Permit for Construction and Removal of Minor Road Crossing. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed.

Mitigation:

TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of rip-rap and other materials within the stream channel will apply.

<u>GARAP Number</u>	7C
Section:	3
Station:	Sta. 890+05.00
Stream Name:	Unnamed tributaries to South Garrison Creek
Stream Type:	Exceptional Tennessee Waters
Feature Number:	STR-C16, STR-C19, SEP-C14 & SEP-C19
Impact:	Construction of seven span dual bridges 870 foot long bridges
Structure Type:	Seven span dual bridges.

Alternatives Analysis:

The non-degradation alternative was determined feasible. During the evolution of the design process, a comparison was made between encapsulating two creeks in a 24" pipe and an 8 ft. x 5 ft. reinforced concrete box culvert and building a structure over them. The cost of the two bridges was estimated at \$7.9 million and the cost of the culverts would have been approximately \$409,000 plus \$230,000 in mitigation. Although constructing a culvert would have saved over \$7.2 million, it was decided to avoid impacting this water resource and thus dual 870-foot seven span bridges are proposed.

Chosen Alternative:

Dual seven span 211-foot long bridges will be constructed rather than using a reinforced concrete pipe to encase the stream as originally designed. The additional cost of the bridges is around \$7.2 million compared to a culvert system. There is an associated impact to SPG-C5. Rip-rap needed for the two bridge abutments will cover SPG-C5's spring head.

The proposed bridge alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running under the proposed bridge and the ability for air and light to reach the stream. After reviewing the ecology information, the habitat score for stream STR-C16 was not available but the following species were identified: EPT, water pennies and Elimia. The habitat score for stream STR-C19 was in the optimal range and the following species were identified: water pennies, Heptageniidae, Limnephilidae, shiners, darters, algae, crayfish and frogs. For additional details concerning aquatic life please see the previously submitted pre-construction benthic and pre-construction fishery surveys for stream STR-C19 and Form "G". Once construction is completed post-construction benthic and post-construction fishery surveys for stream STR-C19 will be submitted to TDEC for their review. Due to the type of structure the available habitat and substrate should not be affected and

movement of aquatic life should not be restricted. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed bridge. Bank areas upstream or downstream that have been disturbed will be planted with native trees/ shrubs upon construction completion.

Based on the General Aquatic Resource Alteration Permits criteria from TDEC, this crossing should meet the requirements of the General Permit for Construction and Removal of Minor Road Crossing. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed.

Mitigation:

TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of rip-rap and other materials within the stream channel will apply.

GARAP Number 8Ca

Section: 3

Station: Sta. 930+50 ± to Sta. 932+00 ±

Stream Name: Unnamed Tributary of Burns Branch

Stream Type: “Waters with Available Conditions”

Feature Number: Stream STR-C29

Impact: Encapsulation of 137± ft of existing stream

Structure Type: 36-inch reinforced concrete piping
20 feet of rip-rap at the outlet of the 36-inch pipe

Alternatives Analysis:

Stream C-29 currently flows to the east, partially beneath the proposed alignment of SR-840. Throughout the evolution of the design process, a number of alternatives were evaluated to minimize negative environmental impacts including the use of a pipe, culvert, or structure across this feature. It was determined that the stream will be channeled beneath the roadway via a pipe under the alignment.

Chosen Alternative:

Stream-C29 will be routed beneath the proposed alignment and encased in a 36-inch diameter reinforced concrete pipe, 137± feet in length. A French drain will run alongside the pipe to provide connectivity for adjacent seeps/springs. 20 ft of riprap will be placed at the pipe outlet to provide a transition to the existing streambed.

The proposed pipe structure alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running through the culvert and the duration of time spent in the structure. After reviewing the ecology information, the habitat score for the subject stream was not give, and no species were identified. For additional details concerning aquatic life please see the previously submitted Form “G”. Due to the type of structure and short length of impact (encapsulation less than 200 feet of stream), the available habitat and substrate will be limited but the pipe should have a minimal impact on the overall stream habit, substrate and movement of aquatic life. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed culvert. As seen at culverts on other sections of State Route 840 these areas become vegetated within a period of months.

Based on the General Aquatic Resource Alteration Permits criteria from TDEC, this crossing should meet the requirements of the General Permit for Construction and

Removal of Minor Road Crossing. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed.

Mitigation:

Erosion prevention, sediment control, placement of roadway drainage pipe and existing water quality, existing roadway and pipe, will be removed in compliance with TDOT specifications.

GARAP Number 9C

Section:	3
Station:	941+11.46
Stream Name:	South Garrison Branch
Stream Type:	Waters with "Available Conditions"
Feature Number:	Streams STR-C32 & STR-C33; Spring SPG-C12
Impact:	Construction of dual 340 ft long bridges
Structure Type:	Dual 340 ft long bridges

Alternatives Analysis:

During the evolution of the design process, a comparison was made between encapsulating this creek in an 8 ft x 5 ft box culvert and building a structure over it. The proximity of Natchez Trace Parkway indicates a structure would be beneficial to maintain access along the route while preserving the creek in its existing location. The additional cost of using a longer bridge to span the stream in addition to the Parkway was estimated at approximately \$1 million, while the cost of a pipe was approximately \$216,000 plus \$68,000 in mitigation. Although constructing a culvert would have cost less, it was decided to pass over the existing roadway and avoid impacting this water resource. Thus dual 304-foot bridges are proposed.

Chosen Alternative:

Dual 304-foot bridges will be constructed along SR-840 rather than using a culvert to encase the stream as originally considered. The bridges will cross over stream South Garrison Branch and Natchez Trace Parkway with a vertical clearance of approximately 27 feet over the roadway.

The proposed bridge alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running under the proposed bridge and the ability for air and light to reach the stream. After reviewing the ecology information, the habitat score for stream STR-C32 was in the optimal, range and the following species were identified: Water striders, stoneflies, water pennies, Caddisflies, snails, fish, Filamentous Green, and crayfish. The habitat score for stream STR-C33 was in the poor range and the following species were identified: snails and Filamentous Green. For additional details concerning aquatic life please see the previously submitted pre-construction benthic and pre-construction fishery surveys (for STR-C32 only) and Form "G". Once construction is completed post-construction benthic and post-construction fishery surveys for stream STR-C32 will be submitted to TDEC for their review. Due to the type of structure the available habitat and substrate should not be affected and movement of aquatic life should not be restricted. Disturbance of riparian

vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed bridge. Bank areas upstream or downstream that have been disturbed will be planted with native trees/ shrubs upon construction completion.

Based on the General Aquatic Resource Alteration Permits criteria from TDEC, this crossing should meet the requirements of the General Permit for Construction and Removal of Minor Road Crossing. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed.

Mitigation:

TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of rip-rap and other materials within the stream channel will apply.

<u>IARAP Number</u>	1C
Section:	3
Station:	771+30 to 773+30
Stream Name:	Unnamed tributary to Locke Branch
Stream Type:	“Waters with Available Conditions”
Feature Number:	STR-C1, SEP-C0.5 & SPG-C14
Impact:	Encapsulation of 309± ft. of existing open stream.
Structure Type:	French drain with 24 inch perforated pipe.

Consideration of Bridge Alternative:

The non-impact alternative for this location would be the construction of a standard bridge rather than the use of a French drain with 24 inch perforated pipe. During the design process a comparison was made between encapsulating this stream with a French drain with 24 inch perforated pipe and building a structure over it. Hydraulic calculations were performed using available hydrological data and accepted engineering practices. The results of these calculations indicated that a French drain with 24 inch perforated pipe with a 309± foot length would be adequate to accommodate the design flow. Using a standard bridge in place of the French drain with 24 inch perforated pipe would have a greater cost and create a hydraulic opening much larger than that necessary to carry the design flow. As a result the non-impact alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The chosen alternative at this location includes a French drain with 24 inch perforated pipe 309± feet long. This alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Locke Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design.

The proposed pipe structure alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running through the culvert. After reviewing the ecology information, the habitat score for the subject stream was in the suboptimal range and the following species were identified: Snails and Caddisflies. For additional details concerning aquatic life please see the previously submitted pre-construction benthic and Form “G”. Once construction is completed post-construction benthic surveys will be submitted to TDEC for their review. Due to the type

of structure the available habitat and substrate will be limited, which could result in restricting movement of aquatic life within the pipe. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed pipe. As seen at culverts on other sections of State Route 840 these areas become vegetated within a period of months. To

Mitigation:

Due to degradation (stream encapsulation) of the stream channel TDOT has proposed a payment of \$61,800.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply.

<u>IARAP Number</u>	3C
Section:	3
Station:	789+92 ±
Stream Name:	Unnamed tributary to Locke Branch
Stream Type:	“Waters with Available Conditions”
Feature Number:	STR-C4 & SEP-C2
Impact:	Encapsulation of 340 ft. of existing open stream
Structure Type:	54-inch reinforced concrete pipe

Consideration of Bridge Alternative:

The non-impact alternative for this location would be the construction of a standard bridge rather than the use of a 54 inch reinforced concrete pipe. During the design process a comparison was made between encapsulating this stream with a 54 inch reinforced concrete pipe and building a structure over it. Hydraulic calculations were performed using available hydrological data and accepted engineering practices. The results of these calculations indicated that a 54 inch reinforced concrete pipe with a 340 foot length would be adequate to accommodate the design flow. Using a standard bridge in place of the 54 inch reinforced concrete pipe would cost an additional \$1.6 million and create a hydraulic opening much larger than that necessary to carry the design flow. As a result the non-impact alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The chosen alternative at this location includes a 54 inch reinforced concrete pipe that is 340 feet long. This alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Locke Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design. The new channel corridor is to be lined with two rows of trees on both sides of the new channel. The proposed channel will be designed to mimic existing stream characteristics (e.g. size, shape, etc) as closely as possible. This alternative was selected to minimize overall impacts to water features in the project area.

The proposed pipe structure alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running through the culvert. After reviewing the ecology information, the habitat score for the subject stream was in the suboptimal range and the following species were identified: EPT,

snails, crayfish, and fish. For additional details concerning aquatic life please see the previously submitted pre-construction benthic and pre-construction fishery surveys and Form "G". Once construction is completed post-construction benthic and post-construction fishery surveys will be submitted to TDEC for their review. Due to the type of structure the available habitat and substrate will be limited, which could result in restricting movement of aquatic life within the pipe. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed pipe. As seen at culverts on other sections of State Route 840 these areas become vegetated within a period of months.

Mitigation:

Due to degradation (stream encapsulation) of the stream channel TDOT has proposed a payment of \$68,000.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply.

TDOT Alternatives Analysis

September 11, 2008

IARAP Number 4C

Section: 3

Station: 843+49 to 847+44

Stream Name: Unnamed Tributary to Garrison Creek

Stream Type: “Waters with Available Conditions”

Feature Number: Stream STR-C12

Impact: Relocation of 330 feet of existing stream

Structure Type: NA

Consideration of Non-Degradation Alternative:

The proposed SR-840 alignment will require the relocation of approximately 330 feet of STR-C12 to minimize stream impacts. This stream connects with STR-C11 near the opening of two proposed 414 foot long three span bridges. These bridges would need to be extended approximately 300 feet to prevent STR-C12 from being relocated. This would cost approximately \$2.6 million and create a hydraulic opening much greater than that needed to carry the design flow. As a result the bridge alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

This alternative relocates approximately 330 feet of existing open STR-C12. The stream realignment adds approximately 95 feet to the existing length. The new channel corridor is to be lined with two rows of trees on both sides of the new channel. The proposed channel will be designed to mimic existing stream characteristics (e.g. size, shape, etc) as closely as possible. This alternative was selected to minimize overall impacts to water features in the project area.

The proposed trees along the relocation will provide riparian canopy and should reduce water temperature once established. After reviewing the ecology information, the habitat score for the subject stream was not given and no species were identified. For additional details concerning aquatic life please see the previously submitted Form “G”. The proposed stream channel has been designed to mimic existing channel characteristics (size, shape, etc.) as closely as possible; therefore habitat and substrate conditions should not be affected and movement of aquatic life should not be restricted. Disturbance of riparian vegetation along transitions area between the proposed stream and existing stream channel shall be kept to a minimum, only removing what is needed to construct the relocation.

Mitigation:

TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply. The new channel corridor is to be lined with two rows of trees on both sides of the new channel. The proposed channel will be designed to mimic existing stream characteristics (e.g. size, shape, etc) as closely as possible.

IARAP Number 4Ca

Section: 3

Station: Garrison Road Sta. 40+25 ± to Sta. 40+50 ±

Stream Name: Unnamed tributary to Garrison Creek

Stream Type: “Waters with Available Conditions”

Feature Number: STR-C10

Impact: Relocation of Stream
Encapsulation of 40 ft. of existing open stream

Structure Type: 40 feet of a 36-inch reinforced concrete pipe

Consideration of Bridge Alternative:

Stream STR-C10 currently flows through a 29-foot long 18-inch diameter pipe beneath Garrison Road. The non-impact alternative for this location would be the construction of a standard bridge rather than the use of a 36 inch reinforced concrete pipe. During the design process a comparison was made between encapsulating this stream with a pipe and building a structure over it. Hydraulic calculations were performed using available hydrological data and accepted engineering practices. The results of these calculations indicated that a 36 inch reinforced concrete pipe with a 40 foot length would be adequate to accommodate the design flow. Using a standard bridge in place of the reinforced concrete pipe would increase costs and create a hydraulic opening much larger than that necessary to carry the design flow. As a result the non-impact alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The proposed alignment of SR-840 necessitates the relocation of stream STR-C10. The chosen alternative at this location includes a 36-inch reinforced concrete pipe that is 40 feet long. This alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Garrison Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design. This alternative was selected to minimize overall impacts to water features in the project area.

The proposed pipe structure and relocation alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running within and through the culvert and the duration of time spent in the structure and relocation. After reviewing the ecology information, the habitat score for the subject

stream was in the poor range and the following species were identified: snails and algae. For additional details concerning aquatic life please see the previously submitted Form "G". Due to the type of structure and short length of impact (encapsulation less than 200 feet of stream), the available habitat and substrate will be limited or should have a minimal impact on the overall stream habit, substrate and movement of aquatic life. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed culvert and relocation. As seen at culverts on other sections of State Route 840 these areas become vegetated within a period of months.

Mitigation:

TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply.

IARAP Number 4Cb

Section: 3

Station: Garrison Road Sta. 40+10 ± to Sta. 40+25 ±

Stream Name: Unnamed Tributary to Garrison Creek

Stream Type: “Waters with Available Conditions”

Feature Number: Stream STR-C10.5

Impact: Loss of 15 ± feet of stream length

Structure Type: NA

Consideration of Non-Degradation Alternative:

Stream STR-C10.5 will lose 15 ± feet of its length due to the proposed alignment of SR-840 and realignment of Garrison Road. The chosen alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Garrison Creek. Where appropriate and feasible, minimization measures have been incorporated into the final design.

Chosen Alternative:

Approximately 15 feet of the existing unnamed tributary of Garrison Creek (STR-C10.5) will be lost.

Mitigation:

Due to degradation (length loss) of the stream channel TDOT has proposed a payment of \$3000.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT’s Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of rip-rap and other materials within the stream channel will apply.

IARAP Number 5C

Section: 3

Station: 894+50 ±

Stream Name: Unnamed Tributary to Locke Branch

Stream Type: Exceptional Tennessee Waters

Feature Number: Stream STR-C22; Seep SEP-C20

Impact: Loss of 15 feet of stream length

Structure Type: NA

Consideration of Non-Degradation Alternative:

Stream STR-C20 is routed beneath the proposed SR-840 alignment in a 6 ft x 4 ft box culvert. Nearby, stream STR-C22 lies partially within the footprint of a fill section. The chosen alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Locke Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design.

Chosen Alternative:

A portion of the existing unnamed tributary of Locke Branch (STR-C22) will lie beneath a fill section; approximately 15 feet of length will be lost. Seep SEP-C20 will also be affected.

Mitigation:

Due to degradation (length loss) of the stream channel TDOT has proposed a payment of \$3000.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of rip-rap and other materials within the stream channel will apply.

<u>IARAP Number</u>	6C
Section:	3
Station:	894+80 to 907+20
Stream Name:	Unnamed tributary to Locke Branch
Stream Type:	Exceptional Tennessee Waters
Feature Number:	STR-C20, SEP-C21, SEP-C22, SEP-C23, SEP-C24 & SEP-C25
Impact:	Encapsulation of 618 ft. of existing open stream and relocation of 796 feet of existing open stream.
Structure Type:	4 ft. x 6 ft. reinforced concrete box culvert.

Consideration of Bridge Alternative:

The non-degradation alternative for this location would be the construction of a standard bridge rather than the use of a 4 ft. x 6 ft. reinforced concrete box culvert and 796 feet of stream relocation. During the design process a comparison was made between encapsulating this stream with a 4 ft. x 6 ft. reinforced concrete box culvert and relocating 796 feet of it and building a structure over it. Hydraulic calculations were performed using available hydrological data and accepted engineering practices. The results of these calculations indicated that a 4 ft. x 6 ft. reinforced concrete box culvert with a 618 foot length would be adequate to accommodate the design flow. Using a standard bridge in place of the 4 ft. x 6 ft. reinforced concrete box culvert would have a much greater cost and create a hydraulic opening much larger than that necessary to carry the design flow. As a result the non-degradation alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The chosen alternative at this location includes a 4 ft. x 6 ft. reinforced concrete box culvert and 796 feet of stream relocation. This alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Locke Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design. The new channel corridor is to be lined with two rows of trees on both sides of the new channel. The proposed channel will be designed to mimic existing stream characteristics (e.g. size, shape, etc) as closely as possible. This alternative was selected to minimize overall impacts to water features in the project area.

The box type culvert alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running through the

culvert. Water temperature will generally remain cooler in the culvert, thus maintaining dissolved oxygen levels. After reviewing the ecology information, the habitat score for the subject stream was in the marginal to poor range and the following species were identified: *Elimia* sp. Caddisflies, fish, and algae. For additional details concerning aquatic life please see the previously submitted Form "G". Due to the length and grade of the culvert, the habitat and substrate inside the structure will be limited, which could result in restricting movement of aquatic life within the culvert. Disturbance of riparian vegetation shall be kept to a minimum, only removing what is needed to construct the proposed culvert and stream relocation. As seen at culverts on other sections of State Route 840 these areas become vegetated within a period of months. Proposed trees along the relocation will provide riparian canopy and should reduce water temperature once established. The proposed stream channel has been designed to mimic existing channel characteristics (size, shape, etc.) as closely as possible; therefore habitat and substrate conditions should not be affected and movement of aquatic life should not be restricted.

Mitigation:

Due to degradation (stream encapsulation) of the stream channel TDOT has proposed a payment of \$123,600.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply.

IARAP Number 7C

Section: 3

Station: Sta. 899+00 to Sta. 899+50

Stream Name: Unnamed Tributary to Locke Branch

Stream Type: Exceptional Tennessee Waters

Feature Number: Stream STR-C23; Spring SPG-C8

Impact: Loss of 140 ft of stream length

Structure Type: N/A

Consideration of Non-Degradation Alternative:

During the evolution of the design process, a comparison was made between encapsulating the nearby stream STR-C20 in a box culvert and building a structure over it. Constructing a culvert would cost less and provide an adequate hydraulic opening for the stream. Stream STR-C23 lies within the footprint of a fill section.

Chosen Alternative:

A portion of the existing unnamed tributary of Locke Branch (STR-C23) will lie beneath a fill section; approximately 140 feet of length will be lost. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc.) to reduce overall impacts to area water features. Where appropriate and feasible, minimization measures have been incorporated into the final design.

The proposed loss of length to stream STR-C23 due to the relocation of stream STR-C20, should have a negligible effect on the overall water temperature. Due to the type of impact, the habitat conditions should not be limited and there will be minimal or no impact on the overall stream habit, available substrate and movement of aquatic life of the remaining stream channel. After reviewing the ecology information, the habitat score for the subject stream was not given and no species were identified. For additional details concerning aquatic life please see the previously submitted Form "G".

Mitigation:

Due to degradation (length loss) of the stream channel TDOT has proposed a payment of \$28,000.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT's Standard Road and Bridge Specifications for erosion prevention,

sediment control and water quality for placement of rip-rap and other materials within the stream channel will apply.

IARAP Number 8C

Section: 3

Station: Sta. 913+20 ± to Sta. 918+00 ±

Stream Name: Unnamed Tributary of Burns Branch

Stream Type: “Waters with Available Conditions”

Feature Number: Stream STR-C25

Impact: Encapsulation of 518 feet of stream length

Structure Type: 18-inch diameter concrete pipe

Consideration of Bridge Alternative:

The proposed alignment of SR-840 crosses the path of stream STR-C25. The non-degradation alternative for this location would be the construction of a standard bridge rather than the use of a culvert or pipe. During the design process a comparison was made between encapsulating this stream with culvert and building a structure over it. Hydraulic calculations were performed using available hydrological data and accepted engineering practices. The results of these calculations indicated that a 30- to 36-inch concrete pipe would be adequate to accommodate the design flow. Using a standard bridge in place of the pipe would have a greater cost and create a hydraulic opening much larger than that necessary to carry the design flow. As a result the non-degradation alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The stream realignment encapsulates approximately 518 feet of the existing stream length. Stream STR-C25 will flow through an 18-inch diameter concrete pipe. Rip-rap will be placed at the pipe outlet, covering a 10 ft x 5 ft area to transition into the existing streambed. The portion of STR-C25 which falls beneath the SR-840 fill section will be filled with graded solid rock. This alternative was selected to minimize overall impacts to water features in the project area.

The proposed pipe structure alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running through the culvert. After reviewing the ecology information, the habitat score for the subject stream was in the poor range and no species were identified. For additional details concerning aquatic life please see the previously Form “G. Due to the type of structure the available habitat and substrate will be limited, which could result in restricting movement of aquatic life within the pipe. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed pipe. As seen at culverts on other sections of State Route 840 these areas become vegetated within a period of months.

Mitigation:

Due to degradation (stream encapsulation) of the stream channel TDOT has proposed a payment of \$103,600.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT Standard Road and Bridge Specifications for erosion prevention, sediment control, and placement of piers, excavation within stream channel, water quality and placement of rip rap will apply

IARAP Number 9C

Section:	3
Station:	918+50
Stream Name:	Unnamed tributary to Burns Branch
Stream Type:	“Waters with Available Conditions”
Feature Number:	STR-C26
Impact:	Encapsulation of 660 ± feet of existing open stream, 130± feet of stream relocation and 20 ft. of rip-rap at outlet for protection.
Structure Type:	634 feet of a 36-inch reinforced concrete pipe and two “U” shaped end walls each 13± feet in length.

Consideration of Bridge Alternative:

The non-degradation alternative for this location would be the construction of a standard bridge rather than the use of a 36-inch reinforced concrete pipe. During the design process a comparison was made between encapsulating this stream with a pipe and building a structure over it. Hydraulic calculations were performed using available hydrological data and accepted engineering practices. The results of these calculations indicated that a 36-inch reinforced concrete pipe with a 634 foot length would be adequate to accommodate the design flow. Using a standard bridge in place of the 36-inch reinforced concrete pipe would increase costs and create a hydraulic opening much larger than that necessary to carry the design flow. As a result the non-degradation alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The chosen alternative at this location includes a 36 inch reinforced concrete pipe that is 634 feet long. “U”-shaped end walls 13 feet in length will be incorporated at either end of this pipe. A 20-foot rip-rap length at the outlet will provide a transition to the stream channel. This alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Burns Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design. This alternative was selected to minimize overall impacts to water features in the project area.

The proposed pipe structure alternative should have a negligible effect on the overall water temperature of the stream due to the overall percentage of stream running through the culvert. After reviewing the ecology information, the habitat score for the subject

stream was in the poor range in the upper reaches and suboptimal in the lower reaches and the following species were identified: Caddisflies, midges, snails, filamentous green, and frogs. For additional details concerning aquatic life please see the previously submitted pre-construction benthic surveys and Form "G". Once construction is completed post-construction benthic surveys will be submitted to TDEC for their review. Due to the type of structure the available habitat and substrate will be limited, which could result in restricting movement of aquatic life within the pipe. Disturbance of riparian vegetation along the stream channel shall be kept to a minimum, only removing what is needed to construct the proposed pipe. As seen at culverts on other sections of State Route 840 these areas become vegetated within a period of months.

Mitigation:

Due to degradation (stream encapsulation) of the stream channel TDOT has proposed a payment of \$132,000.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply.

IARAP Number 10C

Section: 3

Station: Sta. 918+80 to Sta. 920+70

Stream Name: Unnamed tributary to Burns Creek

Stream Type: “Waters with Available Conditions”

Feature Number: STR-C27

Impact: Channel Relocation and 84 ft. stream length loss

Structure Type: N/A

Consideration of Non-impact Alternative:

The proposed SR-840 alignment will require the loss of approximately 84± feet of STR-C27 to minimize stream impacts. Stream STR-C27 will be relocated, changing the total stream length from 264 ± feet to 180 ± feet. Using a standard bridge in place of the stream relocation would have cost an additional \$1.7 million. As a result the non-impact alternative to avoid the stream was determined not to be economically feasible.

Chosen Alternative:

The chosen alternative at this location reroutes a portion of Stream STR-C27. This alternative minimizes channel changes, relocation of residences, loss of farm lands and impacts to surrounding properties. The final design for the chosen alternative considered a range of reasonable minimization measures (reduction in right of way requirements, reduction of proposed slopes on cuts and fills, reduction in grades, use of rock fills, etc) to reduce the impacts to the unnamed tributary to Burns Branch. Where appropriate and feasible, minimization measures have been incorporated into the final design. This alternative was selected to minimize overall impacts to water features in the project area.

As part of on-site, in-kind replacement of stream for the proposed relocation we propose to plant two rows of trees on both sides of the new channel. The proposed trees will provide riparian canopy and should reduce water temperature once established. After reviewing the ecology information, the habitat score for the subject stream was in the poor range and no species were identified. For additional details concerning aquatic life please see the previously Form “G”. The proposed stream channel has been designed to mimic existing channel characteristics (size, shape, etc.) as closely as possible; therefore habitat and substrate conditions should not be affected and movement of aquatic life should not be restricted. Disturbance of riparian vegetation along transitions area between the proposed stream and existing stream channel shall be kept to a minimum, only removing what is needed to construct the relocation.

Mitigation:

Due to degradation (length loss) of the stream channel TDOT has proposed a payment of \$16,800.00 to the In-Lieu Fee Stream Mitigation Program. The TSMP has agreed that the proposed dollar amount listed above would be used within the Murfrees Creek or Leipers Fork Creek watershed (same 12-digit HUC) for on-site mitigation. Therefore TDOT feels that the proposed culvert would result in no net loss of resource value to the watershed. TDOT's Standard Road and Bridge Specifications for erosion prevention, sediment control and water quality for placement of materials within the stream channel will apply.