



*Florida Department of Transportation*

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MIKE DEW  
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July 25, 2017

Khoa Nguyen  
Director, Office of Technical Services  
Federal Highway Administration  
3500 Financial Plaza, Suite 400  
Tallahassee, Florida 32312

Re: State Specifications Office  
Section: **556**  
Proposed Specification: **5560102 Jack and Bore.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Jason Russell of the State Construction Office to update the language.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to [dan.hurtado@dot.state.fl.us](mailto:dan.hurtado@dot.state.fl.us).

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on file

Dan Hurtado, P.E.  
State Specifications Engineer

DH/dt

Attachment

cc: Florida Transportation Builders' Assoc.  
State Construction Engineer

**JACK AND BORE.****(REV ~~3-31-17~~ ~~5-18-17~~ ~~7-25-17~~)**

SUBARTICLE 556-1.2 is deleted and the following substituted:

**556-1.2 General:** J&B is a method for installing a product (often called a casing) that may serve as a direct conduit for liquids or gases, or as a duct for carrier (Pipe, cable, or wire line products). It is a multi-stage process consisting of constructing a temporary horizontal jacking platform and a starting alignment track in an entrance pit at a desired elevation. The product is then jacked by manual control along the starting alignment track with simultaneous excavation of the soil being accomplished by a rotating cutting head in the leading edge of the product's annular space. The ground up soil (spoil) is transported back to the entrance pit by helical wound auger flights rotating inside the product. J&B typically provides limited tracking and steering as well as limited support to the excavation face.

**Micro tunneling** MT is conducted similar to J&B with the exception that it is remotely controlled, guided pipe jacking process that provides continuous support to the excavation face. The guidance system usually consists of a laser mounted in the tunneling drive shaft which communicates a reference line to a target mounted inside the MT machine's articulated steering head. The MT process provides the ability to control the excavation face stability by applying mechanical or fluid pressure to counterbalance the earth and hydrostatic pressures.

Removal and disposition of excess material varies, is the responsibility of the boring contractor and is not covered under this Specification. However, the cost of removal or final disposition is included in the cost of the J&B operation.

No J&B conduit may be left open ended without approval of the Engineer ~~to prevent the conduit from acting as a drainage structure.~~

ARTICLE 556-2 is deleted and the following substituted:

**556-2 Materials.**

Select materials approved for installation within the right-of-way based on their suitability for the construction method as defined in Table 556-2.1. After determining product suitability, individual material standards as contained in Table 556-2.2 apply.

Table 556-2.1 Product Suitability by Construction Method		
Type	Pipe/Casing Installation Mode	Suitable Pipe/Casing
Jack and Bore	Jacking	Steel, Plastic
Micro tunneling	Jacking	DI, FRPM, PC, PCCP, RCCP, RCP, Steel

Table 556-2.2 Material Standards Acceptable for J&B and MT Installations		
Material Type	Non-Pressure	Pressure

Table 556-2.2 Material Standards Acceptable for J&B and MT Installations		
Material Type	Non-Pressure	Pressure
Ductile Iron (DI)	AWWA C150/C151 ASTM A716	AWWA C150/C151
Fiberglass Reinforced Polymer Mortar (FRPM)	ASTM D3262	ASTM D3517 AWWA C950
Polymer Concrete (PC)	DIN 54815-1 & 2	N/A
Prestressed Concrete Cylinder Pipe (PCCP)	N/A	AWWA C301
Reinforced Concrete Cylinder Pipe (RCCP)	N/A	ASTM C361
Reinforced Concrete Pipe (RCP)	ASTM C 76	ASTM C361 AWWA C300/C302
Steel	ASTM A139 Grade B <sup>(1)</sup> API 2B <sup>(2)</sup>	AWWA C200 API 2B <sup>(2)</sup>
Polyvinyl Chloride (PVC)	ASTM D1785	ASTM D1785
<del>Acrylonitrile Butadiene Styrene (ABS)</del>	<del>ASTM D1527</del>	<del>ASTM D1527</del>
Reinforced Thermosetting Resin Pipe (RTRP)	ASTM D2996 or ASTM D2997	ASTM D2996 or ASTM D2997
<sup>(1)</sup> No hydrostatic test required		
<sup>(2)</sup> Dimensional tolerances only		

Unless otherwise tested and approved by the Department, only use encasement pipe or uncased carrier pipe material that is new and has smooth interior and exterior walls.

When the Plans show that the casing is to be used as a drainage carrier pipe, extend the casing the entire length from drainage structure to drainage structure. **When using uncased carrier pipe, use pipe meeting the requirements in 556-4.3.** Maintain a uniform diameter, wall thickness and material type for the entire length of the casing.

**556-2.1 Steel Pipe Casing and Welds:** In addition to meeting or exceeding the conditions contained in Table 556-2.1 and Table 556-2.2, meet the following requirements:

1. The size of the steel casing must be at least 6 inches larger than the largest outside diameter of the carrier. Casing size must accommodate pressure pipe or carrier pipe joint restraints.
2. The casing pipe must be straight seam pipe, spiral seam pipe, or seamless pipe.
3. All steel pipe may be bare inside and out, with the manufacturer's recommended minimum nominal wall thicknesses to meet the greater of either installation, loading or carrier requirements.
4. All steel casing pipe must be square cut and have dead-even lengths which are compatible with the J&B equipment.

Use steel pipe casings and welds meeting or exceeding the thickness requirements to achieve the service life requirements noted in the Department Drainage Manual Chapter 6. For purposes of determining service life, ensure that casings installed under roadways meet or exceed cross drain requirements and casings under driveways meet or exceed side drain pipe

requirements. For pipe used in drainage applications, use pipe meeting the requirements in 556-4.3. For purposes of material classification, consider steel pipe casing structural plate steel pipe. Ensure that steel pipe casing of insufficient length achieves the required length through fully welded joints. Ensure that joints are air-tight and continuous over the entire circumference of the pipe with a bead equal to or exceeding the minimum of either that required to meet the thickness criteria of the pipe wall for jacking and loading or service life. All welding shall be done in accordance with the American Welding Society Structural Welding Code- Steel D1.1.

**556-2.2 Reinforced Concrete Pipe Casing:** In addition to meeting or exceeding the conditions contained in Tables 556-2.1 and Table 556-2.2, meet the following requirements:

Ensure that concrete pipe complies with the following minimum requirements:

1. 5,000 psi concrete compressive strength
2. Class III, IV, or V as required by load calculations, with a C-wall
3. Full circular inner and/or outer reinforcing cage
4. Multiple layers of steel reinforcing cages, wire splices, laps and spacers are permanently secured together by welding in place
5. Straight outside pipe wall with no bell modification
6. No elliptical reinforcing steel is allowed
7. Single cage reinforcement with a 1 inch minimum cover from the inside wall
8. Double cage reinforcement with a 1 inch minimum cover from each wall
9. Joints are gasket type
10. Additional joint reinforcement

11. For drainage applications, use pipe meeting the requirements in 556-4.3.

Upon installation, the Engineer may, at his discretion, require the Contractor to perform concrete wiping or injection of the joints if it is believed the joints have not maintained their water tightness during the jacking operation. No additional payment will be made for this operation.

**556-2.3 Plastic Pipe Casing:** Plastic pipe may be jacked and bored if its physical properties are sufficient meet or exceed the conditions contained in Tables 556-2.1 and 556-2.2, and is rigid such that when supported or suspended at mid point it maintains a straight alignment has a sufficient wall thickness to maintain proper alignment without exceeding the deflection requirements in Section 430-4.89.3. If plastic pipe is Jacked and Bored it may not be used as a pressurized carrier. Plastic pipe casing installed by the jack and bore method requires the use of an auger. Open end jacking without the use of an auger for continuous cleanout of the bore as the pipe is advanced is not permitted. Closed end jacking is not permitted.

For drainage applications, use pipe meeting the requirements in 556-4.3.

**556-2.4 Pipe Couplings and Joints:** In addition to meeting or exceeding the conditions contained in Tables 556-2.1 and 556-2.2, to minimize potential for bore failure, couplings must not project at right angles from the casing diameter by more than 3/4 inch.

1. Steel Pipe Coupling and Joints:
  - a. Welds must comply with 556-2.1(4) when couplings are not used or when the coupling thickness is less than the casing thickness.

b. When couplings are used the casing joint needs only to be tack welded. Couplings must have a full bead weld such that the thickness, when measured at an angle of 45 degrees to the casing and coupling interface, must be no less than the casing thickness.

2. Plastic Pipe Couplings and Joints:

a. Must meet or exceed all ASTM strength and composition standards established for the casing material to which they are being attached.

b. Joints must be made sufficiently strong to withstand the pressures of jacking. All chemical welds must be completely set and cured before any jacking is attempted.

SUBARTICLE 556-3.1 is deleted and the following substituted:

**556-3.1 Site Conditions:**

1. Carry out excavation for entry, exit, recovery pits, auger slurry sump pits, or any other excavation as specified in Section 120. ~~Unless approved by the Engineer~~ **When using auger fluids, the** sump pits ~~are required to~~ **must** contain auger fluids if vacuum devices are not operated throughout the boring operation.

2. Within 48 hours of completing installation of the boring product, ensure that the work site is cleaned of all excess auger fluids or spoils. Removal and final disposition of excess fluids or spoils is the responsibility of the boring contractor and ensure that the work site is restored to pre-construction conditions or as identified in the Plans.

3. Restore excavated areas in accordance with the Specifications and Design Standards.

4. Provide MOT in accordance with the Department Design Standards and the MUTCD when and where the former is silent.

5. Ensure that equipment does not impede visibility of the roadway user without taking the necessary precautions of proper signing and Maintenance of Traffic Operations.

SUBARTICLE 556-3.3 is deleted and the following substituted:

**556-3.3 Damage Restoration:** Take responsibility for restoring any damage caused by heaving, settlement, separation of pavement, escaping boring fluid (frac-out) of the J&B **or MT** operation at no cost to the Department.

**556-3.3.1 Remediation Plans:** When required by the Engineer, submit detailed plans which show how damage to any roadway facility will be remedied. These details will become part of the As-Built Plans Package. Remediation plans must follow the same guidelines for development and presentation of the As-Built Plans. When remediation plans are required, they must be approved by the Engineer before any work proceeds.

SUBARTICLE 556-4.3 is deleted and the following substituted:

**556-4.3 Testing:**

**556-4.3.1 Testing Requirements:** Ensure all casing joints meet the Department's watertight pressure requirements in accordance with Section 430. Testing may consist of one of the following methods but must always meet or exceed Department testing requirements.

1. Follow the Product Manufacturer's pressure testing recommendations.
2. ~~Ensure that the product e~~Carrier pipes installed without a casing must meet the pressure requirements set by the owner. If the owner does not require pressure testing, the Engineer may require at least one test.

~~a.~~**556-4.3.2 Drainage Application Testing (Under Pavement):**

~~The Department requires a water tight pipe and joint configuration where the product is installed beneath any~~ When under pavement (including sidewalk) and front shoulders, all J&B pipe installations must meet or exceed the Department's water tight pipe and joint configuration in accordance with Section 430. The Engineer will determine when and where water tight joint requirements shall be applied to the ultimate roadway section for future widening. When under the pavement, conduct an air pressure test for leaks in the presence of the Engineer at a minimum test pressure of 20 PSI by either of the following methods.

1. ~~Standard~~ 24 hour pressure test with a recording chart or,
2. A dragnet type leak detector or equivalent device capable of detecting pressure drops of 1/2 PSI for a time period recommended by the manufacturer.

~~b.~~**556-4.3.3 Drainage Application Testing (Not Under**

**Pavement):** When ~~a product~~J&B pipe installations isare not located under the pavement, the pipe and joint configuration must meet or exceed soil tight joint requirements. The test for a soil tight joint allows up to 0.1 gallon of water leakage at a sustained pressure of 2 PSI. ~~The water tight joint criteria allows no leakage at all for a sustained pressures of 5 PSI.~~ Conduct test for joint integrity for one hour.

**556-4.3.24 Damaged Product Testing:** When there is any indication that the installed product has sustained damage and may leak, stop the work, notify the Engineer and investigate damage. The Engineer may require a pressure test and reserves the right to be present during the test. Perform pressure test within 24 hours unless otherwise approved by the Engineer. Submit the test results to the Engineer for review and approval. The Engineer shall be allowed up to 72 hours to approve or determine if the product installation is not in compliance with Specifications. The Engineer may require non-compliant installations to be filled with excavatable flowable fill at no cost to the Department.

SUBARTICLE 556-5.2 is deleted and the following substituted:

**556-5.2 Excess Material and Fluids:** Monitor the pumping rate, pressures, viscosity and density of the boring fluids to ensure adequate removal of soil cuttings and the stability of the borehole. Contain excess drilling fluids, slurry and soil cuttings at entry and exit points in pits until they are recycled or removed from the site.

Ensure that all boring fluids and other materials are disposed of or recycled in a manner acceptable to the appropriate ~~local, state or federal regulatory agencies~~Federal, State, and Local Rules and Regulations. When jacking and boring in known or suspected areas of contaminated groundwater or soil, coordinate with the Engineer and District Contamination Coordinator (DCIC) during the pre-construction meeting and prior to the start of boring to determine the best course of action for J&B activities within the contaminated area.~~test the boring fluid for contamination and dispose of appropriately. Remove any excess material upon completion of the bore.~~ If the J&B operation encounters an unidentified area of contamination or abnormal condition indicating the presence of potentially contaminated material, stop operations

~~and it becomes evident that the soil is contaminated,~~ contact the Engineer immediately. Do not continue boring without the Engineer's approval.

**JACK AND BORE.****(REV7-25-17)**

SUBARTICLE 556-1.2 is deleted and the following substituted:

**556-1.2 General:** J&B is a method for installing a product (often called a casing) that may serve as a direct conduit for liquids or gases, or as a duct for carrier (Pipe, cable, or wire line products). It is a multi-stage process consisting of constructing a temporary horizontal jacking platform and a starting alignment track in an entrance pit at a desired elevation. The product is then jacked by manual control along the starting alignment track with simultaneous excavation of the soil being accomplished by a rotating cutting head in the leading edge of the product's annular space. The ground up soil (spoil) is transported back to the entrance pit by helical wound auger flights rotating inside the product. J&B typically provides limited tracking and steering as well as limited support to the excavation face.

MT is conducted similar to J&B with the exception that it is remotely controlled, guided pipe jacking process that provides continuous support to the excavation face. The guidance system usually consists of a laser mounted in the tunneling drive shaft which communicates a reference line to a target mounted inside the MT machine's articulated steering head. The MT process provides the ability to control the excavation face stability by applying mechanical or fluid pressure to counterbalance the earth and hydrostatic pressures.

Removal and disposition of excess material varies, is the responsibility of the boring contractor and is not covered under this Specification. However, the cost of removal or final disposition is included in the cost of the J&B operation.

No J&B conduit may be left open ended without approval of the Engineer.

ARTICLE 556-2 is deleted and the following substituted:

**556-2 Materials.**

Select materials approved for installation within the right-of-way based on their suitability for the construction method as defined in Table 556-2.1. After determining product suitability, individual material standards as contained in Table 556-2.2 apply.

Table 556-2.1 Product Suitability by Construction Method		
Type	Pipe/Casing Installation Mode	Suitable Pipe/Casing
Jack and Bore	Jacking	Steel, Plastic
Micro tunneling	Jacking	DI, FRPM, PC, PCCP, RCCP, RCP, Steel

Table 556-2.2 Material Standards Acceptable for J&B and MT Installations		
Material Type	Non-Pressure	Pressure
Ductile Iron (DI)	AWWA C150/C151 ASTM A716	AWWA C150/C151

Table 556-2.2 Material Standards Acceptable for J&B and MT Installations		
Material Type	Non-Pressure	Pressure
Fiberglass Reinforced Polymer Mortar (FRPM)	ASTM D3262	ASTM D3517 AWWA C950
Polymer Concrete (PC)	DIN 54815-1 & 2	N/A
Prestressed Concrete Cylinder Pipe (PCCP)	N/A	AWWA C301
Reinforced Concrete Cylinder Pipe (RCCP)	N/A	ASTM C361
Reinforced Concrete Pipe (RCP)	ASTM C 76	ASTM C361 AWWA C300/C302
Steel	ASTM A139 Grade B <sup>(1)</sup> API 2B <sup>(2)</sup>	AWWA C200 API 2B <sup>(2)</sup>
Polyvinyl Chloride (PVC)	ASTM D1785	ASTM D1785
Reinforced Thermosetting Resin Pipe (RTRP)	ASTM D2996 or ASTM D2997	ASTM D2996 or ASTM D2997
<sup>(1)</sup> No hydrostatic test required		
<sup>(2)</sup> Dimensional tolerances only		

Unless otherwise tested and approved by the Department, only use encasement pipe or uncased carrier pipe material that is new and has smooth interior and exterior walls.

When the Plans show that the casing is to be used as a drainage carrier pipe, extend the casing the entire length from drainage structure to drainage structure. When using uncased carrier pipe, use pipe meeting the requirements in 556-4.3. Maintain a uniform diameter, wall thickness and material type for the entire length of the casing.

**556-2.1 Steel Pipe Casing and Welds:** In addition to meeting or exceeding the conditions contained in Table 556-2.1 and Table 556-2.2, meet the following requirements:

1. The size of the steel casing must be at least 6 inches larger than the largest outside diameter of the carrier. Casing size must accommodate pressure pipe or carrier pipe joint restraints.

2. The casing pipe must be straight seam pipe, spiral seam pipe, or seamless pipe.

3. All steel pipe may be bare inside and out, with the manufacturer's recommended minimum nominal wall thicknesses to meet the greater of either installation, loading or carrier requirements.

4. All steel casing pipe must be square cut and have dead-even lengths which are compatible with the J&B equipment.

Use steel pipe casings and welds meeting or exceeding the thickness requirements to achieve the service life requirements noted in the Department Drainage Manual Chapter 6. For purposes of determining service life, ensure that casings installed under roadways meet or exceed cross drain requirements and casings under driveways meet or exceed side drain pipe requirements. For pipe used in drainage applications, use pipe meeting the requirements in 556-4.3. For purposes of material classification, consider steel pipe casing structural plate steel pipe. Ensure that steel pipe casing of insufficient length achieves the required length through fully welded joints. Ensure that joints are air-tight and continuous over the entire circumference of the pipe with a bead equal to or exceeding the minimum of either that required to meet the thickness

criteria of the pipe wall for jacking and loading or service life. All welding shall be done in accordance with the American Welding Society Structural Welding Code- Steel D1.1.

**556-2.2 Reinforced Concrete Pipe Casing:** In addition to meeting or exceeding the conditions contained in Tables 556-2.1 and Table 556-2.2, meet the following requirements:

Ensure that concrete pipe complies with the following minimum requirements:

1. 5,000 psi concrete compressive strength
2. Class III, IV, or V as required by load calculations, with a C-wall
3. Full circular inner and/or outer reinforcing cage
4. Multiple layers of steel reinforcing cages, wire splices, laps and spacers are permanently secured together by welding in place
5. Straight outside pipe wall with no bell modification
6. No elliptical reinforcing steel is allowed
7. Single cage reinforcement with a 1 inch minimum cover from the inside wall
8. Double cage reinforcement with a 1 inch minimum cover from each wall
9. Joints are gasket type
10. Additional joint reinforcement
11. For drainage applications, use pipe meeting the requirements in 556-

4.3.

Upon installation, the Engineer may, at his discretion, require the Contractor to perform concrete wiping or injection of the joints if it is believed the joints have not maintained their water tightness during the jacking operation. No additional payment will be made for this operation.

**556-2.3 Plastic Pipe Casing:** Plastic pipe may be jacked and bored if its physical properties meet or exceed the conditions contained in Tables 556-2.1 and 556-2.2, and has a sufficient wall thickness to maintain proper alignment without exceeding the deflection requirements in Section 430-9.3. If plastic pipe is Jacked and Bored it may not be used as a pressurized carrier. Plastic pipe casing installed by the jack and bore method requires the use of an auger. Open end jacking without the use of an auger for continuous cleanout of the bore as the pipe is advanced is not permitted. Closed end jacking is not permitted.

For drainage applications, use pipe meeting the requirements in 556-4.3.

**556-2.4 Pipe Couplings and Joints:** In addition to meeting or exceeding the conditions contained in Tables 556-2.1 and 556-2.2, to minimize potential for bore failure, couplings must not project at right angles from the casing diameter by more than 3/4 inch.

1. Steel Pipe Coupling and Joints:

- a. Welds must comply with 556-2.1(4) when couplings are not used or when the coupling thickness is less than the casing thickness.
- b. When couplings are used the casing joint needs only to be tack welded. Couplings must have a full bead weld such that the thickness, when measured at an angle of 45 degrees to the casing and coupling interface, must be no less than the casing thickness.

2. Plastic Pipe Couplings and Joints:

- a. Must meet or exceed all ASTM strength and composition standards established for the casing material to which they are being attached.
- b. Joints must be made sufficiently strong to withstand the pressures of jacking. All chemical welds must be completely set and cured before any jacking is attempted.

SUBARTICLE 556-3.1 is deleted and the following substituted:

**556-3.1 Site Conditions:**

1. Carry out excavation for entry, exit, recovery pits, auger slurry sump pits, or any other excavation as specified in Section 120. When using auger fluids, the sump pits must contain auger fluids if vacuum devices are not operated throughout the boring operation.
2. Within 48 hours of completing installation of the boring product, ensure that the work site is cleaned of all excess auger fluids or spoils. Removal and final disposition of excess fluids or spoils is the responsibility of the boring contractor and ensure that the work site is restored to pre-construction conditions or as identified in the Plans.
3. Restore excavated areas in accordance with the Specifications and Design Standards.
4. Provide MOT in accordance with the Department Design Standards and the MUTCD when and where the former is silent.
5. Ensure that equipment does not impede visibility of the roadway user without taking the necessary precautions of proper signing and Maintenance of Traffic Operations.

SUBARTICLE 556-3.3 is deleted and the following substituted:

**556-3.3 Damage Restoration:** Take responsibility for restoring any damage caused by heaving, settlement, separation of pavement, escaping boring fluid (frac-out) of the J&B or MT operation at no cost to the Department.

**556-3.3.1 Remediation Plans:** When required by the Engineer, submit detailed plans which show how damage to any roadway facility will be remedied. These details will become part of the As-Built Plans Package. Remediation plans must follow the same guidelines for development and presentation of the As-Built Plans. When remediation plans are required, they must be approved by the Engineer before any work proceeds.

SUBARTICLE 556-4.3 is deleted and the following substituted:

**556-4.3 Testing:**

**556-4.3.1 Testing Requirements:** Ensure all casing joints meet the Department's watertight pressure requirements in accordance with Section 430. Testing may consist of one of the following methods but must always meet or exceed Department testing requirements.

1. Follow the Product Manufacturer's pressure testing recommendations.
2. Carrier pipes installed without a casing must meet the pressure requirements set by the owner. If the owner does not require pressure testing, the Engineer may require at least one test.

**556-4.3.2 Drainage Application Testing (Under Pavement):** When under pavement (including sidewalk) and front shoulders, all J&B pipe installations must meet or exceed the Department's water tight pipe and joint configuration in accordance with Section 430. The Engineer will determine when and where water tight joint requirements shall be applied to the ultimate roadway section for future widening. When under the pavement, conduct an air

pressure test for leaks in the presence of the Engineer at a minimum test pressure of 20 PSI by either of the following methods.

1. 24 hour pressure test with a recording chart or,
2. A dragnet type leak detector or equivalent device capable of detecting pressure drops of 1/2 PSI for a time period recommended by the manufacturer.

**556-4.3.3 Drainage Application Testing (Not Under Pavement):** When J&B pipe installations are not located under the pavement, the pipe and joint configuration must meet or exceed soil tight joint requirements. The test for a soil tight joint allows up to 0.1 gallon of water leakage at a sustained pressure of 2 PSI. Conduct test for joint integrity for one hour.

**556-4.3.4 Damaged Product Testing:** When there is any indication that the installed product has sustained damage and may leak, stop the work, notify the Engineer and investigate damage. The Engineer may require a pressure test and reserves the right to be present during the test. Perform pressure test within 24 hours unless otherwise approved by the Engineer. Submit the test results to the Engineer for review and approval. The Engineer shall be allowed up to 72 hours to approve or determine if the product installation is not in compliance with Specifications. The Engineer may require non-compliant installations to be filled with excavatable flowable fill at no cost to the Department.

SUBARTICLE 556-5.2 is deleted and the following substituted:

**556-5.2 Excess Material and Fluids:** Monitor the pumping rate, pressures, viscosity and density of the boring fluids to ensure adequate removal of soil cuttings and the stability of the borehole. Contain excess drilling fluids, slurry and soil cuttings at entry and exit points in pits until they are recycled or removed from the site.

Ensure that all boring fluids and other materials are disposed of or recycled in a manner acceptable to the appropriate Federal, State, and Local Rules and Regulations. When jacking and boring in known or suspected areas of contaminated groundwater or soil, coordinate with the Engineer and District Contamination Coordinator (DCIC) during the pre-construction meeting and prior to the start of boring to determine the best course of action for J&B activities within the contaminated area. If the J&B operation encounters an unidentified area of contamination or abnormal condition indicating the presence of potentially contaminated material, stop operations and contact the Engineer immediately. Do not continue boring without the Engineer's approval.